

Andreas Luszczak

Using Micr Dynamics

2nd Edition

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Using Microsoft Dynamics AX 2012

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Using Microsoft Dynamics AX 2012

2nd Edition

With 177 Figures



Springer Vieweg

Andreas Luszczak
Vienna, Austria

ISBN 978-3-8348-1742-6
DOI 10.1007/978-3-8348-2191-1

ISBN 978-3-8348-2191-1 (eBook)

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie;
detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>.

Springer Vieweg

© Vieweg+Teubner Verlag | Springer Fachmedien Wiesbaden 2009, 2012

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Cover design: KünkelLopka GmbH, Heidelberg

Printed on acid-free paper

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Preface

When looking for a business management solution supporting business processes in mid-sized and large companies, Microsoft Dynamics AX is likely to be your favorite. Because of its deep functional and technological integration, it is also a good choice for universities teaching ERP systems.

Reading this Book

The primary purpose of this book is to provide you with a good knowledge of the standard application concept and functionality, enabling you to run business processes in Microsoft Dynamics AX 2012. This book applies to you, if you are an end user, student, or consultant interested in learning how to use Dynamics AX.

Going beyond the operations on the user interface, you will also learn how the different parts of the application work together. As a result, you will also take advantage from learning the end-to-end application concept, if you are a system administrator, developer, IT executive or experienced consultant not knowing the complete application already.

Actually working in an application is the best way to learn it. Therefore, this book includes exercises that build up on each other in a comprehensive case study. If you need support solving the exercises, you may access a free download of sample solutions.

This book focuses on Microsoft Dynamics AX 2012 and includes the core improvements of Dynamics AX in the current version. It is based on the previous edition “Using Microsoft Dynamics AX 2009” published in 2010.

Since Dynamics AX is a very comprehensive business solution, it is not possible to cover all parts of the application in a single book. In order to provide a profound understanding of the core application, this book addresses the primary functionality in supply chain (including trade, logistics and production control) and finance management. It shows the application, but does not cover tasks in system administration and development. If you are interested in the concepts and possibilities of Dynamics AX in supply chain and various industries, you may check the books of Scott Hamilton (including “Managing Food Products Manufacturing Using Microsoft Dynamics AX 2012”).

Applicable Settings

In Dynamics AX, you can individually choose the language of your user interface. Descriptions and illustrations in this book refer to the language “EN-US”. Whereas

it is obvious that the Dynamics AX client will display different labels when choosing languages like Spanish or Russian, you will also notice differences when selecting British English. For example, the label for the field “Sales tax” is “VAT” in British English. Other possible differences of your application to the descriptions in the book are applicable local features as well as specific modifications implemented in your Dynamics AX system.

In order to benefit from the explanations, it is useful to access a Dynamics AX application. A separate test application for doing the exercises minimizes the risk of affecting real company data.

This book is based on the initial version of Microsoft Dynamics AX 2012. The exercises and illustrations refer to a sample company “Anso Technologies Ltd.”, which shows a simple setup limited to the functionality described. In order to grant flexibility for selecting the training environment, the tasks in the exercises are specified in a way that you can also choose the Microsoft standard demo environment (“Contoso”) or any other test environment.

Available Support

In order to download the solutions to the exercises in this book and other applicable resources, please access the online service of the publisher or choose the following web site:

<http://axbook.addyn.com>

If you have any comments or questions regarding the book or the related exercises, please contact me through the web site mentioned above or via e-mail to *lua@addyn.com*.

Acknowledgements

Many people have been involved in finalizing this book, directly and indirectly, from the first edition in German to the current English edition. I want to thank all of them. In particular, I would like to mention:

- Matthias Gimbel (Senior Consultant at STZ IT-BusinessConsulting)
- Ingo Maresch (Head of Dynamics AX product management at FWI Information Technology)
- Keith Dunkinson (Owner at ERP advisers)

Thank you also to editorial team Bernd Hansemann and Maren Mithöfer. Finally, my special thanks go to my family – Sonja, Felix and Caroline.

Andreas Luszczak

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1 What is Microsoft Dynamics AX?

Dynamics AX is Microsoft's core business management solution, designed to meet the requirements of mid-sized companies and multinational organizations. Based on state-of-the-art architecture and deep integration, Dynamics AX shows comprehensive functionality while ensuring high usability at the same time.

In version AX 2012, Dynamics AX shows a vast number of new features and enhancements. Main innovations include the new user interface consequently implementing the role tailored user experience across the application, increased capabilities in administration, finance and product data management supporting enterprises with multiple legal entities and organizational hierarchies, and an enhanced industry foundation.

1.1 Axapta and the History of Dynamics AX

Dynamics AX in its origin has been developed under the name *Axapta* by Damgaard A/S, a Danish software company. The first version released to market has been published in March 1998. At that time, the founders of Damgaard – Erik and Preben Damgaard – have already had more than ten years of experience designing ERP systems. Among others, they have been co-founders of PC&C, where they joined the development of Navision (now Dynamics NAV).

Version 1.0 of Axapta has been available in Denmark and the USA only. Version 1.5, published in October 1998, included support for several European countries. Releasing version 2.0 in July 1999 and version 3.0 in October 2002, Axapta provided continuously increasing application functionality and support of additional countries. Until releasing Axapta under the new brand Dynamics AX in version 4.0, improvements have been deployed in a number of service packs.

After signing a merger agreement in November 2000, Damgaard A/S united with the local rival Navision A/S, a successor of PC&C. Finally, Microsoft acquired Navision-Damgaard in May 2002 and accepted their main products, Navision and Axapta, as the core business solutions of Microsoft. Whereas Dynamics NAV (Navision) in functional and technological aspect applies to small companies, Dynamics AX (Axapta) is the product for mid-sized and large companies.

When releasing version 4.0 in June 2006, Microsoft rebranded Axapta to Dynamics AX. Microsoft Dynamics AX 4.0 differs from previous versions not only by functional enhancements but also by a new user interface, showing a complete redesign with a Microsoft Office-like look and feel.

In June 2008, Dynamics AX 2009 has been published including role centers, workflow functionality and an improved user interface. Dynamics AX 2009 also

provided enhanced functionality, including the multisite foundation and additional modules ensuring an end-to-end support for the supply chain requirements of global organizations.

Dynamics AX 2012 has been published in August 2011, updating the user interface to match the current versions of Microsoft Windows and Microsoft Office. Role-based security, the new accounting framework including segmented account structures, the enhanced use of shared data structures and other features facilitate collaboration across legal entities and operating units within the application, also suitable to large multinational enterprises.

1.2 Dynamics AX 2012 Product Overview

Microsoft Dynamics AX is an adaptable business management solution, which is easy to adapt and nevertheless applies to installations of multinational companies. Another characteristic is the deep integration to Microsoft technologies and applications like Microsoft SQL Server, SharePoint Services and BizTalk Server.

Most people are familiar to Dynamics AX from the very first start, since the user interface is already known from Microsoft Windows and Microsoft Office. The intuitive user experience helps to start working in Dynamics AX easily and efficiently, supported by a tight integration to other Microsoft software. Role centers grant an easy and fast overview of information required by individuals.

1.2.1 Functional Capabilities

The end-to-end support of business processes across the whole organization allows integrating external business partners like customers and vendors on the one hand and internal organization units on the other hand.

Multi-language, multi-country and multi-currency support, the organization model for managing multiple hierarchies of operating units and legal entities, and the option to manage several sites within one legal entity make it possible to manage complex global organizations in a common database.

The basic ERP capabilities of Dynamics AX include following main areas:

- Sales and marketing
- Supply chain management
- Production
- Procurement and sourcing
- Service management
- Financial management
- Project management and accounting
- Human capital management
- Business intelligence and reporting

Supplementing the basic ERP solution, industry specific capabilities for manufacturing, distribution, retail, services and the public sector included in the core standard application provide a broad industry foundation.

High scalability and adaptability make it easy to manage changes in the organization and in business processes. As an example, you may limit deployment to functions like finance at the beginning and simply add new functional areas like production or warehouse management later. Enhancing Dynamics AX with additional users or legal entities is as well possible any time.

Local features are available to comply with country-specific requirements. You may activate local features applying appropriate parameter settings or configuration keys.

1.2.2 Business Intelligence

In order to access data for analysis, integrated functionality for reporting and business intelligence grants a fast and reliable presentation of business data. Business intelligence features are not only available for analysis in finance, but also for users in all other areas of Dynamics AX who need to analyze their data. Depending on the requirements, different types of reporting tools including structured and ad-hoc reports are required.

In Dynamics AX, business intelligence is based on the platform of the Microsoft SQL Server. The basis for structured Dynamics AX standard reports is provided by SQL Server Reporting Services (SSRS). Business intelligence components like Key Performance Indicators apply OLAP cubes, which are provided by SQL Server Analysis Services (SSAS).

1.2.3 Collaboration Features

Collaboration functionality to connect external partners is available in two ways:

- Enterprise Portal
- Application Integration Framework

The Enterprise Portal grants direct access to Dynamics AX through a regular Internet browser like Microsoft Internet Explorer. Limiting access to role-specific data, you may deploy the Enterprise Portal to internal employees as well as external customers and vendors.

The Application Integration Framework (AIF) on the other hand supports automatic data exchange with other business applications inside and outside your company. You may receive and send documents like invoices, packing slips or price lists in XML format. Applying an external converter, you may convert the documents to any other format like EDIFACT if necessary.

For legal entities within a common Dynamics AX database, Intercompany functionality enables automatic purchase and sales processes between companies.

1.2.4 Workflow

The workflow system in Dynamics AX (see section 9.4) provides configurable workflows to support routine procedures like the approval process for a purchase requisition. The workflow infrastructure in Dynamics AX is based on the Windows Workflow Foundation enabling workflow messages in Microsoft Outlook, the Enterprise Portal or the regular Dynamics AX client.

1.2.5 Implementation

Microsoft does not directly sell Dynamics AX to customers, but provides an indirect sales channel. Customers may purchase licenses from certified partners, which also offer their services to support the implementation of Dynamics AX. This support includes application training and consulting as well as system installation and the development of enhancements to the core functionality.

In order to assist the implementation of Dynamics applications, Microsoft provides a standardized implementation methodology for partners – Microsoft Dynamics Sure Step. The Microsoft Dynamics Sure Step Methodology is a comprehensive approach to implement Microsoft Dynamics solutions including project management principles and solution-specific guidelines and tools.

Additional resources including product information, customer stories and online demos are available in a global version on the Microsoft Dynamics AX web page <http://www.microsoft.com/en-us/dynamics/erp-ax-overview.aspx> as well as in a local version accessible through the Microsoft homepage of your country.

The Microsoft web pages also provide support to find an implementation partner and to access the Microsoft Dynamics Marketplace providing an overview of partner add-on solutions.

1.3 Technology and System Architecture

The development of Dynamics AX (formerly Axapta) from the very start aimed to support international implementations through multi-language, multi-currency and multi-company support as well as through a deep integration of components. Integration is not limited to components within Dynamics AX – it also includes the Microsoft software stack with Windows operating systems, SQL Server, SharePoint, Internet Information Server and other applications.

Three core technological characteristics are essential in Dynamics AX:

- Development environments
- Model driven layered technology
- Three-tier architecture

1.3.1 Development Environments

Dynamics AX 2012 stores the application objects (like tables and forms) within the SQL database. The Application Object Tree (AOT) shows a tree structure of these application objects.

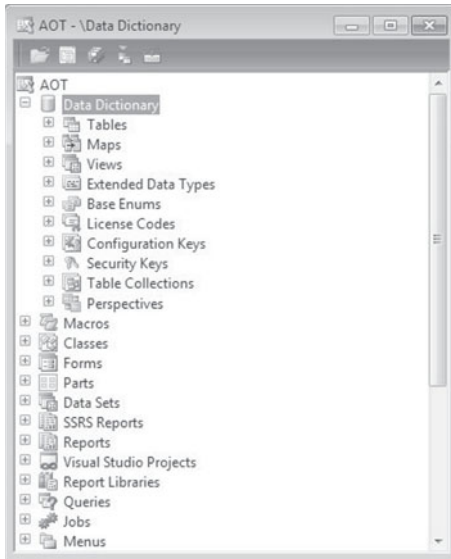


Figure 1-1: The Application Object Tree (AOT) containing programmable objects

For modifying application objects, you may choose between different development environments:

- Microsoft Visual Studio
- MorphX IDE – Integrated development environment in Dynamics AX

The MorphX IDE, which you may open in the developer workspace directly within the Dynamics AX client, provides access to the AOT for designing, editing, compiling and debugging code within the Dynamics AX client.

The Visual Studio development environment, which is closely integrated with MorphX, supports managed code and is required for some tasks like creating reports. Reports in Dynamics AX 2012 are only delivered by SQL Server Reporting Services (SSRS).

The programming language in the MorphX development environment is X++, an object-oriented, proprietary language similar to C# and Java. Since application objects in MorphX show an open source code, you may adjust and enhance Dynamics AX functionality in the development environment.

1.3.2 Layer Technology

Applying a layer structure, Dynamics AX provides a hierarchy of levels in the application source code separating the standard application from modifications. Different application object layers make sure that customer-specific modifications

do not interfere with standard objects stored in other layers. The layering system therefore facilitates release upgrades on the one hand and the implementation of industry or generic solutions on the other hand.

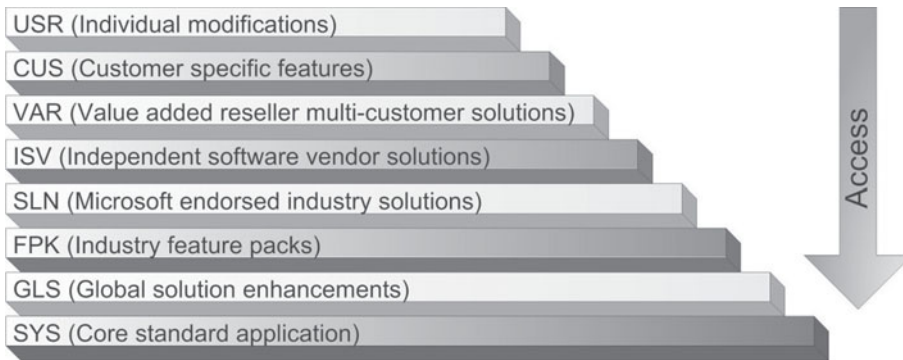


Figure 1-2: Hierarchy of application object layers in Dynamics AX 2012

The lowest object level in Dynamics AX is the SYS layer, which together with the GLS layer contains the core Dynamics AX standard objects. The FPK layer containing industry solutions and features is the third layer of the base solution reserved for Microsoft. The layers SLN, ISV and VAR are available for partners and independent software vendors (ISV) to provide industry, vertical or multi-customer solutions. The highest object level is the USR layer, which contains installation specific modifications.

In addition, every layer refers to a patch layer with a name ending with “P” (e.g. “USP” for the USR layer). The patch layers are reserved for application updates to the related regular layer.

When accessing the Dynamics AX application, the kernel looks for a version of every object required. The version search starts from the highest layer, the USR layer. If no object version is available in the USR layer, the kernel will go through the lower layers until finding the object – locating it in the SYS layer if no modifications apply.

If you have modified the vendor list page as an example, Dynamics AX will run the form *VendTableListPage* that you have modified in the USR layer and not the standard object with the same name in the SYS layer.

1.3.3 Three-Tier Architecture

In order to support large implementations with a high number of users, Dynamics AX consequently applies a three-tier architecture. The three-tier architecture is characterized by separating database, application and client.

Data managed in Dynamics AX 2012 are stored in a relational Microsoft SQL Server database. For large installations, you may use a database cluster.

The application tier contains the business logic of Dynamics AX, executing the code designed in the development environment. It may run on a single Application Object Server (AOS) or on a server cluster to support large implementations.

The client tier contains the graphical user interface, which is required to process data input and output. Apart from the regular Dynamics AX Windows client, web browsers (applying the Enterprise Portal), Microsoft Office (applying Office add-ins) and other applications (e.g. for mobile devices) are further options to access to relevant parts of the Dynamics AX application.

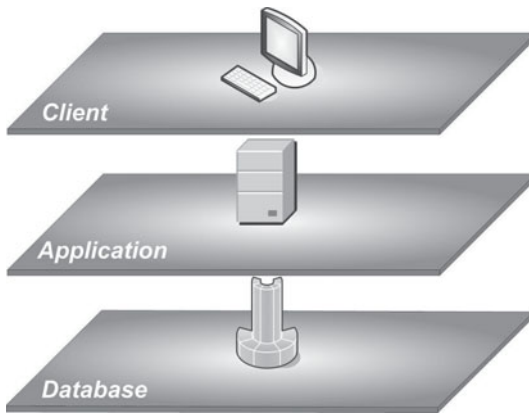


Figure 1-3: The three-tier architecture in Dynamics AX

Database, application (AOS) and client usually run on different computers. In case of small implementations, you may also install database and application together on a single server. For testing purposes, all three tiers may run on a common device.

1.3.4 Data Structure

When working in a module of Dynamics AX (or any other business software), you are accessing and creating data describing processes (e.g. item transactions). As a prerequisite for transactions, you need to manage data describing objects (e.g. customers).

In order to group the different kinds of data, you may distinguish three data types:

- Setup data
- Master data
- Transaction data

Setup data determine the way business processes work in Dynamics AX. As an example, you may choose to apply warehouse locations, pallets or serial numbers in the setup. Apart from modifying programmable objects, setup is the second way to adapt the application according to the requirements of an enterprise. Setup data

are entered when initially setting up the system. Later modifications of core setup data need to be checked carefully.

Master data describe objects like customers, ledger accounts or products. They do not change regularly, but only at the time related objects change – for example when a customer gets a new address. Master data are entered or imported initially before a company starts working in the application. Later on, you need to insert or edit master data occasionally depending on your business.

Transaction data are continuously created when processing business activities. Examples for transaction data are sales orders, invoices or item transactions. In Dynamics AX, the application generates transaction data for every business activity. Registration and posting of transaction data complies with the voucher principle.

1.3.5 Voucher Principle

Vouchers base on master data like ledger accounts, customers or products. If you want to post a transaction, you need to register a voucher containing a header and one or more lines first. It is not possible to post a voucher as long as it does not comply with the rules defined by setup data and the Dynamics AX-internal business logic. Once a voucher is posted, it is not possible to change it any more.

Some minor vouchers like quarantine transactions show exceptions regarding the voucher structure, however. They do not contain a separate header and lines part.

Examples for vouchers in Dynamics AX are orders in sales or purchasing as well as journals in finance or inventory management. After posting, the posted documents are available as packing slips, invoices, ledger transactions or inventory transactions.

2 Getting Started: Navigation and General Options

One of the core principles of Microsoft Dynamics AX is to grant a familiar look and feel to people, who are used to Microsoft software. However, business software has to adapt to business processes, which may be quite complex.

2.1 User Interface and Common Tasks

Before we start to go through business processes and case studies, we want to look at the general functionality in this chapter.

2.1.1 Logon and Authentication

Microsoft Dynamics AX logon is Active Directory based, applying Windows authentication. You do not need to log on to Dynamics AX with separate credentials as a result. After selecting the Dynamics AX icon on the PC desktop or in the start menu, you are automatically connecting to the Dynamics application using your Windows account.

The Dynamics AX user-ID, company (legal entity) and language derive from your user options, which you may change inside Dynamics AX.



Figure 2-1: Icon for Microsoft Dynamics AX on the PC desktop

Sometimes you need to use different user accounts within Dynamics AX – e.g., if you have to check user permissions. In this case, you have to make sure that the user you want to apply is set up in Active Directory administration. In order to start Dynamics AX with a user that is different from your current Windows account, you need to choose the option “Run as different user” in the pop-up menu (shown pressing the *Shift* key while doing a right-hand click) of the Dynamics AX-icon.

If you want to close your session and to logoff from Dynamics AX, you may do it in the same way as you do in any other Windows program: You may select the shortcut key *Alt+F4*, the menu option *File/Exit* or the button  on the top right-hand corner of the Dynamics AX workspace. If you have opened several workspace windows, you will log off when you close the last workspace.

2.1.2 User Interface

When starting Microsoft Dynamics AX, the Dynamics AX workspace will be the first window you see. The content of the workspace depends on the system

configuration on the one hand, and on your permissions and individual settings on the other hand.

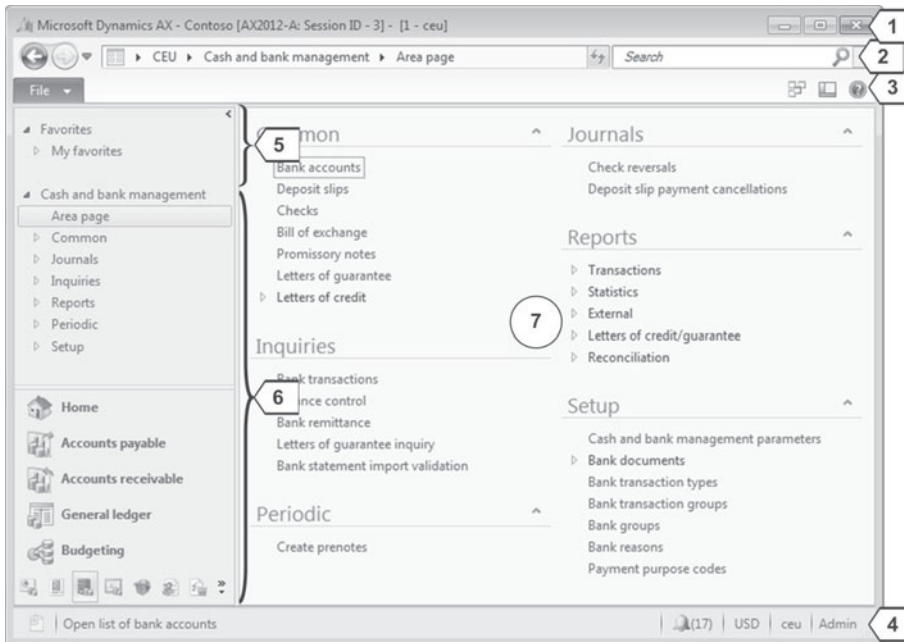


Figure 2-2: Dynamics AX workspace, showing an area page in the content pane

The workspace of Microsoft Dynamics AX 2012 consists of following areas as shown in Figure 2-2:

- Title bar [1]
- Address bar [2]
- Command bar and jewel menu[3]
- Status bar [4]
- Favorites [5]
- Navigation pane [6]
- Content pane [7]

2.1.2.1 Title Bar

The title bar shows the name of the application (“Microsoft Dynamics AX”) as well as the name of the organization holding the Dynamics AX license, the server name, the session ID, and the current company.

2.1.2.2 Address Bar

The address bar (breadcrumb bar) provides navigation possibilities known from the Windows Explorer and present-day Internet browsers. It shows a “breadcrumb” trail of the pages that you have opened in the content pane, enabling you to go back and forward clicking the travel buttons *Forward* and *Back*.

The address field shows the path of the current page and allows navigation to other companies, modules and pages.

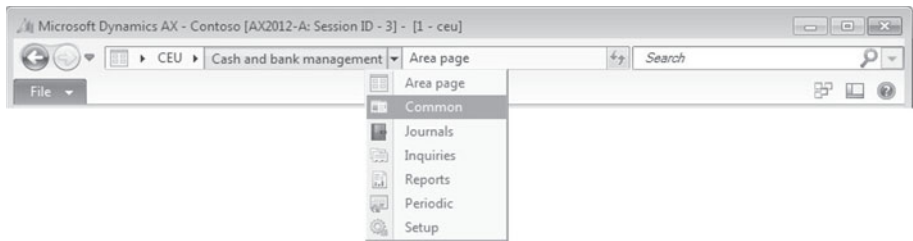


Figure 2-3: Navigating Dynamics AX in the address bar

In the right part of the address bar you will find the search box to access the enterprise search (see section 2.1.6). The search box, which is available if you have enterprise search enabled, provides access to Dynamics AX data as well as help topics.

2.1.2.3 Command Bar and Jewel Menu

The jewel menu contains commands that are globally available within Dynamics AX. This includes common Windows commands like *Copy* and *Paste* as well as specific Dynamics AX commands like *Filter* and *Document handling*. Depending on the content page, some commands are not active. If a certain command is as well accessible by a shortcut key, it will show on the right hand side of the particular command selection.

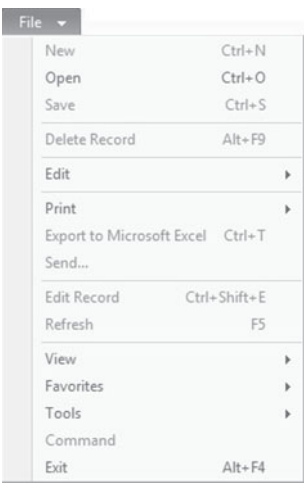


Figure 2-4: The jewel menu in Dynamics AX

In the right part of the command bar, you may find following buttons:

- Windows  to switch between forms.
- View  to change workspace settings.
- Help  to show the online help.

The options to change workspace setting are not only available in the *View* button, you may access them in the jewel menu as well (command *File/View*.)

2.1.2.4 Status Bar

The status bar at the bottom of the Dynamics AX workspace consists of two different parts. On the left side of the status bar, you may see the document handling button and a short help text on the active element (field or menu item) of the workspace. On the right side, you may find information on the status of the session.

If you want to change the data shown in the status bar, you may choose appropriate settings in your user options (see section 2.3.1). If all elements are displayed in the status bar of the workspace window, you may see following fields:

- Document handling [1] – See section 9.5.1
- Help text [2]
- Notifications [3] – Alerts and workflow status
- Currency [4] – Controls currency of displayed amounts
- Application object model [5]
- Application object layer [6]
- Current company [7]
- Caps Lock status [8]
- Num Lock status [9]
- Current user [10]
- Session date [11]
- Session time [12]
- AOS name [13] – Server name
- Operation progress indicator [14] – Shows database activity



Figure 2-5: The status bar in the Dynamics AX workspace (all elements displayed)

The status bar not only displays information, it also offers additional functionality. You may start certain functions by double-clicking following fields in the status bar:

- Notifications – Opens the notifications form.
- Currency – Opens the currency converter, which gives you the possibility to show currency amounts in different currencies.
- Current company – Switch between companies (legal entities).
- Session date – Default for the posting date in the current session.

In detail forms, the status bar looks a little different from the way it looks in the Dynamics AX workspace. As shown in the section on master detail forms below,

the status bar in detail forms additionally provides the option to scroll between records and to switch between the view mode and the edit mode.

2.1.2.5 Navigation Pane

The navigation pane on the left hand side of the Dynamics AX workspace provides access to list pages and forms. List pages and detail forms are the place to work in the different modules of Dynamics AX as described in section 2.1.3 and 2.1.5 in more detail.

In order to hide the navigation pane completely, you may select the button *View / Navigation Pane* in the command bar. If you just want to prevent the navigation pane to show completely all the time, you may collapse the navigation pane automatically to a left-hand sidebar by choosing the button *View/Auto-Hide Navigation*, the shortcut key *Alt+Shift+F1* or the arrow (<) in the top right corner of the navigation pane. If Auto-Hide is enabled, the navigation pane will show completely whenever you move your mouse pointer to the navigation sidebar.

2.1.2.6 Favorites

Whereas the navigation pane grants access to all menu items in a uniform structure, the favorites pane (see section 2.1.3) allows arranging menu items the way you prefer for personal use. This way you can easily access list pages, forms, inquiries and reports you need frequently. The functionality of favorites in Dynamics AX is similar to the administration of favorites in Microsoft Outlook or Internet Explorer.

In order to adjust the workspace elements according to your needs, you may show and hide items like the favorites pane or the navigation pane by selecting the appropriate option in the button *View*  in the command bar.

2.1.2.7 Content Pane

The content pane shown in the center of the Dynamics AX workspace contains following types of pages:

- List pages – See description below
- Area pages – See section 2.1.3
- Role centers – See section 2.1.4

2.1.2.8 Workspace

If you need a second workspace to work in Dynamics AX, you may open a new workspace within your current session by choosing the shortcut key *Ctrl+W* or the button *Windows/New workspace* in the command bar. Another way to open a new workspace is to click the button *New Workspace* in the dialog box that displays when you want to change the company account.

2.1.2.9 List Page

A list page (like the customer page shown in Figure 2-6) provides a list of records of a particular table. You may use list pages to view and to select records as well as to complete daily tasks on those records.

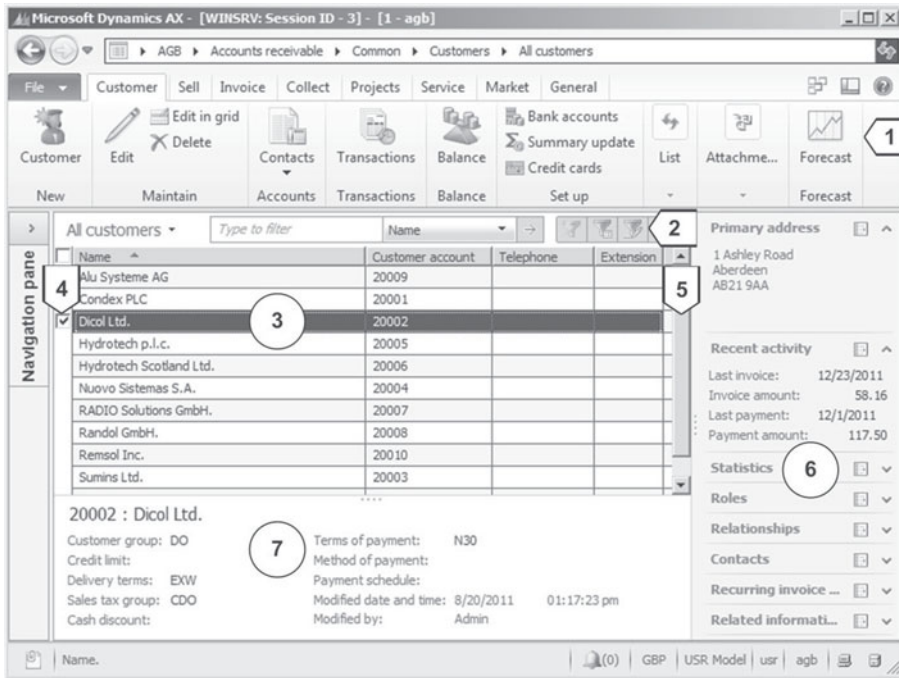


Figure 2-6: List page *Customers* (Auto-Hide Navigation enabled)

List pages show a common structure, with some elements and functions depending on the table displayed. The common structure in list pages includes the following basic elements:

- Action pane [1] – Contains the action buttons (similar to the Microsoft Office ribbon). You may distinguish action buttons to execute activities related to the selected record (like placing an order) on the one hand and action buttons to open related detail forms (displaying more information) on the other.
- The number and functionality of buttons is depending on the particular page. Depending on the number of available actions, they show on several tabs (e.g. the action pane tabs *Customer* or *Sell* in Figure 2-6).
- Filter pane [2] – Allows entering filter criteria (see section 2.1.6).
- Grid [3] – Displays the list of records
- Grid check boxes [4] – Allow selecting multiple or – if selecting the checkbox in the header line – all records.
- Scroll bar [5] – Available to scroll through the records. If you want to switch between records, you may select a pop-up menu which opens when doing a

right-hand click on the scroll bar. Alternatively, you may also choose to push the shortcut keys *PgUp*, *PgDn*, *Ctrl+Home* and *Ctrl+End*.

- Fact boxes [6] – Show a summary of additional information referring to the selected record (e.g. the primary address of a selected customer).
- Preview pane [7] – Below the grid shows more detailed information on the selected record (e.g. additional fields of the customer record).

If you do not want to show all information, you may hide fact boxes and preview pane choosing the appropriate option in the *View* button of the command bar.

A list page does not automatically refresh, if data displayed on the screen change in the database (e.g. if somebody is working on the records concerned). After editing a record in a detail form, you may want to refresh the related list page by choosing the button *Refresh*  on the right-hand side of the breadcrumb bar or the keyboard shortcut *F5*.

2.1.2.10 Detail Form for Master Data

Unlike list pages, which are there to view a list of records, detail forms are there to insert and modify single records. If you choose to work on a record in a list page by double-clicking it, Dynamics AX will open the related detail form.

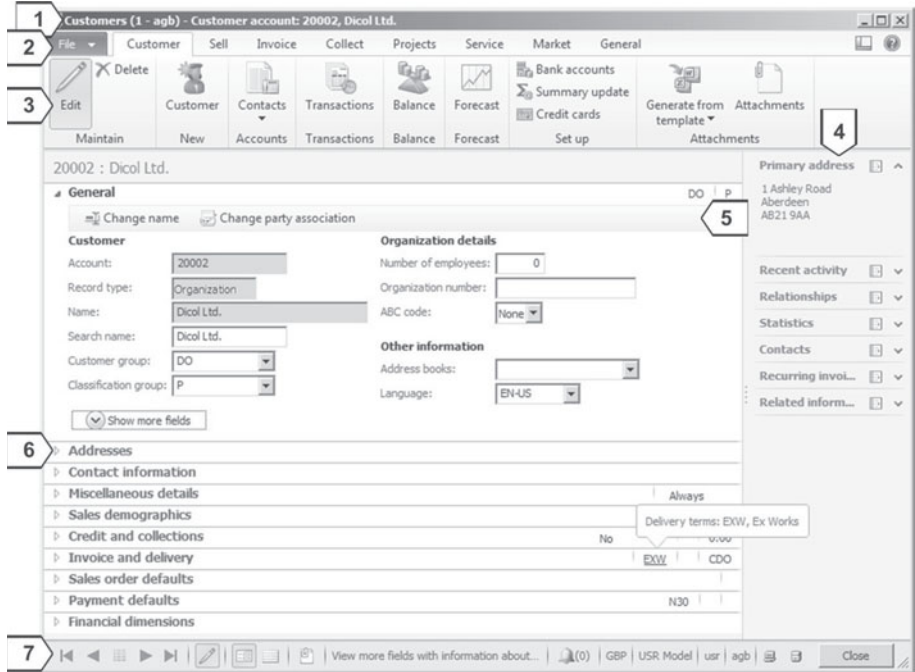


Figure 2-7: Elements of a detail form (customer detail form as an example)

Alternatively, you may access a detail form by clicking the button *Edit* on the first tab of the action pane in a list page.

Whereas list pages are shown within the Dynamics AX workspace, detail forms open separate windows, which you may move and resize on your PC desktop.

Detail forms got a common structure, which is similar to list pages. Some elements and functions depend on the particular form, however. Figure 2-7 shows the customer detail form (accessible through the list page *Accounts receivable> Common> Customers> All customers*) as an example for the structure of detail forms.

The common structure of detail forms includes the following basic elements:

- Title bar [1] – Shows the form name, the current company account (if chosen in the users options) and the identification of the selected line. For illustration, the example in Figure 2-7 shows the number and name of customer “20002” in the company account “AGB”.
- Command bar [2] – Includes jewel menu, *View* and *Help* button.
- Action pane [3]
- Fact boxes [4]
- Action pane strips [5] – Provides access to actions in case there are only a few options available. On the one hand, you may find action pane strips on fast tabs as shown in Figure 2-7, and on the other hand they may replace the full action pane on the top of forms, which only contain a few actions – e.g. in the customer groups form (*Accounts receivable> Setup> Customers> Customer groups*).
- Fast tabs [6] – Groups fields according to their functional area. In comparison to regular tabs, fast tabs additionally show summary fields displaying core data directly on the tab. In Figure 2-7, the fast tab *Invoice and delivery* for example shows the delivery terms “EXW”. You may expand fast tabs by clicking the particular tab. A right-hand click on a tab provides the option to expand or collapse all tabs at the same time.
- Status bar [7] – Shows additional options to move between records (depending on the status bar settings in your user options) in comparison to the status bar in the workspace. Apart from the buttons *Ctrl+PgUp* , *Ctrl+Home* , *Ctrl+PgDn* , *Ctrl+End*  to change the selected record (e.g. moving to another customer in Figure 2-7), you may also choose to view a list of records by clicking the button *Grid View* .

Another option available in the status bar is to switch between the view mode and the edit mode clicking the button *Edit* .

Section 2.1.5 later in this book contains more information on editing records, working with fast tabs and other options available in list pages and detail forms.

2.1.2.11 Grid View

The grid view in detail forms is an option for viewing a list of records. If you select a record in the grid view and return to the details view clicking the button *Details View*  in the status bar, you will see the details of the record selected.

Compared to list pages, which are the starting point to access a detail form, the grid view additionally provides the possibility to edit records. Therefore, you may choose the grid view in edit mode for mass editing data.

Apart from accessing the grid view in the detail form, you may also choose the button *Edit in grid* on the first tab of the action pane in the list page.

2.1.2.12 Detail Form for Transaction Data

In addition to the detail forms for master data described above, Dynamics AX also contains specific detail forms for transaction data like the sales order form shown in Figure 2-8.

Type	Item number	Product name	Sales category	Quantity	Unit	Site
	4001	A2400E External antenna for M2400S		10.00	Pcs.	HQ
	3001	S868S Radio transmission kit 868 MHz		1.00	Pcs.	HQ
			Services	1.00	hour	HQ

Figure 2-8: Sales order form as an example of detail form for transactions

In order to access a transaction detail form from a list page (e.g. the sales order list page *Sales and marketing> Common> Sales orders> All sales orders*), you may apply the same actions as in master data list pages. When accessing transaction detail forms, the fast tab *Lines* expands providing the option to immediately enter lines for the header selected in the list page before.

In the action pane strip of the lines tab, you may choose actions against individual lines as required. If you need to edit details not available in the line grid, you may expand the fast tab *Line details*. In order to structure the field display, the line details fast tab frequently contains several sub-tabs at the bottom.

If you need to view more information on the header, you may expand the header tab. In addition, you may click the button *Header view* in the action pane granting access to all information of the header record. The action button *Line view* will take you back to the lines.

2.1.2.13 Setup Forms

In comparison to detail forms for master data and transactions, setup forms show a simple layout. Dynamics AX 2012 contains the following kinds of setup forms:

- Simple list – Editable grid with an action pane strip, e.g. customer groups (*Accounts receivable> Setup> Customers> Customer groups*).
- Simple list & Details – Two pane form showing the list of records on the left side and editable detail fields on the right side, e.g. terms of payment (*Accounts receivable> Setup> Payment> Terms of payment*).
- Parameter form – Showing a table of contents (similar to the tab structure) on the left and referring fields on the right, e.g. accounts receivable parameters (*Accounts receivable> Setup> Accounts receivable parameters*).

2.1.2.14 New in Dynamics AX 2012

Based on the new design principles for the user interface (initially available in Dynamics AX 2009 list pages), the Dynamics AX client has completely changed in Dynamics AX 2012. List pages and detail forms with fact boxes, fast tabs and action panes now completely replace the forms available in Dynamics AX 2009.

2.1.3 Navigation

There are four ways to open pages and forms in Microsoft Dynamics AX:

- Navigation pane
- Address bar
- Area pages (in the content pane)
- Favorites pane

2.1.3.1 Navigation Pane

Whereas the favorites pane usually contains a limited number of menu items that you want to use frequently, the other options (navigation pane, address bar and area pages) show all items for which you have appropriate permissions.

You may customize the appearance of the navigation pane clicking the button  in the command bar. Apart from hiding or showing the favorites or the navigation pane, you may also hide or move modules choosing the *Navigation Pane Options*.

If all areas of the workspace are available and shown, the Dynamics AX application window consists of following navigation items as shown in Figure 2-9:

- Module buttons [1]
- Menu items [2]
- Common tasks [3]
- Journals [4]
- Inquiries [5]
- Reports [6]

- Periodic activities [7]
- Setup [8]

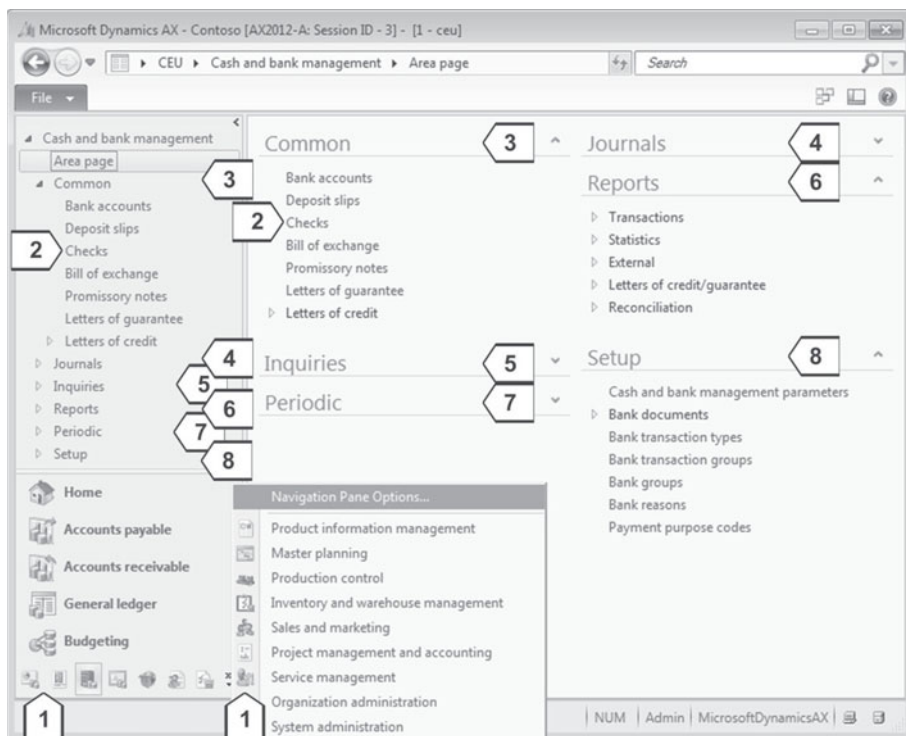


Figure 2-9: Navigation in Dynamics AX 2012 (Favorites pane not shown)

2.1.3.2 Modules

The structure of the navigation pane complies with functional areas like *Accounts payable*, *Budgeting* or *Production control* referring to the different standard roles in the industry.

By default, the first module button is the *Home* menu (see section 2.1.4), followed by functional modules. The module buttons *Organization administration* and *System administration* refer to basic settings and tasks in the system and its companies.

Depending on the space available, the first module buttons display including the module name, followed by modules only showing module icons. If you need to open further modules, you may click the button  right next to the module icons.

After clicking a module button, the workspace shows the menu items of the selected module in the navigation pane and in the area page. The name of the module displays in the title bar of the navigation pane. Whereas the basic structure for navigation is common to all modules as shown below, the subfolders and menu items are different in every module.

2.1.3.3 Menu Structure

The options in the folder **Common** (daily tasks) provide access to list pages for frequent tasks in the particular module, e.g. sales order management in the *Sales and marketing* module.

The folder **Journals** contains forms that are required to enter and post transaction data.

The folder **Inquiries** contains reporting and analysis forms directly showing results on the screen.

Unlike *Inquiries*, the menu items in the folder **Reports** generate a printout on paper. If you do not need an actual hard copy, you may also display a print preview or save the report to a file.

The folder **Periodic** contains items, which are not required frequently. In this folder, you may find menu items for tasks like month closing or summary updates.

The folder **Setup** grants access to configuration data of the particular module. Configuration data are entered when a company (legal entity) is set up initially. Later you will usually change configuration only if an alteration in business processes causes new functional requirements for Dynamics AX.

Some settings should not be changed without a deep knowledge of the Dynamics AX functionality to ensure data integrity in line with correct data in finance. In general, system administrators will set the permissions for the *Setup* folder in a way that regular users may not edit sensible configuration data.

2.1.3.4 Area Page

The first selection of the *Places* area in every module is the area page. The structure of the area page complies with the structure of menu items in the navigation pane. You may open folders and menu items in the area page like you do in the navigation pane.

2.1.3.5 Address Bar

By navigating the address bar you may access list pages and folders available in the navigation pane. When selecting a menu folder in the address bar, available menu items are shown in the workspace.

In addition to the options available in the navigation bar and area page, you may switch companies in the address bar.

2.1.3.6 Favorites

The favorites pane grants the possibility to all users to set up folders and menu items individually according to their particular needs. If you want to add a form or list page to your favorites, you need to select the particular menu item in the navigation pane or in the area page and to choose the option *Add to favorites* in the pop-up menu, which opens by doing a right-hand click.

If you want to hide the favorites pane, you may click the button *View/Show Favorites in Navigation Pane* in the command bar of the workspace.

You may edit your favorites selecting the command *Favorites/Organize favorites* in the jewel menu. As shown in Figure 2-10, favorites administration displays a dialog box known from other Microsoft applications. In order to establish a structure for your favorites, you may create folders and subfolders moving the menu items as needed.

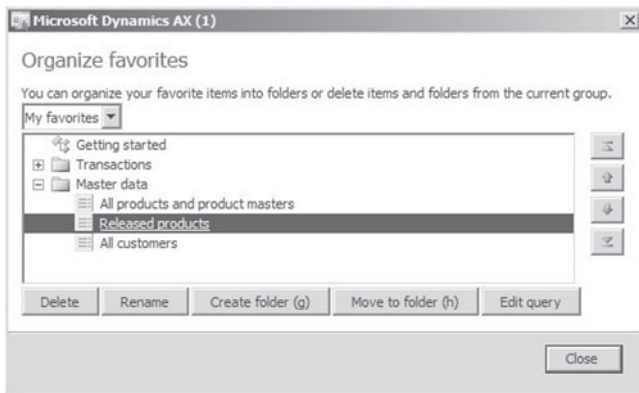


Figure 2-10: Favorites administration dialog box

A feature not available for menu items in the navigation pane is accessible by clicking the button *Edit query* in the favorites administration. This button allows assigning a filter to a form or a list page, which applies whenever you open the particular favorites item. You may choose the query feature if you want to show two separate favorites for one menu item as well – e.g. one for domestic and one for foreign customers. Section 2.1.6 explains how to enter and apply such filters.

2.1.3.7 New in Dynamics AX 2012

In Dynamics AX 2012, the module structure has changed to better comply with role tailored navigation. Examples are the module *Product information management* holding *Products* (former *Items* in *Inventory management*) and *Product builder* or the modules *System administration* and *Organization administration* replacing *Basic* and *Administration*.

Since detail forms are only accessible through the related list page, there is no direct link to detail forms in navigation areas any more.

2.1.4 Home Menu

The home menu, which usually is the first menu in the navigation pane, contains items referring to general tasks. Except for the role center, the home menu therefore shows options and menu items not related to a specific functional role.

2.1.4.1 Home Menu Items

The first item in the home menu is the role center. The other items in the home menu show the regular structure of a module, including area page, common tasks, inquiries, reports, periodic activities and setup.

The options in the area page of the home menu compile menu items from all functional areas, which are relevant for any kind of user. These items include:

- Global address book (see section 2.4)
- Work items, referring to workflow management (see section 9.4.3)
- Cases, referring to case management (see section 9.5.2)
- Activities, referring to sales and marketing
- Absences, referring to human resources
- Time and attendance, referring to human resources
- Timesheets, referring to project management and accounting
- Questionnaires, referring to human resources
- Document management (see section 9.5.1)

2.1.4.2 Role Center

Role centers are customizable role-based homepages, showing an overview of data frequently required. Elements available in role centers include task lists, reports, alerts and analysis views. You may display your role center in the Enterprise Portal (web interface) as well as in the regular Dynamics AX client window, where it is the homepage of your workspace.

The standard application of Dynamics AX 2012 contains multiple role centers, which support different roles like purchasing agent, sales manager or controller. If you have access to the development environment, you may set up additional role centers.

Role centers do not directly refer to the security roles in the role based security concept (see section 9.2.3). The applicable role center of a user is determined by the assigned user profile – and not by assigned security roles.

User profiles represent specific roles in the organization, grouping users with a common role center. In order to set up user profiles, you have to choose the menu item *System administration> Common> Users> User profiles*. If you want to add a user to a user profile, you may click the button *Add user* after selecting the appropriate profile line. You may assign a user to the same user profile for all companies or select different profiles per company.

In the fact box *Profiles for selected user* of the user list page and form (*System administration> Common> Users> Users*), you may view which user profiles are assigned to a specific user. Clicking the button *Profiles* in the user form, you get access to the user profiles form as shown above.

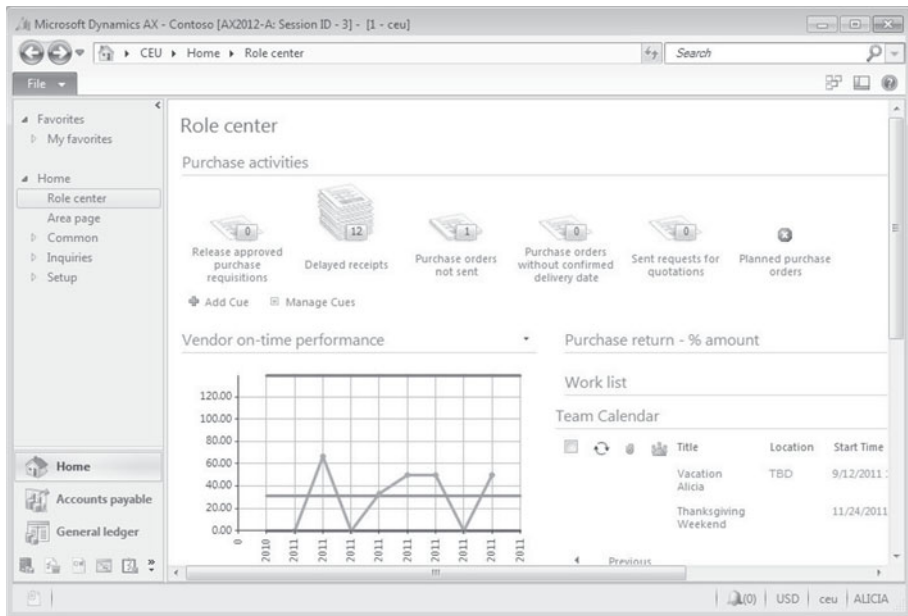


Figure 2-11: Role center for a purchasing agent in Dynamics AX

Cues are a unique element in role centers. Their main purpose is to show remaining work tasks graphically – e.g. the number of purchase orders not sent in Figure 2-11. In addition to a graphic sign, every cue also displays a selected key figure representing the workload for the responsible person. A mouse click on a cue opens the related form in Dynamics AX, where you can do your work.

In order to create a cue, you want to save a filter as a cue in a list page or form (see section 2.1.6). If you have appropriate permissions in Microsoft SharePoint, you may add the new cue to a Web part of your role center page.

As a prerequisite to use role centers, Microsoft SharePoint and the Enterprise Portal Framework need to be available.

2.1.4.3 New in Dynamics AX 2012

In Dynamics AX 2012, the home menu not only contains the role center but compiles menu items relevant for all users.

2.1.5 Working with Records

When choosing a menu item in order to access master data or transactions, Dynamics AX will show the appropriate **list page**. List pages therefore are the starting point for working on items, giving you the possibility to search and filter records you want to view.

Action buttons in the list page provide the option to edit, delete and insert data according to your permissions. It is not possible to edit data in a list page itself,

however. When clicking the action button *Edit* after selecting a line, Dynamics AX will take you to the related **detail form**.

2.1.5.1 Viewing Records

Detail forms contain more information on a selected record of the list page, which is why you may access them for viewing with double-click or the *Enter* key on any line.

Fast tabs on detail forms will expand by clicking them or by pushing the shortcut key “*Ctrl*” + “+”. If you want to collapse an individual fast tab, you may click on the fast tab header again or push the shortcut key “*Ctrl*” + “-”. Further options are available doing a right-hand click on tab headers. If you select to expand all tabs, you may scroll through the complete record information (e.g. using your mouse wheel).

In some tabs you may find less important fields, which are not shown immediately when expanding the tab. In this case, the expanded tab shows the button  *Show more fields* in order to display those fields.

2.1.5.2 Edit/View Mode

Depending on the settings of the form, a detail form usually opens in view mode, which prevents data to be changed unintentionally. If you are in view mode and want to edit a record, you get several options to switch to the edit mode: The button *Edit* in the status bar and in the action pane, the command *File/Edit record* or the shortcut key *Ctrl+Shift+E*.

If you want a certain form to start always in edit mode, you may click the button *View/Default Form/View Edit Mode* in the command bar of the form. If you want to individually set the general default to *Edit* or *View*, you may choose the appropriate setting in the *General* section of your user options.

2.1.5.3 Inserting Data

If you want to insert a record, you may choose the shortcut key *Ctrl+N*, the command *File/New* or the button *New* in the action pane.

In many list pages, a *Quick create* dialog form (see Figure 2-12) displays. The quick create dialog contains the core fields of a record, making it possible to insert records in a fast way. If you need to enter additional data, you may click the button *Save and open* at the bottom of the dialog to switch to the related detail form. Depending on the page, the *Save and open* button includes additional options – e.g. to switch to the sales quotation form immediately when inserting a customer.

If there is no quick create dialog available in a certain list page, Dynamics AX will take you to the related detail form showing an empty record (presuming no templates apply, see section 2.3.2). The detail form shows as well an empty record, if you are in a detail form and decide to insert a record there.

Figure 2-12: Quick create dialog form

If there is a required field on a collapsed fast tab, the fast tab will show the *required field indicator* (*).

In the lines of a transaction form (e.g. sales order lines), you may insert a new record by simply pushing the key *PgDn* (or the *Down Arrow*) in the last line of the grid.

2.1.5.4 Editing Data

Before you may edit a record in a detail form (detail view as well as grid view), you need to make sure you are in the edit mode. In order to switch between the fields of the form, you may choose the mouse as well as the *Enter* or the *Tab* and the *Shift+Tab* key.

Once you have finished entering or viewing record data in a detail form, you may close it clicking the button *Close* at the bottom (the command *File/Close* and Windows standard options like the shortcut key *Alt+F4* or the  top right will work as well).

If inserting a record by mistake which contains a mandatory field, you have to delete it as described below if you want to cancel registration – even if you did not enter any record data. In a quick create dialog, you may click the button *Cancel* at the bottom for this purpose.

There are options available to save a record in detail forms manually – the command *File/Save* as well as the shortcut key *Ctrl+S*. Usually you do not apply them, however, since Dynamics AX saves every change of a record automatically

when you leave the record. If you close a form pushing the *Esc* key, Dynamics AX will ask if you want to save the changes. The confirmation dialog for saving changes also shows if selected in the user options (see section 2.3.1).

The *Undo*-function, available by selecting the command *File/Edit/Undo* or the shortcut key *Ctrl+Z*, refers to the content of fields. It is only available as long as you do not leave the input field to which the changes apply.

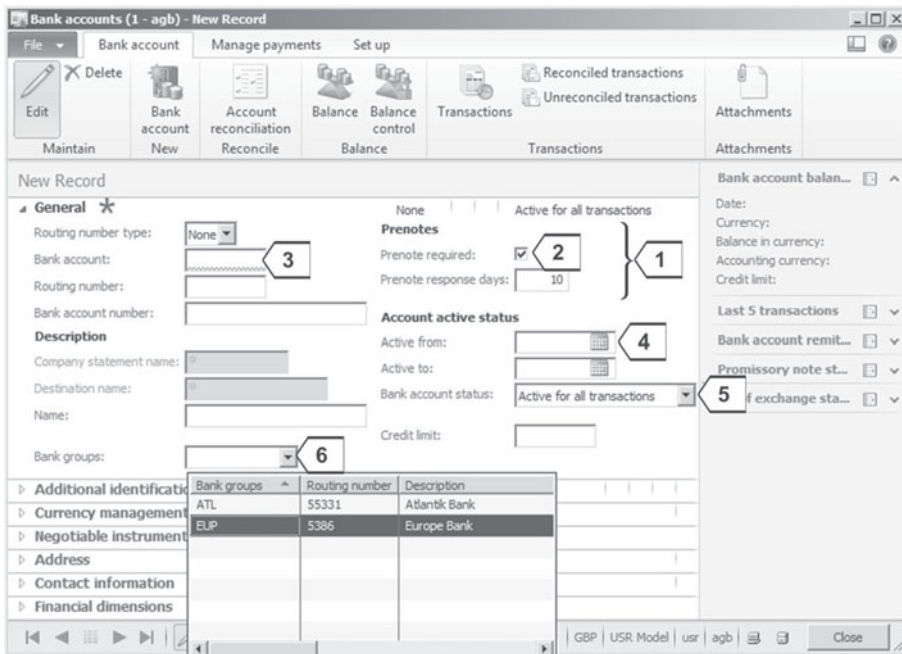
If you have left the field already, but did not select another record or manually save the record yet, you may restore the record from the database choosing the command *File/Command/Restore* or the shortcut key *Ctrl+F5*. Another possibility not to save changes is to close the form pushing the *Esc*-key or the shortcut key *Ctrl+Q* (as long as you did not leave the particular record in the form before).

2.1.5.5 Deleting Data

In order to delete the content of an input field, you want to push the *Delete* key. If you need to delete a complete record, you may choose the command *File/Delete Record* (or the shortcut key *Alt+F9* or the action button  *Delete*) after selecting the appropriate record.

In some cases, Dynamics AX shows an error message preventing you from deleting a record – e.g. if there are open transactions.

2.1.5.6 Elements in a Detail Form



Bank groups	Routing number	Description
ATL	55331	Atlantik Bank
EUP	5386	Europe Bank

Figure 2-13: Types of fields in a form (*Bank accounts* detail form in edit mode)

When registering data in a form, you have to distinguish between following elements as shown in Figure 2-13 on the example of the bank accounts detail form (*Cash and bank management* > *Common* > *Bank accounts*):

- Field group [1]
- Checkbox [2]
- Mandatory field [3]
- Date field [4]
- Lookup field with a fixed list of values [5]
- Lookup field with a related main table [6]

Other field types are textboxes and number fields. If a field is locked for data input in edit mode, it shows in gray.

Field groups link fields to increase display clearness.

Mandatory fields show a wavy red line and require data input before you can save a record. In case data input is missing, the particular fast tab shows the required field indicator (★) at the same time.

If you need to select a **checkbox** (e.g. *Prenote required* in Figure 2-13), you may click it with the left mouse button or push the *Space bar* once the cursor is on the checkbox.

Settings for **date fields** and number fields come from your Windows settings. You know date fields from the calendar icon (📅) that you may click to select a certain date. When entering a date manually, you do not need to type date separators like “.” or “/”. If the requested date is a day of the current month, you may simply enter the day (e.g. “23”). In order to enter the current date, you may type “t” (or “d” for the session date).

If you want to enter a number in a numeric field, you may apply basic arithmetical operations. As an example, you may enter “55 * 1.1” instead of “60.50” in a numeric field, if the value you want is “GBP 55.00 plus 10 %”.

2.1.5.7 Lookup fields

Lookup fields represent another important field type. These fields allow entering of predefined values only. When looking at lookup fields, we may distinguish two different types:

- Lookup fields with a related main table, which defines permitted values – e.g. *Bank groups* in Figure 2-13.
- Lookup fields with a fixed list of values, which is given by Dynamics AX enumerable types (*Enums*) – e.g. *Bank account status* in Figure 2-13.

In **Edit mode**, you may know lookup fields from the lookup button  in the right part of the field. In **View mode**, lookup fields show as a link (similar to Internet links).

When editing or inserting a record in a form, you may choose the lookup button  or the shortcut key *Alt + Down Arrow* in order to execute a value lookup in a lookup field. Another option to start a value lookup is to enter the first characters of the field content followed by an asterisk (*). If you enter “E*” in a lookup field as an example, the lookup form will automatically display and show all records starting with “E” in the key field.

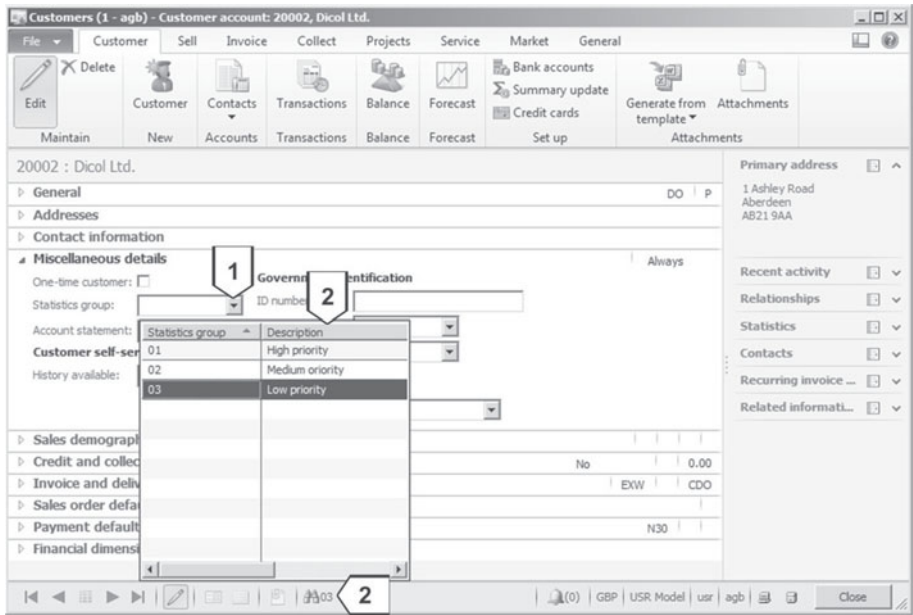


Figure 2-14: Value lookup for the statistics group field in the customer form

In the lookup form, you may select a record to insert into the lookup field by clicking it. If a value lookup contains numerous lines, you may limit the lines displayed applying the functions *Filter*, *Find* and *Sort* as shown in section 2.1.6. You should not click the left mouse button to select a column, however (this way you select a record for the lookup field). In order to select a column, do a right-hand click or push the *Tab* key (or *Shift+Tab*).

A specific feature available in lookup forms is the possibility to go to a line by typing the first characters of the requested value. As shown in Figure 2-14, you may select the first statistics group starting with “03” by typing “03” in the statistics groups lookup form. You may do this in the *Statistics group* column as well as in the *Description* column. If you want to select a record in the *Description* column, you have to push the *Tab* key to activate that column. The characters you type appear in the status line for a while.

If required, you may sort in the lookup form by any column (clicking on the column header *Description* as an example).

2.1.5.8 Table reference

Apart from value lookup, the table reference also provides the possibility to open the administration form referring to a lookup field. If you want to insert a new statistics group as an example in Figure 2-14, you may open the statistics group administration form directly from the *Statistics group* field.

In edit mode, the administration form referring to a lookup field is accessible choosing the option *View details* in the pop-up menu (which opens by doing a right-hand click) or the command *File/Command/View details* (or *Ctrl+Alt+F4*).

In view mode or non-editable fields, the table reference displays as a link providing the option to access the related administration form by a simple mouse click.

After opening a referenced table form, you may edit records in the same way as when accessing that form from the navigation pane. You may use the table reference therefore to directly insert and edit related master data. In addition, you may apply the table reference to view details of related records. As an example, you may directly switch from the sales invoice inquiry (*Accounts receivable>Inquiries>Journals>Invoice journal*) to the related sales order choosing *View details* in the column *Sales order*.

2.1.5.9 Segmented Entry Control

A special kind of lookup is available in ledger fields (e.g. in the lines of financial journals). Ledger fields merge the ledger main account and applicable financial dimensions into one field, applying segmented entry control (see section 8.3.2).

2.1.5.10 Infolog

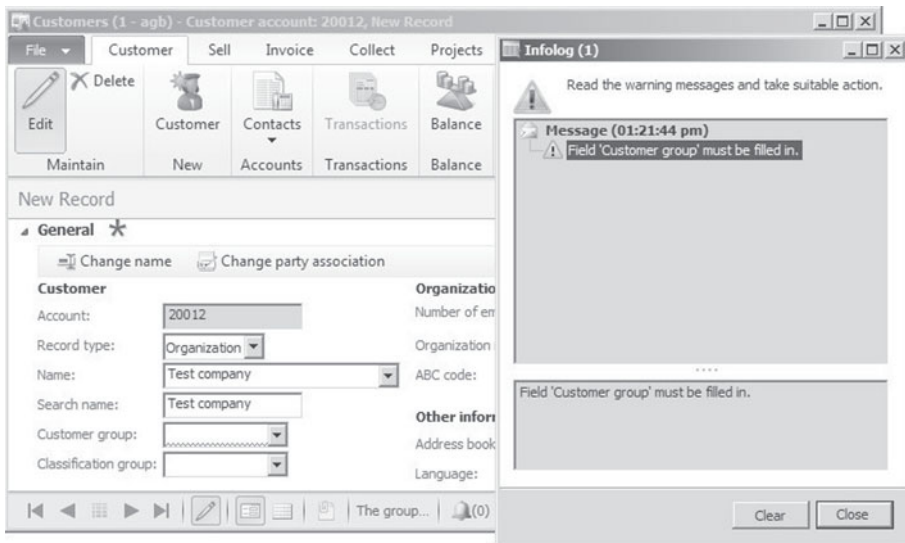


Figure 2-15: Infolog, displaying an error message in the customer form

If there is a problem with the operation that you execute in Dynamics AX, a warning or error message shows up in a separate window – the *Infolog*. It is possible to disable warnings and error messages in the user options.

You may copy or print the message displayed in the *Infolog* through a pop-up menu, which displays when doing a right-hand click on the message text.

2.1.5.11 Transaction Progress

If a transaction – e.g. running a report – is taking a long time, Dynamics AX will show a notification in the taskbar of your Windows desktop. If you do not want to wait until the transaction is finished, you may cancel the operation pushing the shortcut key *Ctrl+Break*. After confirming a dialog box – which is sometimes displayed belatedly – Dynamics AX cancels the transaction.

2.1.5.12 Basic Operations

As shown, you may apply four different elements to execute basic operations in a list page or form:

- Command bar and Jewel menu – Show options for various commands.
- Action pane
- Shortcut keys
- Pop-up menus – Are shown when doing a right-hand click.

Whereas you may find all available functions in the command bar and the action pane, the shortcut keys and pop-up menus grant access to frequently used operations only. In the Appendix, you may find an overview of shortcut keys to execute basic operations in Dynamics AX.

Note: In some forms, there are no separate buttons for standard activities like filtering. Therefore it is a good idea to memorize core shortcut keys (e.g. for filtering).

2.1.5.13 New in Dynamics AX 2012

Based on the design principles for the user interface in Dynamics AX 2012, new elements like fast tabs, fact boxes, the edit mode, the grid view or the quick create dialogs are available in detail forms. In edit mode, the former option *Go to the Main Table Form* is now called *View details*, in view mode it shows as a link.

Another new element is the segmented entry control, which refers to the new financial dimension framework (see section 8.2.4).

2.1.6 Filter, Find and Sort

In order to efficiently work in a table with numerous records, it is essential to find the records you need quickly. For this purpose, you may apply the functions *Filter*, *Find* and *Sort* in list pages and forms.

In Microsoft Dynamics AX, there is no big functional difference between the *Filter* and the *Find* feature.

2.1.6.1 Distinguish Value Lookup

When choosing the *Filter* or *Find* function, you should keep in mind that this is something other than the value lookup shown in section 2.1.5. Whereas the value lookup is available to enter a value into a field, the *Filter* and *Find* feature will select records from the table displayed in the grid.

2.1.6.2 Filter Pane

The filter pane in list pages provides the easiest way to filter records. After entering characters into the filter field as needed, you may apply the filter pushing the *Enter* key or the arrow button ➡ on the right next to the filter field.

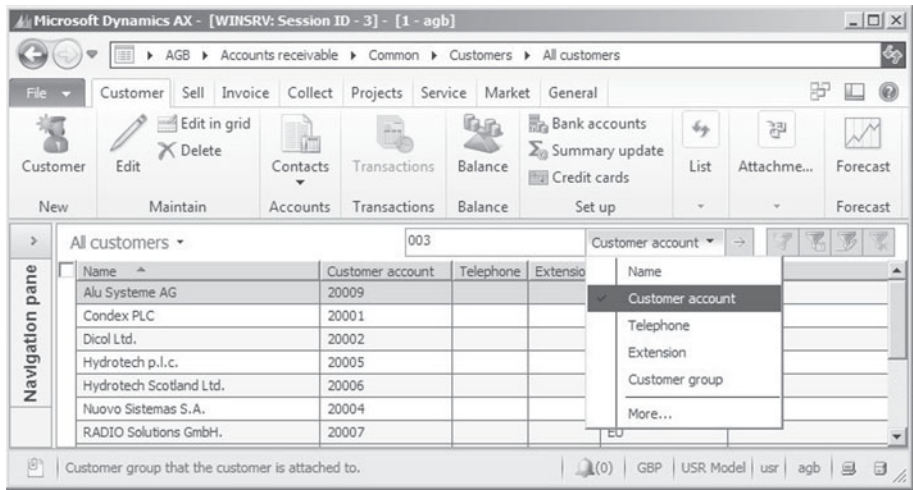


Figure 2-16: Filter pane in a list page, selecting the column for the filter

In the right-hand part of the lookup field, you may select the column to which the filter applies. In addition to the fields which display in the grid, the option *More* at the bottom of the lookup grants access to all fields available for the list page. Selecting an additional field will add the appropriate column to the grid and to the fields available for filtering.

Figure 2-16 shows an example for entering a filter in the filter pane. In the example, the filter for customers containing the characters “003” in the customer account field is not yet executed.

If you need to enter more complex filter criteria, you may apply advanced filter options as described below. Unlike the filter pane, advanced filter options are available not only in list pages but also in the grid view of detail forms.

2.1.6.3 Filter Criteria

When entering characters in the filter field of the filter pane, Dynamics AX shows records containing those characters.

All other filter options (like the filter by grid) allow selecting filter criteria in order to apply more precise filtering definitions. The table below shows an overview of the most important filter criteria:

Table 2-1: Important filter criteria

Meaning	Sign	Example	Explanation
Equal	=	EU	Field content to match "EU"
Not equal	!	!GB	Field content not to match "GB"
Interval	..	1..2	Field content from "1" to "2" (incl.)
Greater	>	>1	Field content more than "1"
Less	<	<2	Field content less than "2"
Connection	,	1,2	Field content to match "1" OR "2"; criteria "Not equal" (e.g. "!1,!2") connect with AND
Wildcard	*	*E*	Field content containing "E"
	?	?B*	First character unknown, followed by a "B", other characters unknown

2.1.6.4 Filter by Selection

If you want to display a list of records that show the same value in a certain column, you may apply the *Filter by selection*. In order to activate this filter, you will set the cursor to the field, which contains the value you want for that field on a list page.

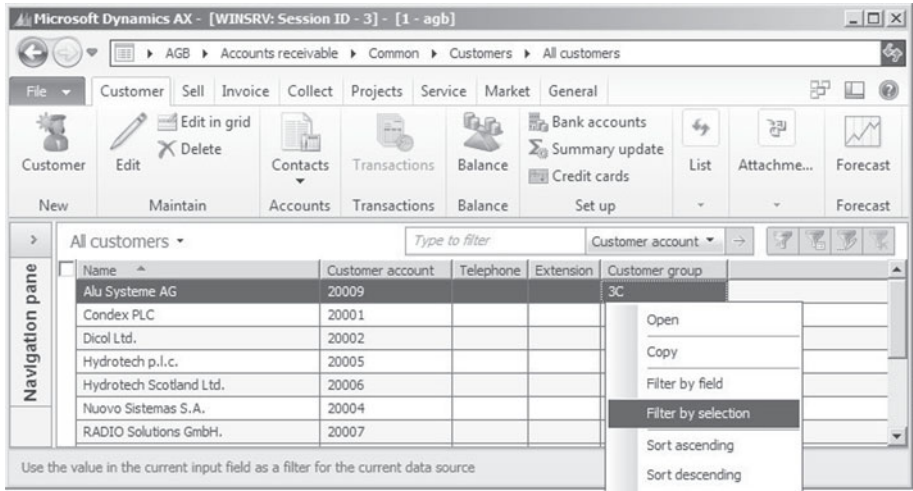


Figure 2-17: Filter by selection (chosen in the pop-up menu)

After selecting the shortcut key *Alt+F3*, the icon  in the filter pane or the option *Filter by selection* in the pop-up menu, the filter will apply. The example in Figure 2-17 shows how to apply a *Filter by selection* for the *Customer group* "3C" in the customer list page (*Accounts receivable> Common> Customers> All customers*).

2.1.6.5 Filter by Grid

Another option to set a filter in list pages is the *Filter By Grid*. This filter will show when you choose the shortcut key *Ctrl+G* or the icon .

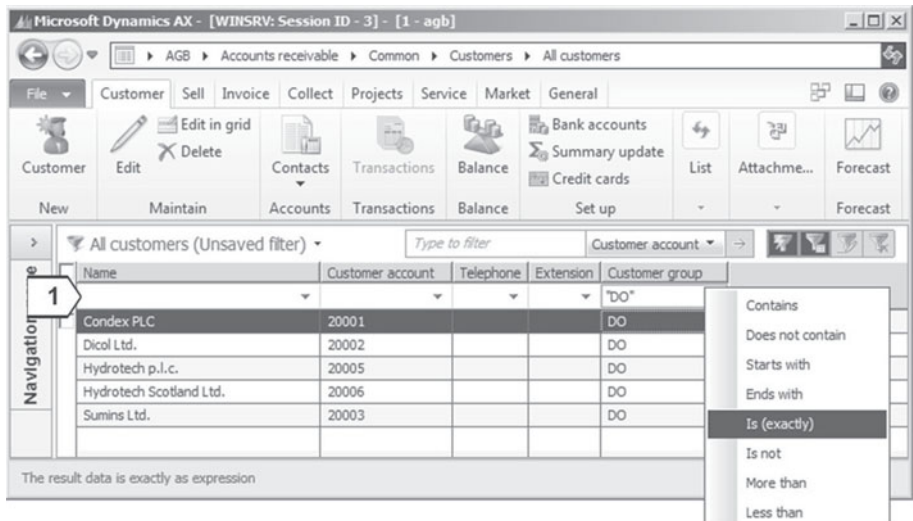


Figure 2-18: Filter by grid

In your user options (see section 2.3.1), you may choose that the filter by grid displays whenever you open a list page or value lookup.

When selecting the *Filter By Grid*, it shows a separate line for filter criteria at the top of the grid. If you need support to enter a criterion in the filter line, you may click the arrow  on the right of a specific filter field. If you have entered filter criteria before showing the filter line (e.g. in a filter by selection), the filter by grid will display them.

2.1.6.6 Advanced Filter

If you have to enter complex filter criteria, you may choose the advanced filter in list pages by choosing the shortcut key *Ctrl+F3* or the icon .

The advanced filter opens a separate form, which displays a different view of the criteria entered in the filter by selection and the filter by grid. In addition, the advanced filter allows setting a filter on fields, which do not show on the list page.

If you need to enter an additional criterion in the advanced filter, you may insert a new record pushing *Ctrl+N* or the button *Add*. In the new filter line, you want to register the fields *Table*, *Derived table*, *Field* and *Criteria*. The fields in the columns *Table* and *Derived table* of a new line automatically contain the basic table of the filtered list page. In case of simple criteria, you do not need to pay attention to it.

A lookup () in the column *Field* helps to select the field name of the table field. Next to the column *Field*, you may find the column *Criteria*, where you want to

enter the filter criterion. If the field for the filter is a lookup field, you may open a value lookup.

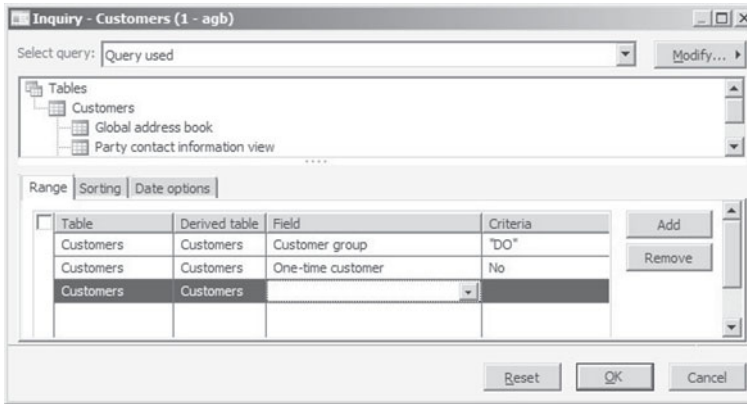


Figure 2-19: Advanced filter form defining filter criteria

Once you have finished entering filter criteria, you may close the advanced filter form clicking the button **OK**. This applies the filter, effecting the list page to show matching records only.

2.1.6.7 Related Tables

The *Structure* pane in the upper part of the advanced filter form enables you to enter filter criteria referring to related tables. In order to apply this option, you need to select the related table choosing the option *1:n* or *n:1* in the pop-up menu (doing a right-hand click) for the appropriate basic table in the *Structure* pane.

Since it is possible to select different tables in the filter lines of the advanced filter form, you need to pay attention to selecting the right table in the column *Table* in this case.

As an example for applying a filter on related tables, you may choose to show only customers in the customer list page, which have got transactions in the current year. The appropriate selection for this filter would be a *1:n*-relation from the customer table to the customer transactions, where the advanced filter contains a filter line on the field *Date* of the table *Customer transactions*.

When applying a filter on related tables, you have to keep in mind that the structure of the filter needs to comply with the database and program structure – especially for filters in reports – to show correct results. To make sure, you should apply a quick check of the result when choosing a new filter combination of related tables.

2.1.6.8 Clearing a Filter

If you do not need to apply a selected filter any longer, you may clear it choosing the shortcut key **Ctrl+Shift+F3** or the icon . After clearing the filter, the list page shows all records again.

2.1.6.9 Active Filter

The icon  to clear a filter also gives a hint, if a filter is active in a certain list page. If the icon is active and you can click it, a filter is in place. In order to display this filter, you may open the advanced filter form (*Ctrl+F3*).

A funnel in the filter button (e.g.  All customers (Unsaved filter) ▾) of list pages additionally indicates an active filter.

2.1.6.10 Filter Button in List Pages

In list pages, the filter button on the left side of the filter pane provides an alternative access (in addition to icons and shortcuts) to all filtering options mentioned above.

2.1.6.11 Filtering in Detail Forms (Grid View)

In the grid view of detail forms, the filter pane is not available and you may access filter features only through shortcuts keys or doing a right-hand click. As an alternative, you may also choose the jewel menu (command *File/Edit/Filter*).

2.1.6.12 Saving a Filter

If you frequently need certain filter criteria or if you want to apply them in your favorites, you may save them. The button *Modify/Save as* in the advanced filter form allows saving filter criteria. In a dialog box, you have to enter a filter name.

Saved filters are stored in your *Usage data*, which means that nobody else can access your saved filters. In order to select a saved filter, you may choose it in the lookup of the field *Select query* in the advanced filter form as shown in Figure 2-20.

Additionally to the filters saved manually, the filter you have used the last time in every page is available by selecting *Previously used query* in the *Select query* lookup.



Figure 2-20: Selecting a saved filter in the advanced filter form

As an alternative to the advanced filter form, you may also choose the filter button in the filter pane of list pages to save and select filters.

2.1.6.13 Saving a Cue

If you need a filter for a cue in your role center, you may save the filter as a cue. Similar to the way you save a filter regularly, you may click the button *Modify/Save as Cue* in the advanced filter form (or the filter button in the filter pane of list pages) to save a filter as a cue.

After saving a filter as a cue, you may show the cue in Web Parts of role centers (see section 2.1.4).

2.1.6.14 Sorting

Sorting in list pages or in the grid view of forms is available by simply clicking the appropriate column header. A second click on the column header will switch between ascending and descending sorting. Alternatively, you may sort in the advanced filter form or choose the option *Sort ascending* or *Sort descending* in the pop-up menu (doing a right-hand click on the appropriate column in the grid).

If you choose to apply sorting in the advanced filter form, you need to record your sorting criteria on the tab *Sorting*. Like entering a filter criterion, you may enter sorting criteria in several lines choosing table and field name.

2.1.6.15 Search Functionality

Apart from filtering, Dynamics AX offers two additional options to search for records: The *Find* function and the *Enterprise search*.

Whereas the find function is similar to a filter, the enterprise search resembles the functionality of search engines.

2.1.6.16 Find Function

Choosing the shortcut key *Ctrl+F* (or the command *File/Edit/Find*) you may access the *Find* dialog box. When applying the find function, you should be aware that finding always refers to the selected column or field. Before opening the find dialog, you need to click into the required column/field therefore. The name of the selected field displays in the header of the find dialog box as shown in Figure 2-21.

The rules for entering find criteria are the same as for filter criteria. In contrast to the filter functionality, the find function does not provide the option to couple criteria on different fields at the same time, though.

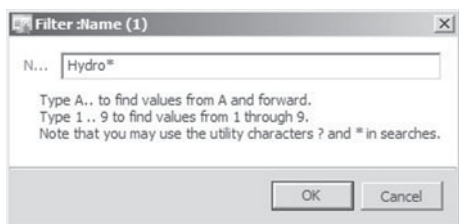


Figure 2-21: The find dialog box (for the column *Customer name* as an example)

The *Filter by field* is quite similar to the find function, except that it opens with the shortcut key *Ctrl+K* (or the option *Filter by field* in the pop-up menu) and already shows the content of the selected field as a default in the dialog box. Since *Filter by field* is a filter function, you may couple criteria – e.g. selecting an additional filter applying the *Filter by field* on a second field.

2.1.6.17 Enterprise Search

Unlike find and filter functions, which are applied to the current list page or form, the enterprise search performs a full search through all Dynamics AX data, documents and help topics according to the system configuration.

Before you can start using the enterprise search, the administrator needs to specify which tables and fields should be included in the search (*System administration> Setup> Search> Search configuration*). The setup for the enterprise search affects search options for all users – in the Dynamics AX Windows client as well as in the Enterprise portal. Therefore, Dynamics AX administration has to be responsible for the search settings.

After setup is finished and the search is started, you may use the enterprise search through the *Search* field of the Dynamics AX address bar. Like in the filter pane of list pages, there is no need to enter wild cards in the *Search* field.

2.1.6.18 New in Dynamics AX 2012

In Dynamics AX 2012, the Enterprise search with enhanced functionality replaces the *Global Search* in Dynamics AX 2009.

2.1.7 Help System

If you need help for functional questions, you may want to access the Microsoft Dynamics AX Help system available in the whole application. In the help system, we may distinguish three areas of help content:

- Application user help
- System administrator help
- Developer help

The help system is based on a help server, which ensures a common and up-to-date content for all users. The content on the help server is focused on application users. For system administrators and developers, the help viewer in Dynamics AX shows links to the appropriate web-based help content.

2.1.7.1 Getting Help

In order to access help, you may choose the shortcut key *F1* or the button /Help in every list page or form. The help viewer displays help information for the particular form – including the help text, the table of contents, the option to print and an enhanced search functionality (see Figure 2-22).

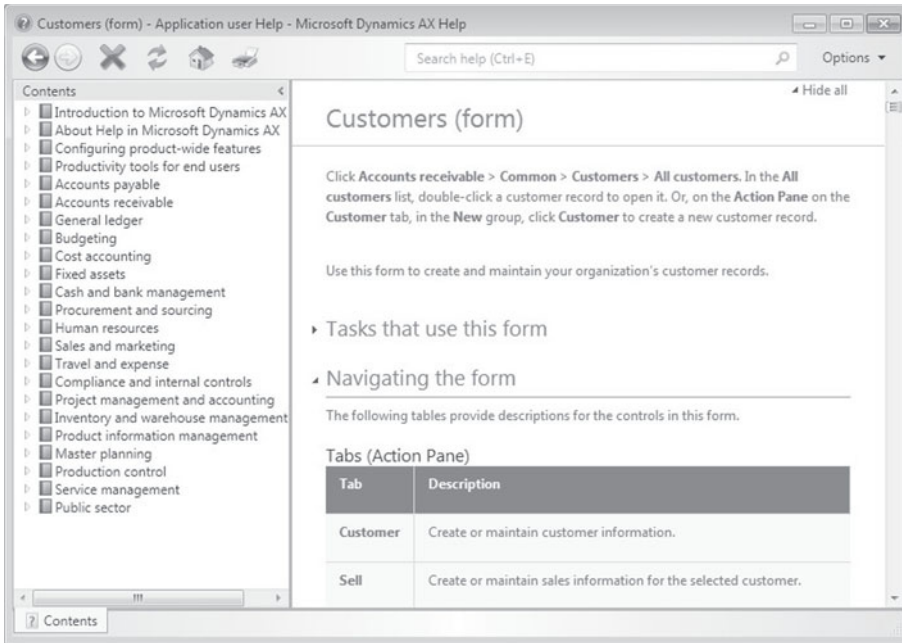


Figure 2-22: Dynamics AX help referring to the customer form

Since help is form-based, you may want to choose the local search in the help viewer (*Ctrl+F* or *Options/Find on this page*) when looking for help text referring to a certain field. In the text, there are three different types of links:

- Links referring to other help content (pressing the *Shift* key while clicking the link will open it in a new window)
- Links referring to menu items in the Dynamics AX client, showing the menu path (clicking the link will take you to the Dynamics AX form)
- Links to web resources

The search field at the top of the help viewer provides options similar to search engines on the web, showing abstracts in the search results to easily discover relevant text.

2.1.7.2 Customizing Help Content

The help server provides an easy possibility to publish individual help content for your organization by simply writing help content in Microsoft Word.

The easiest way to start publishing content is to search for "help template" in the help system. The help viewer will show a link to a Word template containing Macros necessary for publishing as well as a description on how to proceed.

Using the template, you want to start Microsoft Word, write the content as needed and enter required document properties on the tab *Microsoft Dynamics Help* in the Word ribbon. These properties include:

- Topic ID – Enter “*Forms.FormName*” to link help content to a certain form, e.g. “*Forms.CustTable*” for the customer form. You may view the form name on the tab *Information* of the *Personalization* form (see section 2.3.1).
- Publisher ID – Enter your organization name to distinguish your help content from the content of Microsoft, ISVs and partners.

In order to prepare publishing, you want to save the document as a Webpage (file format *mht*). In parallel, the template will save an Html file. Copying both files to a subfolder of the folder *C:/Inetpub/wwwroot/<HelpServerName>/Content* on the help server will publish the content.

2.1.7.3 New in Dynamics AX 2012

The architecture of the help system has completely changed in Dynamics AX 2012, providing a help server with the option to easily update and customize help content.

2.1.8 Case Study Exercises

Exercise 2.1 – Logon

Your first task is to log on to a Dynamics AX training system, where you should access a company different to your default company. Then open a second workspace, where you choose the *Accounts payable* menu in the navigation pane in order to access the list page *All vendors*. Finally, log out and close the Dynamics AX session.

Exercise 2.2 – Favorites

Start a client session in Dynamics AX, select the training company and open the favorites pane. Add the list page *Released products*, which you may find in the menu *Product information management*, to your favorites.

Afterwards, you want to create a new favorites folder “Invoicing”. This folder should contain the list pages *All sales orders* and *All free text invoices* of the menu *Accounts receivables* as well as the form *Payment journal* of the menu *Accounts receivables> Journals*.

Exercise 2.3 – Detail Forms

As an example for detail forms in Dynamics AX, you may access the vendor detail form through the vendor list page (*Accounts payable> Common> Vendors> All vendors*). When accessing the detail form, you want to view the vendor in the third line in the list page. Show an example for a field group and a lookup with and without main table.

Once you have finished, switch to the tab *Details* and show an example for a checkbox field. What can you tell about fast tabs and fact boxes? How do you proceed if you want to edit the vendor? Is there an option to edit several vendors in the form?

Exercise 2.4 – Inserting Records

Insert a new vendor without applying record templates. For the beginning, you only have to register the vendor with the name “##-Exercise 2.4” (## = your user ID) and a vendor group.

Notes: If the number sequence for vendor accounts is set to “Manual”, you have to enter the vendor number manually. If the *Accounts payable parameters* require a tax-exempt number (VAT registration number) to be entered, you need to access the fast tab *Invoice and delivery*, where you enter a *Tax exempt number (VAT number)*, which you create through the *View details* feature before.

Exercise 2.5 – Lookup Fields

Searching for a *Buyer group* on the tab *Miscellaneous details* of the vendor form, you notice that the group you need is not available. Create a new buyer group ##-P (## = your user ID) applying the *View details* feature. Then you should select that group for your new vendor.

Exercise 2.6 – Filtering

To get some exercise with filtering, apply the following filters in the vendor list page one after the other complying with the instructions later in the exercise:

- All vendors containing “inc” in the name
- All vendors assigned to the vendor group you selected in exercise 2.4
- All vendors with a name starting with “T”
- Vendors with a number from 3003 to 3005 or higher than 3008
- Vendors with a number ending with “5” and an “i” in the name
- Vendors with an “e” on the second character of the name
- Vendors with a name not starting with “C”

For the first filter you should apply the filter field in the filter pane, for the second filter choose a *Filter by selection*. For the other filter exercises, apply a *Filter By Grid* as well as the *Advanced Filter/Sort*.

Once you have finished the filtering tasks above, open the advanced filter window and select vendors, who do not have *Terms of payment* “Net 30 days”. Export the result of that filter to an Excel sheet.

2.2 Printing and Reporting

Depending on your requirements, there are several options available to view and analyze data. Apart from Business Intelligence tools, printing structured reports is one of the most common ways to present data.

2.2.1 Printing Reports

Dynamics AX applies Microsoft SQL Server Reporting Services (SSRS) for printing reports. You may start printing of and reports from several places in Microsoft Dynamics AX:

- Menu path *Reports* – In the navigation pane, address bar and area pages
- Buttons – In list pages and detail forms
- Post and print – Checkbox *Print* in posting forms
- Auto-reports – In list pages and forms

2.2.1.1 Standard Reports

In every module, you may find standard reports in the folder *Reports* – in most cases containing subfolders. In addition, some list pages and detail forms also allow to run a standard report by clicking an appropriate button – e.g. a customer account statement clicking the button *Collect/Statements* in the customer list page (*Accounts receivable*> *Common*> *Customers*> *All customers*).

2.2.1.2 Post and Print

When posting an external document like an invoice or a packing slip, you want to print the document as well in most cases. Posting forms therefore contain a checkbox to print the related document – e.g. the checkbox *Print invoice* when posting an invoice. The buttons *Select* (filter selection) and *Printer setup* (printer selection) in posting forms allow defining filter criteria and print destinations as described for standard reports below.

If the printout of a posted document is required at a later date (e.g. if you missed to select the checkbox *Print*), you may print in the inquiry of the particular posted document. If you want to (re-)print a sales invoice for example, you may access the invoice journal (e.g. by clicking the button *Journals/Invoice* on the action pane tab *Invoice* of the sales order form) and click the button *Preview/Print* there.

2.2.1.3 Auto-report

Auto-reports are available in every list page and form by choosing the shortcut key *Ctrl+P* or the command *File/Print/Print*. They show a report containing the main fields of the particular table.

2.2.1.4 Report Form

In order to explain how printing works in Dynamics AX, the description below shows how to print a standard report as an example.

After selecting the menu item of a standard report, Dynamics AX shows the report form that allows entering filter criteria and print destinations. Figure 2-23 shows the report form of the customer list (*Accounts receivable*> *Reports*> *Customer*> *Customers*) as an example, where a filter on the group “10” has already been entered.

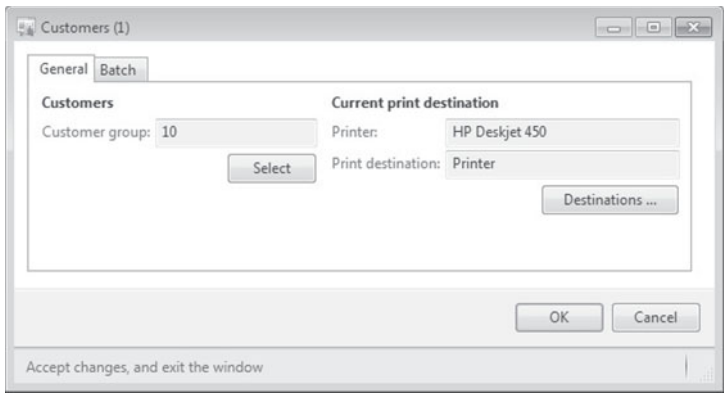


Figure 2-23: Report form for the customer list

2.2.1.5 Print Destination (Printer Selection)

The button *Destinations* in the report form opens the print destination settings, where you may select the destination for the printout. You may choose between following options:

Table 2-2: Print destinations for reports

Destination	Explanation
Print archive	Saves the report selection to the print archive
Screen	Shows a report preview on the screen
Printer	Prints the report to the selected printer
File	Saves the report content to a CSV, Excel, HTML, XML or PDF file or to an image (JPEG or other format)
E-mail recipient	Saves the report content to a file and sends it to an e-mail recipient (the recipient has to be entered manually)

2.2.1.6 Filter in Reports

The button *Select* in the report form opens an advanced filter form, where you may enter filter criteria. The filter form for reports works in the same way as the advanced filter in list pages and forms (see section 2.1.6). You may enter filter criteria on the tab *Range* as well as sorting criteria on the tab *Sorting*.

After closing the filter form, the selected filter shows on the report form.

2.2.1.7 Report Form Defaults

Once you have finished entering the filter criteria and the print destination in the report form, you may run the report clicking the button *OK* in the report form. The settings, which you have selected, are automatically stored in your user options.

They will show as a default when you run the report again. You may change filter criteria and print destination as required.

2.2.1.8 Print Archive

The print archive allows saving a report within Dynamics AX. In the print destination settings, you may choose the archive either by directly selecting the print archive as print destination or – if choosing a different print destination – by selecting the checkbox *Save in print archive*.

The report selection will be stored in the print archive making it possible to reprint the report later. You may access your print archive choosing the command *File/Tools/Print archive*. In order to access the print archives of all users, you may open the form *Organization administration>Inquiries>Print archive*.

Printing to the archive during the regular operation time and applying a batch job to finally print the archive on a printer at night time might be an option to deal with high-volume printing.

2.2.1.9 Print Preview

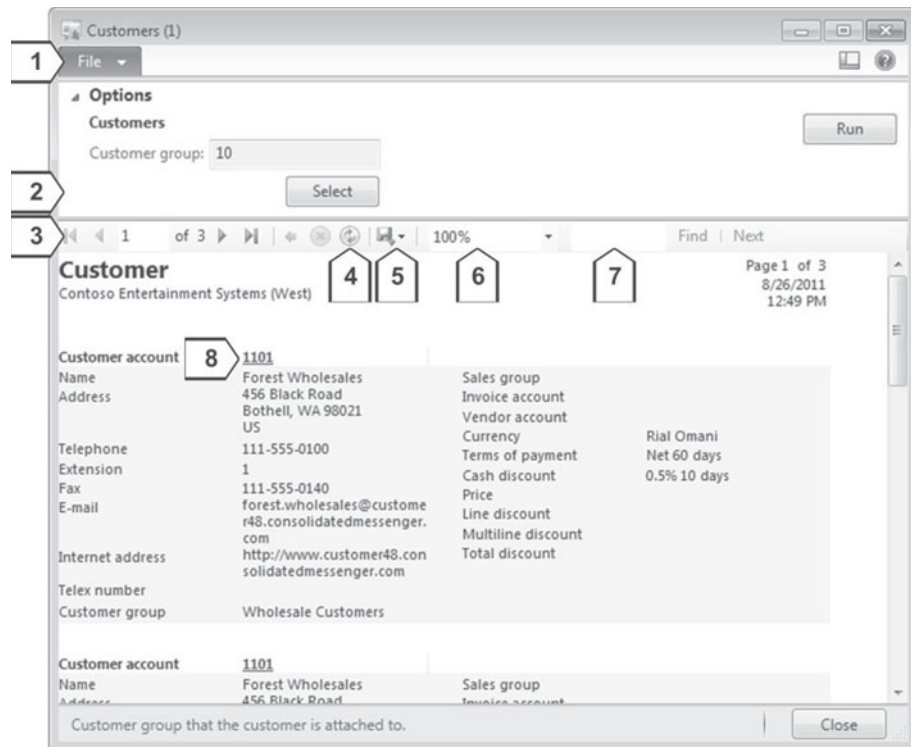


Figure 2-24: Print preview options

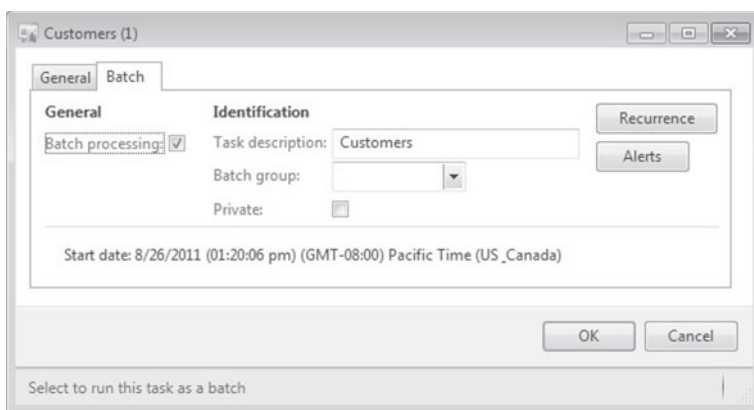
If you select the screen to be the print destination, Dynamics AX will show a print preview on the screen. The preview shows the following options (see Figure 2-24):

- Print [1] the preview (command *File/Print/Print* or shortcut *Ctrl+P*)
- Apply or change filter [2] selections (button *Select* in the section *Options*)

- Scroll [3] between pages entering the page number or pushing *Page Up*/, *Page Down*/, *Ctrl+Home*/ and *Ctrl+End*/
- Refresh [4] the preview to retrieve current data (button )
- Export [5] the preview to different file formats like XML, CSV, PDF, HTML, TIFF, Excel or Word (button )
- Zoom [6] in and out
- Find [7] text in the report
- Link [8] to access the detail form of fields concerned

2.2.1.10 Batch Processing

If you do not need to run a report immediately, you may switch to the tab *Batch* in the report form to choose batch processing. When selecting the checkbox *Batch processing* and – if required – a *Batch group*, you may define a starting time and repetitions for the batch job after clicking the button *Recurrence*.



The screenshot shows a window titled "Customers (1)" with two tabs: "General" and "Batch". The "Batch" tab is active. Inside the "Batch" tab, there are two main sections: "General" and "Identification". In the "General" section, the "Batch processing" checkbox is checked. In the "Identification" section, the "Task description" is "Customers", the "Batch group" is a dropdown menu, and the "Private" checkbox is unchecked. To the right of these sections are buttons for "Recurrence" and "Alerts". At the bottom of the "Batch" tab, the "Start date" is displayed as "8/26/2011 (01:20:06 pm) (GMT-08:00) Pacific Time (US_Canada)". At the bottom of the window are "OK" and "Cancel" buttons. Below the window, there is a text label "Select to run this task as a batch" with a small icon.

Figure 2-25: Batch processing selection in a report form

2.2.1.11 Setup for Batch Processing

As a prerequisite to apply batch processing, a batch server has to be set up and started. You may set up the batch server selecting the menu item *System administration> Setup> System> Server configuration*.

Batch processing is performed in the background on the batch server except for client and private tasks, which require running the periodic activity *Organization administration> Periodic> Batch processing* on a client.

If you want to check and edit the status of batch jobs, you may access the form *System administration> Inquiries> Batch jobs*.

2.2.1.12 Printing and Modifying Auto-reports

Auto-reports are another kind of report. You may start them in every list page or form selecting the command *File/Print/Print* or the shortcut key *Ctrl+P*. Auto-reports show a list containing the main data (field group *Auto-report*) of the

particular table shown in the form. Apart from the additional button *Modify*, auto-report forms work similar to regular report forms.

Clicking the button *Modify/New* in the auto-report form, you may start a report wizard to create your own report. This report will be stored in your usage data. As soon as you have finished the report wizard, you may select the new auto-report in the field *Select report* of the auto-report form.

Compared to reports in the development environment, the wizard for auto-reports has only got limited functionality.

2.2.1.13 New in Dynamics AX 2012

The technical basis of reports has completely changed in Dynamics AX 2012, now applying SSRS reports instead of the MorphX reports in earlier releases. Among other advantages, SSRS reports provide the options to apply filters in the preview, refresh data, search for text within the preview and generate multiple export formats including Word and Excel.

2.2.2 Copy/Paste and Microsoft Office Add-Ins

Whereas you copying data from Dynamics AX and pasting them works with any Windows application, the Office add-ins are designed to work specifically with Microsoft Office.

2.2.2.1 Copy and Paste

A comfortable way to retrieve data of Dynamics AX is the data export through the clipboard. To do so, you may select lines by marking appropriate grid check boxes leftmost in the grid of list pages or the grid view of detail forms individually.

Alternatively, you may select lines clicking in the grid itself while holding the *Ctrl* key. The *Shift* key selects several consecutive lines, the shortcut key *Ctrl+A* (or the grid check box in the header line) selects all lines of the grid.

After selecting, you want to copy the records to the clipboard choosing the shortcut key *Ctrl+C*, the command *File/Edit/Copy* or the option *Copy* in the pop-up menu (doing a right-hand click). Then you may insert them into another Windows application (like Microsoft Excel) pushing *Ctrl+V*.

Copying in a Dynamics AX list page only includes the columns that are displayed in the list page. In contrast, copying in the grid view of detail forms does not only copy fields of the grid tab, it also contains fields shown on the other tabs of the form.

2.2.2.2 Microsoft Office Add-Ins

Microsoft Office add-ins in Dynamics AX enable data interaction with Microsoft Office. This data interaction includes:

- Exporting data from Dynamics AX to Microsoft Excel
- Refreshing and editing AX-data in Microsoft Office

➤ Importing data from Microsoft Excel into Dynamics AX

In the general section of your user options (*File/Tools/Options*), you may find two settings for *Export to Microsoft Excel*, which are relevant for the Office add-ins:

- Workbook support refresh – Apply either static or refreshable exports (choose *Never* for static exports when sharing reports with external people)
- Remote desktop session exports to – Applicable for Remote Desktop Clients (Terminal Services), making it possible to export data directly to Microsoft Office on the local PC.

Changes of the user options concerning Office add-in are available after restarting the Dynamics AX client session.

2.2.2.3 Export to Excel and Refresh

On list pages and in the grid view of detail forms, you may find the command *File/Export To Excel* (and the appropriate button on the first tab of the action pane) to export the list to Microsoft Excel.

Depending on your user options, Dynamics AX will show a static or refreshable Excel sheet, where you may find the tab *Dynamics AX* in the ribbon (see Figure 2-26). When saving a refreshable sheet, you may open it later and get current data including new lines for new records out of Dynamics AX by simply pressing the button *Refresh* in the Excel sheet.

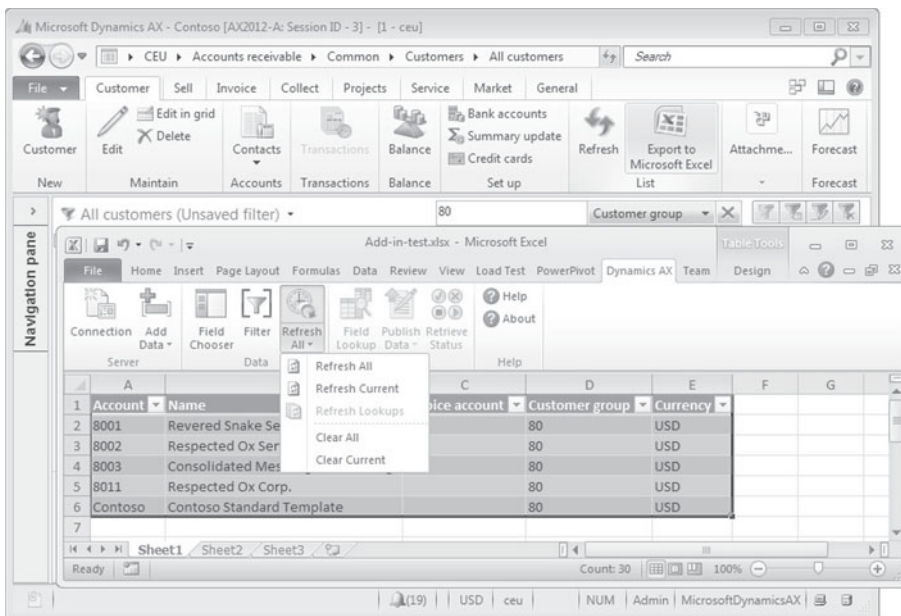


Figure 2-26: Using the Office add-ins (Excel export in the customer list page)

Choosing the button *Field Chooser* in Excel you may add Dynamics AX data columns. You may also add regular Excel columns as required, e.g. using Excel formulas for calculation.

The button *Filter* allows applying a query filter for retrieving Dynamics AX data. When choosing a filter in Dynamics AX before starting the Excel export, this filter will apply automatically (e.g. customer group “80” in Figure 2-26).

2.2.2.4 Edit Data in Excel and Dynamics AX Import Options

When exporting to Excel, Dynamics AX will generate a read-only query. For editing Dynamics AX data directly in Excel, a Web service for the specific use of the Dynamics AX Office add-ins has to be registered in the Organization management module (*Organization management> Setup> Document management> Document data sources*).

In order to edit data in Excel, you want to click the button *Add Data/Add Data* in Excel. A dialog will display, showing installed queries and services which are available for you according to your permissions. After selecting a data source (e.g. *Budget register entries*), Microsoft Excel will show the available fields in the task pane. Indicators show key and required fields, making sure they are entered when editing Dynamics AX data. Clicking the button *Publish Data* transfers the data from Excel to Dynamics AX.

In order to enter data in Microsoft Excel and import them to Dynamics AX, you want to click the button *Add Data/Add Tables* in Excel.

2.2.2.5 New in Dynamics AX 2012

In addition to the static Excel export already available in Dynamics AX 2009, you may now generate Excel sheets for refreshing, editing and importing (presuming you have got access to the appropriate Web services).

2.2.3 Case Study Exercise

Exercise 2.7 – Printing

Print a vendor list (*Accounts payable> Reports> Vendors> Vendors*), selecting a print preview for the print destination. Afterwards, print the vendor list again, filtering on any vendor group of your choice and setting a PDF-file as print destination.

2.3 Advanced Options

Before you can access the Microsoft Dynamics AX workspace, system administration needs to set up a Dynamics AX user assigned to suitable permissions for you.

In some areas of the application, additional data are required from a worker record assigned to your user (see section 9.2.2).

After opening the Dynamics AX workspace, you may choose individual settings to adjust the user interface and access several general tasks like the global address book or document management in your home menu.

2.3.1 User Options and Personalization

In order to adjust the Dynamics AX user interface according to your needs, you may access the user options on the one hand and personalize every single form on the other hand.

2.3.1.1 User Options

User options are the main place to manage personal settings in Dynamics AX. You may access your user options selecting the command *File/Tools/Options*, if you have got appropriate permissions. In addition, the user management form (*System administration> Common> Users> Users*, button *Options*) allows administrators to access your user options as well.

Figure 2-27: Managing preferences in the user options form

When accessing the user option form as shown in Figure 2-27, the following settings are primarily important to define your workspace:

- Start company accounts – Default-company when logging on
- Autocomplete – Text you enter in a field will be the default for the next record, when you start to enter the same characters in that field. This feature applies only within the current Dynamics AX session.
- Language – Language of the user interface
- Alternate help language – Language of the help system
- Detail level – Show warnings and error messages

- Automatic shutdown – Time, after which your session will be closed
- Default view/edit mode – Option to start all detail forms in view or edit mode
- Document handling – See section 9.5.1
- Filter by grid on by default – Show filter line (see section 2.1.6)
- Notifications tab – Alerts and workflow-notifications (see section 9.4.1)
- Status bar tab – Fields shown in the status bar
- Confirmation tab – Show confirmation dialog in forms before deleting or saving modified records.

2.3.1.2 Usage Data

The button *Usage data* in the action pane strip of user options form opens a form, which shows detailed settings of a user. These settings include filter settings, auto-reports, form settings and record templates (user templates), which have been stored automatically as well as manually.

In the usage data, you may switch from the tab *General* to the other tabs that show a list of usage data lines in the particular area. Clicking the button *Data*, you may access detailed data of a usage data record. It is not possible to modify usage data records, but you may delete individual usage data lines choosing the shortcut key *Alt+F9* or the command *File/Delete Record*. Selecting the button *Reset* on the tab *General*, you may delete all your usage data.

If your administration implements modifications or updates in your Dynamics AX application, it may happen that your usage data do not fit to the form settings required by the new application status. In this case, you have to delete the affected usage data records (or reset all usage data) in order to display the new form content correctly.

2.3.1.3 Form Settings

Every user with appropriate permissions in Dynamics AX may adjust forms individually according to his needs. These adjustments are independent from modifications in the development environment, which apply to all users.

2.3.1.4 Form Configuration

The first option to individually adjust a list page or detail form is to configure it. The button *View* in the command bar grants access to the form configuration, providing the option to hide or show fact boxes and preview panes separately for each form.

You may hide or show columns on list pages – fields / fast tabs on detail forms – by selecting the option *Hide* or *Show* in the pop-up menu (right-hand click on the appropriate column).

On list pages, you may also change the width and position of columns with your mouse (drag and drop in the header column). In addition, you may add columns choosing the option *More* in the lookup for the filter field of the filter pane (see

section 2.1.6). In order to remove columns you have added, you need to access the personalization form.

2.3.1.5 Personalization

If you need enhanced options for individual form settings, you want to access the *Personalization* form, which is available in every list page or form choosing the command *File/Command/Personalize* or the option *Personalize* in the pop-up menu. As an example, Figure 2-28 shows a personalization form, which has been opened from the vendor list page (*Accounts payable > Common > Vendors > All vendors*) to personalize the vendor page.

On the *Layout* tab of the personalization form, you may select to hide and move fast tabs, field groups and fields as well as action button groups and buttons. You can move elements in and between tabs with the move-buttons *Up*, *Down*, *Left* and *Right* or with your mouse (drag and drop). If you want, you may also add additional table fields to the form (button *Add fields*).

When selecting an element in the *Layout* pane of the personalization form, you may choose if it should be visible and editable in the *Properties* pane.

Once closing the personalization form, the modified settings will apply. Clicking the button *Save* in the personalization form you can store different versions to display a certain form. When saving a version, you have to enter a name to identify the version for later selection. Selecting a saved version requires to click the button *Load* in the personalization form. If you want to see the standard form again, you may click the button *Reset*.

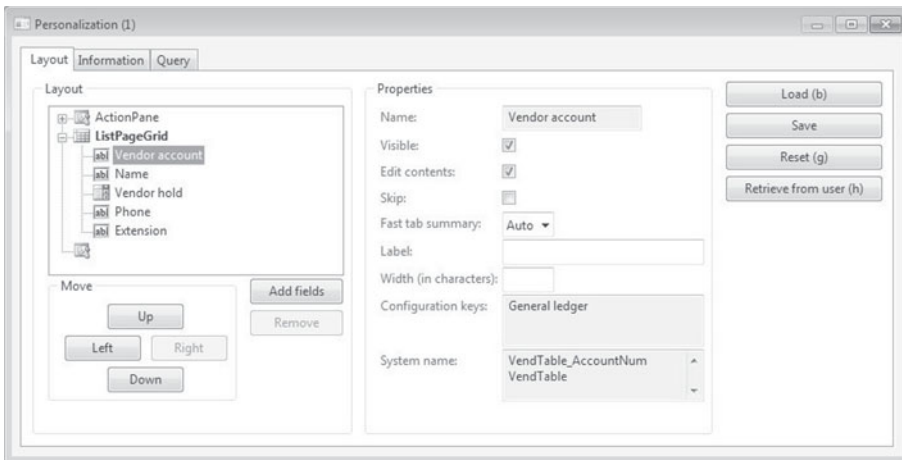


Figure 2-28: Form settings in the personalization form for the vendor page

All individual form settings are stored in your usage data. It is possible to restrict access to form settings by appropriate user permissions, however.

2.3.2 Record Information and Templates

Record information provides access to data and general features not directly shown on a list page or form.

2.3.2.1 Options in the Record Information

After selecting the appropriate record line, you may open the record information dialog in every list page or form choosing the command *Command/Record info* or the option *Record info* in the pop-up menu.

In the *Record information* dialog box, you may choose following options to work on the selected record:

- *Rename* key field – Agree with system administration before.
- *Fill utility* – Modify multiple records.
- *Show all fields* and *Database log* – Information on the selected record.
- *Script* – Create an insert script.
- *Company accounts template* and *User template* – Create a record template (available in detail forms only).

Note: Depending on your permissions and Dynamics AX configuration, some options might not be available.

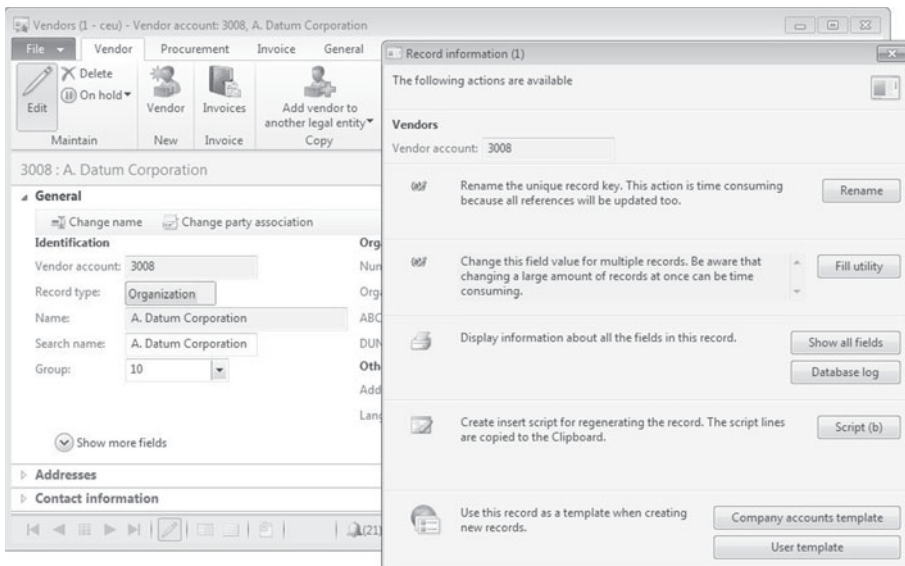


Figure 2-29: The record information dialog in the vendor details form

2.3.2.2 Renaming

Renaming of key fields is possible by clicking the button *Rename* in the record information dialog. Renaming opens a second dialog box, where you may enter the new field content.

Processing a renaming-request may be a time-consuming activity, because Dynamics AX needs to update all references. If you want to modify a vendor number as an example, the vendor number also changes in vendor transactions, purchase orders and all other tables where it is used. You also need to take into account that references will update inside Dynamics AX only. Other applications and external partners like customers or vendors have to receive appropriate information separately.

Therefore, renaming usually is an exceptional activity with restricted access, granted by appropriate permission settings.

2.3.2.3 Fill Utility

You may use the fill utility (similar to *Find and Replace* in Microsoft Office) in order to change the content of a field in several records.

If you have to change the payment terms for a number of vendors for example, you may open the vendor details form (through *Accounts payable* > *Common* > *Vendors* > *All vendors*) and choose the fill utility for the *Terms of payment* after selecting the option *Record info* in the pop-up menu for that field. The fill utility displays a form where you may select a filter identifying the vendors to be modified. Once you are finished entering the filter, you may click *OK* in the filter form. Dynamics AX then displays a separate form where you can see the result of your filter. Confirming the selection with *OK*, you may choose the new payment terms in the dialog box shown next.

Unlike *Find and Replace* in Microsoft Office, the fill utility in Dynamics AX does not only provide the option to change the content of a field from one value to another. The selection of records to insert a new content is independent from the previous content in that field.

The fill utility is available for most fields in master data tables and in unposted financial journals. As a prerequisite to apply the fill utility, it has to be activated in the system configuration (*System administration* > *Setup* > *Licensing* > *License configuration*, folder *Administration*). In addition, you need appropriate user permissions to run the fill utility.

2.3.2.4 Show All Fields and Database Log

The button *Show all fields* in the record information displays the content of all fields of the selected record. You need this information primarily if you want to know the content of fields not shown in a list page or form. *Show all fields* also displays field groups – e.g. the field group *Auto-report* containing the fields of the default auto-report.

The button *Database log* shows a log file of all changes to the selected record. As a prerequisite, logging for the particular table needs to be enabled in the form *System*

administration> Setup> Database> Database log setup or in the development environment.

2.3.2.5 Record Templates

Record templates help creating new records by copying the content of fields from a template created before. As an example, it might be useful for a European company to provide templates in the vendor table for domestic vendors, for vendors in the EU and for foreign vendors to make sure that correct posting groups apply when inserting a new vendor.

When working with record templates, you have to distinguish between two types of templates:

- User templates
- Company accounts templates

2.3.2.6 User Templates

A user template is available only to the user who has created it. You may create user templates by clicking the button *User template* in the record information dialog, which opens a second dialog box where you can enter a name and description for the template. The template is a copy of the record you have selected when opening the record information dialog.

User templates are stored in your usage data, where it is not possible to modify them later. If a user template is not required any more, you may delete it in the usage data (command *File/Tools/Options> button Usage data> tab Record templates*). Alternatively, you may as well delete a user template pushing the shortcut key *Alt+F9* in the template selection dialog as shown in Figure 2-30.

2.3.2.7 Company Accounts Templates

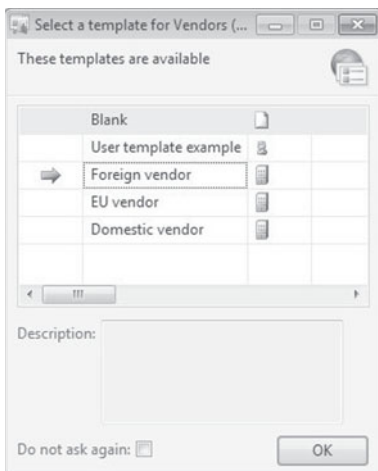


Figure 2-30: The dialog box for template selection

Unlike user templates, each company accounts template is available to all users. You may create company accounts templates by clicking the button *Company accounts template* in the record information dialog.

You may modify company accounts templates in the form *Home> Setup> Record templates*. On the tab *Overview* of the record templates form, you have to select the table to which the template belongs. Switching to the tab *Templates*, you may select a particular template. Clicking the button *Edit* you may modify it.

2.3.2.8 Using Templates

Once templates are available for a table, they display in a template dialog box when inserting a new record in the particular table. As an example, Figure 2-30 shows the dialog box that appears when creating a new vendor in the vendor detail form (through *Accounts payable> Common> Vendors > All vendors*) supposing some templates are available.

In the dialog box, you may select a template by double-clicking the appropriate line or clicking the button *OK*. You may recognize company account templates by the icon , and user templates by the icon . In the far right column, you may select one line to be the default template.

If you select the checkbox *Do not ask again* at the bottom of the template dialog box, Dynamics AX will apply the default template when you insert a record without showing the template dialog box. If you want to show the template dialog box when creating new records again, you need to click the button *Show template selection*, which displays in the record information dialog box.

2.3.3 Case Study Exercises

Exercise 2.8 – User Options and Worker Record

You want to access your user options in order to make sure your name and e-mail address is correct. In addition, select the training company to be the *Start company accounts* to avoid opening a different company when you log on the next time. Your settings for the status bar should include showing the user ID.

Since you need a worker assignment in some of the later exercises, create a new worker W-## (## = your user ID) with your name in the worker form. Your employment in the training company starts at the current date. In the user relations, assign that employee to your Dynamics AX user ID.

Exercise 2.9 – Record Templates

Create a new user template based on the vendor that you have entered in exercise 2.4. Then you may insert a new vendor applying this template to get to know how to use templates.

2.4 Global Address Book

Dynamics AX has got a common table for all entities – called *Parties* – dealing with your enterprise. Parties in the global address book are shared across companies and include customers, sales leads, vendors, organization units, sites, warehouses, employees and other contacts.

2.4.1 Parties and Addresses

Whenever you insert a new customer, vendor or any other kind of party, Dynamics AX will insert a record in the party table. A party may show one or more (postal) addresses and contact information data. Therefore, a party is not the same as an address – a party is an organization or person characterized by its name.

In the global address book (*Home> Common> Global address book*), you may access all parties stored in Dynamics AX according to applicable security settings. In the related party detail form, you may see record details like name, addresses and contact data.

2.4.1.1 Creating Parties

The screenshot shows the 'Party (1) - Party ID: 73, Cave Wholesales, Global address book: Cave Wholesales' form. The form is divided into several sections:

- General**: Includes fields for 'Change name', 'Identification' (Party ID: 73, Record type: Organization, Name: Cave Wholesales, Search name: Cave Wholesales), and 'Other information' (Address books: All CEU, Language: en-us). There is a 'Show more fields' button.
- Addresses**: A table with columns 'Name or description', 'Address', and 'Purpose'. It lists two addresses for 'Cave Wholesales' at '456 White Road Abbeville, GA 31001 US'. The first is 'After-hours address;Ot' and the second is 'Other'.
- Contact information**: A section for contact details.
- Relationships**: A section for relationships.
- Roles**: A table with columns 'Company', 'Account', and 'Role'. It lists roles for 'ceu' (1103, Customer) and 'ceu' (000039, Prospect).

The bottom of the form has a status bar with 'NUM | Admin | MicrosoftDynamicsAX' and a 'Close' button.

Figure 2-31: A party with addresses in the party details form (global address book)

You may insert a new party directly in the global address book. But Dynamics AX will also insert a party whenever you enter a customer, vendor or any other kind of party in any module.

When inserting a new customer, vendor or other kind of party in any Dynamics AX form (e.g. *Accounts receivable*> *Common*> *Customers*> *All customers*), you may choose to refer to an existing party using the lookup in the field *Name* of the *Create new* form. This way you may assign a new role to an existing party instead of creating a new party.

Since a party may already exist in the global address book – e.g. a customer being a vendor in your or an affiliated company in a common database – you should check existing parties before creating a party record in order to avoid duplicate parties. As a last resort when entering a duplicate party name, a dialog form will show – supposing duplicate check is selected in the global address book parameters (see below).

When entering a new party, the first attribute you want to select is the *Record type*. Depending if you choose *Organization* or *Person*, different fields display (e.g. *First name* shows for a person).

2.4.1.2 Postal Address and Contact Information

The tab *Addresses* on the party detail form contains the postal addresses, and the tab *Contact information* is there to manage data like email addresses and phone numbers. Section 3.2.1 shows managing postal addresses and contact information in more detail on the example of vendor management.

2.4.1.3 Internal Organizations

Apart from external parties (Organizations and Persons), internal organizations like operating units and legal entities (see section 9.1.2) are parties in the global address book as well. You may know internal organizations from the *Record type* (e.g. “Legal entities”). Record types of internal organizations are not available for selection when manually inserting a party directly in the global address book.

2.4.2 Address books

An address book is a collection of party records. You may set up one or more address books in the form *Organization administration*> *Setup*> *Global address book*> *Address books*, e.g. one for sales and one for purchasing.

In order to link a party to one or more address book, you want to put a checkmark in front of the address books which display when accessing the lookup for the field *Address books* on the tab *General* of the party details form (see Figure 2-31).

You can use address books to filter addresses – e.g. in the filter field *Address books* in the global address books list page. But different address books may also apply as a basis for setting access permissions (see section 9.2.4).

The global address book is the collection of all parties in all companies of a Dynamics AX system (see Figure 2-32).

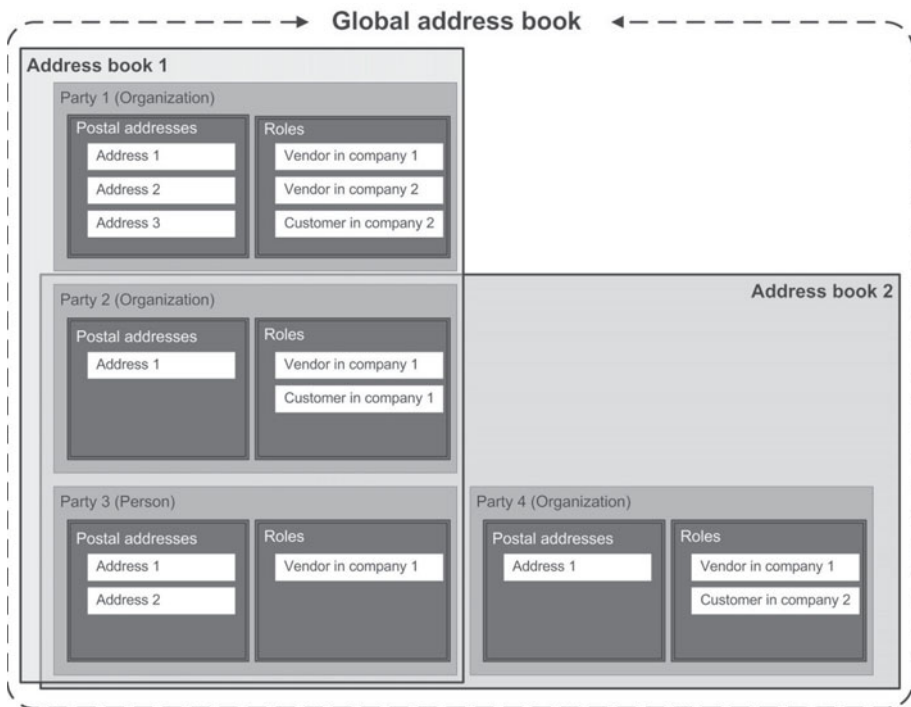


Figure 2-32: Conceptual structure of the global address book

2.4.2.1 Roles

A role (e.g. vendor or customer) describes the kind of relationship between a party and your enterprise. A party may refer to one or more roles in one or more companies.

There are two ways to assign a role to a party:

- Other areas – Creating a record in other areas like the customer list page will automatically create a party with the appropriate role.
- Action pane – Clicking the appropriate button in the action pane (e.g. *New/Customer*) of the party detail form will create a record in the selected area (e.g. customer record) and assign the specific role as well.

The roles of a party are shown in the fact box *Roles* of the global address book list page. If you want to switch from another area (e.g. customer records) to the related party record, you may choose the option *View details* on the field *Name* there.

2.4.2.2 Address Book Parameters

If duplicate check is selected in the global address book parameters (*Organization administration> Setup> Global address book> Global address book parameters*, checkbox *Use duplicate check*), a dialog form will show duplicate party records whenever you try to create a party (directly or indirectly) with a name of a party already existing.

In the dialog form you may choose to link the existing party or to create a new party that shares the same name by accident.

Other global address book parameters include the default party type (*Organization* or *Person*), the name sequence for persons (first/last name) as well as security policy options (see section 9.2.4).

Settings regarding the format of postal addresses and available ZIP/postal codes or cities are specified in the address setup (*Organization administration> Setup> Addresses> Address setup*).

2.4.2.3 New in Dynamics AX 2012

The concept of the global address book has been enhanced in Dynamics AX 2012, now easily sharing parties and addresses across several companies.

2.4.3 Case Study Exercise

Exercise 2.10 – Global Address Book

In order to check the functionality of the global address book, check if you can find a party record for your vendor from exercise 2.4.

Then you want to insert a new party in the global address book. Fields you should enter include the name “##-Exercise 2.10” (## = your user ID) and a postal address in London. This new party becomes a vendor in your company. What do you do in Dynamics AX?

3 Purchasing

The primary responsibility of purchasing is to provide your company with goods and services from suppliers. This task requires following activities:

- Determine material requirements in operations planning
- Process purchase requisitions, requests for quotations and purchase orders
- Post item arrivals and purchase invoices

3.1 Business Processes in Purchasing

Before we start to go into detail, the lines below give an overview of business processes in purchasing.

3.1.1 Basic Approach

Starting point for procurement are correct master data, in particular vendor and product data. When purchasing services or non-inventoried commodities, you may register procurement categories instead of product numbers. As for all master data, vendor and product records (item records) are usually entered once and do not change frequently.

In the course of purchase processing, master data are copied to transaction data. Planning records and purchase orders therefore retrieve defaults from item and vendor data. You may modify these default data in transactions, as an example if you agree on different payment terms in a specific purchase order.

Changing data in a transaction will not change master data. If you generally agree to a change of payment terms with a vendor as an example, you have to update the payment terms in the vendor record therefore.

3.1.1.1 Purchasing Process

Starting from correct master data, we may split the purchasing business process into six steps as shown in Figure 3-1.

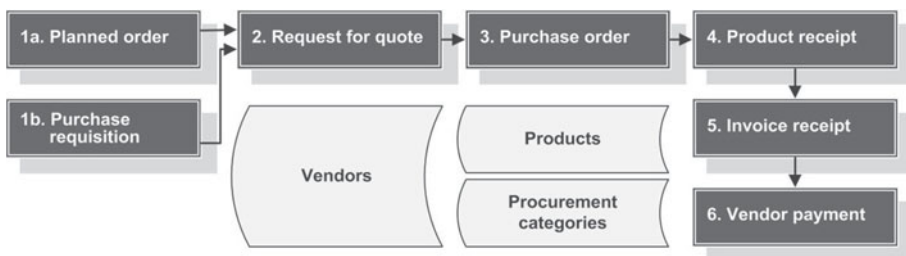


Figure 3-1: Purchase order processing in Dynamics AX

3.1.1.2 Material Requirement

The identification of material requirements is usually the first step in the purchasing process and may take place in two different ways:

- Automatically – Generating planned orders
- Manually – Entering purchase requisitions

The basis for generating planned orders within operations planning (master scheduling, see section 6.3) are accurate figures in inventory, sales orders, purchase orders and forecasts as well as appropriate item coverage settings.

3.1.1.3 Purchase Requisition

Unlike planned orders, which are created automatically by master scheduling, purchase requisitions are internal documents entered manually in order to prompt the purchasing department to obtain items like consumables and office supplies.

A purchase requisition runs through an approval process workflow, before you may release it as a purchase order.

3.1.1.4 Request for Quotation

Requests for quotation are sent to vendors in order to receive information on prices and delivery times. The purchasing department may either enter requests for quotation manually or generate them out of planned purchase orders and purchase requisitions.

3.1.1.5 Purchase Order

You may create purchase orders either manually or by transferring planned orders, purchase requisitions and requests for quotation. A purchase order consists of a header, which contains fields common to the whole order (e.g. vendor data), and one or more lines, which contain the required items.

As soon as the order is completed, you may run the approval process if change management is activated. Once approved – or without approval if change management does not apply – you have to post a purchase order confirmation before you may continue processing. Posting a confirmation means to store it, optionally sending it to the vendor electronically or in a printed document. The purchase order confirmation is available with its original content no matter if there is a modification on the current purchase order afterwards.

To get to know the status of a purchase order, you may look at the order status and the document status in the header as well as at the posted quantities in the lines. Apart from periodic reports and inquiries, you may also apply alerts to get to know problems in order processing like late shipments.

3.1.1.6 Product Receipt

Once goods or services actually arrive, you need to record the product receipt related to the purchase order in Dynamics AX. Posting the product receipt

increases the physical quantity in inventory and reduces the open quantity in the purchase order.

3.1.1.7 Invoice Receipt

Together with the item or some time later, the vendor sends an invoice. When registering the invoice in the vendor invoice form, Dynamics AX supports invoice control by matching the invoice with the purchase order and the product receipt.

If receiving an invoice not referring to a purchase order, you may either enter it in the vendor invoice form or choose an invoice journal (see section 8.3.3).

3.1.1.8 Vendor Payment

Based on posted invoices you may register payments to vendors either manually or by running a payment proposal, taking into account due dates and cash discount periods.

Payment processing is independent from purchase orders and usually a responsibility of the finance department. You may find an appropriate description in section 8.3.4 later in this book.

3.1.1.9 Ledger Integration and Voucher Principle

Because of the deep integration of Dynamics AX, all inventory and vendor transactions in purchasing are posted to ledger accounts depending on the setup as described in section 8.4.

In order to keep record of the whole business process, Dynamics AX comprehensively applies the voucher principle to transactions: You have to register a document (voucher), before you can post it. After posting, it is not possible to modify the document any more. Figure 3-2 shows an overview of the documents in purchase order processing.

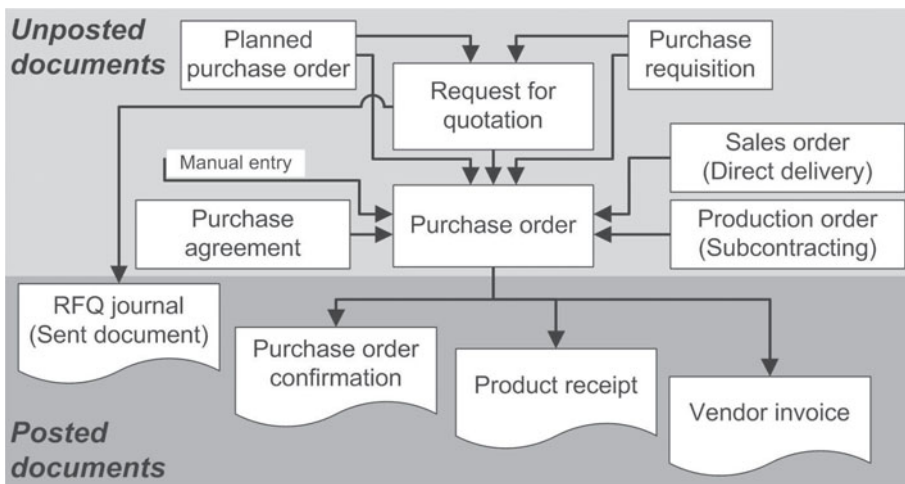


Figure 3-2: Posted and unposted documents in purchasing

3.1.2 At a Glance: Purchase Order Processing

In order to give an overview of the main steps in purchase order processing, this section shows the basics. For convenience, we create the order starting in the vendor list page and post all transactions directly in the purchase order form. Of course, you may choose to start in the *Purchase Orders* list page and to access the specific posting forms for generating the transactions as well.

If creating a new purchase order in the vendor list page (*Procurement and sourcing*>*Common*>*Vendors*>*All vendors*), you may apply a filter selecting the vendor concerned. Clicking the button *New/Purchase order* on the action pane tab *Procurement* will open the line view of the purchase order form in *Edit* mode, creating a new purchase order header with default data like language or currency from the selected vendor.

Clicking the button *Add line* on the tab *Purchase order line* or clicking on a new line, you may register a purchase order line containing item number (or procurement category), quantity and price. When selecting the item, Dynamics AX will insert appropriate defaults for quantity and price as well as for other fields like site or warehouse. Clicking the button *Header view* (or *Line view*) in the action pane at the top of the form, you may switch between the line view shown in Figure 3-3 and the header view.

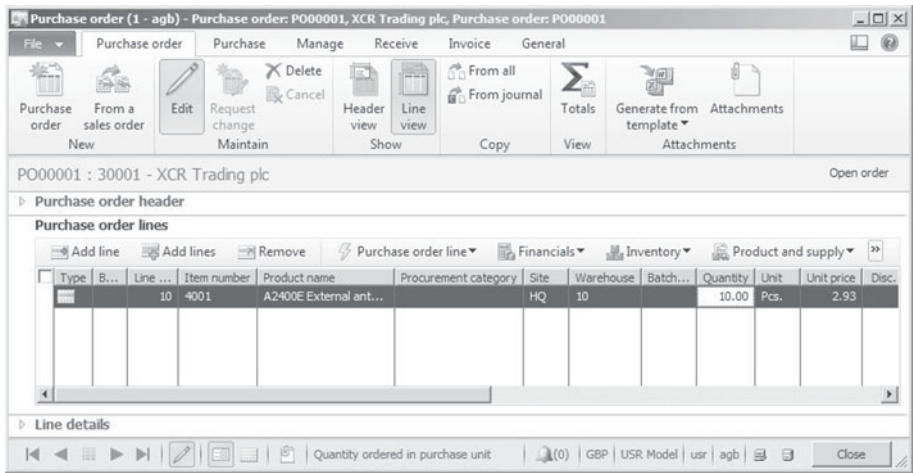


Figure 3-3: Registering a purchase order line (Line view, in edit mode)

If change management applies, a yellow bar will display where you want to click the button *Submit* and wait for approval after registering all order lines. Without change management, an order immediately shows the *Approval status* “Approved”.

After approval you have to post purchase order confirmation clicking the button *Generate/Purchase order* (or *Confirm*) on the action pane tab *Purchase*. If you want to print the purchase order, you have to select the checkboxes *Posting* and *Print*

purchase order in the posting form. The button *Printer setup* is available to select a printer for the printout as described in section 2.2.1.

Note: If registering only one line or if waiting for approval, you might need to press the keyboard shortcut *F5* refreshing the form before you can confirm the order.

Confirm purchase order (1 - agb)

Parameters Other

Parameters

Quantity: Ordered quantity

Posting: ☒

Late selection: ☐

Print options

Print: Current

Print purchase order: ☒

Use print management destination: ☐

Select

Printer setup

Overview Setup

New Delete

	Update	Purchase order	Name
☒	Purchase order	PO00001	XCR Trading plc

OK Cancel Batch

Accept changes, and exit the window

Figure 3-4: Confirming and printing the purchase order

When receiving the item, you may post the product receipt by clicking the button *Generate/Product receipt* on the action pane tab *Receive* of the order form. The posting form for product receipts works similar to the posting form for order posting described above. Unlike that posting, you don't want to print a product receipt usually, and you have to make sure to select "Ordered quantity" in the *Quantity* lookup field (if no previous item registration applies). In the column *Product receipt* you have to enter the vendor's packing slip number. The product receipt increases the physical quantity in inventory and sets the order status to "Received".

If you want to post the invoice receipt directly in the purchase order form, you may click the button *Generate/Invoice* on the action pane tab *Invoice* of the order form. Showing an action pane and factboxes, the form for vendor invoice posting is different from the other posting forms. In order to check the totals there, you may view the appropriate factbox or click the button *Totals*. After entering the vendor invoice number in the field *Number (Invoice identification)*, you may post the invoice clicking the button *Post* in the action pane. Invoice posting generates an open vendor transaction to be paid and sets the order status to "Invoiced".

Note: If you want to quit the vendor invoice form without saving, you have to click the button *Cancel* in the action pane – not the button *Close* at the bottom.

3.2 Vendor Management

Vender records are required in purchasing as well as in finance. According to the deep integration of Dynamics AX, there is only one place to manage vendor records applying to all areas of the application. Setting appropriate permissions, you can limit access to fields and field groups of vendor records. The Dynamics AX application does not provide different vendor forms for purchasing and finance, however.

3.2.1 Vendor Records

In order to check existing or create new vendors, you want to access the vendor list page in the procurement module (*Procurement and sourcing*> *Common*> *Vendors*> *All vendors*) or in the accounts payable module (*Accounts payable*> *Common*> *Vendors*> *All vendors*). According to the general structure of list pages, the vendor page shows the list of available vendors.

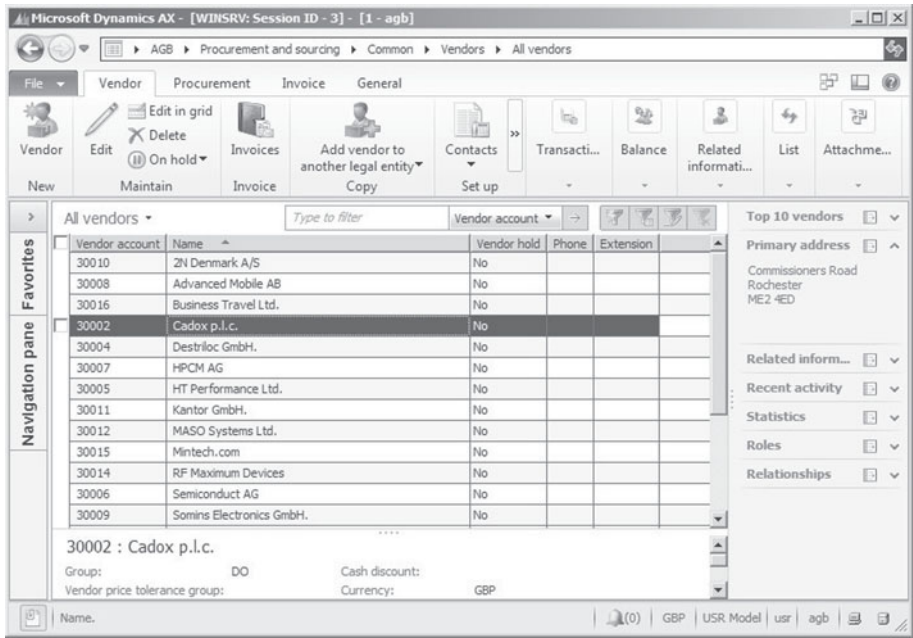


Figure 3-5: Selecting a vendor in the vendor list page

If you want to view details of a vendor showing in the list page, you may double-click on the line of the particular vendor in order to open the vendor detail form. If you want to switch to edit mode in the vendor detail form, you may click the button *Edit* in the action pane or the button  in the status bar there. As an alternative, you may access the vendor form in edit mode by clicking the button *Edit* in the action pane of the list page after selecting the vendor concerned.

The vendor form contains numerous fields, which constitute default values for purchase orders. Below you may find a description of core settings. Additional information is available in the online help.

3.2.1.1 Creating a Vendor

If you want to register a new vendor, you have to insert a record in the vendor detail form or list page choosing the shortcut key *Ctrl+N* or the button *New/Vendor* on the action pane tab *Vendor*. If templates are set up for vendors in your company (see section 2.3.2), you may populate fields of the new record by choosing a template.

Depending on the setting of the number sequence, a unique vendor number in the field *Vendor account* shows automatically or needs to be entered manually.

3.2.1.2 Global Address Book Integration

The *Record type* shows if the vendor is a company (organization) or a person. Depending on the record type, the *General* tab will show different fields – e.g. *First name* and *Last name* for the record type “Person”.

When creating a new vendor, the field *Name* is a lookup field providing the option to select an existing party from the global address book. If you manually enter a duplicate party name and duplicate check is selected in the global address book parameters (see section 2.4.2), a dialog form will show providing the option to link the vendor to an existing party or to create a new party that has the same name by chance.

After saving the vendor record, you may access the party record in the global address book applying the table reference (*View details*) on the vendor name field. If you want to change the vendor name, you have to click the button *Change name* in the action pane strip of the vendor form *General* tab.

Starting in the global address book (*Home> Common> Global address book*, see section 2.4) when creating a new vendor is an alternative to the vendor form, which reduces the probability of duplicate party records. You may check in the global address book before creating a vendor, if the vendor already exists as a party – e.g. being a vendor in an affiliated company. If the vendor is a party, you may immediately convert the party to a vendor in your company. Otherwise you have to create the party record first.

3.2.1.3 General Data

The search name in the vendor record copies from the vendor name, but you may modify it. Mandatory fields in the vendor form apart from the name are the vendor group (lookup field *Group*), which usually controls ledger integration (see section 3.2.3), and the currency on the tab *Purchasing demographics*, which shows the company currency by default.

Other important fields on the tab *General* are the *Language*, specifying the language for printing purchase orders and other documents, and – if distinguishing address books, especially referring to permissions – *Address books* linked to the vendor.

The display field *Vendor hold* on the tab *Miscellaneous details* shows if the vendor is blocked. If you want to change the hold status, you may choose the button *On hold* on the action pane tab *Vendor*. Selecting the status “All”, it will not be possible to post any transaction or to enter any order for the vendor concerned. The status selections “No” and “Never” allow all transactions, with “Never” showing that the vendor should not be blocked after a period of inactivity.

3.2.1.4 Input Tax

Tax settings are available on the tab *Invoice and delivery*, where you should enter a *Sales tax group (VAT group)* for the vendor to specify the tax duty depending on his location. A correct sales tax group is necessary to distinguish between domestic vendors, who charge sales tax or VAT, and foreign vendors, who do not.

The setup of sales tax groups and tax calculation depends on your company and its location. Section 8.2.6 contains more information on tax setup in Dynamics AX.

If your company is located within the European Union and you need to record the VAT registration number of your vendors for tax purposes, you may enter it in the *Tax exempt number (VAT number)* field below the sales tax group. Since it is a lookup field, you have to insert a new tax-exempt number in the main table (*View details* in the pop-up menu, or *General ledger> Setup> Sales tax> External> Tax exempt numbers*) before you may select it for a vendor. The setting *Tax exempt number requirement* in the accounts payable parameters (*Accounts payable> Setup> Accounts payable parameters*, the tab *General*) specifies if you have to enter a tax exempt number.

3.2.1.5 Delivery Terms

The field to enter the usual delivery terms of the vendor is available on the tab *Invoice and delivery* as well. You may access the setup of required delivery terms including text in foreign languages in the form *Procurement and sourcing> Setup> Distribution> Terms of delivery*.

3.2.1.6 Postal Address

Vendor address data are available on the tab *Addresses*, where you may enter several addresses for a vendor. Addresses and contact data are shared with the party in the global address book that refers to your vendor.

In order to register an address of the selected vendor, you may click the button  in the action pane strip of the tab *Addresses*. In the *New address* dialog displayed, you may enter the identification (*Name or description*) of the address, for the primary address of a vendor usually the vendor name.

The *Purpose* determines for which transaction the address serves as default. For the primary address, you may choose “Business”. If entering a second address identifying an alternative payee for example, the option “Payment” applies. You may assign several purposes to one address at the same time. If no specific address is specified for a certain purpose, the primary address will apply.

You may access address purpose management in the form *Organization administration> Setup> Global address book> Address and contact information purpose*, where you may register individual purposes in addition to standard purposes provided by Dynamics AX.

For the primary address of a vendor, you have to make sure the checkbox *Primary* is selected and the checkbox *Private* is not selected.

Another important setting of an address is the *Country/region*, as it is the basis for the address format as well as for reports to the authorities like sales tax and Intrastat reports.

After selecting the country code, only postal codes of that country show in the lookup of the *ZIP/postal Code* field. When manually entering a postal code, Dynamics AX will validate it in the ZIP/postal code table depending on the settings in the address setup form (*Organization administration> Setup> Addresses> Address setup*). If ZIP/postal code validation is selected in the address setup, you have to insert new postal codes in the ZIP/postal code table before you can enter it in an address. You may access postal codes on the tab *ZIP/postal codes* of the address setup form, or applying the table reference (*View details*) on the ZIP/postal code field.

The tab *Contact information* in the address form contains contact data specific to the address (e.g. the phone number of the alternate payee), not general contact data of the vendor.

3.2.1.7 Contact Information

On the tab *Contact information* of the vendor form, you may register general contact data like the vendor telephone number or e-mail address after clicking the button  **Add** in the action pane strip.

On the tab *Purchasing demographics* of the vendor form, you may select the main contact person in the field *Primary contact*. If you want to choose a new main contact, you have to enter that person clicking the button *Set up/Contacts/Add contacts* on the action pane tab *Vendor* of the vendor form first.

3.2.1.8 Settings for Payment

The tab *Payment* contains settings for payment terms and cash discount. You may find more details on these settings in section 3.2.2.

3.2.1.9 Features in the Vendor Form

Clicking the buttons in the action pane of the vendor list page or vendor form, you may access various inquiries and activities referring to the selected vendor:

- Action pane tab *Vendor*:
 - *Transactions* – Showing vendor invoices and payments
 - *Balance* – Showing the total of open liabilities
 - *Contacts* – Managing vendor contact persons
 - *Bank accounts* – Managing vendor bank accounts for payment
- Action pane tab *Procurement*:
 - *New/Purchase order* – Entering an order, see section 3.4.5
 - *Related information/Purchase orders* – Viewing existing orders
 - *Agreements/Trade agreements, Purchase prices, Discounts* – Viewing purchase prices and discounts, see section 3.3.3
 - *Agreements/Purchase agreements* – Blanket orders, see section 3.4.9
- Action pane tab *Invoice*:
 - *New/Invoice* – Entering a vendor invoice, see section 8.3.3
 - *Settle/Settle open transactions* – Settling invoices, see section 8.2.5
 - *Related information/Invoice* – Viewing posted invoices

3.2.1.10 One-time Vendor

One-time vendors are available to keep master data of regular suppliers separate from vendors, which supply items rarely or only once.

The accounts payable parameters (*Accounts payable* > *Setup* > *Accounts payable parameters*, tab *General*) may contain the vendor number of a vendor used as template for one-time vendors. In addition, you may specify a separate number sequence for one-time vendors on the tab *Number sequences* of the parameters.

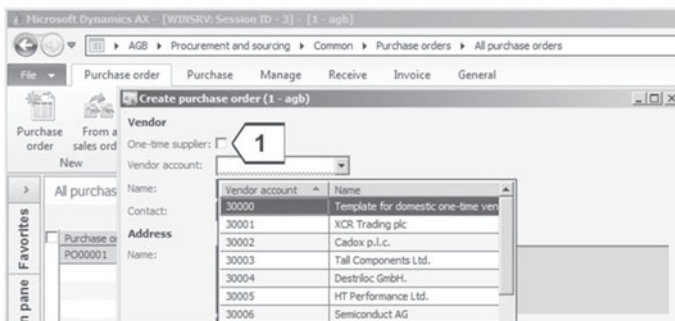


Figure 3-6: Creating a one-time vendor in a new purchase order

If these parameters are set up for one-time vendors, you may select the checkbox *One-time supplier* as shown in Figure 3-6 (instead of choosing an existing vendor) when creating a new purchase order in the list page *Procurement and sourcing* > *Common* > *Purchase orders* > *All purchase orders*. For each such order, Dynamics AX automatically creates a new vendor. In the vendor record of these vendors, the

vendor account number derives from the number-sequence for one-time vendors and the checkbox *One-time supplier* (tab *Vendor profile* on the vendor form) is marked. Deselecting the checkbox *One-time supplier* in the vendor record transforms a one-time to a regular vendor (keeping the original vendor number).

3.2.1.11 New in Dynamics AX 2012

In Dynamics AX 2012, items new to vendor management refer to the deeper integration of the global address book as well as to the new user interface design.

3.2.2 Payment Terms and Cash Discount

Unlike some other business applications, which include cash discount settings in the payment terms, Dynamics AX clearly distinguishes payment terms and cash discount. You have to register two different fields in order to manage vendor payment settings.

Payment terms and cash discounts in Dynamics AX are shared between vendors and customers. Therefore, you may access the appropriate administration forms in the accounts payable menu as well as in the accounts receivable menu.

The calculation of due date and cash discount date starts from the document date, which you may enter when registering an invoice. If you leave the document date empty, Dynamics AX will apply the posting date as the start date for due date calculation. Especially in purchase invoices, the document date may deviate from the posting date.

You may modify the due date and cash discount date when posting the invoice or when settling it in the settle open transactions form (see section 8.2.5).

3.2.2.1 Terms of Payment

T...	Description
CASH	Immediate cash payment
M15	15 days after the end of the month
N14	14 days net
N30	30 days net
N90	90 days net

Terms of payment: N30
Description: 30 days net

Setup

Administration

Payment method: Net
Cash payment: ☐
Months: 0
Days: 30
Payment schedule:
Payment day:
Ledger posting
Cash:
Method of payment, for instance net, current month or current quarter. Close

Figure 3-7: Setting due date calculation in the payment form

In order to specify payment terms, you may access the form *Accounts payable> Setup> Payment> Terms of payment* in the accounts payable menu or *Accounts receivable> Setup> Payment> Terms of payment* in the accounts receivable menu. On the left-hand side of the form, you will find a list showing IDs and descriptions of the terms of payment. Settings for due date calculation of a selected payment term are available on the right-hand side.

The lookup field *Payment method* on the tab *Setup* specifies the start date for due date calculation. A payment method “Net” means starting from the document date, “Current month” means starting from month end. In order to specify the period length for the due date, you may enter the number of days and months. If required, you may as well select a payment schedule.

The button *Language texts* is available to enter a longer description in own and foreign languages. This description will be printed on external documents like the printed purchase order instead of the payment terms name.

3.2.2.2 Cash on Delivery

If you want to specify a term of payment for cash on delivery, you may choose the *Payment method* “COD”, select the checkbox *Cash payment*, and enter the ledger account number of the appropriate petty cash account in the field *Ledger posting/Cash*. When posting an invoice referring to this term of payment, Dynamics AX immediately posts the payment and settles the invoice applying the petty cash account of the payment term.

3.2.2.3 Cash Discount

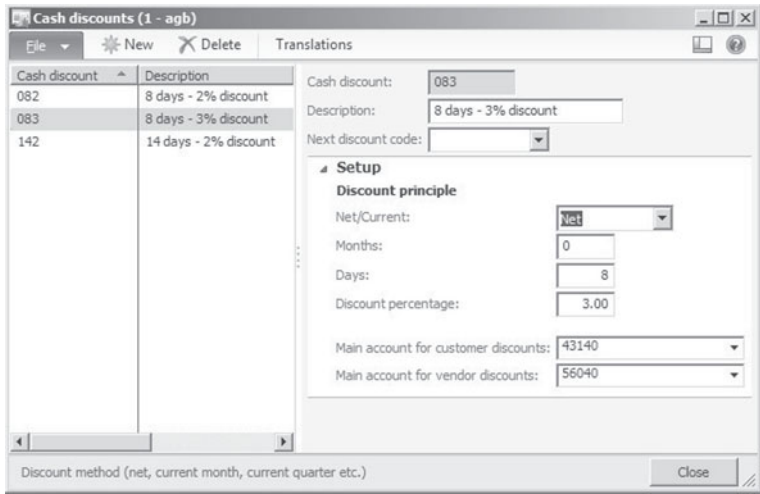


Figure 3-8: Setting up a cash discount

As with payment terms, you may access the cash discount setup in the accounts payable menu as well as in the accounts receivable menu (*Accounts payable> Setup> Payment> Cash discounts* and *Accounts receivable> Setup> Payment> Cash discounts*).

Setting up new cash discounts works like setting up payment terms, except that you have to add a cash discount percentage and ledger accounts for posting. Since cash discounts do not only apply to vendors but also to customers, you need to enter ledger main accounts for two different kinds of transactions:

- Main account for customer discounts
- Main account for vendor discounts

3.2.3 Ledger Integration

Whenever you post an invoice in purchasing, you will automatically post in finance in parallel. The postings in finance apply to two different areas: The general ledger on the one hand and subledgers for accounts payable, accounts receivable, inventory and others on the other hand.

3.2.3.1 Subledger

As mentioned, there is no separate form for vendors in purchasing and the accounts payable ledger in finance administration. Data of both areas are available in a common vendor form. Whenever posting vendor invoices, credit notes and payments, Dynamics AX posts vendor transactions for accounts payable.

3.2.3.2 General Ledger

In parallel to subledger posting, Dynamics AX posts transactions in the general ledger as described in section 8.4.

There are two different areas of assignment between transactions in purchasing and the general:

- Assignment of items (products) to general ledger accounts:
Settings for purchasing transactions, which are posted when receiving or invoicing items (or procurement categories), are available in the inventory setup (*Inventory and warehouse management*> *Setup*> *Posting*> *Posting*) depending on the vendor and the item (or category) – see section 8.4.2.
- Assignment of vendors to summary accounts in the general ledger:
Settings are available in the posting profiles.

Both assignments – item and vendor transactions – are available on the level of particular items and/or vendors as well as on group level.

3.2.3.3 Vendor Group

For vendors, you may set up the vendor groups in the form *Accounts payable*> *Setup*> *Vendors*> *Vendor groups*. You may additionally enter a *Default tax group* for input tax in the vendor group, which defaults the sales tax group in the vendor record when creating a vendor selecting the vendor group concerned.

3.2.3.4 Posting Profile

You may access the vendor posting profiles, which control the assignment of vendors to summary accounts, in the form *Accounts payable> Setup> Vendor posting profiles*. As a prerequisite to post purchase transactions, at least one posting profile has to be available in your company. In addition, the posting profile defaulting regular purchase transactions has to be entered in the accounts payable parameters (*Accounts payable> Setup> Accounts payable parameters*, tab *Ledger and sales tax/Posting*).

In the posting profile form, you may find the column *Summary account* on the tab *Setup*. The ledger main accounts entered in this column specify the summary accounts.

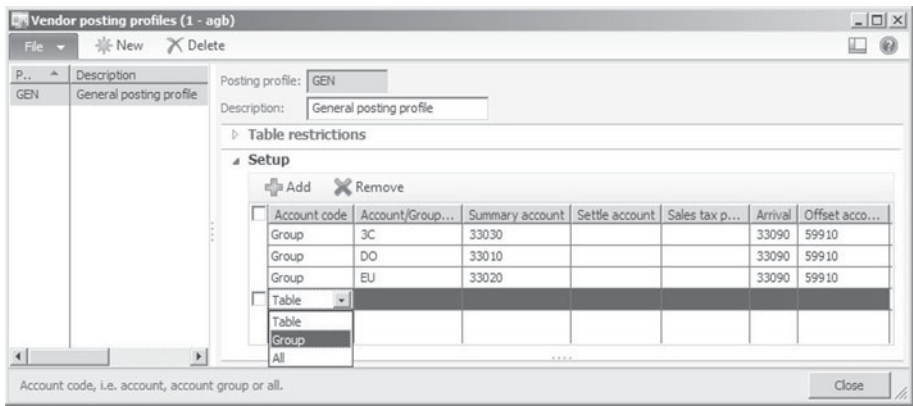


Figure 3-9: The vendor posting profiles form

3.2.3.5 Levels of Assignment

As shown in Figure 3-9, you may assign summary accounts on three different levels. The column *Account code* contains the specification level of a line:

- *Table* – To assign a summary account to a particular vendor (enter vendor number in the column *Account/Group number*)
- *Group* – To assign a summary account to a vendor group (enter vendor group in the column *Account/Group number*)
- *All* – To assign a general summary account (*Account/Group number* remains empty)

If settings are available on several specification levels, Dynamics AX applies the most appropriate setting starting the search with the vendor number. The specification level “All” has the lowest priority.

If you need to apply different profile settings for transactions like prepayment, you may set up additional posting profiles containing other account assignments than the general posting profile. If you need to apply one of the additional posting profiles in a specific transaction, you may choose it in that transaction (e.g. for a

purchase order on the *Setup* tab of the purchase order form header view). For prepayment, the posting profile is included in the accounts payable parameters.

3.2.4 Case Study Exercises

Exercise 3.1 – Terms of Payment

Your company wants to establish new terms of payment “60 days net”, which you have to enter in Dynamics AX choosing a code P-## (## = your user ID). In addition, a new cash discount D-## for “14 days with 3 percent discount” is required.

Be sure to enter the values for due date and cash discount date calculation correctly. When registering the cash discount in Dynamics AX, choose ledger main accounts similar to the accounts in existing cash discounts.

Exercise 3.2 – Create Vendor

The responsible department accepts a new domestic vendor, who wants to ship items to your company. Enter a new record for this vendor in Dynamics AX without applying a template. Register a name (starting with your user ID) and a primary address, select an appropriate vendor group and sales tax group. For this vendor, the terms of payment and the cash discount entered in exercise 3.1 apply.

Exercise 3.3 – Ledger Integration

You want to find out about ledger integration. To which summary account in the general ledger will an invoice from your new vendor post?

3.3 Product Management

Goods received in purchasing are stocked products on the one hand and intangible items like services, fees and licenses on the other hand. Before purchasing any item, you have to ensure correct and complete master data – on the one hand distinctively describing the item ensuring your vendor sells the right product, and on the other hand specifying settings for internal purposes (like assigning an appropriate item group linking ledger accounts for financial transactions).

For inventoried items, you have to register master data of each item in the product and released product table. For intangible items, you may either apply product and released product records as well (selecting the product type “Service” or specific item model groups), or choose procurement categories.

Along with a short introduction to the basics of product management, this section primarily contains an explanation of product data necessary for purchasing. You may find a more general description of product management in section 7.2.

3.3.1 Procurement Categories

Product categories are groups of similar products and services, in category hierarchies establishing a simple or multilevel structure. Depending on the

category hierarchy type, a category hierarchy constitutes procurement categories, sales categories or other categories.

Linking products to product categories, you may set up a hierarchical structure classifying your products. Depending on the requirements, you may keep multiple hierarchies assigning each item to several categories in parallel.

In addition, you may select a product category instead of an item number in purchase and sales order lines, simplifying the management of services and intangible items not tracked on stock.

3.3.1.1 Category Hierarchies

You may access category hierarchies in the list page *Product information management> Setup> Categories> Category hierarchies*. If you want to set up a new hierarchy, you have to click the button *New/Category hierarchy* in the action pane entering a name and optionally a description. In the category hierarchy form, you may set up the categories of the new hierarchy.

In order to assign a category hierarchy to a type, you may access the form *Product information management> Setup> Categories> Category hierarchy types*. You may assign one hierarchy to the *Category hierarchy type* “Procurement category hierarchy” applying to purchasing, and one hierarchy to the type “Sales category hierarchy” applying to sales. Depending on your requirements, you may choose the same or different hierarchies.

Figure 3-10: Editing a product category in the category hierarchy form

The procurement category hierarchy is also available in the purchasing module (*Procurement and sourcing > Setup> Categories> Procurement categories*), including additional tabs and fields for registering purchasing detail data of categories.

3.3.1.2 Product Categories

If you want to view the structure of an existing hierarchy, you may double-click on the line of the particular hierarchy in the category hierarchy list page to access the category hierarchy form. Clicking the button *Edit* in the action pane, you may edit the structure.

In order to add a new category or category folder, you want to select the parent node in the tree structure on the left and click the button *New category node* in the action pane (or do a right-hand click on the parent node). In the new category, you should at least enter *Name*, *Code* and *Friendly name* (see Figure 3-10).

3.3.1.3 Procurement Categories

Product categories belonging to the procurement category hierarchy are available in purchase requisition and order lines, where you may select a procurement category instead of a product number.

In order to register category settings for purchasing, you may access the procurement categories (*Procurement and sourcing > Setup > Categories > Procurement categories*), where the item sales tax group is available on the tab *Item sales tax groups*. Clicking the button *Edit category hierarchy* in the action pane strip of the procurement categories form provides an alternative access to the product category hierarchy assigned to purchasing.

As another prerequisite for purchase transactions, the inventory posting setup (see section 8.4.2) has to contain settings for the categories concerned (*Inventory and warehouse management > Setup > Posting > Posting*, tab *Purchase order*, option *Purchase expenditure for expense*).

3.3.2 Product Master Data for Purchasing

In order to support large enterprises with a multi-company structure, the data structure of product master data in Dynamics AX shows two levels:

- Shared products – Common to all companies
- Released products – Holding company-specific item data

The data structure of shared products applies to all implementations. In a small enterprise with only one company, you may access product management directly in the released products form. When registering a new released product there, Dynamics AX in the background automatically inserts it in the shared products.

3.3.2.1 Shared Products

You may check existing or create new products accessing the menu item *Product information management > Common > Products > All products and product masters*. The all products page shows a list of available items, including regular and configurable products as well as service items. Shared product records are there to ensure

common item numbers and apart from product number and name/description do not contain extensive information.

If you want to enter a new product, you have to click the button *New/Product* in the action pane. In the *Create product* dialog, you want to register following data:

- Product type – “Item” for stocked products, “Service” optional for services
- Product subtype – “Product” for regular items, “Product master” for configurable items with variants (see section 7.2.1)
- Product number – Manually if the number sequence is set to Manual
- Product name
- Search name

In order to create a regular stocked item, choose the *Product type* “Item” and the *Product subtype* “Product”. For intangible items like services, you may choose the *Product type* “Service”. Alternatively, you may also choose the *Product type* “Item” for an intangible item if you link it to an item model group for non-inventoried items (see section 7.2.1) in the released product.

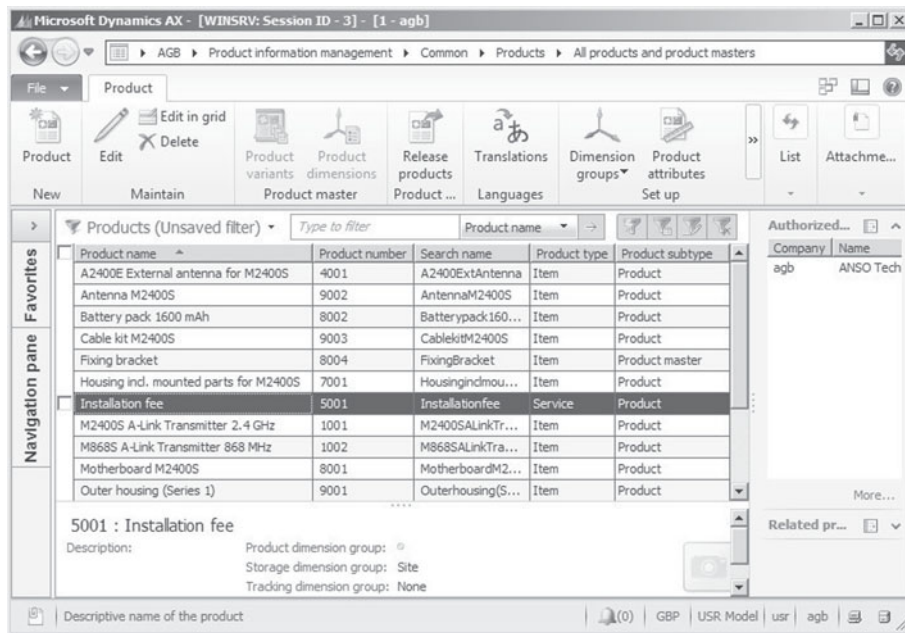


Figure 3-11: Selecting an item in the all products list page

Additional settings in the shared product are optional – e.g. linking the product to categories clicking the button *Set up/Product categories* in order to create hierarchical product structures.

Clicking the button *Dimension groups* in the action pane you may specify which inventory dimensions apply (required either on the shared product or on the released product). For this purpose, Dynamics AX applies dimension groups:

- Product dimension group – Only for subtype “Product master”; specifying if the item is available in different sizes, colors, configurations
- Storage dimension group – Specifying if you track inventory of the item by the site, warehouse, location or pallet
- Tracking dimension group – Specifying if batch or serial numbers apply

3.3.2.2 Releasing a Product

Before you can actually register transactions for a new product, you have to release it by clicking the button *Release products* in the action pane of the shared product. The product selected shows on the tab *Select products* in the release products dialog form. Switching to the tab *Select companies* on the left pane of that dialog, you may put a checkmark in front of all companies which may use the product and confirm the selection clicking the button *OK*.

3.3.2.3 Managing Released Products

Released products (*Product information management> Common> Released products*), also labeled “Item” in some areas of Dynamics AX, contain the item details. You may directly access a released product from the shared products – clicking the link *More* in the factbox *Authorized by company* and then applying the table reference (*View details*) on the column *Item number* in the dialog.

After releasing a new product, you have to populate the following mandatory fields in the release product from:

- Item group (tab *Manage costs*) – Linking ledger accounts for ledger integration
- Item model group (tab *General*) – Specifying item handling and inventory valuation
- Storage dimension group (button *Product/Dimension groups*) – If not specified on the shared product
- Tracking dimension group (button *Product/Dimension groups*) – If not specified on the shared product

In addition, you should enter the *Item sales tax group* for purchasing on the tab *Purchase* and for sales on the tab *Sell*. Another important setting is the *Unit* (inventory unit of measure, defaulting from inventory parameters) on the tab *Manage inventory*.

In order to register a general cost price for the item, you may choose the field *Price* on the tab *Manage costs*. The button *Item price* on the action pane tab *Manage costs* is available to enter a cost price per site as described in section 7.2.4.

If templates are available for released products, you may populate fields of the released product record clicking the button *Maintain/Apply template* on the action pane tab *Product* (overriding record fields already entered). You may create a template in the released product detail form clicking the button *New/Template*.

If applicable (e.g. in a single-company implementation), you may create a new product clicking the button *New/Product* on the action pane tab *Product* in the released products page instead of the shared product page. The *New released product* dialog will create a shared product in parallel.

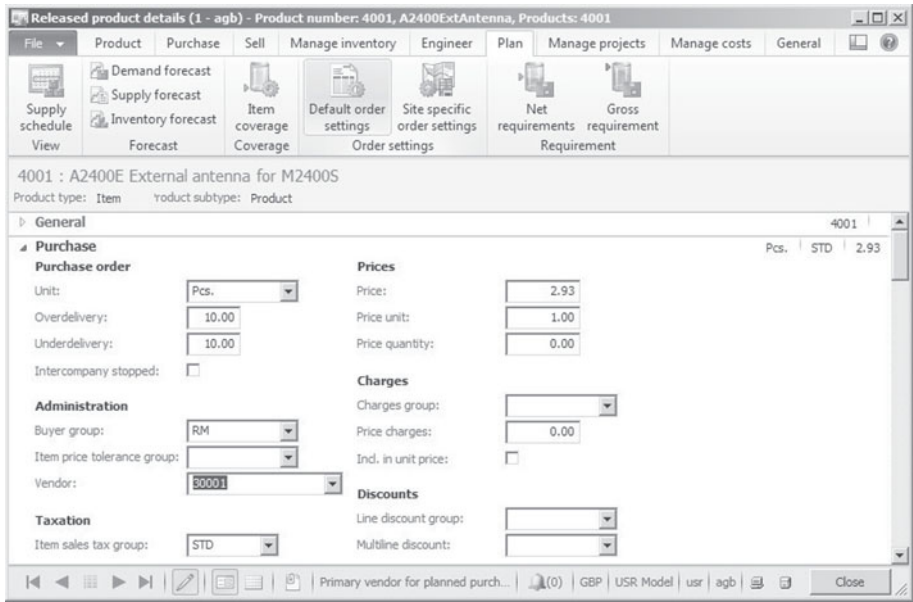


Figure 3-12: Released order detail form, showing the action pane tab *Plan*

3.3.2.4 Purchasing Related Data

Core purchasing information, including the item sales tax group already mentioned, is available on the tab *Purchase* of the released product form. The *Buyer group* there enables to specify purchasing responsibility for the item.

Additional data required for purchasing the released product include purchase prices as well as item coverage and order settings.

3.3.2.5 Default Order Settings

Clicking the button *Default order settings* on the action pane tab *Plan* of the released product form, you may enter order settings for the product on company level.

An important field in the default order setting form is the *Default order type* on the tab *General*. If the default order type is "Purchase order", the item is to be purchased from vendors (if no different settings from item coverage apply).

The tab *Purchase order* in the default order settings shows settings specific for purchasing – including defaults for lot size (field *Multiple*), order quantity (field *Standard order quantity*) and purchase site. Marking the checkbox *Stopped*, you may block an item to transactions.

The second order settings button on the released product form – *Site specific order settings* – enables you to override the default order settings on site level (Sites

represent subsidiaries within a company, see section 9.1.6). After creating a line entering the site concerned, you may record a default warehouse for purchasing, inventory transfer and sales. In order to override the default order settings for quantity defaults and lead time, you need to select the checkbox *Override* in the site-specific order settings.

When recording a purchase or sales order later, you may override the defaults from the order settings (except item blocking).

3.3.2.6 Item Coverage

The primary setting for item coverage is the *Default order type* in the default order settings (see above). In the released product detail form, you may enter a main vendor for purchasing the item (field *Vendor* on the tab *Purchase*).

Coverage groups contain settings for requirements planning (see section 6.3.3). A basic default coverage group is specified in the master planning parameters (*Master planning> Setup> Master planning parameters*, lookup field *General coverage group*). On the tab *Plan* of the released product detail form, you may assign a different coverage group to individual items.

When clicking the button *Item coverage* on the action pane tab *Plan* in the released product form, further settings are available for an item. When inserting or editing a line in the item coverage form, you may specify settings including the minimum and the maximum quantity. In addition, you may enter a *Planned order type* (overriding the default order type) and a *Vendor account* (overriding the main vendor in the released product form). Depending on the dimension groups, you may enter coverage settings on inventory dimension level (e.g. for a site or warehouse).

3.3.2.7 New in Dynamics AX 2012

Dynamics AX 2012 introduces the concept of shared products and product masters containing basic item data common to all companies. The released products form replaces the item form, and the former single inventory dimension group splits to three separate dimension groups. The item type “BOM” is removed – default item replenishment is specified by the default order type now.

3.3.3 Purchase Price and Discount

In Dynamics AX, the base functionality for pricing is the same in purchasing and in sales. Pricing includes a multi-stage calculation of prices and discounts, which starts at the base price in the released product form and proceeds in trade agreements for vendor groups and individual vendors.

Since sales uses discount calculation to a larger extent than purchasing in many companies, the section below focuses on price calculation. Details on discount calculation are available in section 4.3.2.

3.3.3.1 Purchase Base Price

The purchase base price shows in the field *Price* on the tab *Purchase* of the released product form. The *Price unit* specifies the quantity which is the basis for the price. A price unit "100" for example will apply a price for hundred units (e.g. for inexpensive screws).

If you want to record different purchase base prices per subsidiary (site), you may click the button *Item price* on the action pane tab *Manage costs*. In the item price form, you may register and activate a price per site as shown in section 7.2.4 (*Price type* "Purchase price" applies).

Purchase order lines will apply the base price, if no trade agreement is applicable for the vendor and the item concerned.

3.3.3.2 Price Charges

In order to record charges (like fees and freight) which are added to the base price, you may register *Price charges* on the tab *Purchase* of the released product form. If the checkbox *Incl. in unit price* is not selected, the amount entered in the field *Price charges* will add to an order line independent from the quantity. As an example for this case, 10 units for a price of three pounds will add to a line amount of 31 pounds in a purchase order if the price charges are one pound. The price charges will not show in separate fields on documents, however.

If the checkbox *Incl. in unit price* is selected, Dynamics AX adds the price charges to the unit price. In this case, the field *Price quantity* is the quantity basis for allocating the price charges to the unit price. As an example for including price charges in the unit price, 10 units for a price of three pounds will sum up to a total of 40 pounds in the purchase order line amount if the price charges are one pound and the price quantity is zero.

When working with charges, you should not confuse price charges specified in the item record (released product form) with charges transactions assigned to charges codes, which are managed in orders separately. Details on charges management in orders are available in section 4.4.5.

3.3.3.3 Currency for Base Prices

Prices and price charges in the released product form apply the company currency. If a foreign currency applies to an order, Dynamics AX converts base prices derived from item records to the currency of the order.

3.3.3.4 Trade Agreements for Purchase Prices

You may view trade agreements for purchase prices of a product clicking the button *View/Purchase prices* on the action pane tab *Purchase* of the released product form. Trade agreements are available to record detailed settings for prices and discounts showing following specification levels:

- Period of validity – From date and to date
- Quantity – From and to quantity
- Unit of measure
- Currency
- Specification level (column *Account code*) – Individual vendor, vendor group or all vendors

In addition to the options listed above, you may also specify prices on dimension level like site or color. You will need this option, if prices are different per site, or warehouse, or depending on product dimensions like size or color. In order to show columns with required dimensions, you may click the button *Inventory/Dimensions display* in the purchase prices form. As a prerequisite to apply dimensions in pricing, the dimension group of the particular item has to include the selected dimensions in the price search (see section 7.2.2).

3.3.3.5 Search Priority

The price search in Dynamics AX starts from the most specific and browses to the general agreement, in other words from vendor prices to vendor group prices and finally to general prices. By default, Dynamics AX is always searching for the lowest price in trade agreements – a lower group price will override a higher vendor-specific price. You may stop this search by clearing the checkbox *Find next* in the right-most column of the trade agreement.

3.3.3.6 Registering New Prices

In order to set up new purchase prices, you need to register and post a journal in the form *Procurement and sourcing> Journals> Price/discount agreement journals*. Alternatively, you may access price/discount agreement journals clicking the button *Create trade agreements* on the action pane tab *Purchase* of the released product form.

Like all journals (compare inventory journals in section 7.4.2), price/discount agreement journals consist of a header and at least one line. Selecting the appropriate option in the lookup field *Show* at the top of the price/discount agreement journal form, you may choose to view only open journals or to include posted journals. In order to register a new journal, you may click the button *New* and select a journal name.

After clicking the button *Lines*, you may insert the first journal line. When recording a purchase price, make sure “Price (purch.)” is selected in the column *Relation*. The *Account code* specifies if the price is for a vendor (“Table”), for a vendor price group (“Group”) or for all vendors. For prices, the column *Item code* needs to show “Table” along with the product number in the *Item relation*.

C.	Relation	Account code	Account selection	Item code	Item relation	Color	Site	From	To	Unit	Amount in curr...	Curr
1	Price (purch.)	Table	30001	Table	4001			0.00	1,000.00	Pcs.	2.96	GBP
2	Price (purch.)	Table	30001	Table	4001			1,000.00		Pcs.	2.92	GBP
3	Price (purch.)	Group	Cadox	Table	4001			0.00		Pcs.	3.08	GBP

Figure 3-13: Registering purchase prices in a price/discount journal

Apart from the columns in the grid, you need to pay attention to the bottom fields where you may enter a price unit and a lead-time. In an order line, the price, price unit and lead-time of the applicable trade agreement override the defaults from the item record.

In order to view which inventory dimensions are available for pricing, you may take a look at the information text in the header part of the journal. In Figure 3-13, this header information tells that for the selected item you may register price agreements on site level.

After registering all lines required, you may click the button *Post* to activate the agreement. Other buttons available in the journal lines facilitate price management, providing the option to select and adjust existing agreements.

3.3.3.7 Required Setup for Pricing

As a prerequisite for applying trade agreements, the appropriate price options in the price/discount setup (*Procurement and sourcing> Setup> Price/discount> Activate price/discount*) have to be selected.

If you want to enter group prices, you need to set up the required vendor price groups (*Procurement and sourcing> Setup> Price/discount> Vendor price/discount groups, Show "Price group"*). In the vendor detail form (*Procurement and sourcing> Common> Vendors> All vendors*), you may select the appropriate price group on the tab *Purchase order defaults*. When selecting a vendor in a purchase order, the vendor price group will default the order. You may change the price group in the purchase order detail form, nevertheless (*Procurement and sourcing> Common> Purchase orders> All purchase orders, tab Price/Discount* in the header view).

3.3.3.8 New in Dynamics AX 2012

In Dynamics AX 2012, you need to post price/discount agreement journals in order to update in trade agreement prices and discounts. In the trade agreement form itself, an additional column for the to-quantity is available.

3.3.4 Case Study Exercises

Exercise 3.4 – Procurement Categories

Your company purchases a new kind of services, for which you want to set up appropriate product categories in the procurement hierarchy. Enter a new category node “##-services” containing the categories “##-assembling” and “##-fees” (## = your user ID). In addition, make sure the procurement categories receive the item sales tax group referring to the standard tax rate.

Exercise 3.5 – Product Record

In order to accomplish purchase order processing in the following exercises, you need to set up a new product. This first product is a trade item, later on we will continue with the more complex structures of BOM items.

Enter a new shared product with the product number I-## and the name “##-merchandise” (## = your user ID). It should be a regular stocked product without variants, serial or batch numbers. You want to track inventory per site and warehouse. Choose appropriate dimension groups in the shared product.

Then you want to release the product to your test company. In the released product, select an appropriate item group for merchandise and an item model group with FIFO-valuation.

The item sales tax group for sales and for purchasing should refer to the standard tax rate. The unit of measure for the item is “Pieces” in all areas, and the main vendor is the vendor of exercise 3.2. The base purchase price and the base cost price are 50 pounds, the base sales price is 100 pounds.

In the *Default order settings* for purchasing and sales, you should enter the main site as well as default quantities (*Multiple* 20, *Min. order quantity* 40, *Standard order quantity* 100). In the *Site specific order settings*, you should enter the main warehouse of the main site for purchasing and sales.

Note: If the number sequence for product numbers is set up for automatic numbering, you do not need to enter a product number.

Exercise 3.6 – Trade Agreement

You agree upon a lower price for the new item with your main vendor. Set up a trade agreement for the vendor of exercise 3.2, which specifies a purchase price of 45 pounds for the item of exercise 3.5. There is no minimum quantity and no end date for this price.

3.4 Purchase Orders

An order is a definite promise to deliver goods or services on agreed terms. Orders therefore have to include following details to be complete:

- Vendor with name and address
- Currency, Payment terms, Terms of delivery

- Product
- Quantity, Unit of measure
- Price
- Delivery date, Delivery address

When registering a purchase order, Dynamics AX checks these requirements before you may post and print the purchase order.

3.4.1 Basics of Purchase Order Processing

In order to create a purchase order, you may either insert it manually or generate it as follows:

- Create a purchase order automatically as a result of a purchase requisition workflow or master scheduling
- Transfer a request for quotation, planned order or purchase requisition to a purchase order
- Transfer a purchase journal to a purchase order
- Create a release order based on a purchase agreement (see section 3.4.9)
- Create a purchase order in a sales order (direct delivery, see section 4.7)
- Create a purchase order based on a production order (Subcontracting)

Other ways to create purchase orders in Dynamics AX are automatic transfers – from external applications through the AIF-framework as well as from affiliated companies, sharing a common Dynamics AX database, through the Intercompany functionality.

Purchase order processing related to projects is part of the project module, described in the relevant online help and training documentation.

3.4.1.1 Possible Documents prior to Purchase Orders

Within procurement, there are three different documents, which you may process before creating a purchase order:

- Planned orders
- Purchase requisitions
- Requests for quotation

A request for quotation is required, if you want to obtain and compare quotes from several vendors in Dynamics AX. You may create requests for quotation either automatically in a planned order or a purchase requisition, or enter them manually.

If your company applies master scheduling or purchase requisitions, you may want to skip requests for quotation for known items in daily business. In this case, you want create a purchase order directly from a planned order or a purchase requisition.

Planned purchase orders are a result of master scheduling. Depending on master planning setup, master scheduling may skip planned orders and directly create purchase orders. You may find details on the appropriate setup in section 6.3.3.

3.4.1.2 Purchase Order Approval

If change management applies a new purchase order, you need to submit the order for approval. Depending on the order and the approval workflow, approval may be granted automatically or involve manual authorization. If change management does not apply, the approval status immediately shows *Approved*.

3.4.1.3 Purchase Order Processing

After creating – and separate approving if required – a purchase order, you want to process it from the start to the end as shown in Figure 3-14. Depending on the setup, you may skip all steps of order processing except posting the order confirmation and the vendor invoice. If the checkbox *Receiving requirements* on the item model group of a purchased product is selected, you have to post the product receipt before you can post the vendor invoice.

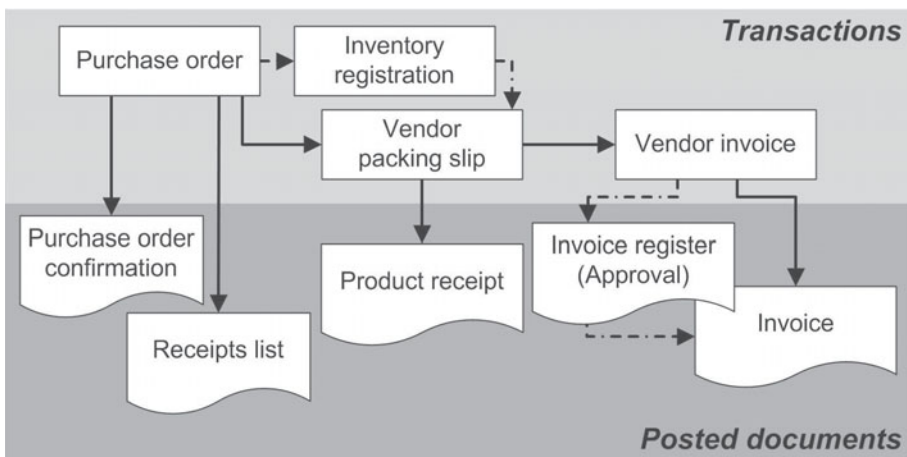


Figure 3-14: Purchase order processing in Dynamics AX

3.4.1.4 Purchase Order Confirmation and Printing

The first step in processing an approved purchase order is to confirm the order. Confirming may include sending a hardcopy or electronic document to the vendor.

3.4.1.5 Receipts List

If your warehouse requires a list of items for information purposes to prepare item arrival, you may print a receipts list.

3.4.1.6 Inventory Registration

Before posting the product receipt, you may register the items including all required inventory dimensions like warehouse, serial number and batch number.

You may do this registration either by posting an item arrival journal in inventory, or in the registration form that is accessible clicking the button *Update line/Registration* in the action pane strip of purchase order line.

If the checkbox *Registration requirements* in the item model group of the purchased product is selected, you have to execute the inventory registration before you may post the product receipt.

3.4.1.7 Product Receipt

When posting a product receipt, Dynamics AX posts inventory transactions and – depending on the setup – general ledger transaction. You may access the product receipt posting form either from the related purchase order, or selecting the appropriate summary update in the procurement module, or from the posted item arrival journal in inventory.

3.4.1.8 Vendor Invoice

Once the vendor invoice arrives, you may post it in the purchase order. Alternatively, you may record the invoice in an invoice register journal if an approval process applies (see section 8.3.3).

3.4.1.9 Physical and Financial Transactions

In the following sections, you may find detailed explanations on purchase order processing. When posting inventory transactions you should be aware that there are two different kinds of transactions: Physical and financial transactions.

Generally speaking, physical transactions mean packing slips (product receipts) and financial transactions mean invoices. You need to distinguish between these transactions, in particular regarding inventory valuation and general ledger posting. Details on these topics are available in section 7.2.5.

3.4.2 Planned Orders

Planned purchase orders are based on the demand for a purchased item. The settings, whether item requirements calculation in master scheduling should include forecasts as well as available inventory on hand, sales quotes, sales orders, production orders and purchase orders are available in the operations planning (master planning) setup.

The description below shows a simple procedure for generating planned orders in master scheduling. The item requirement in the example is caused by a minimum inventory quantity (entered in the item coverage form), which exceeds the quantity on hand.

3.4.2.1 Minimum Quantity

In order to enter a minimum inventory quantity for an item, you may open the item coverage form clicking the button *Item coverage* (action pane tab *Plan*) in the

released product form (*Product information management* > *Common* > *Released products*) after selecting the appropriate item.

If you want to enter a minimum quantity in the item coverage, you have to insert a new record there. Depending on the dimension groups of the item, the minimum quantity is to be entered on dimension level, for example per site and warehouse.

Site	Warehouse	Minimum	Maximum	Coverage group
HQ	10	100.00	0.00	PER

Figure 3-15: Entering a minimum inventory quantity in the item coverage form

3.4.2.2 Net Requirements and Master Scheduling

Item coverage settings and the availability of the item show in the net requirements form, which you may access clicking the button *Net requirements* on the action pane tab *Plan* of the released product form after selecting the item concerned. In the net requirements form, you may update master scheduling as shown in Figure 3-16.

When updating the master schedule by clicking the button *Update/Master scheduling* in the action pane strip of the net requirements form, Dynamics AX generates planned orders. As an alternative, you may also run general master scheduling by choosing the periodic activity *Master planning* > *Periodic* > *Master scheduling* (usually a batch job in the nighttime).

Warehouse	Site	Minimum	Maximum	Coverage group	Planned order type
10	HQ	100.00	0.00	PER	Purchase order

Figure 3-16: Local master scheduling in the net requirements form

Dynamics AX may apply multiple master plans, including a static master plan for current master scheduling and a separate dynamic master plan for simulation purposes (see section 6.3.1). When updating a master schedule, planned orders will be generated in the selected plan only – the static, the dynamic, or any other specific master plan. If master planning parameters define a two master plan strategy the dynamic plan will be the default for updating the master schedule in the net requirements form.

3.4.2.3 Planned Purchase Order

In order to access planned purchase orders generated in master scheduling, you may open the list page *Procurement and sourcing> Purchase orders> Planned purchase orders*. If master planning setup specifies a separate dynamic plan (two master plan strategy), you should choose the dynamic plan in the lookup field *Plan* above the grid in the planned order list page.

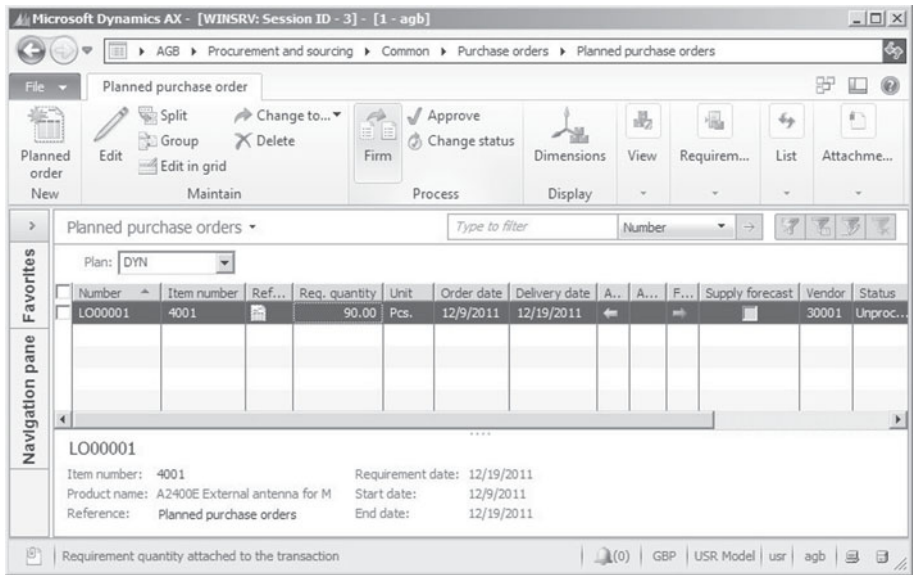


Figure 3-17: Processing a planned purchase order

Selecting the planned order concerned, you may modify the planned supply as necessary in the planned order detail form. If you want to know the origin of a requirement, you may view the tab *Pegging*.

The field *Vendor* on the tab *Planned supply* shows the suggested vendor for the item, deriving from the main vendor in the item record, from a trade agreement or from item coverage. If there is no default for the vendor, you have to assign a vendor manually before you can transfer the planned order to an actual purchase order.

3.4.2.4 Creating a Purchase Order

Once you have finished updating planned orders, you can transfer them to purchase orders. Clicking the button *Process/Firm* in the action pane of the planned orders, Dynamics AX generates purchase orders for one or more planned orders.

As an alternative to directly creating purchase orders, you may change a planned purchase order to a request for quotation clicking the button *Maintain/Change to.../Request for quotation* in the action pane (see section 3.4.4).

3.4.3 Purchase Requisitions

A purchase requisition is an internal document, which requires the purchasing department to buy requested goods or services. Unlike a planned order, which is created automatically because of an item requirement, a purchase requisition has to be entered manually by the person, who needs the item.

3.4.3.1 Prerequisites for Processing Purchase Requisitions

Before a purchase requisition is transferred to a purchase order, it has to run through an approval process. This approval process is based on the workflow system (see section 9.4).

In order to configure the purchase requisition workflow, you have to access the form *Procurement and Sourcing> Setup> Procurement and sourcing workflows*. When configuring a workflow for purchase requisitions, you want to choose the template “Purchase requisition review” (refers to the *Type* “PurchReqReview”) or the template “Purchase requisition line review” (refers to “PurchReqLineReview”).

As a prerequisite for specifying the items available for purchase requisitions, you have to set up and activate a procurement catalog (*Procurement and Sourcing> Common> Catalogs> Procurement catalog*) containing applicable categories and products. In the purchasing policies (*Procurement and Sourcing> Setup> Policies> Purchasing policies*), you want to make sure this catalog is selected in the policy rule *Catalog policy rule* of the policy applying to your organization.

3.4.3.2 Entering a Purchase Requisition

You may enter purchase requisitions in the regular Dynamics AX client as well as in the Enterprise Portal, which is the web access for occasional users.

If choosing the Dynamics AX Windows client, you may access the list page *Procurement and Sourcing> Common> Purchase Requisitions> All purchase requisitions*. When clicking the button *New/Purchase requisition* in the action pane, Dynamics AX shows the create dialog where you may enter a name for the requisition.

Depending on purchasing policy settings, you may choose to request a line on behalf of a different person or organization selecting an appropriate *Requester*, *Buying legal entity*, or *Receiving operating unit* in the purchase requisition lines.

Concerning requested items, the way to enter lines depends on the item kind:

- Internal catalog products – Regular released products, linked to the current procurement catalog, may be selected in the *Item number* column.
- Non-catalog products – Services and new products may be registered entering a *Procurement category* and a *Product name* (description).
- External catalog products – Creating these requisition lines is only possible in the Enterprise Portal, navigating to an external vendor website.

Apart from manually inserting lines in the *Purchase requisition lines* tab choosing item number or procurement category, you may click the button *Add items* in the action pane strip on this tab to open the *Add items* form.

In the *Add items* form, you have to click the button *Select* in the lower pane after selecting requested items on the upper tabs *Catalog items* and *Non-catalog items*. Clicking the button *OK* at the bottom of the form transfers the items to the requisition lines.

3.4.3.3 Approval Workflow

As long as you are working on entering a purchase requisition, it shows the *Status* “Draft”. Once you have finished and the purchase requisition is complete, you may start the requisition workflow clicking the button *Submit*. The requisition status switches to “In review” and the workflow system will process the submitted requisition in a batch process.

The further proceeding for approval depends on the workflow configuration of the purchase requisition workflow. Section 9.4 in this book contains a brief description of configuring and processing workflows.

As long as a purchase requisition shows the status “In review”, you may create a related request for quotation clicking the button *Create request for quotation* in the action pane tab of the purchase requisition.

3.4.3.4 Creating a Purchase Order

Once a purchase requisition is approved, it shows the *status* “Approved” and may be released to generate a purchase order.

In the purchasing policies (*Procurement and Sourcing*> *Setup*> *Policies*> *Purchasing policies*), you may access the policy rule *Purchase order creation and demand consolidation* of the policy applying to your organization in order to specify if purchase orders are generated automatically or need to be released manually.

If manual releasing is necessary, you may click the button *New/Purchase order* in the action pane of the list page *Procurement and sourcing*> *Common*> *Purchase requisitions*> *Release approved purchase requisitions* for releasing a requisition to a purchase order.

3.4.3.5 New in Dynamics AX 2012

In Dynamics AX 2012, purchasing policies and organization hierarchies are new features applying to purchase requisitions.

3.4.4 Requests for Quotation

A request for quotation (RFQ) is an external document, which asks vendors to submit a quotation. In Dynamics AX, you may send a single request for quotation to multiple vendors. Once a quotation from a vendor arrives, you may register it in a “request for quotation reply” to prepare comparing quotes. If you accept a quote, you may transfer it to an order.

You may insert requests for quotation manually in the request for quotations form or generate them from planned purchase orders and purchase requisitions.

3.4.4.1 Entering a Request for Quotation

In order to start a new request for quotations, you may manually enter it clicking the button *New/Request for quotation* in the form *Procurement and sourcing> Common> Requests for quotations> All requests for quotations*. In the create dialog you want to choose the *Purchase type* “Purchase order” for a request referring to a regular purchase order. After registering delivery and expiration date you may close the dialog clicking the button *OK*.

Request for quotation details, Product name (1 - agb) - Case ID: PQ00001, John Doe

File Quotation General Replies

Copy from Delete Request for quotation Send Enter reply Configure request for qu... Compare replies Totals Manage charges Request for quotation journals Attachments

Maintain New Proc... Replies Totals Charges Journals Attachments

PQ00001 : John Doe

12/8/2011

Request for quotation header

Administration

Buyer group: [dropdown]
 Requester: John Doe
 Language: EN-US
 Expiration date: 12/8/2011

Sales tax

Prices include sales tax: ☐

Request for quotation information

Delivery date: 12/8/2011
 Mode of delivery: [dropdown]
 Delivery terms: [dropdown]

Request for quotation lines

Add line Remove Details Set up Functions Inventory

Line type	Procurement category	Item number	Product name	Site	W...	Delivery...	Expiration date	Low...	Highest status	Quantity
Item		4001	A2400E External antenna...	HQ	10	12/8/2011	12/8/2011	Created	Created	1.00
Category	Mechanical comp...		New antenna without ite...	HQ		12/8/2011	12/8/2011	Created	Created	

Vendor *
 Address
 Price/discount
 Financial dimensions

Quantity ordered in purchase unit | (0) GBP | USR Model | usr | agb | Close

Figure 3-18: Entering lines in the request for quotation form

Requests for quotation consist of a header part containing general data like delivery date and quotation deadline (*Expiration date*) and a lines part containing items and quantities. In the header as well as in the lines you may find the columns

Lowest status and *Highest status*, which show the status of the request in conjunction with related quotations – “Created”, “Sent”, “Accepted” or “Rejected”.

Similar to lines in purchase requisitions or in purchase orders, lines entered in the request for quotation may refer to an item number or to a procurement category (in the request for quotation form additionally selecting the *Line type*). Data like delivery date and address in the lines will retrieve appropriate defaults from the header. If you want to add details to the request like data sheets or drawings to header and lines, you may apply document management (see section 9.5.1).

In order to specify vendors that should receive the request for quotation, you want to switch to the tab *Vendor* where you may insert a new line for every vendor concerned.

3.4.4.2 Sending the Request to Vendors

After registering the vendors concerned, you may click the button *Send* in the action pane to open the posting form for processing the request. Clicking the button *Print* in the action pane strip of the posting form, you may select the checkbox *Print request for quotation*. Clicking *OK* in the posting form, you can post and print the request.

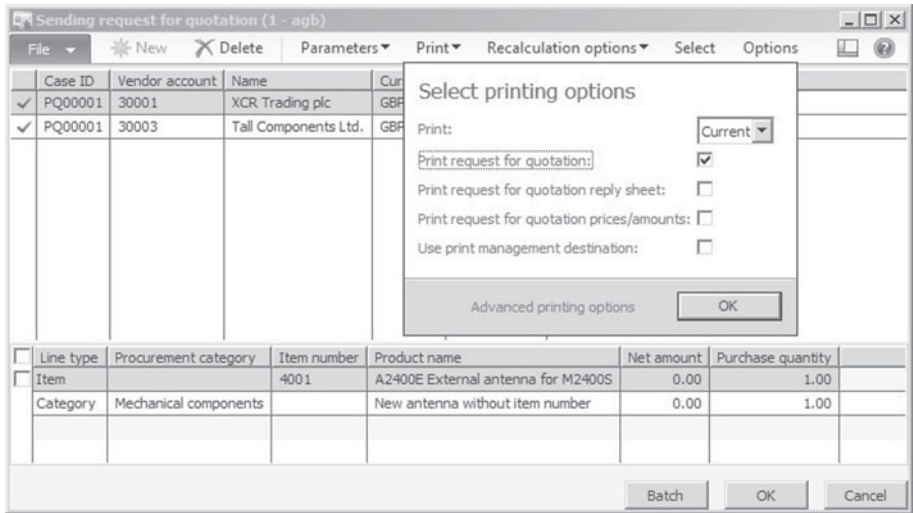


Figure 3-19: Printing a request for quotation

If you want to know afterwards to which vendor you have sent the request for quotation, you may click the button *Journals/Request for quotation journals* to see the posted requests.

3.4.4.3 Request for Quotation Reply Setup

In the action pane of the request for quotation form, you may click the button *Replies/Configure request for quotation reply* in order to specify the fields to be

included in a reply. These fields print on the request for quotation reply sheet, which you may print in parallel when sending the request.

The default for the reply field settings derives from the procurement parameters (*Procurement and sourcing* > *Setup* > *Procurement and sourcing parameters*, button *Default request for quotation reply fields* on the tab *Request for quotation*).

3.4.4.4 Request for Quotation Reply

Once a vendor replies to a request by sending a quotation, you may register the quotation (reply) in the form *Procurement and sourcing* > *Common* > *Requests for quotations* > *Request for quotation replies*. Alternatively, you may enter a reply clicking the button *Replies/Enter reply* in the action pane of the request for quotation form as well (making sure to select the right vendor).

In the reply form, you may enter details of the vendor quote on the tab *Purchase quotation lines* for the lines and on the tab *Quotation* for the header. In order to support data input, you may click the button *Process/Copy data to reply* copying data from the request into the reply fields.

Once you have finished entering the reply, the highest/lowest status of the request and the reply will automatically update to "Received".

3.4.4.5 Approving and Rejecting Vendor Quotations

If you want to compare the replies (quotes) from your vendors, you may click the button *Replies/Compare replies* in the action pane of the request for quotation form to open the *Compare request for quotation replies* form.

In the compare form, you may accept a quotation by selecting the checkbox in the column *Mark* of the reply concerned, and clicking the button *Accept* in the action pane.

Alternatively, you may accept a quotation in the request reply form clicking the button *Accept* there.

When posting the acceptance, Dynamics AX will automatically create a purchase order. When accepting all lines of a request in a reply, Dynamics AX suggests rejecting the other replies for that request. Rejecting a request is also possible clicking the button *Process/Reject* in the reply.

3.4.5 Purchase Order Registration

Like all documents, purchase orders consist of a header and one or several lines. The header contains data, which are common for the whole order like order number, purchase type, vendor, currency, language and payment terms. Other fields in the order header (e.g. the delivery date) provide a default value for the order lines, where you may change them on line-level.

The default for the *Purchase type* in purchase order headers derives from the procurement parameters (*Procurement and sourcing* > *Setup* > *Procurement and*

sourcing parameters), usually showing the type “Purchase order” to set regular purchase orders as default. You may choose any of the following options for the purchase type in the purchase order, however:

- Purchase order – Regular purchase order
- Journal – Draft or template, not affecting inventory or finance
- Returned order – Credit note, see section 3.7

Order lines contain data like item number or procurement category, description, quantity, price and discount as well as delivery date. When ordering a stocked product, you have to select the item number of the released product. For non-inventoried items like services, you may either choose to enter the item number of an intangible item or to select a procurement category (skipping the item number).

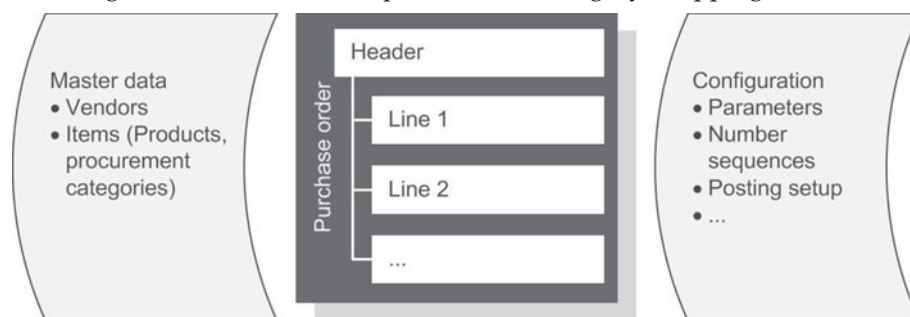


Figure 3-20: Structure of purchase orders

3.4.5.1 Defaults for Purchase Orders

When inserting a new purchase order header or line, Dynamics AX retrieves defaults for numerous fields after selecting the vendor in the header or the item in a line. Depending on your permissions, you may change the content of fields in the purchase order.

If you agree with your vendor for example on different payment terms for a certain order, you may change the terms of payment in the order header. If the new payment terms apply to all future orders, you should also change the terms of payment in the vendor record to get the right default when entering the next order for that vendor.

3.4.5.2 Entering a New Purchase Order

Depending on the activity you want to perform, there are two different ways to access purchase orders:

- Vendor form – Preferable if accessing orders searching a vendor first
- Purchase order form – Preferable if the vendor is not the primary search key (e.g. if looking for all orders not yet approved)

When starting in the vendor list page or detail form (*Procurement and sourcing* > *Common* > *Vendors* > *All vendors*), you may immediately create a new order to the

selected vendor as shown below. Clicking the button *Related information/Purchase orders/All purchase orders* on the action pane tab *Procurement* of the vendor form, you may access the existing purchase orders linked to the vendor (purchase order list page filtered on the vendor).

When accessing the purchase order list page through the menu item *Procurement and sourcing> Common> Purchase orders> All purchase orders*, you will see the list of all purchase orders. If you want to view details of a purchase order displayed in the list page, you may double-click on the line concerned or click the button *Edit* on the action pane tab *Purchase order* to open the detail form.

In order to register a new purchase order in the vendor form, you have to click the button *New/Purchase order* on the action pane tab *Procurement* there. Dynamics AX creates a purchase order header applying defaults from the selected vendor and immediately switches to the purchase order detail form (line view).

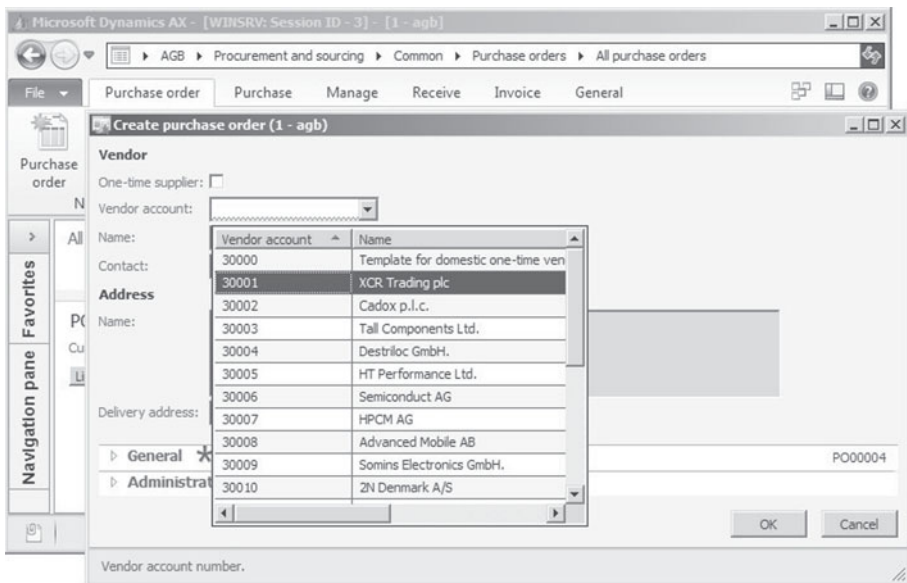


Figure 3-21: Creating a new order in the purchase order list page

If you want to register a new purchase order in the purchase order list page, you have to click the button *New/Purchase order* on the action pane tab *Purchase order*. Dynamics AX shows the *Create purchase order* dialog, where you want to choose a vendor in the vendor lookup (e.g. applying a *Filter by field* with a right-hand click in the column *Name* of the lookup).

After selecting a vendor number, the create order dialog retrieves various defaults from the vendor record. Expanding the tabs *General* or *Administration* of the create order dialog, you may show additional fields of the new order header. If you want to change data like the vendor number, purchase type or currency, you can do it

directly in the dialog or – after closing the dialog – in the purchase order detail form selecting the header view.

When clicking the button *OK* in the *Create purchase order* dialog, Dynamics AX creates the purchase order header and switches to the purchase order detail form showing the line view.

3.4.5.3 Purchase Order Lines

In order to register a purchase order line, you may click in the lines pane or click the button  in the action pane strip of the *Purchase order lines* tab and start selecting an item number (released product) or a purchase category. Item master data provide various defaults for fields like quantity, purchase unit, unit price, site or warehouse. If entered in the order header, the header will override site and warehouse.

Figure 3-22: Registering a purchase order line

Trade agreements may override the unit price from the released product, and provide a default for the discount fields (see section 4.3.2). The net amount of a line is calculated based on quantity, unit price, and discounts. If manually entering a net amount, Dynamics AX does not show unit price and discount.

The default for the *Line number* will display when saving the order line. The increment applicable for line numbering is specified in the system parameters (*System administration> Setup> System parameters*).

For viewing the delivery date and other extended line data, you may expand the fast tab *Line details* and switch to the appropriate sub-tab.

The delivery date available on the sub-tab *Delivery* receives the default value from the purchase order header, if that date is after the lead-time of the item. Otherwise, the default for the delivery date of the line is the lead-time added to the session date. You may specify the lead-time for an item in the default or site-specific order settings of the item, in the purchase price trade agreements and in the item coverage form.

3.4.5.4 Intangible Items and Procurement Categories

If you want to order an intangible item (e.g. a certain service), you may select the item number of a non-inventoried product (item with product type “Service” or linked to an item model group for non-stocked items, see section 7.2.1) and enter the order line like you do for regular inventoried items.

As an alternative, you may choose to skip the item number field in the order line and register a procurement category instead. The procurement category does not include as many details as the item record, however. Therefore you have to enter data including quantity, unit, unit price, line text (sub-tab *General*) and other details as applicable.

3.4.5.5 Inventory Transaction

When entering a line for an inventoried product in a regular purchase order, Dynamics AX creates a related inventory transaction. Clicking the button *Inventory/Transactions* in the action pane strip of the order line, you can see this transaction – showing the receipt status “Ordered”, but neither a *Physical date* nor a *Financial date*. In the course of purchase order processing, product receipt and invoice posting will update the inventory transaction as shown in section 7.2.5.

3.4.5.6 Header View

The information line below the action pane of the purchase order detail form displays order number as well as vendor on the left-hand side, and the order status on the right-hand side.

In the line view of the purchase order detail form, you may additionally expand the tab *Purchase order header* in order to access some core header fields like the delivery date.

If you want to access complete header information, you have to click the button *Header view* on the action pane tab *Purchase order*. In the header view, you may edit data common for the whole order like vendor number, sales tax group or payment terms, and other fields (like the delivery date) only defaulting order lines. If you change header data after inserting order lines, the procurement parameters (button *Update order lines* on the tab *Updates*) control whether to update existing order lines automatically.

In order to switch from the header view to the line view, you want to click the button *Line view* on the action pane tab *Purchase order*.

3.4.5.7 Delivery Address

The default for the delivery address which shows on the tab *Address* in the purchase order header view is your company address, specified on the tab *Addresses* in the legal entities (*Organization administration* > *Setup* > *Organization* > *Legal entities*). If a delivery address is specified for a site or warehouse entered in the order header, the purchase order will retrieve the site or warehouse address.

If you want to change the delivery address of a purchase order, you may choose between two options:

- Select an existing address, already available in the global address book
- Insert a new address

If you want to select an existing address (e.g. a customer address), you may click the button  near the *Delivery address* lookup field on the *Address* tab. In the address selection dialog, you may select addresses from all areas of the global address book.

If you want to enter a completely new address, you may click the button  near the *Delivery address* lookup field. In the *New address* dialog you may enter the postal address for delivery (similar to entering a vendor address, see section 3.2.1). In the lookup field *Purpose* you want to select “Alternative delivery” (“Delivery” if the address is the new main delivery address for your company), and additionally select the checkbox *One-Time* if applicable.

If different delivery addresses are required on line level, you may access the sub-tab *Address* on the *Line details* tab in the purchase order line view. In the lines, you may either choose other addresses or create new addresses in the same way as you do in the header.

3.4.5.8 Charges

You may register additional costs like freight and insurance by entering charges on order header level or on line level. The functionality of charges in purchasing corresponds to charges in sales (see section 4.4.5).

In order to access charges referring to an order header, you may click the button *Charges/Maintain charges* on the action pane tab *Purchase*. For accessing line charges, you may click the button *Financials/Maintain charges* in the action pane strip of the tab *Purchase order lines* after selecting the line concerned.

3.4.5.9 Input Tax

Input tax (Sales tax/VAT) calculation is based on the relation of vendor and item:

- The vendor record contains the *Sales tax group* (VAT group) distinguishing between domestic and foreign vendors. For companies in the European Union, EU vendors will be a third category.

- The item record contains the *Item sales tax group* (item VAT group) distinguishing between items with a regular tax rate and other items, for which a reduced rate applies (food as an example in many countries).

Purchase order header and lines retrieve the tax groups from the vendor and the item to calculate tax automatically. You may edit the *Sales tax group* on the tab *Setup* in the header view. It is copied to the lines, where you may access the *Sales tax group* together with the *Item sales tax group* in the line view on the sub-tab *Setup* of the *Line details* tab.

In order to display the calculated sales tax in the purchase order form, you may click the button *Tax/Sales tax* on the action pane tab *Purchase*.

3.4.5.10 Copying a Purchase Order

As an alternative to manually entering a new purchase order, you may copy an existing order. This existing order may show a different purchase type, providing the possibility to copy a journal into an order as an example.

Copy from all (1 - agb) - Purchase order: PO00005, HT Performance Ltd.

Quantity: Copy charges: ☐ Copy precisely: ☐ Copy order header: ☒ Inventory

Quantity factor: Recalculate price: ☐ Delete purchase lines: ☐ **1**

Invert sign: ☐

Purchase order | Confirmation | Product receipt | Invoice | Show selected transactions

☐ Select all	Purchase order	Vendor account	Name	Created date and time	Currency
☐	PO00001	30001	XCR Trading plc	12/5/2011 05:16:17 am	GBP
☐	PO00002	390001	Sample vendor	12/6/2011 02:39:29 am	GBP
☐	PO00003	30001	XCR Trading plc	12/9/2011 02:26:28 am	GBP
☒	PO00004	30001	XCR Trading plc	12/9/2011 08:09:33 am	GBP
☐	PO00005	30005	HT Performance Ltd.	12/10/2011 01:38:11 am	GBP

☐ Mark	Line number	Item number	Procurement category	Text	Site	Wareho...	Quantity	Unit	Unit price
☒	10	4001		A2400E	HQ	10	1,000.00	Pcs.	2.89
☒	20		Services	Services			1.00	hour	70.00

OK Cancel

Delete previously entered order lines for the current order before copying?

Figure 3-23: Selecting records in the *Copy from all* dialog

Before you may copy an order, you have to insert a new order header into which the copied records will be inserted. Selecting that new header, you may click the button *Copy/Copy from all* on the action pane tab *Purchase order* to access the *Copy from all* dialog displaying a list of orders available for copying. Selecting the checkbox in the left-most column of the dialog you may choose records to be copied as shown in Figure 3-23 – entire orders in the upper part or single lines in the lower part.

When copying an order, verify the checkbox *Delete purchases lines* [1]. If this checkbox is selected, Dynamics AX deletes all existing lines of the new order before inserting the lines selected for copying. Whereas this does not matter for a new order, it may be undesirable if you just want to copy additional lines to an existing order.

Once you have finished selecting order headers and lines (lines may refer to different headers), you may close the copy dialog clicking the button *OK*. Dynamics AX copies the selected lines, depending on the checkbox *Copy order header* including header data like payment terms (if copying header data, you may select only one header).

In addition to the *Copy from all* button, there is another button available for copying in the purchase order form – the button *Copy/Copy from journal*. You may choose this button if there is a purchase order with posted documents like the vendor invoice, and you want to transfer posted lines into that order again.

In addition to the copy buttons in the action pane, you may also find the copy feature choosing the button *Purchase order line* in the action pane strip of the order lines as well.

3.4.5.11 Order Type Journal

Purchase orders of the order type “Journal” serve as draft or template. It is not possible to post documents like an order confirmation or a product receipt for this purchase type. Apart from copying a purchase journal to a regular purchase order, you may transfer journals into purchase orders by simply changing the purchase type in the order header or by running the periodic activity *Procurement and sourcing> Periodic> Post the purchase journal*.

3.4.5.12 New in Dynamics AX 2012

Due to the new user interface including header and line view, purchase order management looks fundamentally different in Dynamics AX 2012. In addition, there are new features like procurement categories, delivery schedules and other improvements like the line numbers. The overview of posted line quantities is now available clicking the button *Line quantity* on the action pane tab *General*.

3.4.6 Change Management and Purchase Order Approval

Depending on the setting for change management, you have to run through an approval workflow before you can proceed with the purchase order.

3.4.6.1 Change Management Settings

The primary setting for purchase order change management is available in the procurement parameters (*Procurement and sourcing> Setup> Procurement and sourcing parameters*, tab *General*). Selecting the checkbox *Activate change management* will require processing an approval workflow for all purchase orders.

Selecting the checkbox *Allow override of settings per vendor* in the procurement parameters, you may enter deviating settings for specific vendors. If you select the checkbox *Override settings* in the vendor detail form (field group *Change management for purchase orders* on the tab *Purchase order defaults*), you may override the general setting in both directions: Activating change management only for specific vendors while approval generally is not required, or the other way around.

The purchase order approval process is based on the workflow system (see section 9.4). Procurement workflows are available in the form *Procurement and Sourcing> Setup> Procurement and sourcing workflows*, where purchase order workflows refer to the template “Purchase order workflow” (Type “PurchTableTemplate”) or the template “Purchase order line workflow” (Type “PurchLineTemplate”).

3.4.6.2 Approval Status

In the purchase order header you may find the *Approval status*, displaying in a separate column in the purchase order list page. Depending on the approval workflow, a purchase order may show the following approval status:

- Draft – When registering the order, before submitting approval
- In review – While the approval workflow is executed
- Approved – After approval, making it possible to post a confirmation
- Confirmed – After posting the order confirmation, optionally sending a hardcopy or electronic document to the vendor
- Finalized – When an approved order is completely invoiced or canceled

If change management does not apply to a purchase order, the approval status immediately shows “Approved” and you may continue order processing by confirming the order.

3.4.6.3 Approval Workflow for Purchase Orders

If change management applies to a purchase order, a yellow bar displays above the grid providing the option to submit the order for approval. You have to submit for approval when you have finished entering a new order, or after registering modifications on an order already approved.

When submitting for approval, the approval status switches to “In review” and the workflow system will process the approval workflow in a batch process. For purchase orders to which change management applies, it is not possible to post the order confirmation immediately because of that batch process. Even in case of workflow configurations applying automatic approval you have to wait until the workflow system has finished the batch process.

If manual approval applies, the responsible may grant approval to the purchase order accessing the work items assigned to him or his queues (see section 9.4.3).

3.4.6.4 Request change

If you want to change a purchase order after approval, you have to click the button *Maintain/Request change* on the action pane tab *Purchase order*.

When approving changes, the responsible may compare the current purchase order with the last confirmed version clicking the button *History/Compare purchase order versions* on the action pane tab *Manage* of the purchase order form. Clicking the button *History/View purchase order versions* you may view and compare all previous versions.

3.4.6.5 New in Dynamics AX 2012

Change management and purchase order approval workflows are new features in Dynamics AX 2012.

3.4.7 Canceling and Deleting Purchase Orders

In Dynamics AX, there is a difference between canceling and deleting a purchase order. Whereas canceling will remove the open quantity remainder for product and invoice receipt, deleting completely eliminates the order or order line.

In addition, deleting an order is not possible after posting the order confirmation or – if change management applies – after approval, whereas you may always cancel the order.

3.4.7.1 Canceling an Order or Order Line

You should cancel a purchase order line, if you want to keep the original order quantity while not expecting any further deliveries for that line.

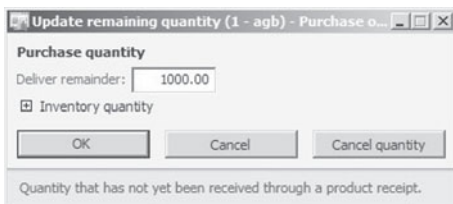


Figure 3-24: The dialog box to change or cancel a remaining line quantity

In order to cancel a purchase order line or to change the open quantity in the purchase order form, you may click the button *Update line/Deliver remainder* in the action pane strip of the purchase order lines after selecting the line concerned. Dynamics AX shows the dialog *Update remaining quantity*, where you may change or cancel the remaining quantity for deliveries. If you want to cancel the deliver remainder, you may click the button *Cancel quantity* in the dialog setting the deliver remainder to zero.

Clicking the button *OK* in the dialog adjusts the deliver remainder quantity in the order line. Canceling the remaining quantity of an order line is possible no matter if there have been partial deliveries before.

If you want to cancel all lines of an order, you may click the button *Cancel* on the action pane tab *Purchase order* of the order form. After canceling all lines, the *Status* of the order shows “Canceled”.

3.4.7.2 Deleting Purchase Orders and Order Lines

Unlike canceling, which reduces the open quantity of an order line, deleting a purchase order line completely removes it from Dynamics AX. In order to delete a purchase order line, you may select the record and click the button *Remove* in the action pane strip of the order lines, or choose the shortcut key *Alt+F9*. If you want to delete a complete order, you may click the button *Delete* in the action pane at the top of the detail form.

Once you have posted the order confirmation or submitted approval, it is not possible to completely delete the order. If you want to delete order lines of an approved order to which change management applies, you have to request a change (button *Maintain/Request change*, see section 3.4.6).

Note: If you want to delete an order line, make sure to click the *Remove* button in the action pane strip – not the button *Delete*, which deletes the complete order.

3.4.7.3 New in Dynamics AX 2012

In Dynamics AX 2012, deleting a purchase order is not possible once processing has started (approval or confirmation).

3.4.8 Purchase Order Confirmation and Printing

Once entering and – if required – approving a purchase order is finished, you have to confirm it, optionally sending it to the vendor.

Confirming a purchase order means to save it unchanging and separate from the current purchase order, which is subject to order processing. The confirmation is available to keep record of the document that has been sent to the vendor and does not create physical or financial transactions.

3.4.8.1 Posting Form

In order to confirm the purchase order, you may click the button *Generate/Purchase order* on the action pane tab *Purchase* of the purchase order form after selecting the order concerned. Alternatively, you may click the button *Generate/Confirm* executing the same functionality without showing the posting form.

When generating the purchase order confirmation, the posting form shows following options:

- *Parameters / Quantity:* „Ordered quantity“ is the only option, posting the total quantity of all lines; in posting forms for other transactions like the receipts list later, additional options are available
- *Parameters / Posting:* If selected, a purchase order document will be posted; if cleared, the output will be a pro forma document

- *Print options / Print*: When selecting several orders for summary update, “Current” will print documents individually while posting, whereas “After” will print after the last document has been posted
- *Print options / Print purchase order*: If selected, the order will be printed; otherwise posting is without printing (reprinting is possible nevertheless)
- *Print options / Use print management destination*: If selected, print settings specified in the setup form *Procurement and sourcing> Setup> Forms> Form setup* (button *Print management*) or in the vendor form (button *Set up/Print management* on the action pane tab *General*) apply; otherwise, print settings chosen by clicking the button *Printer setup* in the posting form apply

Update	Purchase order	Name
☒	PO00005	HT Performance Ltd.

Figure 3-25: Selecting to print in the purchase order confirmation form

In order to complete posting you have to click the button *OK* in the posting form. If the checkbox for printing in the posting form is selected, Dynamics AX depending on the printer selection prints to a printer or file.

3.4.8.2 Pro Forma Document

If the checkbox *Posting* in the posting form is cleared, Dynamics AX prints pro forma documents. A pro forma document, which may be required for purposes like customs declaration, is not a posted document. Therefore it is not possible to reprint or display the document independent from the purchase order once printing is finished.

You may alternatively print a pro forma document by selecting the button *Generate/Pro forma purchase order* on the action pane tab *Purchase* of the purchase

order form. In the posting form for pro forma documents, the checkbox *Posting* is not available.

3.4.8.3 Summary Update

Apart from posting by clicking the appropriate button in the order form, you may choose the periodic activity for summary updates to post purchase orders.

You may access the summary order update by selecting the menu path *Procurement and sourcing > Periodic > Purchase orders > Confirm purchase orders*, which opens the same posting form as the button in the purchase order. Whereas Dynamics AX sets a filter automatically when accessing the posting form from a purchase order (selecting the current order), the summary update requires manually entering a filter. You may do this by clicking the button *Select* in the posting form, which opens the advanced filter form to select the requested purchase orders.

When closing the filter form, you may check the selected orders in the *Overview* tab of the posting form. If you decide not to post an order listed there, you simply have to delete the line concerned before posting by clicking the button *OK*.

3.4.8.4 Purchase Order Confirmation Inquiry

After confirming a purchase order, you may display the posted document independent from modifications to the current order. The purchase order confirmation inquiry is available in the form *Procurement and sourcing > Inquiries > Journals > Purchase order confirmations* or clicking the button *Journals/Purchase order confirmations* on the action pane tab *Purchase* of the purchase order form.

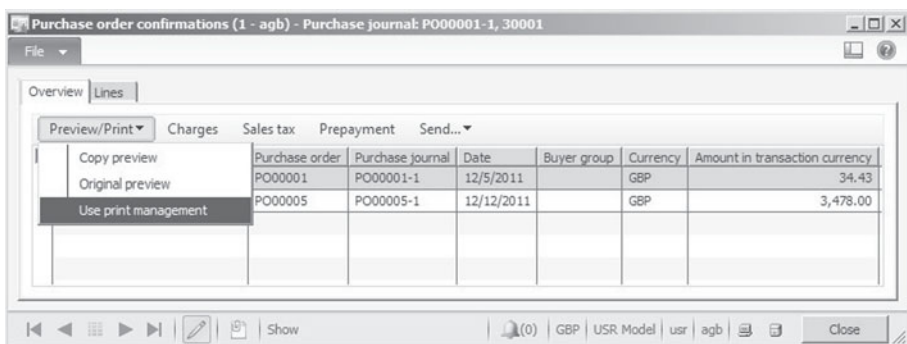


Figure 3-26: Selecting to reprint in the purchase order inquiry form

The order confirmation inquiry form shows all purchase order confirmations on the tab *Overview*. The tab *Lines* displays the order lines of the order confirmation selected on the tab *Overview*.

3.4.8.5 Reprinting a Purchase Order

You may apply the inquiry form to display a print preview of a posted order choosing the option *Copy preview* or *Original preview* in the button *Preview/Print*. In the preview form, you may reprint the document.

In order to print one or more posted orders after selecting, you may also choose the button *Preview/Print/Use print management*, which prints to the printer specified in print management.

3.4.8.6 New in Dynamics AX 2012

In Dynamics AX 2012, posting the purchase order (now called “confirming”) is compulsory.

3.4.9 Purchase Agreements

Purchase agreements in Dynamics AX provide the option to register and control blanket orders. Apart from purchase agreements specifying product number and quantity, you may also register agreements not specifying the quantity, but only the value of a certain product, or agreements not referring to product numbers but to product categories.

3.4.9.1 Managing Purchase Agreements

You may enter a purchase agreement accessing the form *Procurement and sourcing> Common> Purchase orders> Purchase agreements* and selecting the button *New/ Purchase agreement* in the action pane. When registering an agreement, you have to select a *Purchase agreement classification*. Agreement classifications (*Procurement and sourcing> Setup> Purchase agreements> Purchase agreement classification*) are for grouping and reporting purposes only, without different functionality.

The *Effective date* (start date of the contract) and the *Expiration date* (end date) in the agreement header specify the default for the agreement lines. Selecting the *Default commitment* in the header you have to define the level of the agreement:

- Product quantity commitment – Product number and quantity
- Product value commitment – Product number and value
- Product category value commitment – Value of a product category
- Value commitment – Total value for a vendor

After switching to the agreement lines clicking the button *Line view* in the action pane, you may enter columns like *Item number*, *Quantity*, *Unit price*, and *Discount percent* (depending on the *Default commitment*).

Once you have finished entering the agreement lines, you may print the agreement clicking the button *Confirmation* in the action pane. In the posting form of the purchase agreement, you may select the checkbox *Mark agreement as effective* setting the *Status* in the agreement header to “Effective”. Otherwise you must change the status manually from “On hold” to “Effective” before you can generate a release order.

3.4.9.2 Release Orders

If you want to create a release order in the agreement form, you may click the button *New/Release order* after selecting the purchase agreement concerned.

Dynamics AX shows the *Create release order* form, where you may select the required items entering the *Purchase quantity* and the *Delivery date* for the release order. When clicking the button *Create* you will create the new release order as a regular purchase order of the type “Purchase order”.

Instead of creating a release order in the purchase agreement form, you may start in the purchase order form (*Procurement and sourcing*> *Common*> *Purchase orders*> *All Purchase orders*), in the *Create purchase order* dialog linking the order to a *Purchase agreement ID* (tab *General*). When selecting an item covered by the agreement in the new order, Dynamics AX automatically generates a link. If you create a new purchase order in the vendor form (*Procurement and sourcing*> *Common*> *Vendors*> *All vendors*) and there is an applicable agreement, a dialog will display providing the option to select an agreement.

If you want to check the link to the purchase agreement in the purchase order line, you may click the button *Update line/Purchase agreement/Attached* in the action pane strip. On header level, you may click the button *Related information/Purchase agreement* on the action pane tab *General*.

In the release order, you have to post order confirmation, product receipt and vendor invoice like for any other purchase order. When posting product receipt or invoice, the related purchase agreement will show the order fulfillment (line view in the purchase agreement form, sub-tab *Fulfillment* on the tab *Line details*).

3.4.9.3 New in Dynamics AX 2012

In Dynamics AX 2012, purchase agreements replace the former purchase order type “Blanket order”.

3.4.10 Case Study Exercises

Exercise 3.7 – Planned Order

In order to avoid processing purchase order approval, make sure change management does not apply to your vendor entered in exercise 3.2.

A minimum inventory quantity of 200 units on the main warehouse is required for the item entered in exercise 3.5. After registering this minimum quantity, you want to open the net requirements form for the item updating the master schedule. What is result of that master scheduling?

Open the planned purchase order form in the procurement and sourcing menu. If required, switch to the dynamic master plan that has been applied when updating the net requirements. Select the planned order referring to your item and transfer it to a purchase order.

Exercise 3.8 – Request for Quotation

You want to receive vendor quotes for your item. In the request for quotations form, you want to insert a new request therefore. This request should contain a line with your item from exercise 3.5. The RFQ reply configuration for the request

should include the header field *Reply valid to* and the line fields *Quantity* and *Unit price*.

You want to send the request to your vendor from exercise 3.2 and another vendor of your choice. Once you have finished entering the request, choose the option *Send* to post and print the RFQ for these vendors.

After a while, you may receive quotes from both vendors containing quantities and prices of your choice. In order to track the quotes, you want to enter them as request for quotation replies assigned to the original request. Your vendor has submitted the better quote, which you may accept transferring the RFQ reply to a purchase order. Then send a quote rejection to the other vendor.

Exercise 3.9 – Purchase Order

You want to order your item (entered in exercise 3.5) from your vendor (entered in exercise 3.2). You may start registering the purchase order in the vendor form. Which quantity and which price display as default, where do they come from? In a second order line, you want to receive two hours of the procurement category “##-assembling” (entered in exercise 3.4) for a price of GBP 100.

After closing the order from, you want to display all orders referring to your vendor. How do you proceed and how many orders are available?

Exercise 3.10 – Order Confirmation

Post and print both purchase orders that you have created in the last two exercises. One time you should print to a PDF file, the other time you should display a print preview.

Then change the quantity in the first order line of exercise 3.9 to 120 units. How do you proceed?

3.5 Item Receipt

As soon as an ordered item arrives at your warehouse, you want to post an item receipt to make the item available in inventory.

3.5.1 Basic Steps for Item Receipt

In order to make sure that required items arrive in time, you may choose following inquiries in Dynamics AX to display open purchase order lines:

- Open purchase order lines (*Procurement and sourcing> Inquiries> Purchase orders*) showing open order lines containing quantity and delivery date (apply a filter to select relevant records)
- Backorder purchase lines (*Procurement and sourcing> Common> Purchase orders*) showing open order lines which contain a confirmed delivery date before the Backorder date you select in the filter area of the list page

3.5.1.1 Receipts List and Arrival Overview

In preparation for an expected item receipt you may print a receipts list, which serves as information for the vendor and/or the responsible in your warehouse.

Independent from the receipts list, the warehouse responsible may also choose the arrival overview form to view and prepare expected receipts.

3.5.1.2 Posting Item Receipts

Item receipt includes two different steps of posting:

- Inventory registration: You may record inventory registration, which preliminary increases the quantity on hand in inventory, directly in the order line or through an item arrival journal. When posting an arrival journal, pallet transactions in warehouse may be required depending on the setup.
- Product receipt: The product receipt posts the physical inventory transaction and general ledger transactions for the item receipt finally. Inventory registration before the product receipt is an optional step, which is not compulsory.

You may as well completely skip posting the item receipt (registration and product receipt) for a purchase order. In this case, Dynamics AX posts the item receipt together with the invoice receipt.

3.5.2 Receipts List

The functionality of the receipts list is similar to confirming and printing the purchase order: You need to access a posting form to post and print a receipts list, but that posting does not create inventory or financial transactions. Printing of a receipts list is not very common, but you may choose it for information purposes regarding an expected item receipt.

In order to post and print a receipts list, you may access the purchase order form (*Procurement and sourcing* > *Common* > *Purchase orders* > *All purchase orders*) and click the button *Generate/Receipts list* on the action pane tab *Receive* after selecting the order concerned.

As an alternative, you may access the posting form for summary update selecting the menu path *Procurement and sourcing* > *Periodic* > *Purchase orders* > *Posting receipts list*. In the posting form for summary update, you have to enter a filter clicking the button *Select*.

3.5.3 Inventory Registration

Inventory registration is a preliminary step before posting the product receipt. There are three options to start inventory registration:

- Registration form (purchase order line)
- Item arrival journal
- Arrival overview

Inventory registration refers to products, not to order lines directly related to purchasing procurement categories.

3.5.3.1 Registration in a Purchase Order Line

If it is required to register the item quantity before product receipt, you will post an item arrival journal in most cases. But you might also want to enter the inventory registration independent from the item arrival journal, as an example if you need to split a single order line to different locations, batch or serial numbers.

In order to access the item registration form from the purchase order form, you may click the button *Update line/Registration* in the action pane strip of the tab *Purchase order lines* after selecting the order line concerned.

Receipt status	Site	Warehouse	Quantity	Auto-create
Ordered	HQ	10	300.00	☒
Registered	HQ	10	700.00	☐

Site	Warehouse	Register now
HQ	10	300.00

Figure 3-27: Registering a receipt in the inventory registration form

The inventory registration form contains two parts: The upper pane (*Transactions*) shows the status of the inventory transaction(s) linked to the order line. The lower pane (*Register now*) is available to post the registration.

Initially the upper pane shows a single inventory transaction, which Dynamics AX creates when you enter the order line. This transaction is split into several lines if you post partial deliveries or if you split the line manually. In order to register inventory dimensions like different batch or serial numbers (if applicable), you may split a line by clicking the button *Split* or *Create serial numbers* in the registration form.

In order to record and post the inventory registration, you have to insert appropriate lines in the *Register now* pane of the registration form. Apart from manually inserting a record there (button *Add*), you may select the checkbox in the column *Auto-create* of the *Transactions* pane as shown in Figure 3-27.

Before posting the registration by clicking the button *Post all*, you may change warehouse, quantity and applicable inventory dimensions. If you record a partial

registration by entering a quantity smaller than the original quantity in the *Register now* pane before posting, the inventory transaction will split into two lines – one for the registered and one for the remaining quantity.

If you have already started a registration in the *Register now* pane and want to cancel it before posting, you may click the button *Delete all*. Applying this button, the registration remains as it has been before starting the registration.

3.5.3.2 Registration Status

Once the inventory registration is posted, the recorded quantity shows the status “Registered” and is available in inventory. After registration, you may transfer, sell and consume the recorded quantity.

Unlike product receipt and invoice posting, which generate voucher documents that contain unchanging transactions, inventory registration is a preliminary transaction. If you reset an inventory registration, there is no posted transaction of the original registration any more. The only transaction you may see after resetting a registration is the posted item arrival journal, if registration has been posted through an item arrival journal.

3.5.3.3 Item Arrival Journal

If it is required to register item receipts in the warehouse separately from posting vendor packing slips (product receipts) in the office, you may choose to apply item arrival journals. Posting an item arrival journal generates the same transactions in inventory and purchasing as the registration directly in the purchase order line.

Item arrival journals are available in the form *Inventory and warehouse management> Journals> Item arrival> Item arrival*. Registering and posting an item arrival journal works similar to other inventory journals (see section 7.4.2).

After posting the item arrival journal, the inventory transaction shows the status “Registered” and the *Line quantity* form (button *Line quantity* on the action pane tab *General* of the purchase order) shows the posted quantity in the column *Registered*.

As an exception, the status will not be “Registered” but “Arrived” after posting the item arrival journal, if the journal contains settings to post pallet transports for goods on the inbound dock. In this case, the transaction will not show the status “Registered” until you post the pallet transport.

3.5.3.4 Reversing an Inventory Registration

In order to reverse and cancel a registration, which has been posted in an item arrival journal or in the registration form, you may open the registration form in the purchase order after selecting the order line concerned. In *Transactions* pane of the registration form, you may select the checkbox *Auto-create* in the registered transaction concerned and post the transaction like a regular registration, but with a negative quantity.

3.5.3.5 Arrival Overview

If you want to get an overview of expected item arrivals, you may open the form *Inventory and warehouse management> Periodic> Arrival overview*. In the upper pane of the form, you may choose filter criteria like the date range of expected receipts, warehouses or a vendor account number. Clicking the button *Update* will apply the selected criteria. On the tab *Setup* you can find the option to save filter setups.

After selecting expected receipts for arrival (column *Select for arrival* in the *Receipts* or *Lines* pane), you may click the button *Start arrival* in the action pane strip of the *Receipts* pane. Starting arrival will generate an item arrival journal for the lines selected without posting the journal.

In order to post the arrival journal, you may access the item arrival journals through the menu (*Inventory and warehouse management> Journals> Item arrival> Item arrival*). Alternatively, you may click the button *Journals/Show arrivals from receipts* in the action pane strip of the arrival overview after selecting a receipt concerned, for which you have started arrival.

The button *Journals/Product receipt ready journals* in the arrival overview shows posted arrival journals, for which the product receipt (see below) has not been posted yet.

3.5.3.6 Settings for Registration

The item model group of the purchased item controls whether you have to post a registration before posting the product receipt. You have to record a registration, if the checkbox *Registration requirements* on the *Setup* tab of the item model group concerned (*Inventory and warehouse management> Setup> Inventory> Item model groups*) is selected.

3.5.4 Product Receipt

Posting the product receipt (vendor packing slip / delivery note) executes the physical inventory transaction, which finally receives the item in an unchanging voucher document.

3.5.4.1 Ledger Integration

If ledger integration is activated for the product receipt, Dynamics AX posts transactions in the general ledger in parallel to the inventory transactions. These ledger transactions are reversed when posting the related invoice.

There are two relevant settings in order to activate product receipt posting to the general ledger:

- *Post product receipt in ledger* – Checkbox in the accounts payable parameters (tab *Updates*), needs to be marked for ledger posting.
- *Post physical inventory* – Checkbox in the item model group (tab *Setup*) of the purchased item, needs to be marked for ledger posting.

3.5.4.2 Posting Form

Posting the product receipt works similar to confirming and printing the purchase order. You may open the posting form by clicking the button *Generate/Product receipt* on the action pane tab *Receive* of the purchase order form after selecting the order concerned.

The posting form shows the familiar format. The option to be selected in the lookup field *Quantity* is depending on the previous procedure:

- *Registered quantity* – Select this option, if the inventory registration (item arrival) is posted before posting the product receipt. Dynamics AX applies the quantity registered (not yet received) as default for the posting lines.
- *Registered quantity and service* – In addition to the registered quantity of inventoried items, Dynamics AX applies the ordered quantity for order lines referring to product categories and non-inventoried items.
- *Ordered quantity* – Dynamics AX applies the total remaining quantity.
- *Receive now* – Dynamics AX applies the quantity of the order line column *Receive now*.

You may find the applied default posting quantity in the column *Quantity* on the tab *Lines* in the lower part of the posting form. If required, you may change the quantities there before posting.

The other parameters in the posting form are similar to the purchase order confirmation parameters described in section 3.4.8, except for following options:

- *Product receipt* column – You have to enter the packing slip number of your vendor in this column on the *Overview* tab of the posting form.
- *Print product receipt* checkbox – Is usually cleared, because receiving your vendor's packing slip you don't print a document when posting a product receipt.

3.5.4.3 Displayed Warnings

If you see a yellow exclamation mark (⚠) on the tab *Overview*, Dynamics AX indicates a posting problem. A possible reason is that the selected quantity in the posting form is "Registered quantity", but there has not been an inventory registration before product receipt. Selecting the quantity "Ordered quantity" in the posting form will solve this problem.

3.5.4.4 Product Receipt in the Item Arrival Journal

An alternative way accessing the product receipt posting form is available, if an item arrival journal has been posted for the purchase order. In this case, you may choose the button *Functions/Product receipt* in the item arrival journal (*Inventory and warehouse management> Journals> Item arrival> Item arrival*).

If a *Packing slip* number has been entered on the tab *General* in the item arrival journal before posting, it will default to the *Product receipt* number in the product receipt posting form.

3.5.4.5 Summary Updates

As for purchase order printing and for receipt lists, a posting form for summary product receipt update is available, which you may access selecting the menu path *Procurement and sourcing> Periodic> Purchase orders> Product receipt*. In the posting form for summary update, you have to specify a filter clicking the button *Select*.

You may click the button *Arrange* to collect multiple purchase orders into one collective product receipt. More information on arranging orders for collective documents is available in section 4.6.2 of this book.

3.5.4.6 Settings for Product Receipt Posting

If you want to post a product receipt for an item with an item model group, in which the checkbox *Registration requirements* on the *Setup* tab is selected, you have to post the inventory registration before you can post the product receipt for the particular quantity.

If the checkbox *Receiving requirement* on the *Setup* tab of the item model group is selected, you have to post the product receipt before you can post a vendor invoice.

3.5.4.7 New in Dynamics AX 2012

Product receipt posting has been called “Packing slip” in former releases.

3.5.5 Deviating Quantity and Canceling Receipts

You have to post a partial delivery, if you do not receive the whole quantity of a purchase order line in one shipment, but divided into several shipments. It is not possible to post partial deliveries, if the checkbox *Complete* on the tab *Line details* (sub-tab *General*) of the purchase order line is selected.

3.5.5.1 Inventory registration

If applying inventory registration, you may record partial deliveries in the registration form as shown in section 3.5.3 (compare Figure 3-27). If you choose to record the inventory registration through an item arrival journal, you may enter partial quantities in the journal lines.

In the quantity lookup field of the product receipt posting form, you may select “Registered quantity” for a partial product receipt.

3.5.5.2 Quantity Receive Now

If you do not record inventory registration, you may enter a *Receive now* quantity for the purchase order line as a preparation for posting a partial product receipt. The column *Receive now* is available in the *Line quantity* form, which shows when

clicking the button *Line quantity* on the action pane tab *General* of the purchase order form.

The *Receive now* quantity also shows in the right-most column on the *Purchase order lines* tab. In the quantity lookup field of the product receipt posting form, you may choose the option “Receive now” referring to that column.

3.5.5.3 Partial Delivery

As an alternative, you may skip the *Receive now* quantity and choose “Ordered quantity” in the quantity lookup field of the product receipt posting form. In this case, you have to enter received quantities in the column *Quantity* on the tab *Lines* of the posting form.

After posting a partial delivery, you may see the quantity open for future product receipts in the column *Deliver remainder* in the *Line quantity* form (button *Line quantity* on the action pane tab *General* of the purchase order). The total quantity received shows in the column *Received*.

Item...	Product name	Procurem...	Quantity	Receive now	Invoiced	Invoice re...	P...	Received	Deliver remainder
10	4001	A2400E External ...	1,000.00			700.00		700.00	300.00
20		Services	1.00			1.00		1.00	

Line quantity in inventory unit: 1,000.00 | 300.00 | 700.00

Quantity that has not yet been received through a product receipt.

Figure 3-28: Purchase order after posting the product receipt for a partial delivery

Once you receive further partial deliveries, you may post the product receipts in the same way as described for the first delivery until the total of the received quantities equals the ordered quantity.

3.5.5.4 Settings for Over/Under Delivery

You may post under or over deliveries only if the checkbox *Accept underdelivery* or *Accept overdelivery* on the tab *Updates* of the procurement parameters is selected.

Additional settings for over and under delivery are available on the tabs *Purchase* and *Sell* of the released product detail form (*Product information management* > *Common* > *Released products*), where you may enter the maximum percentage for over delivery and under delivery in purchase and sales orders.

The percentages of the released product default to the order lines, where you may adjust them as needed in a particular order (tab *Line details*, sub-tab *Delivery*).

3.5.5.5 Over Delivery

A transaction is an over delivery, if the total received quantity exceeds the ordered quantity when posting a receipt (inventory registration or product receipt). Dynamics AX accepts over delivery, if the exceeding quantity is below the over delivery percentage of the order line.

3.5.5.6 Under Delivery

If you post the receipt of a quantity smaller than the ordered quantity, Dynamics AX posts a partial delivery unless you mark the receipt to be the last one for the particular order line. As shown in Figure 3-29, you may apply under delivery by selecting the checkbox in the column *Close for receipt* on the tab *Lines* of the posting form after entering the received quantity in the *Quantity* column.

Purchase order	Line number	Item number	Procurement...	Text	Site	Warehouse	Quantity	Unit price	Close for receipt
PO00005	10	4001		A2400E	HQ	10	280.00	2.89	☒

Figure 3-29: Selecting an under delivery in the posting form for the product receipt

As an alternative, you may set the open quantity to zero by canceling the deliver remainder quantity as described in section 3.4.7. Unlike when posting an under delivery in the posting form, Dynamics AX does not control if the missing quantity is below the under delivery percentage of the order line in this case, however.

3.5.5.7 Canceling a Product Receipt

You may cancel a posted product receipt applying the *Cancel* feature in the product receipt inquiry form.

In order to access the product receipt inquiry, you may click the button *Journals/Product receipt* on the action pane tab *Receive* of the purchase order form. Selecting the receipt concerned, you may click the button *Cancel* in the action pane strip of the tab *Overview*. If you just want to reduce the posted quantity, you may choose the button *Correct* instead.

3.5.5.8 New in Dynamics AX 2012

The option to cancel a product receipt in the inquiry is new in Dynamics AX 2012.

3.5.6 Order Status and Inquiries

When posting the item receipt, Dynamics AX changes the inventory quantity and the order status.

3.5.6.1 Purchase Order Status

In the purchase order list page, you may view the *Approval status* (see section 3.4.6) and the order status (column *Status*). Switching to the header view of the purchase order detail form, you may additionally view the *Document status* on the tab *General*. Whereas the order status indicates the order progress showing the lowest status of any line in the purchase order, the document status shows the highest status of a posted document.

Therefore, the order status may still be “Open order” while the document status is “Invoiced” in case of partial deliveries. Table 3-1 below shows an overview of receipt transactions and the related order status.

Table 3-1: Order status and document status for receipt transactions

Transaction	Approval status	Order status	Document status
(Approval)	<i>Approved</i>	<i>Open order</i>	<i>None</i>
Confirmation	<i>Confirmed</i>	<i>Open order</i>	<i>Purchase order</i>
Receipts list	<i>Confirmed</i>	<i>Open order</i>	<i>Receipts list</i>
Inventory registration	<i>Confirmed</i>	<i>Open order</i>	As above, no change: <i>Purchase order or Receipts list</i>
Partial product receipt	<i>Confirmed</i>	<i>Open order</i>	<i>Product receipt</i>
Complete product receipt	<i>Confirmed</i>	<i>Received</i>	<i>Product receipt</i>

Clicking the button *Postings* on the action pane tab *General* of the purchase order form, you may additionally view the last document number for the document types involved.

On the line level, you may get to know the status from the field *Line status* (sub-tab *General* on the *Line details* tab) and from different quantity columns in the *Line quantity* form (button *Line quantity* on the action pane tab *General* of the purchase order).

3.5.6.2 Inventory Transaction Status

Inventory registration as well as product receipt posing changes the quantity on hand through inventory transactions.

When you enter a new purchase order line, Dynamics AX inserts an inventory transaction showing the status “Ordered” in the column *Receipt*. You may view this transaction clicking the button *Inventory/Transactions* in the action pane strip of the tab *Purchase order lines* after selecting the order line concerned.

When posting an inventory registration, the receipt status of the inventory transaction will change to “Registered”. The registration date is stored in the field *Inventory date* on the tab *General* of the inventory transaction (if you reverse the inventory registration, Dynamics AX clears the inventory date).

When posting a product receipt – with or without a previous inventory registration – the receipt status of the inventory transaction will switch to “Received”. The posting date of the product receipt shows in the column *Physical date* of the inventory transaction. Since reversing a product receipt is only possible by posting an offsetting transaction, the physical date will never change.

In case of partial receipts, the inventory transaction splits into two transactions with different status according to the posted quantities.

3.5.6.3 Transaction Inquiry

As an example, Figure 3-30 shows the inventory transactions linked to a purchase order line after posting the product receipts for two partial deliveries at a different time.

Site	Wareho...	Physical date	Financial date	Reference	Number	Receipt	Issue	Quantity	Cost amount
HQ	10	12/13/2011		Purchase order	PO00005	Received		280.00	
HQ	10	12/13/2011		Purchase order	PO00005	Received		700.00	

Figure 3-30: Inventory transactions after posting product receipts

As long as you do not post the vendor invoice related to an inventory transaction, the receipt status remains “Received” and the column *Financial date* remains empty. If you want to know the packing slip number, you may switch to the tab *Update* of the inventory transaction.

3.5.6.4 Product receipt Inquiry

In order to access posted product receipts, you may choose the form *Procurement and sourcing> Inquiries> Journals> Product receipt* or click the button *Journals/Product receipt* on the action pane tab *Receive* of the purchase order form. After selecting a product receipt on the tab *Overview* of the inquiry form, you may switch to the tab *Lines* displaying related receipt lines. The button *Inventory/Lot transactions* on the *Lines* tab opens the inventory transactions shown above again.

3.5.6.5 Ledger Transactions

If ledger integration is activated for the product receipt, you may click the button *Ledger/Physical voucher* in the inventory transaction to see related general ledger

transactions. In the product receipt inquiry, you may click the button *Voucher* on the *Overview* tab to see the ledger transactions for the complete product receipt.

Journal number	Date	Year closed	Ledger account	Currency	Amount in transaction currency	Amount	Amount...	Posting layer
GT00010	12/13/2011		10912	GBP	2,023.00	2,023.00	0.00	Current
GT00010	12/13/2011		33010	GBP	-2,023.00	2,023.00	0.00	Current
GT00011	12/13/2011		10911	GBP	2,023.00	2,023.00	0.00	Current
GT00011	12/13/2011		10912	GBP	-2,023.00	2,023.00	0.00	Current

Description: Posting type: Product receipt

Name: Goods received, not invoiced

Figure 3-31: General ledger transactions related to a product receipt

The main accounts in the ledger transactions depend on the inventory posting setup. You may access the inventory posting setup form selecting the menu path *Inventory and warehouse management* > *Setup* > *Posting* > *Posting*.

On the tab *Purchase order* of this form, you may find the options “Product receipt” and “Purchase, accrual” specifying the main accounts applying to product receipt transactions (see section 8.4.2). In addition, the account “Purchase expenditure, un-invoiced” (account 10912 in Figure 3-32) is used as control account, generating offsetting transactions.

3.5.6.6 Transaction Origin

If you click the button *Transaction origin* in the voucher transactions form as shown in Figure 3-31, you may view the transaction origin form showing the transactions in all modules related to the selected document voucher.

Module	Voucher	Date	Number	Text	Currency	Amount in transaction currency	Amount	Dimensions
Ledger	IW00004	12/13/2011	10912		GBP	-2,023.00	-2,023.00	
Ledger	IW00004	12/13/2011	10911		GBP	2,023.00	2,023.00	
Inventory	IW00004	12/13/2011	4001	Physical	GBP	2,023.00	2,023.00	

Name: A2400E External antenna for M

Table: Inventory transaction posting

Figure 3-32: Transaction origin form with all transactions for a product receipt

Depending on integration settings, product receipt posts inventory and ledger transactions as shown in Figure 3-32. Based on the deep integration of all modules

in Dynamics AX, the transaction origin form provides the possibility to see the consequences of a document in all parts of the application.

3.5.7 Case Study Exercises

Exercise 3.11 – Product Receipt

Your vendor ships the goods and services ordered in exercise 3.9 with packing slip PS311. Before posting the receipt, check following items in the purchase order:

- Order status and document status
- Inventory quantity of the ordered item (button *Inventory/On-hand*)
- Inventory transaction related to the order line of the product

Post a product receipt for the complete quantity ordered (120 units for the first line according to exercise 3.10) referring to the vendor packing slip number mentioned above. You may do the posting directly out of the purchase order form.

Now review the status of the items on the list given above in this exercise again. What is different after product receipt posting?

Exercise 3.12 – Partial Delivery

You want to order your item (entered in exercise 3.5) from your vendor another time. Enter a purchase order for 80 units. You may post the product receipt of packing slip PS312 for a partial delivery of 50 units. Then post the product receipt of a second partial delivery containing 10 units.

Do you know how to show the remaining quantity? Check the order status, inventory quantity and inventory transactions like in exercise 3.11. What is different in comparison to exercise 3.11?

Exercise 3.13 – Product Receipt Inquiry

You want to see the product receipt of exercise 3.11. Therefore, open the product receipt inquiry out of the purchase order concerned. In a second step, open the product receipt inquiry choosing the appropriate form in the procurement and sourcing menu. Check product receipt header and lines and try to find out, if there are related ledger transactions.

3.6 Invoice Receipt

Together with the shipment or some time later, the vendor will send an invoice. You have to check the invoice, comparing it to order prices and received quantities, before posting the vendor invoice finalizing the purchase order.

Whereas the product receipt posts a preliminary inventory value, the invoice receipt posts the final value. Posting an invoice receipt therefore not only increases the open vendor balance, it also increases the financial inventory value.

Once all lines of a purchase order are invoiced, purchase order processing in Dynamics AX is completed. Payment of vendor invoices runs through a separate process shown in section 8.3.4.

3.6.1 Different Ways for Processing Vendor Invoices

When receiving invoices from your vendors, you have to distinguish between regular purchasing invoices, which refer to products or procurement categories, and other invoices, directly recorded against ledger main accounts for specific subjects like office rent or legal services.

3.6.1.1 Invoice Journals and the Vendor Invoice Form

When registering a specific invoice which directly posts to ledger main accounts, you may enter a journal transaction with or without separate approval journal processing (see section 8.3.3).

As an alternative to journals for registering vendor invoices not referring to inventory and purchase orders, you may apply the vendor invoice form entering procurement categories or non-inventoried items (instead of ledger main accounts required in invoice journals).

When recording an invoice referring to a purchase order, you may choose between two options depending on whether separate approval registration applies:

- Pending vendor invoice – Entering and final posting of the invoice in the vendor invoice form, with or without approval workflow.
- Invoice register journal – Entering and posting of the invoice to interim accounts in the invoice register journal first and final posting in the invoice approval journal or the invoice pool inquiry (see section 8.3.3).

Applying an approval workflow to pending vendor invoices, you may enforce approval without separately posting an invoice register journal. From a financial perspective, the difference between the vendor invoice approval workflow on the one hand and invoice register posting on the other hand is that the invoice register already posts an invoice, which is subject to tax calculation, when starting the approval process.

3.6.1.2 Approval Workflow for Pending Vendor Invoices

If approval workflows should apply to pending vendor invoices, an appropriate workflow referring to the template “Vendor invoice workflow” (Type “VendProcessInvoice”) or the template “Vendor invoice line workflow” (Type “VendProcessInvoiceLine”) has to be specified in the form *Accounts payable> Setup> Accounts payable workflows*.

The vendor portal as part of the Enterprise Portal enables authorized vendors to register pending vendor invoices through the Web for themselves. If vendor invoices are registered this way, you want to make sure applying an appropriate approval workflow before posting the invoice.

3.6.1.3 Vendor Invoice and Item Receipt

In the vendor invoice form, you may enter all regular purchase invoices referring to products or procurement categories. Depending on the purchased product, there are two options:

- Purchase order invoice
 - For inventoried products, you have to process a purchase order before registering the vendor invoice.
 - For procurement categories and non-stocked items, you may optionally process a purchase order.
- Vendor invoice without order assignment
 - For procurement categories and non-stocked items, you may alternatively register a vendor invoice without a previous purchase order.

If the vendor invoice refers to a purchase orders, you may post it with or without previous item receipt posting. Choosing the option “Ordered quantity” or “Receive now quantity” in the lookup field *Default quantity for lines* of the vendor invoice form, the invoiced quantity is not based on received quantities. If the invoiced quantity exceeds the total previously received quantity for the order concerned, invoice posting will include receipt posting of the exceeding quantity.

Invoice posting without a previous product receipt is useful, if you receive goods or services together with the invoice and do not post a separate item receipt in the warehouse. For inventoried items, the checkbox *Receiving requirement* on the *Setup* tab of the item model group concerned may not be selected (see section 7.2.3) as a prerequisite.

For inventoried items, you frequently want to record invoice receipts referring to product receipts posted before. In the vendor invoice form, you may choose the default quantity option “Product receipt quantity” in this case.

3.6.2 Posting Vendor Invoices

In order to register regular purchase invoices referring to products or procurement categories, you may access the pending vendor invoice form.

3.6.2.1 Pending Vendor Invoices

The pending vendor invoice form (*Accounts payable> Common> Vendor invoices> Pending vendor invoices*) contains all vendor invoices, which have been entered but not yet been posted. Independent from purchase order management, vendor invoice management shows in a separate list page and detail form.

Clicking the button *New/Invoice* on the action pane tab *Vendor invoice* of the pending vendor invoices list page, you may register a new invoice. If you rather want to start entering new vendor invoices in the vendor form (*Accounts payable> Common> Vendors> All vendors*), you may click the button *New/Invoice/Vendor invoice* on the action pane tab *Invoice* there.

Registering an invoice not referring to a purchase order is similar to entering a purchase order in the purchase order form. After selecting a vendor number, the invoice retrieves various defaults from the vendor record which may view and edit in the header view.

Unlike the purchase order form, the tab *Lines* in the lines view of the vendor invoices form only provides the option to insert non-stocked items (and procurement categories), however.

If you close the vendor invoice detail form without posting, the invoice will be stored for later posting and – if applicable – approval. Therefore it displays in the pending vendor invoices.

If you want to cancel registration after starting to enter a new invoice, you have to click the button *Maintain/Cancel* on the action pane tab *Vendor invoice* of the vendor invoice detail form. Clicking the button *Maintain/Delete* provides the option to delete a pending vendor invoice already stored.

3.6.2.2 Entering Purchase Order Invoices

In daily business, you may enter vendor invoices referring to purchase orders in the pending vendor invoice form. After selecting the vendor number in the field *Invoice account*, you may choose the order concerned in the lookup *Purchase order* or clicking the button *Actions/Retrieve purchase orders* in the action pane. Alternatively, you may enter the order in the lookup *Purchase order* first, automatically retrieving the vendor.

Vendor invoice (1 - agb) - Purchase order: PO00005, HT Performance Ltd., Parameter ID: SY000099

File Vendor invoice Financials Review Process

Edit Delete Cancel Invoice Header view Line view Retrieve purchase orders Retrieve product receipts Post Match product receipts Apply prepayment Totals Attachments

Maintain New Show Actions Summ... Attachments

Default quantity for lines: Product receipt quantity

VI002 : HT Performance Ltd.

Vendor invoice header

Vendor

Invoice account: 30005
HT Performance Ltd.

Related documents

Purchase order: PO00005
Add another purchase order

Invoice identification

Number: VI002
Invoice description:

Invoice status details

Prepayment: ☐
On hold: ☐
Match variance: ☒
Header budget check results:

Invoice dates

Posting date: 12/15/2011
Invoice date:
Due date: 1/15/2012

Lines

4001 | 2,832.20

Add line Remove Invoice line Financials Inventory

Budget check results	Item number	Item name	Procurement category	Quantity	Unit
	4001	A2400E External antenna for M2400S		980.00	Pcs.
			Services	1.00	hour

Select the default quantity to use on the invoice lines

Close

Invoice totals

Currency: GBP
Subtotal amount: 2,902.20
Total discount: 0.00
Charges: 0.00
Sales tax: 507.89
Invoice amount: 3,410.09
Discount amount: 102.30
More...

Related info...

Figure 3-33: Registering a vendor invoice referring to a purchase order

If you are working in the purchase order form, you may as well register the vendor invoice starting from there by clicking the button *Generate/Invoice* on the action pane tab *Invoice* after selecting the order concerned.

Although the vendor invoice form looks different to the other posting forms like the product receipt, it shares similar functionality. Like in the other posting transactions, it is depending on the previous procedure which of the options to choose in the quantity selection (lookup *Default quantity for lines*):

- *Product receipt quantity* – Common option, applies if a product receipt has been posted before and you want to link the invoice to the receipt.
- *Ordered quantity* or *Receive now quantity* – If selected, Dynamics AX does not default the received quantity to the column *Quantity* in the invoice lines. For any quantity not yet received, an item receipt will post in parallel to the invoice.

Note: After starting to register a vendor invoice, you have to cancel (button *Maintain/Cancel*) or delete it if you do not want to save or post it. Simply closing the invoice detail form will store the invoice, displaying it in the pending vendor invoices list page. If product receipts are assigned to this invoice, you can't assign them to a second invoice before deleting the first invoice.

3.6.2.3 Selecting Product Receipts

If selecting "Product receipt quantity" in the lookup *Default quantity for lines*, the quantity received not yet invoiced defaults to the *Quantity* column of the *Lines* tab. You may select which product receipts to include for invoicing by clicking the button *Actions/Retrieve product receipts* in the action pane of the vendor invoice form. Alternatively, the link *Add another product receipt* below the field *Product receipt* will open the select form as well.

In the select form, you may view the product receipts available for invoicing. You may include or exclude product receipts marking the checkbox in the column *Include*. After closing the select form clicking the button *OK*, the product receipts selected display in the column *Product receipt* on the tab *Lines* ("<multiple>", if linked to several receipts).

3.6.2.4 Collective Vendor Invoices

If a vendor invoice refers to several purchase orders, you have to post a collective invoice. Entering collective invoices in the vendor invoice form is different to registering collective documents for other document types (e.g. collective product receipts), however.

In the vendor invoice form, you may simply click the link *Add another purchase order* below the field *Purchase order* or click the button *Actions/Retrieve purchase orders* in the action pane to access the select form (similar to selecting product receipts).

When selecting purchase orders, you have to pay attention to the lookup *Default quantity for lines*. The selection in this field controls which purchase orders – according to prior product receipts for the particular orders – will work.

In addition, accounts payable settings (*Accounts payable> Setup> Summary update parameters*) and settings on vendor level specify characteristics of orders which may be collected to a common invoice (similar to accounts receivables, see section 4.6.2).

3.6.2.5 Other Parameters and Total Amount

The invoice number (mandatory field *Number* in the field group *Invoice identification*), the *Invoice date* and the *Due date* (which defaults from payment term calculation) are available on the *General* tab of the line view. More details are available in the header view, where you may also clear the checkbox *Approved* on the *Approval* tab, if you want to exclude an invoice from payment proposals.

Before finally posting the invoice, you might take a look at the factbox *Invoice totals* or click the button *Totals* to compare the totals on the vendor invoice with the totals you are going to post. If necessary, you may adjust quantities, prices, discounts and line amounts on the tab *Lines* or *Line details* in the lines view of the vendor invoice form.

If you want to prevent posting of an invoice (e.g. because of price differences), you may select the checkbox *On hold* on the tab *General* of the vendor invoice form.

3.6.2.6 Invoice Matching

If prices, discounts, charges or other items in the vendor invoice do not match the purchase order, you should not modify prices and amounts in the purchase order line, but enter the invoiced amounts in the vendor invoice form in order to keep record of price variance.

If the amounts entered in the vendor invoice do not match the purchase order and product receipt assigned and exceed specified tolerances, the vendor invoice form shows an exclamation mark (!) in the *Match variance* on the invoice header and – if applicable – in the column *Price match* on the tab *Lines*. In order to view details, you may click the button *Matching/Matching details* on the action pane tab *Review* of the vendor invoice form.

Primary settings for invoice matching are available on the tab *Invoice validation* in the accounts payable parameters. Invoice matching in Dynamics AX applies to different areas which may be activated independently and with different tolerances:

- Invoice totals matching: Compares the invoice total fields (invoice amount, sales tax, charges) with the purchase order
- Price and quantity matching / Line matching policy

- “Two-way matching” compares the invoice price and discount with the order line
- “Three-way matching” in addition compares the quantity of product receipts
- Price and quantity matching / Match price totals: Applies to partial deliveries and invoices, comparing the order line with the total of the current invoice line and related partial invoice lines already posted
- Charges matching: Separate matching settings for charges

You may access specific setup forms for these validation criteria on the level of particular vendors or items through the menu path *Accounts payable> Setup> Invoice matching*.

In addition, business policies (*Accounts payable> Setup> Policies*) enable matching rules not covered by the settings mentioned above.

3.6.2.7 Invoice Posting and Ledger Integration

Once you have finished registering the invoice, you may leave it unposted and post it at a later time – e.g. if an approval workflow applies. In order to finally post the pending vendor invoice, you may click the button *Actions/Post/Post* on the action pane tab *Vendor invoice* of the vendor invoice form. After posting, the invoice shows in the open vendor invoices list page (*Accounts payable> Common> Vendor invoices> Open vendor invoices*) displaying invoices not yet paid.

Posting the vendor invoice will post general ledger transactions, inventory transactions, vendor transactions and transactions in other subledgers like sales tax if applicable.

As shown in section 3.2.3, the vendor posting profile specifies to which summary account in the general ledger the vendor transaction will post. Settings for inventory transactions are available in the inventory posting setup, depending on the item and vendor selection as shown in section 8.4.2.

3.6.2.8 New in Dynamics AX 2012

In Dynamics AX 2012, you do not register vendor invoices in a regular posting form but in the new pending vendor invoice form (saving invoices before posting). The vendor invoice form also allows registering invoices not referring to purchase orders, facilitates collective invoices, and shows enhanced matching features.

3.6.3 Order Status and Inquiries

Like product receipt posting, vendor invoice posting updates the purchase order status.

3.6.3.1 Purchase Order Status

Depending on whether you have posted a partial or a complete invoice, the purchase order shows following status:

- Partial invoice: Order status “Received” or “Open order”, document status “Invoice”
- Complete invoice or last partial invoice: Order status “Invoiced”, document status “Invoice”

Posting the invoice affects inventory transactions, vendor transactions and general ledger transactions.

3.6.3.2 Inventory Transactions

If you want to see the changes in inventory transactions caused by a purchase invoice, you may click the button *Inventory/Transactions* in action pane strip on the tab *Purchase order lines* after selecting the line concerned in the purchase order form.

After posting an invoice, the inventory transactions show the *Receipt* status “Purchased” and display the posting date of the invoice in the column *Financial date*. If you want to know the invoice number, you may switch to the tab *Update* of the inventory transaction.

Site	W...	Serial number	Physical date	Financial date	Reference	Number	Receipt	Issue	Quantity	Cost amount
HQ	10	S001	12/15/2011	12/15/2011	Purchase order	PO00007	Purchased		1.00	100.00

Figure 3-34: Inventory transactions after posting the vendor invoice

The example in Figure 3-34 shows an inventory transactions referring to a purchase order line, for which the invoice has been posted.

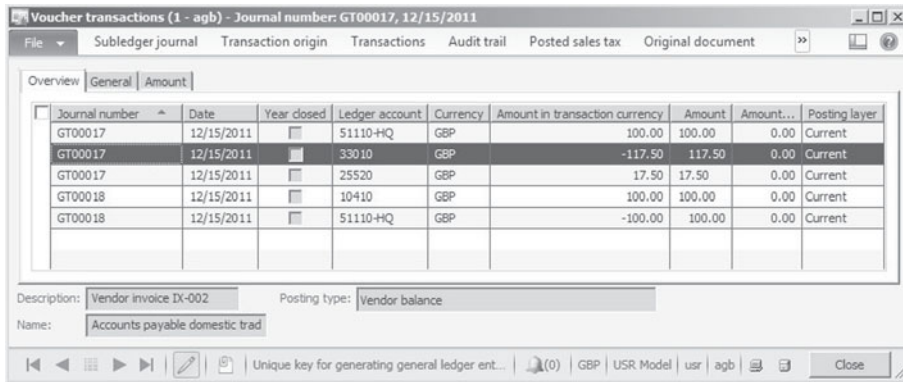
3.6.3.3 Invoice Inquiry

In order to access a posted invoice, you may choose the form *Accounts payable>Inquiries> Journals> Invoice journal* or click the button *Journals/Invoice* on the action pane tab *Invoice* of in the purchase order form. After selecting the appropriate invoice on the tab *Overview* of the inquiry form, you may switch to the tab *Lines* that displays related invoice lines. The button *Inventory/Lot transactions* on the *Lines* tab opens the inventory transactions shown above again.

3.6.3.4 Ledger Transactions

If you want to see the general ledger transactions related to the invoice, you may click the button *Ledger/Financial voucher* in the inventory transaction.

In the invoice inquiry, you may click the button *Voucher* on the *Overview* tab to see the general ledger transactions for the complete invoice.



Journal number	Date	Year closed	Ledger account	Currency	Amount in transaction currency	Amount	Amount...	Posting layer
GT00017	12/15/2011		51110-HQ	GBP	100.00	100.00	0.00	Current
GT00017	12/15/2011		33010	GBP	-117.50	117.50	0.00	Current
GT00017	12/15/2011		25520	GBP	17.50	17.50	0.00	Current
GT00018	12/15/2011		10410	GBP	100.00	100.00	0.00	Current
GT00018	12/15/2011		51110-HQ	GBP	-100.00	100.00	0.00	Current

Description: Vendor invoice IX-002 Posting type: Vendor balance
Name: Accounts payable domestic trad

Unique key for generating general ledger ent... | GBP | USR Model | usr | agb | Close

Figure 3-35: General ledger transactions related to a posted invoice receipt

The voucher transactions form displays all general ledger transactions referring to the posted invoice. As an example, Figure 3-35 shows two ledger journals with following transactions referring to a vendor invoice for a stocked item:

- Vendor summary account transaction – Posting the vendor balance (Account 33010, derived from posting profile)
- Stock account transaction – Posting inventory items (Account 10410, derived from inventory posting setup)
- Input tax transaction – Posting sales tax (Account 25520, derived from the ledger posting group of the sales tax code)

In addition, there are two transactions to the control account “Purchase expenditure for product” (account 51110) offsetting themselves.

The example shows an invoice, which is assigned to a product receipt not posting ledger transactions – the checkbox *Post physical inventory (Ledger integration)* is not selected in the item model group concerned. If the product receipt posts to the general ledger, the invoice will post additional transactions reversing these product receipt transactions.

More information concerning posting profile setup is available in section 3.2.3, and concerning inventory posting setup in section 8.4.2.

3.6.3.5 Transaction Origin

If you click the button *Transaction origin* in the voucher transactions form, you may view the transaction origin form showing the transactions in all modules related to the selected voucher number.

Apart from ledger transactions, the transaction origin includes vendor transactions, inventory transactions and tax transactions as shown in Figure 3-36 for the first journal number of Figure 3-35.

Module	Voucher	Date	Number	Text	Currency	Amount in transaction currency	Amount	Dimension
Ledger	P100006	12/15/2011	25520	Vendor invoice IX-002	GBP	17.50	17.50	
Ledger	P100006	12/15/2011	33010	Vendor invoice IX-002	GBP	-117.50	-117.50	
Ledger	P100006	12/15/2011	51110-HQ	Vendor invoice IX-002	GBP	100.00	100.00	
Vendor	P100006	12/15/2011	30002	Vendor invoice IX-002	GBP	-117.50	-117.50	
Sales tax	P100006	12/15/2011	25520	Sales tax	GBP	17.50	17.50	

Name: Cadoux p.l.c.
Table: Vendor transactions

(0) GBP | USR Model | usr | agb Close

Figure 3-36: Transaction origin form, showing all transactions for a journal

3.6.4 Case Study Exercises

Exercise 3.14 – Purchase Order Invoice

Your vendor sends the invoice VI314, which concerns the goods and services received in exercise 3.11. Before posting the invoice, check following items:

- Order status and document status of the purchase order
- Inventory transaction related to the order line of the product (button *Inventory/Transactions*)

Register and post the vendor invoice for the quantity received. You want to register the invoice in the pending vendor invoices page, checking the invoice total before posting.

Now review the status of the items on the checklist above again. What is different after invoice posting?

Exercise 3.15 – Partial Invoice for a Purchase Order

You receive the invoice VI315, which applies to the goods received with packing slip PS312 in exercise 3.12. Post the vendor invoice starting from the purchase order form, making sure that the vendor invoice only contains the items received with packing slip PS312.

Exercise 3.16 – Vendor Invoice Not Related to a Purchase Order

Your vendor sends the invoice VI316, showing an invoice line with one hour of the procurement category “##-assembling” (entered in exercise 3.4) for a price of GBP 105. The invoice does not refer to a purchase order.

You accept this invoice and want to register it in the pending vendor invoices page, check the invoice total and then post it.

Exercise 3.17 – Invoice Inquiry

You want to see the invoice of exercise 3.14. Therefore, open the invoice inquiry for the order concerned in the purchase order form. As an alternative, choose the

appropriate menu path. Check the invoice header and lines as well as the related ledger transactions.

In exercise 3.3, you were looking for the summary account for your vendor. Can you find the ledger transaction for this account? Finally, open the transaction origin form and check, to which modules your invoice has been posting.

3.7 Credit Notes and Item Returns

If you receive a credit note from your vendor related to inventoried items you did or did not return, you have to post a credit note receipt in purchasing.

Posting credit notes is similar to posting vendor invoices, except that credit notes require a negative quantity. When posting a credit note for a stocked item, Dynamics AX posts an item return (negative receipt) in parallel if no separate item return has been posted before. If the item model group does not allow physical negative inventory, posting an item return is only possible if the item is still on stock.

Like invoice registration, vendor credit note registration also needs to distinguish between transactions related to an inventoried item and transactions for non-stocked items and procurement categories.

For vendor credit notes referring to inventoried items, you want to register item return and crediting in the purchase order form. For crediting not related to inventoried items, you may also register the credit note directly in the vendor invoice form or in invoice journals.

When posting a vendor credit note in an invoice journal for a refund not referring to an item invoice, you have to take into account that this crediting does not affect item statistics and inventory value.

If you have to reverse a product receipt, but not an invoice receipt, you may choose the cancel product receipt feature (see section 3.5.5).

3.7.1 Crediting Item Returns

If you want to post a credit note for an inventoried item, you have to access the purchase order form. If the setting for the parameter *Safety level of invoiced orders* in the procurement parameters (*Procurement and sourcing> Setup> Procurement and sourcing parameters*, tab *Updates*) is not set to “Locked”, you may post credit notes in the original purchase order. Otherwise, you have to enter a new purchase order to register the credit note.

If invoiced orders are not locked, there are following options to register a credit note for an item:

- Original purchase order – Registering a new line in the original order
- New purchase order – Purchase type “Purchase order” or “Returned order”

3.7.1.1 Credit Notes in the Original Purchase Order

If you want to register a credit note in a new line on the original purchase order, you have to start the purchase order in edit mode and enter a regular order line, but with a negative sign in the column *Quantity* for the credited quantity. If you expect a replacement from your vendor, you should enter a second purchase order line with a positive quantity for the replacement.

Depending on change management settings, the order may be subject for approval. Posting the vendor credit note works like posting a vendor invoice – after entering the credit note number in the invoice number field you may post the credit note clicking the button *Post/Post* in the action pane of the vendor invoice form.

If the checkbox *Deductions requirement* in the item model group of the item concerned is selected, you have to post a separate product receipt (item return) before posting the credit note (negative invoice), however.

3.7.1.2 Returned Order

If you choose to enter the credit note in a new order, you may register a regular purchase order of the type “Purchase order”, however showing lines with negative quantity.

Alternatively, you may choose the *Purchase type* “Returned order” on the tab *General* in the *Create purchase order* form when creating the order. For the purchase type “Returned order”, following restrictions apply:

- RMA number – The return merchandise authorization provided by the vendor has to be entered in the *Create purchase order* form.
- Quantity – Has to be negative in the order lines.
- Return action – Has to be selected on the tab *Setup* (default for the return action available in the procurement parameters).

3.7.1.3 Inventory Marking

In order to avoid unintended changes of the inventory value when entering a new order or order line for the credit note, you should click the button *Inventory/Marking* in the action pane strip of the purchase order lines after selecting the new line. In the marking form, you have to select the checkbox in the column *Set mark now* marking the original order line of the item now returned. The inventory value of the new line entered for crediting now will exactly offset the inventory value received from the original line.

Without marking, Dynamics AX calculates the outgoing inventory value of the credit note according to the item model group of the item, applying the FIFO model as an example.

3.7.1.4 Create Credit Note Feature

In order to facilitate entering a credit note, you may choose the *Create credit note* function available by clicking the button *Create/Credit note* on the action pane tab *Purchase* of the purchase order form. Alternatively, you may click the button *Purchase order line/Credit note* in the action pane strip on the order lines.

The credit note feature is similar to the copy feature for purchase orders (see section 3.4.5). You have to pay attention to the checkbox *Delete purchase lines* in the *Create credit note* form depending on whether you add credit note lines to an existing purchase order or if you copy to a new order header.

Unlike the regular copy feature, creating a credit note reverses the quantity sign and additionally marks and reserves the original order line to ensure neutral inventory transactions.

3.7.1.5 Transaction Settlement

Otherwise, you may manually settle the open vendor transaction of the invoice when registering the credit note, if the original invoice has not been paid and settled.

For this purpose, you may click the button *Settle/Open transaction* on the action pane tab *Invoice* of the purchase order form for the crediting purchase order. In the *Settle open transaction* form, you may select the checkbox in the column *Mark* for the invoice concerned. After marking, you may simply close the form (the form does not include an *OK* button).

When posting the credit note, the open vendor transaction of the invoice will close. Otherwise, you need to settle invoice and credit note in the open transaction editing as described in section 8.2.5.

When working with settlements, you have to take into account that there is no manual settlement if automatic settlement is selected in the applicable vendor posting profile (tab *Table restrictions*) or in the accounts payable parameters (tab *Settlement*).

3.7.1.6 New in Dynamics AX 2012

In Dynamics AX 2012, there is no option to register a credit note entering a negative *Receive now* quantity in the original purchase order line.

3.7.2 Inventory Valuation for Separate Credit Notes

If you receive a credit note from a vendor reducing the item price (e.g. refunding depreciation of damaged goods), there is no item return.

3.7.2.1 Crediting and Re-Invoicing

The easiest way to post such a refund is to register and post a purchase line with negative quantity and the original price (credit note) and a new order line with

positive quantity and the new price (invoice). You may register both lines in a single purchase order.

3.7.2.2 Crediting and Allocating Charges

If this is not suitable, for example if you have already shipped the credited goods, you may only post a credit note which does not directly refer to the item and separately allocate the credit amount to the item.

For registering this credit note, you want to choose one of the following options:

- Vendor invoice form – Entering an invoice line with negative quantity choosing an appropriate purchasing category.
- Invoice journal – Entering a journal line with negative amount choosing an appropriate ledger main account (see section 8.3.3).

After posting the credit note, you may register a charges transaction to adjust inventory valuation. For this purpose, you want to select the original invoice in the invoice inquiry (*Accounts payable* > *Inquiries* > *Journals* > *Invoice journal*) and to click the button *Charges/Adjustment* in the action pane strip.

In the *Allocate charges* form you may enter a line for the charges transaction. In the lookup *Charges code*, only charges with a *Debit type* “Item” and a *Credit type* “Ledger account” are available. You may offset the balance on this credit ledger account by selecting a charges code referring to the same ledger account which you did select when posting the credit note. The ledger account on the credit note is either determined by the purchasing category (if posting in the vendor invoice form) or entered as offset account in the invoice journal.

Information on the general use of charges is available in section 4.4.5 of this book, more detailed information on the *Allocate charges* form in the online help of that form.

3.7.3 Case Study Exercise

Exercise 3.18 – Credit Note

The goods received in the first order line of exercise 3.11 show serious defects. You agree to return them to your vendor receiving the credit note VC318. The vendor will not send a replacement. Which ways do you know to register the credit note?

You decide to register the credit note in the original order. Enter the data required and post the credit note.

4 Sales and Distribution

The primary responsibility of sales and distribution is to provide customers with your goods and services. In order to fulfill this task, sales and distribution needs to manage material requirements of customers by processing sales orders through picking, shipping and invoicing.

4.1 Business Processes in Sales and Distribution

Before we start to go into detail, the lines below give an overview of business processes in sales and distribution.

4.1.1 Basic Approach

Starting point for sales and distribution are correct master data, in particular customer and product data. When selling non-stocked items, you may apply sales categories instead of product numbers.

In the course of sales order processing, master data are copied to transaction data. Sales quotations and orders therefore retrieve defaults from item and customer data. You may modify these default data in transactions, as an example if your customer requests a different delivery address. If such a modification applies to future orders as well, you should change the customer record.

4.1.1.1 Sales Order Processing

Sales order processing is very similar to purchase order processing, as it mirrors the purchasing process. Figure 4-1 shows the primary steps of sales order processing.

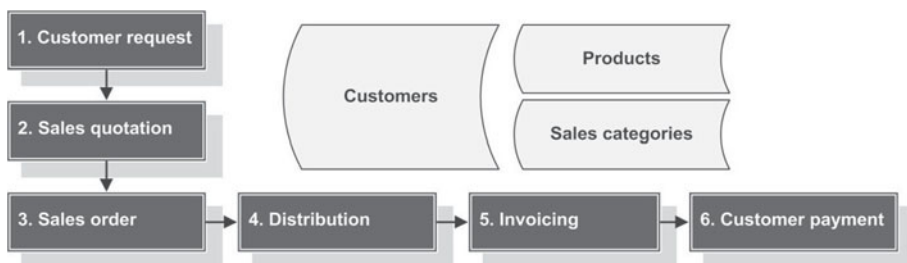


Figure 4-1: Sales order processing in Dynamics AX

4.1.1.2 Sales Quotation

If we disregard prior marketing activities, sales order processing starts with a request from a customer or prospect. Answering this request, the sales team will create a quote and send it to the possible or actual customer. Based on the sales quotation, Dynamics AX may generate activities to follow up on the quotation.

4.1.1.3 Sales Order

If a customer agrees to your proposal and orders goods or services, you will register a sales order. Like purchase order, sales orders consists of a header, which primarily contains customer data, and one or more lines, which contain the ordered items (products and sales categories).

If required, you may send a sales order confirmation to the customer. In order to generate a hardcopy or an electronic version of the confirmation, you need to post it. Posting an order confirmation means to save it, ensuring that you may access the confirmed order data unchanged, no matter if there are modifications on the current order later.

In order to manage long-term contracts (blanket orders), you may enter sales agreements in Dynamics AX. If you want to start a specific shipment of a blanket order, you may create a release order for a partial quantity of the sales agreement. Release orders are regular sales orders referring to the agreement.

4.1.1.4 Distribution

Depending on the type and settings of the item, master scheduling as part of operations planning covers the material requirements in purchasing or production to fulfill the sales order.

Before shipping the item, you may print a picking list preparing delivery. After finishing the internal shipment procedure you may post the packing slip.

The packing slip reduces the physical quantity in inventory as well as the open sales order quantity. You may post a packing slip without posting a picking list before, if your company does not need picking lists.

4.1.1.5 Invoicing

After posting the packing slip, you may post an invoice. If you do not require a separate packing slip, you may as well post the invoice without a previous packing slip. In this case, the invoice posts the physical and the financial transaction in parallel.

If you want to process a sales transaction not referring to an inventoried item, you may choose to apply a sales order containing order lines with sales categories instead of item numbers.

If you just need an invoice and do not require to process an order, you may enter and post a free text invoice. In the lines of a free text invoice, you have to select ledger account numbers instead of item numbers.

4.1.1.6 Customer Payment

You expect your customer to pay the invoice before the due date, with or without cash discount deduction. Section 8.3.4 contains a description on how to post the customer payment settling the invoice in the customer transactions.

If the customer does not pay in time, you may process payment reminders in Dynamics AX.

4.1.1.7 Ledger Integration

Because of the deep integration of Dynamics AX, all inventory and customer transactions in sales and distribution post to ledger accounts in parallel as described in section 8.4.

In order to keep record of the whole business process, Dynamics AX comprehensively applies the voucher principle to these transactions.

4.1.1.8 Comparison to Purchasing

As mentioned, sales order processing mirrors the purchasing process in many ways. You may notice Dynamics AX functionality in sales to be very similar to the appropriate purchasing function in various areas.

For your guidance, Figure 4-2 below shows a comparison of purchasing and sales documents in order processing.

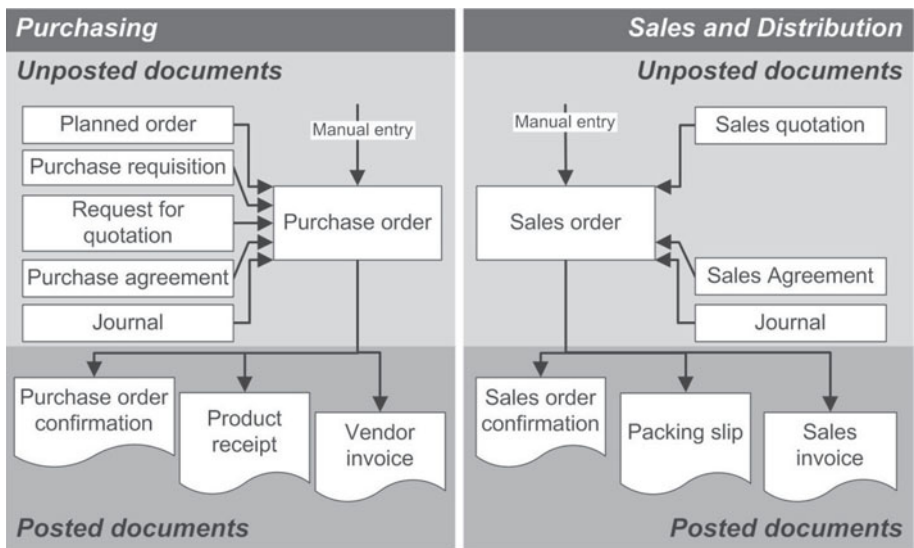


Figure 4-2: Comparison of purchasing and sales documents

4.1.2 At a Glance: Sales Order Processing

In order to give an overview of the main steps in sales order processing, this section shows the basics. For convenience, we create the order starting in the customer list page and post all transactions directly in the sales order form. Of course, you may also choose to start in the *Sales Orders* list page and to access the specific posting forms for generating the transactions.

If creating a new sales order in the customer list page (*Sales and marketing>Common>Customers>All customers*), you may apply a filter selecting the customer concerned. Clicking the button *New/Sales order* (not the big button *New/Sales quotation*) on the action pane tab *Sell* opens the line view of the sales order form in *Edit* mode, creating a new sales order header with default data like language or currency from the selected customer.

Clicking the button *Add line* on the tab *Sales order line* or clicking on a new line, you may register a sales order line containing item number (or sales category), quantity and price. When selecting the item, Dynamics AX applies appropriate defaults for quantity and price as well as for other fields like site or warehouse. Clicking the button *Header view* (or *Line view*) in the action pane at the top of the form, you may switch between the line view and the header view shown in Figure 4-3.

Figure 4-3: Entering header data in the sales order header view

Note: If registering only one order line, you might need to press the keyboard shortcut *F5* to refresh the form before you can post the order confirmation.

If you want to print the order confirmation, you may post it clicking the button *Generate/Sales order confirmation* on the action pane tab *Sell*. If you want to print the purchase order, you have to select the checkboxes *Posting* and *Print confirmation* in the posting form. The button *Printer setup* is available to select a printer for the printout as described in section 2.2.1.

In order to post the packing slip in the sales order form, you may click the button *Generate/Packing slip* on the action pane tab *Pick and Pack* of the order form. In the posting form, you should choose “All” in the field *Quantity* if wanting to ship the whole quantity. Selecting the checkboxes *Posting* and *Print packing slip* you may click the button *OK* to post and print the packing slip. Packing slip posting in sales reduces the physical quantity in inventory and sets the order status to “Delivered”.

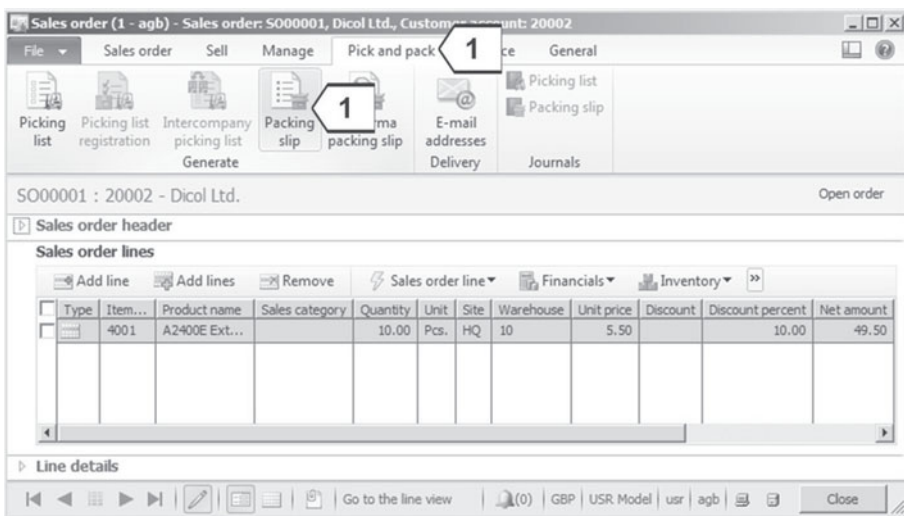


Figure 4-4: Clicking the button *Generate/Packing slip* in the action pane

Posting the sales invoice by clicking the button *Generate/Invoice* on the action pane tab *Invoice* of the order form is similar to packing slip posting. In order to invoice only shipped items, make sure to choose “Packing slip” in the field *Quantity*. Choosing “All” would deliver quantities not shipped before in parallel to invoicing. Invoice posting generates an open customer transaction to be paid and sets the order status to “Invoiced”.

If applicable, you may skip transactions in the process described above. As a minimum, you may post the invoice directly after registering the sales order (Select “All” in the *Quantity* field of the invoice posting form in this case).

4.2 Customer Management

Customer records are required to manage business partners, which receive goods or services. Whereas sales quotations are available for leads and prospects as well, the business partner in a sales order needs to be included in the customer records.

Customer records in sales mirror vendor records in purchasing not only regarding functional principles. Data management in both areas applies list pages and forms, which are very similar to each other. As an example, you may work with one-time customers, payment terms, cash discounts, posting profiles and global address book integration in the same way as in customer and vendor records.

4.2.1 Basic Data and Comparison to Vendors Records

In order to check existing or create new customers, you want to access the customer list page in the sales module (*Sales and marketing* > *Common* > *Customers* > *All customers*) or in the accounts receivable module (*Accounts receivable* > *Common* > *Customers* > *All customers*). According to the general structure of list pages, the customer page shows the list of available customers.

4.2.1.1 Create New Customer Dialog

In the customer list page, you may click the action pane button *New/Customer* to access the *Create new customer* dialog. In the create dialog you may select the *Record type* (Person/Organization). The field *Name* in the dialog is a lookup providing the option either to enter a new name or – if the customer is already a party in the global address book – to select an existing party.

Customer records are assigned to global address book parties in the same way as vendor records, which is why features like duplicate control and changing name work as described for vendors (see section 3.2.1).

Clicking the button *Save and open/Sales order* in the dialog provides the option to switch immediately to the sales order form for registering an order after entering the customer.

4.2.1.2 Customer Detail Form

If you want to see details of a customer showing in the list page, you may double-click on the line of the particular customer to open the related customer detail form. Clicking the button *Edit* in the action pane of the detail form, you may switch to edit mode. Alternatively, you may access the customer detail form in edit mode clicking the button *Edit* in the list page after selecting the customer concerned.

The customer form contains numerous fields, which constitute default values for sales orders. Like the vendor group in vendor records, the *Customer group* in customer records is a core setting, controlling ledger integration through posting profiles (see section 3.2.3). Other important fields include the *Sales tax group* (VAT group) on the tab *Invoice and delivery*, the currency on the tab *Sales demographics*, the

terms of payment on the tab *Payment defaults*, and settings for blocking (lookup *Invoice and delivery on hold* on the tab *Credit and collections*).

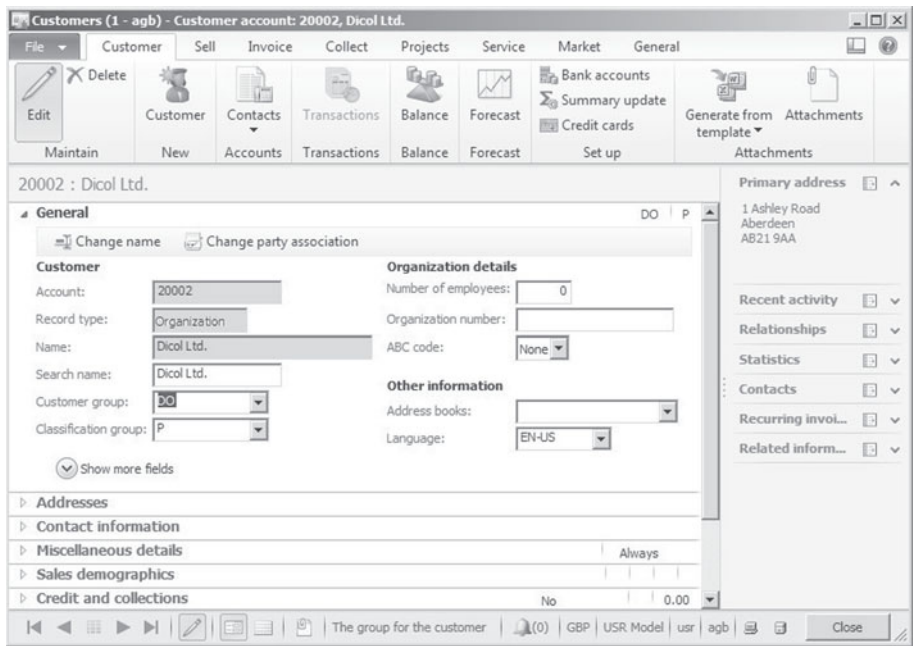


Figure 4-5: Editing a customer in the customer detail form

4.2.1.3 Comparing Vendor Records

Since structure and content of the fields in the customer record are very similar to the vendor record, the description below only covers deviations and elements, which primarily refer to customer records and which have not been explained for vendor records, therefore.

4.2.1.4 Invoice Account

As an example, in sales it is sometimes required to send an invoice to a customer different to the order customer (e.g. for subsidiaries of an affiliated group). In order to comply with this situation, you may select the customer number of the invoice customer in the field *Invoice account* on the tab *Invoice and delivery*. A customer number registered here will be the default for the field *Invoice account* in related sales order headers. If required, you may change the invoice account in the sales order as well.

Invoices of orders concerned will post to the invoice customer (instead of the order customer), generating an open customer transaction referring to the customer number of the invoice account. Unless chosen different in the lookup field *Invoice address* (tab *Invoice and delivery*) of the customer record, the printed invoice will also show the address of the invoice account.

4.2.1.5 Alternative Address and Global Address Book Integration

Whereas the invoice account number in the customer form refers to a second customer number (assigning a separate customer record), adding addresses to a customer on the *Addresses* tab of the customer form assigns several addresses to a single customer number.

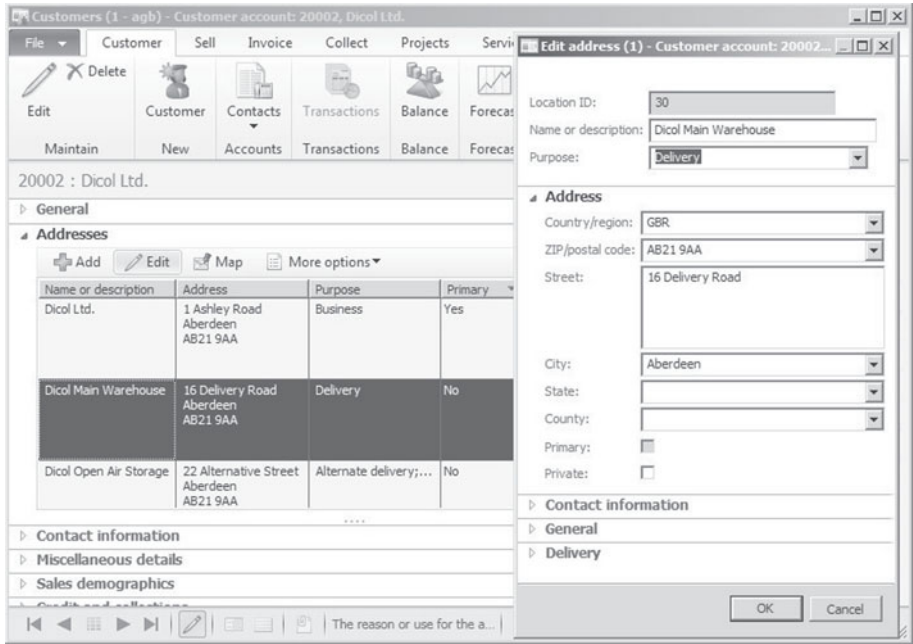


Figure 4-6: Editing a customer delivery address in the address dialog

Like postal addresses for vendors (see section 3.2.1), customer addresses are shared with the party concerned in the global address book.

After clicking the button  in the action pane strip of the tab *Addresses*, the address dialog displays where you may register a name and one or several purposes. For the primary customer address, you need to make sure the checkbox *Primary* is selected.

If you enter an address selecting the purpose “Invoice”, invoices for the customer will print this address instead of the primary address. An address with the purpose “Delivery” will be the default for the delivery address in sales orders. If you want to ship to other addresses than the delivery address or – if no specific delivery address is available – the primary address, you may select one of the additional customer addresses or enter a completely new address in the sales order.

4.2.1.6 Print Management

Base settings for printing options like the destination (printer), the number of copies, or the footer text are available in the accounts receivable print management setup (*Accounts receivable> Setup> Forms> Form setup*, button *Print management*).

You may override these settings for individual customers in the customer form, clicking the button *Set up/Print management* on the action pane tab *General*. After selecting the appropriate original or copy document there, you have to select the option *Override* in the pop-up menu (which opens by right-clicking) before you can enter the individual settings. Customer print management settings are transferred to sales orders, where you may override them on order level again.

Print management settings (e.g. a specified printer) apply to documents, if the checkbox *Use print management destination* is selected in the posting form concerned (see section 3.4.8).

4.2.1.7 Shipping Carrier and Mode of Delivery

If shipping carrier interfaces (*Inventory and warehouse management> Setup> Shipping carrier> Carrier interface*) are enabled, automatically integrating information from carrier software of selected carriers, you want to select a *Mode of delivery* on the tab *Invoice and delivery* of the customer form. Modes of delivery (*Sales and marketing> Setup> Distribution> Modes of delivery*) specify the transport method, including if and which carrier applies (tab *Setup* in the mode of delivery).

4.2.1.8 Credit Limit

Many companies want to apply credit limit control in sales operations. In order to activate credit limit control, your company needs to specify in the accounts receivable parameters (*Accounts receivable> Setup> Account receivable parameters*, tab *Credit rating*) how credit rating should work. Depending on the setup, credit limit control includes only open invoices or as well packing slips or open orders and shows a warning or an error message.

The tab *Credit and collections* in the customer form contains the field *Credit limit* to enter the credit limit amount for a customer. If the checkbox *Mandatory credit limit* is selected, the credit limit amount always applies, otherwise a credit limit amount of zero means unlimited credit.

When entering (or posting, depending on the parameter settings) a sales order, Dynamics AX checks if the customer exceeds the credit limit and either displays a warning message or prevents posting showing an error message.

4.2.1.9 New in Dynamics AX 2012

In Dynamics AX 2012, items new to customer management refer to the new user interface design, to the global address book integration, and to the carrier interface.

4.2.2 Case Study Exercises

Exercise 4.1 – Customer Record

A new domestic customer wants to order your items. Insert a new record for this customer containing name (starting with our user ID), primary address, a mode of delivery without carrier and an appropriate customer and sales tax group for domestic customers. In addition, the terms of payment and the cash discount entered in exercise 3.1 apply.

Deliveries to that customer should go to a different address. Therefore, enter a domestic delivery address of your choice, which should be the default for orders of this customer.

Exercise 4.2 – Ledger Integration

You want to find out about ledger integration. To which summary account in the general ledger will an invoice for your new customer post?

4.3 Product Management

Apart from customer records (providing the main data source for sales order headers), products and sales categories (applying to order lines) are the second core area of master data for sales operations.

Product and released product records are required for inventoried items, and may optionally apply to for intangible items (with product type “Service” or specific item model groups). The other option for intangible items is to apply sales categories.

The following section primarily contains an explanation of product record data necessary for sales and distribution. You may find a more general description of product management in section 7.2.

4.3.1 Product Records and Categories in Sales

Product categories may be assigned to products enabling hierarchical product structures, but you may also register a sales line directly on a sales category.

4.3.1.1 Sales Categories

A product category (see section 3.3.1) is a group of similar products or services, which you may access through category hierarchy administration (*Product information management* > *Setup* > *Categories* > *Category hierarchies*).

Product categories available in sales belong to the sales category hierarchy. In order to enter category settings for sales, you may want to access the sales categories (*Sales and marketing* > *Setup* > *Categories* > *Sales categories*), where the item sales tax group is available on the tab *Item sales tax groups*.

In sales order lines, you may select a sales category instead of a product number.

4.3.1.2 Product Record Structure

The product record structure in Dynamics AX shows two levels, involving shared products for data common to all companies and released products for company-specific data (see section 3.3.2 and 7.2.1).

You may access the shared product in the form *Product information management> Common> Products> All products and product masters*. Sales specific data are available in the released product form (*Product information management> Common> Released products*).

4.3.1.3 Creating a Released Product

In order to create a new released product (item), you may access the shared product form and insert a record clicking the button *New/Product* in the action pane. Apart from the basic product description in default language, which you may enter in the *Description* field on the shared product, you may record item descriptions in foreign languages clicking the button *Languages/Translations* in the action pane.

Once finished entering shared product data, you may click the button *Release products* in the action pane of the shared product to create released products.

In the released product, you need to enter at least the item group, the item model group, and the dimension groups (if not specified on the shared product).

As an alternative way for creating a released product, you may access the released products form and click the button *New/Product* on the action pane tab *Product*. The *New released product* dialog will create a shared product in parallel.

4.3.1.4 Sales Related Data

Core sales information, including the *Item sales tax group* (specifying whether regular sales tax / VAT or a reduced rate applies), is available on the tab *Sell* of the released product form.

Clicking the button *Order settings/Default order settings* on the action pane tab *Plan* of the released product form, you may – on company level – enter settings for order quantities and lot size. Site-specific settings are available clicking the button *Site specific order settings* – in case of quantity settings selecting the checkbox *Override* in the site-specific order settings form.

The order setting forms contain data for purchasing, sales and inventory. In order to access sales-related data you will switch to the tab *Sales order*. Marking the checkbox *Stopped* there, you may block the product for sales transactions.

4.3.1.5 Discount Groups

Apart from the *Base sales price*, the tab *Sell* of the released product form also contains the item discount groups for line discount and multiline discount. As

shown below, line discount calculation is based on individual order lines whereas multiline discount calculation includes all lines of an order.

Another kind of discounts are total discounts (invoice discounts), which are available on order header level independent from items. On the tab *Sell* in the released product form, you may clear the checkbox *Total discount* to exclude a product from the calculation of the total discount, however.

4.3.1.6 New in Dynamics AX 2012

In Dynamics AX 2012, shared products as well as sales categories are a new.

4.3.2 Sales Price and Discount

Whereas the base sales price may be entered directly in the released product record, managing sales discounts involves trade agreements.

4.3.2.1 Base Sales Prices

The base sales price on the tab *Sell* of the released product form may be updated automatically bases on the purchase or cost price. Settings for the base price calculation are available in the field group *Price update* on the tab *Sell*, where you may select the *Sales price model* and the *Base price*. If you choose “Purchase price” in the *Base price* lookup, price calculation refers to the base purchase base price on the tab *Purchase*, whereas the option “Cost” refers to the base cost price on the tab *Manage costs*.

The *Sales price model* specifies, if price calculation is based on the field *Contribution ratio* or on the field *Charges percentage*. The *Sales price model* “None” means that there is no automatic calculation of the base sales price.

The other options regarding base sales price (including price unit and charges) are similar to the base purchase price settings (see section 3.3.3).

In addition to the base sales price on the tab *Sell* of the released product form, you may enter base prices on site level in the item price form (button *Set up/Item Price* on the action pane tab *Manage costs* of the released product form). In the item price form, you may start automatic calculation of sales prices based on the bill of materials and route of manufactured items.

4.3.2.2 Trade Agreements

Trade agreements in sales are there to enter prices and discounts depending on customers and items (released products). Dynamics AX includes following types of trade agreements for this purpose:

- Sales prices
- Line discounts
- Multiline discounts
- Total discounts (Invoice discounts)

A description on managing prices in trade agreements is available in section 3.3.3. In addition to the options available in purchasing, you may specify a *Generic currency* and an *Exchange rate type* in the accounts receivable parameters (*Accounts receivable> Setup> Accounts receivable parameters*, tab *Prices*) to convert automatically from price list prices in the generic currency to other currencies when registering a sales order line.

Regarding discounts, you may distinguish two different calculation levels:

- Line and multiline discounts – Assignment to order lines
- Total discounts – Assignment to order headers

In trade agreements, discounts and prices may refer to different pricing levels. As an example, discounts may apply to an individual customer, a customer group or all customers. In parallel, you may link released products to discount groups for line discounts and multiline discounts.

Table 4-1 shows an overview of the different levels in two dimensions – the item and the customer dimension – that are available to manage line and multiline discounts.

Table 4-1: Discount calculation levels for line discount and multiline discount

	Item number	Item discount group	All items
Customer number	X	X	X
Customer discount group	X	X	X
All customers	X	X	X

In comparison, trade agreements for prices and total discounts only show one dimension. Prices are available per item, which restricts the item dimension to “Item number”, whereas total discounts apply to a whole order, restricting the item dimension to “All items”.

4.3.2.3 Activate Price/Discount Group

The setting, which levels (“Table”, “Group”, “All”) are applicable in price and discount calculation, is available in the form *Sales and marketing> Setup> Price/Discount> Activate price/discount*.

Within the activated elements, discount calculation in Dynamics AX always searches from the specific definition to the general – that is from the customer and item number to the groups and to the general discounts. Depending on the checkbox *Find next*, only one discount or the total of discounts on several levels applies to a certain order line (see below).

4.3.2.4 Viewing Line Discounts

In order to view registered sales line discounts, you may access the line discounts form from different menu items depending on the basis for the discount:

- For an item (including the applicable line discount group) – In the released product form (*View/Line discount* on action pane tab *Sell*)
- For a customer (including the applicable line discount group) – In the customer form (*Trade agreements/Line discount* on action pane tab *Sell*)
- For an item discount group – In the item discount group form (*Sales and marketing> Setup> Price/Discount> Item discount groups*, button *Trade agreements/View line discount*)
- For a customer discount group – In the customer line discount groups (*Sales and marketing> Setup> Price/Discount> Customer price/discount groups*, Show “Line discount group”, button *Trade agreements/View line discount*)

If you want to view a line discount for a customer discount group as an example, you may access the customer discount groups (*Sales and marketing> Setup> Price/Discount> Customer price/discount groups*) and choose “Line discount group” in the lookup field *Show* there. Clicking the button *Trade agreements/View line discount* you may display available line discounts.

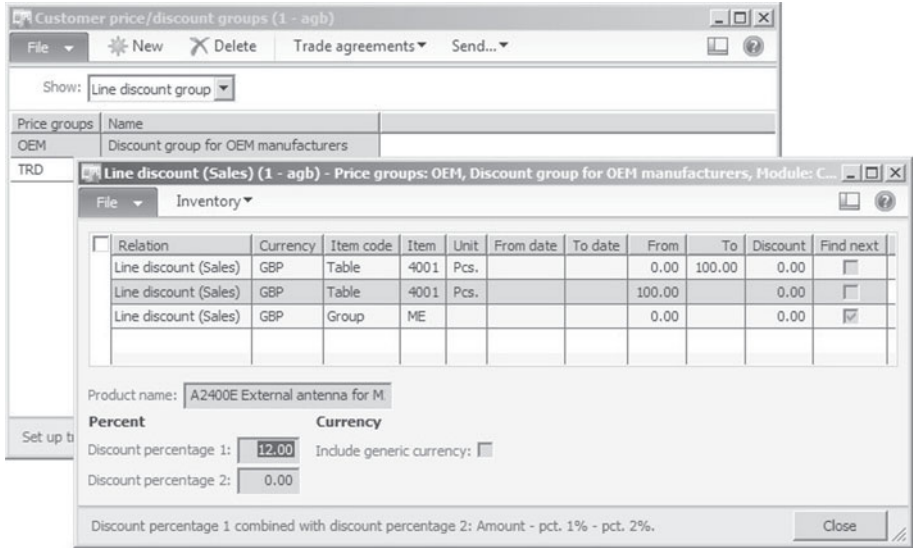


Figure 4-7: Managing line discounts based on a customer discount group

In the line discounts form, discount percentages display in the footer part of the form. The column *Discount* shows a discount amount.

Another important setting is available in the column *Find next*. The checkbox there should only be marked for discounts, which apply in addition to discounts entered on a different level. As an example in Figure 4-7, the discount in a sales order line would be 17 percent, if the checkbox *Find next* was marked for the 12 percent discount line and a discount of 5 percent would apply to the appropriate item discount group.

4.3.2.5 Registering New Line Discounts

Like registering a new price agreement (see section 3.3.3), registering a new sales line discount agreement requires entering and posting a price/discount agreement journal (*Sales and marketing > Journals > Price/discount agreement journals*). Clicking the button *New* in the agreement journal header form, you may insert a journal and switch to the journal lines clicking the button *Lines*.

When registering a sales line discount, make sure to select “Line discount (Sales)” in the column *Relation*. Similar to price agreements, line discount agreements may refer to following fields:

- Period of validity – From date and to date
- Quantity – From and to quantity
- Unit of measure
- Currency
- Customer dimension level (column *Account code*) – Individual customer, customer group or all customers
- Item dimension level (column *Item code*) – Individual item, group or all

When entering line discounts you have to keep in mind that discount percentages are available in the footer part of the journal lines (compare Figure 4-7).

Clicking the button *Inventory/Dimensions display* in the action pane strip you may choose to show appropriate dimension columns, if you want to enter line discounts referring to inventory dimensions like site or color. As a prerequisite, the dimension group of the item concerned needs to include the selected dimension in the price search.

After registering all line discounts concerned, you may click the button *Post* to activate the agreement.

4.3.2.6 Multiline Discount

Whereas line discount calculation is based on individual order lines, multiline discount calculation will include all items in an order, which got the same multiline discount group. You may apply this option, if you want to give a quantity discount based on the total quantity of several items as an example.

Managing multiline discounts works similar to managing line discounts.

4.3.2.7 Total Discount

Unlike line discounts, total discounts (invoice discounts) are not based on items or item groups. Total discounts refer to the complete invoice and show the option to enter a discount based on the invoice total.

4.3.2.8 Settings for Discount

As a prerequisite for applying trade agreements on group level, you need to enter the appropriate price and discount group in the customer and released product

form. For customer records, fields to assign discount groups are available on the tab *Sales order defaults* of the customer form.

For items, fields to assign the line and the multiline discount group in sales are available on the tab *Sell* in the released product form. The checkbox *Total discount* there is available to exclude an item from total discount calculation.

For a situation where line discount and multiline discount at the same time apply to a sales order line, the setting in the lookup field *Discount* on the tab *Prices* of the accounts receivable parameters controls, how to calculate the total of line and multiline discount.

4.3.2.9 Ledger Integration

Since discounts affect finance, Dynamics AX includes discount posting in ledger transactions. Concerning ledger transactions as well as concerning revenue calculation in sales, you have to distinguish between line and multiline discounts on the one hand and total discounts on the other hand.

Line and multiline discounts are included in item revenue calculation, therefore reducing revenue and gross margin. Regarding ledger integration, you may decide if line and multiline discount reduce the amount posted to revenue accounts of the products concerned or if discount should post to separate accounts. Dynamics AX will post to separate accounts, if the inventory posting setup (see section 8.4.2) contains appropriate main accounts (*Inventory and warehouse management* > *Setup* > *Posting* > *Posting*, tab *Sales order*, option *Discount*).

In contrast to line and multiline discount, total discounts do not reduce the revenue on item level. As a limitation of total discounts, it is not possible to post these discounts to different main accounts. The account number for total discount transactions is available in the accounts for automatic transaction (*General ledger* > *Setup* > *Posting* > *Accounts for automatic transactions*), where you may find a line for the posting type "Customer invoice discount" containing the appropriate main account.

4.3.2.10 Discounts in Sales Orders

Line discounts immediately show in an order line, if an applicable trade agreement is available. In order to calculate multiline discounts and total discounts, you need to run a calculation after finishing order line entry (see section 4.4.4).

You may manually enter or change discounts in order lines independent from trade agreement settings. If you change data which are among the basis of price calculation (e.g. the ordered quantity) in an order at a later time, Dynamics AX may overwrite your manual discount with the applicable trade agreement. Depending on the accounts receivable parameters (tab *Prices*, include the source "Manual entry" in the section *Trade agreement evaluation*), Dynamics AX shows a dialog before overwriting the manual discount.

4.3.2.11 New in Dynamics AX 2012

New items in Dynamics AX 2012 are the option of price lists in a generic currency and the requirement to post agreement journals for updating trade agreements.

4.3.3 Case Study Exercises

Exercise 4.3 – Sales Categories

Your company offers installation services to the customers. Therefore you want to set up a sales category “##-installation” (## = your user ID) and make sure this sales category receives the item sales tax group referring to the standard tax rate.

Exercise 4.4 – Price List

Your company requires an additional price list to cover new sales markets. Enter a new customer price group P-## (## = your user ID) for that price list and attach it to your customer of exercise 4.1.

The new price list should show a price of GBP 90.00 starting from the current date for the item of exercise 3.5. Record and post the price in a price/discount agreement journal. Finally you want to check if the price shows correctly on your customer.

Exercise 4.5 – Line Discount

You agree with your customer of exercise 4.1 to grant a line discount of 10 percent for all items. Enter and post a trade agreement for that discount, which only applies to your customer. Make sure to enter a percentage, not a discount amount.

Which setting is required to make use of this discount in sales order lines?

4.4 Sales Orders and Quotations

The first step of the sales process in Dynamics AX often is a sales quote, which you may send to prospects and customers in reply to a request for quotation. Once a customer orders goods or services, you want to enter a sales order. With regard to functionality and structure of forms and list pages, sales orders largely mirror purchase orders. This section therefore primarily contains the description of issues, which are different in sales and purchasing.

4.4.1 Basics of Sales Order Processing

Unlike purchase orders, which are primarily caused by material requirements available inside the Dynamics AX database, sales orders originate from sources outside the database in most cases.

Apart from the manual entry of a sales order, there are only a few other options available within Dynamics AX to generate a sales order. Possible preliminary steps to a sales order are as follows:

- Sales quotations
- Sales agreements (blanket orders)
- Enterprise Portal (web shop)

- AIF framework (exchanging data with other applications)
- Intercompany functionality (purchase orders of another legal entity)

4.4.1.1 Sales Agreements

In Dynamics AX, blanket orders are covered by sales agreements (*Sales and marketing> Common> Sales orders> Sales agreements*), which do not only contain contracts specifying product number and quantity, but also contracts only specifying the sales amount for a product or the total sales volume for a customer.

In order to ship and invoice deliveries referring to a sales agreement, you need to create release orders (regular sales orders linked to a sales agreement). The functionality of sales agreement matches the purchase agreements functionality as shown in section 3.4.9.

4.4.1.2 Sales Order Processing

Once you have finished creating a new sales order – either manually or transferring a prior document like the sales agreement – you may post and print an order confirmation. The further proceeding depends on the transactions actually performed in inventory and sales, and on the company settings in Dynamics AX.

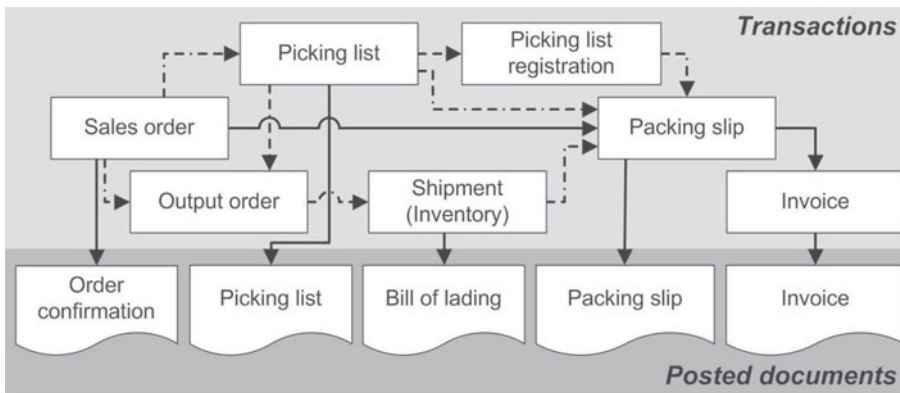


Figure 4-8: Sales order processing in Dynamics AX

As shown in Figure 4-8, we may distinguish four different options to process a sales order in Dynamics AX:

- Packing slip – Without preceding transactions in Dynamics AX
- Picking list – Posting a picking list before packing slip posting
- Picking list registration – Registration of the posted picking list before packing slip posting
- Output orders and shipments – Specific transactions in inventory (with warehouse locations and pallet transports) before packing slip posting

The available options of sales order processing primarily differ in the way picking is done in inventory management.

4.4.2 Sales Quotations

In Dynamics AX, the business partner in a sales quotation does not need to be a customer – it may be a prospect as well. Since sales orders require a customer record, you may convert the prospect to a customer in parallel when accepting a quotation and transferring it to an order.

4.4.2.1 Managing Prospects

Prospects are parties – companies and persons – which do not have an active financial relation with your company yet. You may apply them for CRM activities in Dynamics AX like mailings and marketing campaigns.

If you want to register a new prospect, you may access the form *Sales and marketing> Common> Prospect> All prospects* and click the action pane button *New/Prospect* to access the *Create new prospect* dialog. The create prospect dialog works like the create customer dialog (see section 4.2.1), integrating prospects with the global address book.

Similar to entering a new customer, you want to check core data like the sales tax group (VAT group) and the customer group of the new prospect. Some default data like the prospect type (*Type ID* on the tab *General*) for a new prospect derive from the tab *Prospects* in the sales and marketing parameters. A new prospect creates automatically, when inserting an opportunity (*Sales and marketing> Common> Opportunities> All opportunities*) entering a new party name.

In order to convert the prospect to a customer, you may click the button *Convert/Convert to customer* on the action pane tab *General* of the prospect form. Depending on the setting in the type (*Sales and marketing> Setup> Prospects> Relation types*) of the prospect, the prospect is deleted automatically when converting.

4.4.2.2 Processing Sales Quotations

You may register a sales quotation clicking the button *New/Sales quotation* on the action pane tab *Quotation* of the list page *Sales and marketing> Common> Sales quotations> All quotations*. Alternatively, you may create a sales quotation clicking the button *New/Sales quotation* on action pane tab *Sell* in the customer form or in the prospect form.

When creating quotation starting in the sales quotation form, the *Create quotation* dialog displays where you have to select the *Account type* (“Customer” or “Prospect”). When clicking the button OK in the dialog, Dynamics AX creates the quotation header and switches to the quotation detail form showing the line view.

In order to register a quotation line, you may click in the lines pane or click the button  *Add line* in the action pane strip and start selecting an item number or a sales category.

Create quotation (1 - agb)

Customer

Account type:

Prospect:

Name of prospect:

Contact:

Address

Delivery name:

Address:

Delivery address:

Template

General:

Shipping and delivery

Administration

OK Cancel

The type of account used for this quotation: customer or prospect

Figure 4-9: Creating a new quotation selecting a prospect

Clicking the button *Generate/Send quotation* on the action pane tab *Quotation* of the quotation form, you may post and print the quotation similar to order confirmation posting in a sales order. Depending on the answer of the prospect or customer, you may click the button *Confirm* on the action pane tab *Follow up* of the quotation form later to confirm the quotation and automatically transferring it to a sales order.

If the quote refers to a prospect, you need to transfer the prospect to a customer before creating the sales order.

4.4.3 Sales Order Registration

Like in purchase orders, the order type in sales orders is a core characteristic as well. Sales orders may contain following order types:

- Sales order – Regular sales order
- Journal – Draft or template, not affecting inventory and finance
- Subscription – Periodic order, remains open after invoicing
- Returned order – Credit notes, see section 4.6.4

The order type “Item requirements” shown as additional option is applicable for a specific kind of sales orders generated in the Dynamics AX project module, which is beyond the scope of this book. It is not possible to enter orders of the type “Item requirements” in the sales module.

4.4.3.1 Entering a New Sales Order

If you want to enter a sales order manually, you may either start from the customer form (button *New/Sales order* on the action pane tab *Sell*) or from the sales order form. If starting from the sales order form (*Sales and marketing* > *Common* > *Sales*

orders> All sales orders), you have to click the button *New/Sales order* on the action pane tab *Sales order*. Dynamics AX shows the *Create sales order* dialog, where you want to choose a customer in the lookup (e.g. applying a *Filter by field* doing a right-hand click in the column *Name* of the lookup).

When inserting a new sales order, the order header retrieves various defaults from the customer record. When inserting order lines, you need to start selecting the item number (released product) or the sales category.

Working in sales orders widely matches purchase orders, which is why you may refer to section 3.4.5 regarding following topics:

- Structure and functions in the order form
- Delivery address in order header and lines
- Sales tax / VAT (see also section 8.2.6)
- Copy function
- Journals

The screenshot shows the 'Sales order (1 - agb) - Sales order: SO00002, Hydrotech Scotland Ltd.' window. The 'Sales order' tab is selected, showing a ribbon with various actions. Below the ribbon, the 'Sales order header' section displays 'SO00002 : 20006 - Hydrotech Scotland Ltd.' and an 'Open order' button. The 'Sales order lines' section contains a table with the following data:

Type	Item	Product name	Sales category	Quantity	Unit	Site	Warehouse	Unit price	Discount	Discount percent	Net amount
	4001	A2400E Ext...		10.00	Pcs.	HQ	10	5.50		10.00	49.50
	3001	S868S Radi...		1.00	Pcs.	HQ	10	100.00		5.00	95.00
		Services				HQ					

At the bottom, the 'Line details' section shows navigation buttons and a status bar with 'Category from the sales cate...', '(0)', 'GBP', 'USR Model', 'usr', 'agb', and a 'Close' button.

Figure 4-10: Entering a sales order line with a sales category in the order form

In the description of purchase order processing, you may also find following subjects that apply to sales order processing as well:

- Canceling orders (Section 3.4.7)
- Partial delivery, over and under delivery (Section 3.5.5)
- Order status and inquiries (Section 3.5.6 and 3.6.3)

4.4.3.2 Deleting a Sales Order

Unlike purchase orders, sales orders do not apply change management and order approval. Among other items, sales orders therefore are different to purchase orders regarding deleting. When deleting sales orders, accounts receivable parameters (*Accounts receivable> Setup> Accounts receivable parameters*) apply:

- *Mark order as voided* (tab *General*) – If marked, deleted sales orders show in the form *Sales and marketing> Inquiries> History> Voided sales orders*.
- *Delete order line invoiced in total* and *Delete order after invoicing* (tab *Updates*) – If marked, orders/order lines are deleted when invoice posting

4.4.3.3 Delivery Date Calculation

An issue in sales orders, which is quite different to purchase orders, is the assignment of delivery dates. A number of aspects determine the calculation of delivery dates in sales:

- Order entry deadlines
- Sales lead time
- Delivery date control
- Availability and item requirements

Regarding delivery date, Dynamics AX distinguishes between the shipping date and the date when the customer receives the item on the one hand and between a requested and a confirmed date on the other hand. The delivery date therefore splits into four different fields, which you may find on the sub-tab *Delivery* of the *Line details* tab on a sales order line.

4.4.3.4 Order Entry Deadlines and Sales Lead Time

Order entry deadlines (*Inventory and warehouse management> Setup> Distribution> Order entry deadlines*) determine the hour, till which you may enter a shipment date for the same day in sales order lines, and after which delivery date calculation will start with the next day.

The sales lead time is the number of days required internally until an item ships. A general setting for the sales lead time is available on the tab *Shipments* of the accounts receivable parameters. The lead time specified there applies to the ship date in the order header. Order lines will accept the header ship date, if the date calculated with the sales lead time of the item is not after the header ship date.

You may specify sales lead times for items in the default or site-specific order settings (button *Default order settings* or *Site specific order settings* on the action pane tab *Plan* of the released product form), and in trade agreements for sales prices.

Making sure the lookup *Delivery date control* on the sub-tab *Delivery* of the order line shows “None”, you may choose an earlier delivery date, however.

4.4.3.5 Delivery Date Control

If you want to apply shipping calendars and item availability when determining delivery dates, you may access the *Shipments* tab of the accounts receivable parameters. The lookup *Delivery date control* there provides following options:

- Sales lead time – Delivery date is based on lead time and calendar settings
- ATP – Calculates item availability within the *ATP time fence*

- ATP + Issue margin – Adds issue margin from the item coverage to the determined delivery date
- CTP – Immediately creates a planned order

When selecting ATP calculation, the shipping date will be the first day after the *ATP time fence*, if the required quantity is not available within the ATP time fence. In order to avoid unnecessary delays, the ATP time fence should match the lead time therefore. The offset time settings apply to calculating delayed demand and supply transactions, which are scheduled for past periods.

Figure 4-11: Delivery control settings in the accounts receivable parameters

Delivery date control settings of the item concerned (default/site-specific order settings in the released product form) override the base settings in the accounts receivable parameters. If you want to activate or deactivate delivery control for a specific sales order or sales order line, you may additionally override the lookup *Delivery date control* on the (sub-)tab *Delivery* of the header or line.

Delivery date control includes following calendar and transport time settings:

- *Inventory and warehouse management* > *Setup* > *Inventory breakdown* > *Warehouses*, tab *Master planning* (select shipping calendar for warehouses)
- *Organization administration* > *Setup* > *Organization* > *Legal entities*, tab *Foreign trade and logistics* (select general shipping calendar)
- *Sales and marketing* > *Common* > *Customers* > *All customers* (select receipt calendar for customers or assigned delivery addresses)
- *Sales and marketing* > *Setup* > *Distribution* > *Modes of delivery*, button *Transport calendar* (select transport calendar for delivery modes)
- *Inventory and warehouse management* > *Setup* > *Distribution* > *Transport* (enter transport times depending on delivery mode, shipping warehouse and receiving address or warehouse)

If delivery date control is activated, Dynamics AX checks if the item in an order line is available at the delivery date entered. In order to receive a proposal of possible delivery dates, you may click the button  near the field *Confirmed ship*

date on the *Delivery* (sub-)tab in order headers and lines. If necessary, you may deactivate delivery date control for an order or order line to enter a date, which is not in the dates of possible delivery.

4.4.3.6 Availability Inquiries

In order to check the availability of an item in the sales order form, you may access some inquiries. If you only want to see the actual quantity on hand for the item including applicable inventory dimensions (like site/warehouse), you may click the button *Inventory/On-hand inventory* in the action pane strip of the order line. In addition to the actual quantity on hand, the form also displays data referring to reservation and transaction totals (see section 7.2.5).

The screenshot shows a software window titled "On-hand (1 - agb) - Closed: NoItem number: 4001, New Record". It has several tabs: "Overview", "Ordered items", "Items on order", "Net requirements", and "Intercompany on-hand". The "Overview" tab is active. The form displays the following data:

Product name:	
A2400E External antenna for M.	

Inventory dimensions	
Site:	HQ
Warehouse:	10

Unit	
Show:	Inventory unit
Unit:	Pcs.

On-hand	
Physical inventory:	981.00
Physical reserved:	
Available physical:	981.00
Available for reservation:	981.00
Ordered in total:	10.00
Ordered reserved:	
On order in total:	10.00
Total available:	981.00
Physical cost amount:	
Financial cost amount:	2,832.60
Cost price:	2.89

Physical inventory	
Posted quantity:	980.00
Deducted:	
Picked:	
Received:	
Registered:	1.00

Ordered in total	
Arrived:	
Ordered:	10.00

Various	
On order:	10.00
Quotation receipt:	
Quotation issue:	

At the bottom, there is a status bar with icons and text: "Physical quantity available...", "(0)", "GBP | USR Model | usr | agb", and a "Close" button.

Figure 4-12: Checking inventory for an order line in the on-hand form

Clicking the button *Overview* in the *On-hand*-form, you may view the distribution of the item quantity among warehouses and other inventory dimensions. Clicking the button *Dimensions display*, you may select which dimensions display. If you click the button *Net requirements*, you may view the net requirements form with the possibility to start local master scheduling.

You may as well access the net requirements form clicking the button *Product and supply/Net requirements* in the action pane strip of the sales order line. The button

Product and supply/Explosion in the action pane strip of the order line opens the explosion form, which shows item availability for several BOM levels.

More details on master scheduling and BOM explosion are available in section 6.3 of this book.

4.4.3.7 Delivery Address

The delivery address for a sales order derives from the primary address or – if specified – from the delivery address of the customer. On the *Address* tab in the header view of the order form, you may choose to insert an alternative address:

- Select an existing address (which is already available in the global address book) clicking the button  near the *Delivery address* lookup.
- Register a new address clicking the button  near the *Delivery address*.

If you need to ship the lines of a sales order to different addresses, you may select separate addresses on the *Address* sub-tab of the order lines. The setting, whether posted sales documents like invoices are split based on different addresses, are available on the tab *Summary update* of the accounts receivable parameters.

4.4.3.8 Invoice Address

Unlike the delivery address, you may not register address data for the invoice address in a sales order. The invoice address is the address of the *Invoice account* on the tab *General* in the sales order header view. The default for the invoice account number derives from the customer record of the order customer, but you may choose a different invoice account number in an order nevertheless.

If the invoice account field in the customer record is empty, Dynamics AX inserts the order customer number into the invoice account of the order. In case the customer record of the invoice account contains an address of the type “Invoice”, that address prints on documents instead of the primary address of the invoice customer.

4.4.4 Sales Prices and Discounts

Based on price and discount groups in the order header, selected products and applicable trade agreements, Dynamics AX determines prices and discounts.

4.4.4.1 Sales Price

The sales price in an order line derives from the base price in the item record or from applicable trade agreements. Trade agreements containing prices for the customer number take precedence of prices on price group level.

Applying price groups (representing price lists in Dynamics AX), you may assign a customer to a price list selecting the *Price group* concerned on the tab *Sales order defaults* of the customer form. When entering a sales order, the price group of the customer defaults to the price group on the tab *Price and discount* of the sales order header view. If required, you may change the price group in the sales order.

It is possible to modify or insert prices in sales order lines manually. If you change data which are among the basis for pricing (e.g. the ordered quantity) later, Dynamics AX may overwrite the manual price with the appropriate trade agreement. Depending on the accounts receivable parameters (tab *Prices*, include the source “Manual entry” in the section *Trade agreement evaluation*), Dynamics AX shows a dialog before overwriting the manual price.

4.4.4.2 Discounts

If trade agreements include applicable total discounts, multiline discounts or line discounts, the order will retrieve appropriate defaults. If you want to change a discount group in the order header, you may select the group concerned on the tab *Price and discount* of the sales order header view.

For the total discount, the order header does not only show the discount group, but also the discount percentage since it is a discount on header level.

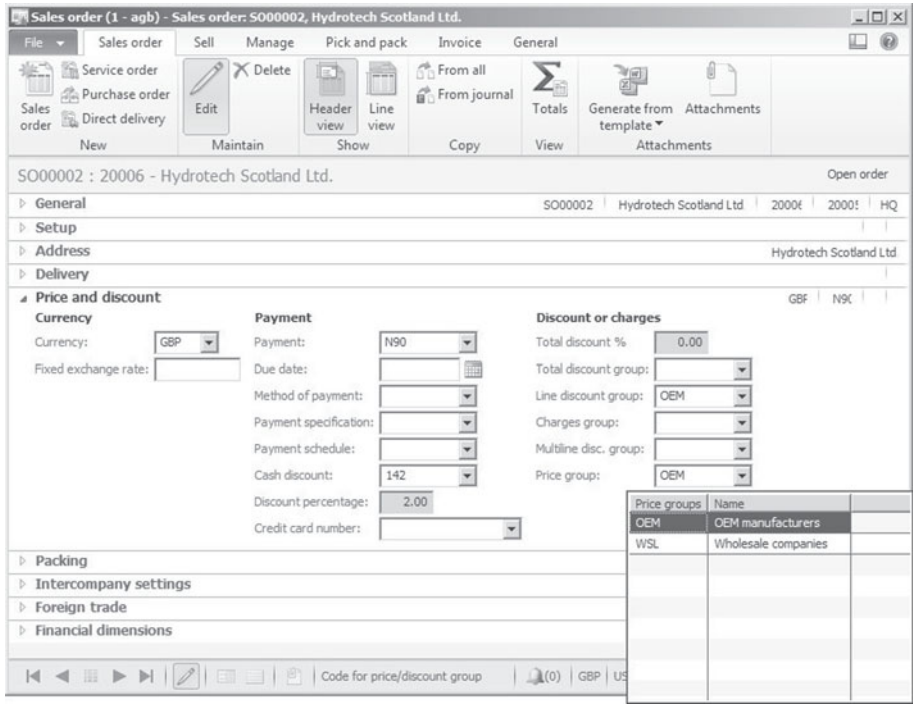


Figure 4-13: Price and discount groups in the sales order header view

The percentage for the line discount shows in a column on the tab *Sales order lines* in the line view. Together with the multiline discount, the line discount percentage also shows on the sub-tab *Price and discount* of the *Line detail* tab in the order line. In parallel to the percentage, there are separate fields for a line discount amount and a multiline discount amount – be aware not to confuse percentage and amount fields.

Dynamics AX calculates the line discount for a sales order line whenever saving the line. Unlike line discount calculation, multiline discount and total discount calculation need to be started manually by clicking the button *Calculate/Multiline discount* or *Calculate/Total discount* on the action pane tab *Sell*.

For the total discount, you may skip manual calculation if the checkbox *Calculate total discount on posting* on the tab *Prices* of the accounts receivable parameters is selected. In this case, Dynamics AX calculates the total discount whenever you print or post an order.

Depending on the accounts receivable parameters (tab *Prices*), Dynamics AX shows a dialog when manually entering a multiline discount and running multiline discount calculation later, asking whether to overwrite the manual discount. The same applies to the line discount if you later change data like the ordered quantity.

4.4.4.3 New in Dynamics AX 2012

The option to show a dialog when automatically recalculating prices and discounts is an item new in Dynamics AX 2012.

4.4.5 Managing Charges

Charges (in former releases called “Miscellaneous charges”) in sales and purchase orders are available to manage expenses, which are not included in the price shown in order lines – fees, freight and insurance as an example.

You may enter charges manually in a purchase or sales order. Nevertheless, it is as well possible to specify default charges, which automatically insert when you enter an order.

Charges are available on header and on line level. Standard documents like the order confirmation only print the charges total amount, no matter if the charges included refer to the header or to specific lines, however.

4.4.5.1 Charges Codes

A prerequisite to apply charges is to register the required charges codes. Charges codes for sales and purchasing are independent from each other. For sales you need to access the form *Accounts receivable> Setup> Charges> Charges code*, and for purchasing *Accounts payable> Setup> Charges> Charges code*.

Apart from the charges code and description, you need to enter the item sales tax group (if applicable) as well as ledger integration data (tab *Posting*).

For sales charges posting, you have to choose the *Debit/Type* “Customer/Vendor” if you want to calculate the charges on top of the item sales, printing them on documents (e.g. invoices) separately. The *Credit/Type* is “Ledger account”, combined with an appropriate revenue account in the *Account* field.

For purchase charges that show separately on the vendor invoice, you want to choose “Customer/Vendor” in the *Credit/Type*. The *Debit/Type* is “Ledger account”

(posting to a separate ledger account), or “Item” (including the charges amount in the inventory value).

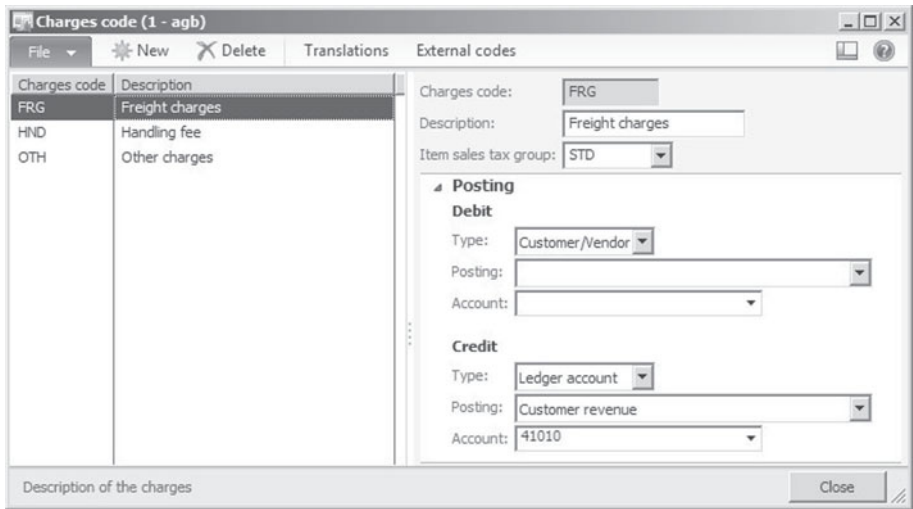


Figure 4-14: Managing charges codes for sales

In addition to the options mentioned above, which apply to charges shown separately on documents, it is also possible to set up codes for internal posting. When setting up these codes, you do not choose the type “Customer/Vendor”.

4.4.5.2 Manual Charges

If you want to apply charges in a sales order manually, you may click the button *Charges/Charges* on the action pane tab *Sell* of the order header concerned. In purchase orders, you may choose the button *Charges/Manage charges* on the action pane tab *Purchase*.

For assigning line charges to sales and purchase orders, you may click the button *Financials/Maintain charges* in the action pane strip after selecting the line concerned on the tab *Order lines*.

In the charges transactions form, you need to select the appropriate charges code. The column *Category* specifies, if the charge is a fixed amount or if to calculate it depending on line amount or quantity.

4.4.5.3 Auto Charges

If specific charges should apply automatically for every order concerned, you may specify *Auto charges* in the form *Accounts receivable> Setup> Charges> Auto charges*.

The header of that form shows the lookup *Level*, where you choose to apply the charges to order headers (*Level* = “Main”) or to lines (*Level* = “Line”). In the grid, you may enter the charges depending on the customer (customer number, group or all customers) and on the item (item number, group or all). For header charges, the item selection is fixed to “All”.

In order to enter the calculation formula for the charge, you may switch to the tab *Lines*.

Account code	Customer relation
Table	20003
Group	FR

Currency	Charges code	Category	Charges value	Charges currency code
GBP	HND	Fixed	10.00	GBP

Figure 4-15: Managing auto charges

As a prerequisite for applying auto charges in sales orders, the checkboxes *Find main charges* (for header charges) and *Find charges for line* (for line charges) on the tab *Prices* of the accounts receivable parameters have to be selected.

4.4.6 Order Confirmation

If you want to print an order confirmation, you have to post it in Dynamics AX. Like confirming a purchase order, posting a sales order confirmation does not create inventory or financial transactions.

Posting an order confirmation means to save it unchanging and separately from the current sales order you work on. Therefore, you may keep record of the documents sent to the customer within Dynamics AX.

4.4.6.1 Posting Form

In order to post and print an order confirmation, you may click the button *Generate/Confirmation* (or *Generate/Sales order confirmation*) on the action pane tab *Sell* after selecting the appropriate order in the sales order form.

The posting form for the sales order confirmation is similar to the posting forms in purchasing (see in section 3.4.8). Like there, the printer selection works by clicking the button *Printer setup* or marking the checkbox *Use print management destination*.

Making sure the checkboxes *Posting* and *Print confirmation* are selected, you may start posting and printing by clicking the button *OK* in the posting form.

As an alternative to confirmation posting in the sales order form, you may as well post the order confirmation accessing the posting form for summary update (*Sales and marketing> Periodic> Sales update> Sales order confirmation*). In the posting form for summary update, you need to apply a filter clicking the button *Select*.

4.4.6.2 Inquiries

Once a sales order confirmation has been posted, you may display and reprint the confirmation independent from modifications to the current order. Access to posted order confirmations is available in the form *Sales and marketing> Inquiries> Journals> Confirmation* or clicking the button *Journals/Sales order confirmation* on the action pane tab *Sell* in the sales order form.

4.4.7 Case Study Exercises

Exercise 4.6 – Sales Order

Your customer (entered in exercise 4.1) orders 20 units of your item entered in exercise 3.5. You may register the sales order starting in the customer form. Which quantity and which price display as default, where do they come from?

Switching to the header view, you want to check the delivery address and the price group of your order.

Exercise 4.7 – Charges

Circumstances require invoicing a handling fee to your customers. Enter a charges code C-## (## = your user ID) to which the standard tax rate applies, selecting the posting type “Customer revenue” and an appropriate revenue account for the credit posting.

In the sales order header of exercise 4.6, you want to make sure this new handling fee is charged to the customer by entering a charge of 10.00 pounds.

Exercise 4.8 – Order Confirmation

Post and print the order confirmation for your order of exercise 4.6, selecting to display a print preview. Can you tell which amount shows in the order line and where the confirmation prints miscellaneous charges?

4.5 Distribution

On the ship date, warehouse needs to finish picking and shipping of the ordered items. Picking means to take required items in the warehouse in order to supply delivery.

4.5.1 Basics and Setup for Picking and Shipping

In Dynamics AX, you are not required to register picking separately. You may ship an item by immediately posting a packing slip or an invoice.

If you want to process picking in Dynamics AX, you may choose between different options depending on system configuration and setup:

- One-step picking
 - Pick form – Manual registration in the pick form
 - Picking list – With automatic picking list registration

- Two-step picking
 - Order picking – Picking list, followed by picking list registration
 - Consolidated picking – Output order and shipment

One-step picking applies, if you need to perform picking but do not require to confirm picked quantity. Two-step picking requires confirming the quantity actually picked – either entering the picking list registration (order picking) or through consolidated picking, enabling combined picking of several orders.

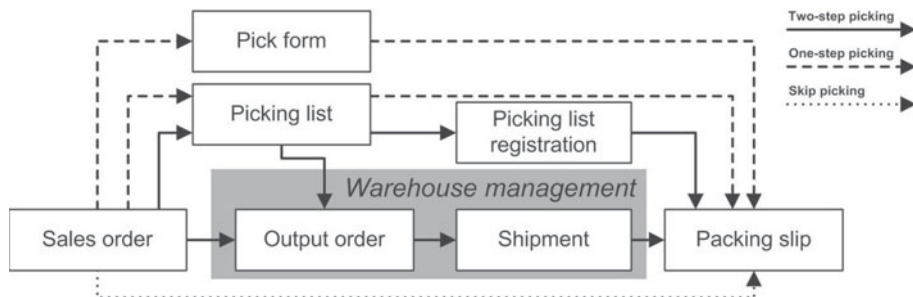


Figure 4-16: Options for sales order picking in Dynamics AX

When posting picking lists, Dynamics AX always generates output orders and shipments. Except for consolidated picking, these transactions are automatically completed and ended in the background.

4.5.1.1 Review Pending Deliveries

No matter whether you perform picking in Dynamics AX, you need to check expected deliveries continuously. In order to support in-time deliveries, there are several forms available to review the pending shipments:

- *Sales and marketing* > *Sales orders* > *Backorder Lines*
- *Sales and marketing* > *Inquiries* > *Order status* > *Open sales order lines*
- *Sales and marketing* > *Inquiries* > *Order status* > *Backorder lines*

In addition, you may as well filter on delivery/ship date in the posting form of picking lists and packing slips.

4.5.1.2 Release Sales Order Picking

For picking list posting, the release picking form (*Inventory and warehouse management* > *Periodic* > *Release sales order picking*) provides another option to select sales order lines for shipping.

When opening the release picking form, an advanced filter displays where you may enter filter criteria to specify which order lines to show. You may change this filter later clicking the button *Select* in the action pane strip of the release picking form.

The release picking form shows sales order lines for items currently on stock only. Clicking the button *Activation* in the action pane strip or manually inserting

quantities in the column *Activate now*, you may activate and reserve items for picking.

Release sales order picking (1 - agb) - Sales order: 5000003, 4001

File | Select | Activation | Release for pick | Functions | Trace orders | Inventory | Recalculate

Order parameters

Setup Deduct released for picking: ☐ **Range** Ship dates: **Last updated** Date: 12/21/2011 Time: 01:44:35 pm

Sales lines | Sales order

C...	Ship date	Sales order	Customer account	Item number	Unit	Quantity	Activate remainder	Activate now	All orders can be delivered
	12/19/2011	5000002	20006	4001	Pcs.	10.00	10.00		☒
P	12/21/2011	5000003	20004	4001	Pcs.	20.00	20.00	20.00	☒

Quantity

Quantity: 20.00 Reserved physical: 20.00 Picking list reserved: **Reservation method** Reservation: Manual

Delivered: Reserved ordered: Picking list not reserved:

Picked: Reservation quantity: 20.00 On order:

On-hand

Item...	Product name	Physical inventory	Physical reserved	Available physical	Picking list not reserved	Available for activation
4001	A2400E External antenna for ...	981.00	20.00	961.00		

Quantity to activate now in inventory units | (0) | GBP | USR Model | usr | agb | Close

Figure 4-17: Release sales order picking

For the quantities in the column *Activate now*, you may post the picking list clicking the button *Release for pick* in the action pane strip.

4.5.1.3 Customer Classification

You may set priorities for sales order picking by entering a *Customer classification group* on the tab *General* of the customer form. This group displays on the left-most column of the release picking form, providing the option to filter on this criterion.

4.5.1.4 Setup for Picking

In order to control the picking process, some settings are required. In particular, you have to check following settings related to picking:

- Accounts receivable parameters – One-step or two-step picking
- Item model group – Picking requirement, Consolidated picking

4.5.1.5 Accounts Receivable Parameters

If the *Picking route status* on the tab *Updates* of the accounts receivable parameters is set to “Completed”, automatic picking list registration is enabled. Dynamics AX will immediately reduce the quantity in inventory when you post the picking list.

If the *Picking route status* is set to “Activated”, two-step picking is enabled. Dynamics AX in this case does not change the quantity in inventory when posting

the picking list. Depending on the item model group of the released product, you need to update either the *Picking list registration* or the *Output order* next.

4.5.1.6 Item Model Group

On the tab *General* of the released product form, every item is assigned to an item model group. In order to configure item model groups, you may access the form *Inventory and warehouse management*> *Setup*> *Inventory*> *Item model groups*.

Item model groups contain two checkboxes on the tab *Setup*, which are core settings for picking:

- Picking requirements – If selected, picking has to be posted before posting a packing slip.
- Consolidated picking method – If selected, the shipment functionality is active to pick multiple orders in picking routes and pallet transports as shown in section 4.5.3.

Regarding the consolidated picking method in the item model group, you have to take into account, that following settings may override them:

- Warehouse settings (*Inventory and warehouse management*> *Setup*> *Inventory breakdown*> *Warehouses*, tab *Warehouse management*)
- Item settings / Warehouse item (Released product form, button *Warehouse/Warehouse items* on the action pane tab *Manage inventory*; in the warehouse item form switch to the tab *Locations*)
- Picking list posting form (When posting a picking list, checkbox *Consolidated picking method* on the tab *Line details* of the posting form)

4.5.2 Pick Form and Picking List

Picking in sales mirrors inventory registration in purchasing: After picking, the quantity concerned shows the status “Picked” and is not available in inventory any more. Like inventory registration in purchasing, picking is a preliminary transaction not shown separately in inventory transactions.

If you want to register picking, you need to perform one-step picking or two-step picking depending on the setup for picking.

4.5.2.1 Pick Form

The first option for picking, the pick form (manual picking of sales orders) works similar to the registration form (item arrival for purchase orders, see section 3.5.3). In the sales order form, clicking the button *Update line/Pick* in the action pane strip of the order lines will open the pick form.

In order to record picking in the pick form, you need to insert appropriate lines in the *Picking list updates* pane of the registration form. Apart from manually inserting records there (button *Add*), you may click the button *Add picking list update* in the action pane strip of the upper pane. After changing warehouse, quantity and

inventory dimensions in the lower pane as applicable, you may post the picking transaction clicking the button *Register all*.

4.5.2.2 Picking List

If you need a printed report to start picking in the warehouse, you want to post and print a picking list instead of registering in the pick form. Posting of a picking list is possible out of several forms:

- Sales order (*Sales order form*, button *Generate/Picking list* on the action pane tab *Pick and pack*)
- Summary update (*Sales and marketing> Periodic> Sales update> Picking list*)
- Release picking form (see above)

After posting and printing the picking list, warehouse personnel may receive a hardcopy of the picking list.

If warehouse immediately picks items, you might apply one-step picking and set the parameter *Picking route status* in the accounts receivable parameters to “Completed” in order to avoid manual picking registration. The next step in Dynamics AX is posting the packing slip in this case.

4.5.2.3 Picking List Registration

You need to enter picking list registration after posting a picking list, if the parameter *Picking route status* is set to “Activated” and consolidated picking does not apply.

Figure 4-18: Picking list registration (fast tab *General* collapsed)

In order to access the picking list registration form, you may click the button *Generate/Picking list registration* on the action pane tab *Pick and pack* in the sales order form. As an alternative, you may access the form in the menu item *Sales and marketing> Journals> Sales order> Picking list registration* (or the menu item *Inventory*

and warehouse management> Periodic> Picking list registration). If starting from the sales order, picking list registration will apply a filter for the current order. Otherwise you need to manually choose a filter for the orders concerned.

In the *Lines* pane of the picking list registration form, you may choose specific lines for update by marking the checkbox in the column *Select* as shown in Figure 4-18. Before confirming the picked quantity of these lines clicking the button *Updates/Update selected* (or *Updates/Update all* for all lines), you may adjust the quantity in the *Pick quantity* column.

4.5.2.4 Reverse Picking Transactions

In order to reverse and cancel a picking transaction, which has been posted in the pick form or through a picking list, you may open the pick form in the sales order after selecting the order line concerned. In *Transactions* pane of the pick form, you may click the button *Add picking list update* after selecting the line concerned and post the reversing transaction like regular picking, but with negative quantity.

If the original picking has been posted through a picking list, you may alternatively reverse picking in the picking list registration form. Clicking the button *Functions/Unpick* in the action pane strip of the tab *Lines* will reverse picking list registration. Afterwards canceling the unpicked quantity– or already in the unpicking dialog selecting the appropriate checkbox– will reverse the picking list.

4.5.3 Output Order and Shipment

Consolidated picking in Dynamics AX includes output orders, picking routes and pallet transports, providing the option to merge several orders into one shipment.

Dynamics AX generates output orders and shipments even if you do not apply consolidated picking. Without consolidated picking, Dynamics AX posts output orders and shipments automatically when posting and registering picking lists.

4.5.3.1 Prerequisites and Setup for Consolidated Picking

As a prerequisite for consolidated picking, you need to manage locations and a location structure including outbound docks within your warehouses in Dynamics AX. In addition, companies applying consolidated picking want to manage picking routes and pallet transports, requiring pallet management in Dynamics AX. The storage dimension group of the items needs to include the dimensions *Location* and *Pallet ID* in this case.

In order to run consolidated picking, consolidated picking needs to be selected in the item model group, warehouse, or released product (warehouse item) as described above in this section.

Settings required for shipments in consolidated picking include shipment templates, shipment reservation sequences and shipment reservation combinations. You may access these settings in the menu *Inventory and warehouse management> Setup> Distribution*.

A detailed description of consolidated picking is beyond the scope of this book, which is why the following lines explain the basics of consolidated picking only.

4.5.3.2 Output Order

Dynamics AX automatically generates an output order when posting a picking list. Alternatively, you may create an output order manually clicking the button *Inventory/Output order* in the sales order line.

In order to access output orders, you may open the form *Inventory and warehouse management> Inquiries> Output orders*. As a preparation for shipments, you may create or change reservations clicking the button *Inventory/Reservation* in the action pane strip of the output order form.

If required, you may as well delete an order in the output order form – for example if you want to stop the picking process for a sales order.

4.5.3.3 Shipment and Shipment List

Shipments in inventory are based on output orders. If you do not apply consolidated picking, Dynamics AX creates shipments of the type “Order picking” automatically in parallel to output orders when posting the picking list. In this case, you do not need to go through the steps described below like activating the shipment.

If you do use consolidated shipping, however, you may continue with the picking process by creating a shipment in the form *Inventory and warehouse management> Common> Shipments* clicking the button *New* in the action pane strip. Depending on the options in the shipment form (button *Functions/Options*), inserting a record in the shipments will start a wizard.

Since a shipment of the type “Consolidated picking” contains one or more output orders, you have to assign output orders to the shipment. If you do not go through the wizard, you need to assign them manually clicking the button *Add* in the shipment lines. The shipment lines form is accessible clicking the button *Show lines* in the action pane strip of the shipment form.

When working with shipments and output orders, you should be aware that Dynamics AX might create new shipments or add output orders to an existing shipment automatically. Appropriate settings are available in the shipment templates.

If you want to print a shipment list in order to support item picking in the warehouse, you may click the button *Print/Shipment list* in the shipments form.

Clicking the button *Functions/Activate* in the shipment form, you may activate the shipment. Activating generates pallet transports for lines, which may be shipped in complete pallets. For smaller quantities, picking routes are activated.

Pallet transports are available in the form *Inventory and warehouse management> Common> Pallet transports*, where you may start and complete the transport.

Picking routes are available in the form *Inventory and warehouse management> Common> Picking routes*, where you may choose the picking route in the lookup field *Picking route*, select – or create (button *Create picking pallet*) – a picking pallet and start the picking route (button *Start picking route*). When picking is done, you may click the button *Approve details* switching to the approve form, where you may click the button *Pick selected*. Finally clicking the button *Deliver picked items* will complete the shipment.

If you perform consolidated picking, but do not apply pallet transports, you may complete the shipment in the picking list registration form (see section 4.5.2), which shows after clicking the button *Inquiry/Picking routes* in the shipment form.

4.5.4 Packing Slip

Posting the packing slip (delivery note) is the last transaction in the picking and shipping process.

4.5.4.1 Ledger Integration

If ledger integration is activated for packing slip posting, Dynamics AX posts transactions in the general ledger in parallel to inventory transactions. These ledger transactions will reverse when you post the related invoice.

There are two relevant settings to enable packing slip posting to the general ledger:

- *Post packing slip in ledger* – Checkbox in the accounts receivable parameters (tab *Updates*) needs to be marked.
- *Post physical inventory* – Checkbox in the item model group (tab *Setup*) of the sold item needs to be marked.

4.5.4.2 Posting Form

You may open the posting form for packing slips either clicking the button *Generate/Packing slip* on the action pane tab *Pick and pack* of the sales order form, or accessing the summary update form *Sales and marketing> Periodic> Sales update> Packing slip*.

The posting form shows the familiar format. Which option to select in the lookup field *Quantity*, depends on the previous procedure:

- *Picked* – Select this option, if picking transactions are posted before posting the packing slip. Dynamics AX applies the picked quantity to the column *Update* on the tab *Lines* of the posting form.
- *All* – Dynamics AX applies the total remaining quantity.
- *Deliver now* – Dynamics AX applies the quantity of the order line column *Deliver now*.

Selecting the checkboxes *Posting* and *Print packing slip*, Dynamics AX posts and prints the packing slip after clicking the button *OK* in the posting form.

Like in purchasing, you may post partial deliveries, over deliveries, and under deliveries (see section 3.5.5). Regarding updates of the order and document status, please also refer to the appropriate purchase order status as described in section 3.5.6.

4.5.4.3 Transaction Inquiry

If you want to see the inventory transactions in the sales order form after packing slip posting, you may click the button *Inventory/Transactions* in action pane strip of the order lines. After posting a packing slip, the issue status of the inventory transaction is “Deducted”. The posting date of the packing slip shows in the column *Physical date* of the inventory transaction, the *Financial date* remains empty until posting the invoice. If you want to know the packing slip number, you may switch to the tab *Update*.

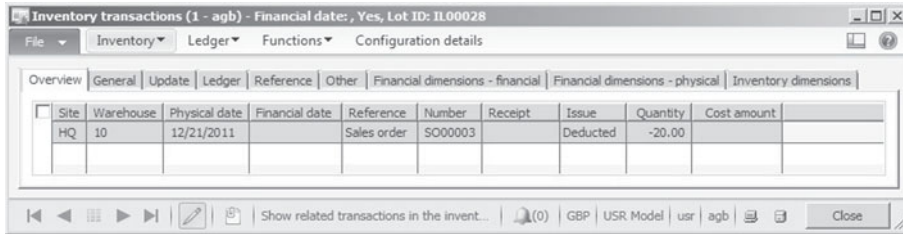


Figure 4-19: Inventory transaction after packing slip posting

In order to access posted packing slips, you may choose the form *Sales and marketing> Inquiries> Journals> Packing slip* or click the button *Journals/Packing slip* on the action pane tab *Pick and pack* of the sales order form. After selecting a packing slip on the tab *Overview* of the inquiry form, you may switch to the tab *Lines* displaying related packing slip lines.

If you want to see related general ledger transactions, you may open the voucher transactions form clicking the button *Vouchers* on the *Overview* tab of the packing slip inquiry or the button *Ledger/Physical voucher* in the inventory transactions.

4.5.4.4 Canceling a Packing Slip

You may cancel a posted packing slip applying the *Cancel* feature in the packing slip inquiry form (*Sales and marketing> Inquiries> Journals> Packing slip*). Selecting the packing slip concerned, you may click the button *Cancel* in the action pane strip of the tab *Overview*. If you just want to reduce the posted quantity, you may choose the button *Correct* instead.

4.5.4.5 New in Dynamics AX 2012

The option to cancel a packing slip in the inquiry is new in Dynamics AX 2012.

4.5.5 Case Study Exercises

Exercise 4.9 – Packing Slip

You need to find out, which order lines are available for shipping. The inquiry should not be limited to your orders; it should also include other orders available in your company. Which possibilities do you know?

You want to ship the items ordered in exercise 4.6 posting a packing slip. Before posting, check following items in the sales order:

- Order status and document status
- Inventory quantity of the ordered item (button *Inventory/On-hand*)
- Inventory transaction related to the order line (button *Inventory/Transactions*)

Post and print a packing slip for the complete order quantity directly out of the sales order form, selecting a print preview as printing destination.

Now review the status of the items on the checklist above again. What is different after packing slip posting?

Exercise 4.10 – Picking List

Your customer of exercise 4.1 orders another 20 units of the item entered in exercise 3.5. Enter an appropriate sales order.

Warehouse does not want to apply consolidated picking, but requires a picking list this time. Therefore, you want to post a picking list containing 10 units of the ordered item. Can you tell which setting controls if you need to enter picking list registration? If required, update the picking list registration.

Then post the packing slip for the picked items.

Exercise 4.11 – Packing Slip Inquiry

You want to see the packing slip of exercise 4.10. Open the packing slip inquiry out of the sales order concerned. In a second step, open the packing slip inquiry choosing the appropriate menu path. Check packing slip header and lines and try to find out, if there are related ledger transactions.

4.6 Invoicing

Posting the sales invoice is the last step in sales order processing. The invoice increases the open customer balance on the one hand and reduces the inventory value on the other hand.

After invoicing all lines of a sales order entirely, the sales order is completed. Payment for the invoice runs through a separate process in finance (see section 8.3.4).

If you want to invoice inventoried products, you need to run through sales order processing shipping and invoicing the items. However, you are free to post the sales order invoice immediately after registering the order (without separately posting a packing slip).

If you want to post invoices not referring to products or sales categories, you may apply free text invoices (see section 4.6.3). In the lines of a free text invoice, you need to enter ledger numbers instead of item numbers. Such an invoice has no connection to items and therefore no impact on inventory and supply chain management.

4.6.1 Invoicing Sales Orders

Posting a sales invoice works similar to posting the packing slip. You may open the posting form for invoices either clicking the button *Generate/Invoice* on the action pane tab *Invoice* of the sales order form, or accessing the accounts receivable summary update form *Accounts receivable> Periodic> Sales update> Invoice*.

4.6.1.1 Posting Form

The posting form shows the familiar format. Which option to select in the lookup field *Quantity*, depends on the previous procedure:

- *Packing Slip*: Common option, since a packing slip is posted first in most cases and you want to link the invoice to the shipped quantity.
- *All or Deliver now*: If selected, Dynamics AX does not default the shipped quantity to the column *Update* in the invoice lines. For any quantity not yet shipped, the packing slip will post in parallel to the invoice.

When choosing “Packing Slip” in the lookup *Quantity*, you may select specific packing slips for invoicing clicking the button *Select packing slip* – similar to selecting product receipts for vendor invoices in purchasing (see section 3.6.2).

The button *Totals* in the posting form is available to check the totals that you are going to post. You post the invoice clicking the button *OK* in the posting form.

4.6.1.2 Transaction Inquiry

Posting the invoice generates general ledger transactions, inventory transactions, customer transactions and transactions in other subledgers like sales tax, if applicable. If all lines are invoiced completely, the order status will change to “Invoiced”.

In order to see the inventory transactions after posting an invoice, you may click the button *Inventory/Transactions* in the action pane strip of the sales order line. The issue status of the inventory transaction is “Sold”, and the posting date of the invoice shows in the column *Financial date* of the inventory transaction.

You may access posted sales invoices choosing the form *Accounts receivable> Inquiries> Journals> Invoice journal* or clicking the button *Journals/Invoice* on the action pane tab *Invoice* of in the sales order form. After selecting an invoice on the tab *Overview* of the inquiry form, you may switch to the tab *Lines* displaying related invoice lines.

If you want to see related general ledger transactions, you may open the voucher transactions form clicking the button *Voucher* on the *Overview* tab of the invoice inquiry or the button *Ledger/Financial voucher* in the inventory transactions.

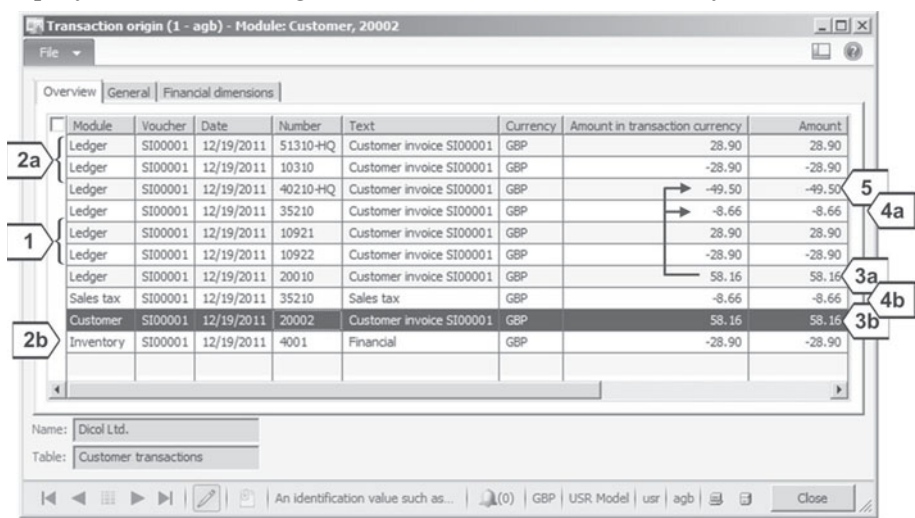


Figure 4-20: Transactions of a sales invoice in the transaction origin form

4.6.1.3 Transaction Origin

If you click the button *Transaction origin* in the voucher transactions form, you may view the transaction origin form showing the transactions in all modules related to the selected sales invoice (compare section 3.6.3 referring to purchasing invoices). As an example for sales invoices, Figure 4-20 displays a domestic invoice for an item, which has been shipped with a separate packing slip.

Classifying the transactions of the invoice shown in Figure 4-20, you may distinguish following kinds of transaction:

Table 4-2: Transactions of the sales invoice in Figure 4-20

Transaction	General ledger	Subledger
Packing slip reversing	Account 10921 offsetting account 10922	[1]
Inventory	Account 51310 for COGS offsetting stock account 10310	[2a] Financial inventory transaction for item 4001 [2b]
Customer	Summary account 20010 offsetting tax account 35210 and revenue account 40210	[3a] Customer transaction and sales tax transaction [3b] [4b] [5]

Invoice posting will generate packing slip reversing transactions only if a prior packing slip has posted to the general ledger.

The ledger accounts in all transactions depend on the actual operation and on the company setup in Dynamics AX. Therefore, you may notice additional or missing

transactions if you compare the transactions of other invoices to Figure 4-20. As an example, you may miss the sales tax transaction for invoices to foreign countries.

For more information on the transactions shown, please refer to following sections of the book:

- Section 3.2.3 regarding customer transactions (explaining similar vendor transactions)
- Section 8.2.6 regarding ledger posting groups for sales tax
- Section 8.4.2 regarding ledger integration of inventory transactions

4.6.2 Collective Invoice

If you want to post an invoice referring to several sales orders (e.g. a monthly invoice), you need to post a collective invoice in a summary update. Collective documents are available for all document types. Therefore, apart from collective invoices you may as well post collective packing slips for example.

The way to post collective documents is not different from posting an individual document. Settings on company and customer level control, whether to generate a collective document.

4.6.2.1 Setup for Summary Updates

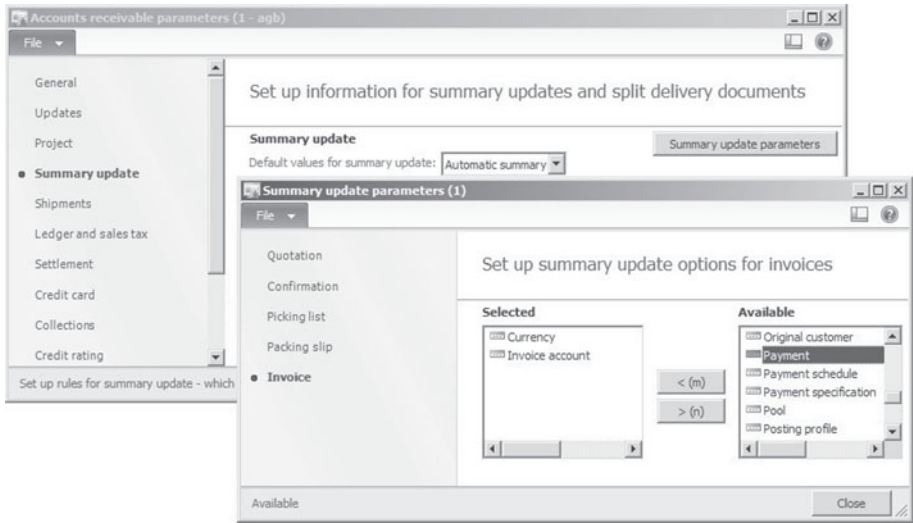


Figure 4-21: Summary update parameters for sales

Basic configuration for collective documents in sales is available on the tab *Summary update* of the accounts receivable parameters. The first setting there is the lookup field *Default values for summary update*, where you choose if settings for collective document posting are available on order level. In most cases the choice is “Automatic summary”, which allows deselecting specific orders from a collective document in the order form. If you select “Invoice account”, you may exclude individual orders only by removing them in the posting form.

After clicking the button *Summary update parameters* in the accounts receivable parameters form, Dynamics AX shows the summary update parameters form. This form displays a tab per document type, where you may select the fields that must be equal in sales orders to join a collective document.

If “Automatic summary” is selected in the *Default values for summary update*, it additionally needs to be enabled for all customers concerned (button *Setup/Summary update* on the action pane tab *Customer* in the customer form). The setting on the customer defaults to sales orders, where you may change it clicking the button *Setup/Summary* on the action pane tab *General* of the sales order form.

4.6.2.2 Posting Collective Invoices

In order to post a collective invoice, you may access the summary update form *Accounts receivable> Periodic> Sales update> Invoice*. In most cases you want to select “Packing slip” in the lookup field *Quantity* of the posting form, making sure invoice posting only retrieves shipped quantities.

As shown in Figure 4-22, you may click the button *Select [1]* in order to select appropriate sales orders in the advanced filter form next. After closing the filter form, you may view the selected orders on the tab *Overview* of the posting form.

Figure 4-22: Posting a collective invoice receipt

If you notice some orders that you do not want to post, you may delete the appropriate lines. Deleting a line in the posting form only removes the selection. It does not delete the order or the packing slip, which is why the order concerned will show again, whenever you want to post an appropriate invoice the next time.

If you want to exclude particular packing slips from invoice posting, you may choose the button *Select packing slip* [2].

Once you have finished selecting sales orders and packing slips, you may click the button *Arrange* [3]. The *Arrange* feature combines the orders into a common invoice according to the summary update parameters. If the setting in the accounts receivable parameters is not suitable in a certain situation, you may choose a different option on the tab *Other* of the posting form before arranging.

In the example shown in Figure 4-22, Dynamics AX will merge the two orders into a common line.

4.6.3 Free Text Invoices

Free text invoices are required to post and print sales invoices, which do not refer to a product or sales category.

The structure of free text invoices is similar to sales orders: Every free text invoice consists of a header and one or more lines. Instead of product numbers and sales categories, the lines of a free text invoice contain ledger accounts.

After registering a free text invoice, you may post and print it. The only posted document available in free text invoices is the invoice – it is not possible to post an order confirmation for example.

Free text invoice (1 - agb) - Invoice account: 20002

File Invoice

Edit Delete Free text invoice Payment journal Header view Line view Post Accounting Details Related informati... Print manage... Attachme...

Maintain New Show Post

20002 - Dicol Ltd.

Free text invoice header

Customer

Customer account: 20002 Name: Dicol Ltd. Invoice account: 20002 Name: Dicol Ltd.

Invoice

Date: 12/22/2011 Invoice: Currency: GBP

Invoice lines

Add line Remove Distribute amounts

Description	Main account	Sales tax group	Item sales tax group	Quantity	Unit price	Amount
Air transport fee	41010	CDO	STD	1.00	100.00	100.00

Line details

Ledger account for pos... (0) GBP USR Model usr agb Close

Figure 4-23: Registering an invoice line of a free text invoice

You may register credit notes in the free text invoice form by entering a negative invoice amount. Free text invoices and credit notes do not affect item statistics and inventory valuation, however.

4.6.3.1 Registering Free Text Invoices

In order to enter a free text invoice, you may access the form *Accounts receivable> Common> Free text invoices> All free text invoices* and click the button *New/Free text invoice* in the action pane. Alternatively, you may create a free text invoice clicking the button *New/Free text invoice* on action pane tab *Invoice* of the customer form.

The free text invoice consists of a header, where you need to select the customer account number, and invoice lines. Unlike the sales order form, the free text invoice does not show a separate *Create new* dialog when creating a new invoice starting in the free text invoice list page.

In the invoice lines, you may register description, ledger main account number, quantity and unit price, or amount. If a longer description referring to the line is required, you may enter it in the invoice text field on the sub-tab *General* of the *Line details* tab. If sales tax (VAT) applies, you should pay attention to choose a correct sales tax and item sales tax group.

If you want to apply financial dimensions like department or cost center, you may switch to the sub-tab *Financial dimensions line* of the *Line details* tab and enter applicable dimension values or choose a financial dimension default template (lookup *Template ID*).

If you want to sell fixed assets, you may enter the *Fixed asset number* on the sub-tab *General* of the *Line details* tab.

4.6.3.2 Posting and Inquiry

In order to post a free text invoice, you need to click the button *Post/Post* in action pane of the free text invoice form. After posting, you may see the posted invoice clicking the button *Related information/Invoice journal* in the action pane.

Free text invoices also display in the general invoice inquiry *Accounts receivable> Inquiries> Journals> Invoice journal*. In the invoice inquiry, you may recognize free text invoices by the missing order number and different invoice numbers (if a separate number sequence applies).

4.6.3.3 Recurring Free Text Invoices

If you want to post and print the same free text invoice periodically, you may register a template (*Accounts receivable> Setup> Free text invoice templates*). A customer may refer to one or more templates, which you may specify clicking the button *Set up/Recurring invoices* on the action pane tab *Invoice* of the customer form.

In order to periodically generate appropriate free text invoices, you may access the periodic activity *Accounts receivable> Periodic> Recurring invoices> Generate recurring invoices*. The periodic activity generates regular free text invoices, which you may access in the free text invoice form before posting.

4.6.3.4 New in Dynamics AX 2012

In Dynamics AX 2012, new features for free text invoices include recurring free text invoices and the option to enter quantities and unit prices.

4.6.4 Credit Notes and Item Returns

If a customer returns items and receives a replacement or a financial compensation, you need to post a credit note in sales order and return order management. Other types of credit notes apply if crediting a customer not actually returning items or crediting a price variance.

When managing customer returns, you want to register return orders.

4.6.4.1 Disposition Codes

As a prerequisite for return orders, you need to configure disposition codes (*Sales and marketing* > *Setup* > *Sales order* > *Returns* > *Disposition codes*). The core setting in a disposition code is the field *Action*, which controls handling of a defective item:

- Credit only – Credit without item return
- Credit or Scrap – Return items and credit
- Replace and credit or Replace and scrap – Return items and replace
- Return to customer – Do not credit

If scrap applies, an item receipt has to be posted (similar to an item receipt for products returned to stock). In parallel to the packing slip of the return order, Dynamics AX posts an inventory transaction for scrapping.

4.6.4.2 Registering Return Orders

In order to process item returns, you may access the list page *Sales and marketing* > *Common* > *Return Orders* > *All return orders*. Return orders are sales orders of the type “Returned order”, showing the sales order number on the tab *General* in the return order detail form.

Except for return orders referring to a “Credit only” disposition code, return orders do not show in the regular sales order form until you post the item arrival, however.

When creating a return order clicking the button *New/Return order* in the action pane of the return order form, you may optionally select a *Return reason code* in the header for statistical purposes and for automatically assigning charges if applicable.

Clicking the button *Return/Find sales order* on the action pane tab *Return order*, you may copy existing sales invoice lines into the return order. As an alternative, you may also enter return order lines with a negative quantity manually. The *Disposition code* for a line is available on the sub-tab *General* of the *Line details* tab. Before item arrival, you do not enter the disposition code (except for disposition codes “Credit only”, crediting without item return).

Figure 4-24: Registering an item in the return order form

Clicking the button *Send/Return order* you may optionally print a RMA document and send it to your customer.

If you want to send a replacement for returned items to the customer in advance, you may create an appropriate sales order clicking the button *New/Replacement order* in the return order form.

4.6.4.3 Credit Only Return Orders

If you do not want your customer to return the item, you may choose a disposition code without item return ("Credit only") on the sub-tab *General* of the *Line details* tab in the return order. In this case, you may immediately post the credit note in the sales order form (*Sales and marketing* > *Common* > *Sales Orders* > *All sales orders*) or in the summary update *Accounts receivable* > *Periodic* > *Sales update* > *Invoice*.

4.6.4.4 Item Arrival and Crediting Return Orders

When receiving the items of a return order, you have to enter inventory registration. Like the inventory registration in purchasing (see section 3.5.3), the registration for return orders may be done either in the registration form (button *Update line/Registration* in the return order lines) or in the item arrival journal.

If you choose to register an item arrival journal (*Inventory and warehouse management* > *Journals* > *Item arrival* > *Item arrival*, see section 7.4.2), you need to assign the return order in the journal header and/or lines. For this purpose you may access the journal header tab *Default values*, select "Sales order" in the lookup *Reference* and enter the return order number in the lookup *RMA number*. Since a *Disposition code* is required to post the item return, you may enter it in the header as a default for the journal lines. In order to create the journal lines, you may either

click the button *Functions/Create lines* or enter journal lines manually. After posting the item arrival journal clicking the button *Post*, the status of the return order line updates to “Registered”.

Next, you may print an acknowledgement of the receipt by clicking the button *Send/Acknowledgement* in the action pane of the return order form.

You may complete the item receipt by posting the packing slip either in the return order form (button *Generate/Packing slip*) or in the sales order form (button *Generate/Packing slip* on the action pane tab *Pick and pack*).

In order to credit the item return finally, you may access the sales order form and click the button *Generate/Invoice* on the action pane tab *Invoice*. Alternatively, you may choose the summary update *Accounts receivable> Periodic> Sales update> Invoice*.

4.6.4.5 Other Ways of Crediting

As an alternative to return orders, you may credit a customer in the regular sales order form as well. Since you may not select the order type “Returned order” manually, the order header looks like the header of a regular sales order when choosing one of following options for crediting:

- Credit note registered in the original order line
- Credit note in a new order line
- Credit note in a new sales order

The options to register a new order or a new line are similar to purchasing (see section 3.4.5). In order to register a credit note in the original order line, you may enter a negative quantity in the column *Deliver now* of the *Line quantity* form, which shows when clicking the button *Line quantity* on the action pane tab *General* of the sales order form. In the quantity lookup field of the invoice posting form (creating a credit note), you may choose “Deliver now” referring to the *Deliver now* column.

4.6.4.6 Inventory Valuation

If registering a credit note in a new order or order line, you should enter the original invoice number in the lookup *Return lot ID* (sub-tab *Setup* of the *Line details* tab) in the order line before posting. This link ensures that the inventory value of the crediting line exactly matches the inventory value of the original delivery.

Dynamics AX automatically applies the return lot ID, if you choose the button *Return/Find sales order* in action pane of the return order form or the button *Create/Credit note* on the action pane tab *Sell* of the sales order form.

If you do not select a return lot ID, Dynamics AX applies the *Return cost price* (sub-tab *Setup*) of the crediting order line for inventory valuation.

4.6.4.7 Scrapping Items

If a customer is not required to return a defective item, you may select the checkbox *Scrap* on the sub-tab *Setup* of the *Line details* tab in in the crediting order

line. When posting the invoice (credit note), Dynamics AX posts an item receipt as well, but an inventory loss will automatically post at the same time.

In return orders, the checkbox *Scrap* is controlled by the disposition code.

4.6.4.8 Refund

You may register and post customer refunds in the free text invoice form (see section 4.6.3). If a refund applies to an item, you should avoid registering a free text invoice, since it does not affect item statistics and inventory valuation.

In case of crediting a price variance, it is better to enter a new sales order containing a line with a negative quantity and the old price and a second line with a positive quantity and the right price. Applying *Inventory/Marking* as shown in section 3.7.1, you may connect the two transactions to offset inventory value.

4.6.5 Case Study Exercises

Exercise 4.12 – Invoice

You want to invoice the items shipped in exercise 4.9. Before posting the invoice, check following items:

- Order status and document status of the sales order
- Inventory transaction related to the order line (button *Inventory/Transactions*)

Post and print the invoice directly out of the sales order form, checking the invoice total in the posting form before posting.

Now review the status of the items on the checklist above again. What is different after invoice posting?

Exercise 4.13 – Partial Invoice

You want to invoice the items picked and shipped in exercise 4.10. Post and print the invoice directly out of the sales order form, making sure to invoice only shipped items.

Exercise 4.14 – Shipping with Invoice

Your customer of exercise 4.1 orders another unit of the product entered in exercise 3.5. In addition, he wants to order one hour of the installation service entered in exercise 4.3 for a price of GBP 110. This time you do not post a packing slip, you want to ship the items with the invoice.

Enter an appropriate sales order and immediately post the invoice. After posting the invoice, review the order status, the document status and the inventory transaction of the product.

Exercise 4.15 – Invoice Inquiry

You want to view the invoice posted in exercise 4.12. Open the invoice inquiry and check the invoice header and lines as well as the related ledger transactions.

In exercise 4.2, you were looking for the summary account for your customer. Can you find the ledger transaction for this account? Finally, open the transaction origin form and check, to which modules your invoice has been posting.

Exercise 4.16 – Free Text Invoice

You want to invoice specific services, for which no product or sales category is available, to your customer of exercise 4.1. Enter a free text invoice choosing an appropriate revenue account and post the invoice. What is the difference between a free text invoice and an invoice related to a sales order?

Exercise 4.17 – Credit Note

Your customer complains defects on the items invoiced in exercise 4.12. You agree to an item return before crediting the invoice. Enter an appropriate return order and post the item receipt applying a suitable disposition code. After posting the packing slip return, you want to post and print the credit note.

4.7 Direct Delivery

Direct delivery means shipping goods from a vendor directly to a customer. Avoiding an own warehouse in between, you save time and expenses for transportation and stocking.

4.7.1 Processing Direct Deliveries

In order to process direct deliveries, you may find two different options in the sales order form:

- Create purchase order
- Create direct delivery

Both options require entering a sales order for the customer, who receives the items.

4.7.1.1 Registering the Sales Order

When registering an order for direct delivery, there is no difference to registering a regular order. However, selecting a specific warehouse for direct deliveries avoids mixing direct deliveries and regular inventory transactions in the warehouse.

When you have finished registering the sales order, you may create an assigned purchase order by clicking the appropriate button in action pane tab *Sales order* of the sales order form.

4.7.1.2 Using the Create Purchase Order Option

The button *New/Purchase order* generates a purchase order, which refers to the sales order. If no main vendor is specified for the item, you need to select the vendor in the *Create purchase order* form when generating the purchase order. Processing of purchase and sales order works like processing regular orders including change management for the purchase order.

In the purchase order, the delivery address for the vendor is the warehouse or company address (like in any regular purchase order). You may post the product receipt in your warehouse and then perform picking and shipping to the customer.

4.7.1.3 Using the Create Direct Delivery Option

The button *New/Direct delivery* generates a purchase order like the create purchase order option, but links it closer to the sales order. Purchase delivery is to the customer address, modifications of the address in the sales order as well as changes of quantity or delivery date will synchronize to the purchase order (requiring confirming the purchase order again in order to inform the vendor about the changes).

When posting the product receipt for a direct delivery in purchasing, Dynamics AX automatically posts the related sales packing slip. If you are required to print a packing slip for the customer, you may select the checkbox *Print sales documents* in the posting form for the packing slip receipt (see Figure 4-25).

Invoice posting in sales is independent from the purchase invoice, however.

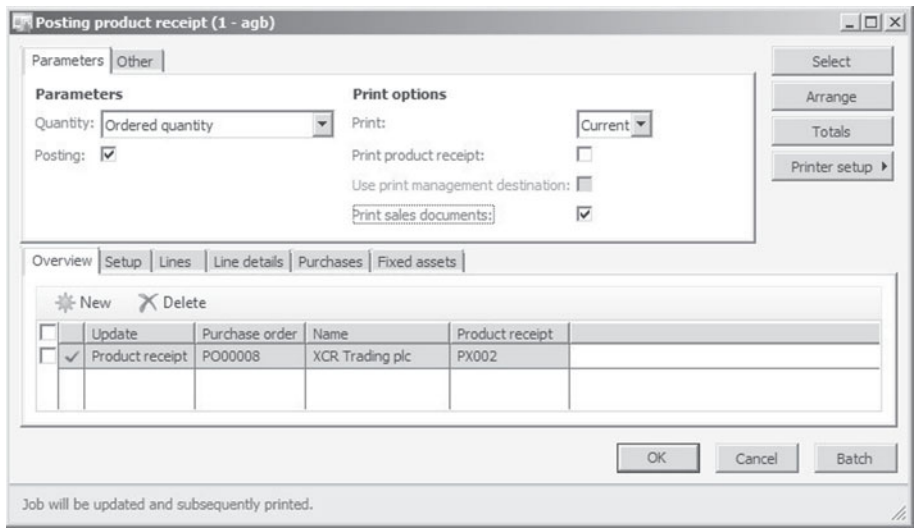


Figure 4-25: Printing a sales packing slip when posting the product receipt

4.7.1.4 Links between Purchase and Sales Order

If you need to know the sales order line related to a purchase order line or the other way around, you may take to look at the item reference on the sub-tab *Product* (tab *Line details*) of purchase or sales order lines.

In the header of purchase or sales orders, you may view the reference clicking the button *Related information/References* on the action pane tab *General*. In the sales order form, you may in addition click the button *Related information/Purchase order* on the action pane tab *General* to directly access the purchase order assigned.

4.7.2 Case Study Exercise

Exercise 4.18 – Direct Delivery

Your customer orders 100 units of the item entered in exercise 3.5. In order to avoid stocking that large quantity in your warehouse, you want to process a direct delivery. Enter an appropriate sales order and choose the option *Create direct delivery* to generate a purchase order for you vendor of exercise 3.2.

Your vendor confirms shipping the item with packing slip PS418. You want to post the product receipt in the purchase order. In the next step, check the status of the sales order, then post and print the sales invoice. After receiving the purchase invoice VI418, you want to post the invoice receipt.

5 Production Control

The primary responsibility of production control is to manufacture finished goods. To meet this task, manufacturing needs to consume items as well as resource capacity (men and machinery). The manufacturing process may include the production and stocking of semi-finished goods. Semi-finished goods are items that are included in the bill of materials of finished goods.

5.1 Business Processes in Manufacturing

Depending on the requirements of your company, you may choose to apply following manufacturing concepts in Dynamics AX:

- Discrete manufacturing – Core production functionality including bills of materials (BOM), resources, routes and production orders.
- Process manufacturing – Supporting additional requirements of batch-producing industries (like formulas and co-products).
- Lean manufacturing – Supporting production flows and Kanbans (also applying bills of materials and resources, but working independently from routes and production orders).

You may run these concepts in mixed mode, for example choosing process manufacturing for components, and lean manufacturing for finished products.

The explanations in this book are limited to the core production functionality, covered by discrete manufacturing. Before we start to go into detail, the lines below give an overall picture of discrete manufacturing.

5.1.1 Basic Approach

Like in purchasing and sales, correct master data are an essential prerequisite to successfully execute production control. The item record (available in the released product form) contains a description of the item main characteristics. The bill of materials (BOM) describes the structure of finished or semi-finished items, consisting of components (raw materials, parts or semi-finished products).

Resources (e.g. machines or human resources) are the place providing capacity to execute manufacturing activities. Routes and operations describe the work required to produce finished goods.

5.1.1.1 Production Order Processing

In the course of production order processing, master data are copied to transaction data. You may modify these default data in transactions, for example choosing a non-standard bill of materials in a specific production order.

Figure 5-1 shows the required steps in production order processing.

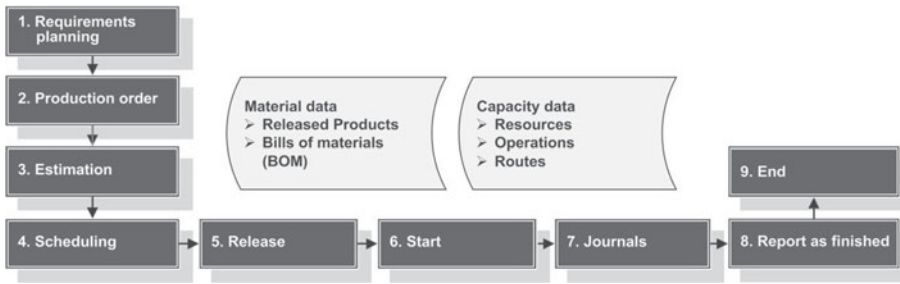


Figure 5-1: Production order processing in Dynamics AX

5.1.1.2 Material Supply Requirement

The identification of material supply requirements in operations planning (master planning, see section 6.3) is the first step in the manufacturing process. Depending on item coverage settings, the item demand comes from different sources: Master scheduling may include forecasts as well as current sales quotations, sales orders, quantity in inventory and coverage settings for minimum stock.

5.1.1.3 Creating a Production Order

As a preliminary step to creating production orders, master scheduling in operations planning generates planned production orders, which you may transfer to actual production orders. Apart from transferring planned orders, you may create production orders in the following ways:

- Manually – In the production order form entering an order
- Sales order – In a sales order line choosing to create a production order
- Pegged supply – In the production order of a finished item automatically creating a production order for a semi-finished item (sub-production)

A production order consists of an order header, which refers to the produced item, and order lines. Unlike purchase and sales orders, which only contain lines for items, production orders contain two different types of lines showing in separate forms: BOM item lines and route operation lines.

Depending on parameter settings, you have to execute all subsequent steps after creating a production order from estimating to ending the order one after the other, or you may skip steps which you do not require in a certain order.

5.1.1.4 Estimation and Scheduling

Estimation is the first step in order processing after creating a production order. Estimation determines the quantity and cost of all items and resources, which are required for manufacturing the product.

Whereas estimation only calculates item quantity and resource capacity demand without timing it, scheduling as the next step calculates exact dates for production.

5.1.1.5 Releasing and Starting

Releasing a production order means to hand it over from the front office to the shop floor. When releasing the order, you may print the production papers.

As soon as manufacturing of a production order should actually start, you need to set the order status to “Started”. At this stage, you may start to post item and working time consumption. When starting an order, you may print the picking list and post automatic consumption of items and resource capacity.

5.1.1.6 Production Journals

In the course of the manufacturing process, the shop floor consumes material and resource capacity. Reporting of this consumption is done by posting production journals. Depending on production settings, you may post these journal either manually or automatically (applying scheduled figures). You may also report consumption through shop floor terminals in the module *Manufacturing execution*.

5.1.1.7 Reporting as Finished and Ending the Production Order

Once manufacturing is completed for the whole or a partial quantity of the finished product, you want to post reporting as finished. After posting, the reported quantity of the finished product is available in inventory. Ending the production order is the last step in production order processing, calculating actual costs of production and finally posting to the general ledger.

5.1.1.8 Ledger Integration and Voucher Principle

Yet before ending an order, production journals for material and working time consumption on the one hand and finished product receipts on the other hand post to ledger accounts (see section 8.4.3).

According to the general principle for processing transactions in Dynamics AX, the voucher principle also applies to transactions in manufacturing. You have to register a transaction in a journal before you can post it.

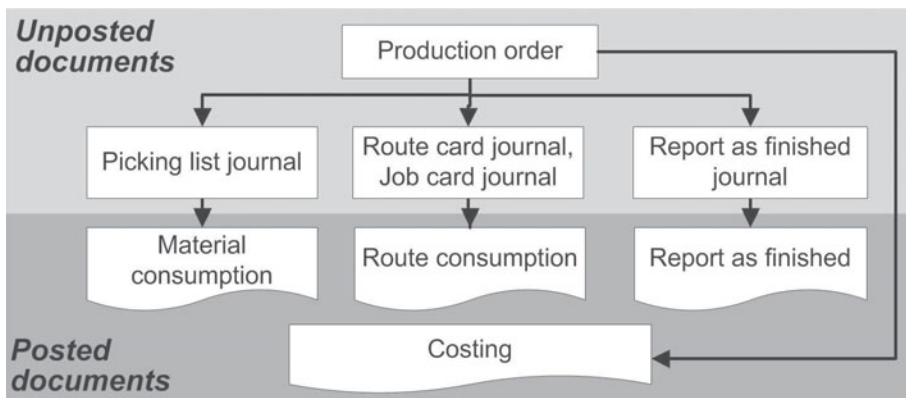


Figure 5-2: Posted and unposted documents in production control

5.1.2 At a Glance: Production Order Processing

In order to give an overview of the main steps in production order processing, this section shows the basics. For convenience, we post all transactions directly in the production order form.

If creating a new production order manually, you want to access the form *Production control> Common> Production Orders> All Production Orders* and click the button *New/Production order* on the action pane tab *Production order*. Dynamics AX shows the *Create production order* form, where you may select the *Item number* of the manufactured item. Data from the item record like quantity, BOM number and route number will transfer to the production order. Clicking the button *Create* in the create order form will finally create the new production order.

On the action pane tab *Production order* of the production order form, you may choose to access the editing form of the material components (button *Production details/BOM*) and of the route operations (button *Production details/Route*).

Note: Pressing the keyboard button *F5* refreshes the form to display the new order.

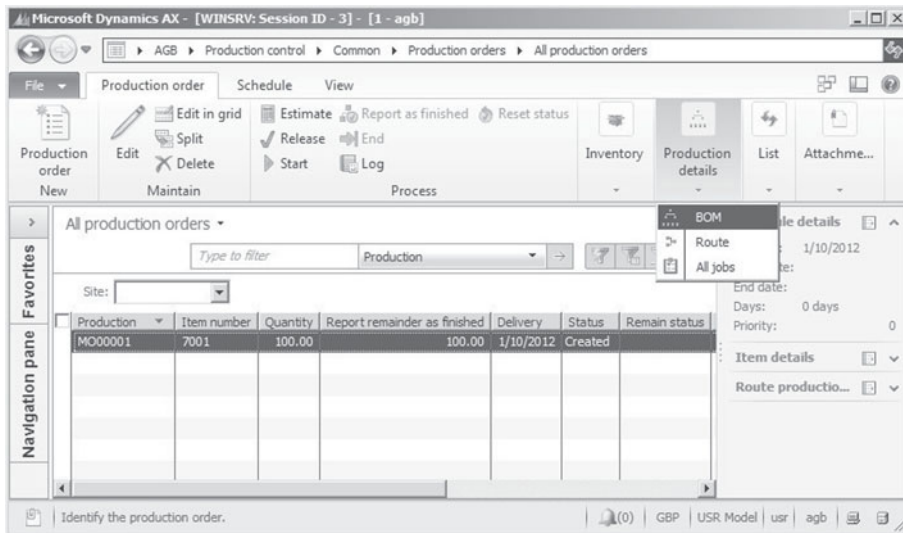


Figure 5-3: Managing a production order in the production order form

For processing the production order you want to change the order status clicking following buttons one after the other:

- *Process/Estimate* (action pane tab *Production order*)
- *Production order/Schedule operations* or *Schedule jobs* (tab *Schedule*)
- *Process/Release* (tab *Production order*)

When changing the status, you may select certain parameters – e.g. setting the scheduling direction – on the tab *General* of the update dialog of each step. When releasing the order, you may select to print production papers (job card, route card) in the update dialog. When starting the order, you may print picking lists.

Once the production order should go to the shop floor, you want to click the button *Process/Start* starting the order and posting automatic material and route consumption as applicable. If you start an order without separately executing the previous steps, Dynamics AX performs them automatically when starting.

In order to register consumption of items configured for manual posting, you may click the button *Journals/Picking list* on the action pane tab *View* of the production order. Clicking the button *Picking list/Create lines* in the production journal form, you may generate a proposal for the picking list lines. Selecting “Remaining quantity” in the lookup field *Proposal* of the *Create lines* dialog provides a default for open quantities to the journal lines. If required, you may edit the consumption quantity, the warehouse or other data in the journal lines before posting the picking list clicking the button *Post*.

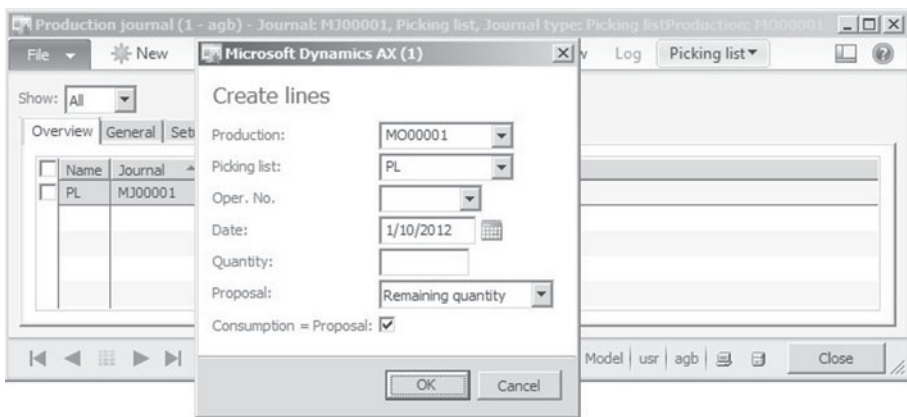


Figure 5-4: Creating a proposal for the picking list lines

Depending on the scheduling type selected when scheduling the production order before releasing (*Operations scheduling* or *Job scheduling*), you may register actual working time either on route level or on job level (button *Journals/Route card* or *Journals/Job card* on the action pane tab *View* of the production order).

Unlike picking list registration, route card and job card journals do not provide proposals for manual working time registration. You may click the button *Create new* in the route card or job card journal header, and enter operation/job number, resource, hours and good quantity in the lines before clicking the button *Post*.

Clicking the button *Process/Report as finished* on the action pane tab *Production order* of the production order form increases the quantity on stock of the finished item. If you want to ignore missing consumption postings, you may select the checkbox *Accept error* on the tab *General* in the update dialog.

Once posting of all transactions for the production order has been finished, you may cost and close the order clicking the button *Process/End*.

5.2 Product Data and Bills of Materials

All components required for production control in Dynamics AX are included in the product and released product records (item records). Apart from inventoried items like finished products, semi-finished products and raw material or parts, product records are also required for phantom items or purchased services.

Bills of materials (BOM) control how component items build finished products. You may assign a single bill of materials to one item, to multiple items, or multiple bills of material to a single item. Assigning multiple bills of material to one item is required if different bills of materials are valid for certain periods in time, or depend on the lot size for example.

In order to manage product variants, you may select the product subtype “Product master” when creating a released product (see section 7.2.1). For product masters, the *Product dimension group* containing the dimensions *Configuration*, *Size* and *Color* and different configuration technologies are available. Applying configuration groups and configuration rules, you may process a make-to-order production. A detailed description of item configurations is beyond the scope of this book, however.

5.2.1 Product Master Data for Manufacturing

You may find the item records of finished products and raw materials or parts in the products form (*Product information management> Common> Products> All products and product masters*) and the released products form (*Product information management> Common> Released products*).

Details on general product data are available in section 7.2 of this book. The lines below therefore only cover product data specifically applying to production control. Except for the product type, which is specified in the product form, you may find these data in the released product form.

5.2.1.1 Item Model Group and Default Order Type

All released products, which you want to use in a bill of materials as finished product or as a component, need to be linked to an *Item model group* for stocked products (see section 7.2.1) on the tab *General* of the released product form. Since this item model group also applies to non-inventoried BOM-components like subcontractor work, you want to choose the *Product type* “Service” for these products to avoid inventory control.

Controlling item sourcing, the default order type is another important setting. The lookup field *Default order type* is available on tab *General* in the default order settings form, which you may access clicking the button *Default order settings* on the action pane tab *Plan* of the released product form. Following options are available for the order type:

- Purchase order – Creating planned or actual purchase orders
- Production – Creating planned or actual production orders
- Kanban – Creating planned or actual kanbans (lean manufacturing)

If you are required to override the default order type for a certain site, warehouse or other inventory dimension, you may access the item coverage form (button *Item coverage* on the action pane tab *Plan* of the released product form). On the tab *General* there, you may find the lookup field *Planned order type* overriding the default order type.

5.2.1.2 Quantity and Price

Apart from the default order type, the default order settings form contains additional default data for production on the tab *Inventory* including lot size (field *Multiple*) and order quantity. In the site-specific order settings, accessible through the button *Site specific order settings* on the action pane tab *Plan* of the released product form, you may override the default order settings on site level.

On the tab *Manage costs* in the released product form, the field *Price* specifies the general cost price for the item. Site-specific cost prices are available clicking the button *Set up/Item Price* on the action pane tab *Manage costs* of the released product form as described in section 7.2.4.

If the item model group of a released product refers to a valuation model “Standard cost”, you need to activate a cost price in the item price form, selecting a costing version that refers to the costing type “Standard cost”.

5.2.1.3 Phantom Item

The checkbox *Phantom* on the tab *Engineer* in the released product form specifies a default, which applies to the *Line type* when inserting the item in BOM lines. Phantom items are semi-finished products referring to a bill of materials and optionally a route. When estimating a production order, Dynamics AX explodes BOM lines of the type “Phantom”. As a result, the production order contains BOM lines with the components of the phantom item (instead of a line with the phantom item itself).

5.2.1.4 Flushing Principle

The *Flushing principle* on the tab *Engineer* of the released product form controls, if production orders should post automatic consumption of the item in BOM lines.

The flushing principle shows three different options:

- Start – Automatic consumption when starting the production order
- Finish – Automatic consumption when reporting as finished
- Manual – No automatic consumption

In the BOM lines concerned, you may override the flushing principle specified in the released product record.

As a prerequisite for automatic consumption based on the released product or BOM line setting, you need to select the option “Flushing principle” in the lookup *Automatic BOM consumption* on the tab *General* of the update dialog for starting – or reporting as finished – a production order (see section 5.4.3).

5.2.1.5 Calculation Group

Another setting available on the tab *Engineer* in the released product form is the *Calculation group*. If you select a calculation group in a released product, that group overrides the general calculation group in the inventory management parameters (*Inventory and warehouse management* > *Setup* > *Inventory and warehouse management parameters*, tab *Bills of materials*) when calculating costs for the item.

You may access calculation groups in the form *Inventory and warehouse management* > *Setup* > *Costing* > *Calculation groups*. Calculation groups control the basis for calculating the cost price and sales price of items and therefore serve the same purpose as *Cost categories* for resources and routes (see section 5.3.3).

5.2.1.6 New in Dynamics AX 2012

Referring to product master data relevant for manufacturing, Dynamics AX 2012 replaces the item type “BOM” by the default order type “Production”.

5.2.2 Bills of Materials (BOM)

A bill of materials (BOM) primarily is a list of products and quantities. The main purpose of a bill of materials is to specify the components (raw material or parts) of a finished item.

5.2.2.1 Bill of Materials Structure

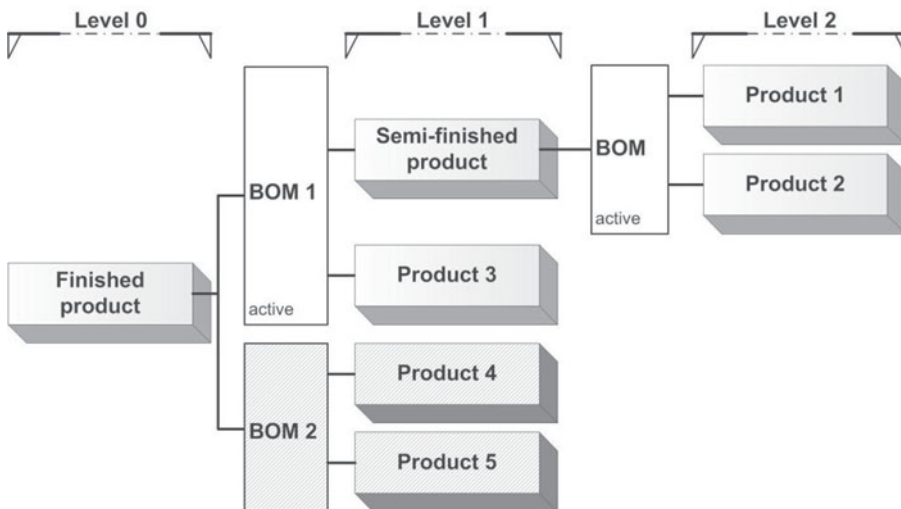


Figure 5-5: Example of a multi-level product structure

Items, which are part of a BOM, may themselves consist of other items and therefore refer to a secondary BOM. Such items are semi-finished goods constituting a multi-level product structure.

As shown in Figure 5-5, bills of materials in Dynamics AX are independent from items. You may assign one or several bills of materials to an item.

In order to apply a bill of materials in production control, it has to be approved. Bills of materials, which you want to apply as a default in production orders and in master planning, have to be activated in addition. The active BOM needs to be unique for a certain period, quantity and site.

If a single bill of materials is assigned to several finished items, you may approve and activate the BOM independently for the different items. As an example referring to Figure 5-5, you might assign and activate BOM 1 as well as BOM 2 for other finished items, no matter if they are approved or activated for the first finished item.

5.2.2.2 Managing Bill of Materials

You may access bills of materials in two ways:

- From the released product (*Product information management* > *Common* > *Released products*, button *BOM/Lines* on the action pane tab *Engineer*)
- From the menu (*Inventory and warehouse management* > *Common* > *Bills of materials*)

Although both forms manage the same BOM records with a common data structure, the functionality and structure of the form themselves is different.

Since understanding the data structure is easier starting from the menu, we want to look at the BOM form accessed this way first. The upper part of the BOM form in this case shows a list of available bills of materials, and the lower part the finished items assigned to the BOM selected in the upper part (see Figure 5-6).

Bills of materials (1 - agb)

File New Delete

Overview Configuration route

Lines Designer Approve Configuration rules Functions

BOM	Name	Site	Item group	Approved by	Approved
BM00001	BOM M2400S	HQ	FP	E001	☒
BM00002	BOM for housing M2400S	HQ	SP	E001	☒
BM00003	BOM V2400S		FP	E001	☒
BM00004	M2400S (starting from 100 pieces)	HQ	FP	E001	☒

Versions

+ Add - Remove Approve Activation Send...

Item number	Size	Color	Site	From date	To date	From qty.	Active	Approved by	Approved
1001			HQ			100.00	☒	E001	☒

BOM identification (0) GBP USR Model usr agb Close

Figure 5-6: Viewing bills of materials (accessed from the menu)

In order to enter a new bill of materials, you want to click the button *New* in the action pane strip of the BOM form (inserting a record in the upper pane). Depending on the settings of the number sequence, the BOM number inserts automatically or has to be entered manually.

If the bill of materials is site-specific, you want to enter the site in the column *Site*. Leaving the site empty specifies a general bill of material applying to all sites.

In the next step, you want to insert a record in the lower part of the form, assigning the BOM to a finished product. Dynamics AX also applies the term “Versions” for the assignment of bills of materials to items. This term is just another name for the BOM assignment.

In the assignment line, you want to enter the *Item number* of the finished product. If the BOM is only valid for a certain period, you may enter the *From date* and the *To date*. If the BOM assignment depends on the lot size, you may enter a *From qty*. If the BOM assignment depends on the site, you may register the *Site* in the assignment line.

If you want to assign the BOM to a second finished item, you may enter a second assignment line.

5.2.2.3 BOM Lines

Clicking the button *Lines* in the upper pane of the BOM form, you may open the BOM lines form accessing the components of the finished product. BOM lines contain raw materials and parts required for producing the finished item.

When entering a new BOM line, you need to register the *Item number* and the *Quantity* at least.

If a bill of materials is site-specific, you may select a picking warehouse in the column *Warehouse* of the BOM lines. For general bills of materials not referring to a certain site, the picking warehouse in the BOM lines is not available. In both cases, you may alternatively select the checkbox *Resource consumption* to apply the picking warehouse of the resource group or production unit.

Two other important fields are available on the tab *General* of the BOM lines form:

- Operation number (*Oper.No.*)
- Line type

Production order scheduling as well as master planning calculates material requirements in a way that all components have to be available at the start date of the production order. If this does not apply to some components because they are required at a later date, you may enter the operation number of the route operation, for which the component is required, in the BOM line. Available operation numbers are depending on the route assigned to the finished item. Therefore, the lookup for the operation number only works if accessing the BOM lines (or the BOM designer, see below) from the released products form.

The *Line type* controls the explosion of a BOM line providing following options:

- Item – Semi-finished or purchased item, material requirement in inventory
- Phantom – Semi-finished item, replaced by its components when estimating a production order
- Pegged supply – Semi-finished item, creating a linked sub-production or purchase order when estimating the production order of the finished item
- Vendor – Service item for subcontracting

BOM lines of the line type “Item” generate a material requirement in inventory. For generating production or purchase orders, master planning will combine requirements of different demands (orders and warehouse replenishing proposals) according to item coverage settings. The default order type or the order type in the item coverage (see above) controls, if master planning creates a planned purchase order, production order or kanban. There is no direct link between the order for the semi-finished item and the original production order of the finished product.

On the tab *Setup* of the BOM lines you may select a *Flushing principle* (see section 5.2.1 above) for automatic consumption. If the flushing principle in the BOM line is empty, the setting in the released product record of the BOM item applies.

In order to enter a new bill of materials, which is similar to an existing one, you may apply the copy-function. The copy-function is available in the BOM lines clicking the button *Functions/Copy*.

5.2.2.4 Approving and Activating

Only approved bills of materials are available when creating a production order. In order to approve the bill of materials itself and the assignment of the BOM to a finished product (*Version*), you have to click the button *Approve* in the upper and in the lower pane of the BOM form. When approving the BOM assignment in the lower pane, you may approve the BOM itself in parallel, though.

If you want to default the bill of materials in production orders and in master planning, you need to activate the BOM assignment clicking the button *Activation*. Activated BOM assignments show a checkmark in the column *Active*.

5.2.2.5 Bills of Materials in the Released Product

As an alternative to accessing bills of materials through the appropriate menu item, you may access bills of materials from the released product form (*Product information management> Common> Released products*).

Clicking the button *BOM/Lines* on the action pane tab *Engineer* after selecting a finished item in the released product form will open the BOM lines form displaying the bills of materials assigned to that item. If a bill of materials is assigned to several items, you need to keep in mind that modifying the bill of materials in this form applies to all other items concerned as well.

Unlike the BOM form accessed from the menu, the BOM lines form accessed from the released product form shows the BOM lines of the selected bill of materials directly in the lower pane (see Figure 5-7).

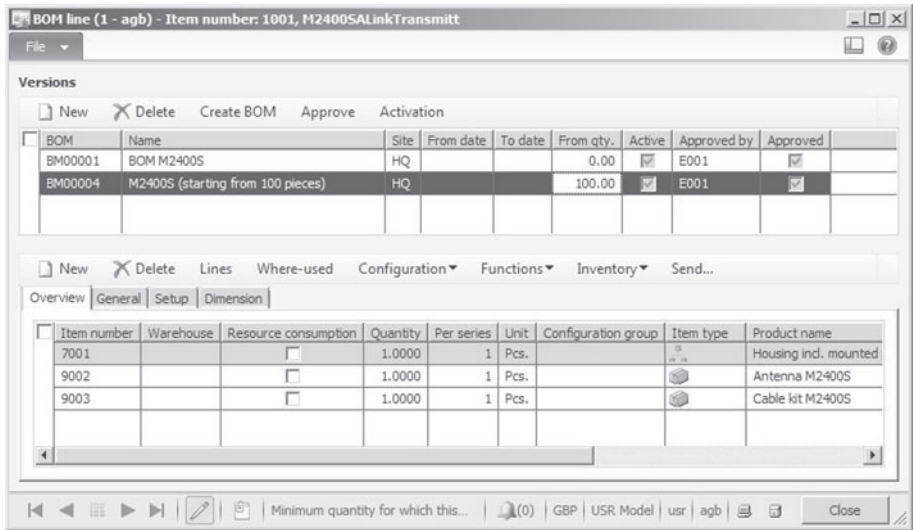


Figure 5-7: Working in the BOM line form accessed from the released product form

If you want to enter a new bill of materials in this from, you need to click the button *Create BOM*. Clicking the button *New* in the upper pane to insert a line is only applicable, if you want to assign the item to an existing bill of materials.

5.2.2.6 BOM Designer

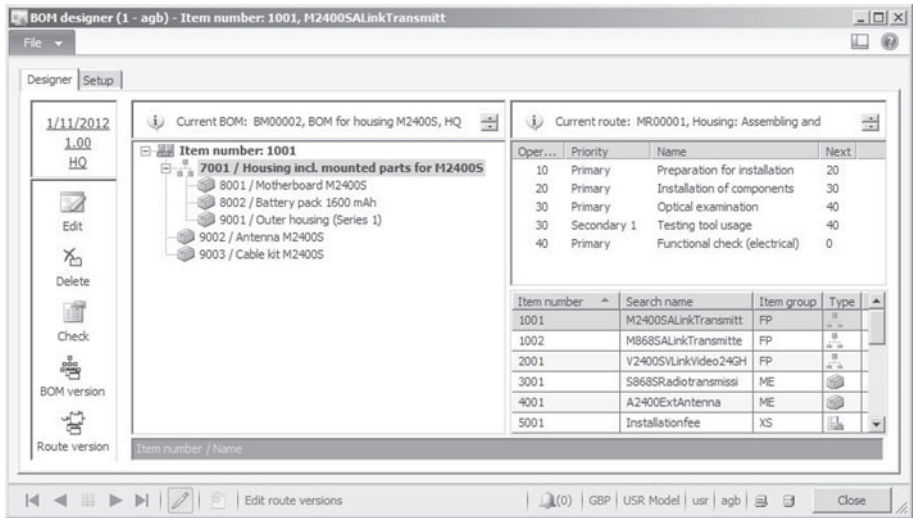


Figure 5-8: Working in the BOM designer accessed from the released product form

If you are looking for an easy way to manage bills of materials, you may want to use the BOM designer. The BOM designer is available clicking the button

BOM/Designer on the action pane tab *Engineer* of the released product form, or the button *Designer* in the action pane strip of the BOM form.

The BOM designer shows a multi-level structure of the bill of materials with the option to insert items into the selected BOM by simply dragging and dropping them from the right pane into the left pane.

If you open the BOM designer from the released product form, it does not only show the bill of materials, but also the route of the selected item. In this case you may also drag and drop a BOM line to a route operation for specifying the operation number (*Oper.No.*, see above) of the route operation, for which the component is required.

In order to change settings for BOM designer display, you may switch to the tab *Setup* in the BOM designer form.

5.2.2.7 Where-Used

When accessing a bill of materials, it shows the components of an item. If you need to know for a component, in which products it is included, you want to choose the where-used form. The where-used form, which shows all bills of materials and assigned finished items, is available clicking the button *BOM/Where-used* on the action pane tab *Engineer* of the released product form after selecting the component concerned.

5.2.3 Case Study Exercises

Exercise 5.1 – Components

Your company wants to produce a new finished item, which consists of two components. You want to enter these components in Dynamics AX, registering an item with the product number I-##-C1 and the name “##-Component 1” (## = your user ID) and an item with the number I-##-C2 and the name “##-Component 2” in the released product form. Variants, serial or batch numbers do not apply.

For both items, choose an appropriate product subtype, item group (raw material/parts) and tracking dimension group. The selected storage dimension group should only contain site and warehouse as active dimensions. The item model group should be a group referring to the inventory model “FIFO”. The unit of measure for the items is “Pieces”, and the item sales tax groups should refer to the standard tax rate.

The base purchase price and the base cost price of both items is 100 pounds. In addition, select your vendor of exercise 3.2 to be the main vendor for the items. The flushing principle should be “Manual”. For purchasing and inventory, you should enter the main site in the *Default order settings* and the main warehouse of the main site in the *Site specific order settings*.

Note: If the number sequence for product numbers is set up for automatic numbering, you do not need to enter a product number.

Exercise 5.2 – Finished Item

For the finished item, enter an item with the product number I-##-F (if no automatic number sequence is assigned) and the name “##-Finished product” in the released product form. Variants, serial or batch numbers do not apply.

Select an appropriate product subtype, item group (finished product) and tracking dimension group. The selected storage dimension group should only contain site and warehouse as active dimensions. The item model group should be a group referring to the inventory model “FIFO”. The unit of measure for the item is “Pieces”, and the item sales tax groups should refer to the standard tax rate.

The base cost price is 500 pounds and the base sales price 1,000 pounds. For inventory and sales, you should enter the main site in the *Default order settings* and the main warehouse of the main site in the *Site specific order settings*.

Exercise 5.3 – Bill of Materials

Once item records for the finished item and its components are available, you may enter a bill of materials for the finished item of exercise 5.2 choosing the appropriate button in the action pane of the released product form.

The BOM applies to the main site and contains two units of the first and one unit of the second item entered in exercise 5.1. The warehouse for picking the components should be the main warehouse. Once you have finished entering the components, approve and activate the BOM.

5.3 Resources and Routes

Resources are entities in a company executing the operations in manufacturing. They include working places and personnel as well as machines, tools and vendors (subcontractors). Resources provide the available capacity, which master planning compares with capacity requirements.

Routes are the basis for calculating the capacity requirement, specifying necessary resources and working time to produce a certain item.

Along with items and bills of materials, resources and routes therefore are the second area of master data required for production control.

5.3.1 Production Units and Resource Groups

Production units represent plants for capacity management. Within a production unit, resource groups collect resources according to the physical organization. Resources within a resource group may show different capabilities and do not need to be interchangeable.

5.3.1.1 Production Units

Production units are separate from the storage dimension “Site” referring to material management. Multiple production units may be linked to a common site.

Setting up production units is optional. If you want to enter a production unit, you need to access the form *Production control> Setup> Production> Production units*. Apart from identification and name, you need to assign a site to the production unit. On the tab *General*, you may enter a picking warehouse, which applies to BOM lines that show a mark in the checkbox *Resource consumption*.

In the resource groups form (*Organization administration> Common> Resources> Resource groups*) you may link resource groups to the production unit. Production units are not included in inventory transactions, but you may apply them for filtering/sorting in applicable production control forms (e.g. *Production control> Common> Current operations*).

5.3.1.2 Resource Groups and Resource Assignment

Resource groups in Dynamics AX reflect the physical organization of resources. They serve the following purposes:

- Resource structure – Linking resources to production units, sites and warehouses
- Operations scheduling – Capacity planning on resource group level

Assigning resources to resource groups is date effective, providing the option to manage organizational and seasonal changes. At a given date, a resource may not be member of more than one resource group.

When creating a new resource or when detaching a resource from the resource group (setting an expiry date), the resource is not member of any group. Because of required settings like the site specified on the group, resource scheduling includes only resources which are assigned to a resource group.

5.3.1.3 Managing Resource Groups

In order to manage resource groups, you may access the form *Organization administration> Common> Resources> Resource groups*. You may insert a new resource group as a new record clicking the button *New/Resource group* in the action pane and entering identification, name and site.

On the tab *General* of the resource group form, you may assign a production unit. The *Input warehouse* specifies the warehouse for consuming BOM items, for which the checkbox *Resource consumption* is selected in the BOM. Other parameters like scheduling and operation settings correspond to equivalent settings on resources in the resource form (see section 5.3.2 below).

On the tab *Resources* of the resource group, you may on the one hand view which resources are already member of the group and on the other hand assign additional resources. When setting up a new resource in the resource form, you may as well go the other way around starting in the resource and assigning the resource group there.

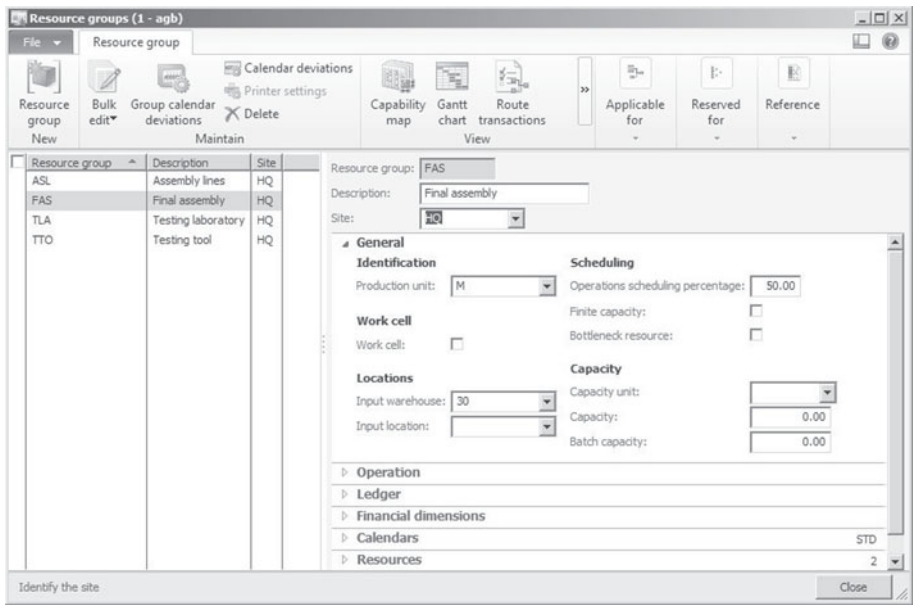


Figure 5-9: Managing resource groups

By selecting the checkbox *Work cell* on the tab *General*, the resource group refers to lean manufacturing and is not available for discrete manufacturing (routes, production orders, and scheduling). In addition, the tab *Work cell capacity* specifying capacity for lean manufacturing is editable in this case.

5.3.1.4 Working Time Calendars and Templates

Together with the efficiency percentage, the operating time determines the available capacity of resources and resource groups.

In Dynamics AX resource management, working time calendars define the operating time. Since the time of an individual resource is determined by the assigned organizational unit (*Resource group*), calendar allocation is available on resource groups and on resource assignment lines, but not directly on resource records.

If you want to assign a calendar to a resource group, you have to access the tab *Calendars* of the resource group form. Calendar assignment is date effective, providing the option to change the calendar – for example switching from regular business hours to 24 hour operation in a specific resource group.

Before you may assign a calendar to a resource group, the calendar needs to be set up in the form *Organization management> Common> Calendars*. If you need to enter a new calendar – for example if a resource group has working times different to all existing calendars – you may insert a record in the calendar form clicking the button *New* or copy an existing calendar clicking the button *Copy calendar*.

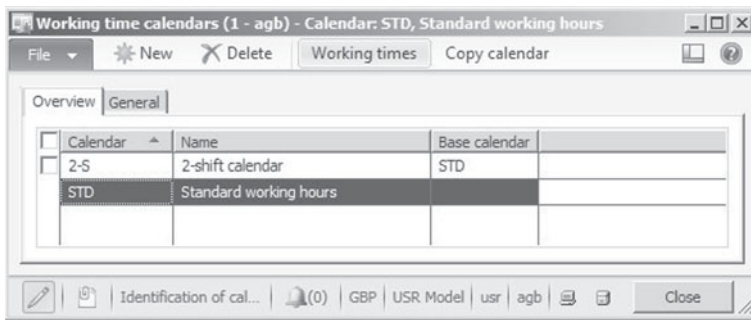


Figure 5-10: Managing calendars in the calendar form

In order to assign working days and working hours, you may click the button *Working times* in the calendar form. In the working times form, you may insert and manage individual dates in the upper pane, entering the working hours for a day in the lower pane. Alternatively, you may automatically create working days and hours by clicking the button *Compose working times* in the working times form.

As a prerequisite for composing working times automatically, you need to set up working time templates. Working time templates are available in the form *Organization management> Common> Calendars> Working time templates*, where you may specify the weekly working hours on the tabs *Monday* to *Sunday* after selecting the appropriate template on the tab *Overview*.

When choosing to run *Compose working times* in the working times form, you may select a working time template to default daily working times.

5.3.1.5 New in Dynamics AX 2012

Dynamics AX 2012 introduces the new operations resource model, also shown by terminology changes (replacing “Work center” by “Resource”). The new model includes a flexible and date effective assignment of resources to resource groups. Since the assignment of route operations to resources is provided by resource requirements and not by a direct link, the resource group does not refer to a resource type and resources of a resource group do not need to be interchangeable.

5.3.2 Resources and Capabilities

Operation resources are the basis for scheduling in Dynamics AX, constituting the lowest level of entities providing capacity to perform manufacturing activities.

5.3.2.1 Managing Resources

You may access operation resources choosing the form *Organization administration> Common> Resources> Resources*. When inserting a new resource, you need to take into account that the resource identification needs to be unique – not only within the resources, but also within resource groups.

When entering a resource, you have to select one of the following resource types distinguishing between different kinds of resources:

- Machine – Default, production machine
- Human Resources – Linking workers from the human resources module
- Tool – Device, often subject to wear through usage
- Location – Physical location, applied to manage physical space
- Vendor – External resource (subcontracting), not calculating capacity

In most cases, you do not require separate resources for a machine and its operating staff. You may manage them in a common resource of the type “Machine”. If you want to manage tools, you typically might enter tool usage as a secondary operation in routes (see section 5.3.3 below).

On the tab *Resource groups* you may view and change the resource group and calendar assignment of the resource. In order to change group assignment, you may also click the button *Maintain/Add to resource group* in the action pane providing the calendar of the resource group as a default.

5.3.2.2 Resource Capabilities

Resource capabilities specify the kind of activities a resource can execute, for example welding or cutting. You may assign one or more capabilities to an individual resource temporarily or permanently. In the *Resource requirements* of routes, you may assign resources to operations by specifying required capabilities in addition or instead of assigning resource groups (see section 5.3.3 below).

Capability	Description
Q-OP	Quality control operations
M-CT	Mechanical cutting
M-AS	Mechanical assembly

Resource	Description	Expiration	Priority	Level
ASL-1	Assembly line 1	Never	1	0.00
FAS-1	Final assembly 1	Never	2	0.00
FAS-2	Final assembly 2	Never	2	0.00
TLA-1	Testing laboratory	Never	9	0.00

Figure 5-11: Managing capabilities in the capabilities form

You may set up capabilities (shared across companies) in the form *Organization administration> Common> Resources> Resource capabilities* entering identification and description. On the tab *Resources* of the capabilities form, you may assign resources to a capability. Alternatively, you may assign capabilities to a resource in the resource form, clicking the button *Maintain/Add capability* in the action pane or the button *Add* on the tab *Capabilities*.

Capability assignment is date effective, providing the option to manage changes of resource abilities. In addition, you may enter a *Priority* in the assignment line. When executing job scheduling, depending on scheduling parameters (see section

5.4.1) Dynamics AX selects the applicable resource with the lowest priority number first.

5.3.2.3 Resource Scheduling

There are two types of resource scheduling in production orders, which may run alternatively or successively (see also section 5.4.3):

- Operations scheduling
- Job scheduling

Operations scheduling is a rough scheduling, calculating the production time per day. It reserves capacity on the resource group allocated through resource requirements in routes. Resource requirements may include capabilities, resource types, and resource groups. If resource requirements for operations scheduling directly refer to a resource number, capacity reservation is on that resource instead of the group.

Operations scheduling simultaneously respects the overall capacity of the resource group, the capacity per resource type, and the capacity per capability. The available capacity of a resource group is the total capacity of its resources.

Job scheduling at a later stage of a production order calculates the capacity on individual resource level only, reserving capacity with exact start and end times. Depending on the scheduling parameters, the selected resource is the available resource with the shortest duration (throughput time) or with the lowest priority number.

5.3.2.4 Capacity Settings on the Resource

On the tab *General* in the resource form, you may enter an efficiency percentage, which reduces or increases the scheduled time of a route. The default for the efficiency percentage is 100.

If you create a new resource, which – for example – is 25 percent faster than the other resources, you may enter 125 in the efficiency percentage. When scheduling an operation usually lasting 10 hours, the scheduled time for this resource will be only 8 ($= 10 * 100/125$) hours.

The checkbox *Finite capacity* controls, if scheduling is based on limited capacity utilization for the selected resource. If you select the checkbox, Dynamics AX does not schedule operations of different orders to run at the same time on that resource. Otherwise, scheduling calculates every production order separately not taking into account the other orders at the same resource. In most cases, finite capacity settings are restricted to resources and resource groups with limited capacity not available for increasing (e.g. by overtime hours).

If you want to apply finite capacity, you need to make sure that the master plan for master scheduling on the one hand and the update dialog for operations and job scheduling on the other hand select to include finite capacity.

Figure 5-12: Managing resources

The unit of time for scheduling a resource is hours. If you need a different unit of time for a resource, you may enter a conversion factor in the field *Hours/time* on the resource form (field group *Times* on the tab *Operation*). If you need to record minutes for the times entered in the routes as an example, you may insert $1/60 = 0.0167$ in the field *Hours/time*.

If the unit of measure is not a unit of time for a certain resource, you may select an alternative *Capacity unit* on the tab *General* of the resource form. The field *Capacity* in this case contains the conversion factor to hours.

The other fields on the tab *Operation* in the resource form contain defaults for route operations. These defaults apply when selecting the resource or resource group in a route.

5.3.2.5 Ledger Integration

The tab *Ledger* in the resource form contains the ledger main accounts applying to route consumption. When posting a route card or job card journal in production, Dynamics AX in parallel posts the cost amount of the consumed working time to the ledger accounts specified in the field group *Accounts-WIP* of the resource form. The accounts in the field group *Accounts-Costing* apply, when costing and ending a production order.

The ledger settings in the resource apply, if the option “Item and resource” is selected in the lookup *Ledger posting* of the production control parameters (see section 8.4.3). If the option “Item and category” applies, the cost categories in the route define applicable ledger accounts.

5.3.2.6 New in Dynamics AX 2012

As part of the new operations resource model, shared capabilities replace and significantly extend the task group functionality of previous versions.

5.3.3 Routes and Operations

A route includes the required operations to produce an item. It therefore is a supplement to the bill of materials, which contains the required material.

Like bills of materials, routes contain planned figures providing targets for production. In the course of manufacturing, your workshop reports actual figures in production journal transactions. Comparing and analyzing target and actual figures gives the possibility for improvements.

In order to describe the operations in manufacturing sufficiently, a route needs to contain following data at least:

- Manufacturing activity – *Operation*
- Provider of capacity – *Resource requirements*
- Sequence of operations – Next operation (*Next*)
- Time consumption – *Setup time, Run time*
- Finished item – Assigned item (*Item relation*)
- Required material – Assigned operations in BOM lines

If workshop does not require all components of the bill of materials to be available when starting the first operation, you may link items in the bill of materials to a specific operation of the route as shown in section 5.2.2.

5.3.3.1 Managing Operations

Operations, available in the form *Production control> Setup> Routes> Operations*, are a prerequisite to set up a route in Dynamics AX.

Operation	Name
AS-HOU	Installation of components
AS-PCK	Packing and final assembling
AS-PRE	Preparation for installation
QU-ELE	Functional check (electrical)

Identification of the operation

Close

Figure 5-13: Managing operations in the operations form

Operations are independent from routes, containing only a unique identification and a name to describe the performed activity. Other details required to execute an operation – like allowed time or resource assignment – are not available in the operation itself, but in the operation lines of assigned routes.

You may select a single operation in as many routes as required. Clicking the button *References* in the operations form, you may view the routes assigned.

5.3.3.2 Operation Sequence

The sequence of operations is not specified in the operation record, but in the route. You may distinguish two types of operation sequences:

- Simple sequence
- Complex sequence

If the checkbox *Route network* on the tab *General* of the production control parameters is cleared, simple operation sequences apply. Routes therefore only contain operations that are scheduled one after the other.

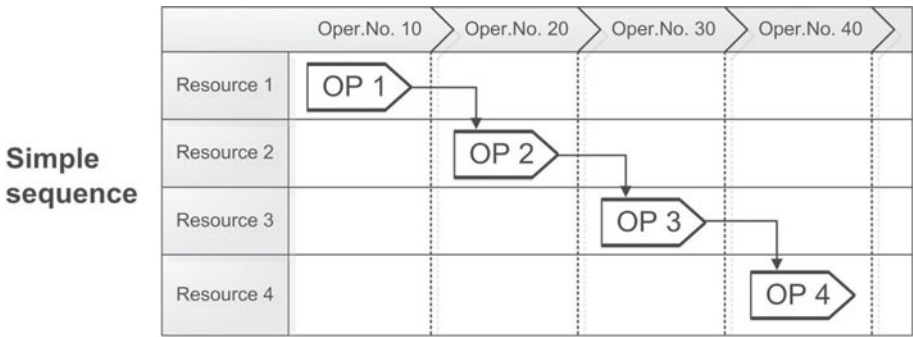


Figure 5-14: Example of a simple operation sequence

If the checkbox *Route network* is selected, you have to enter the next operation in each operation of a route. This setting enables complex operation sequences, where you may connect a certain operation to several independent prior operations.

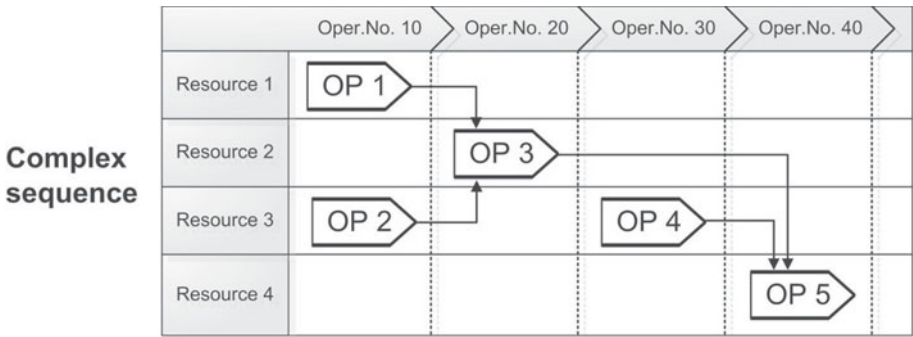


Figure 5-15: Example of a complex operation sequence

No matter if simple or complex operation sequences apply, you may specify operations to be performed on multiple resources in parallel by registering a secondary operation in routes (selecting the *Priority* "Secondary" for the route operation concerned).

If the options in the route do not meet your specific requirements, you may set up an intermediate level of a virtual semi-finished item in the structure of a finished product. The line type of the BOM line, which contains that virtual item, should be “Pegged supply” to connect the production orders concerned closely to the production order of the finished item.

Managing Routes

Managing routes in Dynamics AX is similar to managing bills of materials, including the way you may access the form:

- From the released product (*Product information management* > *Common* > *Released products*, button *View/Route* on the action pane tab *Engineer*)
- From the menu (*Production control* > *Common* > *Routes* > *All routes*)

Although both forms manage the same route records with a common data structure, the functionality and structure of the forms is different. Like the assignment of bills of materials, the assignment of routes to finished items is called “Version”.

If accessing routes from the menu item, Dynamics AX displays the routes in a list page. Clicking the button *Maintain/Route versions* in the action pane of the list page you may view the finished item (or items) to which a route is assigned. Double-clicking a route record in the list page opens the route detail form, which shows the operation list of the selected route in the upper pane. In the lower pane of the route detail form, the assignment of finished items to the operation number selected in the upper pane displays – providing the option to choose different operations for individual items if the route is assigned to multiple finished items.

If accessing the route form from the released product, the upper pane of the form shows the routes assigned to the item selected in the released product form. As with bills of materials, route assignments (“Versions”) may show validity dates and a from-quantity. Unlike bills of materials, a route always refers to a site.

When accessing the route from the released product, you may create a new route clicking the button *Create route* in the upper pane. Clicking the button *New* in the upper pane to insert a line is applicable, if you want to assign the item to an existing route.

Depending on the settings of the number sequence, when creating a route the route number inserts automatically or has to be entered manually. Like bills of materials, routes and route assignments (*Versions*) need to be approved before they are available for production orders. You may approve route and version clicking the buttons *Approve* in the route form. If you want to default the route in production orders and in master scheduling, you need to activate the route assignment clicking the button *Activation*.

Route (1) - Item number: 7001, Housing: Assembling and quality control, Item number: 7001

File

Versions

New Delete Create route Copy route Update route Approve Activation Route feasibility

Route number	Name	Site	From date	To date	From qty.	Active	Approved by	Approved
MR00001	Housing: Assembling and quality control	HQ			0.00	✓	E001	✓

New Delete Copy and edit relation Delete relation Applicable resources Maintain resource require...

Overview General Setup Times Resource requirements Description

Oper. No.	Priority	Operation	Run time	Process qty.	Next	Route group	Item code	Route code
10	Primary	AS-PRE	0.01	1.00	20	JOU	All	Route
20	Primary	AS-HOU	0.10	1.00	30	JOU	All	Route
30	Primary	QU-OPT	0.01	1.00	40	AUT	All	Route
30	Secondary 1	QU-TTU	0.01	1.00	40	AUT	All	Route
40	Primary	QU-ELE	0.05	1.00	0	AUT	All	Route

The number of resources needed for an activity. (0) USR Model usr Close

Figure 5-16: Managing routes in the route form, accessed from the released product

5.3.3.3 Route Operations

If accessing the route from the released product, you may insert the operations with operation number (column *Oper.No.*) and *Run time* (see operation times below) one after the other in the lower pane of the route form. If production control parameters specify complex operation sequences, you need to enter the number of the next route operation in the column *Next* in every line (except for the last operation).

If the shop floor should execute operations in parallel, you may enter two operations with the same operation number, but a different *Priority*. As an example in Figure 5-16, the operation number 30 shows two parallel operations – one with priority “Primary” and the other with priority “Secondary 1”.

Switching from the tab *Overview* to the other tabs of the route operations, you may enter detailed data.

Note: If accessing the routes from the menu, route operation details show on assignment pane (*Versions*) in the lower part of the form).

5.3.3.4 Route Groups

An essential setting for posting working time consumption related to an operation is the column *Route group* on the tab *Overview*. If you want to apply automatic posting of time consumption (actual = estimate), you need to select a route group with appropriate settings for automatic route consumption.

In order to access route group settings, you may choose the form *Production control> Setup> Routes> Route groups*. In addition to the checkboxes controlling automatic posting of route consumption, you may find parameters regarding estimation and cost calculation on the tab *General* of the route group form.

The estimation and costing checkboxes control, if to include related operations in cost calculation. For regular operations, either the checkboxes for time based cost calculation or the checkbox for quantity based cost calculation will be selected.

5.3.3.5 Costing Resource and Cost Categories

On the tab *Setup* of the route form, you may enter the *Costing resource* specifying the resource applicable for cost estimation of production orders. After scheduling a production order, the resource actually allocated by scheduling – possibly identical with the costing resource – determines costs.

When selecting a costing resource in a route operation, data from the resource default to the *Cost categories* and the fields on the tab *Times* as applicable.

Cost categories are a second setting in addition to the route group for controlling cost estimation and cost calculation. You may assign different cost categories for setup time, run time and quantity. When assigning cost categories you should make sure, however, that the appropriate checkbox in the route group is selected to include time or quantity in cost calculation.

Before creating a new cost category, you have to enter a shared category in the form *Production control> Setup> Routes> Shared categories* ensuring common category definitions across companies.

Cost categories themselves are available in the form *Production control> Setup> Routes> Cost categories*, containing three important settings:

- Cost price – Determining the hourly rate of capacity
- Cost group – Classifying different types of costs in cost calculation (see section 5.4.1)
- Ledger-Resources – Determining ledger main accounts similar to ledger integration of resources (see section 5.3.2 above), if the production control parameter *Ledger posting* specifies the option “Item and category”

In order to manage the cost price, you may click the button *Price* in the cost categories form to access the cost category price form. In the price form you may enter a cost price with a start date, assigned to a costing version (for costing versions, please refer to section 7.2.4). In order to apply the price, you want to activate it clicking the button *Activate*.

5.3.3.6 Route Operation Times

On the tab *Times* of the route operations, you may find allowed times for the operation, split into setup time, run time, queue times and transit time. The figure you may enter in the field *Run time* is the time, in which the workshop should process the quantity of the product entered in the field *Process qty*.

If the *Process qty* is 1.00, the run time is the time in hours to produce one unit. You may apply other units of time, selecting a conversion factor *Hours/time* in the route operation or selecting a capacity unit in the resource (see section 5.3.2).

The processing time of an operation calculates according to following formula:

$$PROCESSING\ TIME = \frac{Setup\ time + (Run\ time \times Quantity)}{Efficiency\ percentage\ of\ the\ resource}$$

In order to calculate the total lead-time, you need to add queue and transit times.

5.3.3.7 Resource Requirements

On the tab *Resource requirements* of the route operations, you may specify which resources are applicable to the operation (independent from the costing resource). If you enter several requirement lines, applicable resource must meet all requirements.

You may specify requirements for *Operations scheduling* different to *Job scheduling*, selecting the checkboxes in the appropriate columns as applicable.

In the column *Requirement type*, you may choose if a requirement is based on a resource group, resource, resource type or capability. The options “Skill”, “Courses”, “Certificate” and “Title” apply to job scheduling for resource of the resource type “Human resource”, referring to worker data in human resource management.

Clicking the button *Applicable resources* at the top of the lower pane in the route form helps checking which resources meet the requirements entered for a route operation. Since the assignment of resources to resource groups and capabilities is date effective, you may choose the date for displaying applicable resources.

5.3.3.8 New in Dynamics AX 2012

Items new in Dynamics AX 2012 related to routes include the resource requirements on route operations (replacing direct work center and work center group assignment in previous releases) and shared categories for cost categories.

5.3.4 Case Study Exercises

Exercise 5.4 – Route Setup

In order to better understand the function of capabilities, route groups and cost categories, you want to set them up.

As a start, register a capability C-## (## = your user ID) with the name “##-specific”. Then you want to enter a route group R-## for manual posting of working time consumption. Estimation and costing should be based on setup time and run time.

Finally you want to set up a new cost category G-## (together with a shared category applying to production), assigning an appropriate cost group of your choice, ledger accounts similar to existing cost categories, and an activated cost price of 100 pounds.

Exercise 5.5 – Resources and Resource Group

In order to produce the finished product of exercise 5.2, a new resource is required.

Enter a new resource group W-## (## = your user ID) with the name “##-assembly”, referring to the main site and an appropriate production unit. The cost categories are the ones entered in exercise 5.4. For the resource group calendar, choose a regular calendar.

Then you want to enter two new resources, W-##-1 and W-##-2, of the type “Machine”. For both resources, the route group and the cost categories of exercise 5.4 apply. The ledger accounts for the resources may be similar to existing resources. Assign both resources to the new resource group W-##, but only the resource W-##-2 to the capability entered in exercise 5.4.

Exercise 5.6 – Operation

In order to produce your product, you need a new operation. Register that operation ## (## = your user ID) with the name “##-processing”.

Exercise 5.7 – Route

Manufacturing your product also requires a new route. You may enter this route based on the elements set up in previous exercises.

After selecting your item I-##-F of exercise 5.2 in the released product form, open the route form clicking the appropriate button. Insert a new route, which contains the operation ## of exercise 5.6 as the only route operation.

The run time for the operation is one hour per unit. Select the resource W-##-1 of exercise 5.5 as costing resource, providing defaults for route group and cost categories. Resources applicable to the operation must belong to the resource group W-## and show the capability C-## of exercise 5.4.

Finally approve and activate the route.

5.4 Production Orders

A production order is the request to manufacturing for producing a certain product. Apart from the item number and quantity of the finished or semi-finished item, production orders contain data regarding required materials and resources.

The production status displays progress of a production order. Therefore, the status will update with every step in the sequential flow of order processing.

5.4.1 Basics of Production Order Processing

You may create a production order either manually or automatically. For automatic creation, following options are available:

- Master scheduling – Within the firming time fence immediately generating a production order (see section 6.3.3)
- Planned production order – Transfer to a production order by firming (see section 6.3.4)

- Pegged supply – Automatic generation from the BOM line of another production order (sub-production, see section 5.4.3)
- Sales order – Creating a production order by clicking the button *Product and supply/New/Production order* in the action pane strip of a sales order line

5.4.1.1 Production Order Status

If you create a production order manually, the first status is “Created”. The status “Created” is the only status, which allows deleting a production order. If you need to delete a production order in a later status, you first need to reset the status.

After creating a production order, it runs through the manufacturing cycle updating the order to following status:

- Created
- Estimated
- Scheduled
- Released
- Started
- Reported as finished
- Ended

The order status changes every time when you update the production order, either by clicking an appropriate button on the action pane tab *Production order* or *Schedule* of the production order form, or by running a periodic activity in the menu *Production control> Periodic> Production orders* or *Production control> Periodic> Scheduling*. Depending on production control parameters, you may skip certain steps. In this case, Dynamics AX will automatically run the omitted steps, applying standard parameter settings, when you start a subsequent step.

If you want to reset the status of an order, you may click the button *Process/Reset status* on the action pane tab *Production order* of the production order form. When resetting the status, you should keep in mind that Dynamics AX reverses all posted transactions referring to that status.

5.4.1.2 Default Values

When choosing to update the status of a production order, an update dialog displays. In the update dialog, you may click the button *Default values*, if you require default values that are different to the standard defaults. Clicking the button *User default* in the default values form will apply customized default values to all users.

5.4.1.3 Production Control and Scheduling Parameters

Production control parameters are available site-specific and on company level. In the production control parameters on company level (*Production control> Setup> Production control parameters*) you may specify, if site-specific parameters apply to

your company (lookup *Parameter usage*). If they do, you may enter them in the form *Production control> Setup> Production control parameters by site*.

On the tab *Status* of the production control parameters (general or site-specific) you may specify from which status to which status production orders may be updated. These settings apply to skipping production steps and for resetting the status.

Scheduling parameters, defaulting to the update dialogs for scheduling production orders, are available separately in the form *Organization administration> Setup> Scheduling> Scheduling parameters*, also providing the option to specify site-specific parameters. Key scheduling parameters include the *Primary resource selection*, specifying if capability-based scheduling is to be based on the shortest duration (latest start date when scheduling backwards) or the lowest priority number

5.4.1.4 Production Journals

As a prerequisite for posting transactions in manufacturing, you need to set up the required journals in the form *Production control> Setup> Production journal names*. Picking lists, route cards, job cards and report as finished journals refer to different journal names, which you need to set up selecting the appropriate *Journal type*.

5.4.1.5 Cost Groups

Cost calculation requires two basic settings:

- Cost groups
- Costing sheets

Cost groups classify and group different types of costs in cost calculation on the one hand and on the other specify different margins for sales price calculation. You may access cost groups in the form *Inventory and warehouse management> Setup> Costing> Cost groups* or in the form *Production control> Setup> Routes> Cost groups*. The *Cost group type* of a cost group includes following cost types:

- Direct materials – Material consumption
- Direct manufacturing – Resource operations
- Indirect – Overhead margins
- Undefined – Unspecific cost classification

In one cost group per *Cost group type* you should select the checkbox *Default* to specify appropriate default groups. In order to specify margins applying to sales price calculation, you may access the tab *Profit* of the cost group form.

On the tab *General* in the released product form, you may assign a cost group to items. For items not assigned to a specific cost group, the default cost group for the cost group type “Direct materials” applies.

Route operations are not directly assigned to a cost group. As shown in section 5.3.3, route operations are linked to cost categories, and cost categories refer to cost groups.

5.4.1.6 Costing Sheet

In order to get a clear structure of costs for estimation and costing, you may set up costing sheets accessing the form *Inventory and warehouse management* > *Setup* > *Costing* > *Costing sheets*. The costing sheet has got two different purposes:

- Classify costs – Classification by cost groups
- Overhead costs – Specifying rules for calculating overhead costs of manufactured and purchased items

In order to provide a useful structure of different cost types for an item, the costing sheet contains bottom-level nodes for assigning different cost groups as well as nodes for totals at any level. You may insert a node in the costing sheet form doing a right-hand click on an upper node.

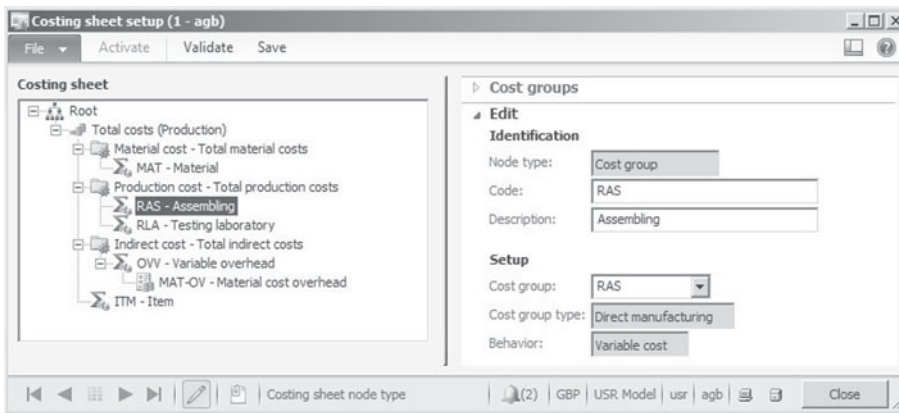


Figure 5-17: Setting up a simple costing sheet

When creating a node on the level directly below the *Root* node, you want to choose the *Node type* “Price” and the *Setup - Type* “Cost of goods manufactured” for a cost structure applying to production. For a structure specifying indirect costs for purchasing, you want to choose the *Type* “Costs of purchase”.

In a node for a cost group, you want to choose the *Node type* “Cost group”. If you want to specify calculation rules for overhead costs, you need to select a costing sheet line with a *Cost group* referring to the *Cost group type* “Indirect”.

You may insert a calculation line for overhead costs assigned to the indirect cost line. The *Node type* of that calculation line needs to be “Surcharge” or “Rate”. After selecting a *Code* on the tab *Calculation* to specify the basis for the calculation, you may enter a percentage or rate in the lower pane of the form. The calculation needs to be assigned to a costing version (see section 7.2.4) and activated. Ledger main accounts for posting indirect costs to the general ledger need to be entered on the tab *Posting*.

Before closing the costing sheet setup, you need to save your changes clicking the button *Save*.

5.4.1.7 New in Dynamics AX 2012

Items new in Dynamics AX 2012 include the scheduling parameters and the option to specify indirect costs for purchasing in the costing sheet.

5.4.2 Production Order Registration

Like all documents, production orders contain a header with data common for the whole order – for example the order number, the item number of the finished product, the order quantity and the delivery date. Unlike sales or purchase orders, production orders include two different types of lines:

- BOM lines – Required material (in the production BOM form)
- Route lines – Required resource operations (in the production route form)

The production order detail form, which you may access double-clicking an order in the production order list page (*Production control* > *Common* > *Production Orders* > *All Production Orders*) only includes the production order header.

In order to access the BOM lines of a specific production order, you may click the button *Production details/BOM* on the action pane tab *Production order* of the production order form.

Clicking the button *Production details/Route* in the action pane of the production order, you may access the production route (containing resource operations).

5.4.2.1 Defaults for Production Orders

When creating a new production order, Dynamics AX copies the active bill of materials and route of the finished item into the production order.

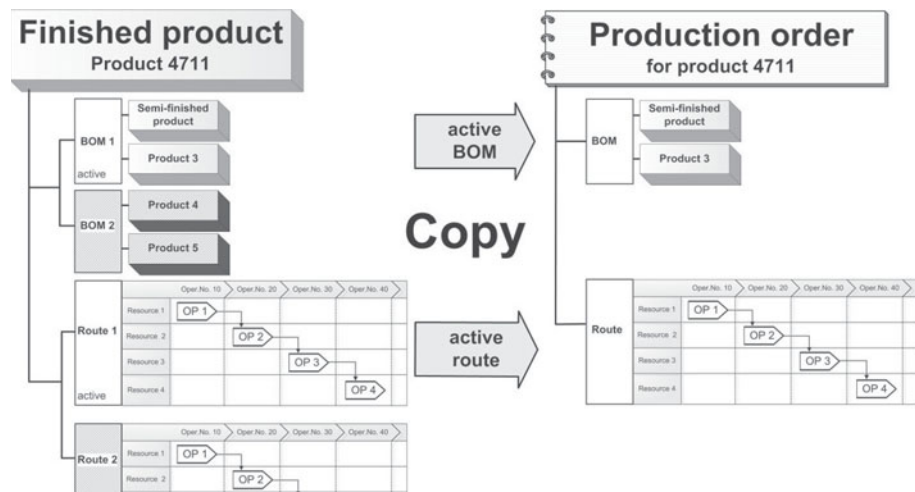


Figure 5-18: Copying BOM and route when creating a production order

Production orders therefore contain a copy of the BOM and route, which you may modify according to the specific requirements of a certain production order. If there are several active bills of materials and routes available for a finished item,

Dynamics AX selects the applicable version based on site, validity date, order quantity and item configuration.

5.4.2.2 Entering a New Production Order

The screenshot shows the 'Create production order (1 - agb) - New Record' dialog box. It has tabs for 'BOM' and 'Route'. The 'Identification' section contains 'Production' (MO00002), 'Item number' (7001), and 'Name' (Housing incl. mounted parts for). The 'Groupings' section has 'Pool' and 'Production group'. 'Inventory dimensions' includes 'Site' (HQ), 'Warehouse' (30), and 'Batch number'. The 'Setup' section has 'Ledger' (Item and resource) and 'Reservation' (Manual). The 'Production' section includes 'Type' (Standard), 'Quantity' (100.00), 'Delivery' (1/14/2012), and 'Time' (10:00 am). The 'Project' section has 'Project ID', 'Activity number', and 'Posting method' (None). The 'BOM/route' section includes 'BOM date' (1/14/2012), 'BOM number' (BM00002), and 'Route number' (MR00001). There is also a 'Finished item' section with 'Category', 'Line property', 'Sales currency', and 'Unit'. At the bottom are 'Create' and 'Cancel' buttons.

Figure 5-19: Creating a production order

If you want to enter a production order manually, you have to insert a record in the form *Production control> Common> Production Orders> All production orders*. When inserting a new header, Dynamics AX shows the *Create production order* dialog where you have to choose the item number of the finished product. Depending on the selected item, Dynamics AX inserts several defaults. If required, you may change the defaulted values, selecting a different route as an example.

You may change settings of a production order later, for example adapting the BOM or route lines in the order. If estimation or scheduling has been executed, however, you should update estimation and/or scheduling after changing the production order to ensure correct production data. If production papers have been printed already, you might need to reprint them with updated data.

Clicking the button *Create* in the create order dialog, Dynamics AX inserts the production order. After creating, the order shows the status “Created” and switches to a subsequent status when updating the order. A summary of executed status updates is available on the tab *Update* of the production order detail form, which you may access double-clicking an order in the list page.

5.4.2.3 References to the Origin

Production orders, which are not created manually in the order form, show a reference to their origin on the tab *References* of the production order detail form. The original order displays in the item reference type and number, if a production order refers to another order.

If you have created the production order out of a sales order line, the item reference type is “Sales order”. In production orders generated as sub-production for the BOM line of another production order, the item reference type is “Production line”.

5.4.3 Processing Production Orders

After creating a production order, you want to update the status preparing the execution of manufacturing.

5.4.3.1 Estimation

Estimation is the first step after creating a production order. The primary task of estimation is to calculate the specific requirement of material and resource capacity to execute a production order. The basis for the calculation is the bill of materials and the route of the order.

In order to run estimation, you want to click the button *Process/Estimate* on the action pane tab *Production order* of the production order form. In the estimation dialog (tab *General*), you may choose a profit setting for the sales price calculation.

In parallel to calculating required quantities and times, estimation calculates estimated costs based on the cost price of material components and route operations. The markup of the calculated sales price derives from the cost groups of the items and route operations.

After estimation, you may check the cost estimation clicking the button *Related information/Price calculation* of the action pane tab *View* of the production order form. On the tab *Overview estimation* of the price calculation form, you may view the list of individual estimation lines. The tab *Costing sheet* shows a summary according to the costing sheet setup.

Material requirements create inventory transactions when estimating. The transactions of the items concerned look similar to the inventory transactions of open sales and purchase order lines. You may access them clicking the button *Inventory/Transactions* in the BOM lines form and – for the finished item – on the action pane tab *Production order* of the production order form.

For BOM lines of the line type “Pegged supply”, estimation creates and estimates sub-production orders (supposing the default order type of the item is “Production order”). Sub-production orders are regular production orders linked to the main production order with regard to scheduling and inventory transactions.

For BOM lines of the line type “Phantom”, estimation replaces the BOM line by the components of the phantom item BOM.

5.4.3.2 Scheduling

Scheduling of a production order is necessary to calculate exact dates for material and resource requirements. You may distinguish two types of order scheduling: Operations scheduling and job scheduling. Whereas operations scheduling is the first step, determining dates on an aggregate level of capacity planning, job scheduling breaks down to details:

- Split resource groups – Reserving capacity on individual resources
- Split operations – Reserving capacity for jobs with start and end time

Depending on your requirements, you may execute only operations scheduling, or choose to apply job scheduling (with or without prior operations scheduling).

Operations scheduling calculates capacity requirements per day on the level of resource groups (if operations are not directly assigned to individual resources), reserving capacity on the resource group allocated through resource requirements (capabilities, resource groups, resource types) in routes.

Job scheduling calculates exact start and end times and generates jobs, splitting the route operations of a production order to individual tasks. These individual tasks differ in the job type, corresponding to the different time fields like *Setup time* and *Run time* on the tab *Times* of the route operation. On the tab *Setup* in the route group form of the operation’s *Route group*, you may find the setting which job types are available for the operation concerned.

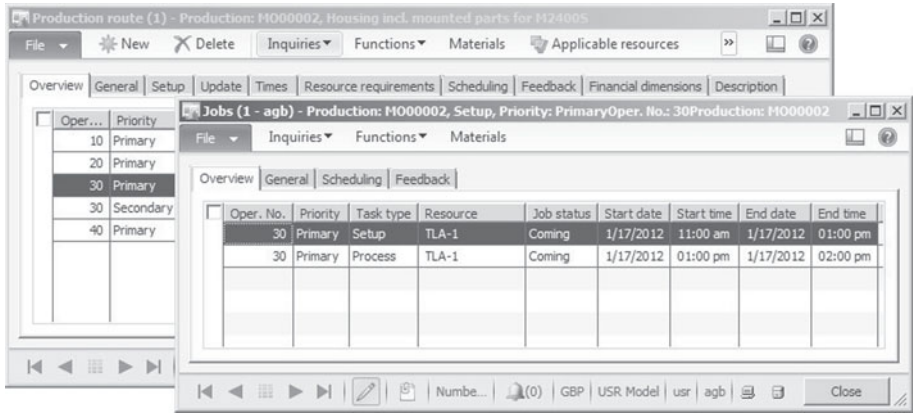


Figure 5-20: Jobs form, accessed from the production route

Job transactions (referring to job scheduling) are independent from route transactions (referring to operations scheduling). You need to decide whether to schedule capacity and post actual time consumption on operations level or on detailed job level, therefore. Jobs are recorded in a separate table, which you may access clicking the button *Production details/All jobs* on the action pane tab

Production order of the production order or *Inquiries/Jobs* in the production route form (*Production details/Route* in the action pane of the production order).

Jobs are not available for a production order, if you skip job scheduling.

In order to run scheduling, you want to click the button *Production order/Schedule operations* or *Production order/Schedule jobs* on the action pane tab *Schedule* of the production order form. If you want to run scheduling for multiple orders, you may access the corresponding periodic activities available in the menu item *Production control> Periodic> Scheduling*.

On the tab *General* of the update dialog for scheduling, you may set following parameters:

- *Scheduling direction* – Choose an option of forward or backward scheduling
- *Schedule references* – Select to schedule sub-productions in parallel
- *Finite capacity* and *Finite material* – Select to check resource or item availability
- *Keep warehouse from resource* – Preventing re-scheduling a production order to select a resource assigned to a different input warehouse (applicable if selecting the checkbox *Resource consumption* in BOM lines)
- *Primary resource selection* – When job scheduling, specifying if the priority for resource selection based on capabilities should be the shortest duration (latest start date when scheduling backwards) or the lowest priority number

In addition, you may select to skip certain job types on the tab *Cancellation*. As an example, this might be useful if it is possible to skip queue time for a specific production order of high importance.

If you do not execute operations or job scheduling as a separate task, scheduling runs automatically when selecting to update to a later status like *Release*. In this case, the *Scheduling method* on the tab *Automatic update* of the production control parameters specifies, whether Dynamics AX runs operations scheduling or job scheduling.

5.4.3.3 Releasing

At the time you want to transfer the production order to the shop floor, you have to release the order clicking the button *Process/Release* on the action pane tab *Production order* of the production order form.

On the tab *General* of the update dialog for releasing, you may choose to print production papers like job card or route card. Selecting the checkbox *References* you may release referenced sub-production orders in parallel.

5.4.3.4 Starting

After starting a production order (button *Process/Start* on the action pane tab *Production order*), you may post inventory and time transactions referring to that order. If you do not want to start production of the whole quantity, you may enter a partial quantity on the tab *General* of the update dialog for starting. Entering an

appropriate *From Oper.No* and *To Oper.No*, you may as well decide not to start all order operations together.

In order to specify whether to post automatic route consumption (working time consumption), you may access the field group *Route card journal* on the tab *General* of the update dialog. The field *Route card* defines the journal name for posting, showing a default from the production control parameters. In order to control posting of *Automatic route consumption*, the following options are available:

- Route group dependent – Automatic consumption, depending on the route group of the operation (see section 5.3.3)
- Always – Automatic consumption of the whole route
- Never – No automatic consumption

The checkbox *Post route card now* controls whether to post the consumption journal immediately. If automatic route consumption is selected but not posted, Dynamics AX provides an unposted journal for manual editing.

Controlling automatic BOM consumption in the field group *Picking list journal* of the update dialog works similar to the automatic route consumption. In order to control *Automatic BOM consumption* depending on the item consumed, you may choose the option *Flushing principle* referring to the corresponding field on the tab *Engineer* of the released product form (see section 5.2.1).

Selecting the appropriate checkbox in the update dialog, you may additionally choose to print the picking list. In order to print a complete picking list, you should also select the checkbox *Complete picking list journal*. Otherwise, the picking list only contains items, which are included in the picking list journal generated for automatic consumption.

5.4.4 Case Study Exercises

Exercise 5.8 – Production Order

Your company needs five pieces of the finished item entered in exercise 5.2. Enter an appropriate production order and check the bill of materials and the route in the order.

Exercise 5.9 – Change Status

Run estimation for your production order of exercise 5.8. Once the estimation is finished, check the price calculation. Then you want to update the order choosing to run operations scheduling, job scheduling and releasing one after the other.

When starting the order, make sure to print a complete picking list as a print preview. You do not want to post the picking list. Is it possible to apply these settings as a default for all users?

5.5 Production Journal Transactions

Reporting of actual material and working time consumption in production journals is required to update scheduling and to analyze production performance.

5.5.1 Journal Types

Production journals for posting consumption include following types:

- Picking list – Posting item consumption
- Route card – Posting time consumption referring to operations
- Job card – Posting time consumption referring to jobs

Another journal type available – *Report as finished* – does not refer to item consumption, but to finishing production receiving the product in inventory.

5.5.1.1 Creating Journals

For automatic route and item consumption, Dynamics AX creates production journals automatically when starting a production order or reporting it as finished. Production journals are also generated automatically, if registrations are transferred from the shop floor module *Manufacturing execution*.

If BOM lines or route operations require manual recording in the production module, you need to create production journals. Manual journals apply to the following lines:

- Operations – If assigned to a route group, which does not show checkmarks for automatic route consumption
- Items – If showing a flushing principle “Manual”

5.5.1.2 Ledger Integration

When ending and costing a production order, item and route consumption post to the general ledger. Before ending the order, you may post consumption to clearing accounts for WIP (work in progress) when recording production journal transactions.

As a prerequisite for posting item consumption to WIP accounts, the checkbox *Post picking list in ledger* needs to be selected on tab *General* of the production control parameters. In addition, the checkbox *Post physical inventory* on the tab *Setup* in the item model group of the picked item needs to be marked as well.

Like ledger transactions referring to packing slips in purchasing and sales, general ledger transactions for route/job consumption journals and picking lists will reverse when ending and costing the production order.

5.5.2 Picking List

Picking list journals are available to post item consumption. You may access them clicking the button *Journals/Picking list* on the action pane tab *View* of the

production order form or selecting the menu item *Production control> Journals> Picking list*.

Journals are unposted vouchers, consisting of a header and a lines part. When accessing picking list journals, you may view a list of registered journals. The lookup field *Show* at the top of the journal header form allows choosing whether to show posted journals or open journals.

If you want to enter a new journal, you have to insert a new line clicking the button *New* in the action pane strip of the journal header form. After selecting an appropriate journal name, you may switch to the journal lines clicking the button *Lines*. As an alternative, you may choose the button *Create new* to create a new journal as well.

5.5.2.1 Consumption Proposal

In order to support picking list registration, you may click the button *Picking list/ Create lines* in the journal header form instead of the button *Create new*.

In the *Create lines* dialog box, you may choose which items to include in the proposal. Selecting “Remaining quantity” in the field *Proposal* will default the open BOM line quantity of the order estimation to the column *Proposal* of the picking list lines. If you select the checkbox *Consumption=Proposal*, the column *Consumption* in the journal lines will receive the proposal quantity in parallel. In this case, you may immediately post the journal without needing to enter quantities manually.

5.5.2.2 Journal Lines

Figure 5-21 shows an example of lines in a picking list journal, which are generated by a consumption proposal. The last line in the journal line form has been entered manually, which is why the quantity in the column *Proposal* is empty.

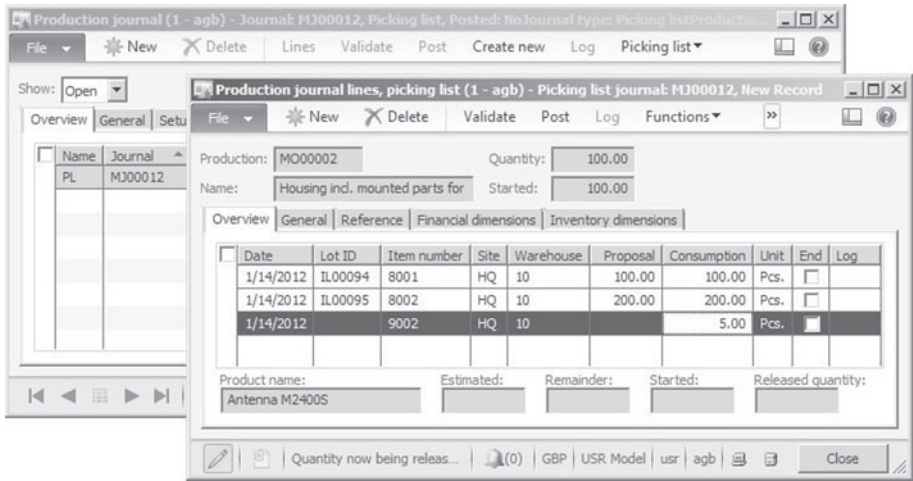


Figure 5-21: Registering picking list lines

When entering picking list lines in the journal lines form manually, you have to register the *Consumption* quantity and select a *Lot ID* to link the consumption to a BOM line. If you select the checkbox in the column *End*, the BOM line will be set to finished, no matter if you consume the total estimated quantity or less.

If you want to register consumption of an item not included in the BOM lines of the production order, you may insert a picking list line entering the item number and leaving the lot ID empty. Dynamics AX in this case automatically creates a corresponding BOM line on the order and inserts the lot ID into the picking list line.

Once you have finished picking list registration, you may post the journal clicking the button *Post* in the journal header or lines. The posted transactions are similar to the packing slip transactions of sales orders, reducing the quantity on inventory of the picked items.

In inventory valuation, the journal posting applies a preliminary valuation. Financial valuation posts when you end and cost the production order. Costing a production order is the corresponding action to invoicing a sales order.

5.5.2.3 Inquiries and Reversal

You may view the posted journal in the picking list journal form selecting “All” or “Posted” in the lookup field *Show*. The posted journal shows a checkmark in the column *Posted* and does not allow modifications.

In addition, you may view the posted transactions clicking the button *Related information/Production posting* on the action pane tab *View* of the production order form or accessing the inquiry form *Production control> Inquiries> Production> Production posting*.

If you want to reverse a posted picking list journal, you may register and post a picking list journal with negative quantities. In order to facilitate registration, you may select “Full reversal” in the field *Proposal* when clicking the button *Picking list/ Create lines* to create a picking list proposal.

5.5.3 Working Time Registration

Depending on the way of scheduling the production order, you may select either route cards or job cards for recording working time consumption.

5.5.3.1 Route Card and Job Card

If not executing job scheduling for a production order, there are no records in the job table for this order and you are required to report resource consumption in route cards.

If job scheduling has been executed, you may want to register jobs in job cards.

5.5.3.2 Journal Registration

You may access route card journals clicking the button *Journals/Route card* on the action pane tab *View* of the production order form or selecting the menu item *Production control> Journals> Route card*. For job cards, choose the button *Journals/Job card* in the production order or the menu item *Production control> Journals> Job card*.

Entering of journal headers and lines for resource consumption works like entering picking list journals. Except for automatic consumption, you do not have the option to create a consumption proposal for route cards or job cards, however.

When inserting a journal line for resource consumption, you need to select the operation number or the job identification first. Then you may enter the resource, the number of hours, the produced quantity, and other data like the worker or – if applicable – the defective quantity (*Error quantity*) of the finished product. In a job card, you may also register start time and end time. Once you have finished entering journal lines, you may post the journal clicking the button *Post* in the journal header or lines.

5.5.3.3 Reporting as Finished

When registering the last operation or job in a journal line, you may select the checkbox in the column *Production report as finished*. In this case, Dynamics AX posts a report as finished journal for the good quantity of the finished item in parallel to the route card or job card. A default for the report as finished setting in journal lines is available in the production control parameters (tab *Journals*, checkbox *Automatic report as finished*).

5.5.3.4 Inquiries

After posting the route card or job card, you may view the posted journals in the route card or job card journal form, selecting “All” or “Posted” in the lookup *Show*. In addition, you may view the posted transactions clicking the button *Related information/Route transactions* or *Related information/Production posting* on the action pane tab *View* of the production order form. The transactions are also available accessing the inquiry form *Production control> Inquiries> Routes> Route transactions* or *Production control> Inquiries> Production> Production posting*.

5.5.4 Case Study Exercises

Exercise 5.10 – Purchasing Components

In order to process the production order of exercise 5.8, the required components need to be available in inventory.

Enter a purchase order, purchasing nine units of the first and five units of the second item of exercise 5.1 from your vendor of exercise 3.2. Once you have finished entering and confirming the purchase order, you want to post the packing slip receipt and the vendor invoice.

Exercise 5.11 – Picking List

You may now pick the components required for the production order of exercise 5.8. Enter and post a picking list journal, picking nine units of the first and five units of the second item. Picking should be done from the warehouse to which you have posted the items in exercise 5.10.

Exercise 5.12 – Job Card

Choosing a job card, you want to record the working time required to process manufacturing. Enter and post a job card line referring to the production order of exercise 5.8, producing five units in the time between 8:00 AM and 2:00 PM (6 hours). You do not want to post reporting as finished in parallel.

5.6 Reporting as Finished and Ending Production

In the cycle of production order processing, reporting as finished and ending are the last steps. Since reporting as finished posts physical transactions, it increases the inventory quantity of the finished product. Ending the order is the final step of order processing, costing the order and posting financial transactions.

5.6.1 Reporting as Finished

Reporting as finished physically receives the finished item in inventory. In Dynamics AX, there are three options to report a production order as finished:

- Order status update – Updating the status of the production order
- Production journal – Posting a report as finished journal
- Time registration – Reporting as finished when posting the route card or job card for the last operation

Section 5.5.3 includes reporting as finished when posting the time registration for the last operation – the description below shows the other two options.

5.6.1.1 Order Status Update

In order to report as finished by updating the order status, you may click the button *Process/Report as finished* on the action pane tab *Production order* of the production order form or select the periodic activity *Production control> Periodic> Production order> Report as finished*. If you want to report only a part of the whole order quantity, you may adjust the *Good quantity* on the tab *Overview* or *General* of the update dialog.

If you don't expect further quantity of the selected order to be reported as finished, you should select the checkbox *End job* to clear any remaining open quantity.

If not all estimated consumption has been posted, you may select the checkbox *Accept error* on the tab *General* to enable posting the report as finished update in spite of missing consumption.

5.6.1.2 Automatic Consumption

Similar to the appropriate option when starting the order (see section 5.4.3), you may post automatic item and route consumption when reporting as finished.

In the item record, you may select the flushing principle “Start” to post consumption when starting the production order, and “Finish” to post consumption when reporting as finished. Therefore, you may choose to consume some items at the start and other items at the end of a production order.

Route operations do not show this option. You need to decide for all automatic operation postings of an order in common, whether posting should apply when starting or when reporting as finished.

5.6.1.3 Production Journal

Apart from the status update, you may also report as finished in a production journal. You may access that journal clicking the button *Journals/Report as finished* on the action pane tab *View* of the production order form or selecting the menu item *Production control> Journals> Report as finished*.

Posting a report as finished journal for a production order works similar to posting a packing slip receipt for a purchase order. Inventory physically receives the item with a preliminary value; the quantity in inventory includes the quantity received.

5.6.1.4 Ledger Integration

If you want to post the items to clearing accounts in the general ledger when reporting as finished, ledger integration needs to be activated for reporting as finished. You may apply the required setting by selecting the checkbox *Post report as finished in ledger* on tab *General* of the production control parameters. In addition, the checkbox *Post physical inventory* on the tab *Setup* in the item model group of the finished item needs to be selected.

General ledger transactions for reporting as finished will reverse when you end and cost the production order.

5.6.2 Ending and Costing

Ending a production order is required to cost-account and close the order. In finance, WIP ledger transactions for production journals reverse. BOM-item and route consumption as well as finished item receipt post to the final ledger accounts.

You need to end a production order in time. Otherwise, the finished item is still included in the WIP account balance instead of the stock account balance.

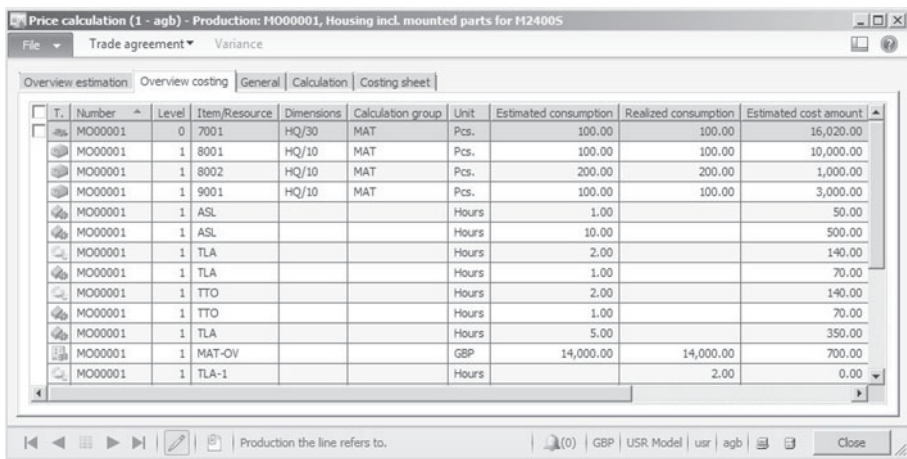
5.6.2.1 Ending

Ending a production order closes the order. Since it is not possible to post any transactions for a closed production order, you should not end the order until you are sure all transactions have been posted.

In order to end the production order, you want to click the button *Process/End* on the action pane tab *Production order* of the production order form. If you want to end multiple orders, you may access the corresponding periodic activity in the menu item *Production control> Periodic> Production orders> End*.

5.6.2.2 Costing

When costing the order in the course of the ending routine, Dynamics AX calculates actual costs for all item and route consumption transactions as well as the cost price of the finished item. If standard cost valuation applies to the finished item, costing posts cost price differences to deviation accounts.



T. Number	Level	Item/Resource	Dimensions	Calculation group	Unit	Estimated consumption	Realized consumption	Estimated cost amount
M000001	0	7001	HQ/30	MAT	Pcs.	100.00	100.00	16,020.00
M000001	1	8001	HQ/10	MAT	Pcs.	100.00	100.00	10,000.00
M000001	1	8002	HQ/10	MAT	Pcs.	200.00	200.00	1,000.00
M000001	1	9001	HQ/10	MAT	Pcs.	100.00	100.00	3,000.00
M000001	1	ASL			Hours	1.00		50.00
M000001	1	ASL			Hours	10.00		500.00
M000001	1	TLA			Hours	2.00		140.00
M000001	1	TLA			Hours	1.00		70.00
M000001	1	TTO			Hours	2.00		140.00
M000001	1	TTO			Hours	1.00		70.00
M000001	1	TLA			Hours	5.00		350.00
M000001	1	MAT-OV			GBP	14,000.00	14,000.00	700.00
M000001	1	TLA-1			Hours		2.00	0.00

Figure 5-22: Comparing estimation and costing in the calculation form

5.6.2.3 Inquiries

You may compare actual costs to estimated material and time consumption costs clicking the button *Related information/Price calculation* on the action pane tab *View* of the production order form. On the tab *Overview Costing* of the price calculation form, you may – on item and operation line level – compare estimated and realized quantity consumption as well as estimated and realized costs. The tab *Costing sheet* shows a summary of estimation or costing according to the costing sheet setup.

In order to see the transactions generated when ending the order you may click the button *Related information/Production posting* on the action pane tab *View* of the production order form. Alternatively, you may choose the menu item *Production control> Inquiries> Production> Production posting*.

In the production posting form, the transactions posted when ending and costing the production order show the type “Costing”. In order to see related ledger transactions, you may click the button *Ledger/Voucher*. Like when posting invoices in purchasing or sales, costing a production order posts financial transactions for the items consumed and reported as finished.

The ending date of the production order shows in the field *Financial date* of the inventory transactions. The receipt status in transactions of items reported as finished is “Purchased”. For items consumed, the issue status is “Sold”.

5.6.2.4 Ledger Integration

In the first step of ledger posting, costing reverses the WIP ledger transactions posted through picking list journals, route card journals, job card journals and report as finished journals. In the second step, costing posts the following ledger transactions closing the order in finance:

- Consumption of components – To the stock accounts of concerned items
- Consumption of working time – To the resource costing accounts
- Receiving the finished item – To the stock account of the finished item

Ledger accounts applying to the item transactions are specified in the inventory posting setup (*Inventory and warehouse management* > *Setup* > *Posting* > *Posting*). Ledger accounts for resource consumption may derive from settings in the resource form or in cost categories. As an alternative, you may choose production groups to specify applicable ledger accounts.

Receiving a default from production control parameters, the lookup *Ledger* on the tab *Setup* of the production order detail form specifies, which setting actually applies to determining suitable ledger accounts (see section 8.4.3).

5.6.3 Case Study Exercise

Exercise 5.13 – Ending Production

Report the whole quantity for the production order of exercise 5.8 as finished, choosing the button *Process/Report as finished* in the production order form. On the tab *General* of the update dialog, select the checkboxes *End job* and *Accept error*. Finally, you may end the production order, locking it for further postings. After ending, view the price calculation inquiry to compare estimation and costing.

6 Operations Planning

The primary responsibility of operations planning is to make sure that items are available at the time they are required whilst meeting the target of high economic efficiency. Operations planning has to solve the conflicting priorities of high supply readiness on the one hand and low inventory on the other.

6.1 Business Processes in Operations Planning

In Dynamics AX, long-term forecasting and short-term master planning are covered by the operations planning module (“Master planning”).

6.1.1 Basic Approach

Operations planning on the one hand includes forecasting to identify item demand on a long-term basis, and on the other hand master planning with the master scheduling process to calculate requirements and planned orders on a daily basis.



Figure 6-1: Operations planning in Dynamics AX (Forecasts and master planning)

6.1.1.1 Forecasting

Forecasting is a long-term prognosis for planning and budgeting purposes. It includes demand forecasts (sales and other issues) as well as supply forecasts (purchasing and other receipts). Different versions of forecasts provide the option to run different scenarios for the total forecast in parallel.

6.1.1.2 Master Planning

Master planning covers short-term planning for daily business. Based on current orders and on-hand inventory, master scheduling calculates material requirements to schedule purchase and production. Similar to forecasting, you may run different scenarios of master planning in parallel. Dynamics AX distinguishes a static master plan for current master scheduling and a separate dynamic plan for simulation.

6.1.2 At a Glance: Master Planning

Before we start to go through the details of master planning, this section shows the basics on the example of the net requirements of a finished item.

As a basis for analyzing net requirements, you want to enter a sales order with a line containing a finished item (default order type “Production”) to be delivered today. Clicking the button *Product and supply/Net requirements* in the action pane strip of the sales order line, you may access the net requirements form for the item. If existing production orders and the quantity in inventory do not cover the item requirements, you may click the button *Update/Master scheduling* in the action pane strip of the lower pane to run local master scheduling for the item.

The screenshot shows the SAP Net requirements form for a finished item. The title bar indicates the plan is DYN, site is HQ, warehouse is 10, and sorting is by requirement date. The form has two main sections. The top section shows a table with columns: Warehouse, Site, Minimum, Maximum, Coverage group, and Planned order type. The bottom section shows a table with columns: R., Reference, Number, Requirement date, Req. quantity, Accumulated, Action date, Action quantity, and Futures date. The bottom section also has tabs for Overview, General, Action, Futures, and Period. The bottom section is currently showing the 'Update' tab, which displays a table with the following data:

R.	Reference	Number	Requirement date	Req. quantity	Accumulated	Action date	Action quantity	Futures date
	Sales order	SO00007	1/19/2012	-3.00	-3.00			
	Planned production orders	LO00034	2/1/2012	3.00				

Figure 6-2: The net requirements form after running local master scheduling

Master scheduling generates a planned production order to produce the finished item showing the earliest delivery date possible. The arrows in the columns on the right side of the list show proposals calculated in master scheduling avoiding missing delivery dates. Details are available on the tab *Action* and *Futures*.

Master scheduling is available in multiple scenarios, distinguishing between static and dynamic plans. The static plan is the operations plan used in purchasing and production. If applying a dynamic plan for simulation purposes, this plan will be the default for master scheduling in the net requirements form. In order to switch between the different plans, you may choose the lookup *Plan* at the top of the net requirements form.

6.2 Forecasting

Forecasting is a long-term prognosis, required to estimate and adjust future capacities of resources and material supply. In parallel, forecasting is also the basis for budgeting in finance. In order to support planning of alternative scenarios for business development, you may record multiple forecasts in parallel.

Forecasting in Dynamics AX does not only include sales forecasts. Demand forecasts also include other sources of item issue. In addition, supply forecasts are available, which for example may be a basis for long-term contracts with vendors.

6.2.1 Basics of Forecasting

When entering forecast figures in Dynamics AX, you need to select a forecast model. Forecast models represent different planning scenarios.

Forecast models refer to forecast plans, which are the basis for calculating forecasts in forecast scheduling. You may include forecast plans in master scheduling.

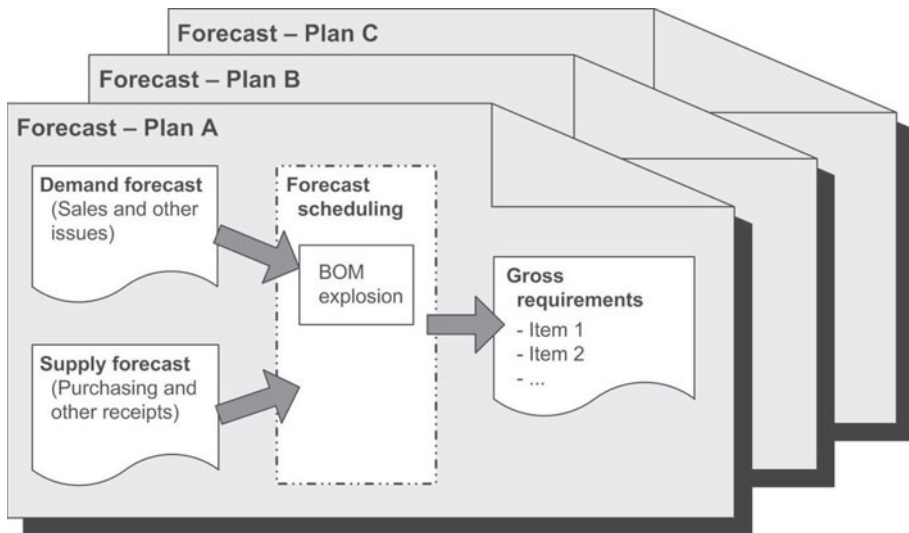


Figure 6-3: Forecasting in Dynamics AX

6.2.1.1 Demand/Sales Forecast

Forecasting demand with estimated sales figures is the starting point of the forecasting process. You may enter a sales forecast on item or on item group level. Apart from direct sales, a demand forecast also may contain other demand – e.g. the demand for semi-finished items (instead of finished items) if it is not possible to determine reasonable forecast figures on the detail level of finished products.

Since forecast scheduling and master scheduling are based on item numbers, you need to enter an item allocation key if you do not enter forecasts per item number. Item allocation keys are groups, containing a percentage for every item included in the key.

6.2.1.2 Supply Forecasts

In parallel or after finishing demand forecasting, you may enter a separate supply forecast which includes purchasing and other receipts. In the next step, you may align demand and supply forecasts in an inventory forecast.

6.2.1.3 Forecast Scheduling

Once you have finished registering forecast figures, you may run forecast scheduling to calculate the gross requirements of finished items, based on their bills of materials. Depending on settings of the selected forecast plan, Dynamics AX creates planned purchase and production orders covering the gross requirements of forecasting as a result of forecast scheduling. These planned orders refer to the selected forecast plan.

If entered, the supply forecast provides the minimum figures for generating planned purchase or production orders, no matter if they exceed the direct and indirect demand from the demand forecast.

Since forecast scheduling refers to a long-term prognosis, it does not include the current inventory and current orders in the calculation.

You may integrate forecasts into master scheduling, choosing the way scheduling should include forecast figures in the master plan settings.

6.2.2 Forecast Settings

Before starting to register forecasts, you need to finish the required setup in Dynamics AX.

6.2.2.1 Forecast Models

Forecast models represent the different scenarios for forecasting. In order to register forecasts, you need to set up at least one forecast model in the form *Inventory and warehouse management> Setup> Forecast> Forecast models*.

If you want to apply a structure to forecasts (e.g. grouping forecasts by region), you may set up two-stage forecasts assigning submodels to a main model. If applying submodels, you want to register submodels in the forecasts model form first. Then you may enter the main model and assign submodels on the tab *Submodel* of the forecast model form.

In order to protect forecasts from modifications, you may select the checkbox *Stopped* in the forecast model. As an example, you might block an annual forecast once it is finished, inserting a separate forecast model for the next year.

6.2.2.2 Forecast Plan

Whereas forecast models apply when entering forecasts, forecast plans are the grouping element of separate forecast scenarios in master planning. In order to assign forecast models to forecast plans, you need to access the form *Master planning> Setup> Plans> Forecast plans*. Submodels of the (inventory) forecast model

are applied by assigning the main model on the tab *General* of the forecast plans form. In addition, you may choose whether to include supply or demand forecasts. On the tab *Time fences* of the forecast plan, you are to enter the period in days (starting from the day of calculation), which should be covered by forecast scheduling.

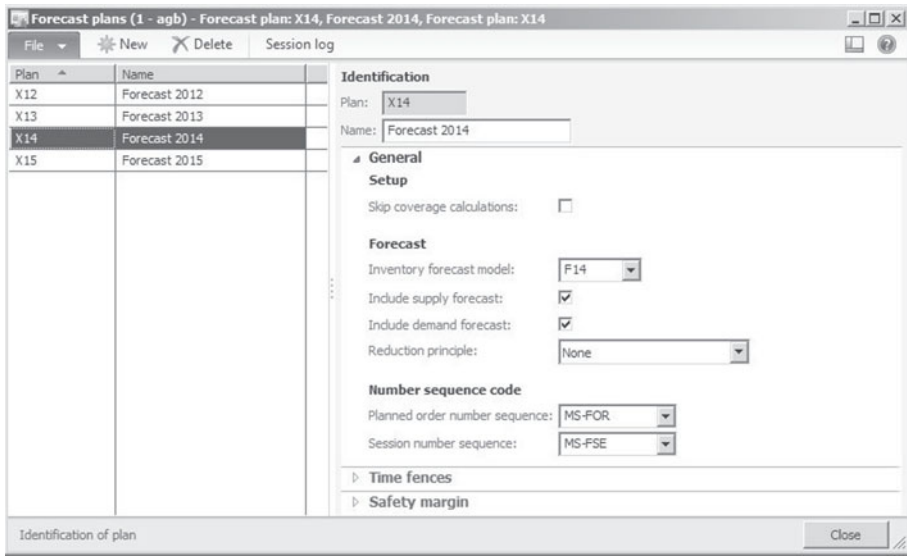


Figure 6-4: Editing a forecast plan in the forecast plans form

6.2.2.3 Parameters and Item Allocation Keys

You may enter the *Current forecast plan* in the master planning parameters (*Master planning> Setup> Master planning parameters*), thereby providing a default forecast plan for displaying forecast scheduling results.

Another important setting for item forecasts is the coverage group, which specifies how to summarize net requirements. More information on coverage groups is available in section 6.3.3 later in this chapter.

If you do not want to enter forecasts for individual items, you may apply item allocation keys entering a forecast total for a group of items. You may specify item allocation keys in the form *Inventory and warehouse management> Setup> Forecast> Item allocation keys*. After selecting or inserting an item allocation key, you may click the button *Lines* in the action pane strip to access the item allocation lines, where you may assign items with their percentage of the group total.

6.2.3 Forecasts and Forecast Scheduling

You may record forecasts in the options available in the menu tree node *Inventory and warehouse management> Periodic> Forecast> Entry*. As an alternative, you may choose the button *Forecasting* or *Forecast* in the form of the master tables concerned, for example in the released product form or the customer form.

In the forms referring to items and item groups, you may register demand forecasts as well as supply forecasts. Demand forecasts are also available in the customer and customer group form, supply forecasts in the vendor and vendor group.

6.2.3.1 Demand/Sales Forecast

If you want to access the demand forecast form for an item group as an example, you may click the button *Demand* in the form *Inventory and warehouse management> Periodic> Forecast> Entry> Item group*. In the demand forecast form, you may insert a record selecting the appropriate (forecast) model. If you want to enter different scenarios, you may register different models in several lines.

In the date column, you may enter the start date of the individual forecast period – for example the first day of a month if you enter a line per month. If you choose an allocation method in the pane *Allocation* in the middle of the form, you might register one line for the whole forecast time fence.

In order to enable gross requirement calculation, you have to enter either an item number or an item allocation key. Depending on the dimension groups of the item (checkbox *Coverage plan by dimension* in the tracking and the storage dimension group) you have to enter inventory dimensions in the forecast line.

Model	Date	Customer account	Customer group	Item number	Item allocation key	Quantity	Unit	Amount	Currency
F12	1/1/2012		DO		FP	10.00		5,000.00	GBP
F12	4/1/2012			1001		100.00	Pcs.	37,000.00	GBP

Allocation

Method: Period Per: 1 Unit: Months Period key: End: 12/1/2014 Create lines

Exploded

Date	Quantity	Unit	Amount	Currency
1/1/2012	10.00		5,000.00	GBP
2/1/2012	10.00		5,000.00	GBP
3/1/2012	10.00		5,000.00	GBP

Figure 6-5: Registering a sales forecast line in the demand forecast form

6.2.3.2 Supply Forecast and Inventory Forecast

If you want to register a supply forecast independent from the demand forecast, you may enter it in parallel to the demand forecast selecting the button *Forecast/Supply forecast* in the action pane of the appropriate master table form. You may include the supply forecast in parallel to the demand forecast in forecast scheduling.

In addition to demand and supply forecasts, you may select the button *Inventory forecast* in appropriate master table forms. The inventory forecast shows the result of supply and demand forecasts, broken down to item numbers and individual periods.

6.2.3.3 Forecast Scheduling

You may want to see the results of forecasts to prepare future production and purchasing of merchandise, finished items, raw materials, parts and components.

In order to determine these multi-level forecast figures, you want to explode bills of materials performing forecast scheduling (*Master planning> Periodic> Forecast scheduling*). In the update form for forecast scheduling, you need to choose the forecast plan, for which to run the calculation.

The results of forecast scheduling are available in the gross requirements form, which you may access clicking the button *Requirements/Gross requirement* on the action pane tab *Plan* of the released product form. By default, the form shows the forecast plan set up as current forecast plan in the master planning parameters. You may select a different scenario in the lookup *Plan* at the top of the net requirements form.

Warehouse	Site	Minimum	Maximum	Coverage group	Planned order type
30	HQ	0.00	0.00	PER	Production

R.	Reference	Number	Requirement date	Req. quantity	Accumulated	Action date	Action quantity	Future
	Planned production orders	FP00044	1/31/2012	7.00	8.00			
	BOM line	FP00034	1/31/2012	-7.00	1.00			
	BOM line	FP00040	1/31/2012	-1.00				
	Planned production orders	FP00045	2/29/2012	1.00	1.00			

Figure 6-6: Forecasting results for a semi-finished item in the gross requirements

Forecast scheduling results are not only available in the gross requirements form. Selecting a forecast plan in lookup field *Plan* of the list page *Master planning> Common> Planned orders*, you may as well access planned orders resulting from forecast scheduling.

6.2.3.4 Budget Transfer

If you want to apply demand and supply forecasts for budgeting in finance, you may transfer them to ledger budgets. Transferring requires running the appropriate periodic activity for sales and/or purchase in the menu *Inventory and*

warehouse management> Periodic> Forecast> Update selecting the ledger budget model, which should receive forecast figures.

6.2.3.5 New in Dynamics AX 2012

In Dynamics AX 2012, the terminology for sales and purchase forecasts has changed to demand and supply forecasts reflecting flexible forecasting options.

6.2.4 Case Study Exercises

Exercise 6.1 – Forecast Settings

You require a sales forecast for items that you have set up in previous exercises – the merchandise item of exercise 3.5 and the finished item of exercise 5.2. Your forecast should be in a scenario separate from other forecasting scenarios.

To meet this constraint, you want to insert a new forecast model F-## (## = your user ID) without applying submodels. In a second step, you want to register a new forecast plan Y-##. You need to assign your forecast model to this forecast plan and to include demand forecasts in the plan. The number sequences required may be similar to settings in existing forecast plans.

Exercise 6.2 – Demand Forecast

For the next quarter, you expect your customer of exercise 4.1 to order 200 units of your merchandise item and 100 units of your finished item on the last day of each month.

You need to record these figures in a sales forecast, applying your forecast model of exercise 6.1. Once you have finished, you want to start forecast scheduling for your forecast plan, checking the results afterwards.

6.3 Master Planning

Dynamics AX master planning covers the short-term calculation of material and capacity requirements. It is the basis for the daily work in purchasing and production management.

Master planning includes relevant information of setup, master and transaction data for items and resources in all areas of Dynamics AX. Depending on the setup, these data contain the current quantity in inventory, purchase orders, production orders, sales orders, forecast plans as well as master data in released product and resource records.

Results of master planning are planned orders for purchasing, production, kanbans and inventory transfer on the one hand, and action and future messages to adjust existing orders on the other hand.

6.3.1 Basics of Master Planning

Data regarding item transactions – including orders – and quantity in inventory are an essential basis for master planning. In addition, master planning may cover

sales quotations, purchase requests for quotation and forecasts. You may reduce requirements of forecasts and sales quotations applying a probability percentage or reduction principle.

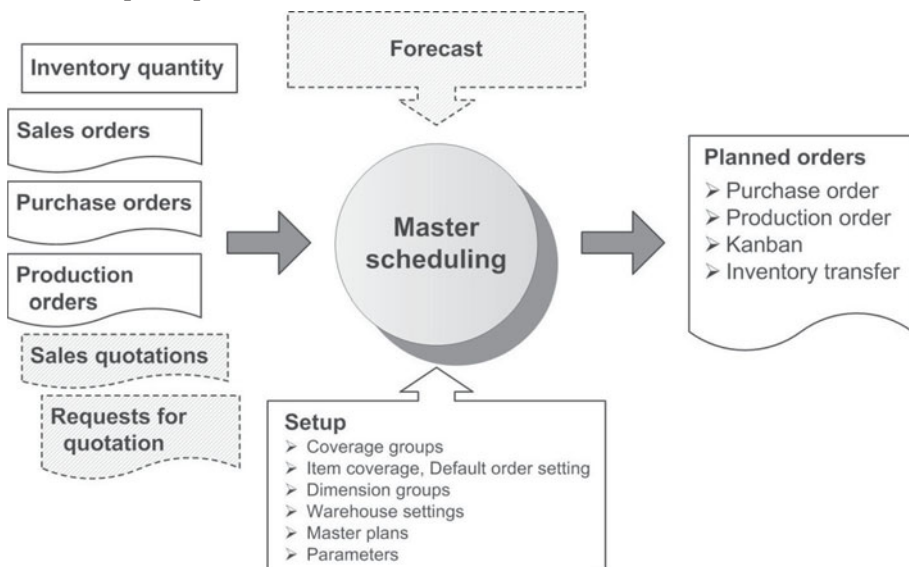


Figure 6-7: Elements of master planning

As with forecasting, you may apply several scenarios in master planning. A scenario is represented by a master plan, which contains the settings for the scenario. These settings include on the one hand which elements to cover in scheduling and on the other hand the calculation principles for planned orders.

6.3.1.1 Master Planning Strategies

Dynamics AX applies two different strategies for master planning, which you may specify in the master planning parameters:

- One plan strategy
- Two plan strategy

Master scheduling usually is a batch job, which runs every night calculating net requirements for all items. The result of that calculation is available in the *static master plan*. The static plan is the master plan to be used in purchasing and production control for scheduling orders. It is the default plan when accessing the planned orders forms.

On the other hand, the sales department needs a plan to run simulations in order to check possible delivery dates in sales orders. For this purpose, sales has to execute a master scheduling simulation locally, only for the individual item. The result of that simulation is available in the *dynamic master plan*.

If you enter the same master plan for the static and the dynamic master plan in the master planning parameters, you run a one master plan strategy. Planned orders of

current master scheduling simulations in sales update the static plan, which is used in purchasing and production control. Depending on the requirements of your company, this strategy may fit to your business.

Alternatively, you may choose a two master plan strategy. In this case you have to enter a different master plan for the static and the dynamic plan. When running the batch job for static master scheduling in the night, you probably want to copy the static plan into the dynamic plan in order to base simulations on the current static plan.

In this case, simulation in sales will start in the morning with the same data basis as purchasing and production management. Simulation throughout the day does not change planned orders in the static plan, thereby avoiding problems in purchasing and production control caused by planned orders changing every moment.

6.3.1.2 Coverage Group

The coverage group specifies the method of calculating lot size and delivery dates. You may set a general coverage group in the master planning parameters. If items differ in lead-time and cost price very much, you should enter different coverage groups in the released products.

6.3.1.3 Customer Order Decoupling Point

Depending on the structure of your products, you may choose between two key supply policies in production control to fulfill customer orders:

- Make-to-Stock – Produce based on sales forecasts and historical demand
- Make-to-Order – Produce based on confirmed sales orders

In addition, you may find hybrid order fulfillment strategies applying a make-to-stock strategy to some products (semi-finished or purchased items) and a make-to-order strategy to other products (finished, semi-finished or purchased items). When applying a hybrid strategy, the customer order decoupling point determines the level in the product structure, to which the items are built to stock.

In Dynamics AX, you may apply all of these strategies choosing a coverage group with an appropriate coverage principle (see section 6.3.3). The customer order decoupling point is determined by the items (semi-finished products), for which you record forecasts. Since forecasts on semi-finished products are not offset by sales orders, you may choose to include all inventory transactions (including demand resulting from bills of materials of finished products in sales orders) in the coverage group parameter *Reduce forecast by*.

6.3.1.4 Master Scheduling and Planned Orders

Master scheduling generates planned purchase orders, planned production orders, planned kanbans, and planned inventory transfer orders based on item demand and settings for master planning.

Once master scheduling is finished, you may check and edit the planned orders. In the planned orders form, you may transfer planned orders to purchase orders, production orders, kanbans and inventory transfer orders.

6.3.1.5 New in Dynamics AX 2012

In Dynamics AX 2012, you may flexibly specify the customer order decoupling point – entering forecasts and calculating offsetting current demand on any level of the product structure.

6.3.2 Master Planning Setup

Before running master scheduling, you need to finish the setup determining requirements calculation in Dynamics AX.

6.3.2.1 Master Plans

You may regard a master plan as a scenario, which contains requirement calculations independent from other scheduling scenarios. Depending on the planning strategy, you may apply one or two master plans. If you need multiple simulation scenarios, you may insert additional master plans.

You may access master plans selecting the menu item *Master planning> Setup> Plans> Master plans*. Selecting the appropriate checkboxes on the tab *General*, you may choose to include following items in the master plan:

- Current inventory
- Inventory transactions (open orders)
- Sales quotations (reduced by an optional probability percentage)
- Requests for quotation (entered in purchasing)
- Forecasts

In order to include forecasts and forecast scheduling, you need to select the appropriate forecast plan in the lookup *Inventory forecast model*. If forecasts are included in master planning, you may want to offset forecast figures by sales orders and other demand, avoiding excessive demand resulting from adding forecasts to current orders.

The lookup field *Reduction principle* in this case determines the way to reduce forecast figures. If the selected principle refers to a *Reduction key*, you need to enter reduction keys in the coverage groups concerned (tab *Other* in the coverage group form, see section 6.3.3).

The *Scheduling method* on the master plans form controls whether to run operations scheduling or job scheduling (see section 5.4.3) for planned production orders. Among other settings for scheduling planned production orders there is the option to apply finite capacity.

Switching to the tab *Time fences* on the master plans form, you may select to override the time fences specified in the coverage group or in the item coverage.

Figure 6-8: Editing a master plan in the master plans form

On the tab *Futures message*, you may choose if master scheduling may set the requirement date in planned orders to a date, which is after the actual requirement date, if it is not possible to meet the actual requirement date because of delivery times. Applying those settings, you prevent impossible dates like a delivery date before today.

On the tab *Action message*, you may select to postpone planned purchase orders to a later date, if it is not necessary to receive the item as early as the planned order date specifies.

6.3.2.2 Master Planning Parameters

Parameters for master planning are available on the form *Master planning> Setup> Master planning parameters*. One of the core settings concerns the planning strategy: If applying a one master plan strategy, you have to enter the same master plan in the field for the *Current static master plan* and the *Current dynamic master plan*.

If applying a two master plan strategy, you want to select different master plans. In addition, you may want to select the checkbox *Automatic copy* to reset the dynamic plan to the status of the static plan when running master scheduling.

Master planning parameters also contain the *General coverage group*. This group applies for items, which do not include a coverage group in the released product.

6.3.2.3 Warehouse Settings

If master scheduling should not include the quantity in inventory of certain warehouses – e.g. a consignment stock managed by the customer – you may select

the checkbox *Manual* on the tab *Master planning* of the warehouse form (*Inventory and warehouse management> Setup> Inventory breakdown> Warehouses*).

You may additionally select in the warehouse form, if the warehouse should be refilled from another warehouse (main warehouse). Master scheduling will generate item transfer proposals, if the item concerned is assigned to a storage dimension group, for which the checkbox *Coverage plan by dimension* is selected in the dimension “Warehouse”.

6.3.3 Item Coverage and Item Settings

Coverage groups as well as item settings control the calculation of lot sizes and dates of planned orders, generated by master scheduling.

6.3.3.1 Coverage Group

In order to access coverage group management, you may choose the menu item *Master planning> Setup> Coverage> Coverage groups*.

Figure 6-9: Selecting the coverage code in a coverage group

The core setting of a coverage group is the coverage code, which specifies the coverage principle. The coverage principle controls, how requirements summarize into a planned order.

6.3.3.2 Coverage Principle and Period Settings

In Dynamics AX, the following options are available for the coverage principle as shown in Figure 6-10:

- Period – Summarizing requirements within the coverage period
- Requirement – Planned order per requirement (“Make-to-Order”)

- Min./Max. – Replenishing to the maximum quantity when inventory drops below the minimum quantity
- Manual – Planned orders are not generated in master scheduling

Master scheduling generates a planned order, if the calculated inventory at a date is below the minimum quantity or below zero, if a minimum quantity is not recorded in the item coverage of the released product.

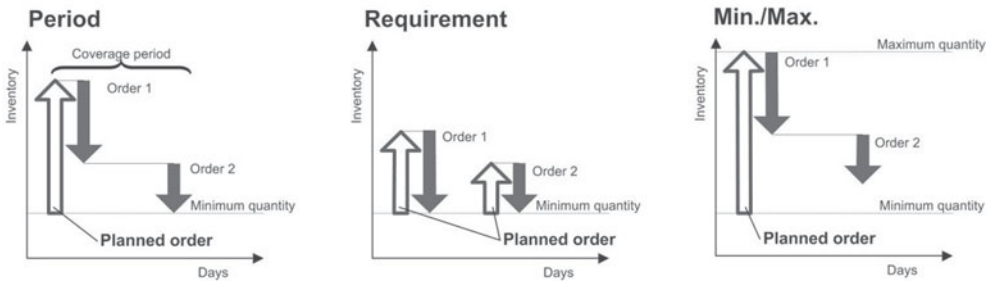


Figure 6-10: Coverage principles in Dynamics AX

The *Coverage time fence* as well as the time fence fields on the tab *Other* of the coverage group form define the periods included in master scheduling. Depending on the planning strategy and the lead-time of the items, the number of days entered in the time fence fields will cover some weeks or months.

The *Positive days* on the tab *General* sets the time fence to include the current quantity in inventory for covering requirements and should correspond to the lead-time or the coverage time fence depending on the order history.

On the tab *Other*, the *Firming time fence* determines the period, for which master scheduling does not create a planned order but an actual purchase or a production order. If no main supplier is available in the item record or the applicable trade agreement (supposing the checkbox *Find trade agreement* in the master planning parameters is selected), master scheduling will generate a planned purchase order within the firming time fence instead of a purchase order.

6.3.3.3 Forecast Plan Calculation and Reduction Keys

Concerning forecasts, settings in the coverage group (tab *Other*) include the time fence for forecasts as well as forecast reduction.

Reduction keys (*Master planning> Setup> Coverage> Reduction keys*) control the periods and percentages applied for reducing forecast figures in the course of time. As a prerequisite for applying the reduction key selected in the coverage group, the reduction principle in the master plan has to refer to reduction keys.

Choosing the option “All transactions” in the lookup *Reduce forecast by* of the coverage group you may offset forecasts not only by sales orders, but also by all issue transactions. This setting is required for semi-finished items constituting customer order decoupling points (see section 6.3.1).

6.3.3.4 Action and Futures Messages

Action messages activated on the tab *Action* of the coverage group form are messages from master scheduling to adjust purchase and production orders as well as planned orders. The aim of action messages is to optimize quantities and dates of item receipts.

Unlike futures messages, action messages only show proposals for optimizing (like postponing a purchase order, which is too early). Item availability is granted, no matter if you disregard action messages.

If you choose to apply futures messages on the tab *Futures*, you may select "Requirement date" in the lookup field *Basis date* on the tab *Action*. In this case, actions will be based on the date the item is actually required.

Futures messages show actual problems of item availability, which will cause delays in order fulfillment.

6.3.3.5 Coverage Group Assignment

You may assign a *Coverage group* to an item on three different levels. Master scheduling will identify the applicable coverage group in following order:

- Item coverage – Button *Coverage/Item coverage* on the action pane tab *Plan* of the released product form
- Released product – Tab *Plan* on the released product detail form
- Master planning parameters – *General coverage group* on the tab *General*

Since lot sizes and therefore the coverage principle depend on the cost price and the lead-time of an item, you should group items with similar characteristics to coverage groups.

6.3.3.6 Dimension Group Settings

Settings in the storage and tracking dimension groups specify the inventory dimensions covered separately in master scheduling. The dimension groups of an item therefore determine if master scheduling calculates specific requirements per – for example – warehouse.

You may access dimension groups in the in the menu path *Product information management> Setup> Dimension groups*, selecting the checkbox *Coverage plan by dimension* for storage and tracking dimensions to be calculated separately in master scheduling. For the dimension *Site*, the checkbox is always selected.

In order to assign dimension groups to an item, you want to click the button *Set up/Dimension groups* on the action pane tab *Product* of the shared or released product (see section 7.2.1).

6.3.3.7 Item Coverage

In addition to the coverage group and the dimension group, the item coverage is another important setting for master scheduling.

Clicking the button *Coverage/Item coverage* on the action pane tab *Plan* of the released product form, you may access the item coverage form where you may enter a minimum and – if applicable – a maximum quantity for the item. Depending on the dimension groups of the item and applicable dimension group settings (see above) you may register item coverage settings per site, warehouse or other dimensions like color or configuration.

In the item coverage form, you may – for example – enter specific settings for an item on a certain warehouse, on the tab *General* selecting a coverage group which is different to the coverage group in the released product form. In addition, you may choose a different main vendor and a different planned order type, for example purchasing the item from an external vendor for one specific warehouse but producing it internally for other warehouses.

The lookup field *Minimum key* on the tab *General* enables recording a seasonal trend for the minimum quantity. If selecting a minimum key, you may check the results on the tab *Min./Max.* of the item coverage form.

In order to set up minimum keys, you may access the form *Master planning> Setup> Coverage> Minimum/Maximum keys*, entering a factor per period.

6.3.4 Master Scheduling and Planned Orders

Master scheduling is required to generate planned orders for purchasing, production and inventory transfer, based on item requirements and coverage settings.

You may run master scheduling on two different occasions:

- Local master scheduling – Availability check, e.g. in a sales order line
- Global master scheduling – Regular master scheduling for all items

6.3.4.1 Global Master Scheduling

In daily business, global master scheduling is the basis for releasing orders in purchasing and production. You may start global master scheduling choosing the menu item *Master planning> Periodic> Master scheduling*. Depending on the company size and item structure, master scheduling involves extensive calculations causing a heavy server load. Usually it runs as a batch job in the nighttime.

In the update form of master scheduling, you need to select the *Master plan* – for global master scheduling usually the current static master plan. You do not need to run the current dynamic master plan separately, if the checkbox *Automatic copy* in the master planning parameters is selected.

The second selection in the master scheduling update form is the calculation principle, for which you may choose between following options:

- Regeneration – Complete calculation, deleting all existing planned orders
- Net change – Generating action and futures messages for all requirements, but planned orders only for new requirements
- Net change minimized – Like net change, limiting new messages to new requirements

When selecting the static plan, only the principle “Regeneration” is available. In order to apply current data to scheduling, you should also choose “Regeneration” for dynamic plans if there are changes of coverage settings like the minimum quantity in items.

On the tab *Scheduling helper* of the update form, you may choose settings for distributed master scheduling on several servers.

6.3.4.2 Local Master Scheduling

Unlike global master scheduling, local master scheduling is there to check item availability and possible delivery dates limited to a selected item. You may execute local master scheduling in the net requirements form, which is accessible clicking the button *Requirements/Net requirements* on the action pane tab *Plan* of the released product form or clicking the button *Product and supply/Net requirements* in the action pane strip of order lines.

The net requirements form shows the result of the last master scheduling calculation for the dynamic master plan. If a one master plan strategy is in place, the lines shown are identical to those used in purchasing and production control. If the master planning parameter *Automatic copy* is selected, this also applies for a two master plan strategy as long as no local master scheduling has been executed and the static plan has not been edited.

Clicking the button *Update/Master scheduling* in the net requirements form, you may start local master scheduling. Local master scheduling updates the current dynamic master plan for the selected item and its components. When looking at the results, you need to take into account that not all dependencies of other items are covered by the calculation, in particular regarding resource capacity requirements.

6.3.4.3 Planned Orders

Master scheduling generates planned orders, which you may access in the list page *Master planning> Common> Planned orders*. When accessing the planned orders list page, the default plan is the current static master plan. In the lookup *Plan*, you may select the current dynamic or any other master plan.

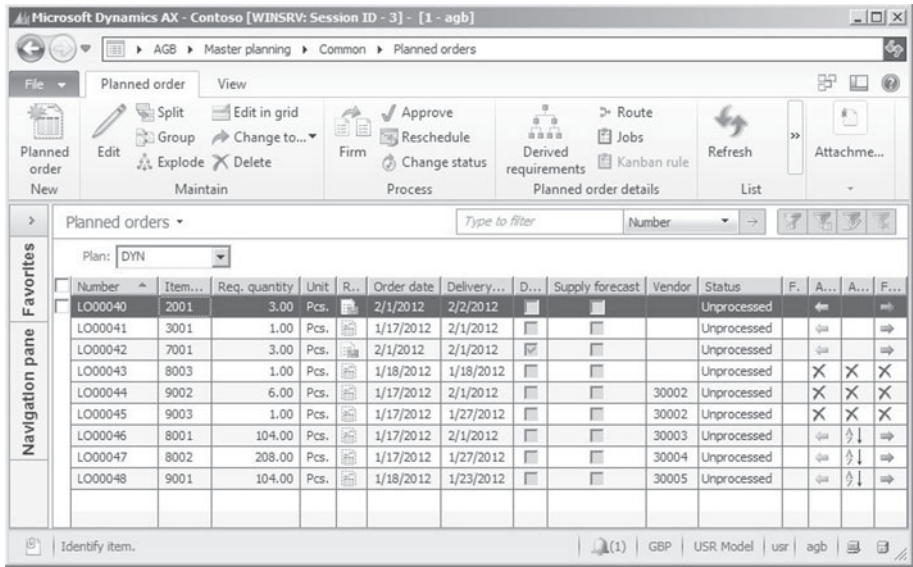


Figure 6-11: Planned orders in the planned orders list page (preview pane hidden)

In the master planning menu, the planned order form shows planned orders for purchasing, for production and for inventory transfers. The icons in the column *Reference* and the field *Reference* in the preview pane or in the detail form show if a line contains a planned order for production, sales or inventory transfer.

In procurement, the menu item for planned orders (*Procurement and sourcing*> *Common*> *Purchase orders*> *Planned purchase orders*) refers to planned purchase orders, in production control (*Production control*> *Common*> *Production orders*> *Planned production orders*) to planned production orders.

Apart from the delivery date and the requirement quantity, the planned orders list page displays action and futures messages in the columns on the right side. Accessing the planned order detail form by double-clicking a planned order in the list page, you may view action and futures message details on the tabs *Action* and *Futures*. The tab *Pegging* of the detail form shows the requirements covered by the specific planned order – e.g. sales orders, BOM lines of production orders, demand forecasts or safety stock.

6.3.4.4 Firming an Order

You may edit the delivery date and the quantity on the tab *Planned supply* of the planned orders detail form. For planned purchase orders, you need to make sure that a vendor number is registered in the lookup *Vendor*.

If your company applies status management before firming planned orders, you may change the status by clicking the button *Process/Change status* or *Process/Approve* on the action pane tab *Planned order* or by directly editing the lookup field *Status* on the tab *General* of the planned orders form.

After selecting one or several planned orders in the planned orders list page, you may generate purchase orders, production orders and transfer orders clicking the button *Process/Firm* on the action pane tab *Planned order*. If you want to create a request for quotation (see section 3.4.4) instead of a purchase order, you may choose the button *Maintain/Change to/Request for quotation*.

6.3.4.5 Net Requirements and Explosion

In order to get an overview of the net requirements related to a planned order, you may click the button *Requirements/Requirement profile* on the action pane tab *View* of the planned order form. The requirement profile shows the net requirements form, which is the common form also available to show net requirements in the released product form or the order lines.

Explosion (1 - agb) - Item number: 2001, LO00040, Reference: Planned production orders/number: LO00040

File

Principle: Down Transfer futures date Reread Update Gantt

Reference	Number	Site	Warehouse	Requirement date	Req. quantity	Requested date	Futures date
Planned production orders	LO00040	HQ	10	2/2/2012	3.00	1/19/2012	2/2/2012

Overview Gantt Action Critical on-hand inventory

V2400S V-Link Video 2.4 GHz / 2001 / Planned production orders

- Video unit V2400S / 8003 / On-hand
- Video unit V2400S / 8003 / Inventory journal
- Housing incl. mounted parts for M2400S / 7001 / Planned production orders (dynamic)
- Video unit V2400S / 8003 / Planned purchase orders

Planned orders Explosion Update line Inquiries Inventory Setup

Level	Reference	Reference	Number	Requirement date	Requested date	Futures date	Req. q
1		Planned production orders	LO00042	2/1/2012	1/18/2012	2/1/2012	
1		Planned purchase orders	LO00043	1/18/2012			

Pegging

Direction of explosion (2) GBP USR Model usr agb Close

Figure 6-12: The explosion form to analyze availability for a BOM structure

The button *Requirements/Explosion* on the action pane tab *View* of the planned order form opens another inquiry form, which is available in order lines as well. This form – the explosion form – shows the item availability including components of all BOM levels.

If you select “Down” in the lookup field *Principle* at the top of the explosion form, the form shows semi-finished items and raw materials or parts of all BOM levels for the selected item. If you select “Up” in the principle, the form will show a where-used analysis.

6.3.5 Case Study Exercises

Exercise 6.3 – Min./Max. Principle

You want to apply a Min./Max. coverage principle to your finished item of exercise 5.2. Select an appropriate coverage group in the released product form and enter a minimum quantity of 500 units and a maximum quantity of 1000 units in the item coverage of the item.

Once you have finished, you want to run local master scheduling in the net requirements form and check the result. In a second step, change the minimum quantity to one unit. After running local master scheduling a second time, can you explain the result?

Exercise 6.4 – Period Principle

You want to apply a coverage principle summarizing requirements per period for your finished item of exercise 5.2 now. Choose an appropriate coverage group in the item record and delete the Min./Max. record in the item coverage.

Your customer of exercise 4.1 orders 100 units of the finished item. Enter a sales order for this requirement without posting a packing slip or invoice.

You may run local master scheduling in the net requirements form now. Check the results and enter a second order of your customer containing 150 units of the finished item for the same delivery date as the first order.

Start local master scheduling a second time and check the result again.

7 Inventory Management

The primary responsibility of inventory and warehouse management is to control the item stock by quantity and value. To meet this task, you may change inventory in Dynamics AX only by posting inventory transactions, which you need to register in vouchers before.

The current quantity in inventory therefore always is the total of item issue and receipt transactions. Most of the transactions are not a result of business processes within the inventory management module – they are created automatically in other modules. Dynamics AX for example in parallel posts a receipt transaction in inventory when you record and post a product receipt in the procurement module.

7.1 Principles of Inventory Transactions

Before we start to go into detail, the lines below show the principles of transactions in inventory management.

7.1.1 Basic Approach

Core master data in inventory management are product records of inventoried items. Inventory management controls stock per item number. Depending on the dimension groups assigned to the specific product, you may break down the item quantity and value by up to nine dimensions. These dimensions include storage dimensions (e.g. warehouse or location), tracking dimensions (e.g. serial numbers) and product dimensions (e.g. configurations).

7.1.1.1 Types of Transactions

In order to change the quantity on hand, you need to post an item transaction. Depending on the direction of the item transactions, you may distinguish three different types:

- Item receipts – Inward transactions
- Item issues – Outward transactions
- Inventory transfers

Item receipts increase the quantity on hand. They include product receipts in purchasing, customer returns in sales, reporting as finished in production as well as positive inventory counting adjustments and manual journals in inventory.

Item issues on the other hand include vendor returns in purchasing, packing slips in sales, picking lists in production as well as negative inventory counting adjustments and manual journals in inventory.

Inventory transfers include transfer orders and transfer journals. Transfer orders support the transfer of items from one warehouse to another, providing the option to post and print picking lists. Transfer journals on the other hand are not only available for transfers from one warehouse to another, but also for changing other dimension values (e.g. adjusting a serial number).

Although you have to enter the complete transaction in a single line when recording a transfer in a transfer journal, the posted transactions will show two lines: One for the item issue from the old warehouse and one for the item receipt at the new warehouse (instead of warehouses, other dimensions may apply).

7.1.1.2 Transaction Integration

As mentioned at the beginning of this chapter, most of the inventory transactions do not originate in the inventory and warehouse management module, but derive from other parts of Dynamics AX. Therefore, you have to enter all data required for the inventory transaction (like warehouse, quantity and price) at the transaction origin in the other module – e.g. in the purchase order.

When looking at a posted inventory transaction in Dynamics AX, you may view the reference to the transaction origin including voucher number and date.

7.1.1.3 Inventory Quantity and Value

In order to grant an accurate inventory valuation, Dynamics AX distinguishes between the physical transaction (affecting quantity) and the financial transaction (affecting valuation).

For illustration purposes, Figure 7-1 shows the physical and the financial part of an inventory transaction related to a purchase order line.

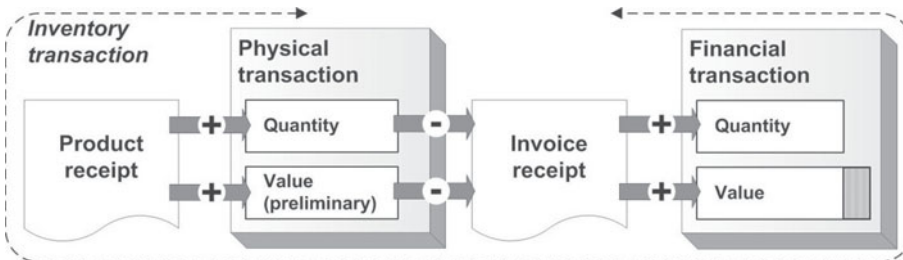


Figure 7-1: Physical and financial transaction in inventory for a purchase order line

The physical transaction in Dynamics AX causes a change of the quantity on hand in inventory. As an example in purchasing, posting the product receipt posts the physical transaction.

In terms of inventory quantity, the transaction is already finished when posting the product receipt. Inventory valuation only receives a preliminary cost price, however. The value of the product receipt shows in the field *Physical cost amount* separate from the field *Cost amount*, which shows the inventory value in finance.

The second part of the inventory transaction is the financial transaction, which contains the cost amount referring to the invoiced quantity. As an example in purchasing, the financial transaction is generated when posting the vendor invoice.

In detail, posting the vendor invoice reverses the related preliminary posting of the product receipt (physical amount) and posts the cost amount of the invoice. Quantity and amount of the invoice are included in the financial inventory value.

7.1.1.4 Transaction Vouchers

The differentiation between the physical and the financial transaction applies to every inventory transaction, no matter in which module it originates. The way of posting depends on the origin, however.

For receipt transactions in purchase orders, posting the product receipt generates the physical transaction and posting the vendor invoice the financial transaction.

In production, reporting as finished of finished items posts the physical transaction. The financial transaction posts when you end the production order.

For issue transactions in sales orders, the packing slip posts the physical and the invoice the financial transaction similar to purchasing.

In production, posting the picking list of BOM components posts the physical transaction. As with receiving finished items, the financial transaction of BOM components posts when you end and cost the production order.

Unlike the other transactions, journals in inventory management do not post physical and financial transaction in two separate steps, but in parallel.

7.1.1.5 Inventory Closing

Receipt transaction got their final financial value when posting the invoice (except for later manual adjustments). The financial value of issue transactions frequently is not known, however, and therefore not final when posting the invoice. As an example, you may receive a purchase invoice after posting the related sales invoice. If the purchase invoice shows a higher price than the preliminary amount posted with the product receipt, the contribution margin of the sales transaction will change.

Except for items referring to a standard cost prize, you need to reevaluate issue transactions in an inventory closing procedure. The main purpose of inventory closing, usually running at the end of each month, is to recalculate the financial value of issue transactions based on the value of receipt transactions.

7.1.1.6 Ledger Integration

Inventory journals post to general ledger accounts depending on applicable settings (see section 8.4) in the same way as inventory transactions generated in other modules.

7.1.2 At a Glance: Inventory Journal Transactions

Inventory journals are available to record a manual change of the quantity on hand in inventory, independent from orders in purchasing, sales or production. For your convenience, the example below shows a manual item receipt in an inventory adjustment journal. In regular business, such transactions will be an exception, since problems or missing end-to-end business processes are the reason for receiving an item without a purchase, production or customer return order in most cases.

If you want to access an inventory journal for manual adjustments, you may choose the form *Inventory and warehouse management> Journals> Inventory adjustment*. Inventory journals are vouchers and therefore consist of a header and a lines part. Unlike purchase or sales orders, inventory journals do not show header and lines in a common form. Header and lines show in two separate forms.

In order to register a transaction, you want to insert a record in the journal form choosing the keyboard shortcut *Ctrl+N* or the button *New* in the action pane strip. In the next step, you need to select a journal name in the column *Name*. The journal number in the column *Journal* defaults from the number sequence.

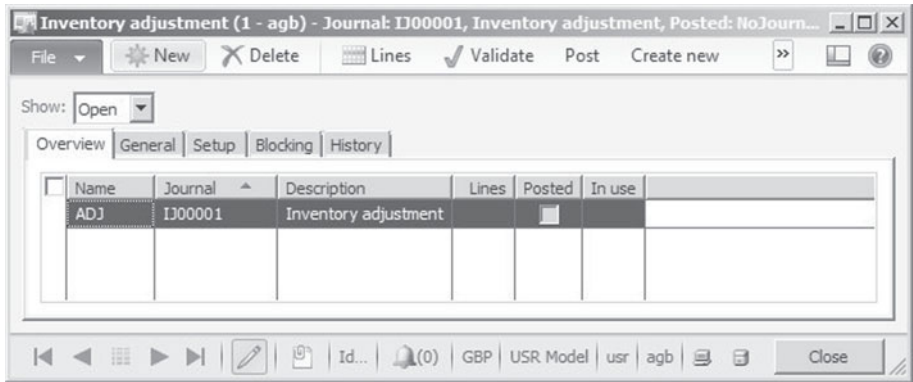


Figure 7-2: Entering a journal header in the inventory adjustment journal form

If you want to support later analysis, you may enter a short text explaining the transaction in the column *Description*. The column *Lines* shows the number of registered lines of a journal.

If somebody works in a certain journal currently, the journal shows a red "X" in the column *In use*. You may see the user blocking the journal on the tab *Blocking*. It is not possible to access the line of that journal until the other user leaves the journal concerned.

The checkbox *Posted* shows a checkmark, if a journal has been posted already. You may view posted journals after selecting "All" or "Posted" in the lookup field *Show* at the upper part of the form.

As an alternative way for creating a journal, you may click the button *Create new* in the action pane strip to insert a header record and immediately switch to the lines. If not using the *Create new* feature, you need to click the button *Lines* in order to access the journal lines.

In the journal lines form, you may select the item number before registering site, warehouse and other dimensions like batch number or locations depending on the settings of applicable dimension groups. In order to control which dimension columns display in the lines, you may click the button *Inventory/Dimensions display*.

Date	Item number	Site	Warehouse	Batch number	Location	Quantity	Cost price	Cost amount	Log
12/23/2011	4001	HQ	10			10.00	2.93	29.30	

Figure 7-3: Registering a journal line

Defaults for warehouse, quantity and cost price derive from the item record. The default for the quantity is 1.00, if the released product (default or site-specific order settings) does not contain a default inventory quantity. You may override all defaults except the cost price of standard cost items.

If you enter a positive quantity, the transaction will be an item receipt, whereas a negative quantity shows an item issue.

Inventory journals post the physical and the financial transaction at the same time – unlike transactions in purchasing, no separate financial transaction from an invoice applies. Therefore, you need to ensure a correct cost price in the journal line when registering such a journal in particular when posting an item receipt.

In order to post the journal after entering the last journal line, you may click the button *Post* in the journal header or lines.

Before posting, you may click the button *Validation* running a check of posting problems. The validation does not check all possible problems, however, which is why you may receive an error message when posting on rare occasions, even if the validation does not show a problem.

7.2 Product Information Management

Since all business processes related to inventory require inventoried products, product data are the core element of master data in supply chain management.

The data structure of products in Dynamics AX shows two levels – shared products holding basic item data common to all companies, and released products holding company-specific item data.

Product records contain all physical items including raw materials, parts, semi-finished products and finished products. In addition, product records also include non-inventoried items like service or phantom items, which do not exist physically, but are required in order management or bills of materials.

In some areas of the application, the label “Item” refers to released products.

7.2.1 Product Master Data

Product master data have been discussed in section 3.3, 4.3, 5.2.1 and 6.3.3 already, referring to the options required in purchasing, sales, production and master planning. This section does not include these topics, therefore. Apart from general features of the product and released product form, the focus in this section is on item data in inventory and on inventory valuation.

7.2.1.1 Structure of Product Data

In order to view shared products, you may access the form *Product information management> Common> Products> All products and product masters* showing a list of products available in any company. Core data in the shared products (common for all companies) include product number (deviating product number for a company possible), product type and subtype (non-inventoried, inventoried or configurable item) and dimension groups (if shared).

Essential item data on company level, available in the released product records (*Product information management> Common> Released products*), are dimension groups (if not shared) as well as the item group and the item model group.

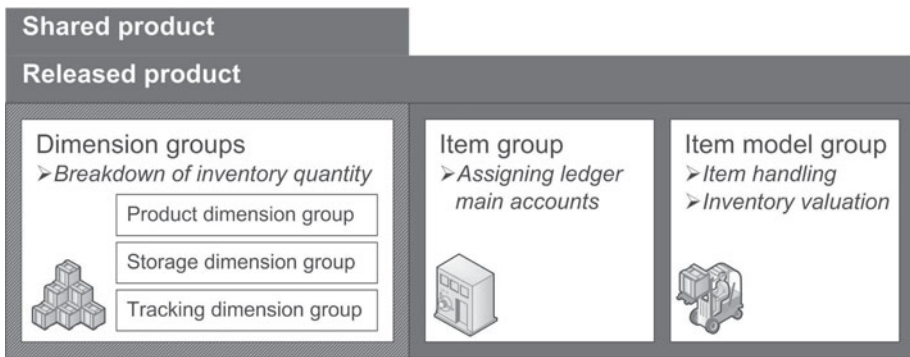


Figure 7-4: Main control groups of a product

7.2.1.2 Creating a Product

Depending on the requirements in your company, there are two ways for creating a new product (see section 3.3.2):

- Start with shared product – Create a shared product and release it.
- Start with released product – Create a product in the released product form, automatically generating a shared product in the background.

When creating a product, the product number needs to be unique and inserts automatically. Depending on the setting of the number sequence for item numbers (*Product information management> Setup> Product information management parameters*, tab *Number sequences*), manual assignment may as well be necessary, however.

In order to create an item in the shared product form, you want to click the button *New/Product* in the action pane. When releasing the product, you may click the button *Release products* in the action pane and select applicable companies on the tab *Select companies* of the release product dialog.

The released product is available through the appropriate menu item, or directly from the shared product clicking the link *More* in the factbox *Authorized by company* and then applying the table reference (*View details*) on the column *Item number* in the dialog. You might need to refresh the shared product form (button *F5*) to view released products in the factbox before.

In order to ensure the released product contains all required data and groups mentioned above, you may click the button *Maintain/Validate* on the action pane tab *Product* of the released product form.

If templates (see section 2.3.2) are available for released products, you may populate fields of the released product record by clicking the button *Maintain/Apply template* on the action pane tab *Product*. In order to create a template in the released product detail form, you have to click the button *New/Template*.

7.2.1.3 Product Name

The default for the product name and the search name derives from the product number. You may override the default, entering a short text in the product name.

The place to enter a longer description is the field *Description*. If you require descriptions in foreign languages, you may click the button *Translations* in the action pane of the shared product form.

7.2.1.4 Product Type and Subtype

The *Product type* controls, if a product is an inventoried item: Whereas the product type “Item” refers to regular items, the product type “Service” specifies an item non-inventoried in all companies.

The *Product subtype* refers to item configuration: Whereas the product subtype “Product” specifies a regular unique item, the product subtype “Product master” is the base item for assigned product variants.

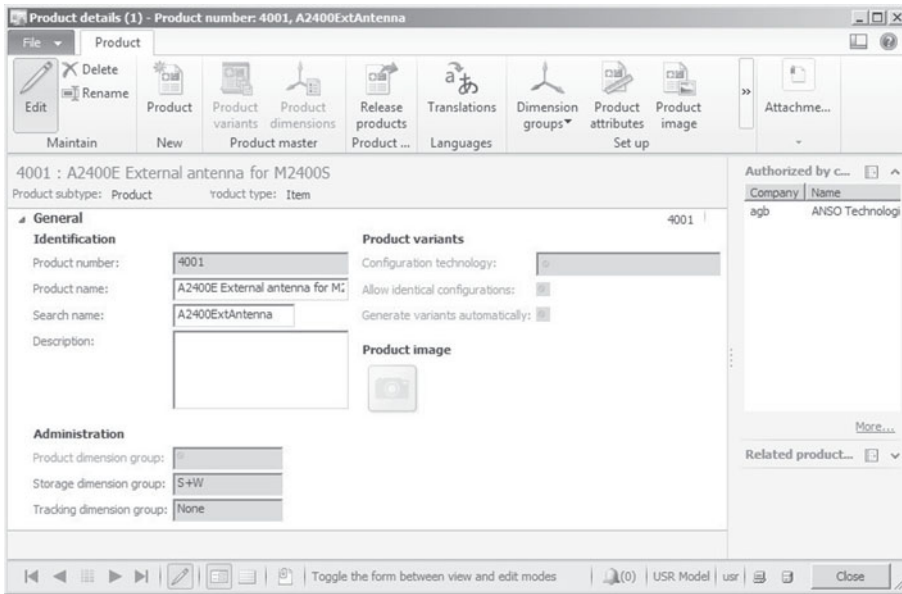


Figure 7-5: Managing an item in the shared product form

7.2.1.5 Product Master

If choosing the product subtype “Product master”, the product number does not uniquely specify the item on stock. Transactions require defining product variants in this case, distinguishing different sizes, colors or configurations of a product.

When creating a product master, the *Product dimension group* – one of the three dimension groups discussed in section 7.2.2 – is available in the *Create product* dialog. It has to be selected on shared product level in order to specify which of the dimensions *Size*, *Color* and/or *Configuration* apply.

The *Configuration technology*, which is the second data field you need to register when creating a product master, specifies the way to create product variants.

If selecting the configuration technology “Predefined variant”, you may enter dimension values (available dimensions are specified by the product dimension group) after clicking the button *Product master/Product dimensions* in the shared product. In the next step, you have to specify available variants clicking the button *Product master/Product dimensions* in the shared product.

Before choosing a product variant in a transaction, you have to release it clicking the button *Release products* in the action pane of the shared product and selecting it in the release product dialog. Releasing product variants may be done in parallel to releasing the product master itself or at a later time.

7.2.1.6 Non Inventoried Items and Services

Apart from regular products, for which you want to manage inventory transactions and the quantity on hand, there are items – e.g. services or office supplies – for which you do not want to track inventory.

Dynamics AX provides two separate options specifying whether inventory control applies to a product:

- Product type – Product type “Item” or “Service”
- Item model group – Checkbox *Stocked product* selected or deselected

Depending on the combination of both settings, inventory control works different (see Table 7-1).

Table 7-1: Options for the inventory control of products

	Product type Item	Service
Item model group		
Stocked product	Inventory transactions, inventory quantity	Inventory transactions, no quantity
Non-stocked product	No transactions	No transactions

The product type “Service” applies to products, which do not show inventory quantity in any company. If assigned to an item model group for stocked products, products of this type show inventory transactions, however. This setting is required for intangible items which are used as part of a BOM.

When setting up items of the product type “Service”, you have to assign a specific item group and item model group to grant correct inventory valuation and ledger postings.

Linking a released product to an item model group, which got the checkbox *Stocked product* deselected, will not only avoid showing inventory quantity but also prevent inventory transactions. Since the item model group is assigned to the released product, this setting enables to specify inventory control for an item individually per company.

7.2.1.7 Essential Settings in Released Products

Whereas dimension groups are assigned either on shared product or on released product level (except the *Product dimension group*, which is only available on shared product level for product masters), other core settings like the *Item group* or the *Item model group* are only available in released products.

Other essential product data available in the released product are the sales tax groups, the units of measure and the cost price.

7.2.1.8 Item Group

The main purpose of item groups is to classify products, which should post to common ledger main accounts in finance. Therefore you will need at least as many

item groups, as there are different stock and revenue accounts for inventory items in finance. You may find more details on the inventory posting setup in section 8.4.2.

When releasing a product, you have to keep in mind that you should not change the item group after registering the first transactions of the released product. Dynamics AX displays a warning but does not prevent you from changing the item group, saying that it will cause issues in finance when doing inventory reconciliation, if you do not carefully check the consequences of changing the group in the particular case.

Item groups do not only control ledger integration, they also are a filtering and sorting criteria in many reports.

7.2.1.9 Units of Measure

Units of measure are shared across companies. If you require a new unit of measure, you have to set it up in the units form (*Organization administration* > *Setup* > *Units* > *Units*) before you may assign it to a released product.

The *Unit class* (e.g. “Quantity” or “Weight”) specifies the area to which a unit of measure applies. For one unit within every unit class, you may select the checkbox *System unit* in order to apply this unit to fields not associated to a specific unit of measure (e.g. the net weight field in the released products).

Clicking the button *Unit conversions* in the action pane of the units form you may enter a unit conversion calculation. Conversion factors between two units entered on the tab *Standard conversion* apply to all products. On the tab *Intra-class conversions*, you may enter conversions per product number within a *Unit class*.

When releasing a new product, Dynamics AX applies the default unit available in the inventory management parameters (*Unit* on the tab *General*). As a prerequisite for entering transactions, the unit of measure has to be specified in a released product. Once inventory transactions are recorded for an item, you may not change the inventory unit.

If the units of an item are not the same in purchasing, sales, and inventory, you may assign different units on the tabs *Purchase*, *Sell* and *Manage inventory* of the released product form. The applicable unit in the released product defaults to transactions entered for the item, e.g. in a sales order line. If necessary, you may select a different unit in the order line. When choosing a different unit, the selected unit requires a unit conversion to the inventory unit.

7.2.1.10 Number Groups

When entering a batch or serial number in a transaction, the number needs to be available in the batch or serial numbers table (*Inventory and warehouse management* > *Inquiries* > *Dimensions*). If you want Dynamics AX to generate batch or serial

numbers automatically, you need to enter appropriate groups in the number group form (*Inventory and warehouse management*> *Setup*> *Dimensions*> *Number groups*).

On the tab *General* of the number group form, you may specify the structure of related numbers and assign a number sequence. In addition, you may specify which transaction should generate numbers.

Figure 7-6: Managing number groups for batch and serial numbers

In the released product form, the *Tracking dimension group* (button *Dimension groups* on the action pane tab *Product*) controls, if batch or serial numbers apply to an item. If tracking dimensions apply, you may select a batch or serial number group on the tab *Manage inventory* of the released product which will generate batch or serial numbers for the item automatically.

7.2.1.11 New in Dynamics AX 2012

In Dynamics AX 2012, product master data management shows in a separate module implementing the concept of shared products and released products (former “Items”).

7.2.2 Inventory Dimension Groups

Inventory dimensions control the breakdown of inventory quantity within released products. Applying dimensions, you may separate inventory quantity and transactions to a more detailed level than the item number.

Inventory dimensions in Dynamics AX therefore are a prerequisite to show the quantity of an item on a certain warehouse or of a certain color.

7.2.2.1 Available Dimensions

Dynamics AX contains nine inventory dimensions, separated into three groups:

- Product dimensions – Configuration, size and color show characteristics of an item (only available for product masters).
- Storage dimensions – Site, warehouse, location and pallet apply to inventory structures.
- Tracking dimensions – Batch number and serial number control tracking options.

The product dimensions *Size* and *Color* may receive a different name by clicking the button *Rename* in the product dimension groups form. Product dimensions and the storage dimension *Pallet ID* are not available, if the appropriate configuration key in the system administration is not active.

If you record an inventory transaction of an item, the dimension groups of the item controls which inventory dimension you need to insert. If the batch number dimension is active in the tracking dimension group of the item as an example, you need to enter batch numbers.

7.2.2.2 Dimension Groups and Settings

Name	Description
S+W	Site and warehouse
Site	Site

Name: S+W
Description: Site and warehouse

Warehouse specific setup
Mandatory: ☒
Primary stocking: ☒

Name	Active	Blank receipt allowed	Blank issue allowed	Physical inventory	Financial inventory	Coverage plan
Site	☒	☐	☐	☒	☒	☒
Warehouse	☒	☐	☐	☒	☒	☒
Location	☐	☐	☐	☐	☐	☐
Pallet ID	☐	☐	☐	☐	☐	☐

Dimension name

Close

Figure 7-7: Managing storage dimension groups

In order to access dimension group management you may choose the menu path *Product information management> Setup> Dimension groups* and select the option *Product dimension groups*, *Storage dimension groups* or *Tracking dimension groups* there. The different dimension group forms for the three dimension groups look similar except for the available dimensions (product, storage or tracking dimensions). As shown in Figure 7-7 on the example of the storage dimension group form, the dimension group form shows the list of dimension groups on the left pane. On the right pane of the form, you may access the inventory dimension settings for the dimension group selected on the left pane.

If you need an additional dimension group, you have to insert a new record clicking the button *New* in the action pane strip. The next step is to set up the inventory dimensions of the new dimension group selecting the checkboxes as explained in Table 7-2.

Table 7-2: Available settings for inventory dimensions in a dimension group

Parameter	Explanation
Active	Dimension available for transactions of the item
Primary stocking	Mandatory dimension for reservation; in addition displays in the on-hand inquiry as default dimension
Blank receipt allowed	Dimension value not required for inward transactions
Blank issue allowed	Dimension value not required for outward transactions
Physical inventory	Item availability per dimension value (depending on the item model group, no negative inventory e.g. per batch number)
Financial inventory	Inventory value per dimension values (necessary for calculating value and cost price, e.g. per batch number)
Coverage plan by dimension	Separate item coverage in master planning per dimension value (see section 6.3.3)
For purchase prices	Dimension available for purchase price agreements (see section 3.3.3)
For sales prices	Dimension available for sales price agreements

In storage dimension groups, the dimension *Site* (see section 9.1.6) is always active, requiring registering sites in every inventory transaction. For the dimension *Warehouse*, the additional parameter *Mandatory* specifies if the warehouse has to be entered in every transaction.

In product dimension groups, only the parameters *Active*, *For purchase prices* and *For sales prices* are available.

7.2.2.3 Setting up Dimension Groups

In order to avoid invalid dimension values in posted transaction, it is not possible to change inventory-related settings of a dimension group once a transaction refers to the dimension group. For the same reason, it is not possible to change the dimension group of an item, if there is an inventory quantity or open transaction.

If you need to change dimension settings for an item, you may post transactions issuing the complete stock physically and financially. After inventory closing, you may assign the new group and post transactions according to the stock actually on hand in the warehouse.

When setting up dimension groups, you should activate only dimensions actually required in your business processes. In addition, you should apply a limited number of dimension groups. System load, complexity and time for registration increase with the number of dimensions in use.

On the other hand, you need to activate all dimensions required. As an example, you may see the quantity on hand per warehouse location only if the dimension *Location* is active for the items concerned. If you need a certain dimension for some, but not all transactions of an item, the best way is to apply a pseudo-value for transactions where the dimension is not applicable. As an example, if warehouse locations are not applicable to all of your warehouses, you may insert a pseudo-location providing a default for warehouses without locations.

7.2.2.4 Dimension Display

When looking at reports and inquiries of inventory quantity and inventory value, you need to take into account that only those queries show a reliable result, which comply with the dimension setup.

Therefore, it is not useful to report inventory value and cost price per warehouse, if the checkbox *Financial inventory* is not selected in the applicable storage dimension group. The reason for this is that inventory valuation –with that setting – does not link item issue transactions with item receipt transactions per warehouse separately, causing a result different to what you expect.

The default for displaying dimension columns in forms – e.g. the order lines in the sales order form – is available on the tab *Inventory dimensions* in the parameters form of all relevant modules (e.g. *Accounts receivable> Setup> Accounts receivable parameters*).

When showing a form you may change the display of dimension columns clicking the appropriate button in the action pane strip – e.g. *Sales order line/Display/Dimensions* in the sales order lines or *Inventory/Dimensions display* in inventory journal lines.

7.2.2.5 New in Dynamics AX 2012

In Dynamics AX 2012, inventory dimension groups are split to three different groups according to their purpose – product, storage and tracking dimensions.

7.2.3 Item Model Groups

Item model groups include settings for the valuation method on the one hand and for item handling on the other hand. They are very important for inventory valuation and ledger integration, therefore.

You may access the form to manage item model groups selecting the menu item *Inventory and warehouse management> Setup> Inventory> Item model groups*. The left pane of the item model group form displays a list of available groups, for which the right pane contains the particular settings.

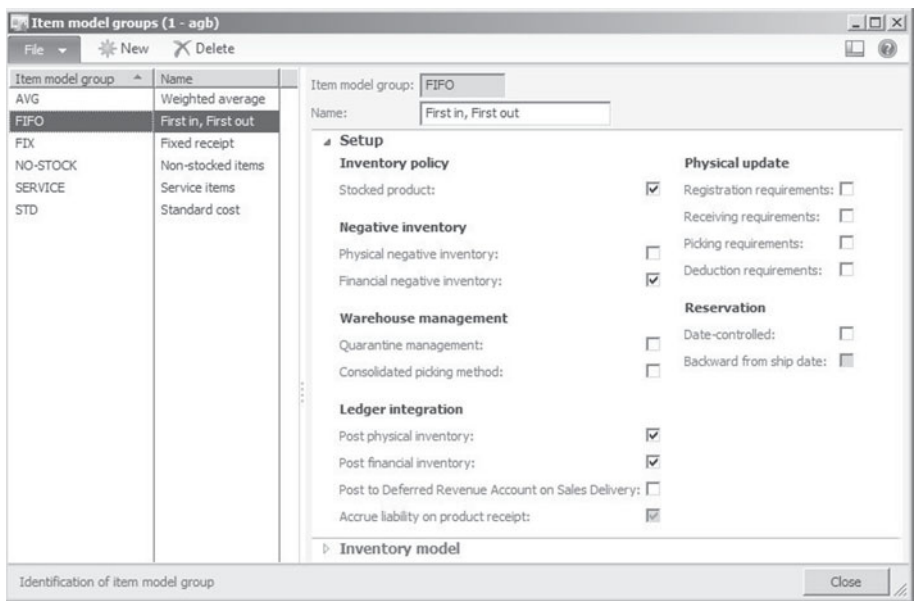


Figure 7-8: Available settings in the item model group

7.2.3.1 Item Handling

In item model groups for inventoried items, the checkbox *Stocked product* needs to be selected. Deselecting this checkbox prevents assigned products to generate inventory transactions, which is the right choice for non-inventoried products like service items.

The parameters *Quarantine management* and *Consolidated picking method* control the automatic generation of internal orders.

If you select the checkbox *Quarantine management*, Dynamics AX automatically creates a quarantine order (see section 7.4.4) when posting an item receipt. This setting concerns posting an item arrival journal (or a product receipt) for purchase orders and customer returns as well as reporting as finished in production.

If selecting the checkbox *Consolidated picking method*, output orders for shipping assigned items show the type “Consolidated picking” (see section 4.5.3).

If you select the checkbox *Registration requirements*, you need to post an inventory registration in an item arrival journal or in the registration form, before you may post the product receipt in purchasing (see section 3.5.3). The checkbox *Picking requirements* similar applies to picking and picking list posting before packing slip posting in sales.

The checkboxes *Receiving requirements* and *Deduction requirements* control, if you need to post a packing slip in sales or a product receipt in purchasing before posting the invoice.

7.2.3.2 Negative Inventory

In most cases you do not allow a negative physical inventory for inventoried items, but you do accept a financial negative inventory. A financial negative inventory applies, if you post a sales invoice before posting the purchase invoice of the items sold.

When specifying the parameters for negative inventory, you need to consider dimension groups: Dynamics AX controls negative physical (or financial) inventory for inventory dimensions, which show a checkmark in the parameter *Physical inventory* (or *Financial inventory*).

7.2.3.3 Inventory Model

Selecting an inventory model (FIFO, LIFO, average or standard cost) on the tab *Inventory model*, you may specify the inventory valuation method. The valuation method is the way Dynamics AX links issue transactions to receipt transactions in terms of valuation.

Details on inventory valuation methods are available in section 7.3, details on ledger integration in section 8.4.2.

7.2.3.4 Setting Up Item Model Groups

If you change the *Inventory model* or *Ledger integration* settings on the tab *Setup* of an item model group after posting item transactions, reconciliation of inventory and finance may become difficult.

Before you do changes of these settings, you should carefully plan the consequences in the same way as you do when changing a dimension group.

The number of required item model groups depends on the requirements of your company for processing items. In a regular Dynamics AX installation, you need to apply at least two groups – one for inventoried items and one for service items. The item model group for service items should allow physical and financial negative quantity and deactivate ledger integration.

7.2.3.5 New in Dynamics AX 2012

In Dynamics AX 2012, the new checkbox *Stocked product* enables products without inventory transactions.

7.2.4 Cost Price Settings

Core settings regarding the inventory valuation of an item are available on the tab *Inventory model* of the item model group: The lookup field *Inventory model* controls, if the valuation method is FIFO, LIFO, weighted average or standard cost. For the methods FIFO, LIFO and weighted average, you may additionally select the checkbox *Fixed receipt price* if you want to apply a standard cost price for item receipts only.

7.2.4.1 Item Cost Price

On the tab *Manage costs* of the released product form, you may enter a basic cost price. This basic cost price does not apply to the valuation method “Standard cost”, however. All other valuation methods apply the basic price in the item record as a default for the cost amount of item receipts in inventory journals and counting journals, if no site-specific cost price applies. You should make sure a correct price applies, therefore.

The cost price per site – as well as a standard purchase and sales price per site – is available in the item price form, which you may access clicking the button *Set up/Item Price* on the action pane tab *Manage costs* of the released product form.

7.2.4.2 Costing Versions and Item Price Form

Before you may enter a record in the item price form, the appropriate costing version (*Inventory and warehouse management* > *Setup* > *Costing* > *Costing versions*) needs to be available. Costing versions contain separate versions of prices, which may differ in calculation. The *Costing type* “Standard cost” is required for versions, which apply to standard cost prices in the item price form.

In order to register a new cost price in the item price form, you need to select the tab *Pending prices*. For a cost price you may choose the *Price type* “Cost” and select the costing version in the column *Version*. If no default value for *Site* and *From date* applies from the costing version, you may enter these fields.

Price type	Version	Name	Site	Price	Price unit	Price charges	Price quantity	Ind. in unit price	Unit
Cost	STD1	Standard costs	HQ	185.00	1.00	0.00	0.00	☒	Pcs.

Figure 7-9: Entering a pending price in the item price form

For finished or semi-finished items referring to a bill of materials, you may click the button *Calculation* in order to run a cost calculation. Once you have finished entering the pending price, you may activate it clicking the button *Activate* in the action pane strip of the item price form. Active prices then show on the tab *Active prices* of the form.

If you want to enter cost prices for product variants of a product master based on the product dimensions *Configuration*, *Size* and *Color*, you need to select the checkbox *Use cost price by variant* for the product master on the tab *Manage costs* of the released product form.

7.2.5 Transaction and Inventory Inquiry

If you want to know inventory transactions or the quantity on hand of an item, you may click the button *View/Transactions* or *View/On-hand inventory* on the action pane tab *Manage inventory* of the released product form. Both options are as well available choosing the button *Inventory* in the action pane strip of many other forms (e.g. the sales order lines).

Another way to access inventory transactions and the quantity on hand is available through the menu items *Inventory and warehouse management> Inquiries> On-hand* or *Inventory and warehouse management> Inquiries> Transactions> Transactions*.

7.2.5.1 Transactions Form

When accessing inventory transactions from the released product form, the transactions form will show all transactions of the item concerned. In the columns *Reference* and *Number*, you may see the original voucher.

Site	Warehouse	Physical date	Financial date	Reference	Number	Receipt	Issue	Quantity	Cost amount
HQ	10			Sales order	SO00002		On order	-5.00	
HQ	10			Quotation	SQ00001		Quotation issue	-10.00	
HQ	10			Purchase order	PO00006	Ordered		10.00	
HQ	10			Purchase order	PO00003	Registered		1.00	
HQ	10	12/5/2011	12/5/2011	Purchase order	PO00001	Purchased		10.00	29.30
HQ	10	12/13/2011	12/15/2011	Purchase order	PO00005	Purchased		280.00	809.20
HQ	10	12/13/2011	12/15/2011	Purchase order	PO00005	Purchased		700.00	2,023.00
HQ	90	12/23/2011		Purchase order	PO00008	Received		10.00	
HQ	90	12/23/2011		Sales order	SO00006		Deducted	-10.00	
HQ	10	12/23/2011		Sales order	SO00005	Received		2.00	
HQ	10	12/23/2011	12/23/2011	Sales order	SO00004		Sold	-3.00	-8.67
HQ	10	12/23/2011		Sales order	SO00003		Deducted	-20.00	
HQ	10	12/23/2011	12/23/2011	Sales order	SO00002		Sold	-5.00	-14.45
HQ	10	12/23/2011	12/23/2011	Inventory adjustment	IJ00001	Purchased		10.00	29.30

Figure 7-10: Inventory transactions of an item in the transactions form

In addition to posted transactions, the transactions form also shows future transactions not posted yet. These transactions include order lines in sales, purchasing and production, for which no packing slip/product receipt or invoice has been posted. You may recognize the lines concerned by the empty physical and financial date. In addition, the transactions show a receipt status “Ordered” or an issue status “On order”.

7.2.5.2 Physical and Financial Transaction

When posting a product receipt in purchasing, a packing slip in sales, a picking list in production, or a report as finished journal, Dynamics AX applies the posting date to the *Physical date* in the inventory transaction. In parallel, the status of the transaction changes to “Received” or “Deducted”. In the field *Physical cost amount*

on the tab *Update*, you may view the preliminary inventory value of the transaction.

The *Financial date* in an inventory transaction is updated when posting the invoice in purchasing or sales, or when ending the production order. In parallel, the status of the transaction changes to “Purchased” or “Sold” and the inventory value of the transaction displays in the column *Cost amount*.

Dynamics AX does not change the posted financial cost amount any more. If you post an adjustment of the inventory value in the course of inventory closing or with a manual adjustment, the difference applied is available separately in the field *Adjustment* on the tab *Update* of the transaction.

7.2.5.3 Inventory Picking and Registration

Inventory picking in sales (see section 4.5.2) and registration in purchasing (see section 3.5.3) are specific steps of an inventory transaction. When posting a picking or registration transaction, it will change the quantity on hand as well as the status of the inventory transaction. Unlike product receipt and packing slip transactions, picking and registration do not post an unchanging voucher.

After posting the packing slip in sales (or product receipt in purchasing), you may view the date of picking (or registration) in the field *Inventory date* on the tab *General* of the inventory transaction. If you do not proceed the regular way – posting a packing slip after picking or a product receipt after registration – but cancel the registration, it is not possible to see the original picking or registration transaction in the inventory transactions any more.

7.2.5.4 Arrived Status

If you work in the warehouse module applying pallets and inventory locations, you may view the additional receipt status “Arrived”. Dynamics AX applies this status when posting an item arrival journal with activated pallet transports.

Transactions showing this status are not included in the physical quantity. When posting the related pallet transport, the transaction status changes to “Registered” and the posted quantity increases the physical inventory.

7.2.5.5 Voucher Data

Apart from data showing on the tab *Overview*, data on the tab *Update* contain valuable information on inventory transactions. The columns *Physical*, *Financial* and *Settlement* group the fields on this tab.

The field group *Physical* displays date, number and preliminary value of the product receipt or packing slip. Invoice data are available in the field group *Financial*.

If the value of a transaction changes according to the valuation method when closing inventory or according to manual adjustments, the value difference shows

in the field *Adjustment*. The original financial *Cost amount* therefore does not change any more, all later adjustments add in the field *Adjustment*.

The screenshot shows the 'Inventory transactions' window with the title bar 'Inventory transactions (1 - agb) - Financial date: 12/15/2011, Yes, Lot ID: IL00019'. The window has a menu bar with 'File', 'Inventory', 'Ledger', 'Functions', and 'Configuration details'. Below the menu bar are tabs: 'Overview', 'General', 'Update', 'Ledger', 'Reference', 'Other', 'Financial dimensions - financial', 'Financial dimensions - physical', and 'Inventory dimensions'. The 'Overview' tab is active, showing three main sections: 'Physical', 'Financial', and 'Settlement'.
 - **Physical** section: Physical date: 12/15/2011, Physical voucher: IV00004, Route: (empty), Packing slip: PS001, Physical cost amount: 2,023.00, Physical revenue: (empty).
 - **Financial** section: Financial date: 12/15/2011, Financial voucher: IV00005, Invoice: VI002, Cost amount: 2,023.00, Adjustment: (empty), Profit and loss, posted amount: (empty), Unposted invoice: (empty).
 - **Settlement** section: Financially closed: (empty), Settled quantity: (empty), Amount settled: (empty).
 - **Ledger** section: Physically posted: ☒, Financially posted: ☒, Physical turnover posted: ☐.
 At the bottom, there is a status bar with navigation icons, a 'Date of physical transaction' field, a user selection dropdown showing '(0)', and a 'Close' button.

Figure 7-11: Voucher data in an inventory transaction

The field group *Settlement* shows if an inventory transaction is settled by inventory closing already. If the quantity of a transaction completely settles matching item issues or receipts, inventory closing records the closing date in the field *Financially closed* and closes the transaction by setting the lookup *Value open* on the tab *General* to “No”. However, by registering a manual adjustment to a closed transaction, you may later reopen it again.

7.2.5.6 Ledger Integration

The checkbox *Physically posted* on the tab *Update* of an inventory transaction shows that the product receipt or packing slip has been posted to the general ledger. As a prerequisite, ledger integration for physical transactions needs to be activated in the item model group of the particular item.

Assuming ledger integration for financial transactions is active, the checkbox *Financially posted* shows that the invoice has been posted. For purchase invoices, the checkbox is marked after invoice posting even if ledger integration is not active for an item, though. The reason for this is that the purchase invoice always posts a ledger transaction for the item: To a stock account for the receipt transaction if ledger integration is active or to an expense account for immediate consumption otherwise.

7.2.5.7 Quantity on Hand

In order to see the current quantity on hand of an item, you may click the button *View/On-hand hand inventory* on the action pane tab *Manage inventory* of the released product form. The tab *Overview* of the on-hand form displays a list of inventory quantities, grouped by the inventory dimensions selected as primary stocking dimensions for the item.

Site	Warehouse	Physical inventory	Physical reserved	Available physical	Ordered...	On order	Ordered reserved	Total available
HQ	10	955.00		955.00	10.00	5.00		960.00
S1	21	10.00		10.00				10.00
HQ	90							

Figure 7-12: On-hand overview of an item

7.2.5.8 Dimensions Display

You may click the button *Dimensions display* in the action pane of the on-hand form to open a dialog box, which allows selecting displayed dimension columns. This dialog box is available in many other forms as well, clicking the appropriate button in the action pane strip – e.g. *Sales order line/Display/Dimensions* in the sales order lines.

If you choose to show an additional column for the batch number as an example, the lines in the form will display the quantity per batch. In order to see the overall quantity of an item, you may clear all dimensions for displaying.

7.2.5.9 On Hand Details

In order to see detail data of an on-hand record line, you may switch to the tab *On-hand*. Apart from the *Physical inventory*, which is the actual quantity in inventory, the form shows availability data as well as the current cost price (average cost price, except for standard cost and fixed receipt price items).

The physical inventory is the total of transactions, which show following status:

- Posted quantity – Invoiced quantity of purchasing deducting sales
- Received – Product receipt in purchasing, adds to posted quantity
- Deducted – Packing slip in sales, deducts from posted quantity
- Registered – Registration and item arrival, adds to posted quantity
- Picked – Picking in sales, deducts from posted quantity

Apart from purchasing and sales, the same status and calculation applies to transactions in production.

All data shown in the on-hand form refer to the selected dimensions. As an example, the dimensions selected in Figure 7-13 are the site “HQ” and the warehouse “10”. According to this selection, Dynamics AX applies a filter showing the quantity and cost amount on warehouse “10”. When viewing cost price and cost amount you need consider that cost figures are only reliable for dimensions with separate financial inventory according to the dimension group settings.

On-hand (1 - agb) - Closed: NoItem number: 4001Item number: 4001, New Record

File Transactions Net requirements Intercompany on-hand Quantity adjustment Counting history Dimensions display

Overview On-hand

Item Item number: 4001 Product name: A2400E External antenna for M	Units Show: Inventory unit Unit: Pcs.	Physical inventory Posted quantity: 972.00 Deducted: 20.00 Picked: Received: 2.00 Registered: 1.00
Inventory dimensions Site: HQ Warehouse: 10	On-hand Physical inventory: 955.00 Physical reserved: Available physical: 955.00 Available for reservation: 955.00 Ordered in total: 10.00 Ordered reserved: On order in total: 5.00 Total available: 960.00 Physical cost amount: -52.04 Financial cost amount: 2,809.86 Cost price: 2.89	Ordered in total Arrived: Ordered: 10.00 Various On order: 5.00 Quotation receipt: Quotation issue: 10.00

Identify item. (0) | GBP | USR Model | usr | agb | Close

Figure 7-13: On-hand details

7.2.5.10 On Hand Inventory in the Past

If you want to know the physical inventory on a date in the past, you may select an appropriate report in the menu path *Inventory and warehouse management> Reports> Status*. When selecting dimensions like warehouse or serial number in these reports, you need to take into account again, that cost amounts shown in the appropriate columns are only reliable for dimensions with separate financial inventory according to the dimension group settings.

7.2.6 Case Study Exercises

Exercise 7.1 – Dimension Groups

In order to investigate the functionality of dimension groups, you want to create a new storage dimension group D-## and a tracking dimension group D-## (## = your user ID). You should set up the dimension groups in a way that the dimensions *Site*, *Warehouse* and *Batch number* are required in every transaction. For the warehouse dimension, separate financial inventory valuation should apply.

Exercise 7.2 – Inventory Model Group

In order to prepare the next exercise, you want to enter a new item model group T-## (## = your user ID) with FIFO valuation, assigning the inventory model “FIFO”. The ledger integration for physical and financial inventory should be active. The item model group applies to stocked products and a negative financial inventory is allowed. All other checkboxes remain cleared.

Then you want to set up a second item model group S-## for standard cost valuation, which got the same settings as the first group, except that the inventory model is “Standard cost” and a negative physical inventory is possible.

Exercise 7.3 – Product Record

Entering two new items in the released products form you want to examine the consequences of the settings in the dimension groups and the item model group:

- Item I-##-S to show standard cost pricing (item model group S-##)
- Item I-##-T to show FIFO valuation (item model group T-##)

For both items, the product subtype is “Product” and the storage and the tracking dimension group are the groups you have set up in exercise 7.1. In addition, select an appropriate item group for merchandise and the unit of measure “Pieces”. The item sales tax groups for purchasing and sales should refer to the standard tax rate. The base purchase price and the base cost price are 50 pounds, the base sales price is 100 pounds. For purchasing, inventory and sales, you should enter the main site in the *Default order settings* and the main warehouse of the main site in the *Site specific order settings*.

For the item I-##-S you need to register and activate a standard cost price. Enter a standard cost price of 50 pounds for the main site in the item price form.

Exercise 7.4 – Inventory Transactions

You want to enter a purchase order referring to your vendor of exercise 3.2, which contains a line of 100 units of the first and 100 units of the second item entered in exercise 7.3. Enter 60 pounds in the purchase price of both order lines.

Try to find out, if you may post a product receipt without inserting a batch number. Choosing the option *View details* in the batch number column, you may create the batch number B001 for both items in the batch table. In the purchase order lines, you may insert the batch number afterwards.

Once you have finished, you may confirm the purchase order. Then you want to post the product receipt and the invoice receipt for the complete quantity. If you look at the item transactions and the quantity on hand, can you explain the difference of the cost amount and the cost price of the two items?

Note: If required, you may show the column for the dimension *Batch number* in the order lines clicking the button *Inventory/Dimensions display*.

7.3 Inventory Valuation

Based on the deep integration of all parts of the application, Dynamics AX provides a very accurate calculation of inventory values. Therefore, apart from the valuation methods of average or standard costs, you may choose an end-to-end FIFO or LIFO valuation as well.

The basis of inventory valuation is a simple principle:

- Receipt cost amounts are provided by the receipt transaction
- Issue cost amounts are calculated according to the valuation model

The cost amount of the issue transaction derives from the receipt transactions, which refer to the issue according to the valuation model (FIFO, LIFO, average). It is not possible to enter the cost price and cost amount in an issue transaction.

A special case is the valuation according to standard cost price, for which Dynamics AX provides two different options:

- Fixed receipt price
- Standard cost

The option “Fixed receipt price” is available in combination with the valuation methods FIFO, LIFO and average cost. Applying this option fixes the receipt cost price in advance, preventing to change it when recording a transaction.

Unlike the fixed receipt price, the inventory model “Standard cost” provides true standard costs, applying the standard cost price of an item for all issue and receipt transactions.

The difference between the methods “Standard cost” and “Fixed receipt price” shows, when changing the standard cost price of an item. Whereas the standard cost method immediately posts an adjustment of inventory value, the fixed receipt price method does not adjust the value of stock on hand. For this method, the new price only applies to new receipts – existing inventory will issue to the old price until it is consumed completely.

7.3.1 Valuation Method

Dynamics AX provides the following valuation methods – available in the field *Inventory model* of the item model group – for calculating the cost amount of issue transactions:

- FIFO
- LIFO
- LIFO date
- Weighted average
- Weighted average date
- Standard cost

7.3.1.1 Valuation of Item Receipts

Receipt transactions receive their financial value when posting the related financial transaction (invoice). Except for the standard cost method, the different transaction types therefore provide the receipt cost price and amount as follows:

- Purchase order receipts – Amount of the invoice line, optionally adding indirect costs through costing sheets (see section 5.4.1)

- Production receipts – Cost amount of picked BOM line items, consumed resource time, and indirect costs
- Sales item return – Original value of the returned item if assigned to an original sales order; otherwise return cost price entered in the return order
- Other receipts – Cost amount entered in the journal line

7.3.1.2 Valuation of Item Issues

The cost price and amount of item issues always complies with the average cost price when posting the transaction. The valuation method applies when closing inventory, determining the assignment of item receipts to item issues according to the inventory model (FIFO, LIFO or average).

Inventory closing calculates the cost price and amount of an issue transaction based on assigned receipts. The issue price and amount therefore is not final until you have posted the financial transaction (invoice) of all assigned receipts and inventory closing is finished.

An exception is the valuation according to standard cost price (“Standard cost” and “Fixed receipt price”), for which Dynamics AX applies the standard cost price immediately for issue transactions as well.

7.3.1.3 Standard Cost Price

For items of the inventory model “Standard cost”, inventory closing is not required because all receipts and issues immediately post the standard cost price available in the item price form (see section 7.2.4).

When activating a new standard cost price, Dynamics AX immediately applies an adjustment of inventory value for the current stock, which posts in inventory and in the general ledger. The new standard cost price therefore applies to issues of that stock right away.

7.3.1.4 Fixed Receipt Price

The checkbox “Fixed receipt price” in the item model group applies in combination with the valuation methods FIFO, LIFO or average cost. When selecting this option, the cost price entered in the released product form or in the item price form specifies a fixed cost price for receipt transactions.

The cost price and cost amount calculate according to the valuation method and – as long as you do not change the item cost price – always comply with the standard cost price of the item.

When changing the item cost price, consumption transactions immediately apply the new cost price. Since there is no posting of revaluation when changing a fixed receipt price, the financial value of existing stock however still complies with the old price. As a result, inventory closing is required for the option “Fixed receipt price” to adjust the cost amount of issue transactions to the old price according to

the valuation method (until all inventory received with the old price has been consumed).

7.3.1.5 Calculating Inventory Value

Following table shows an overview of the different valuation methods available in Dynamics AX:

Table 7-3: Inventory models controlling the valuation methods in Dynamics AX

Inventory model	Explanation
FIFO <i>First In First Out</i>	Item issues refer to the oldest item receipt still on stock
LIFO <i>Last In First Out</i>	Item issues refer to the newest item receipt on stock that is available when closing inventory
LIFO date	Like LIFO, limiting the assignment of issues to receipts before the particular issue
Weighted average	The cost price of item issues is the average cost price of the inventory quantity when closing inventory
Weighted average date	Like “Weighted average”, calculating the average cost price for the particular issue date
Standard cost	The cost price of item issues and receipts is equal to the active standard cost price of the item

Table 7-4 is here to show a short example of the cost price calculation for the different valuation methods. Basis of the example are three receipt transactions showing different cost prices and an issue transaction in between:

Table 7-4: Posted transactions for comparing valuation methods

Date	Transaction	Quantity	Cost amount
July 1	Receipt	10	100
July 2	Receipt	10	200
July 3	Issue	10	(to be calculated)
July 4	Receipt	10	300

After inventory closing, the cost amount of the issue shows following figure depending on the valuation method:

Table 7-5: Valuation of the item issue in Table 7-4

Inventory Model	Amount	Explanation
FIFO	100	From receipt on July 1
LIFO	300	From receipt on July 4
LIFO date	200	From receipt on July 2
Weighted average	200	Average of all receipts
Weighted average date	150	From receipt on July 1 and July 2

In addition to the inventory model, you need consider item dimension settings when calculating the cost amount of an item issue. Assigning of issues and receipts is not possible across dimensions with separate financial inventory according to the dimension group settings.

If separate financial inventory is activated for the dimension *Warehouse*, issues of a warehouse “20” will only assign receipts to warehouse “20” (including transfers) as an example. If separate financial inventory is not active for the dimension *Warehouse*, assignments comply with the date sequence independent from the warehouse in the transactions.

7.3.1.6 Inventory Marking

Marking is another option, influencing the automatic assignment according to the inventory model. Markings work like lots for inventory valuation, assigning the cost amount of a specific receipt to a specific issue – e.g. required in vendor returns (see section 3.7.1). In order to mark a transaction, you may click the button *Inventory/Marking* in transactions inquiries, order lines or journal lines.

7.3.2 Inventory Closing and Adjustment

When posting an issue transaction, Dynamics AX always applies the average cost price (except for the standard cost model). In order to calculate the correct cost price and amount according to the valuation method (*Inventor model*) of the item, you need to close inventory. Inventory closing does not affect items assigned to the inventory model “Standard cost”, however.

You need to close inventory periodically – usually as part of the month closing procedure in finance – in order to show correct item costs in finance and to close inventory transactions. After closing inventory, it is not possible to post inventory transactions in the closed period any more. If you need to post a transaction in a closed period, you may cancel inventory closing.

7.3.2.1 Inventory Closing

Inventory closing is available in the form *Inventory and warehouse management>Periodic>Closing and adjustment*, displaying a list of previous closings. If you want to close a period, you need to click the button *Close procedure*.

The first and second option in the close procedure, checking open quantities and cost prices, provide reports to assess inventory transactions. You may run these reports to take corrective actions in case of missing or wrong transaction before actually closing a period. Dynamics AX does not require these steps before closing, however.

In order to finally close an inventory period, you want to click the button *Close procedure/3.Close* in the inventory closing form. Depending on the number of transactions, it might be useful to run closing as a batch job not within regular business hours.

Active	Date	Voucher	Type	Executed	Cancellation	OK	Has log
☒	9/30/2011	IG00001	Closing	10/4/2011	☐	☒	☐
☒	10/31/2011	IG00002	Closing	11/1/2011	☐	☒	☐
☒	11/30/2011	IG00003	Closing	12/5/2011	☐	☒	☐
☒	12/30/2011	IG00004	Recalculation	12/30/2011	☐	☒	☐

Figure 7-14: The inventory closing and adjustment form

As a prerequisite to close a period in inventory, the accounting period has to be open. As far as applicable, you should post vendor invoices for all item receipts in purchasing, and end all production orders that are reported as finished. The product receipts concerned in purchasing and production then show the financial cost amount (instead of the physical cost amount which shows before invoicing), minimizing the number of open transactions as far as possible.

After closing inventory, you may view posted adjustment transactions clicking the button *Settlements* in the inventory closing form. If you need to cancel inventory closing, you may click the button *Cancellation*. The button *Recalculation* calculates and posts adjustment transactions like inventory closing, but does not actually close a period.

7.3.2.2 Manual Adjustment of Inventory Value

If you want to adjust the inventory value of an item manually, you may click the button *Adjustment* in the inventory closing form. You may choose the option *Adjustment/On-hand* to adjust the cost price and amount of the current inventory quantity on the level of inventory dimensions. Choosing the other option, clicking the button *Adjustment/Transaction*, you may adjust the cost amount of individual receipt transactions.

In the adjustment form, you may choose the items or transactions concerned by clicking the button *Select*. In the records of the adjustment form, you may insert a positive or negative adjustment amount either manually or by choosing the appropriate option of the button *Adjustment* providing a proposal. Clicking the button *Post* in the adjustment form posts the adjustment.

7.3.3 Case Study Exercises

Exercise 7.5 – Purchase Order

You want to order 100 units of the first and 100 units of the second item of exercise 7.3 from your vendor of exercise 3.2. Enter an appropriate purchase order choosing the batch number B001 and a purchase price of GBP 120.00 in both order lines.

Once you have finished entering the order, you should confirm it and post the product receipt and the vendor invoice for the whole quantity. In the *Product receipt date* (tab *Setup* of the product receipt posting form) and in the *Posting date* in the vendor invoice, you should enter the day after the posting date of exercise 7.4 (e.g. July 2, if exercise 7.4 has been on July 1).

After posting the invoice, check the inventory transactions as well as the inventory quantity and value (cost amount) of the two items.

Exercise 7.6 – Sales Order

Your customer of exercise 4.1 orders 150 units of the first and 150 units of the second item of exercise 7.3. Enter an appropriate sales order choosing the batch number B001 in both order lines. Then you may post the sales invoice for the whole order quantity. For the *Invoice date* on the tab *Setup* of the posting form, you should enter the day after the posting date of exercise 7.5 (e.g. July 3, if exercise 7.5 has been on July 2).

After posting the invoice, check the inventory transactions as well as the inventory quantity and cost amount of the two items again.

Exercise 7.7 – Closing Inventory

You want to perform a *Recalculation* in the inventory closing form in order to calculate the correct inventory value of your items according to the valuation method. In the recalculation form, select an appropriate filter to limit calculation to your items and set the recalculation date to the posting date of exercise 7.6 (e.g. July 3).

Then check the cost price and amount of the inventory transactions and the inventory quantity for the two items. Which changes come from recalculation, can you explain the result?

7.4 Business Processes in Inventory

The only way to change the inventory quantity or value of an item is to post an inventory transaction. Most business processes causing changes of inventory do not origin in inventory management, however, but refer to procedures in other areas like purchasing, sales or production. These processes automatically generate inventory transactions in the background.

Descriptions of processes in these areas are available in the appropriate previous section of the book. Below you may find business processes within inventory management, therefore.

7.4.1 Inventory Structures and Parameters

As a prerequisite to record inventory transactions, inventory management setup and released product records have to be available.

7.4.1.1 Warehouse and Location Structure

In order to show a structure in inventory, Dynamics AX provides three storage dimensions for grouping inventory within a company account: *Site*, *Warehouse* and *Location*. Depending on the applicable dimension group, you need to record these dimensions in an inventory transaction.

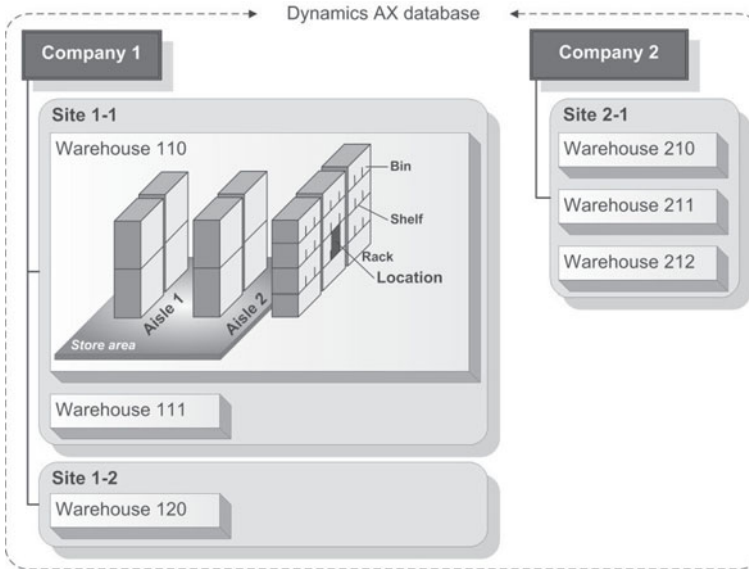


Figure 7-15: Warehouse and location structure in Dynamics AX

Within a site, warehouses are the upper grouping level of inventory. In order to specify additional structures between warehouse and location, you may organize locations applying the following elements:

- Aisle
- Rack
- Shelf
- Bin

In addition, you may group locations by store areas and store zones. As an example, you may grant frozen products to be stored in chilled locations by assigning applicable store zones to the items on the tab *Locations* of the warehouse items form (accessible clicking the button *Warehouse/Warehouse items* on the action pane tab *Manage inventory* of the released products form).

7.4.1.2 Warehouse Management

In order to set up a new warehouse, you need to access the form *Inventory and warehouse management> Setup> Inventory breakdown> Warehouses*. Inserting a new record by clicking the button *New* you want to enter warehouse ID and description. The lookup *Site* provides the option to link the warehouse to a site.

In the lookup *Type*, you may select if the warehouse is a regular warehouse, a quarantine warehouse or a transit warehouse for items in transit. When working with quarantine warehouses you need to take into account, that quarantine only locks items by posting a quarantine order (see section 7.4.4) and not by simply posting an inventory transfer to the quarantine warehouse. If applying quarantine management, you may assign an appropriate *Quarantine warehouse* to regular warehouses.

On the tab *Master planning*, you may enter specific settings for the warehouse related to master planning. The tabs *Warehouse management* and *Location names* control warehouse locations.

Warehouse	Name
10	Main warehouse
11	Main warehouse - Quarantine
21	External warehouse - Sales 1
22	External warehouse - Sales 2
30	Production storage
60	Consignment stock at the customer
70	Consignment stock at the vendor
90	Direct delivery
99	Transit

Warehouse:	10
Name:	Main warehouse
General	
Site:	HQ
Type:	Default
Quarantine warehouse:	11
Transit warehouse:	99
Reference	
Vendor account:	
Master planning Warehouse management Location names	

Figure 7-16: Managing warehouses in the warehouse form

7.4.1.3 Locations

The further organization of warehouses including aisles and locations as well as the setup and assignment of store areas and store zones is available in the items of the menu path *Inventory and warehouse management> Setup> Inventory breakdown*. A detailed description of location and pallet management in inventory is beyond the scope of this book, however.

7.4.1.4 Storage Dimensions

When setting up warehouse structures, be aware that the storage dimension group of the released product controls, which inventory dimensions apply to inventory transactions. If you want to manage locations in a specific warehouse for example, the storage dimension group of all items concerned needs to include an active dimension *Location*. Since this setting applies locations to all warehouses, you need to set up at least one (pseudo-)location for each warehouse in this case.

7.4.1.5 Inventory Parameters and Journal Setup

Apart from warehouse structures, you need to set up inventory journals before you may record journal transactions in inventory. Journals are available to register

manual transactions in inventory. When setting up journals, we may distinguish two groups:

- Inventory journals
- Warehouse management journals

Inventory journals are available to register general transactions like item receipt, issue, transfer and inventory counting. In order to configure inventory journals you may access the form *Inventory and warehouse management> Setup> Journals> Journal names, inventory*. You need to set up at least one journal name for the *Journal type* "Movement", "Inventory adjustment", "Transfer", "BOM" and "Counting", before you can enter and post transactions concerned. Assigning an appropriate number sequence in the lookup *Voucher series*, you may apply separate number sequences for different journals.

Warehouse management journals are available to register item receipts from vendors and customers (for item returns) in item arrival journals and item receipts of finished goods in production. In order to configure warehouse management journals you may access the form *Inventory and warehouse management> Setup> Journals> Journal names, warehouse management*.

Inventory parameters are available in the form *Inventory and warehouse management> Setup> Inventory and warehouse management parameters*. Among others, they contain settings for number sequences, the default unit of measure, calculation group and defaults for journal names. On the tab *Inventory dimensions*, you may choose for every journal which dimension to display as default.

7.4.2 Journal Transactions

You want to apply journals in inventory management in order to record transactions independent from other areas like purchasing, sales or production.

7.4.2.1 Journal Structure

Since inventory transactions affect financial values, the voucher principle applies: You need to register a journal in a first step and post the transaction separately in a second step. Every journal consists of a journal header and at least on line.

Inventory journals in Dynamics AX show a common structure. Nevertheless, following journals are available to fit the different transaction types:

- Inventory adjustment
- Movement
- Transfer
- Bills of materials
- Item arrival
- Production input
- Counting
- Tag counting

If you want to record manual item issues or receipts in inventory, you need to choose a journal of the type “Movement” or “Inventory adjustment”.

7.4.2.2 Movement and Inventory Adjustment Journals

The difference between movement journals and inventory adjustment journals is that movement journals show the field *Offset account*. The offset account contains the expense or revenue account for the item receipt or consumption.

In inventory adjustment journals, the offset account derives from the inventory posting setup and does not show in the journal lines. Therefore, you will apply movement journals for posting item consumption of a department if you need to apply a specific ledger account as an example.

Section 7.1.2 at the beginning of this chapter explains how to register and post an inventory adjustment journal.

In order to register a movement journal, you want to insert a new record in the form *Inventory and warehouse management*> *Journals*> *Item transaction*> *Movement*. In the field *Offset account* on the tab *General* of the journal header, you may enter a default for the offset account. After switching to the lines, you may insert posting date, item number, applicable inventory dimensions and quantity (negative for item issues). For item receipts, you may change the cost price which defaults from the item. Making sure to apply the right ledger account in the column *Offset account*, you may post the movement.

7.4.2.3 Transfer Journals

Unlike movement journals, which apply to issues and receipts, transfer journals are available for transferring product inventory from one dimension combination to another. In most cases, you want to transfer from one warehouse or location to another. You may also post a transfer to change the batch or serial number, however.

In order to register an item transfer, you want to choose the form *Inventory and warehouse management*> *Journals*> *Item transaction*> *Transfer*. In addition to the data recorded in inventory adjustment journal lines, you need to enter the applicable inventory dimensions to which the item should transfer.

Entering the *Quantity* with a negative sign issues the item from the “from-dimensions” and receives it at the “to-dimensions”.

7.4.2.4 BOM Journals

Bill of materials journals, accessible through the menu item *Inventory and warehouse management*> *Journals*> *Item transaction*> *Bills of materials*, provide the possibility to post a receipt of a finished items while consuming the components at the same time. Entering a negative quantity, you may as well post disassembling of a finished item.

Unlike the proceeding for other journals, you do not need to enter journal lines manually in a bill of materials journal. In order to create journal lines, you may click the button *BOM/Report as finished* in action pan strip of the BOM journal lines.

Date	Item number	Site	Warehouse	Batch number	Quantity	BOM	Explosion	Post now
12/30/2011	7001	HQ	30		100.00	BM00002	Never	☒

Figure 7-17: Report as finished form, opened from the bill of materials journal

In the report as finished form, you want to insert a line (*Ctrl+N*) selecting the finished item that you want to receive in inventory. If you put a checkmark in the column *Post now*, the bill of materials journal will immediately post once you close the report as finished form clicking the button *OK*. If the checkbox *Post now* is cleared, the finished item as well as its component lines will show in the bill of materials journal lines, where you may edit them before posting.

7.4.2.5 Item Arrival Journals

Item arrival journals, accessible through the menu item *Inventory and warehouse management> Journals> Item arrival> Item arrival*, provide the option to post item receipts related to purchase orders (see section 3.5.3) or customer returns (see section 4.6.4). Production input journals similarly apply to production order receipts.

You may record an item arrival journal similar to recording an inventory journal. In order to register the reference to a purchase order, you may switch to the tab *Default values* on the journal header, where you may select the order number in the field *Number* choosing “Purchase order” for the *Reference*. For customer returns, you may enter the *Reference* “Sales order” and the *RMA number*.

Clicking the button *Functions/Create lines* in the journal header, you may default the order lines to the journal lines. Clicking the button *Post*, you may post the arrival journal. Unlike inventory journals, which post physical and financial transaction immediately, you need to post the product receipt and the vendor invoice of the related purchase order in order to generate the physical and financial transaction.

If you want to apply warehouse transactions with locations and pallets, you may select appropriate checkboxes in the arrival journal header (tab *Default values*, field group *Mode of handling*).

7.4.3 Inventory Counting

In order to determine the actual quantity in inventory, you may physically execute inventory counting (stocktaking) in the warehouse. Depending on legal and other requirements, you may need to do item counting periodically in order to adjust the quantity in the books to the quantity actually counted.

In Dynamics AX, you want to register the counted quantity in inventory journals. When posting the inventory journal, the difference between the counted quantity and the physical quantity in Dynamics AX will post as an item issue or receipt similar to an inventory adjustment journal.

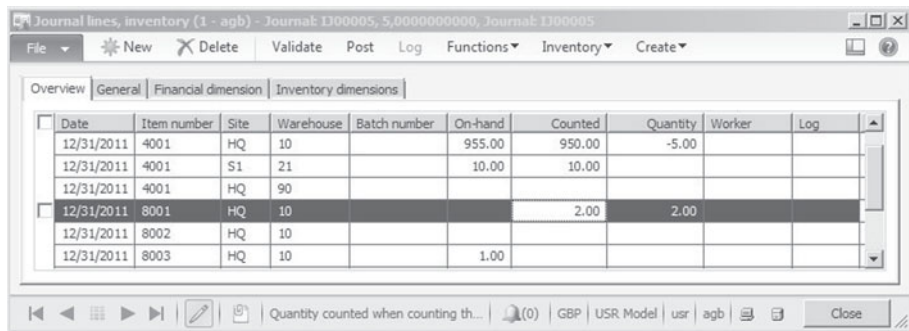
You do not need to stop transactions in inventory while counting, because Dynamics AX will calculate the counting difference for the date entered in the counting journal line. If required, you may however choose to lock inventory while counting (*Lock items during count* on the tab *General* of the inventory parameters).

7.4.3.1 Counting Journal

In order to register a new counting journal, you may insert a journal header in the form *Inventory and warehouse management > Journals > Item counting > Counting*. When creating the journal header, you have to choose which inventory dimensions to record in the counting journal. In the lines, you got two options to register inventory counting:

- Manual registration
- Automatically creating counting lines

If you want to enter a counting journal lines manually, you may insert a line recording counting date, item number, warehouse and applicable dimensions like in any other inventory journal. In the column *Counted*, you need to enter the counted quantity. In the column *On-hand* you may see the inventory quantity calculated in Dynamics AX according to the posted transactions. The difference between the counted and the on-hand quantity shows in the column *Quantity*, which also is the quantity of the issue or receipt transaction posted when posting the inventory journal.



Date	Item number	Site	Warehouse	Batch number	On-hand	Counted	Quantity	Worker	Log
12/31/2011	4001	HQ	10		955.00	950.00	-5.00		
12/31/2011	4001	S1	21		10.00	10.00			
12/31/2011	4001	HQ	90						
12/31/2011	8001	HQ	10			2.00	2.00		
12/31/2011	8002	HQ	10						
12/31/2011	8003	HQ	10		1.00				

Figure 7-18: Entering the counted quantity in a counting journal line

In order to automatically create lines for counting existing stock, you may click the button *Create/On-hand* in the action pane strip of the counting journal lines. In the *Create on-hand counting journal* dialog, you may select a filter for the lines. You may for example choose to count only items and inventory dimensions, which show an inventory transaction after the last inventory counting.

Once finished with manually or automatically creating counting journal lines, you may – before and after entering the counted quantity – print a counting list clicking the button *Print/Counting list* in the journal header form.

7.4.3.2 Counting Groups

In order to support selecting items for automatically creating counting lines, you may filter on counting groups in the *Create counting journal* dialog. Counting groups contain settings like the *Counting code*, which controls when to execute counting (periodically, when equal or below minimum stock or when reaching zero stock). You may set up counting groups in the form *Inventory and warehouse management> Setup> Inventory> Counting groups* and assign items in the released product form (tab *Manage inventory*) or in the warehouse items form (button *Warehouse/Warehouse items* on the action pane tab *Manage inventory* of the released product form).

In order to apply counting code settings when automatically creating counting lines, you have to select the checkbox *Activate counting code* in the *Create counting journal* dialog.

7.4.3.3 Tag Counting

Tag counting (*Inventory and warehouse management> Journals> Item counting> Tag counting*) is an option to pre-register counting lines. The principle of tag counting is to attach numbered tags to the warehouse locations. While counting physically, you write item number, quantity and applicable dimensions like warehouse and serial number on each tag. Then you want to collect the tags and register them in the tag-counting journal. When posting the tag-counting journal, you do not post inventory transactions, but transfer the lines to a regular counting journal.

7.4.4 Quarantine and Inventory Blocking

In Dynamics AX, there are two options to exclude quantities of an item from available stock, e.g. quality control:

- Quarantine Management
- Inventory Blocking

Inventory blocking generates a temporary transaction, manually or automatically for quality inspection. Quarantine management on the other hand is based on quarantine orders, which post a transfer to a quarantine warehouse. You may transfer stock to quarantine either automatically with every item receipt, or manually when required.

7.4.4.1 Setup for Quarantine Management

As a prerequisite for working with quarantine in Dynamics AX, you need to set up at least one warehouse of the type “Quarantine”. If you want to apply automatic quarantine for item receipts, you need to assign a quarantine warehouse in the warehouse form (*Inventory and warehouse management> Setup> Inventory breakdown> Warehouses*) to every regular warehouse concerned.

Automatic quarantine applies to released products, for which the checkbox *Quarantine management* is selected in the assigned item model group.

7.4.4.2 Manual Quarantine

If you want to lock a certain inventory quantity manually, you may choose the form *Inventory and warehouse management> Periodic> Quality management> Quarantine orders*. The quarantine order form shows a list of open quarantine orders, selecting the checkbox *View ended* you may also see ended quarantine.

Quarantine number	Item number	Site	Warehouse	Batch number	Quarantine warehouse	Quantity	Status	Disposition code
IQ00001	7001	HQ	30	B00001	11	50.00	Started	
IQ00002	1001	HQ	10	B00002	11	1.00	Ended	
IQ00003	4001	HQ	10		11	5.00	Created	

Figure 7-19: Managing quarantine in the quarantine order form

In order to enter a quarantine order, you need insert a record registering item number, quantity, warehouse and applicable dimensions. The default for the quarantine warehouse in the line derives from the quarantine warehouse of the warehouse entered. All other inventory dimensions for quarantine will retrieve the default from the original dimensions that you have entered. If you want to change quarantine dimensions, you may display appropriate storage dimension columns (button *Inventory/Dimensions display*) or switch to the tab *Inventory Dimensions*.

Clicking the button *Start* in the quarantine order form transfers the recorded quantity to quarantine. Transfer to quarantine includes moving to the quarantine warehouse as well as reserving the item for quarantine to block it for issue transactions. In parallel to the quarantine transaction, Dynamics AX generates a second inventory transaction without date for the future re-transfer to the original warehouse.

If you need to partly or completely scrap an item in quarantine, you may click the button *Functions/Scrap*.

In order to end quarantine – if applicable after scrapping a part of the quantity – you may click the button *End* in the quarantine order form. Dynamics AX will post the re-transfer to the original warehouse and cancel quarantine reservation.

The button *Report as finished* in the quarantine order is available to post the completion of inspections as an intermediate step. The item is not available in inventory before ending the quarantine order, which is why you want to apply this step only if you separately post pallet transports in warehouse management.

7.4.4.3 Automatic Quarantine

When posting item arrival journals, production input journals or product receipts, Dynamics AX will automatically create and start quarantine orders for items, which are assigned to an item model group with *Quarantine management* selected. The further proceeding of quarantine works as with manual quarantine.

7.4.4.4 Inventory Blocking

Inventory blocking usually applies in combination with quality orders in Dynamics AX quality management (not covered in this book, needs to be enabled on the tab *Quality management* of the inventory management parameters). You may execute manual inventory blocking without the applying the quality management functionality, nevertheless.

In order to manually block an item, you may access the form *Inventory and warehouse management> Periodic> Inventory blocking* and insert a record registering item number, quantity and – on the tab *Inventory dimensions* – applicable dimensions. If you expect the item to become available again (like a quarantine order), you may select the checkbox *Expected receipts*. Depending on the expected receipt, Dynamics AX generates one or two inventory transactions showing “Inventory blocking” in the column *Reference*. In order to end inventory blocking, you may simply delete the line concerned in the inventory blocking form.

7.4.4.5 New in Dynamics AX 2012

Inventory blocking is a new feature in Dynamics AX 2012.

7.4.5 Transfer Orders

Whereas inventory transfer journals are there for transferring items immediately without shipping documents, transfer orders provide the option to consider transport time and to print shipping documents.

7.4.5.1 Setup for Transfer Orders

As a prerequisite for working with transfer orders, you need to set up at least one warehouse of the type “Transit” which is used for the items during the transport time. If items apply the storage dimension *Location*, you should specify a default receipt and issue location for the transit warehouse. In addition, you want to assign a transit warehouse in the warehouse form (*Inventory and warehouse management>*

Setup> Inventory breakdown> Warehouses) to every regular warehouses concerned. Optionally, delivery date control applies (similar to sales, see section 4.4.3).

7.4.5.2 Processing Transfer Orders

In order to enter a transfer order, you may access the form *Inventory and warehouse management > Periodic> Transfer orders* and click the button *New* in the action pane strip. The transfer order consists of a header, where you have to select the *From warehouse* and the *To warehouse*, and transfer order lines.

Figure 7-20: Registering a line in a transfer order

In the transfer order lines, you may enter item number, transfer quantity and inventory dimensions as applicable. Similar to sales order processing, you may execute picking (see section 4.5.2) or immediately post the shipment.

In order to post the shipment, you may click the button *Posting/Ship transfer order*. In the upper pane of the *Shipment* posting form you want to select the checkbox in the column *Edit lines*, and “All” in the column *Update* to ship the complete quantity (or, depending on previous steps, select the picked or the ship-now quantity). The checkbox *Print transfer shipment* allows printing a shipping document. Clicking the button *OK* in the posting form will post a transfer to the transit warehouse.

When receiving the item at the destination warehouse, you may process inventory registration and item arrival similar to a purchase order receipt.

In order to finally receive the item, you may click the button *Posting/Receive* in the transfer order form (corresponding to the product receipt in purchasing). In the *Receive* posting form, you may select the checkbox *Edit lines* and choose “All” in the column *Update* (depending on previous steps, alternatively select the registered or the receive-now quantity). Clicking the button *OK* in the posting form will post a transfer from the transit to the final warehouse.

7.4.6 Case Study Exercises

Exercise 7.8 – Journal Transaction

In the main warehouse, you find 100 units of the item I-## that you have set up in exercise 3.5. Post an appropriate transaction in an inventory adjustment journal.

Exercise 7.9 – Transfer Journal

You want to transfer the quantity received in exercise 7.8 to another warehouse. Register an appropriate inventory transfer journal and post it. After posting, check the transactions and the quantity of your item on the selected warehouse.

Exercise 7.10 – Inventory Counting

You want to perform inventory counting on the main warehouse for the item I-## that you have set up in exercise 3.5. The quantity counted is 51 units. You may create a counting journal line either registering it manually or automatically generating it, filtering on your item and the main warehouse. After inserting the counted quantity, you should post the journal and check the quantity on hand.

Exercise 7.11 – Manual Quarantine

Because of quality issues reported, you want to execute a quality check of the quantity you have transferred in exercise 7.9. Enter a manual quarantine order, choosing an appropriate quarantine warehouse. Check the quantity on hand of your item and start the quarantine order. After performing quality inspection, you may end quarantine, checking the inventory quantity before and after ending.

Exercise 7.12 – Transfer Order

You want to transfer 50 units of the item relocated in exercise 7.9 back to the main warehouse processing a transfer order. Before entering the transfer order, make sure a transit warehouse is assigned to the warehouse from where the item ships. Then register an appropriate transfer order and post the shipment. After posting, check the inventory transactions as well as the inventory quantity of your item on all warehouses. Finally, receive the item transfer at the main warehouse.

8 Finance Administration

The primary responsibility of finance administration is to control and analyze all transactions related to monetary amounts. These transactions occur in business processes all over your organization.

Finance management therefore is the core area of business management solutions. In Dynamics AX, a deep integration of the application supporting business processes in all departments grants accurate financial figures, available immediately.

8.1 Principles of Ledger Transactions

Before we start to go into detail, the lines below show the principles of ledger transactions.

8.1.1 Basic Approach

The core task of finance is to manage accounts in the general ledger, which are the basis for balance sheet and income statement (profit and loss statement). In addition to the general ledger, accounting keeps subledgers like accounts receivables, accounts payables, fixed assets, projects and inventory. These subledgers contain detailed data supporting parts of the general ledger. As an example, inventory transactions show details for changes of stock account balances.

When posting to subledgers, each monetary transaction in Dynamics AX – an invoice in sales as well as a counting difference in inventory – in parallel posts to the general ledger. For example, posting a sales order invoice affects the following areas:

- Inventory – Item transaction
- Accounts receivable – Customer debt
- General ledger – Stock account, revenue account, account for COGS, customer summary account

A big advantage of ledger integration as implemented in Dynamics AX is to grant a general ledger which is always up-to-date. In addition, you may trace all vouchers in finance back to its origin in other modules.

As a basis for ledger integration, Dynamics AX comprehensively applies the voucher principle to transactions: In every part of the application, you have to register a voucher, before you can post it. After posting, it is not possible to modify the voucher any more.

8.1.2 At a glance: Ledger Journal Transactions

In order to record manual ledger transactions in Dynamics AX, you have to register a journal. The lines below show how to post a single-line transaction, which is similar to processing an inventory journal (see section 7.1.2).

Accessing the form *General ledger> Journals> General journal* you need to register a voucher header before you may record the journal lines. When inserting a new record (*Ctrl+N*) in the journal header form, you need to select a journal name in the column *Name*. In the column *Description*, you may enter a short text explaining the transaction before switching to the lines form by clicking the button *Lines*.

In the journal lines form, you may register a ledger journal transaction leaving “Ledger” in the column *Account type* and selecting the account number – including financial dimensions as applicable for segmented entry control – in the column *Account*. If you want to post to a subledger like accounts payable, you may for example choose the *Account type* “Vendor” and select the vendor number in the column *Account*. In case sales tax (VAT) applies, it depends on the appropriate checkbox on the tab *Setup* of the journal header, if the amount in the debit or credit column of the journal line includes tax.

In a single-line transaction, you may select the offset account (including applicable financial dimensions) directly in the journal line.

Once you have finished registering the line, you may post the journal clicking the button *Post/Post*.

Figure 8-1: Registering a general journal line (referring to an account structure without dimensions)

8.2 Setting up Finance

Since finance is a core area of the Dynamics AX application, you need to finish basic finance configuration before you may set up other modules or post transactions in any part of the application.

This basic finance configuration includes the following elements:

- Fiscal and ledger calendars
- Currencies and exchange rates
- Chart of accounts

In Dynamics AX 2012, you may share charts of accounts (including applicable ledger main accounts) as well as fiscal calendars and currencies/exchange rates across multiple companies.

In the ledger form, you need to assign the appropriate chart of accounts, fiscal calendar and accounting currency to your company after finishing shared configuration. If required, you may keep a separate chart of accounts or fiscal calendar for your company by choosing a different assignment per company.

8.2.1 Fiscal and Ledger Calendars

The primary purpose of fiscal calendars is to specify the fiscal year, providing the start and end date for financial periods. Based on the fiscal calendar, the ledger calendar is there to define which financial periods are open for posting transactions in your company.

8.2.1.1 Fiscal Calendar

Fiscal calendars are shared across all companies within a common Dynamics AX database. In the ledger form (*General ledger> Setup> Ledger*) you may select, which of the fiscal calendars applies to your company.

Accounting periods within the fiscal years of a fiscal calendar are specified with a start date and an end date. When setting up a period, you are free to choose any period length according to your specific requirements.

Fiscal calendars are available in the form *General ledger> Setup> Fiscal calendars*. In order to create a new fiscal calendar, you may click the button *New fiscal calendar* and enter a calendar identification as well as the settings for the first fiscal year. If you want to add a fiscal year to an existing fiscal calendar, you may select the calendar concerned and click the button *New fiscal year*. In a dialog box you are to enter start date, end date, period length and unit – be sure to select the unit “Months” if you want monthly periods. Clicking the button *OK* in the dialog box will create the accounting periods.

8.2.1.2 Closing and Opening Period Types

Apart from regular operating periods, there are two special period types not available for posting regular transactions: *Closing periods* and *Opening periods*. In

Dynamics AX 2012, you may attach several closing periods to a regular period if required.

Closing periods contain year-end transactions, which you may enter in the closing sheet (*General ledger> Periodic> Fiscal year close> Closing sheet*). Opening periods contain the opening transactions for a fiscal year, which are transferred in the form *General ledger> Periodic> Fiscal year close> Opening transactions* after closing a year.

8.2.1.3 Ledger Calendar

The period status controls whether postings are possible on a certain date. Based on the accounting periods specified in the fiscal calendar assigned to your company, you may manage the period status in the ledger calendar per company.

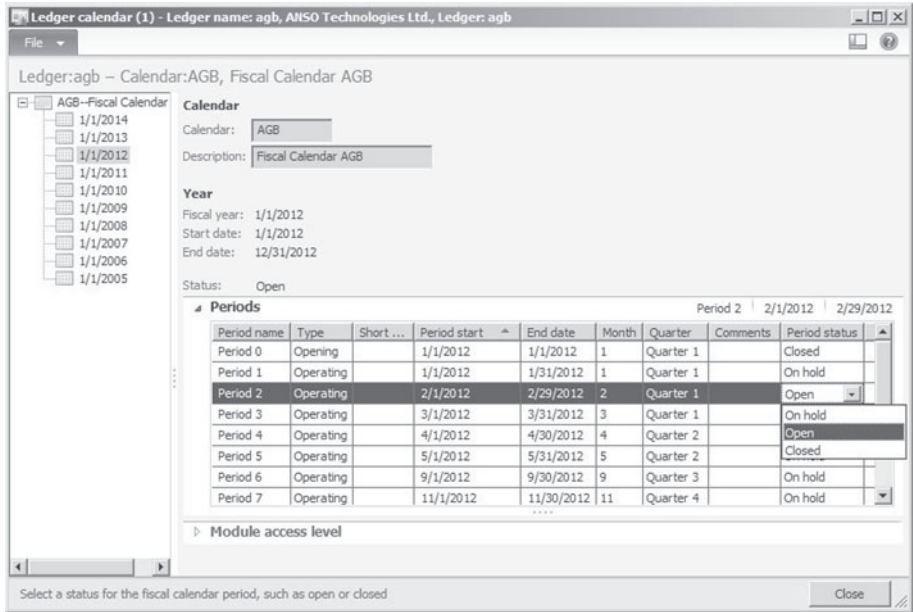


Figure 8-2: Managing the period status in the ledger calendar

In order to access the ledger calendar, you want to open the ledger form (*General ledger> Setup> Ledger*) and select the button *Ledger calendar* there. After selecting the fiscal year concerned on the left pane of the ledger calendar form, you may open or close periods in the column *Period status* (scroll to the rightmost column on the tab *Periods*).

The period status “Open” allows posting transactions in the period, whereas the period status “On hold” blocks posting. The status “Closed” also blocks posting – unlike periods on hold, closed periods are not available for reopening, however. Therefore, the status “Closed” should only apply if a period is closed definitely in accounting after reporting to the authorities.

The tab *Module access level* provides the possibility to specify blocking per module and to except user groups from blocking.

8.2.1.4 New in Dynamics AX 2012

Items new in Dynamics AX 2012 referring to ledger periods include shared fiscal calendars and the option to specify multiple closing periods.

8.2.2 Currencies and Exchange Rates

Every value-based transaction refers to currencies – general ledger transactions as well as subledger transactions like inventory or customer transactions. A transaction is always recorded in the accounting currency of your company, and sometimes additionally in a foreign currency. Currencies are a main requirement before you can do any posting in Dynamics AX, therefore.

8.2.2.1 Currencies

In order to facilitate currency management in multi-company organizations, the currency table is shared across all companies within a common Dynamics AX database. In addition, Dynamics AX will automatically provide all currencies by default.

You may access the currencies form choosing the menu item *General ledger> Setup> Currency> Currencies*. Major settings apart from currency code and name include the definition of the rounding precision on the tab *Rounding rules*.

The setting in the field *General rounding rule* specifies the precision in finance. If financial transactions are posted with two decimal places, you should set it to “0.01”, even if a higher number of decimal places is required in other areas like sales prices.

On the tab *Currency converter*, you may specify if the selected currency is available in the online currency conversion tool (see below).

8.2.2.2 Exchange Rates

Exchange rate types (*General ledger> Setup> Currency> Exchange rate types*) in Dynamics AX 2012 provide the option to manage multiple exchange rates per currency in parallel. For example, different exchange rates may be useful to distinguish rates for current transactions from budget entries.

The *Currency exchange rates* form is available choosing the menu item *General ledger> Setup> Currency> Currency exchange rates* or clicking the button *Exchange rates* in the *Exchange rate types* form.

Referring to the *Exchange rate type* selected at the top of the currency exchange rates form (see Figure 8-3), you may view and add currency relations registered for conversion in the left pane. The *Quotation unit* specifies the applicable factor for exchange rate calculation.

After selecting a currency relation in the left pane, the right pane shows the exchange rates in chronological order. The filter *From date* and *To date* specifies the date range for displaying exchange rates. In the bottom line of the right pane you

may view the conversion result, providing the option to check if exchange rates are entered the right way.

In daily business, you have to enter or import new exchange rates continuously to ensure correct currency conversion. Frequently you may find a line without a start date for an exchange rate. This setting provides the option to calculate currency conversion for transactions before the first real start date of conversion.

From currency	To currency	Quotation unit
CHF	GBP	100
DKK	GBP	100
EUR	GBP	100
USD	GBP	100

Start date	Exchange rate
	60.0000
12/31/2001	61.0700
12/31/2002	65.3500
12/31/2003	70.6210
12/31/2004	70.8460

Figure 8-3: Managing exchange rates in the currency exchange rates form

Currency exchange rates and exchange rate types are shared across all companies, but you may select a different exchange rate type per company in the ledger form as required.

8.2.2.3 Currency Settings in the Ledger Form

The ledger form (*General ledger> Setup> Ledger*) sets the *Accounting currency* of your company. All financial transactions post in this currency, which may not be modified as soon as transactions are registered in the particular company. If you need to change the local currency – e.g. converting to a new currency in your country – later, you will require specific conversion tools.

Concerning exchange rate conversion, the ledger form contains the *Default exchange rate type* that specifies the exchange rate type for regular transactions. In addition, a separate default for budget transactions is available.

In addition, the lower part of the ledger form contains the ledger accounts for posting exchange rate gains and losses on the tab *Posting* in your company.

8.2.2.4 Currency Converter

When recording transactions in Dynamics AX to which foreign currencies may apply (e.g. purchase orders or bank transactions), you can always find a separate field to enter the appropriate currency code.

For internal reporting, transactions and master data, amounts are converted to your accounting currency. You may apply the currency converter to view these amounts in a different currency (e.g. the currency of a parent company).

The currency converter dialog is accessible by double-clicking the currency field in the status bar. In the dialog, you may select the currency concerned with a second double-click. Figure 8-4 for example shows the *Credit limit* below the grid in US-dollars after selecting “USD” in the currency converter.

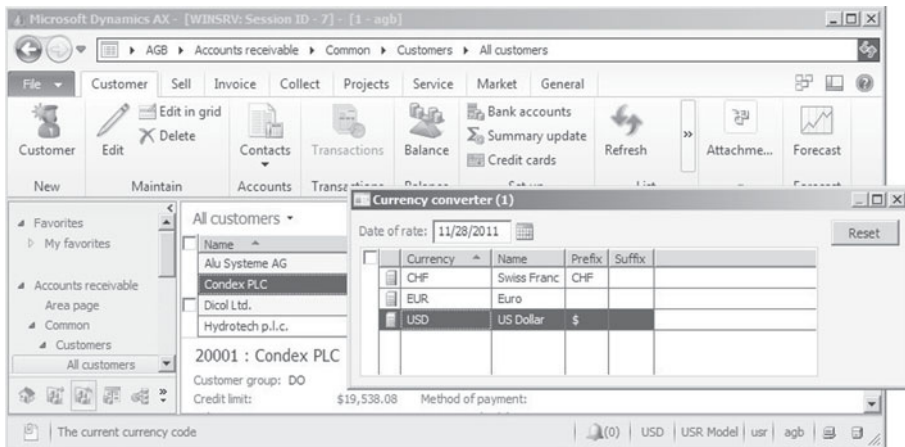


Figure 8-4: Applying the online currency conversion feature

The currency field in the status bar shows, which currency presently applies to display amounts. The currency converter is limited to displaying – when selecting a certain field with a mouse-click for editing, the amount in this field will show in local currency. Any amount entered also needs to be in local currency, therefore.

In order to reset currency conversion, you may open the currency converter dialog again and click the button *Reset*. The currency converter only shows currencies, for which the currency converter has been enabled in the currencies form (see above).

8.2.2.5 New in Dynamics AX 2012

In Dynamics AX 2012, currencies are shared across legal entities. Exchange rate types enable maintaining different exchange rates in parallel.

8.2.3 Financial Dimensions

In addition to the ledger main accounts specified in the chart of accounts, financial dimensions provide further levels for structuring financial transactions. Depending on the account structure assigned to your company, you are required to enter dimension values for these financial dimensions – e.g. inserting a certain cost center – when posting transactions.

Based on the posted dimension values, you may run financial analysis and reports not only on company level but also based for financial dimensions. This is important for the multisite functionality: Assigning a financial dimension to the

inventory dimension “Site” (see section 9.1.6), you may for example report the income statement for subsidiaries within a legal entity.

8.2.3.1 Dimension Structure

In Dynamics AX 2012, financial dimensions and – as applicable – dimension values are shared across all companies within a common Dynamics AX database.

Financial dimensions are not limited to standard dimensions like department, cost center and purpose. You may easily set up as many financial dimensions as required. Taking into account practical reasons like structural clearness, probability of wrong entries and effort for registration, you should not set up and apply more dimensions as needed, however.

8.2.3.2 Managing Financial Dimensions

You may access financial dimensions choosing the menu item *General ledger> Setup> Financial dimensions> Financial dimensions*. If a required financial dimension does not exist yet, you may insert it clicking the button *New*. The lookup field *Use values from* specifies the origin of related financial dimension values:

- <Custom dimension> – Creating a dimension not referring to other areas of the application.
- One of the other options – Linking the dimension to other entities of the application like customers, item groups or operating units.

If you select *Use values from* “Departments” for example, the financial dimension is linked to operating units of the type “Department”. In this case, all departments entered in the organization management (*Organization administration> Setup> Organization> Operating units*) are financial dimension values for that dimension automatically.

If you select *Use values from* “<Custom dimension>”, you have to enter financial dimension values manually clicking the button *Financial dimension values*.

8.2.3.3 Financial Dimension Values

For custom dimensions, you may insert new records in the financial dimension values form entering dimension value and description. In the lookup field *Select level of dimension value to display* you may choose if entries on the other tabs apply to all companies (“Shared value”). If you select “Companies”, you have to click the button  near the field *Companies* to select a certain company.

If you want to prevent further postings to a certain dimension value on the select level, you may select the checkbox *Suspended* or enter appropriate *Active from / Active to* dates.

In the financial dimension values form, you cannot insert values for financial dimensions that are not custom dimensions. However, you may enter other dimension value settings like suspending a value on shared or company level.

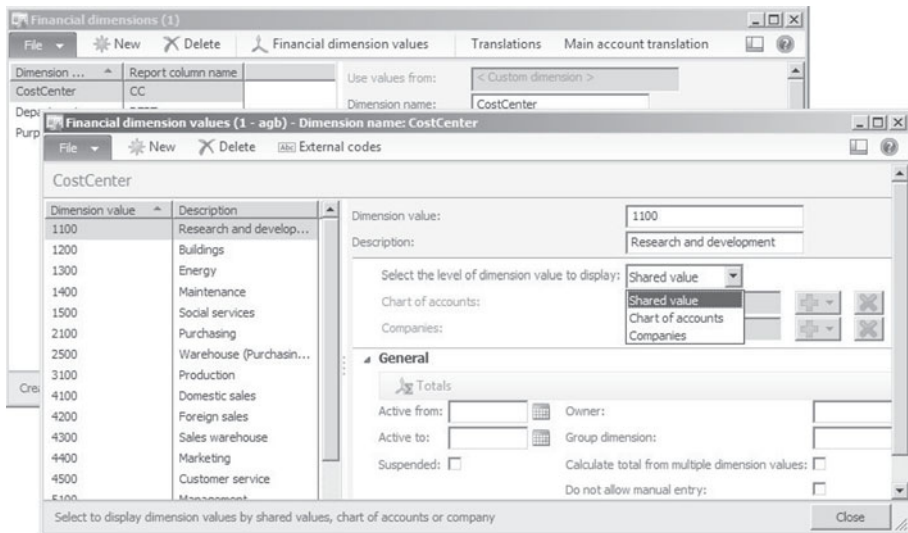


Figure 8-5: Managing financial dimension values for a custom dimension

8.2.3.4 Applying Financial Dimensions

Once a financial dimension is created, it needs to be included in account structures or advanced rule structures applying to your company (see section 8.2.4) before you can choose it in transactions and inquiries. In addition, the account structures and applicable advanced rule structures specify if and which dimension value is optional or required when posting to the certain account.

The tab *Financial dimensions* on master data forms like ledger main accounts, customers or items (released products) shows all financial dimensions that are included in account structures and advanced rule structures applying to your company. You may enter dimension values there in order to default dimension values when registering an order or journal line.

When registering a transaction in a ledger journal line or any other form containing a ledger account field, financial dimensions are not available as separate fields. Applying segmented entry control (see section 8.3.2) you have to enter financial dimensions together with the main account in one – segmented – field.

8.2.3.5 New in Dynamics AX 2012

In Dynamics AX 2012, financial dimensions are shared across legal entities and provide the option to easily add dimensions as well as to populate dimension values from other tables. Account structures specify which financial dimensions apply and segmented entry control changes the way to enter dimension values.

8.2.4 Account Structures and the Chart of Accounts

In Dynamics AX 2012, charts of accounts with their distinct ledger main accounts are shared across companies. Choosing a specific chart of accounts in the ledger

form will set applicable ledger main accounts and – through account structures – applicable financial dimensions for you company.

8.2.4.1 Chart of Accounts

You may access available charts of accounts choosing the menu item *General ledger> Setup> Chart of Accounts> Chart of Accounts*. Depending on the structure of your organization and the number of legal entities, the left pane of the carts of accounts form shows one or more charts of accounts.

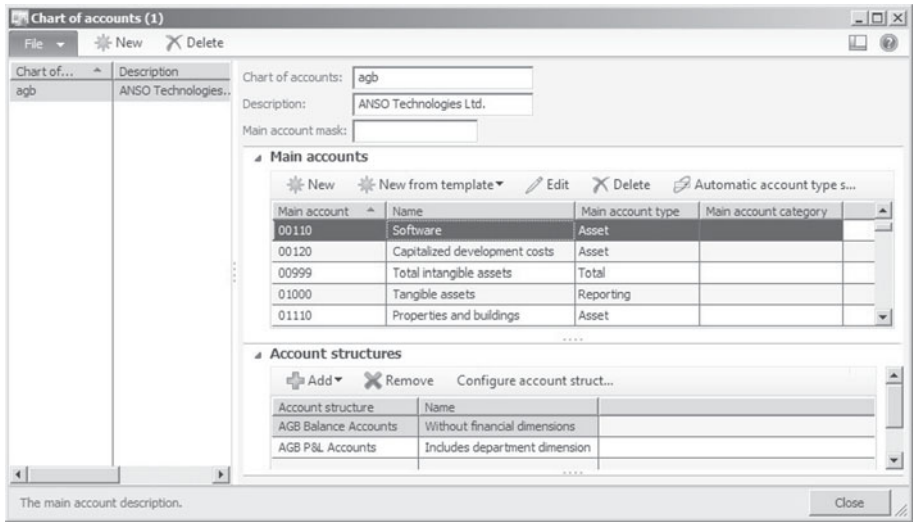


Figure 8-6: Managing charts of accounts in the chart of accounts form

As shown in Figure 8-6 , the right pane of the charts of accounts form displays the ledger main accounts and the account structures related to the chart of accounts selected in the left pane.

Clicking the button *New* or *Edit* on the tab *Main accounts* of the chart of accounts form will take you to the main accounts form, where you can insert or modify the ledger main accounts of the particular chart of accounts. Alternatively, you may access ledger main accounts – limited to the chart of accounts of the current company – through the list page *General ledger> Common> Main accounts*.

The *Account structures* tab of the chart of accounts form contains the account structures referring to the selected chart of accounts. In order to add an applicable account structure to that chart of accounts, you may click the button . Since account structures specify which financial dimensions are available when posting to the individual ledger main accounts, each main account included in the chart of accounts needs to be assigned to exactly one account structure without overlapping or missing assignments.

8.2.4.2 Chart of Accounts Settings in the Ledger Form

In the ledger form (*General ledger> Setup> Ledger*), you have to specify the chart of accounts applicable to your company before registering the first transaction. You may share a chart of accounts, assigning several companies to one common chart of accounts.

It is not possible to change the chart of accounts assignment of a company after posting the first transaction in that company.

8.2.4.3 Account Structures

You may access the account structure configuration form through the menu item *General ledger> Setup> Chart of Accounts> Configure account structures* or clicking the button *Configure account structures* on the tab *Account structures* of the chart of accounts form.

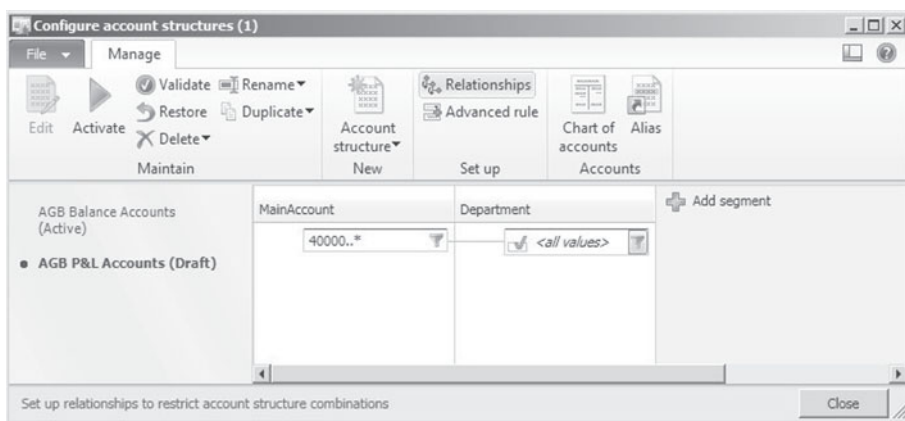


Figure 8-7: Configuring an account structure

If you want to create a new account structure in order to specify a new segment combination of main account and applicable financial dimensions, you may click the button *New/Account structure* in the account structures configuration form. The main account usually is added to be the first segment, but it is also possible to deselect this option and to add a financial dimension in the first segment – e.g. if divisions apply and should be selected first when entering transactions.

When creating a new account structure or editing an existing structure, it will appear in *Draft* mode. You may add dimensions to the account structure clicking the button *Add segment*. The filter button  in the segment fields provides the option to limit available dimension values. When selecting the checkbox *Allow blanks* for financial dimensions in the filter dialog, entering a dimension value is optional and you are not required to select a dimension value when registering a transaction for a main account referring to the account structure.

The example in Figure 8-7 shows a simple account structure applying to main accounts starting with account 40000, containing the financial dimension “Department” without restricting available dimension values on that dimension.

If applicable to your account structure, you may add lines (nodes) to specify different dimension value combinations entering appropriate filters in the specific nodes.

Once you have finished the setup of account structure segments, you may click the button *Activate* to make the account structure available.

8.2.4.4 Advanced Rule Structures

In addition to the account structures, advanced rules and advanced rule structures provide the option to add dimension segments that only apply to one or a few specific accounts. For example, you might want to track marketing campaigns applying a financial dimension “Campaigns” only for a certain marketing main account.

You may set up advanced rule structures to specify applicable financial dimensions in the form *General ledger> Setup> Chart of Accounts> Advanced rule structures* similar to setting up account structures as described above.

In order to apply an advanced rule structure, you may access the account structures form and click the button *Advanced rule* when editing a selected account structure. Clicking the button *New* in the advanced rules form, you may enter an advanced rule ID and name. In order to specify to which main accounts the advanced rule applies, you want to click the button  in the middle of the right pane of the advanced rules form.

Clicking the button  on the tab *Advanced rule structures* you may add advanced rule structures to the advanced rule as applicable. Activating the account structure to which the advanced rule applies will activate the advanced rule in parallel.

8.2.4.5 Ledger Main Accounts

You are free to specify any structure of ledger main accounts in the chart of accounts as required by your organization.

In order to edit the ledger main accounts, you may access the list page *General ledger> Common> Main accounts* and click the button *Edit* there. Alternatively, you may choose the chart of accounts concerned in the chart of accounts form as described above.

The main accounts list page as well as the main accounts form contains the chart of accounts applying to your company. For information purposes, the form header in the main accounts form shows the name of the applicable chart of accounts. If this chart of accounts is shared, you need to pay attention to the fact that the changes you do on main accounts will affect the other companies concerned as well.

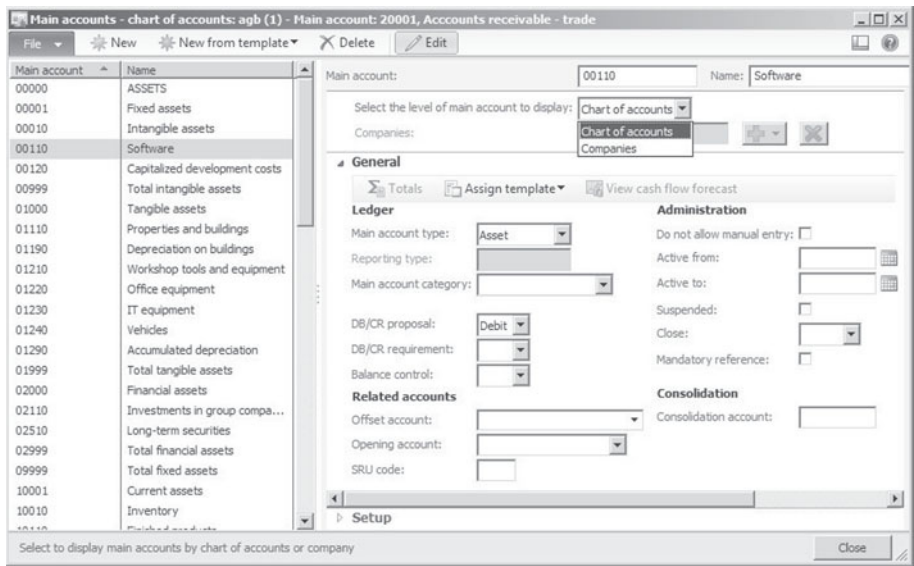


Figure 8-8: Editing a main account

If you want to enter a new account, you have to insert a record including a unique account number, an account name and an account type. For ledger accounts, which receive transactions from other modules according to ledger integration settings (e.g. summary accounts for vendor liabilities), you should select the checkbox *Do not allow manual entry* in order to block manual posting.

In the lookup field *Select level of main account to display* you may choose if entries on the fields and tabs concerned (e.g. active dates) apply to all companies linked to the current chart of account (select “Chart of accounts”). If you select “Companies” to add data specific for a certain company, you have to click the button  near the field *Companies* to select a certain company.

Regarding main account structure, you have to distinguish between transaction accounts and auxiliary accounts. Assigning a *Main account type*, you may group main accounts according to following table 8-1.

The main difference between transaction accounts and auxiliary accounts is that posting is only possible to transaction accounts. Auxiliary accounts support a clear structure of the chart of accounts. They are not necessarily required, however.

Transaction accounts include balance accounts on the one hand and nominal account (income statement accounts) on the other hand. Referring to Dynamics AX functionality, these two types are different in fiscal year closing: Whereas the balance of nominal accounts will be zero in the opening transactions for the next year, balance accounts will transfer their balance.

Distinguishing between asset accounts and liability accounts may support grouping and selecting of balance accounts in reports. You may as well do without

this distinction in the account structure and only use the account type “Balance sheet”, however.

Table 8-1: Structure of ledger main accounts

Type		Account type in Dynamics AX
Transaction accounts	Balance accounts	Balance sheet
		Asset
		Liability
		Equity
	Nominal accounts	Profit and loss
		Expense
		Revenue
Auxiliary accounts		Reporting
		(Choose <i>Reporting type</i> “Header”,
		“Empty header” or “Page header”)
		Total

As with balance accounts, you are free to split nominal accounts (type “Profit and loss”) into cost accounts and revenue accounts as well.

Selecting a *Main account category* in the main account form, you may apply an additional classification of ledger accounts. Calculation of performance indicators (KPIs) included in some cubes and role centers is based on account categories.

On the tabs *General*, *Setup* and – on company level – *Financial statement* and *Financial dimensions* you may enter default data and settings for allowed transactions.

In the main accounts list page, the fact box *Balance* shows the account balance of a period, which you may select clicking the button *Balances/Parameters* in the action pane. Clicking the button *Journal entries/Posted* in the main accounts list page, you may directly access the ledger transactions referring to a selected main account. The transaction form itself contains following buttons in the action pane strip to show further information:

- Voucher – Shows all transactions of the voucher in the general ledger
- Transaction origin – Shows related transactions in all modules
- Original document – Preview of the printed document

8.2.4.6 Financial Statement

In order to comply with different regulations for various internal and external reports, you need alternative groupings of ledger accounts to show business data independent from the account structure in the chart of accounts.

For that purpose, you may set up as many different financial statements as you like. As an example, the financial statements may include a revenue report as well as different versions of the balance sheet and income statement.

You may run a financial statement choosing the menu item *General ledger> Reports> Transactions> Financial statement*, exporting it to different file types like XBRL and Excel. Before starting a financial statement, you need to complete the setup in following menu items:

- *General ledger> Setup> Financial dimensions> Financial dimension sets*
- *General ledger> Setup> Financial statement> Row definition*
- *General ledger> Setup> Financial statement> Financial statement (setting up columns)*

8.2.4.7 Accounts for Automatic Transactions

Ledger account settings available in the form *General ledger> Setup> Posting> Accounts for automatic transactions* apply to automatic ledger transactions, for which other settings are missing or – as with invoice discounts – are not available.

In order to enter an account for automatic transactions, you may insert a record selecting the posting type and the assigned main account. Clicking the button *Create default types*, you may create a basic set of posting types to enter default accounts.

Core accounts for automatic transactions are as follows:

- Error account – Applying in case of missing account settings
- Penny difference in accounting currency – For small payment differences
- Year-end result – Account for profit/loss when closing the fiscal year
- Sales tax rounding
- Order invoice rounding – Sales invoice rounding
- Purchase invoice rounding-off – Purchase invoice rounding
- Vendor invoice discount
- Customer invoice discount

If the checkbox *Interrupt in case or error account* in the general ledger parameters is selected and no ledger account is available in the integration settings for a certain transaction, Dynamics AX displays an error message instead of posting to the error account.

8.2.4.8 New in Dynamics AX 2012

In Dynamics AX 2012, you may set up charts of accounts with their set of ledger main accounts independent from companies, sharing them across legal entities as required. Account structures specify combinations of main accounts and financial dimensions required for registering transactions.

8.2.5 Customer, Vendor and Bank Accounts

When entering a ledger journal line, you have the option to select customers, vendors, bank accounts or fixed assets instead of ledger accounts.

8.2.5.1 Bank Accounts

Before you may select a certain bank account, you need to set it up choosing the menu item *Cash and Bank management> Common> Bank accounts*. When creating a new bank account clicking the button *Bank account/New*, you want to enter a bank account ID, a *Routing number* identifying the bank, your *Bank account number* as specified by the bank, and a *Name* for the bank account.

On the tab *Currency management* of the bank account form, the *Main account* field needs to contain the main account referring to the bank account. The *Currency* field specifies the currency of the bank account.

If your company holds several accounts at a certain bank, you may register a bank group (*Cash and Bank management> Setup> Bank groups*) that contains the common defaults for address, routing number and contact data of the bank accounts assigned.

8.2.5.2 Vendors

As shown in section 3.2.1, you may access vendor records in the list page *Accounts payable> Common> Vendors> All vendors*. In order to view vendor transactions (invoices and payments), you may click the button *Transactions* after selecting the vendor concerned. Apart from the invoice or payment amount, the vendor transaction form shows the open, not yet settled amount in the column *Balance*.

8.2.5.3 Transaction Settlement

In order to apply a payment to an invoice, you may click the button *Settle/Settle open transaction* on the action pane tab *Invoice*. In the open transactions form, you need to select the checkbox *Mark* of the transaction lines you want to settle – one or several invoices on the one hand and payments or credit notes on the other hand. In the lookup field *Settlement posting date* on the upper part of the form, you may choose the settlement date for calculating exchange rate gains or losses in case foreign currencies.

Referring to cash discount calculation specified in the lookup field *Date used for calculating discounts*, there are two options:

- Transaction date – Select the transaction line containing the date for discount calculation and click the button *Mark payment*
- Selected date – Manually enter a discount calculation date

You may check the balance of marked transactions in the field *Marked total* in the upper pane of the form. Clicking the button *Update* will post the settlement.

In order to avoid posting settlements separately, you may record a settlement when entering a payment (see section 8.3.4). If you want to cancel a posted settlement, you may access the closed transaction form clicking the button *Settle/Closed transaction editing* (action pane tab *Invoice*) in the vendor form.

8.2.5.4 Customers

Explanations on the customer record (*Accounts receivable* > *Common* > *Customers* > *All Customers*) are available in section 4.2.1. The way to execute transaction inquiries and to settle transactions (action pane tab *Collect*) is similar to appropriate activities in vendor management.

8.2.6 VAT / Sales Tax Settings

The sales tax/VAT functionality in Dynamics AX applies to different regulations in many countries like the sales tax in the United States or the value added tax in Europe.

Sales tax codes, determining the tax rate, are the basis for sales tax calculation. The sales tax code of an invoice line depends on the item sales tax group of the item and the sales tax group of the customer or vendor.

A basic setting for tax calculation is if to apply US sales tax: If you do, you need to select the checkbox *Apply U.S. taxation rules* on the tab *Sales tax* of the general ledger parameters, which includes sales tax jurisdictions as an additional grouping in tax calculation. In this section, we do not cover the specific issues of US sales tax. For more information on that topic you may check the Dynamics AX online help.

Apart from general settings in the general ledger parameters, the setup of sales tax/VAT calculation includes following items:

- Sales tax authorities
- Sales tax settlement periods
- Ledger posting groups
- Sales tax codes
- Item sales tax groups
- Sales tax groups

8.2.6.1 Sales Tax Authorities

The first step in sales tax setup is to enter the competent authorities in the form *General ledger* > *Setup* > *Sales tax* > *Sales tax authorities*, providing authority ID, name and report layout for tax reporting.

8.2.6.2 Sales Tax Settlement Periods

Applicable periods for tax reporting (often a monthly period) are available in the form *General ledger* > *Setup* > *Sales tax* > *Sales tax settlement periods*. When creating a new settlement period definition with ID and *Description*, you need to assign the competent *Authority* and the *Period interval* on the tab *General*. After specifying the period interval, you may switch to the tab *Periods* where you have to enter the first period manually (e.g. Jan 1 – Jan 31). In order to create further periods automatically, you may click the button *New period* in the action pane strip.

8.2.6.3 Ledger Posting Groups

Sales tax ledger posting groups control the main accounts, which apply to sales tax posting depending on the sales tax code. You may set up sales tax ledger posting groups in the form *General ledger> Setup> Sales tax> Ledger posting groups*. Apart from group code and description, you may insert the main account for sales tax payable (input tax), sales tax receivable and use tax per ledger posting group. The *Settlement account* field contains the balance account that holds the amount to be paid to the tax authorities.

8.2.6.4 Sales Tax Codes

Sales tax codes control the tax rate and the calculation base. You may create a new sales tax code in the form *General ledger> Setup> Sales tax> Sales tax codes* inserting code and name. On the tab *General*, you need to assign settlement period and ledger posting group.

Sales tax code	Name
E00	Input tax 0% for EU acqu.
E05	Input tax 5% for EU acqu.
E175	Input tax 17.5% for EU acqu.
I00	Input tax 0%
I05	Input tax 5%
I175	Input tax 17.5%
R05	Reverse charge 5%
R175	Reverse charge 17.5%
ST1	Sales tax on import
V00	Value added tax 0%
V05	Value added tax 5%
V0E	Value added tax 0% EU sales
V0T	Value added tax 0% 3rd country
V175	Value added tax 17.5%

Sales tax codes (1 - agb)

Sales tax code: V175
Name: Value added tax 17.5%
Sales tax jurisdiction code:
Percentage/Amount: 17.50000

General

Currency
Currency: GBP

Invoicing
Print: Print code
Print code: 2

References
Settlement period: MON
Ledge posting group: V175

Packing duty
Sort code:

Negative sales tax percentage
Negative sales tax percentage: ☐

Conditional sales tax
Payment sales tax code:

Calculation

Calculation parameters
Origin: Percentage of net amount
Marginal base: Net amount of invoice balance
Calculation method: Whole amount

Round-off
Round-off: 0.00
Rounding form: Normal

Duty

Name of ledger posting group for sales tax.

Close

Figure 8-9: Managing sales tax codes

In order to insert calculation parameters, you need to switch to the tab *Calculation*. Clicking the button *Values* in the action pane strip of the sales tax codes form, you may enter the tax rate in the column *Value* of the sales tax codes values form.

Dynamics AX determines the sales tax code of an invoice line according to the sales tax code, which is included in the settings of both tax groups – the item sales tax group and the sales tax group of the customer or vendor.

In order to apply a tax code “V175” in a sales invoice line as an example, the line needs to comply with following conditions:

- The item sales tax group (e.g. “STD” for a standard rate) of the item contains the sales tax code “V175”
- The sales tax group of the customer (e.g. “CDO” for domestic customers) contains the sales tax code “V175”

8.2.6.5 Item Sales Tax Groups

In order to manage item sales tax groups, you may access the form *General ledger> Setup> Sales tax> Item sales tax groups*. Apart from entering tax group identification and description on the tab *Overview*, you want to switch to the tab *Setup* to register applicable sales tax codes for the items belonging to the group.

The assignment of item sales tax groups to individual items is available in the released product form (*Product information management> Common> Released products*), where you want to enter the tax group for sales (tab *Sell*) and purchasing (tab *Purchase*) when setting up an item.

For assigning item sales tax groups to product categories, you want to access the procurement categories form (*Procurement and sourcing > Setup> Categories> Procurement categories*) and the sales categories form (*Sales and marketing> Setup> Categories> Sales categories*).

8.2.6.6 Sales Tax Groups

Choosing the menu item *General ledger> Setup> Sales tax> Sales tax groups* you may set up sales tax groups (applying to customers and vendors), which is similar to setting up item sales tax groups.

In order to assign the sales tax groups to customers and vendors, you need access the customer or vendor form switching to the tab *Invoice and delivery* there.

8.2.6.7 Sales Tax Transactions

When registering a transaction in a journal or order line, Dynamics AX will default the sales tax code according to the combination of item and customer/vendor. You may show the calculated tax clicking the button *Sales tax* on the appropriate tab of the action pane or action pane strip in journal lines, sales and purchase order headers and lines as well as in posting forms yet before posting.

If necessary, you may change the sales tax groups and the sales tax code in journal or order lines. When posting an invoice, Dynamics AX will post a transaction for sales tax in the general ledger (according to the ledger posting group assigned to the sales tax code) as well as a sales tax transaction in a separate subledger.

8.2.6.8 Sales Tax Payment

In order to calculate the sales tax payable to the authorities for a certain period, you may run the periodic activity *General ledger> Periodic> Sales tax payments> Sales tax payments*. As a prerequisite, the reporting codes for the report layout assigned to the sales tax authority have to be set up in the form *General ledger> Setup> Sales tax> External> Sales tax reporting codes*.

8.2.7 Case Study Exercises

Exercise 8.1 – Financial Dimensions

Your organization introduces business areas for reporting. For that purpose, you want to set up an additional financial dimension “##Areas” (custom dimension), showing the shared values “Area ## 1” and “Area ## 2” (## = your user ID).

Exercise 8.2 – Main Accounts

You want to set up following main accounts (## = your user ID):

- Main account “111C-##”, Name “Petty cash”, account type “Balance Sheet”
- Main account “111B-##”, Name “##-Bank”, account type “Balance Sheet”
- Main account “6060##”, Name “## - Consulting”, account type “Expense”
- Main account “ZZ##”, Name “## account structure test”, account type “Balance Sheet”

Create these accounts making sure to apply the appropriate chart of accounts.

Exercise 8.3 – Account structures

Whereas the other main accounts created in the previous exercise are in an account number range referring to existing account structures, you want to set up a new account structure only applying to the main account “ZZ##”.

Create and activate a new account structure configuration “ZS##”, containing main accounts and the financial dimension “##Areas” which is linked only to your main account “ZZ##”.

Add your new account structure to the chart of accounts of your test company.

Notes: If you are sharing your Dynamics AX training database with other people, be sure to remove your account structure from the chart of accounts once you have finished all exercises of Chapter 8 in order to avoid confusing other people with too many applicable financial dimensions.

Exercise 8.4 – Bank Accounts

Your company opens a new bank account at you preferred bank. Register an appropriate bank account “B-##”, referring to any routing number and bank account number you like. On the tab *Currency management* you may select the main account “111B-##” and leave the default currency.

8.3 Business Processes in Finance

Every business process related to monetary amounts in Dynamics AX generates financial transactions related to ledger accounts. Most of the transactions do not origin in accounting, however, but refer to transactions in other areas like purchasing, sales or production. Transactions in these areas automatically generate ledger postings in the background.

Some ledger transactions directly derive from activities in accounting, nevertheless. In order to record these transactions, you will register and post a journal in the general ledger module.

8.3.1 Basics Setup for Journal Transactions

As a prerequisite to register journal transactions in the general ledger of Dynamics AX, the basic setup of the general ledger module has to be finished and the chart of accounts has to be available as described before.

8.3.1.1 Journal Names

In order to classify transactions by subject matters, Dynamics AX applies journal names. The setup of journal names is available in the form *General ledger> Setup> Journals> Journal names*. The *Journal type* field controls, which journals apply to a certain journal name. The most common journal types are:

- Daily – General journal
- Periodic – Periodic journal
- Post fixed assets – Fixed asset transactions
- Vendor invoice recording – Invoice journal in accounts payable
- Vendor disbursement – Vendor payment
- Customer payment – Payment of customers

If your company applies invoice register and invoice approval journals in purchasing, you will additionally need the journal types “Invoice register” and “Approval”.

Name	Description	Account type
CPY	Customer payment	Bank
DLT	General ledger transac...	Ledger
FAP	Asset posting	Ledger
GEB	Europe Bank transaction	Bank
GLP	Periodic transaction	Ledger
GPC	Petty cash transaction	Ledger
VIA	Vendor invoice approval	Ledger
VIN	Vendor invoice	Ledger
VIR	Vendor invoice registra...	Ledger
VPY	Vendor payment	Ledger
XXX	Accrual (Upgrade task)	Ledger

Name: GEB
Description: Europe Bank transaction

General
Journal type: Daily

Approval
Active: ☐
Approve:

Approval workflow
Approval workflow: ☐
Workflow:

Blocking
Private for user group:

Voucher number
Voucher series: GL-JVC
New voucher: In connection with balance
Number allocation at posting: ☐
Document:

Offset account proposal
Fixed offset account: ☐
Account type: Bank
Offset account: E001

Posting
Delete lines after posting: ☐
Posting layer: Current
Detail level: Details
Fees posting: ☐
Lines limit: 0

Currency
Fixed rate: ☐
Currency:

Sales tax
Amounts include sales tax: ☒

Figure 8-10: Managing journal names

Ledger journals show a common structure independent from the journal type. As a difference between different journal types, different fields show in the particular

journal registration forms. In addition, some journals show additional functionality like the payment proposal in the vendor payment journal.

Selecting different number sequences in the *Voucher series* field of journal names, you may distinguish voucher numbers of different journals.

The default for the offset account in journal lines is available in the fields *Account type* and *Offset account* of the journal names form. As an example in Figure 8-10, the default for the offset account in journal lines will be the bank account “E001”, if you select the journal “GEB”.

Another important setting on journal names is the checkbox *Amount include sales tax*. If this checkbox is selected, the amount entered in the journal lines includes sales tax (or input tax) if applicable. Otherwise, the line amount entered is a net amount, to which Dynamics AX adds sales tax.

8.3.1.2 Journal Approval

There are two options to ensure a registered journal must be approved before somebody may post it:

- Journal approval system – Field group *Approval*
- Approval workflow – Field group *Approval workflow*

You may activate the journal approval system for a journal name selecting the checkbox *Active* in the field group *Approval*. In the field *Approve*, you have to insert the user group responsible for approval in this case.

If you want to assign an approval workflow, an appropriate general ledger workflow has to be specified in the form *General ledger> Setup> General ledger workflows*. The template “Ledger daily journal workflow” (Type “LedgerDaily Template”) for example applies to approval workflows linked to daily journals. More information on workflows is available in section 9.4.

8.3.1.3 Posting Layer

The *Posting layer* on journal names usually is “Current”. If you need to cut off certain ledger transaction according to local tax regulations as an example, you may set up separate journals for the posting layers “Operations” and “Tax”. Selecting these journals when either posting appropriate transactions or executing the fiscal year closing procedure, you may print different finance statements based on postings in these layers.

8.3.1.4 General Ledger Parameters

The general ledger parameters form (*General ledger> Setup> General ledger parameters*) contains further basic settings for journal transactions. As an example, you should reject duplicate vouchers in order to avoid confusion when looking at posted documents.

8.3.2 General Journals

If you want to post a manual ledger transaction, you may register a general journal in the form *General ledger> Journals> General journal*.

Apart from the general journal, you may choose a journal optimized for specific transactions like the fixed assets journal in the fixed assets module, or payment journals in the accounts payable and the accounts receivable module. If you do not need the specific functionality of a certain journal like the payment proposal, you may as well register the transactions concerned in the general journal.

8.3.2.1 Journal Structure

Journals are vouchers and therefore consist of a header and at least one line. The header combines lines to post together and contains defaults for line registration. In every line, you may override defaults choosing different posting dates or other transaction data. Before you can post a journal, the balance of every voucher number and the balance of the complete journal (shown in the header pane of the lines form) have to be zero.

8.3.2.2 Journal Header

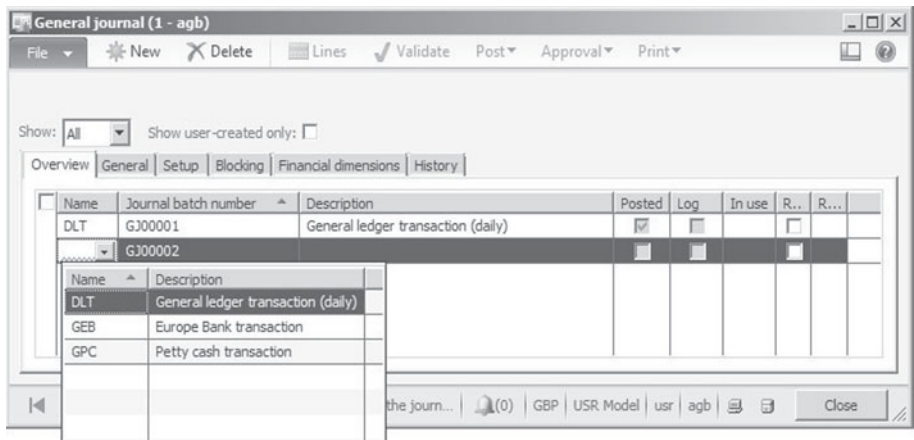


Figure 8-11: Selecting a journal name when inserting a general journal header

Selecting the appropriate option in the lookup field *Show* at the top of the general journal form, you may choose to view only open journals or to include posted journals. In order to register a new journal, you may click the button *New* and select a journal name. In a general journal, all journal names of the journal type “Daily” are available.

On the tab *Setup* of the journal header, you may change defaults deriving from the journal name like the offset account and the currency. If somebody works in the lines of a certain journal while you are viewing the journal header, the journal shows a red “X” in the column *In use*. The user ID of the user, who blocks the journal, shows on the tab *Blocking*.

8.3.2.3 Journal Lines

After clicking the button *Lines*, you may record the first journal line. The default for the posting date in a line is the current session date. Dynamics AX retrieves the voucher number from the number sequence of the journal name that you have selected in the header. Depending on your selection in the column *Account type* of the lines, you need to choose a ledger account, vendor, customer, bank account or fixed asset number in the column *Account*.

If you choose to enter a ledger account in the *Account* field, segmented entry control applies (see below). Depending on the applicable account structure, you may enter the main account in the first segment usually. If and which financial dimension segments are available and need to be entered depends on the settings for the main account. Depending on the segment currently selected, the value lookup will show available values for that segment.

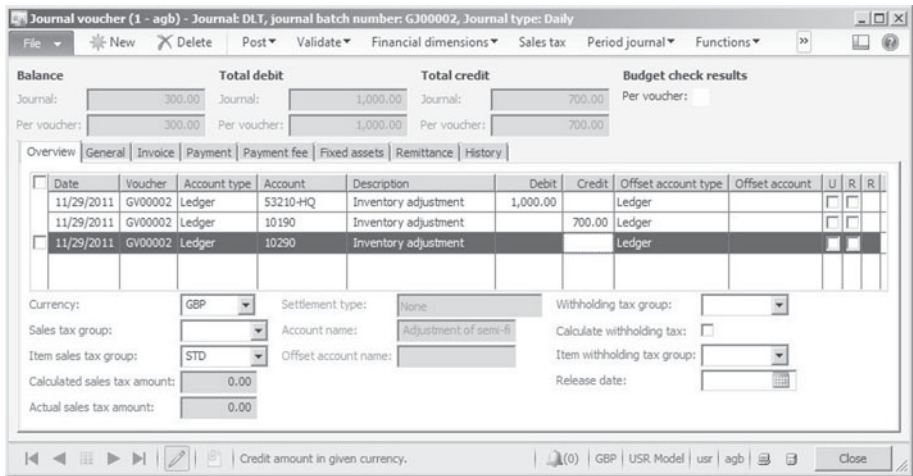


Figure 8-12: Registering a voucher with multiple offsetting lines

Depending on the transaction, you want to enter the amount in the column *Debit* or *Credit*. In a single-line transaction, which shows the same amount for the debit and the credit account, you may enter the offset account type and the offset account (including segments for financial dimensions if applicable) in the appropriate columns of the journal line.

If a transaction splits to more than one offsetting account, you need to register a voucher in multiple lines. In this case, you do not enter an offset account in the first line, but in one or more separate offsetting journal lines. As long as the balance of the voucher is not zero, Dynamics AX inserts the same voucher number as in the previous line.

Once the voucher balance is zero, the voucher number in the next line will increase (supposing the selection for *New voucher* in the journal name settings is “In connection with balance”).

In the top part of the lines form, you may see the balance of the voucher referring to the selected line and of the complete journal.

8.3.2.4 Segmented Entry Control

Segmented entry control applies to fields containing the ledger main account. Since Microsoft Dynamics AX 2012 merges ledger main account and applicable financial dimensions (like department and cost center) into one single ledger account field, you may enter the complete account structure posting information in this field by selecting main account and financial dimension values one after the other.

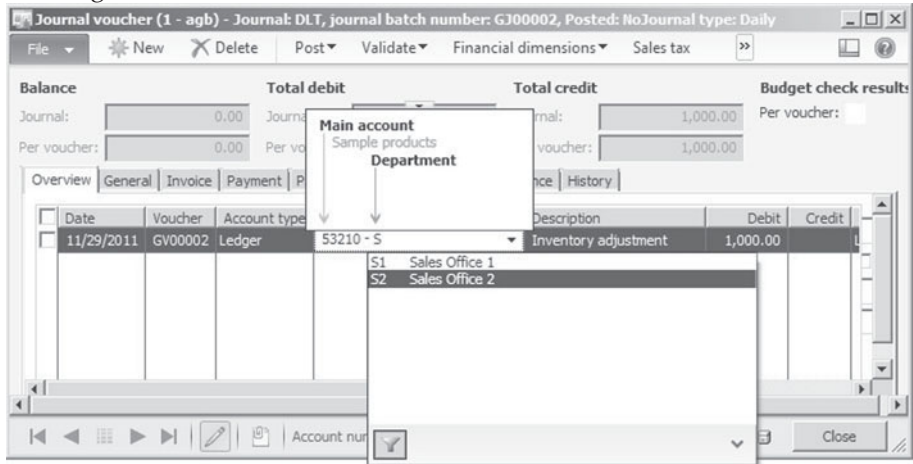


Figure 8-13: Segmented entry for main account and financial dimensions

If you choose the shortcut key *Alt + Up Arrow* or the small arrow  at the top of an account field, Dynamics AX displays the names of the individual segments as shown in Figure 8-13.

Depending on the segment currently active, the value lookup will show available content for that segment. In order to search for a segment value, you may directly enter search content – parts of the identification or name – in the appropriate segment of the account field before or after opening the value lookup choosing the lookup button  or the shortcut key *Alt + Down Arrow*.

Filtering on the segment content in the account field, unlike the value lookup on other fields the value lookup related to segmented entry control does not offer the option to open a filter/search form within the lookup. At the bottom of the value lookup for segments, the buttons  and  provide additional filtering options.

In the example Figure 8-13, the segment value lookup shows the departments list filtered on departments containing “S” in the ID or the name since the department is the segment currently active and an “S” has been entered in the segment.

The order and the number of segments depend on the account structure applicable to the main account entered (see section 8.2.4). If the account structure does not

apply financial dimensions or allows blanks for a specific segment, it is not required to enter the segment value concerned.

8.3.2.5 Posting Financial Journals

Once you have finished entering voucher lines, you may post the journal clicking the button *Post/Post*. In case of incorrect data, Dynamics AX shows an error message canceling posting.

If choosing the button *Post/Post and transfer* to post a journal, Dynamics AX posts correct vouchers in the journal and transfers incorrect vouchers to a new journal.

8.3.2.6 Applying the Journal Approval System

If the journal approval system applies according to the settings of the selected journal name, you may not immediately post a registered journal. Instead of clicking the button to post the journal, you want to request approval choosing the button *Approval/Report as ready* in the journal header. The responsible for approval then will choose the button *Approval/Approve* to release the journal for posting.

8.3.2.7 Repeated Transactions

If you need to record certain transactions repeatedly, you may select one of two options to support registration:

- Periodic journals
- Voucher templates

8.3.2.8 Periodic Journals

Periodic journals are there to register transactions like office rent or monthly installments, which repeat periodically.

You may register periodic journals in the form *General ledger> Periodic> Journals> Periodic journals* entering a journal header and lines like in a general journal. An alternative way to create a periodic journal is to copy a general journal to a periodic journal clicking the button *Period journal/Save journal* in the general journal lines.

The column *Date* in the periodic journal lines specifies the start date for the periodic transactions. In the columns *Units* and *Number of units*, which are also available on the tab *Periodic*, you will enter the frequency of the transaction (e.g. once a month).

In order to post the periodic journal, you need to register a general journal in every period. In the lines of that general journal, you may retrieve the periodic journal clicking the button *Period journal/Retrieve journal*. Once the journal has received the periodic journal lines, you may edit and post the general journal lines as required.

Instead of a general journal, you may also choose a vendor invoice journal (see section 8.3.3) for retrieving periodic journals if applicable.

Figure 8-14: Retrieving a periodic journal for posting

In the lines of the periodic journal, the column *Date* will show the next date for posting the journal, which is calculated by adding the frequency period to the date shown before retrieving the periodic journal. The date, when the periodic journal has been retrieved the last time, is available on the tab *Periodic*.

8.3.2.9 Voucher Templates

Unlike periodic journals, voucher templates are templates for copying journals without managing a periodic interval.

In order to record a voucher template, you may click the button *Functions/Save voucher template* in the lines form of a general journal or of a purchase invoice journal. Selecting “Percent” for the *Template type* when saving the template, you may apply proportions for the line amounts.

When selecting such a template in a journal later (button *Functions/Select voucher template*), you may enter an amount that will distribute to the lines according to the proportion in the template.

8.3.2.10 New in Dynamics AX 2012

In Dynamics AX 2012, items new to general journal functionality are related to account structures and the segmented entry control.

8.3.3 Invoice Journals

Depending on the business case that is the basis for posting a particular invoice, there are different ways to register and post an invoice. In Dynamics AX, you may find the following options for posting invoices:

- Sales order invoice for items shipped to customers (see section 4.6.1)
- Free text invoice for sales invoices not related to items (see section 4.6.3)
- Vendor invoice for items and procurement categories received from vendors (with or without reference to a purchase order, see section 3.6.2)
- Manual sales invoice in a general journal (not to be printed)
- Purchase invoice in an invoice journal or in a general journal, not referring to items and procurement categories

8.3.3.1 Registering Invoices in a General Journal

If you want to enter a vendor invoice directly referring to a ledger account, you will usually choose a vendor invoice journal. For customer invoices, you will usually apply a free text invoice.

Nevertheless, you may also register an invoice in the general journal (*General ledger> Journals> General journal*). As an example, this might be useful if you want to record sales invoices that are not printed in Dynamics AX (e.g. invoices written manually or printed in a separate upstream application like a POS solution).

When entering a sales invoice in a general journal, you want to select the *Account type* "Customer" and enter the customer number in the column *Account* of the journal lines. On the tab *Invoice*, you have to enter the invoice number as well as the terms of payment or applicable cash discount. Before posting, you should check if correct sales tax groups apply on the tab *Overview* or *General*.

Recording a purchase invoice in a general journal works similar to the sales invoice (choosing the *Account type* "Vendor").

8.3.3.2 Purchase Invoices

Unlike the accounts receivables, the accounts payable module does not contain a type of invoice like the free text invoice where you may directly enter ledger main accounts in invoice lines. The vendor invoice form (*Accounts payable> Common> Vendor invoices> Pending vendor invoices*, see section 3.6.2) enables entering invoices not only related to purchase orders, but also without order reference. However, it requires registering item numbers or procurement categories.

In order to register a purchase invoice not referring to an item number or a procurement category, but directly to a ledger main account (usually for subjects like office rent), you want to record a journal entry. In purchasing, you may apply following journals to register and approve invoices:

- Invoice journal, with or without prior pool/approval registration
- Vendor invoice pool excluding posting details, in conjunction with the *Invoice journal*
- Invoice register, in conjunction with the *Invoice approval journal*
- General journal, as described in the section above

If approval workflows should apply to purchase invoice journals, an appropriate accounts payable workflow with a template referring to the journal type concerned (see section 8.3.1) has to be specified in the form *Accounts payable> Setup> Accounts payable workflows* and assigned to the journal name concerned.

Independent from the journal used to post a purchase invoice, the list page *Accounts payable> Common> Vendor invoices> Open vendor invoices* shows all invoices not yet paid. Clicking the button *New/Invoice* in the open vendor invoice list page

provides the option to directly access the different vendor invoice journals and the vendor invoice form.

8.3.3.3 Invoice Journal

The invoice journal, which you may access in the form *Accounts payable> Journals> Invoices> Invoice journal*, is the main journal form for registering invoices. In the invoice journal, you may record new invoices or retrieve invoices from the vendor invoice pool excl. posting.

Journal voucher (1 - agb) - Journal: VIN, journal batch number: GJ00009, Posted: No, Journal type: Vendor invoice recording

File | New | Delete | Post | Validate | Financial dimensions | Sales tax | Period journal

Balance Journal: 0.00 **Total debit** Journal: 117.50 **Total credit** Journal: 117.50 **Budget check results** Per voucher: 0.00

Per voucher: 0.00 Per voucher: 117.50 Per voucher: 117.50

Overview | General | Cash discount | Invoice | Fixed assets | Remittance | History

Date	Voucher	Account type	Account	Invoice	Description	Debit	Credit	Offset account type	Offset account
11/30/2011	PG00001	Vendor	30002	IX-001	Office supplies		117.50	Ledger	74120 - HQ

Invoice
 Terms of payment: M15
 Due date: 12/15/2011
 Payment ID:
 Tax exempt number: GB999 9999 02

Sales tax
 Sales tax group: VDO
 Item sales tax group: STD
 Calculated sales tax amount: 17.50
 Actual sales tax amount: 17.50

Document
 Document:
 Document date:

Account name
 Account name: Cadox p.l.c.
 Offset account name: Office supplies

Currency
 Currency: GBP

Cash discount
 Cash discount:
 Cash discount date:
 Discount amount: 0.00

Offset account for the transaction. | (0) | GBP | USR Model | usr | agb | Close

Figure 8-15: Registering invoice journal lines

As with every voucher, you need to insert a header record in the invoice journal before you may switch to the lines. Once you have finished transferring or manually entering invoice journal lines – including vendor number, vendor invoice number, transaction text, amount, offset account, terms of payment, approver (*Approved by* on the tab *Invoice*) and other data like sales tax and cash discount as applicable – you may post the invoice clicking the button *Post/Post*.

8.3.3.4 Vendor Invoice Pool Excluding Posting Details

The form *Accounts payable> Journals> Invoices> Vendor invoice pool excluding posting details* provides an option to pre-register purchase invoices.

Unlike the invoice register, which actually posts a vendor transaction as well as tax and ledger transactions, the vendor invoice pool is a way to store a purchase invoice without further consequences within Dynamics AX. You may transfer vendor invoice pool data to invoice journal lines, however.

In order to register an invoice in the vendor invoice pool, you simply have to insert a new record in the vendor invoice pool form. Once you have finished entering

posting date, vendor number, amount, vendor invoice number and other applicable data, you may close the form.

In the *Invoice journal*, you may afterwards retrieve an invoice from the vendor invoice pool by clicking the button *Functions/Invoice pool excl. posting* in the journal lines. Selecting the appropriate invoice in the invoice pool selection form, you want to transfer them clicking the button *Accept* there.

8.3.3.5 Invoice Register

Apart from the vendor invoice pool, the invoice register (*Accounts payable> Journals> Invoices> Invoice register*) provides another option to pre-register purchase invoices. Unlike the vendor invoice pool, the invoice register actually posts approval registration and includes options to link invoices to purchase orders.

The structure of the invoice register journal header and lines is similar to the structure of the general journal, restricting the account type to "Vendor". In the journal lines, you have to enter the employee responsible for approval (*Approved by* on the lower pane of the tab *Overview*) as well as terms of payment, cash discount and sales tax groups.

If the invoice refers to a purchase order, you should select the purchase order number in the appropriate field on the tab *Overview* or *General* in order to facilitate approval. In order to post the invoice register, you want to click the button *Post/Post*.

Posting the invoice register creates a regular vendor transaction (including sales tax/input tax), which you may view in the vendor list page (*Accounts payable> Common> Vendors> All vendors*) clicking the button *Transactions* after selecting the vendor concerned. The checkbox *Approved* (tab *General*) in that transaction is not selected, however, which is why the invoice is not included in payment proposals.

The related ledger transactions post to interim accounts specified in the posting profile settings, instead of applicable stock and vendor summary accounts. You may find the settings for the interim accounts in the columns *Arrival* and *Offset account* on the tab *Setup* of the form *Accounts payable> Setup> Vendor posting profiles*.

8.3.3.6 Invoice Approval Journal

After the invoice register has been posted, the employee responsible for approval may approve it in the invoice approval journal.

Invoice approval starts with inserting a new header in the invoice approval journal (*Accounts payable> Journals> Invoices> Invoice approval journal*). After switching to the approval journal lines, you may click the button *Find vouchers* to retrieve the posted invoice register.

The find vouchers form shows available invoice registers in the upper pane. The button *Select* there provides the option to choose one or more invoices for

approval. Closing the find vouchers form by clicking the button *OK* will transfer selected invoices to the approval journal lines.

The screenshot shows the 'Journal voucher' window for voucher P300001, dated 11/30/2011, with journal batch number G300007. The window is divided into several sections:

- Balance:** Journal: -200.00, Per voucher: -200.00
- Total debit:** Journal: 235.00, Per voucher: 235.00
- Total credit:** Journal: 435.00, Per voucher: 435.00
- Budget check results:** Per voucher: (empty)

Below these sections is a table with the following data:

Date	Voucher	Vendor account	Invoice	Pending vendor invoice	Approved by	Description	Currency
11/30/2011	P300001	30005	V1001	☐	E001	Invoice 1	GBP

Below the table is a tabbed interface with the following tabs: Overview, General, Invoice, Payment, Bank, Fixed assets, Remittance, History, Invoice information. The 'Overview' tab is selected, showing a table with the following data:

Date	Voucher	Account type	Account	Description	Debit	Credit	Currency	Sales tax group	Item
11/30/2011	P300001	Ledger		Invoice 1	200.00		GBP		
11/30/2011	P300001	Ledger	59910-	Invoice 1		200.00	GBP		
11/30/2011	P300001	Ledger	33010	Invoice 1		235.00	GBP		
11/30/2011	P300001	Ledger	33090	Invoice 1	235.00		GBP		

Below the table is a section for 'Sales tax on voucher' with the following data:

Sales tax from invoice register:	Sales tax for posting:
35.00	0.00

The bottom of the window shows a status bar with the following information: Account number for current account type, (0) GBP, USR Model, usr, agb, and a Close button.

Figure 8-16: The invoice approval journal lines after fetching an invoice register

The next steps depend on whether the approved invoice refers to a purchase order:

- Not related to a purchase order – In this case you have to select a ledger account – e.g. expense account – in the lower pane of the invoice approval journal lines (first line in the lower pane of Figure 8-16). If sales tax has already been posted in the invoice register (depending on sales tax settings in the accounts payable parameters), the total amount for posting to the final accounts does not include tax. If multiple expense accounts apply, you may register several lines sharing the total amount. In order to post the approval finally, you may click the button *Post/Post*.
- Referring to a purchase order – In this case you want to click the button *Functions/Purchase order* to access the posting form for the related purchase order invoice. In the posting form, you may post the invoice as described in section 3.6.2.

8.3.3.7 Rejecting Invoice Approval

If you do not want to approve a vendor invoice which has been posted in the invoice register (because it does not comply with applicable purchase orders or because of other reasons), you have to post a cancellation.

For this purpose, you want access the invoice approval journal lines, retrieve the applicable invoice register and select the button *Functions/Cancel*. Clicking the button *Post/Post* in the invoice approval journal will post cancellation.

8.3.3.8 Invoice Pool Inquiry

In order to show open invoice register approvals, you may access the form *Accounts payable> Inquiries> Invoice pool*.

In the invoice pool inquiry form, you can only process invoice registers referring to a purchase order. Clicking the button *Purchase order* in that form will open the posting form for the related purchase order invoice like the appropriate button in the approval journal lines.

8.3.4 Payments

Posting an invoice creates an open transaction for the vendor liability or the customer debt.

8.3.4.1 Open Transactions

You may access open transactions clicking the button *Settle/Settle open transaction* on the action pane tab *Collect* of the customer page (*Accounts receivable> Common> Customers> All Customers*) or on the action pane tab *Invoice* of the vendor form (*Accounts payable> Common> Vendors> All vendors*). The button *Transactions* in the customer or vendor form shows all transactions. Selecting the checkbox *Show open only* you may restrict the form to show only open transactions.

In order to print open transactions you may choose the report *Accounts receivable> Reports> Transactions> Customer> Open transactions* for customers and the report *Accounts payable> Reports> Transactions> Invoice> Vendor invoice transactions* for vendors.

8.3.4.2 Customer Payment

You may record customer payments in the general journal or in the customer payment journal (*Accounts receivable> Journals> Payments> Payment journal*).

After inserting a record in the customer payment journal header, you may switch to the lines where you want to enter customer number, transaction text, payment amount, and offset account. If the customer has paid to your bank account, you want to choose "Bank" for the offset account type.

If you want to apply an invoice when recording a payment line, you may select the invoice number concerned in the column *Invoice* of the journal line (automatically inserting the invoice amount for payment).

You may also apply one – or more – invoice numbers to a payment line clicking the button *Functions/Settlement*. In the settlement form, you may choose invoices that are paid by selecting the checkbox in the column *Mark*. After closing the settlement form (there is no separate button *OK* available), recorded marking will apply to the payment journal line.

As an alternative to manually entering payment lines, you may choose the button *Enter customer payment* in the payment journal header to create and settle payment

lines by selecting paid invoices. An option applying to direct debiting is the customer payment proposal in the payment journal lines (similar to the vendor payment proposal, see below).

Once you have finished recording payment lines, you may post the customer payment journal clicking the button *Post/Post* in the header or the lines.

8.3.4.3 Vendor Payments

Like customer payments, payments to vendors may be entered in a general journal or in a specific payment journal. The payment journal for vendors is available choosing the menu item *Accounts payable> Journals> Payments> Payment journal*.

You may register vendor payment lines manually similar to registering a customer payment. In most cases you require additional support and control of outgoing payments, however. In Dynamics AX, the payment proposal and the payment status are available for that purpose.

8.3.4.4 Block Payments

If you want to prevent paying a certain invoice, you may clear the checkbox *Approved* or enter an *Invoice payment release date* on the tab *General* of the vendor transaction. The payment proposal will not include the invoice until you mark the approval-checkmark in the transaction again or the release date has passed.

8.3.4.5 Payment Proposal

The payment proposal supports choosing vendor invoices you want to pay. In order to run a payment proposal, you may click the button *Payment proposal/Create payment proposal* in the journal lines of a vendor payment journal.

In the dialog box of the payment proposal, you may choose the *Proposal type* (due date or cash discount) and a date range for invoices to include (*From date, To date*). In order to actually generate a proposal, the checkbox *Generate* needs to be selected. Clicking the button *Select* you may enter a filter on vendor and transaction data

Depending on the proposal type, the proposal will default the invoice due date or cash discount date in the posting date for payment. If this date is in the past or before a future date entered in *Minimum date*, today (or the *Minimum date*) will default.

After closing the dialog box by clicking the button *OK*, the payment proposal form displays where you may check and edit the payment proposal. Depending on your requirements, you may modify data like the payment amount or delete lines in the upper pane of the form. Clicking the button *Transfer* in the payment proposal form will transfer the proposal to the payment journal. Depending on the method of payment (see below) in the particular invoices, there will be one payment line for several invoices or a separate payment line per invoice.

Figure 8-17: Registering lines in a vendor payment journal

The payment proposal marks a settlement for the selected invoices. Before posting the vendor payment, you may edit the proposal clicking the button *Payment proposal/Edit payment proposal* in the journal lines.

8.3.4.6 Method of Payment

Methods of payment, which you may access in the form *Accounts payable> Setup> Payment> Methods of payment*, are an important setting for processing vendor payments.

Usually you will need two methods of payment at least: One for manual transfers and one for electronic banking. In the field group *Posting* on the tab *General* of the methods of payment, you may enter a bank (or ledger) account to specify from which account you want to pay. This account is the default for the offset account when selecting the method in a payment. In order to support bank reconciliation by posting to a bridging account (see below), you may select the checkbox *Bridging posting* and enter the bridging account number.

For methods of payment related to electronic payment, you should select the status “Sent” or “Approved” for the *Payment status* to prevent posting a payment before generating a related payment export file. Further settings for electronic payments like the file formats are available on the other tabs.

In order to assign a default payment method to a vendor, you need to access the tab *Payment* in the vendor form. The *Method of payment* selected in the vendor record defaults to purchase orders, vendor transactions and the payment journal.

8.3.4.7 Print Payment Journal and Generate Payment

Before generating and posting a payment, you may print the payment journal for control purpose clicking the button *Print/Journal* in the header or lines if required.

In order to generate an export file for electronic payment, you may click the button *Functions/Generate payments* in the payment journal lines after selecting an appropriate method of payment. If you require an export file, you need to generate it before posting the payment.

8.3.4.8 Payment Status and Posting a Payment

When generating the payment, Dynamics AX sets the payment status of the journal lines to "Sent". If required, you may also manually change the payment status clicking the button *Payment status*.

In order to finish the payment procedure, you may click the button *Post/Post* in the payment journal to post the payment from the selected bank or ledger account.

8.3.4.9 Applying Bridging Accounts

If the payment does not directly post to the bank account, but to a bridging account as selected in the payment method, you need to post a transfer from the bridging account to the bank account when receiving the appropriate bank statement later.

In order to post this transfer, you need to record a new journal in the general journal form (*General ledger> Journals> General journal*). In the general journal lines, you want to click the button *Functions/Select bridged transactions* to access the form for selecting and accepting the transaction concerned.

8.3.4.10 Centralized Payment

The functionality of centralized payments supports a company structure within Dynamics AX, where a central company processes payments of an affiliated group. As a prerequisite for registering centralized payments, you need to set up intercompany accounting (*General ledger> Setup> Posting> Intercompany accounting*) for the legal entities concerned. In addition, appropriate permission settings applying an organization hierarchy with the purpose "Centralized payment" are required.

Payment journals and payment proposals show the company in the column *Company accounts*. When posting a payment applying centralized payments, you may settle invoices in other companies.

8.3.4.11 New in Dynamics AX 2012

Payment features new in Dynamics AX 2012 include changes in the setup of centralized payments referring to organization hierarchies and shared data.

8.3.5 Reversing Transactions

In Dynamics AX, you may find two different types of transaction reversals: Manually entered reversals for corrections and automatic reversals for accruals.

8.3.5.1 Transaction Reversal

The transaction reversal, which is available for ledger, vendor and customer transactions (e.g. free text invoices), provides a simple way to correct wrong vouchers in finance. It is not applicable for transactions referring to inventory, purchase orders or sales orders, however. In order to reverse these transactions, you need to register an appropriate document in the original module like a customer return order (see section 4.6.4) in the *Sales and marketing* module.

In order to reverse a transaction in finance, you need to access the transaction inquiry available by clicking the button *Transactions* in the vendor page (*Accounts payable*> *Common*> *Vendors*> *All vendors*) or customer page (*Accounts receivable*> *Common*> *Customers*> *All Customers*). For ledger transaction, you want to choose the button *Journal entries/Posted* in the main accounts page (*General ledger*> *Common*> *Main accounts*).

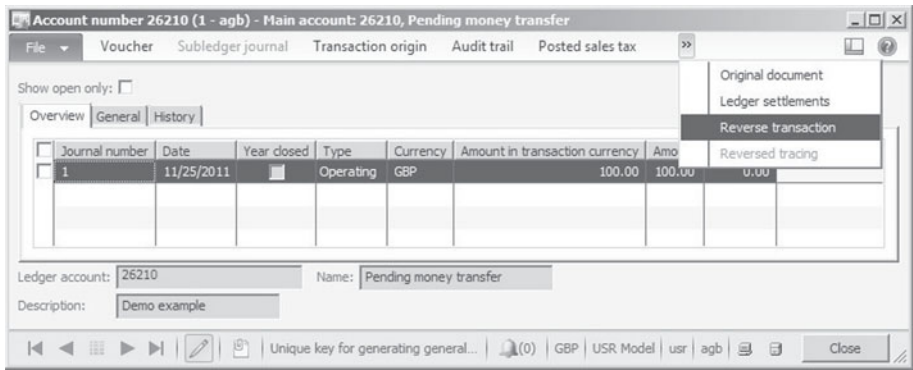


Figure 8-18: Reversing a ledger transaction

After selecting the transaction concerned, you may click the button *Reverse transaction*, which opens a dialog box to enter the posting date for reversal. If you want to reverse a settled vendor or customer transaction (e.g. a paid invoice), you have to cancel the settlement of the transaction (see section 8.2.5) before you get the option to reverse the transaction.

Transaction reversal will post a new transaction, offsetting the original transaction. If required, you may reverse the reversal as well.

8.3.5.2 Automatic Reversal with Reversing Entries

Unlike manual transaction reversals, which apply to adjust incorrect transactions, reversing entries are transactions generated automatically to reverse accruals in a later period.

Reversing entries are available in general journals (*General ledger*> *Journals*> *General journal*). In order to generate a reversing entry, you may select the checkbox *Reversing entry* and insert a *Reversing date* in the rightmost columns on the tab *Overview* of the journal lines when entering the original transaction. In the general

journal header, the checkbox *Reversing entry* and the reversing date are available providing a default for the lines.

When posting a general journal with automatic reversal, Dynamics AX in parallel automatically posts a second transaction reversing the original transaction.

8.3.6 Case Study Exercises

Exercise 8.5 – Journal Names

You want to register the transactions of the exercises below in your own journals. For that purpose, you want to register a journal name “G-##” (## = your user ID) with the type “Daily”, a journal name “I-##” with the type “Vendor invoice recording” and a journal name “P-##” with the type “Vendor disbursement”. Choose an existing number sequence for all of the journal names.

Exercise 8.6 – Segmented Entry in General Journals

You want to transfer GBP 50.00 from your main account “ZZ##” in “Area ## 1” to your petty cash account “111C-##” (both accounts entered in exercise 8.2).

Register an appropriate transaction in a general journal, choosing your journal name “G-##”. Which segments apply to your main account “ZZ##” and how can you show them? Check the value lookup for the main account and the financial dimension.

Then post the journal and check the balance and the transactions on both accounts of the journal line.

Exercise 8.7 – General Journal

You want to withdraw GBP 100.00 from the bank account “B-##” entered in exercise 8.4 and put it to your petty cash account “111C-##” entered in exercise 8.2. Register the appropriate transaction in a general journal, choosing your journal name “G-##”.

Check the balance and transactions of the bank account and of the petty cash account before posting. Then post the journal and check the balance and the posted transactions again.

Exercise 8.8 – Purchase Invoice

The vendor, which you have entered in exercise 3.2, sends the invoice “VI808” showing a total of GBP 50.00. The invoice refers to expenses, for which you have entered the main account “6060##” in exercise 8.2.

Selecting an invoice journal in the accounts payable menu, you want to record this invoice choosing your journal name “I-##”. The terms of payment and the cash discount entered in exercise 3.1 apply to this invoice.

Check the vendor balance and transactions of your vendor as well as the ledger balance and transactions of your expense account before posting. Then post the invoice and check the balance and the transactions again.

Exercise 8.9 – Vendor Payment

You want to pay the invoice “VI809” that you have posted in the previous exercise. Register the payment, choosing a vendor payment journal applying your journal name “P-###”. Withdrawing applicable cash discount, you want to pay from your bank account “B-###” entered in exercise 8.4.

Check the vendor balance and the bank account balance before posting. Then post the payment and check the balances again, in addition controlling the voucher transaction and the transaction origin of the payment transaction.

Exercise 8.10 – Transaction Reversal

Your vendor of exercise 3.2 sends the invoice “VI810”, showing a total of GBP 30.00. Register and post the invoice like you did in exercise 8.8.

Afterwards you notice that the invoice is incorrect and want to reverse the transaction. Check the vendor balance and transactions of your vendor as well as the ledger balance and transactions of your expense account before reversing. Then reverse the invoice and check the balance and the transactions again.

8.4 Ledger Integration

One of the main advantages of an integrated business solution like Dynamics AX is, that business transactions registered anywhere in the application are available for all parts of the company.

When looking at a sales order invoice as an example, posting the invoice does not only generate the document required, it also affects other areas generating following transactions:

- Inventory transactions reducing inventory value
- General ledger transactions to revenue, COGS, stock and customer debt accounts
- Customer transaction for the open invoice in accounts receivable
- Sales tax transactions as applicable

Depending on the business case, the invoice may additionally post transactions for commission, discount or cash payment as an example.

8.4.1 Basics of Ledger Integration

Ledger integration – the integration of the general ledger in finance with the other areas of the application – is one of the core characteristics of an integrated business solution (ERP solution).

In Dynamics AX, transactions in all areas relevant to finance – like sales, purchasing, inventory or production – automatically post to the general ledger.

8.4.1.1 Basic Settings

A number of settings control, whether and which ledger accounts apply to the different transactions. For the areas of purchasing, sales, inventory and production covered in this book, you may find the following settings:

- Summary accounts for vendor liabilities and customer debts in the posting profiles for accounts payable/receivable
- Ledger accounts for inventory transactions in the inventory posting setup
- Ledger accounts for production transactions in resources, cost categories and production groups

In addition, specific settings are available for particular transactions like sales tax, cash discount, indirect costs or miscellaneous charges.

8.4.1.2 Vendors and Customers

Vendor posting profiles control the assignment of vendor transactions to summary accounts in the general ledger. You may find more details on vendor posting profiles in section 3.2.3. Similar settings apply to customers.

8.4.1.3 Subledger Accounting

Subledger accounting in Dynamics AX provides the option to decouple posting to subledgers – like accounts receivables – from posting to the general ledger. Applying the subledger journal entry functionality, it is possible to run the transfer to the general ledger either synchronous or asynchronous and either detailed or summarized.

Subledger accounting does not apply to all subledger transactions, but to specific document types including:

- Free text invoice – See section 4.6.3
- Product receipt – Purchase order receipt, see section 3.5.4
- Vendor invoice – Purchase order invoice, see section 3.6.2

In the general ledger parameters (*General ledger> Setup> General ledger parameters*, tab *Batch transfer rules*), you may select different options per document type for the subledger transfer. Whereas the *Transfer mode* “Synchronous” will immediately post to the general ledger and “Asynchronous” immediately as soon as server capacity is available, the transfer mode “Scheduled batch” will provide the option to view subledger transactions before G/L transfer.

For documents applying scheduled batch transfer, you may access posted subledger transactions before transfer in the form *General ledger> Inquiries> Subledger journal entries not yet transferred*. Clicking the button *Transfer entry* (for immediate transfer) or *Batch transfer* (for scheduled transfer) in that form will post to the general ledger.

The button *Subledger journal* in the subledger transfer form and in applicable source documents (e.g. free text invoices) provides access to the complete accounting information including all applicable financial segments.

8.4.1.4 New in Dynamics AX 2012

In Dynamics AX 2012, the financial framework now includes subledger accounting.

8.4.2 Ledger Integration in Inventory

When posting inventory receipts and issues to the general ledger, Dynamics AX distinguished between two different types of transactions (see section 7.1.1):

- Physical transaction (Packing slip)
- Financial transaction (Invoice)

Physical and financial transactions refer to different ledger accounts.

8.4.2.1 Physical Transaction

For physical transactions, you may decide whether to post to the general ledger. Relevant settings on this subject include following checkboxes:

- *Post physical inventory* in the item model group
- *Post product receipt in ledger* (Accounts payable parameters, tab *Updates*) or *Post packing slip in ledger* (Accounts receivable parameters).

In the production module, a similar checkbox in the production parameters applies. Physical transactions in production are picking list and report as finished transactions.

8.4.2.2 Financial Transaction

For financial transactions, the checkbox *Post financial value* in the item model group is available to specify whether inventory transactions should post to the general ledger. If you clear this checkbox for an item model group, ledger integration for the items assigned is not active. Posting a purchase invoice directly posts to the expense account for consumption. Inventory issues do not post ledger transactions. You should apply this setting for service items.

8.4.2.3 Ledger Assignment

In order to control which ledger main accounts apply to automatic ledger posting referring to an inventory transaction, you may access the inventory posting setup (*Inventory and warehouse management*> *Setup*> *Posting*> *Posting*).

The inventory posting setup form includes account settings for following transactions:

- Sales order tab– Packing slips and invoices in sales
- Purchase order tab – Product receipts and invoices in purchasing
- Inventory tab – Journal transactions in inventory

- Production tab – Picking lists, reporting as finished and costing of production orders
- Standard cost variance tab – Standard cost variances

Each of these tabs shows a list of available transaction types in the left pane. After selecting a transaction type in the left pane, you may choose the ledger main accounts applying to related ledger transaction in the right pane.

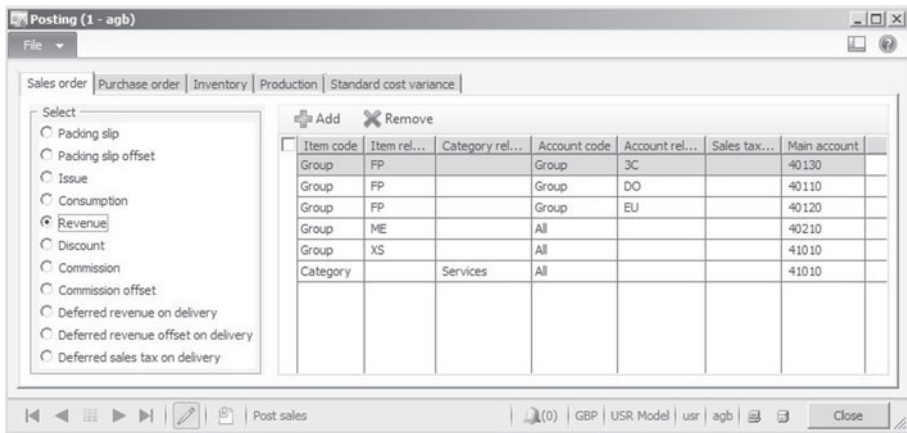


Figure 8-19: The inventory posting setup, showing account settings for revenue

8.4.2.4 Transaction Combinations

The inventory posting setup primarily depends on the combination of two dimensions:

- Items / Categories and
- Customers / Vendors

In addition, you may apply ledger main account settings depending on the sales tax group and – for standard cost variance transactions – on the cost group.

For the item dimension as well as for the customer (tab *Sales order*) or the vendor (tab *Purchase order*) dimension, ledger account settings are available on three levels:

- Table – Individual item, customer or vendor
- Group – Item group, customer group or vendor group
- All

An additional option is available for the item dimension in purchasing and sales: The *Item code* “Category”, which enables settings depending on product categories (instead of an item relation) as shown in the last line of the revenue settings in Figure 8-19.

When posting a transaction, Dynamics AX always searches for the specific setting (“Table”) first, then for the group setting and finally for the general setting (“All”). If you post a sales invoice for example, settings for the customer and item number have the highest priority, followed by group settings. In the field group *Posting* on

the tab *Ledger and sales tax* in the accounts receivable parameters, you may choose whether the search order should prioritize the item or the customer dimension. A similar setting for purchasing is available in the accounts payable parameters.

Ledger account assignment is not only available in the inventory posting setup form. You may as well access these settings clicking the button *Posting* in the item group form or the button *Setup/Item posting* in the customer or vendor group form. When accessing the posting setup from a group form, it shows the ledger settings filtered on the selected group. In the item group form itself, the right-hand pane shows the ledger main account settings filtered of the selected item group.

8.4.2.5 Available Combinations and Ledger Reconciliation

In the transaction combinations form (*Inventory and warehouse management*> *Setup*> *Posting*> *Transaction combinations*) you may select, which dimension levels are available in the inventory posting setup.

Since reports for the reconciliation between inventory and the general ledger like the report *Inventory and warehouse management*> *Reports*> *Status*> *Inventory value*> *Inventory value* refer to the item group, you want to activate the item group relation usually. The setup for the inventory value report is available in the form *Inventory and warehouse management*> *Setup*> *Costing*> *Inventory value reports*.

8.4.2.6 Example – Transactions Referring to Sales Order Processing

As an example for automatic ledger transactions, the lines below show the transactions for sales order processing if ledger integration is selected for packing slip and invoice posting (physical and financial transactions).

When posting the packing slip for the sales order, Dynamics AX posts a ledger transaction to the ledger accounts selected for *Packing slip* and *Packing slip offset* in the inventory posting setup. When posting the invoice, Dynamics AX reverses the ledger transactions of packing slip posting, and post a ledger transaction to the account *Issue* against *Consumption*. In parallel, a customer debt to the summary account specified in the posting profile posts against the account *Revenue* and the sales tax account if applicable.

If the inventory posting setup includes settings for the line discount in the option *Discount*, the discount posts to that account. Otherwise, the discount does not post separately but reduces the revenue amount.

8.4.2.7 Standard Cost Price

For items assigned to an inventory model “Standard cost” (see section 7.3.1), you may find important settings on the tab *Standard cost variance* of the inventory posting setup. This tab shows settings for the ledger accounts to post the difference between the actual cost price of the purchase invoice (or production costing) and the applicable standard cost price for different cases like *Purchase price variance*.

For items assigned to an inventory model that specifies a fixed receipt price, settings for posting the price difference are available on the tabs *Purchase order* and *Inventory*.

8.4.2.8 Service Items and Non-stocked Items

You may assign items like office supplies or consumables to the product type “Service”, applying a separate item group and item model group. In the item model group, ledger integration for physical and financial transactions (see above) should be deselected. In sales orders concerned, Dynamics AX posts a ledger transaction of the revenue account against the customer summary account and does not post to the issue or consumption account.

For non-stocked items which are not part of a bill of materials, you may additionally or alternatively choose to link the released product to an item model group that shows the checkbox *Stocked product* deselected (see section 7.2.1). This setting prevents inventory transactions and ensures ledger integration for physical and financial transactions is deselected.

8.4.2.9 Change of Settings

In order to avoid problems when reconciling inventory and general ledger, you should not change integration settings in the item model group, parameters and inventory posting setup for items, which are on stock or show open inventory transactions. This includes changing the setup itself as well as changing the assignment of active items to item groups.

8.4.2.10 New in Dynamics AX 2012

In Dynamics AX 2012, posting transaction settings available for product categories complement the posting setup of the item dimension.

8.4.3 Ledger Integration in Production

Unlike transactions in purchasing, sales and inventory, ledger transactions for the inventory receipt value of finished items in production need to include the cost of resource operations.

8.4.3.1 Production Parameters

In order to comply with that requirement, production parameters (*Production control> Setup> Production control parameters*) controlling ledger integration contain following options in the lookup field *Ledger posting*:

- Item and resource
- Item and category
- Production groups

The setting in the general production parameters, which is not available in the production parameters by site, is the default for production orders. You may

change the setting for a certain production order, for example if you want to apply specific settings for prototype production.

8.4.3.2 Item and Resource

If you choose “Item and resource” in the ledger posting parameter, Dynamics AX applies the ledger account settings of the inventory posting setup (as shown in section 8.4.2) to item transactions. For resource operations, the ledger account settings on the tab *Ledger* of the resource (*Organization administration* > *Common* > *Resources* > *Resources*) apply.

8.4.3.3 Item and Category

If you choose “Item and category” in the ledger posting parameter, ledger posting for item transactions again refers to ledger account settings of the inventory posting setup. For resource operations, settings of the applicable cost category (*Production control* > *Setup* > *Routes* > *Cost categories*, tab *Ledger-resources*) apply.

8.4.3.4 Production Group

If you choose “Production group” in the ledger posting parameter, Dynamics AX applies the ledger account settings of the posting group (*Production control* > *Setup* > *Production* > *Production groups*). You may select the applicable production group in the production order. A default for the production group is available on the tab *Engineer* in the released product form, where you may enter it in the item record of the finished product.

8.4.3.5 Ledger Transactions for Production

When processing a production order, Dynamics AX posts following ledger transactions to the ledger accounts specified in dependence on the ledger posting parameter (see above):

- Picking list – Account *Picking list* against *Picking list offset account*
- Resource operation – Account *WIP issue* against *WIP account* (WIP = “Work In Process”)
- Report as finished – Account *Report as finished* against *Report as finished offset account*

When costing the production order, Dynamics AX reverses all these transactions and posts the final finished item receipt, component issue and resource issue transaction to the ledger accounts as specified in the ledger posting parameter.

9 Core Setup and Essential Features

The organization of an enterprise determines the setup of the ERP system. Before starting to work in Dynamics AX, there needs to be an implementation project setting up the enterprise organization and other core parameters, therefore.

An instance is an independent installation of Dynamics AX, which contains its own database and application. Therefore, modifying configuration settings and programmable objects in one instance does not affect other instances. You may physically install one Dynamics AX instance on one or more database and application servers. It is also possible to install several instances on one server, however.

In a business environment, you will find usually at least one instance for testing and development separate from the operational ERP system. It needs to be independent from the operational system in order to do testing and development without affecting daily business.

9.1 Organizational Structures

Within one Dynamics AX instance, the organization model shows the structure of the enterprise and its business processes. Therefore, you need to set up the specific operational and statutory structure of your enterprise in the Dynamics AX organization model.

Depending on the type and the size of an enterprise, there may be different organizational structures existing in parallel. When looking at organizational structures, we may distinguish between three different main types:

- Statutory organization structures for legal reporting: Hierarchies according to regulations of public authorities (e.g. for tax purposes).
- Operating organization structures for management reporting: Hierarchies according to requirements of the internal management to control and improve business processes (e.g. divisional structures).
- Informal structures, not showing organizational hierarchies.

In order to comply with different reporting requirements, large enterprises may show different organizational structures and hierarchies in parallel, suiting the purpose of legal entities, divisions, regions and projects.

For other companies one simple hierarchy may be adequate, without the need to manage different organizational structures.

9.1.1 Organization Model Architecture

The flexible organization model in Microsoft Dynamics AX supports the requirements of the different organization types. You may manage multiple organization hierarchies in parallel, decoupling the operating organization from the statutory organization. Alternatively, you may set up only one simple hierarchy and use it for all purposes at the same time.

9.1.1.1 Organization Types

The organization model in Dynamics AX shows the following organization types:

- Legal entities – Showing the statutory organization
- Operating units – Showing the operating organization
- Teams – Showing informal structures

When setting up organization hierarchies in Dynamics AX (see section 9.1.3), you may choose organization units of the type *Legal entity* and *Operating unit*.

Since *Teams* are an informal type of organization, they are not included in hierarchies. Teams apply to several areas of Dynamics AX – you may for example restrict access to the global address book based on teams (see section 9.2.4).

9.1.1.2 Using the Organization Model within Dynamics AX

Within Dynamics AX, the organization model applies to following areas:

- Company structure – Legal entities are linked to companies in Dynamics AX, which is why you need to set up legal entities for creating companies.
- Financial dimensions – Since legal entities and operating units are available as financial dimension, you may do financial reporting on these organizations.
- Data security – Based on the organization hierarchy purpose *Security*, you may restrict user access to organizations independent from the structure of legal entities (see section 9.2).
- Business policies – Business rules for areas like approval processes and centralized payments may apply to a structure different to the hierarchy of legal entities.

Legal entities and operating units are not only part of organizational hierarchies, they are at the same time included in the **global address book** (see section 2.4). Therefore, you may apply the functionality of the global address book like address and contact administration when managing elements of the internal organization.

9.1.2 Organization Units

The organization model includes organization units of the type legal entities, operating units and teams. Legal entities and operating units are the basic elements in the organizational structure of an enterprise, displayed in organizational hierarchies.

The list page *Organization administration> Common> Organization> Internal organizations* shows an overview of all organizations with their type. Forms tailored to the specific requirements of the different organization types are available in the folder *Organization administration> Setup> Organization*.



Figure 9-1: Organization units in the organization model

9.1.2.1 Legal Entities

Legal entities (*Organization administration> Setup> Organization> Legal entities*) are there for legal reporting, linked with company accounts (see section 9.1.4 below) in Dynamics AX. Financial statements like balance sheets and income statements are based on legal entities.

Since a Dynamics AX instance may contain several legal entities, you can manage the relations between these legal entities. Depending on your requirements, you may apply following features:

- Financial consolidation – Managing financial consolidation of companies in an affiliated group.
- Intercompany – Automating business processes between legal entities of a multi-company organization.
- Organization hierarchies – Applying legal entities in the organization model (e.g. for setting up data security or approval processes).

9.1.2.2 Operating Units

Operating units (*Organization administration> Setup> Organization> Operating units*) are there for management reporting, supporting internal control of business processes. Depending on the enterprise, there are different types of operating units like divisions or regions.

In a standard Dynamics AX implementation, you may find the following operating unit types:

- Business Unit – Controlling strategic business objectives (e.g. divisional structure)
- Cost Center – For budgeting and expenditure control

- Department – Representing functional categories in an organization
- Value Stream – Referring to production flows (lean manufacturing)

The *Operating unit type* is the first item you have to select when setting up a new operating unit clicking the button *New* in the action pane strip of the operating unit form. Then you may enter additional data like name, addresses and contact data.

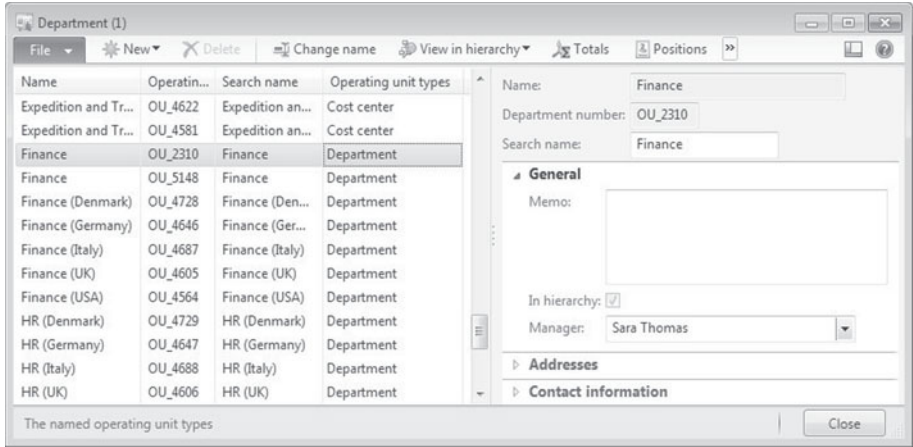


Figure 9-2: Managing a department in the operating unit form

Once an operating unit is assigned to one or more hierarchies (see section 9.1.3), you may click the button *View in hierarchy* to check the integration within organizational structures. Applying operating units to financial dimensions (see section 8.2.3) you may report on their performance.

9.1.2.3 Teams

Teams (*Organization administration> Setup> Organization> Teams*) represent the informal organization of an enterprise. You may choose teams to set up a group of people, without a hierarchical organization structure between different teams.

Team types, accessible by pressing the action button *Team types* in the teams form, may restrict team membership to different kinds of people, e.g. Dynamics AX users, employees or sales contacts. In the section *Add team members* you may select persons belonging to a selected team. Depending on the team type, available members are Dynamics AX users or other types like vendors or employees.

Teams are applicable to different areas of the application, e.g. collections (select the responsible team in the accounts receivable parameters) or access restriction to the global address book (see section 9.2.4).

9.1.2.4 New in Dynamics AX 2012

The organization model is a new element in Dynamics AX 2012.

9.1.3 Organization Hierarchy Structures

Organization hierarchies show the relationship between different organization units referring to a certain perspective on your enterprise. For example, an organizational hierarchy of legal entities may show the legal structure.

Depending on the requirements of your enterprise, you may set up several hierarchies in parallel. Purposes of hierarchies specify what a hierarchy is used for. Hierarchies of the type *Security* for example apply to data security.

9.1.3.1 Organization Hierarchies

You may access organization hierarchies in the form *Organization administration> Setup> Organization> Organization hierarchies*. When inserting a new hierarchy clicking the button *New*, you have to enter a hierarchy name. Assigning a hierarchy purpose (see below) clicking the button *Assign purpose* on the right part of the hierarchies form specifies what the hierarchy is used for and which organization types are allowed.

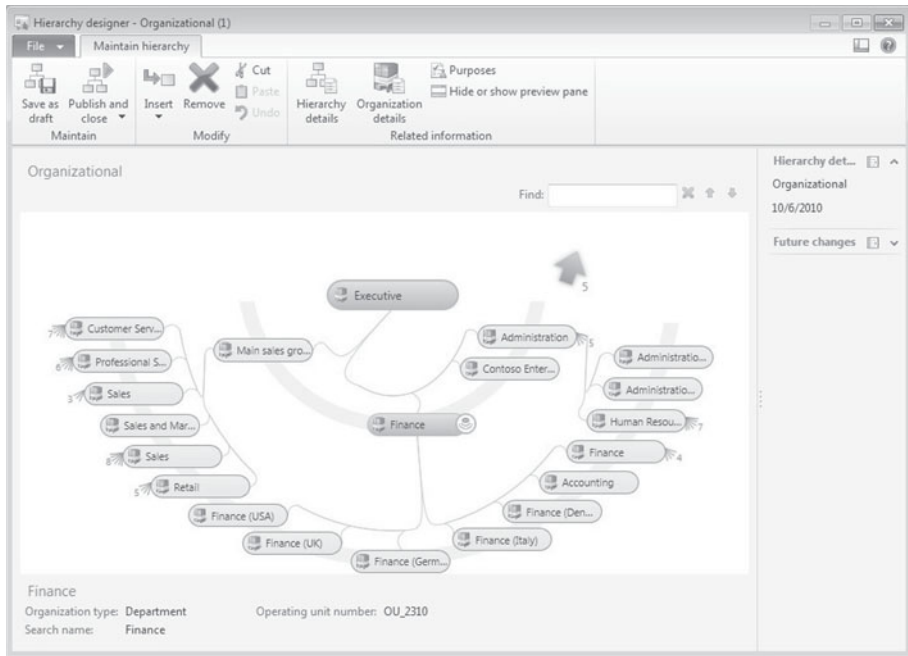


Figure 9-3: Editing an organization hierarchy in the hierarchy designer

Clicking the button *View* in the action pane strip, you may access the hierarchy designer providing the option to view the hierarchy. You may navigate within the hierarchy, and switch the focus by clicking the icon  on the right of a node.

After switching to the edit mode (button *Edit*), you may insert or remove organization units from the hierarchy choosing the appropriate option in the action pane or the pop-up menu (right-hand click on an organization unit). The buttons

Cut and *Paste* provide the option to move a unit including subunits within the whole organization hierarchy.

The organization structure is time-related, which is why you need to enter an effective date when publishing the hierarchy after editing.

9.1.3.2 Organization Hierarchy Purposes

There may be several hierarchies in parallel in the organization hierarchy, depending on the perspective to or purpose of a hierarchy.

Organization hierarchy purposes are available in the form *Organization administration> Setup> Organization> Organization hierarchy purposes*. Available purposes like *Centralized payments* or *Security* as well as allowed organization types for a purpose are provided by Dynamics AX, since there are relations of functional areas of the application.

Clicking the button *Add* on the tab *Assigned hierarchies* you may assign your organization hierarchies to purposes. Depending on your requirements, you may assign several hierarchies to one purpose and one hierarchy to several purposes.

9.1.4 Legal Entities (Company Accounts)

When logging on to Dynamics AX, you are always working in a company account (legal entity). In your user options or in the client configuration, you may select a default company. Dynamics AX shows this company when you start the client. Depending on your user options, the current company shows in the status bar and in the title bar of forms.

9.1.4.1 Switching the Company

If you want to switch from one legal entity to another, you need to access the dialog box for switching companies. You may access that dialog box choosing the command *File/Tools/Select company accounts*, or clicking the company field of the status bar, or selecting the first node in the menu path of the address bar.

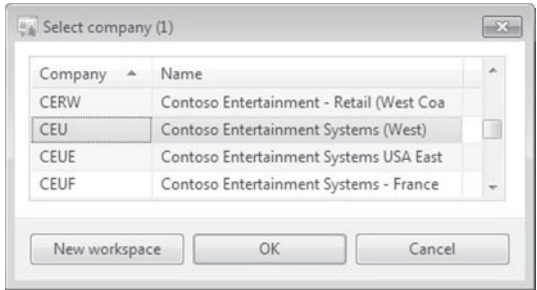


Figure 9-4: Dialog box for switching the current company

When selecting a company in the dialog box, you may open it by double-clicking or by clicking the button *OK*. If you choose the button *New workspace*, the selected company opens in a second Dynamics AX workspace.

9.1.4.2 Company Master Data

The company management (legal entity administration) in Dynamics AX is available in the form *Organization administration> Setup> Organization> Legal entities*. In order to create a new company, you need to insert a record (button *New* or shortcut *Ctrl+N*) entering the company name, code and country (specifying applicable country-specific Dynamics AX features).

Figure 9-5: Creating a company in the legal entity form

Before you can start to enter and post transactions in that new company, some setup needs to be done. In addition to the company name (which prints on all documents and reports) the legal entity form contains further essential setup data.

On the tab *Addresses* you should enter the primary address of the company. If you need to enter additional addresses like invoice or delivery addresses, you may add them clicking the button *Add* and assigning the appropriate purpose. For example, you may apply additional addresses to set a default delivery address which is different to the primary company address. This delivery address will default to purchase orders (supposing no address from a site or warehouse applies).

Contact data of the company are available on the tab *Contact information*. Legal entity administration in Dynamics AX is linked to the global address book, which is why company addresses and contact data also show there.

Other important company settings include registration numbers like the *Routing number* for tax reporting on the tab *Bank account information* as well as the primary bank account on that tab. Companies located in the European Union will enter their VAT registration number (exempt number) on the tab *Foreign trade and logistics*. The language code on the tab *General* specifies the general default for the company language.

9.1.4.3 Data Structure

Within one instance of Dynamics AX, you may set up multiple company accounts. Except for basic data shared across companies like the global address book, fiscal calendars, currencies, workers and product masters or chart of accounts data, company accounts get their own separate set of data within one common Dynamics AX database. In order to identify data of an individual company account, all concerned Dynamics AX tables contain the key field *DataAreaId*.

A specific company account included in all Dynamics AX databases is the company "DAT". Dynamics AX automatically generates this company, which holds system data, when installing the system. You cannot delete it and you should not use it for a test or operational company in order to clearly distinguish company data from non-company specific data.

9.1.4.4 Copying a Company

If you want to create a copy of an existing company in Dynamics AX 2012, you may switch to the original company and export the company (*System administration> Common> Data export/Import> Export to*) after setting up an appropriate definition group.

If the duplicate company is required within the original Dynamics AX database, you want to create a new legal entity clicking the button *New* in the legal entity form. After switching to that new company, you may import the previously exported data to the new company (*System administration> Common> Data export/Import> Import*).

Because of multiple areas of shared data in Dynamics AX 2012, you should avoid setting up a test company within an operational database. If required, you may import a company to a different database or create a duplicate instance for testing and training, which is the better option.

9.1.4.5 New in Dynamics AX 2012

In Dynamics AX 2012, the concept of legal entities replaces the structure of company account settings in former releases. The legal entity form now includes the former company information, moving the company currency to the ledger settings (see section 8.2.2).

9.1.5 Virtual Company Accounts

Dynamics AX 2012 contains several functional areas like fiscal calendars, currencies, address books, charts of accounts or product management, where data are shared across legal entities.

In addition, virtual company accounts allow joint management of data, which are not included in these areas but nevertheless common to several companies of your enterprise. Depending on the requirements, you may define areas of common data

by selecting shared tables for delivery terms, tax setup, bills of material or any other table required.

9.1.5.1 Setup of Virtual Companies

In order to set up a virtual company, you need to access the form *System administration> Setup> Virtual company accounts*. There you may insert a new record on the tab *Virtual company accounts*, entering a *Company accounts* code and a name. Dynamics AX internally applies the virtual company account code instead of the regular company account in the key field *DataAreaId* for all tables of the table collections assigned to the virtual company. Therefore, it is not possible to choose a code which already exists for a regular company in Dynamics AX.

Once the new virtual company account record is saved, you may switch to the tab *Company accounts* where you can assign companies to the virtual company moving them from the right pane to the left pane by drag and drop with your mouse or by clicking the arrow buttons  and .

In order to set the common tables of these companies, you need to switch to the tab *Table collections*. You cannot specify individual tables on this tab, however. You need to select table collections, which represent a group of tables and which you may set up or modify in the development environment if you have an appropriate permission and license.

If virtual company accounts are applied, they are a basic setup which needs to be configured at the very beginning of an implementation project. If you add virtual companies or shared tables when there are already data in the tables concerned, you have to manage data consolidation directly in the database. Without doing this, data in the tables concerned will not be visible any more for the affected companies.

9.1.5.2 Working in Virtual Companies

Unlike working in regular company accounts, you cannot directly switch to a virtual company. In order to access virtual company data, you log on to a regular company and insert, modify and delete records of shared tables like you do in tables with company-specific data.

Modifications of data in tables of a shared table collection are immediately available in all companies of the virtual company account.

9.1.6 Sites

Unlike company accounts, which comply with legal entities, sites are there to manage subsidiaries within a company. Being an inventory dimension (storage dimension), sites are available in all areas of supply chain management within Dynamics AX.

In order to separate different subsidiaries in finance and cost accounting, you may link the inventory dimension "Site" to a financial dimension. Linking the inventory

dimension “Site” representing your subsidiaries to the financial dimension “Department” or “BusinessUnit” as an example, you may print an income statement per subsidiary applying a filter on the department (or business unit) dimension.

9.1.6.1 Multisite Functionality

The multisite functionality to run subsidiaries in Dynamics AX includes the following options:

- Operations planning (master scheduling) – Per site or for the whole company
- Bills of materials and routes – Per site or for the whole company
- Production parameters – Per site or for the whole company
- Item data (Released products) for order management and planning – Per site or for the whole company
- Transactions – Sites in all inventory transactions, sales orders, purchase orders and production orders
- Financial reports – Like balance sheet and income statement for sites

9.1.6.2 Setup of Sites

Sites are available in the form *Inventory and warehouse management> Setup> Inventory breakdown> Sites*. Apart from the code, the name and the address of the site, you may enter an appropriate value of the linked financial dimension on the tab *Financial Dimensions*. This setting is mandatory if you have activated the dimension link.

In order to specify the dimension link between the inventory dimension “Site” and a financial dimension, you need to access the form *Inventory and warehouse management> Setup> Posting> Dimension link*. If applicable in your enterprise structure, you may activate and lock the link there. As an example, Figure 9-6 shows the site form in a company, where the financial dimension “Department” refers to sites.

Since sites are a mandatory storage dimension, they are automatically activated in all storage dimension groups. Therefore, appropriate dimension values need to be entered in every inventory transaction. In addition, each warehouse has to be linked to a site.

If sites do not apply to the organization of your enterprise, you may set up Dynamics AX in a way that a single site defaults to all transactions (e.g. applying appropriate defaults in the *Default order settings* of released products). More information on inventory dimensions is available in section 7.2.2.

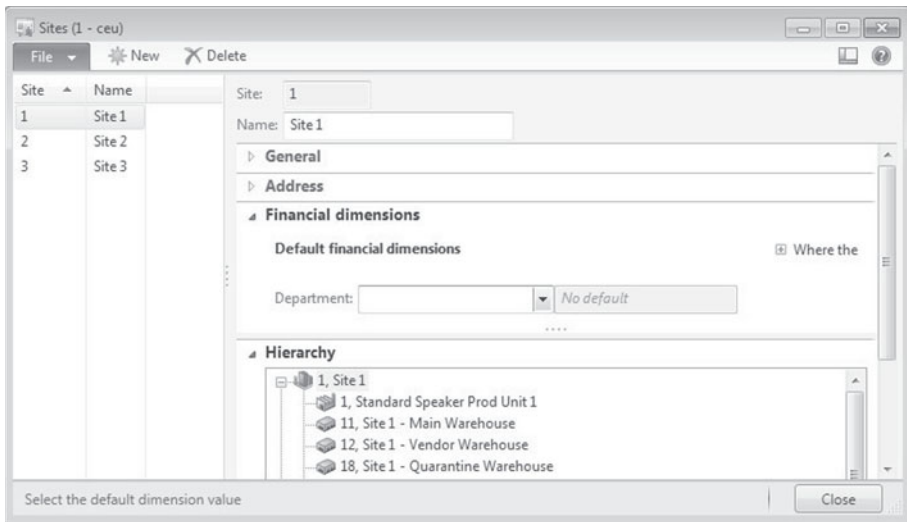


Figure 9-6: Sites in a company (linked to the financial dimension “Department”)

9.1.6.3 Production Units

Whereas material management applies *Sites* as a storage dimension to establish an administration level below legal entities, capacity management applies *Production units* to structure resources and resource groups. Each production unit is linked to a site and represents a plant in operations planning. More information on production units is available in section 5.3.1.

9.1.6.4 Linking Sites to the Organization Model

It is not possible to directly include sites in the organization model. But you can link sites to a financial dimension and financial dimensions to organization units, which in the end provides the option to use sites in the organization model.

In order to apply sites to Dynamics AX finance and organization administration, you have to perform following implementation steps:

- Set up operating units for the individual sites choosing a common operating unit type, e.g. *Department* or *Business unit*
- Set up a financial dimension (see section 8.2.3) linked to that organization unit type, selecting *Use values from* “Departments” (or “Business units”)
- Apply an account structure (see section 8.2.4) in your company, which contains this financial dimension
- Link the storage dimension *Site* to this financial dimension as described above

By choosing the same name for the organization unit and the referring site, you may visualize sites in the organization hierarchy and apply security settings on site level. If the link between site and financial dimension is activated in the dimension link settings, financial reporting on site level is available.

9.1.6.5 New in Dynamics AX 2012

In Dynamics AX 2012, sites are mandatory.

9.2 Security and Information Access

Business applications like Microsoft Dynamics AX contain confidential data. In order to protect sensitive information, access to the application has to be limited depending on the needs of the specific company.

9.2.1 Access Control

Access control in Dynamics AX is based on two elements:

- Authentication – Identification of users
- Authorization – User permissions

9.2.1.1 Authentication

As a prerequisite for you to authenticate in Dynamics AX, system administration needs to create and enable a Dynamics AX user ID linked to your Windows user ID.

Usually you do not notice the authentication and logon procedure, since it happens automatically in the background applying your Windows user ID. If you do not have a valid Dynamics AX user ID, Dynamics AX will reject to grant access to you, however.

User authentication is not only required to control permissions. It is also the basis to log transactions and to track changes you make to table data. Other settings linked to the Dynamics AX user ID are favorites, user options and usage data, which enable a personalized workspace in Dynamics AX.

9.2.1.2 Authorization

According to the role-based security concept in Dynamics AX, information access within Dynamics AX depends on the permission settings of the roles attached to your Dynamics AX user ID.

Your roles are linked to duties and privileges, limiting data access to read or write permission. Access control in this functional context is based on menu items, forms, tables and fields.

Record level security, in addition, is there to restrict the records you can see in a table depending on record data. As an example, it is possible to limit users in sales to see only certain customers.

9.2.2 User Management

As mentioned above, each individual accessing Dynamics AX has to be set up as a Dynamics AX user.

Apart from Active Directory authorization, Dynamics AX user management may also include users showing claims-based authentication – especially for users only accessing the Enterprise Portal. Claims-based authentication refers to a trusted identity provider in SharePoint that authenticates the user

9.2.2.1 User Accounts

You may add a user manually in the list page *System administration> Common> Users> Users* clicking the button *New User*. After choosing the *User ID* for the Dynamics AX user, you may register the Windows user ID in the field *Alias* and the Active Directory domain in the field *Network domain* supposing the *Account type* is “Active Directory user”. In addition, the checkbox *Enabled* needs to be selected to enable the user to log on to Dynamics AX.

As an alternative, you may import Dynamics AX users from the Active Directory applying the import wizard, which is accessible clicking the button *Import*.

The screenshot displays the 'User (1) - User ID: ALICIA, Alicia Thorner' form. The 'General' tab is active, showing fields for User ID (ALICIA), User name (Alicia Thorner), Network domain (contoso.com), Alias (ALICIA), Account type (Active Directory user), Default company (ceu), Enabled (checked), and External (unchecked). The 'User's roles' section shows a tree view with roles: Roles, Buying agent, Employee, Purchasing agent, and System user. The right pane shows 'Privileges in selected role' and 'Users with selected role'.

Figure 9-7: Managing a user in the user detail form

9.2.2.2 Assigning Security Roles

In order to specify permissions for a user, you need to access the tab *User's roles* in the user detail form, where you may assign appropriate security roles. As an alternative, you may link users to roles in the form *System administration> Setup> Security> Assign users to roles*.

Security roles of a selected user also display in the appropriate fact box of the users list page. If you assign a user to several roles, the permissions of all selected roles apply. In case permission settings for an object overlap, the higher access level applies.

9.2.2.3 Assigning Organizations

After assigning a security role to a user in the user detail form, you may select the role and click the button *Assign organizations*. In the *Assign organizations* form you may select to grant the selected role in all organizations or only in specific organizations.

When selecting specific organizations, you may choose legal entities or elements of organization hierarchies with purpose *Security* (see section 9.1.3).

9.2.2.4 User Options

The button *Options* in the users list page and detail form allows opening the user options, which the user may also access himself selecting the command *File/Tools/Options*. As an example, the administrator may want to choose certain options like the language or start company to provide appropriate settings for a new user to start with.

9.2.2.5 User Profiles

Clicking the button *Profiles* in the action pane of the users form, you may link the user to a role center as described in section 2.1.4.

Profiles and role centers are independent from security roles. In order to ensure data access required in a certain role center, you need to assign a user to appropriate security roles.

9.2.2.6 User Relations

Apart from being a user, individuals accessing Dynamics AX may be employees, contractors or external parties like customers. Master data for workers (employees and contractors, see below) as well as external parties are stored in separate tables within Dynamics AX.

In order to assign a Dynamics AX user to his worker record or external relation, Dynamics AX requires a link. The form *System administration> Common> Users> User relations*, which you may also access clicking the button *Relations* after selecting the appropriate user in the users list page, is there to establish this link.

Clicking the button *New* in the user relations form, you have to choose a *Person* from the global address book in the appropriate lookup field. In case of an internal employee, the person selected for linking the *User ID* refers to a worker record.

Dynamics AX requires worker records throughout the whole application, in purchase requisitions, pallet transports, project accounting, human resources, case management and sales prospect management as well as in other areas. After linking a user to a worker record, the worker ID will apply there, e.g. automatically inserting it in the field *Employee responsible* when entering a new prospect (*Sales and marketing> Common> Prospects> All prospects*).

9.2.2.7 Workers (Employees)

The user form contains general user settings for a person accessing Dynamics AX. In addition, the worker form is there to hold data of the enterprise personnel.

Workers include internal employees and contractors, Dynamics AX users as well as personnel not accessing Dynamics AX. Worker records are shared and included in the global address book. Security settings determine if worker records are visible in all companies.

You may access worker records choosing the list page *Human resources> Common> Workers> Workers*. Clicking the button *Hire new worker* you may set up a new employee or contractor (depending on the *Worker type*). If and which data you need to enter primarily depends on the Dynamics AX modules used in your organization. If applicable, detailed data are necessary for project accounting, human resources and expense management.

Name	Search name	Personnel number	Telephone
Julia Funderburk	Julia Funderburk	000131	543-555-0144
Julia Ilyina	Julia Ilyina	000043	

Julia Funderburk

Title: Marketing Executive
 Status: Employed
 Position: 0310-ceu
 Department: Finance

Telephone: 543-555-0144
 E-mail: julia@contoso.com
 Office location:
 Office address:

Worker loans
 Worker skills
 Worker goals
 Position assignment
 Position: 0310-ceu
 Title:
 Description: Coordinator
 Job: 01008
 Start: 8/26/2010
 End: 1/1/2021
 Primary position: No
 1 of 1 More

Figure 9-8: The workers list page

9.2.2.8 Online Users

If you need to know which users currently access Dynamics AX, you may open the form *System administration> Common> Users> Online users*. The inquiry shows all client sessions connected to your Dynamics AX application. Assuming you have got appropriate administrator permissions, you may use this form to log off a user by clicking the button *End sessions* if required.

9.2.2.9 User Groups

User group administration (including user assignment) is available in the form *System administration> Common> Users> User groups*. User groups do not refer to the role-based security concept, but you may apply them for specific settings like the

module-based access to ledger periods on hold or for grouping purposes when assigning workflow tasks or financial journals.

9.2.2.10 New in Dynamics AX 2012

Items new in Dynamics AX 2012 refer to the role-based security concept, assigning users to security roles (instead of user groups). Direct assignment of security roles to companies replaces the security domains available in Dynamics AX 2009.

Shared data for employees (workers) refer to changes in human resource management and the global address book.

9.2.3 Role-based Security

According to the role-based security concept, permissions are not directly granted to users, but to security roles. The link between users and permissions is established by assigning users to roles.

9.2.3.1 Security Concept

The role-based security model in Dynamics AX contains the following elements:

- Role: Group of duties required for a certain job function (e.g. sales manager)
- Duty: Group of privileges to perform a task (e.g. approving product prices)
- Privilege: Contains permissions required for individual objects (e.g. post price journal)
- Permission: Basic access restriction to units of data and functionality (e.g. tables, fields)

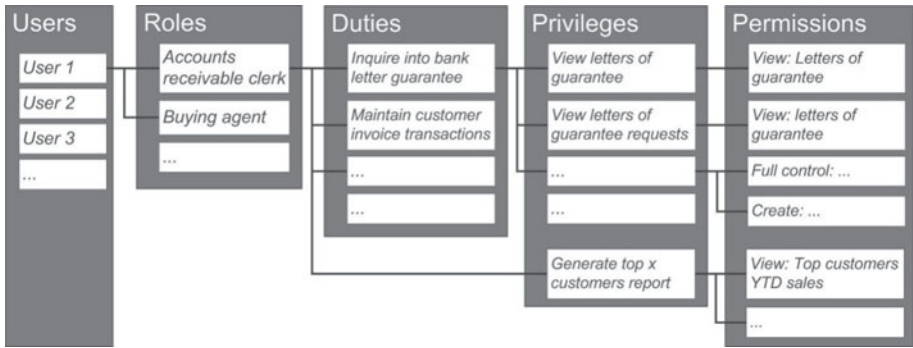


Figure 9-9: Grouping levels involved for assigning users to permissions

These elements represent a hierarchical structure for assigning permissions to a user. As shown in Figure 9-9, you may assign one or more roles to a user depending on his job functions.

Roles are linked to privileges through duties preferably, but it is possible to directly assign a privilege to a role as well.

Usually, assigning one or more roles to a user – including the assignment of applicable companies – in the user form is the only thing to do for system administration when setting up a new user.

9.2.3.2 Security Roles

A role is a set of access permissions required to perform a job function. In a Dynamics AX standard application, there are about 80 reference roles available which contain the duties referring to primary job functions.

Roles are depending on factors like size, culture and industry, showing different role types:

- Functional roles complying with the customer model – e.g. buying agent
- Organizational roles – e.g. employee
- Application roles – e.g. system user

The role *System administrator* has access to all areas of the application and cannot be limited.

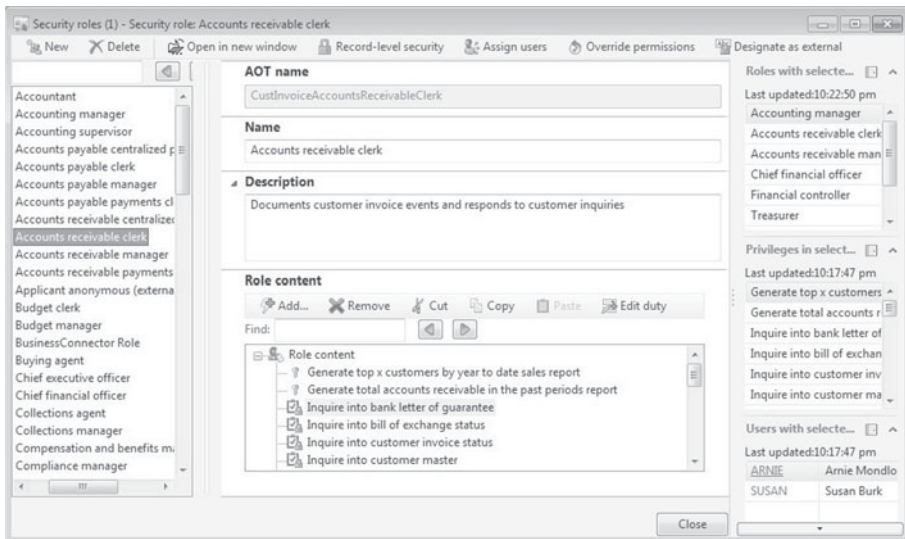


Figure 9-10: Security roles, showing duties and directly assigned privileges

You may access role management in the form *System administration> Setup> Security> Security roles*. On the left part of the form, you may see roles available in your application. When selecting a role, you may view assigned duties and privileges in the section *Role content*. You may distinguish duties and roles from the icon shown – duties show a lock whereas directly assigned privileges show a key (see Figure 9-10). Clicking the button *Add* in the role content section, you may add duties and privileges.

In the fact boxes on the right of the security roles form, you may view:

- Roles – Assigned to the duty selected in the role content section

➤ Privileges – Assigned to the role selected (directly or through duties)

You may as well check the privileges assigned to a user through a certain role by viewing the appropriate fact box in the users detail form (*System administration> > Common> Users> Users*).

9.2.3.3 Duties and Process Cycles

Duties represent a group of privileges required for a specific task, e.g. maintaining customer invoice transactions. In a Dynamics AX standard application, there are about 800 reference duties available, which are updated when hotfixes and releases cause changes to data structure, functionality and permissions.

You may access duties clicking the button *Edit duty* in the role content pane of the security roles form. Duties are also accessible through the form *System administration> Setup> Security> Security privileges*.

The security privileges form shows a tree structure applying process cycles. A process cycle in this context is a grouping according to high level processes like the revenue cycle.

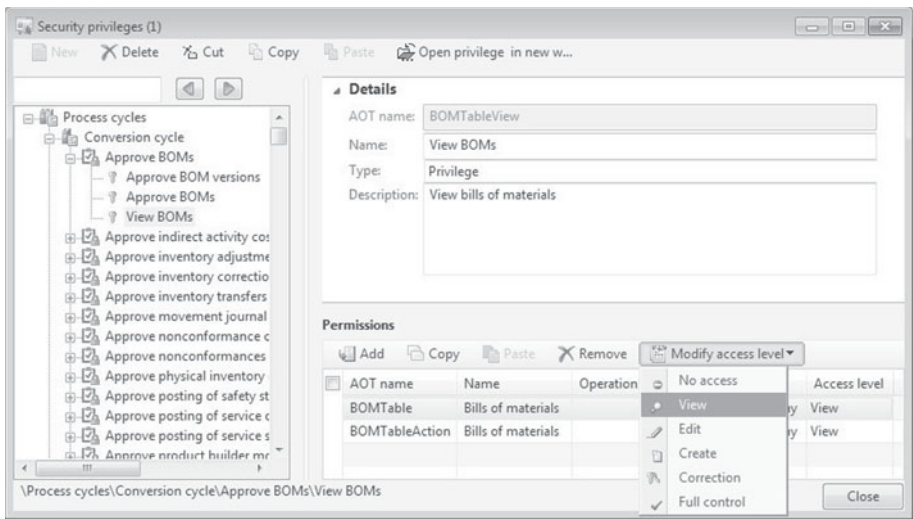


Figure 9-11: Managing duties and privileges in the security privileges form

In order to access a certain duty, you may expand the process cycle tree or search for the duty choosing the search field located above the process cycle section. Expanding a duty as shown in Figure 9-11 (example: “Approve BOMs”), you may view assigned privileges.

Choosing the buttons *Delete*, *Cut*, *Paste*, *Copy*, *Paste* or dragging and dropping elements with your mouse you may assign privileges. Depending on the hierarchy level of the active element in the privileges tree, the button *New* adds a duty or a privilege.

9.2.3.4 Privileges and Permissions

A privilege contains all permissions required for an individual application object. In the example Figure 9-11, you may see the privilege “View BOMs” showing required permissions in the section *Permissions*. If required, you may choose different access levels like *View* or *Edit* clicking the button *Modify access level* as well as add or remove permissions from a privilege clicking the appropriate button in the permissions section.

Permissions set access restriction to units of data and functionality like tables and fields. The definition of available permissions is done by application development.

9.2.3.5 Adjusting Security Settings

Setting access restrictions usually starts by assigning users to roles of the reference model. If required, you may adjust existing or create new roles, removing duties or adding additional duties.

Since duties will be updated with hotfixes and new releases, it is preferable to adjust existing duties for grouping standard features instead of creating new duties. New duties are applicable for individual functionality developed additionally.

Although it is possible to directly assign privileges to roles (see Figure 9-9), maintenance of permissions will be easier if privileges are added to roles only.

9.2.3.6 Segregation of Duties

If your organization requires ensuring segregation of duties, you may manage rules for the segregation of duties in the form *System administration > Setup > Security > Segregation of duties > Segregation of duties rules*. Entering sets of two duties which may not be assigned together to one user ensures complying with segregation of duties policies by logging conflicts for approval or rejection.

In business processes, segregation of duties is supported by business policies and workflow management (see section 9.4).

9.2.3.7 New in Dynamics AX 2012

Roles in the role-based security concept of Dynamics AX 2012 replace the user groups of Dynamics AX 2009. Instead of directly assigning user groups to permissions, permission settings for roles in AX 2012 involve duties and privileges.

9.2.4 Securing the Global Address Book

The core usage of the role-based security framework is to restrict access to functional roles. The global address book, however, containing all parties of a Dynamics AX instances is required by nearly all roles in all companies of a common database.

In order to control access to different party and address data depending on address associations, there are security options for the global address book. These options refer to two groupings:

- Address books – Grouping different parties
- Teams – Grouping different people

9.2.4.1 Security Setup

Address books (see section 2.4.2) are available for assigning a party when you enter the party record. You may assign one or more address books to a party. Since address books are the basis for security settings, you want to keep required access restrictions in mind when setting up address books (e.g. creating a separate address book holding employee records).

Teams (see section 9.1.2) are a flexible option to set up organization units independently from a hierarchical structure. Referring to the global address book, you may want to set up specific teams according to access restriction to the global address book (e.g. a separate team for users accessing employee addresses).

9.2.4.2 Security Options

In the section *Security policy options* of the global address book parameters (*Organization administration> Setup> Global address book> Global address book parameters*), you may select *Secure by address book*.

Clicking the button *Assign teams*, you may select an address book in the lookup field and add the selected team for access in the *Assign teams* form. Another option to assign teams is to click the button *Assign teams* in the address books form (*Organization administration> Setup> Global address book> Address books*).

The checkbox *Secure by legal entity* in the global address book parameters restricts access to parties depending on party roles (e.g. vendor or customer). When selecting this checkbox, users may view only parties assigned to a role in the current company.

9.2.4.3 Applying Address Book Security

If the global address book parameter *Secure by address book* is to set restrict access by address book, only users assigned to a team, which is selected to access a certain address book, may access parties of that address book.

A party in the global address book assigned to several address books is available to all users, who have the permission to access any of the address books concerned.

Access restriction not only applies to the global address book list page itself, but also to other list pages and forms containing party data (like vendors or customers). In addition, the restriction includes related information such as orders or invoices.

9.2.4.4 New in Dynamics AX 2012

Global address book security options are new in Dynamics AX 2012.

9.3 General Settings

There are a number of settings, which are required before an enterprise can start to work in the Dynamics AX application operationally. These settings include:

- Organization management – See section 9.1
- Security management – See section 9.2
- Finance settings – See section 8.2

Each module you want to use also has to be configured according to the requirements of your enterprise (e.g. setting up effective terms of payment in purchasing and sales). In addition, there are some basic general settings applying to all areas of the application. You may find a short description of them below.

Explanations regarding the setup of individual modules are available in the chapter referring to the particular module. In the Appendix, you will find an overview of basic settings for a Dynamics AX installation.

9.3.1 Number Sequences

Number sequences drive the automatic allocation of numbers throughout the whole application. In particular, you may find them in the following areas of the application:

- Master data – For example assigning vendor numbers
- Journals (including orders) – For example assigning purchase order numbers
- Posted transactions – For example assigning invoice numbers

In Dynamics AX 2012, common number sequences are available to all companies. In the scope parameters of a number sequence, you may choose if the number sequence is shared or specific to a company (or other organization unit). In addition, a number sequence may refer to a fiscal calendar period.

9.3.1.1 Creating and Editing

Number sequences are available in the list page *Organization administration> Common> Number sequences> Number sequences* as shown in Figure 9-12. The fact box *Segments* in the number sequences list page immediately shows to which company a number sequence is attached or if it is shared.

You may create a number sequence choosing the button *New/Number sequence* or the shortcut *Ctrl+N*. After inserting a unique *Number sequence code* and a *Name*, you need to specify in the *Scope parameters* if the number sequence is shared or if it is restricted to a company or organization unit.

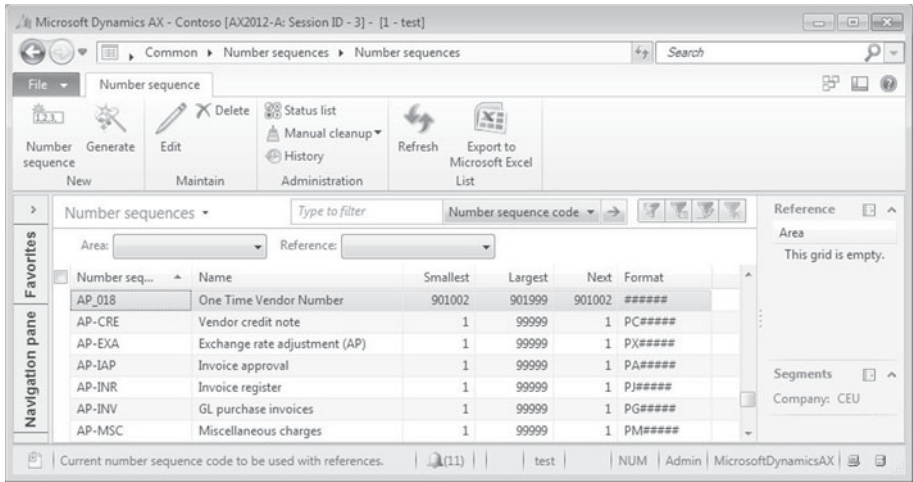


Figure 9-12: The number sequences list page

9.3.1.2 Segments

In the section *Segments* of the number sequence detail form, you may specify the format of numbers referring to the number sequence. Segments of the number may show different segment types:

- **Alphanumeric** – Number increasing every time the number sequence is used replacing the number signs (#) in the format with the next number. The length of the alphanumeric segment needs to be able to hold the largest number.
- **Constant** – Segments of the type Constant may be used for prefixes (e.g. for a format “INV#####” or “12#####”) as well as for suffixes (e.g. a format “#####-INV”). In general, prefixes are preferable since they are easier to use (e.g. for filtering).
- **Other types** – Segments of the type Company, Legal entity, Operating unit or Fiscal calendar are available, if they are included in the Scope of the number sequence.

9.3.1.3 References

Number sequence references specify the assignment of number sequences to master data and transactions. They are available on the tab *References* in the number sequences form.

Alternatively, you may specify number sequence references on the tab *Number sequences* of the parameters form in each module.

In order to ensure easy tracking of transactions through the whole application, you should assign unique document and transaction numbers paying attention to avoid overlapping.

You may assign a single number sequence to several number sequence references – as an example if you want to apply a common number sequence for invoices and

credit notes. There will not be any duplicate number in this case. Depending on the chronological order of transaction posting, Dynamics AX alternately assigns numbers to invoices and credit notes.

9.3.1.4 General Settings of a Number Sequence

On the tab *General*, you have to give the numeric first (*Smallest*) and last (*Largest*) number of the number sequence.

The field *Next* contains the number, which the number sequence will apply next. You may change the next number, but you have to make sure to avoid duplicate keys and gaps in continuous numbers – Dynamics AX shows an error message to the user who tries to apply that number.

Another option available controls if users can change a number automatically assigned from the number sequence to a higher or lower number. Marking the checkbox *Manual*, you may also specify a purely manual entry of numbers.

The checkbox *Continuous* prevents gaps in a number sequence. To ensure a better system performance, you should select it only for number sequences where you actually need continuous numbers, however. Continuous numbering applies to voucher numbers frequently, since it is a statutory requirement in many countries.

9.3.1.5 New in Dynamics AX 2012

In Dynamics AX 2012, number sequences are shared across all legal entities.

9.3.2 Calendars

As a prerequisite to post any transaction in Dynamics AX, the ledger period for the posting date has to be available and opened.

9.3.2.1 Ledger Calendar

Ledger calendars (*General ledger> Setup> Ledger*, button *Ledger calendar*), which refer to the fiscal calendar associated with your company, are there to specify which periods are opened and closed for posting (see section 8.2.1).

Apart from periods in accounting, other areas of the Dynamics AX application have additional period and calendar definitions.

9.3.2.2 Other Calendars

In the form *Organization administration> Common> Calendars> Working time templates* you may define working times, which are the basis for setting up calendars in the form *Organization administration> Common> Calendars> Calendars*. Calendars managed in this form apply to supply chain management including operations planning, production, purchasing, sales and inventory management.

The project module has a separate calendar linked to estimates, invoice subscriptions and employees, which you may access in the form *Organization*

administration> Common> Calendars> Period types. This calendar is required for project invoicing.

9.3.2.3 New in Dynamics AX 2012

In Dynamics AX 2012, the concept of accounting periods has changed providing fiscal calendars shared across companies, replacing fixed asset calendars as well.

9.3.3 Address Setup

Address setup is a prerequisite to enter and print addresses correctly. You may access address setup in the form *Organization administration> Setup> Addresses> Address setup*.

9.3.3.1 Address Parameters

On the tab *Parameters* you may decide whether Dynamics AX should check *ZIP/postal code*, *District* or *City* when entering an address.

If selected, you cannot enter an address with e.g. a new ZIP code before inserting the new ZIP code in the ZIP code main table.

9.3.3.2 Address Format

The address format on the tab *Address format* specifies how street, ZIP/postal code, city and country display in the address field of addresses. To comply with the regulations in different countries, you may enter a specific format per country. If addresses should be printed in the same way for some countries, you may apply the same address format.

In order to set up a new format, you want to click the button *New* in the upper section of the address formats. In the lower section, you may specify the way address components (like *Street* and *City*) show on printed documents. The selection of address components also applies on showing fields: When entering an address, Dynamics AX only shows address components of the address format concerned.

When setting up address formats, you have to take into account that Dynamics AX stores the formatted address in addition to the individual fields of the address. If you change the format after entering some addresses, you need to update existing addresses clicking the button *Update addresses*.

9.3.3.3 Country/Region

The Microsoft Dynamics AX standard provides a list of countries showing a 3-digit country code, which you may display on the tab *Country/region*. When setting up additional countries, you have to select the appropriate format in the column *Address format*.

9.3.3.4 New in Dynamics AX 2012

In order to support the global address book, components like address formats and countries are shared across all companies in Dynamics AX 2012.

9.3.4 Parameters

Parameters include basic settings and enable selecting the specific business process settings from the options available in Dynamics AX, which fit best to the way your organization works.

Setting parameters is a core task when implementing Dynamics AX. Depending on the individual parameter, later changes are possible in a working environment or not. Before you do any changes on basic settings in an operational environment, be sure you are aware of all consequences. Depending on the circumstances, you might read the online help or ask an expert to avoid data inconsistency or other problems.

9.3.4.1 System Parameters

In the system parameters (*System administration > Setup > System parameters*), you may find global parameters like the system language or the default basic currency.

9.3.4.2 Module Parameters

In addition, a parameters form controlling company-specific settings is available in each module of Dynamics AX. You may access the parameters of an individual module through the menu item *Setup > Parameters* – as an example the accounts payable parameters in *Accounts payable > Setup > Accounts payable parameters*.

9.4 Alerts and Workflow Management

A workflow is a sequence of operations in a routine business process, containing necessary activities to be performed on a document. Typical examples of workflows are approval processes, e.g. for purchase requisitions.

Microsoft Dynamics AX provides functionality to configure and process workflows, including the option to automate processes. As an example, low-value purchase requisitions may be approved automatically. In the development environment, a workflow development wizard enables experts to easily create additional workflows not included in a standard Dynamics AX instance.

Alerts within Dynamics AX are automatic notifications referring to alert rules, based on selected events (e.g. inserting a record). Compared to workflows (which support a sequence of activities including automatic actions), alerts only provide a notification without further options.

9.4.1 Alert Rules and Notifications

Alert rules do not require configuring consecutive steps for processing alerts. You may simply create an alert rule in any Dynamics AX form to automatically notify users.

9.4.1.1 Alert Rules

Depending on your permission settings, you may define alert rules as required. For example, you may set up a rule to notify the responsible person once an agreed delivery date passes, or a new vendor is entered.

You may set up alert rules choosing the option *Create alert rule* in the pop-up menu (doing a right-hand click) or the command *File/Command/Create alert rule* in each detail form or list page (in case of a field-based rule after selecting the appropriate field). Dynamics AX will show a dialog box, where you may edit the alert rule.

In the field *Event* of the alert rule dialog, you may select the trigger for the alert – e.g. that a record has been created or deleted or that a certain field content has been modified. If the basis of an alert rule is a date field, the field *Event* will provide an option to generate alerts when the date is due.

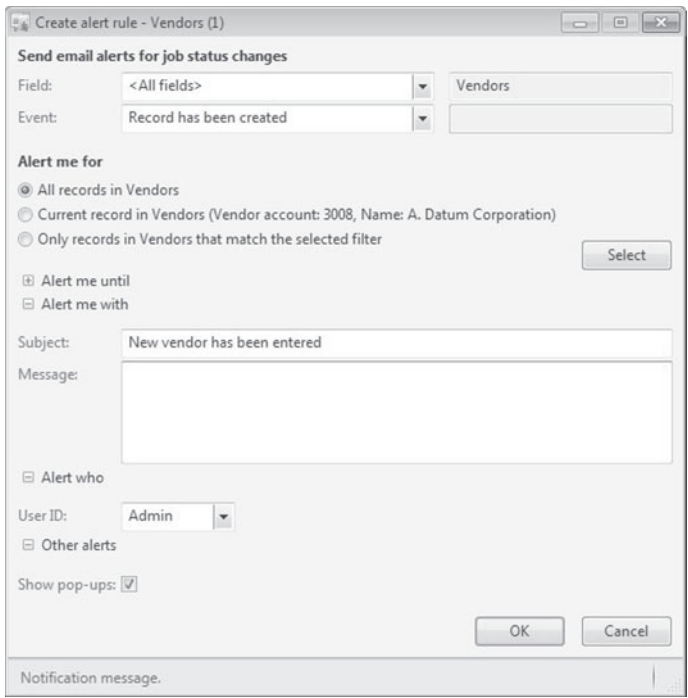


Figure 9-13: The dialog box for creating an alert rule

Figure 9-13 shows the example of entering an alert rule that applies when a new vendor record is created. In order to limit alerts, you may define a filter choosing the button *Select* in the alert rule dialog (for example if you want alerts for vendors of a certain vendor group only).

If you want to edit existing alert rules, you may choose the command *File/Tools/Manage alert rules* or the menu item *Organization administration> Setup> Alerts> Alert rules*. In the alert rule administration form, you may also create new alert rules based on alert templates. Alert templates are regular record templates (see section 2.3.2), which are created in the alert rule administration form.

9.4.1.2 General Alert Management

Alert notifications will show only after the periodic activities *System administration> Periodic> Alerts> Change based alerts* and/or *System administration > Periodic> Alerts> Due date alerts* have been executed. Usually system administration will submit these activities as a periodic batch job, but you may run them online manually for testing purposes as well.

On the tab *Alerts* of the system parameters (*System administration> Setup> System parameters*), you may set the period which Dynamics AX should process for due date alerts like exceeding an agreed delivery date.

9.4.1.3 User Options

On the tab *Notifications* of your user options, you may choose the period for receiving notifications. In addition, you may select if you want alert notifications to generate email messages and to show in a pop-up window. In the user options, you may additionally choose the notification form to show workflow notifications in parallel to alerts.

9.4.1.4 Working with Notifications

A notification will show if an event triggering an alert occurs. Depending on alert rule settings and your user options, alert notifications and workflow notifications display in the status bar, in a pop-up and as an e-mail message.

When receiving an alert notification, you may display the alert in the notification list form by double-clicking on the alert icon  in the status bar or by selecting the command *File/View/Notifications*. In the notification line, you may click the button *Go to origin* in the action pane strip to access the alert origin.

Selecting the shortcut key *Alt+F9* or the command *File/Delete Record*, you may delete alert notifications not required any more. Alternatively, you may set the alert notification status to “Read” by switching to the tab *General* or clicking the button *Change status*.

9.4.2 Configuring Workflows

Workflows are available in many areas of Microsoft Dynamics AX, including but not limited to:

- Financial journals
- Purchase requisitions
- Purchase orders

- Invoice posting
- Time and attendance

9.4.2.1 Workflow List Page

In each applicable module, the setup folder contains a menu item for the workflows in the particular module.

When selecting this menu item, the workflow list page displays showing the workflows configured in the module concerned. For example, the list page *Procurement and sourcing> Setup> Procurement and sourcing workflows* is there to create, edit, view and delete workflows in the procurement module.

9.4.2.2 Graphical Workflow Editor

After selecting a workflow in workflow list page, you want to access the graphical workflow editor clicking the action button *Edit* or doing a double-click.

The graphical workflow editor may show three panes:

- Canvas – The place to design workflows by dragging and dropping elements and connections.
- Toolbox – On the left, containing available workflow elements.
- Error pane – Displays error messages and warnings below the canvas (not shown in Figure 9-14, click the button *Error pane* in the action bar to display)

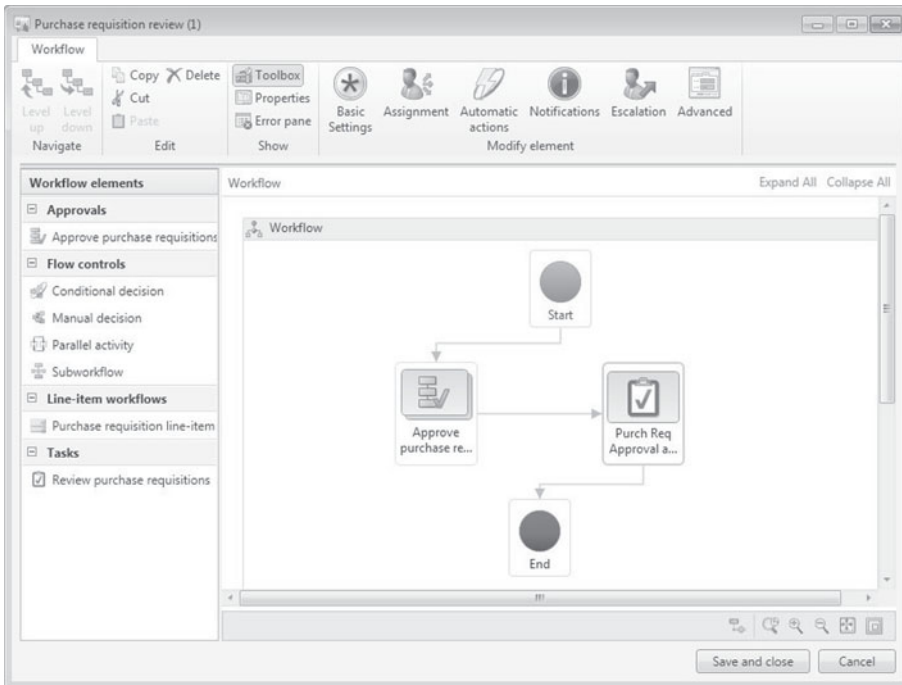


Figure 9-14: Graphical workflow editor showing the purchase requisition workflow

In the toolbox, workflow elements are grouped by different types like approvals and tasks. Depending on the selected workflow, different elements may be available. In order to hide or show the toolbox, you may click the button *Toolbox* in the action pane.

If you want to add a workflow element to the workflow, you may click it in the toolbox and drag it to the canvas. The properties of an element, accessible by doing a right-hand click or by clicking the buttons in the action pane group *Modify workflow*, are specific to the selected element.

Apart from basic settings like the element name, you may choose *Notifications* and *Assignment* to different user categories like participants (referring to user roles), workflow users (user starting or owning a workflow) or specific user names.

Escalation provides the option to automatically reassign a work item once a time limit for the assigned user is exceeded.

Automatic actions provide the option to automatically take an action if the condition entered for the automatic action is met – e.g. approving a requisition if the invoice amount is below a certain value.

Workflow elements of the type “Approval” contain a lower workflow level showing approval steps. You may access approval steps by double-clicking the approval element or by clicking the button *Level down* in the workflow editor. In order to see the first level again, you may click on the level *Workflow* in the path shown on the header line of the canvas.

9.4.2.3 Workflow Properties

You may access properties of the workflow itself by doing a right-hand click or by clicking the buttons in the action pane group *Modify workflow* after selecting an empty space in the canvas. Important settings include the *Owner* of the selected workflow.

9.4.2.4 Work Item Queues

A specific option available for assigning workflow elements is “Queue” (e.g. applicable for tasks). Assignment to queues refers to work item queues, which you may set up in the form *Organization administration> Setup> Workflow> Work item queues*.

Work item queues are there to pool activities originating from a workflow, assigning an activity to a group of people instead of a single person. If a work item is assigned to a work item queue, all members of the queue may claim the work item and work on it.

When setting up a new work item queue, you need to select the *Document* linking the item queue to a workflow type. Setting the status to *Active* makes it available for assignment.

Apart from manually adding users to a work item queue, you may choose automatic assignment based on filter criteria clicking the button *Work item queue assignment* or selecting the menu item *Organization administration> Setup> Workflow> Work item queue assignment rules*.

9.4.2.5 Workflow Versions

When saving a workflow clicking the button *Save and close* in the workflow editor, Dynamics AX creates a new version. A dialog box asks whether to activate the new version or to keep the previous version activated.

You may check and edit the versions of a workflow clicking the button *Versions* in the workflow list page. In the workflow versions form, you may change a certain version to the active version.

The active version applies to workflows submitted after activation. Work items of workflows in progress will finish on their original version.

9.4.2.6 Create Workflows

The button *New* in the workflow list page opens a form, where you may choose an available workflow *Type* – e.g. “Purchase requisition review”. Clicking the button *Create workflow* after selecting the appropriate type will bring you to the graphical workflow editor as described above.

If there are two workflows of the same type available in the workflow list page, you may click the button *Set as default* in the action pane of the list page to specify a default.

9.4.2.7 Basic Settings for Batch Processing

Processing of workflows is an asynchronous batch job, which is why the next step in a workflow is not available immediately, but after batch processing of the specific workflow element has been completed. Depending on the batch configuration, this may last some time.

In order to initially set up the workflow infrastructure, you may want to access the wizard *System administration> Setup> Workflow> Workflow infrastructure configuration*. The wizard generates three batch jobs, which you may view in the form *System administration> Inquiries> Batch jobs*. In order to process batch jobs, a batch jobs have to be processed (see section 2.2.1).

In the system service accounts (*System administration> Setup> System> System service accounts*), an account for workflow execution needs to be specified.

9.4.3 Working with Workflows

If workflow processing is required in a certain Dynamics AX form, a yellow workflow message bar shows at the top of the form. Thus the user entering a transaction gets to know that workflow processing is necessary and may immediately submit the workflow.

When working with workflows, you should keep in mind that the workflow system processes workflow tasks in a batch process. Work items therefore are not available before the batch process has processed the submitted workflow.

9.4.3.1 Submitting a Workflow

After inserting a record requiring workflow processing, you may click the button *Submit* in the workflow message bar as shown in Figure 9-15.

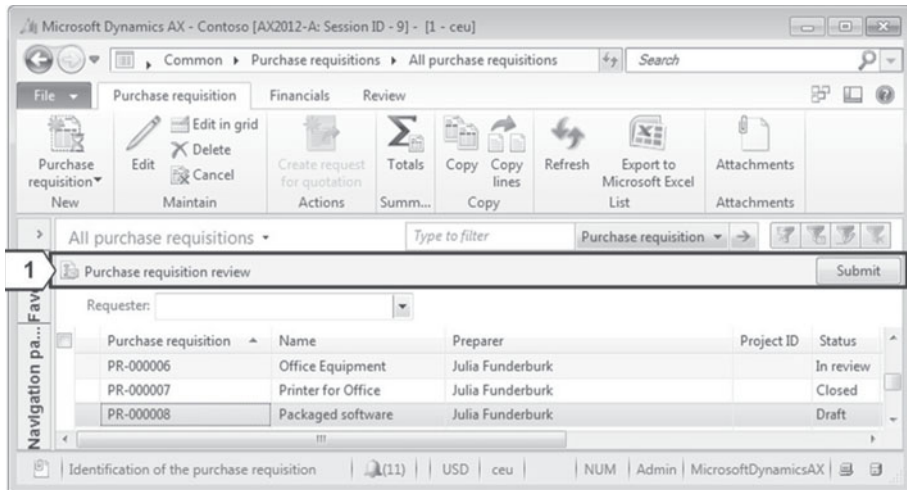


Figure 9-15: Submitting a workflow for a purchase requisition

Submitting a workflow actually starts it, generating **work items** for processing corresponding workflow elements.

After submitting a workflow, the workflow message bar shows the button *Actions* instead of *Submit*. Depending on workflow settings and status, you may find different options in the *Actions* button.

Choosing the option *Action/View history* in the workflow message bar, you may check the current status of workflow processing.

9.4.3.2 Approving Work Items

Depending on the settings of the related workflow element, work items are assigned to a work item queue on the one hand and to individual users (including assignments by definitions like participant or workflow user) on the other hand.

If a work item is assigned to a responsible user, it is available in the work item list of his home menu (*Home> Common> Work Items> Work items assigned to me*). The list page *Home> Common> Work Items> All work items* will show work items of all users.

The options available in the workflow message bar at the top of the work item list depend on the workflow element (Actions allowed in *Properties/Advanced settings*). If the option is available, you may approve a work item clicking the button *Actions/Approve*.

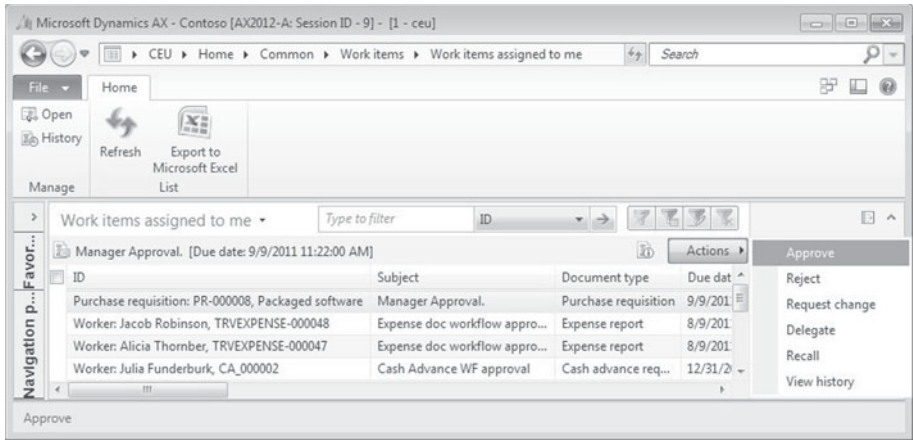


Figure 9-16: Approving a work item

Depending on the settings for workflow notifications in your user options, a notification along with alert notifications will show when a work item is assigned to you.

9.4.3.3 Working with Work Item Queues

If a work item is assigned to a work item queue, you may see it in the *All work items* list page and in the list page *Home > Common > Work Items > Work items assigned to my queues* as well. As a prerequisite, you need to be member of the work item queue referring to the work item.

In the work item queue, you may claim a work item clicking the button *Actions/Accept* in the yellow workflow message bar to prevent other queue members working on the same items. After claiming a work item, it shows in the work item list amongst the work items directly assigned to you as described above.

In the work item list, you may choose workflow actions like approving or rejecting in the same way as for the other work items. In addition, you may choose *Reassign* to reassign the work item to other persons or *Release* to release it to the queue.

9.4.3.4 New in Dynamics AX 2012

In Dynamics AX 2012, the workflow framework has been significantly enhanced including the graphical workflow editor resembling Microsoft Visio, line-item workflows, work item queues and a simplified installation architecture (avoiding workflow server components on an IIS server).

9.5 Other Features

9.5.1 Document Management

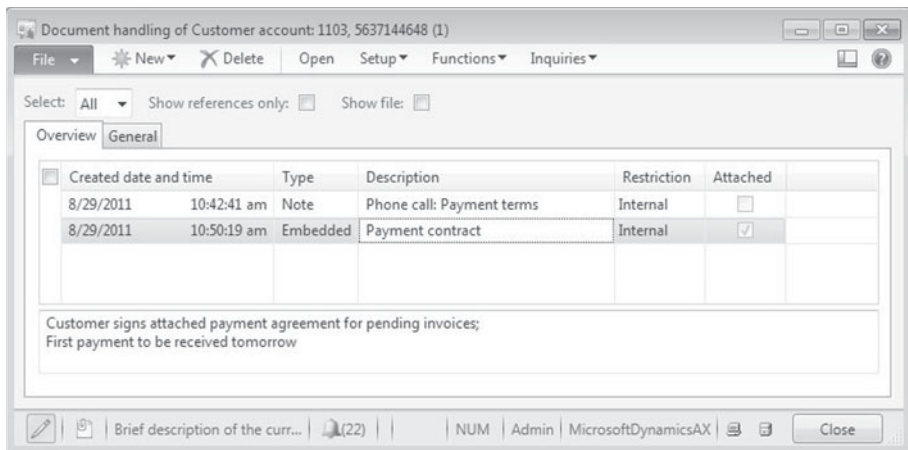
In daily business, you work with structured data available as records in your business application (e.g. customers). In parallel, important data referring to that records frequently are available in an unstructured format only (e.g. files or mails).

Document management in Microsoft Dynamics AX is there to deal with this issue by making it possible to assign as many files as required to any table record. The files attached are accessible directly within Dynamics AX.

If you use document management to attach all notes and files for a certain customer in the customer form as an example, you may access all relevant information for that customer – business data inside Dynamics AX as well as related files – directly from the customer form.

9.5.1.1 Document Handling Form

In order to manage notes and documents in Dynamics AX, you may access document handling in any list page or form clicking the button  in the status bar or in the action pane (called *Attachments* there). In the document handling form, you may edit existing or add new documents attached to the record selected in the original form when opening document handling.



Created date and time	Type	Description	Restriction	Attached
8/29/2011 10:42:41 am	Note	Phone call: Payment terms	Internal	☐
8/29/2011 10:50:19 am	Embedded	Payment contract	Internal	☒

Customer signs attached payment agreement for pending invoices;
First payment to be received tomorrow

Figure 9-17: Document handling form showing attachments to a certain customer

If you want to create a new document in the document handling form, you may click the button *New* in the action pane strip or as well insert a new line pushing the shortcut key *Ctrl+N*. By selecting the document type, you define if the document is a note, a file attachment, a URL or a new Word document/Excel worksheet.

If you select an existing line with an attachment, you may display the attachment in a separate form by clicking the button *Open*. As an alternative, you may select the checkbox *Show file* in the document handling form to display the file in the lower pane of the form.

9.5.1.2 User Options

As a prerequisite to access the document handling form, the checkbox *Document handling active* in your user options has to be selected. The checkbox *Show*

attachment status in the user options controls, whether the document-handling button will highlight for records holding attached documents.

9.5.1.3 Document Form

As an alternative to the document handling form, you may choose the document form in your home menu (*Home> Common> Document management> Documents*). The document form shows all documents regardless the table to which they refer.

9.5.1.4 Document Types

In document management, you may distinguish several types of documents:

- Simple notes do not include an attached file. In the lower pane of the document handling form, you may enter multiple lines of text.
- File attachments are there to attach any files.
- Word documents and Excel worksheets are there to create documents directly out of the document handling form.
- URLs are there to enter web links in the lower pane of document handling.

In order set up available document types, you may access the form *Organization administration> Setup> Document management> Document types*. Every document type refers to a certain class and group (fields *Class* and *Group*), specifying if assigned documents are simple notes, attachments or new documents. The selection in the fields *Location* and *Archive directory* is available to override settings from the document management parameters. If selecting “Database” for the file location, Dynamics AX stores the files inside the database.

Note: The menu item *Document content types* in document management setup refers to unattached documents (*Home> Common> Document management> Unattached documents*).

9.5.1.5 Document Management Setup

You may find parameters for document management in the form *Organization administration> Setup> Document management> Document management parameters*. Basic parameters include the *Archive directory* (usually a separate shared directory on a file server) and a number sequence for documents. The archive directory in the parameters is not applicable for document types, which contain the definition of a file location specific to the particular document type. You should take care to include the archive directories in backup procedures.

The tab *File types* in the document management parameters controls which file types are available in document management (you may want to exclude dangerous file types like Exe-files).

If the checkbox *Use active document tables* in the parameters is active, document handling will be available only for tables included in the active document tables (*Organization administration> Setup> Document management> Active document tables*).

In the document data sources (*Organization administration> Setup> Document management> Document data sources*), you may specify data sources available for the Microsoft Office Add-ins (see section 2.2.2).

9.5.1.6 New in Dynamics AX 2012

Items new in Dynamics AX 2012 document management include the document form in the home menu, the document type URL and the support of Office add-ins.

9.5.2 Case Management

Case management is there to centrally manage questions and issues. It does not only support customer service, but as well applies to collections, purchase management and human resources.

9.5.2.1 Case Configuration

There are two main items to configure case management:

- Case categories
- Case processes

Case categories (*Organization management> Setup> Cases> Case categories*) are there to group cases by functional areas like sales. Choosing the button *New* in the action pane, you may set up a hierarchy of case categories. On the tab *General*, you may choose defaults for the owner and the *Case process* of cases linked to the category.

Case processes (*Organization management> Setup> Cases> Case processes*) are there to ensure performing necessary steps when processing a case. Depending on the different types of cases in your enterprise, you may want to set up one or more case processes.

When setting up a new case process with *Name* and *Description*, you want to assign steps (stages) for processing the case by clicking the button *Actions/Create level*. In the field *Purpose*, you may enter the name of the stage. If required, you may set up a multi-level hierarchy of stages.

For simple case processes, defining stages may be sufficient. However, you may assign activities (like *Appointments* or *Tasks*) to the stages by clicking the button *Actions* or doing a right-hand click on the appropriate element in the *Actions* area of the form. Activities referring to cases are the same activities you may find in *Sales and marketing* (former CRM activities). You may access them in your *Home* menu (see section 2.1.4).

If you want to ensure some activities to be performed, you may select the checkbox *Required* on the activity concerned, and the checkbox *Check for required activities* on the tab *Exit criteria* of the related stage.

9.5.2.2 Processing Cases

You may create a new case choosing the appropriate button in the action pane of any list page or detail form where case management applies – e.g. sales orders

(Sales and marketing> Common> Sales orders> All sales orders, button General/Cases/ Create case), customers, collections, vendors, or released products.

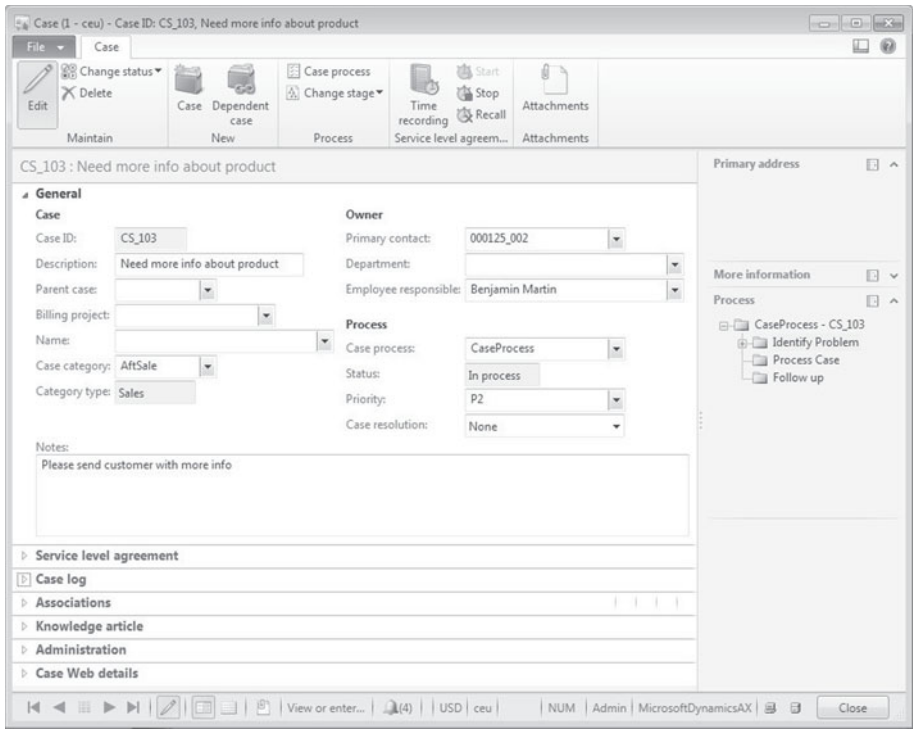


Figure 9-18: Editing details of a case

When creating a case in a sales order, Dynamics AX links the case with the order and with the customer. In the *Create* dialog form, you want to enter *Case category* and *Description*. Defaults for *Owner*, *Service level agreement* and *Case process* on the tab *Other* are retrieved from the *Case category* selected before. Clicking the button *Create* in the create dialog records the case.

If you want to follow up on a case, you may choose the list page *Home> Common> Cases> All cases*. Switching to the detail form, you may edit the case. Associations (e.g. to a sales order) are shown on the tab *Associations*. If additional associations apply, you may add them (e.g. a return order in addition to the original sales order).

The fact box *Process* tells you which case process stages and activities are planned according to the configuration. Clicking the button *Case/Case process*, you may check the status of the stages, which shows next to the *Name* field there.

When starting to work on a case, you may click the action button *Case/Change status/In process* if that status has not been already selected when creating the case. When proceeding with the case later, you may click the button *Case/Change stage*, selecting the next stage of the case.

On the tab *Case log*, you may log all interactions (e.g. receiving a product) referring to the case. Using the case log, other persons looking at a specific case may easily know the status of a case.

If the *Case process*, to which a case is attached, refers to *Activities*, you may find them in the page *Home> Common> Activities> All activities* or clicking the button *General/Activities/View activities* in the case detail form. Required activities of the case need to be completed by the responsible person.

If a case refers to a *Service level agreement* (tab *Service level agreement*), time recordings are enabled. Time recording starts when the case status changes (action button *Case/Change status*) or when clicking the button *Case/Start* or *Case/Stop*. You may view the time recorded clicking the button *Time recording*. Time recordings in case management do not refer to time recordings in project management or manufacturing execution, however.

In order to close a case, you may click the action button *Change status/Close* in the case management form.

9.5.2.3 New in Dynamics AX 2012

Case management is a new feature in Dynamics AX 2012.

Appendix

Setup Checklist

The checklists below show the most essential steps to set up a new Dynamics AX database. You can use these checklists as a guideline to do a basic setup of Dynamics AX.

The section “Basic Setup” contains necessary configuration steps for all functional areas covered by the book. They have to be done before you can start to use the particular module. Master data and other essential settings are shown in the section afterwards. Depending on the specific requirements of a certain installation, additional setup is required in most cases.

Basic Setup

Table A-1: Basic setup of a Dynamics AX database

No.	Name	Menu Item	Section
1.1	Configuration	<i>System administration> Setup> Licensing> License configuration</i>	
1.2	Parameters	<i>System administration> Setup> System parameters</i>	
1.3	Legal entities	<i>Organization administration> Setup> Organization> Legal entities</i>	9.1.4
1.4	Users	<i>System administration> Common> Users</i>	9.2.2
1.5	Virtual company accounts	<i>System administration> Setup> Virtual Company accounts</i>	9.1.5

Table A-2: Basic setup of a legal entity

No.	Name	Menu Item	Section
2.1	Operating units	<i>Organization administration> Setup> Organization> Operating units</i>	9.1.2
2.2	Dimensions	<i>General ledger> Setup> Financial dimensions> Financial dimensions</i>	8.2.3
2.3	Sites	<i>Inventory and warehouse management> Setup> Inventory breakdown> Sites</i>	9.1.6
2.4	Dimension link	<i>Inventory and warehouse management> Setup> Posting> Dimension link</i>	9.1.6
2.5	Warehouses	<i>Inventory and warehouse management> Setup> Inventory breakdown> Warehouses</i>	7.4.1
2.6	Fiscal calendars	<i>General ledger> Setup> Fiscal Calendars</i>	8.2.1
2.7	Currencies	<i>General ledger> Setup> Currency> Currencies</i>	8.2.2
2.8	Rate types	<i>General ledger> Setup> Currency> Exchange rate types</i>	8.2.2
2.9	Exchange rates	<i>General ledger> Setup> Currency> Currency exchange rates</i>	8.2.2
2.10	Chart of Accounts	<i>General ledger> Setup> Chart of accounts> Chart of accounts</i>	8.2.4

No.	Name	Menu Item	Section
2.11	Account structure	<i>General ledger> Setup> Chart of accounts> Configure account structures</i>	8.2.4
2.12	Ledger	<i>General ledger> Setup> Ledger</i>	8.2
2.13	Bank accounts	<i>Cash and bank management> Common> Bank Accounts</i>	8.2.5
2.14	Address setup	<i>Organization administration> Setup> Addresses> Address setup</i>	9.3.3
2.15	Address book parameters	<i>Organization administration> Setup> Global address book> Global address book parameters</i>	2.4.2
2.16	Number sequences	<i>Organization administration> Common> Number sequences> Number sequences</i>	9.3.1
2.17	Units	<i>Organization administration> Setup> Units> Units</i>	7.2.1
2.18	Unit conversion	<i>Organization administration> Setup> Units> Unit conversions</i>	7.2.1

Table A-3: Basic setup for the general ledger

No.	Name	Menu Item	Section
3.1	Default descriptions	<i>Organization administration > Setup> Default descriptions</i>	
3.2	Accounts for aut. transactions	<i>General ledger> Setup> Posting> Accounts for automatic transactions</i>	8.2.4
3.3	Ledger posting groups	<i>General ledger> Setup> Sales tax> Ledger posting groups</i>	8.2.6
3.4	Sales tax authorities	<i>General ledger> Setup> Sales tax> Sales tax authorities</i>	8.2.6
3.5	Sales tax settlement periods	<i>General ledger> Setup> Sales tax> Sales tax settlement periods</i>	8.2.6
3.6	Sales tax codes	<i>General ledger> Setup> Sales tax> Sales tax codes</i>	8.2.6
3.7	Sales tax groups	<i>General ledger> Setup> Sales tax> Sales tax groups</i>	8.2.6
3.8	Item sales tax groups	<i>General ledger> Setup> Sales tax> Item sales tax groups</i>	8.2.6
3.9	Journal names	<i>General ledger> Setup> Journals> Journal names</i>	8.3.1
3.10	Parameters	<i>General ledger> Setup> General ledger parameters</i>	

Table A-4: Basic setup for procurement and accounts payable

No.	Name	Menu Item	Section
4.1	Terms of payment	<i>Accounts payable> Setup> Payment> Terms of payment</i>	3.2.2
4.2	Vendor groups	<i>Accounts payable> Setup> Vendors> Vendor groups</i>	3.2.3
4.3	Posting profiles	<i>Accounts payable> Setup> Vendor posting profiles</i>	3.2.3
4.4	Accounts payable parameters	<i>Accounts payable> Setup> Accounts payable parameters</i>	
4.5	Procurement parameters	<i>Procurement and sourcing> Setup> Procurement and sourcing parameters</i>	

Table A-5: Basic setup for sales and accounts receivable

No.	Name	Menu Item	Section
5.1	Terms of payment	<i>Accounts receivable> Setup> Payment> Terms of payment</i>	3.2.2
5.2	Customer groups	<i>Accounts receivable> Setup> Customers> Customer groups</i>	4.2.1
5.3	Posting profiles	<i>Accounts receivable> Setup> Customer posting profiles</i>	4.2.1
5.4	Form setup	<i>Accounts receivable> Setup> Forms> Form setup</i>	4.2.1
5.5	Accounts receiv. parameters	<i>Accounts receivable> Setup> Accounts receivable parameters</i>	

Table A-6: Basic setup for product and inventory management

No.	Name	Menu Item	Section
6.1	Storage dimension groups	<i>Product information management> Setup> Dimension groups> Storage dimension groups</i>	7.2.2
6.2	Tracking dimension groups	<i>Product information management> Setup> Dimension groups> Tracking dimension groups</i>	7.2.2
6.3	Item groups	<i>Inventory and warehouse management> Setup> Inventory> Item groups</i>	7.2.1
6.4	Transaction combinations	<i>Inventory and warehouse management> Setup> Posting> Transaction combinations</i>	8.4.2
6.5	Posting	<i>Inventory and warehouse management> Setup> Posting> Posting</i>	8.4.2
6.6	Item model groups	<i>Inventory and warehouse management> Setup> Inventory> Item model groups</i>	7.2.3
6.7	Costing versions	<i>Inventory and warehouse management> Setup> Costing> Costing versions</i>	7.2.4
6.8	Journal names	<i>Inventory and warehouse management> Setup> Journals> Journal names, inventory</i>	7.4.1
6.9	Warehouse journals	<i>Inventory and warehouse management> Setup> Journals> Journal names, warehouse management</i>	7.4.1
6.10	Parameters	<i>Inventory and warehouse management> Setup> Inventory and warehouse management parameters</i>	

Table A-7: Basic setup for production control

No.	Name	Menu Item	Section
7.1	Production units	<i>Production control> Setup> Production> Production units</i>	5.3.1
7.2	Working time templates	<i>Organization administration> Common> Calendars> Working time templates</i>	5.3.1
7.3	Calendars	<i>Organization administration> Common> Calendars> Calendar</i>	5.3.1
7.4	Resource capabilities	<i>Organization administration> Common> Resources> Resource capabilities</i>	5.3.2
7.5	Resource groups	<i>Organization administration> Common> Resources> Resource groups</i>	5.3.1

No.	Name	Menu Item	Section
7.6	Resources	<i>Organization administration> Common> Resources> Resources</i>	5.3.2
7.7	Journal names	<i>Production control > Setup> Production journal names</i>	5.4.1
7.8	Route groups	<i>Production control > Setup> Routes> Route groups</i>	5.3.3
7.9	Cost groups	<i>Production control > Setup> Routes> Cost groups</i>	5.4.1
7.10	Shared categories	<i>Production control > Setup> Routes>Shared categories</i>	5.3.3
7.11	Cost categories	<i>Production control > Setup> Routes> Cost categories</i>	5.3.3
7.12	Calculation groups	<i>Inventory and warehouse management> Setup> Costing> Calculation groups</i>	5.2.1
7.13	Costing sheets	<i>Inventory and warehouse management> Setup> Costing> Costing sheets</i>	5.4.1
7.14	Parameters	<i>Production control > Setup> Production control parameters</i>	
7.15	Parameters by site	<i>Production control > Setup> Production control parameters by site</i>	

Table A-8: Basic setup for master planning

No.	Name	Menu Item	Section
8.1	Coverage groups	<i>Master planning> Setup> Coverage> Coverage groups</i>	6.3.3
8.2	Master plans	<i>Master planning> Setup> Plans> Master plans</i>	6.3.2
8.3	Forecast models	<i>Inventory and warehouse management> Setup> Forecast> Forecast models</i>	6.2.2
8.4	Forecast plans	<i>Master planning> Setup> Plans> Forecast plans</i>	6.2.2
8.5	Parameters	<i>Master planning> Setup> Master planning parameters</i>	

Other Key Settings and Master Data

Table A-9: Other key settings

No.	Name	Menu Item	Section
9.1	Workers	<i>Human resources> Common> Workers> Workers</i>	9.2.2
9.2	User relations	<i>System administration> Common> Users> User relations</i>	9.2.2
9.3	Terms of delivery	<i>Sales and marketing> Setup> Distribution> Terms of delivery</i>	3.2.1
9.4	Modes of delivery	<i>Sales and marketing> Setup> Distribution> Modes of delivery</i>	4.2.1
9.5	Cash discounts	<i>Accounts payable> Setup> Payment> Cash discounts</i>	3.2.2
9.6	Payment methods (Purchasing)	<i>Accounts payable> Setup> Payment> Methods of payment</i>	8.3.4
9.7	Activate trade agreements (Purchasing)	<i>Procurement and sourcing> Setup> Price/discount> Activate price/discount</i>	3.3.3
9.8	Vendor price/discount groups	<i>Procurement and sourcing > Setup> Price/Discount> Vendor price/discount groups</i>	3.3.3

No.	Name	Menu Item	Section
9.9	Item discount groups	<i>Procurement and sourcing > Setup> Price/Discount> Item discount groups</i>	4.3.2
9.10	Trade agreement journal names	<i>Procurement and sourcing> Setup> Price/discount> Trade agreement journal names</i>	3.3.3
9.11	Price tolerance setup	<i>Accounts payable> Setup> Invoice matching> Price tolerances</i>	3.6.2
9.12	Activate trade agreements (Sales)	<i>Sales and marketing> Setup> Price/discount> Activate price/discount</i>	4.3.2
9.13	Customer price/discount groups	<i>Sales and marketing> Setup> Price/Discount> Customer price/discount groups</i>	4.3.2
9.14	Charges codes (Purchasing)	<i>Accounts payable> Setup> Charges> Charges code</i>	4.4.5
9.15	Charges codes (Sales)	<i>Accounts receivable> Setup> Charges> Charges code</i>	4.4.5
9.16	Return action (Purchasing)	<i>Procurement and sourcing> Setup> Purchase orders> Return action</i>	3.7.1
9.17	Disposition codes	<i>Sales and marketing> Setup> Sales orders> Returns> Disposition codes</i>	4.6.4
9.18	Category hierarchies	<i>Product information management> Setup> Categories> Category hierarchies</i>	3.3.1
9.19	Procurement categories	<i>Procurement and sourcing> Setup> Categories> Procurement categories</i>	3.3.1
9.20	Sales categories	<i>Sales and marketing> Setup> Categories> Sales categories</i>	4.3.1
9.21	Carrier interface	<i>Inventory and warehouse management> Setup> Shipping carrier> Carrier interface</i>	4.2.1
9.22	Document management parameters	<i>Organization administration> Setup> Document management> Document management parameters</i>	9.5.1
9.23	Document types	<i>Organization administration> Setup> Document management> Document types</i>	9.5.1
9.24	Workflow configuration	<i>System administration> Setup> Workflow> Workflow infrastructure configuration</i>	9.4.2
9.25	Batch-Server	<i>System administration> Setup> System> Server configuration</i>	2.2.1

Table A-10: Master data

No.	Name	Menu Item	Section
10.1	Vendors	<i>Accounts payable> Common> Vendors> All vendors</i>	3.2.1
10.2	Customers	<i>Accounts receivable> Common> Customers> All customers</i>	4.2.1
10.3	Products	<i>Product information management> Common> Products> All products and product masters</i>	7.2.1
10.4	Released products	<i>Product information management> Common> Released products</i>	7.2.1
10.5	Bills of material	<i>Inventory and warehouse management> Common> Bills of materials</i>	5.2.2
10.6	Operations	<i>Production control> Setup> Routes> Operations</i>	5.3.3
10.7	Routes	<i>Production control> Common> Routes> All routes</i>	5.3.3

Commands and Shortcut Keys

Table A-11: Basic commands and shortcut keys

Shortcut Key	Command	Description
<i>Ctrl+N</i>	<i>File/New</i>	Create a record
<i>Alt+F9</i>	<i>File/Delete Record</i>	Delete a record
<i>Alt+F4</i>	<i>File/Exit</i>	Close form or workspace
<i>Esc</i>		Close form (optionally without saving)
<i>Ctrl+F5</i>	<i>File/Command/Restore</i>	Restore record (Undo pending changes)
<i>F5</i>	<i>File/Command/Refresh</i>	Refresh (Save and synchronize record)
<i>Ctrl+P</i>	<i>File/Print/Print</i>	Print auto-report
	<i>File/View/Show Favorites in Navigation Pane</i>	Show/hide favorites pane
<i>Ctrl+W</i>	<i>Windows/New workspace</i>	Open an additional workspace
<i>Ctrl+X</i>	<i>File/Edit/Cut</i>	Cut (content of one field)
<i>Ctrl+C</i>	<i>File/Edit/Copy</i>	Copy (field or record)
<i>Ctrl+V</i>	<i>File/Edit/Paste</i>	Paste (content of one field)
<i>Ctrl+F</i>	<i>File/Edit/Find</i>	Find (opens the field filter window)
<i>Ctrl+F3</i>	<i>File/Edit/Filter/Advanced Filter/Sort</i>	Open the window for advanced filtering
<i>Alt+F3</i>	<i>File/Edit/Filter/Filter by selection</i>	Set a filter applying the content of the selected field
<i>Ctrl+G</i>	<i>File/Edit/Filter/Filter By Grid</i>	Show the filter line
<i>Shift+ Ctrl+F3</i>	<i>File/Edit/Remove Filter/Sort</i>	Clear filter
	<i>File/Command/Document handling</i>	Document management
	<i>File/View/Notifications</i>	Show notifications
<i>F1</i>	<i>Help/Help</i>	Help on forms

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