Infor LN Functions and Features

Important Notices

Trademark Acknowledgements

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About this document

This document describes the functions and features in LN, categorized by LN package. It provides detailed information on the use of functionality to streamline business processes.

About this guide

This document describes the functionality in LN, and is a technical document that provides detailed information on how you can use the functionality to streamline business processes.

No detailed knowledge is required to use this document. However, understanding the contents is easier if you are familiar with the overall structure and functions of LN.

This document contains the following:

- " LN Overview", provides a general introduction to LN and this document.
- "Enterprise Modeler", discusses the Enterprise Modeler functionality in LN.
- "Production Typologies and LN Scenarios", describes the broad range of production typologies in discrete manufacturing environments that LN supports.
- provide a detailed description of the modules and functionality of the various packages in LN.
- " LN Technology", provides detailed information about the technology used in LN.

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Chapter 1
Infor LN

1

Introduction

Infor LN is a global ERP (Enterprise Resource Planning) solution with market-leading support for small and medium enterprises as well as multinational requirements and complex organizational structures such as multisite and multicompany environments.

LN is designed as a single-instance global ERP system supporting regional deployments. It allows you to model financial and operational structures, providing transaction management, planning, and shared services. LN helps companies consolidate systems and standardize information and business processes across their global operations. Companies have financial visibility and operational excellence based on industry best practices. With LN, companies can enter new markets rapidly and streamline compliance with local regulations.

LN is a flexible, modular solution for the industrial enterprise with a primary focus on discrete manufacturing. The LN comprehensive manufacturing functionality supports various types of manufacturing, including make to stock, make to order, engineer to order, configure to order, assemble to order, individually, combined, or all at the same time. Supporting this core are modules for financials, sales, purchasing, logistics, and service functionality.

The LN solutions are proven in many industries. The latest release of LN extends flexibility. Many enhancements were added to simplify steps in carrying out business processes, reduce the cost of ownership, simplify implementation, and to work with other systems across enterprises.

LN complies with many national and international business practices and legal requirements, supports multiple currencies and languages, and helps to build successful international operations in today's global environment.

Production typologies

LN supports a broad range of production typologies in discrete manufacturing environments, including the following:

- Job shop
- Production cell

- Flow
- Lean/ Kanban
- MTS/ATO/MTO/ ETO/ CTO
- Assembly control
- Multi-model
- Mixed-model
- Hybrid manufacturing

Project control supports tracking and costing for customer-specific production in job shop environments.

Multisite environments

Infor LN provides extensive support for large global enterprises that comprise multiple companies and any number of sites.

An LN multisite environment usually consists of a structure of multiple logistic and financial companies. Therefore, multisite is often synonymous with multicompany. If the various sites are located in separate countries, you must set up a multicurrency system for the companies of the multicompany structure.

To meet the requirements of multisite environments, LN supports the following:

- **Financial companies**
  A company with at least one set of financial tables. The main function of a financial company is to register all accounting transactions that result from the activities carried out in the enterprise units that are linked to the financial company. These activities consist of the operational and logistical transactions that result from a logistic goods flow and from production, service, warehousing, and support activities.
- **Logistic companies**
  A company used for logistic transactions, such as the production, purchase, sales, warehousing and transportation of goods. All the logistic data concerning the transactions is stored in the company's database.
- **Enterprise units**
  A set of logically grouped entities linked to a financial company and to the same logistic company. Enterprise units are considered independent financial units within a logistical context.
- **Enterprise structure modeling**
  You can use the Enterprise Modeler tool to model the structure of your enterprise. In this way, you can model your enterprise independent of the organization of the LN databases. Alternatively, you can set the enterprise structure up directly in LN in the Enterprise Modeling Management module.
- **Multicurrency systems**
  In LN, a logistic company can operate in multiple countries. The LN multicurrency systems enable a company to conduct accounting in more than one currency. Amounts can be calculated and registered in up to three currencies.

- **Intralogistic-company transactions**
  Sales offices, purchase offices, work centers, service centers, and warehouses are entities of logistic companies. The entities are grouped into enterprise units.

  You can define the enterprise units in one logistic company as each other's customers and suppliers and model the goods flow and the corresponding financial relations, such as invoicing and pricing agreements between them. To accomplish this, you must define internal business partners and link the business partners to the enterprise units. A one-to-one relationship must exist between internal business partners and enterprise units.

- **Data sharing**
  The companies of a multicompany structure must use consistent data. For example, you can use the same calendars, item codes, business partners, and pricing information in the various sites.

  Some data must be shared, other data can be shared if required, and still other data must not be shared at all. You can use several data sharing and replication techniques to make the same data available to companies.

- **Multicompany processing**
  The multicompany structure enables enterprise-wide production planning and operations management. The sections below describe the multicompany functions that the various LN packages support.

Multicompany Financials

In one logistic company, you can process logistic transactions between departments, work centers, and warehouses of enterprise units that are linked to different financial companies. If the debit and credit sides of a logistic transaction are posted to different financial companies, LN can automatically create intercompany transactions between the companies.

You can aggregate the data of a group of financial companies to the financial group company for corporate accounting.

Multicompany Taxation

Tax reporting is part of the financial accounting and is restricted to one country. Therefore, the LN tax handling in a multicompany structure is similar to the tax handling in a single company environment.

Tax handling in LN includes the following:

- **Tax registration**
  For tax registration, you define the various tax details for each country in the Taxation module. In the General Ledger module of Financials, you specify the ledger accounts for the tax amounts separately for each financial company. LN can post the tax amounts calculated for a tax code to different ledger accounts in the individual financial companies, for example, in a single logistic, multifinancial company structure.

- **VAT processing for intra-EU transactions**
  The goods transfer between the countries of the European Union (EU) requires value-added tax (VAT) handling. Depending on the countries in which the goods are issued, delivered, and invoiced, various VAT types apply to the transactions.
- **Tax registration in a foreign country**
  In some situations, transactions must be reported for taxation in a foreign country. Typically, this can happen if service items are delivered directly from the supplier to the customer's site at which the service activities are performed, and if spare parts that were not used are returned directly from the service location to the suppler.

Multicompany Invoicing

Invoicing in LN includes the following:

- **Sales invoicing**
  For one business partner, you can combine sales invoice lines from various logistic packages such as Sales, Project, and Service on one invoice document, provided that the conditions for the composing criteria are met. Invoicing can combine financial data such as manual sales invoice data into one invoice along with other logistic data.

  Invoice documents are generated for each financial company.
- **External Material Delivery**
  For this kind of internal trade, internal financial settlements are generated if goods and the invoice for the goods are sent by or received by various entities. The entities can be departments, warehouses, and internal or external business partners. LN automatically generates the internal invoices or the settlement between the associated entities in the financial companies.

  The invoicing can occur between enterprise units of the same logistic company and different financial companies. LN uses the self-billing function to generate the internal invoices and payments.

Multicompany Enterprise Planning

You can use central multicompany planning to define a central plan that coordinates and triggers the local plans in the production companies. You can also aggregate and disaggregate the plans to different levels.

Multicompany Manufacturing

Product definition, engineering data management, production scheduling, and execution is controlled in each logistic company. Enterprise units do not affect activities that have no financial impact.

In a logistic company, routings can include work centers in different countries that belong to different enterprise units. The work-in-process (WIP) transfers are posted to the financial companies of the enterprise units.

Multicompany Sales and Procurement

During sales order entry, to see the available inventory in warehouses of your own and other logistic companies, you can use the bill of enterprise or use Enterprise Planning and Order Promising. If the sales office and the warehouse are linked to separate financial companies, LN can generate intercompany settlements between the financial companies.

LN registers some financial business partner data separately for each sales office and for each purchase office. Various enterprise units can conduct business with the same customers and suppliers.

In a multicompany structure, you can manage all or part of the purchase orders centrally. For example, you can create a central purchase contract with your suppliers, including price and discount agreements that apply to all the sites of your organization.

Multicompany Project

You must link a project to an enterprise unit and, in this way, to a financial company. If you use multiple financial companies, you can perform separate financial accounting for the projects of one logistic company.

You can aggregate the data of several subprojects to a main project for integrated project monitoring.

You can specify a project currency for each project and subproject. In this way, you can manage a project in any currency, for example, the local currency of the country where the work is performed.

Multicompany Service

Service departments and warehouses that contain spare parts and components used for service and maintenance belong to enterprise units. To perform separate financial accounting for the service departments and their warehouses, you can assign service departments and warehouses to enterprise units that are linked to different financial companies.

If material, labor, or other costs are transferred between service departments and warehouses, or from one service department to another (in the case of internal subcontracting for depot repair), LN can perform the invoicing between these departments and warehouses. In the Enterprise Modeling Management module, you can define internal trade relationships with invoicing between various entities.

You can also record and process service operations in a multilogistic company environment.

Multicompany Warehousing

You can define internal trade relationships between enterprise units or individual warehouses of the same logistic company for the transfer of material, labor, or other costs between warehouses, and to generate invoices for these without using sales orders and purchase orders. For example, you can use this to transfer goods between warehouses in different countries.

You can define warehouse surcharges, which are added to the actual costs of the goods either when the goods are issued from a warehouse or when the goods are received.

Multicompany Freight

You can centrally manage and process freight orders (and order clusters), shipments and loads across multiple sites. By using this process, you get a clear insight of the transport-related requirements, optimization in the handling of freight orders, consolidation and planning of loads and shipments, reduction of costs, and subcontracting of transport to carriers.

Chapter 2
Master Data

2

Introduction

You use Master Data to specify the data that is required by and shared among the Infor LN packages.

This topic provides an overall listing of the master data.

Note

For detailed information about a particular topic, refer to the online help under Master Data.

You must specify these parameters and master data:

- Codes
- Item data
- Business partners
- Addresses
- Contacts
- Companies, implemented software components, and enterprise model
- Financial integrations

Chapter 3
CRM

3

Introduction

You use CRM to support the marketing and sales of a product.

You can use opportunities to record and monitor sales information related to a business partner with the purpose of selling a product or service to this business partner.

An essential part of the customer relation management functionality is the ability to create activities and follow-up activities to schedule for business objects (business partners, contacts, opportunities, or other activities), and to track the progress of these activities. An activity is an appointment, call, task, or mailing that must be completed by a user and that is registered in LN.

In CRM, you can register any type of information on current and prospective business partners, opportunities, contacts, and sales and marketing activities. You can add user-definable attributes if you require more specific information. Direct mailing can be performed through standard letters.

The main functions and features of CRM are described in these topics:

- *Master Data (p. 19)*
- *Marketing, Sales, Utilities (p. 20)*

Master Data

CRM master data includes mandatory and optional master data functions and features. The mandatory data is required to perform CRM procedures. The optional data can be specified for specific use in several CRM processes.

- **Addresses**
  To communicate with persons and organizations in CRM, you must specify addresses and address formats.
- **Business partners, contacts, and employees**
  You must specify the business partners, contacts, and employees with whom you work.

- **Optional sessions**
  Several sessions are available in which you can specify optional, but basic information, such as opportunity types, sales processes, phases, and sources.
- **Attributes**
  You can specify attributes, which are used to record distinctive information on business partners, contacts, activities, opportunities, letters, and reports.

Marketing, Sales, Utilities

To remain competitive and profitable, you must identify, communicate, and track the requirements of business partners. In CRM, you can specify and track sales and marketing data in a flexible way. You can specify information on prospective business partners, maintain additional information on current business partners, use opportunities to record and monitor sales potentials, and create, schedule, and report on various sales and marketing activities. Contacts and activities can be synchronized between CRM and Microsoft Exchange.

CRM does not have a set of mandatory steps. All information is optional.

- **Opportunities**
  You can use opportunities to record and monitor sales information related to a business partner for the purpose of selling a product or service to this business partner. Because a sales quotation can be generated from an opportunity, an opportunity can be the basis for product offerings to a business partner.
- **Project pegging**
  Project pegging in Sales includes the pegging of project costs for sales order lines and sales quotation lines. If project pegging is required for an item, you can optionally link a peg to an opportunity's item.
- **Activities**
  You can use activities to schedule for business objects (business partners, contacts, opportunities, or other activities), and to track the progress of these activities. An activity is an appointment, call, task, mailing, or e-mail that must be created or executed by a user and that is registered in LN. Activities include, for example, phone calls, mailings, visits, and surveys.
- **Letters**
  Letters to business partners and mass mailings are common marketing activities. In CRM, you can create, save, and modify letters. You can use the mail merge functionality to print a generic letter that contains specific business partner information. You can export letters to other word processing programs to use functionality such as spell checkers.
- **Selection expressions**
  You can use selection expressions to specify search criteria to create a target group. This target group can be used to specify who to include in a particular action. Selection expressions are used to create targeted ranges for opportunities, global additions of attributes and activities, letters (mail merges), and reports.

- **Text Editor**
  If you create a letter or a selection expression, you can use the Text Editor to specify the actual layout of the letter or to specify an expression.
- **Reports**
  You can specify reports to view user-defined data. You can print and process reports to view CRM data based on your requirements.
- **Synchronizing CRM contacts and activities to Microsoft Exchange**
  Contacts from LN can be synchronized to Microsoft Exchange. Activities with the **Call** or **Appointment** types can be synchronized as calendar events between LN and Microsoft Exchange. Calendars are synchronized in both directions.

Chapter 4
Sales

4

Introduction

You use Sales to manage sales activities and maintain the data that is the result of these activities.

The main procedures in Sales are the sales order and sales schedule procedures, which cover the complete administrative procedure for selling items. Usually, the sales order/schedule procedure is preceded and followed by other procedures.

These procedures (can) precede the sales order/schedule procedure:

- Sales quotation procedure
- Sales contract procedure

The main functions and features of Sales are described in these topics:

Sales Master Data

Sales master data includes mandatory and optional master data functions and features. The mandatory data is required to complete the sales procedures. The optional data can be specified for use in several sales processes.

- **Sales item data**
  In Item Base Data, you can specify items and item data on a general level. Before you can complete sales procedures, you must also specify sales-related item data in Sales Item Data.
- **Inventory shortage handling**
  You can check available inventory and resolve inventory shortages for sales quotation lines, sales order lines, and sales order component lines.
- **Time-phased inventory check**
  With a time-phased inventory check, the availability of sufficient inventory during the item's order lead time can be checked for sales order lines and sales quotation lines. This means that the difference between the inventory on hand and the allocations at that particular moment are ignored. Instead, LN considers the difference between the inventory on hand and all planned inventory transactions during the entire order lead time.
- **Item replacement**
  If an item is no longer sold, you can replace it with a different item.
- **Alternative items**
  If an inventory shortage occurs for an item, you can offer the sold-to business partner an alternative item. Optionally, you can use the available inventory of the original item and then fill the remaining shortage with an alternative.
- **Selling items from list groups**
  You can specify the list group(s) used to find list items when you sell a list item to a sold-to business partner. You can indicate whether the business partner can buy from multiple list groups or only from a default list group.
- **Sales organizational data**
  Before you can complete sales procedures, you must specify sales organizational data, such as sales order types that define the mandatory steps in the sales order procedure, sales offices that you can use to create sales contracts, sales orders, sales schedules, and user profiles with user-specific default data.
- **Customer approval**
  You can set up customer approval if sold-to business partners must approve the goods that are delivered on a sales order before the goods can be invoiced. The ownership of the goods changes from the supplier to the sold-to business partner when the goods are approved by the sold-to business partner.
- **Flexible sales order processing**
  You can automate the processing of sales orders. For each activity that is linked to an order type, you can specify its execution mode: automatic or manual.
- **Multisite invoice between a purchase office and a sales office**
  For a direct delivery, the sales office receives money from the customer and the purchase office pays the supplier for the goods. As a result, the account books of both financial companies show discrepancies. LN can then automatically generate settlements between a purchase office and a sales office that belong to different financial companies and update the account books.

- **Rate determiners**
  You can use rate determiners to specify which date is used to determine the exchange rates. Amounts in foreign currencies are converted to the home currency, based on the valid exchange rate.
- **Sales order templates**
  You can specify sales order templates for recurring sales orders from the same (group of) business partner(s). You can generate sales orders or sales order lines from an order template.
- **Product catalogs**
  You can specify product catalogs to group items into logical product categories. Catalogs can be structured hierarchically and contain, at the lowest levels, items that can be sold or purchased.
- **General sales data**
  Before you can complete sales procedures, you must specify general sales data, such as data to track order changes and to determine the reason for the changes, the conditions and reasons for automatically blocking a sales order, and order priority simulations.
- **Additional costs**
  You can specify additional costs that can be placed on a sales order or shipment to charge extra costs for an order (line) or shipment (line).
- **Changing orders**
  A purchase order of one company is linked to a sales order of another company. Therefore, a change in a purchase order can influence the corresponding sales order, and vice versa. You can specify the handling of change order information.
- **Sales quotations**
  Before you can complete the sales quotation procedure, you must specify the sales quotation master data, which includes competitors, the reasons for acceptance or rejection of quotations, and the sales quotation parameters.
- **Sales schedules**
  Before you can complete the sales schedule procedure, you must specify the sales schedule master data.
- **Automatic sales schedule processing**
  You can automate the processing of sales schedules. For each activity, you specify whether the activity is run automatically or manually.

Sales Quotations

Sales quotations are used to supply a sold-to business partner with the details required to make a purchasing decision.

You can create a sales quotation in response to a request-for-quotation (RFQ) from a business partner, or as a sales tool for initiating the sales process with potential business partners. A quotation includes the dates, terms, items or item descriptions to be sold, and a success percentage, which reflects the level of certainty that the quotation will be accepted. Sales quotations are included in the planning

modules on the basis of their success percentages. Quotations with a high success percentage are considered as sold.

You can print and send quotations to business partners. You can specify the results of the returned quotations in Sales. If the quotation is not accepted, you can specify the reason for failure and the competitor who won the quote. If the business partner accepts the quotation, you can transfer the quotation to a sales order and specify the reason for success.

- **Sales quotation procedure**
  The normal sales quotation procedure includes the creation, printing, specification of results, and processing of sales quotations. In addition, you can perform other tasks, such as ATP and CTP checks, create alternative quotation lines, and copy bill of material components to a sales quotation.
- **Project pegging in Sales**
  To identify costs, demand, and supply for a project, you can peg project costs for sales quotation lines.
- **Inserting items from a catalog**
  You can add items from a catalog to a sales quotation.
- **Product variants**
  You can configure or link product variants for generic items on the sales quotation line.

Sales Orders

Sales orders are used to sell and deliver items or services to a sold-to business partner under certain terms and conditions. Sales orders can result from a variety of sources, such as **Contracts**, **Quotations**, **EDI**, and **Planning**. In Sales, you can create and modify orders.

After approval, a sales order is a legal obligation to deliver items according to the agreed terms and conditions, including specific prices and discounts.

- **Sales order procedure**
  The normal sales order procedure includes the creation, approval, printing, release to warehousing, delivery, invoicing, and processing of sales orders.
- **Project pegging**
  To identify costs, demand, and supply for a project, you can peg project costs for sales order lines.
- **Demand pegging**
  If the demand pegging functionality is used in a company, inventory is allocated when sales orders are created. In addition, a specification is linked to these orders.
- **Customer furnished materials**
  On a sales order line, you can specify an item that contains customer furnished materials. The sales order line has a linked demand peg for the customer demand.
- **Inserting items from a catalog**
  You can add items from a catalog to a sales order.

- **Product variants**
  You can configure or link product variants for configurable items on the sales order line.
- **Direct delivery sales orders**
  On a sales order, you can indicate that you want the sold goods to be directly delivered. For a direct delivery, a sales order results in a purchase order. Because the buy-from business partner delivers the goods directly to the sold-to business partner, Warehousing is not involved.
- **Cross-docking and splitting deliveries**
  To fulfill an existing sales order for which no inventory is available, you can take inbound goods immediately from the receipt location to the staging location for issue. To initiate this process, you must generate a cross-docking order. If a cross-docking order exists and a split delivery is required, you can further split a delivery line into several deliveries.
- **Synchronizing sales order line and delivery lines**
  A sales order line can have linked delivery lines or back order lines. A delivery line can also have linked back order lines. The sales order line holds the aggregated information of the delivery lines/back order lines. Another product's external order line can connect to the sales order line and update the sales order line. Changed fields on the sales order line are synchronized with the delivery lines and vice versa.
- **Rush orders**
  You can specify a rush order or rush an existing sales order.
- **Kit handling**
  In the sales order procedure, you can deliver components instead of main items. Components can be handled by component lines or by a sales BOM.
- **Integration sales and freight management**
  To identify and choose the appropriate means of transportation during order entry, you can generate a freight order from a sales order. The progress of the shipment and loads can be exchanged and information can be shared between Freight and Sales. You can invoice your business partner for the freight costs.
- **Sales return orders**
  If goods must be returned on a sales order, a return order can be created. A return order can contain negative amounts only.
- **Changing sales data after release to Central Invoicing**
  Depending on the invoice status, you can update sales invoice data after the sales data is released to Invoicing.
- **Backorder handling for sales orders**
  If a final delivery is made for a sales order (delivery) line and only a part of the goods or none of the goods are shipped, LN creates a back order.
- **Installments**
  Invoicing by installment enables you to send invoices for partial amounts or percentages of the total net amount before or after the ordered goods are delivered for a sales order. To indicate the installments, you must add installment lines to the sales order.
- **Order blocking**
  Several reasons can exist for blocking a sales order or a sales order line. An order can be held for more than one reason at any point in the sales order procedure.

- **Order priority (simulations)**
  You can use order priority simulations to calculate the priority sequence in which inventory is allocated to orders. For example, if insufficient inventory is available, you can use a priority simulation to sort sales orders according to the order delivery priority.
- **Copy templates**
  You can use copy templates when copying sales orders (lines). A copy template specifies how order (line) data is copied and contains a standard set of copy exceptions.
- **Sales order history**
  You can use sales order history to track the creation and modification of sales orders and installment orders. You can keep certain information after the original order is completed.

Sales Contracts

Sales contracts are used to register agreements about the delivery of specific goods to a sold-to business partner.

These agreements can be registered at the following levels:

- **Sales contract lines**
  In contract lines, the delivery agreements for an item or group of items for a specified period of time are registered. These agreements include the total quantities, prices, and discounts. You can specify an effective period and indicate whether the minimum quantity to be sold is binding.
- **Terms and conditions agreements**
  In terms and conditions agreements, detailed terms and conditions regarding orders, schedules, planning, logistics, invoicing, and demand pegging are registered for the sale, purchase, or transfer of goods. To use a sales terms and conditions agreement, you must link it to a sales contract before you can use it.

You can create the following contract types:

- Normal contracts
- Special contracts

Special contracts are used to record agreements that relate to specific projects. A special contract can also be a promotional contract. For each sold-to business partner, you can close multiple special contracts in one period. In a specific period, you cannot specify more than one normal contract per item or price group for a sold-to business-partner.

Sales contracts are used as the basis of sales orders or sales schedules. The data specified in the sales contract serves as a parent of the data that you specify in the linked sales order or sales schedule. Sales schedules and terms and conditions agreements can be linked only to normal contracts and not to special contracts.

- **Specifying sales contracts**
  The regular sales contract procedure includes the creation of a sales contract header and sales contract lines with sales contract price revisions and logistic agreements.

- **Discount schedules on contracts**
  You can link one or more discount schedules to a sales contract.
- **Retrieving sales contracts**
  How sales contracts are retrieved depends on various parameters settings, such as the use of terms and conditions and customer order number.
- **Scheduled requirements for a sales contract**
  To use a simplified sales schedule, you can define scheduled deliveries based on a sales contract. You can use this process if you do not receive schedules from your sold-to business partners, and you want to set up a list of time-phased deliveries using a sales contract. You can specify scheduled requirements for a sales contract using delivery schemes or sales schedules.
- **Copying sales contracts**
  You can copy sales contracts to create sales contracts.
- **Evaluating sales contracts**
  If a sales contract is used for a sales order or sales schedule, you can evaluate the sales contract during and after the sales order or schedule procedure. During the contract's effectivity period, you can check if the deliveries were made as agreed in the contract. At the end of the contract's effectivity period, you can check if the agreed quantities were delivered.
- **Additional processes**
  You can use several additional processes in the sales contract procedure, such as activating or deactivating a range of sales contracts, printing sales contract acknowledgements, printing sales contract reminders, terminating, and deleting sales contracts.

Sales Schedules

Sales schedules are used to support long-term sales projects with frequent deliveries. They represent schedules for specific goods that are used between trade partners.

Because sales schedules provide a more detailed way to specify delivery dates and times for items, use sales schedules instead of standard sales orders when you require full visibility and time phasing of material requirement information, for example, in a just-in-time (JIT) environment.

Sales schedules can be referenced or non-referenced.

After approval, a sales schedule is a legal obligation to deliver items according to the agreed terms and conditions, including specific prices and discounts.

- **Sales schedule procedure**
  The main sales schedule procedure includes the creation and processing of sales releases to sales schedules, calculation of schedule authorizations and cumulatives, approval, release to warehousing, release to invoicing, and processing of sales schedules.
- **Sales releases**
  Sales releases are used to group, by release type, a customer's sales schedule requirements. Sales releases are usually received by electronic data interchange (EDI), but can also be manually specified, or received by a Business Object Document (BOD). Sales releases or

separate release lines can be processed and converted to sales schedules. A sales release represents the external customer view for schedule requirements, while the sales schedule represents the internal supplier view.

- **Pick-up sheets**
  A pick-up sheet is a list of items that a carrier must pick-up at the supplier's site for transport in one shipment to the customer on a specific day. A pick-up sheet is identified by a specific reference number, called the shipment reference, which originates from the customer. This shipment reference is used to identify pick-up sheets, shipments, and payments. Usually, the shipment exactly covers the pick-up sheet requirements, but the required goods on the pick-up sheet are spread among different sales schedules.
- **Referenced sales schedules**
  On referenced sales schedules, schedule requirements are communicated based on (shipment) references. A reference is used to identify specific requirements that your business partner needs in a specific sequence at a specific line station of the assembly line. A shipment reference is used to identify the shipment. If you use pick-up sheets, the shipment reference also identifies the pick-up sheet for the linked sales schedule line.
- **Additional information fields**
  You can use additional information fields to specify additional information on sales schedules. These fields are used throughout the process. For example, they are used in the sales schedule, the warehouse order, and the shipping process in Warehousing.
- **Sales schedule revisions**
  Sales schedule revision numbers are used to uniquely identify the revision of the sales schedule. They indicate the sales schedule updates that are sent by your business partner.
- **Requirement types**
  A requirement type represents a requirement in time, used for scheduling. On a sales schedule line, the following requirement types can be communicated: planned requirements, firm requirements, and immediate requirements.
- **Planned warehouse orders**
  You can use planned warehouse orders to decouple schedule updates and revisions from warehouse orders and to consolidate sales schedule lines by quantity and by date.
- **Required quantity of zero**
  You can receive sales schedule lines with a required quantity of zero. The sales schedule line quantity can also be changed to zero when the sales schedule procedure is completed. When a sales schedule receives a required quantity of zero, an attempt to cancel the sales schedule line or the planned warehouse order is performed.
- **Sales schedule authorizations**
  Sales schedule items are shipped based on the requirement type. The **Firm** requirement type, however, can deviate from the earlier received **Planned** requirement type. If you use authorizations, your sold-to business partners give you permission to fabricate goods or to buy raw materials for a certain quantity level before communicating the **Firm** requirement type. By using this process, sold-to business partners must pay for the fabrication and/or raw materials regardless of whether the goods are called-off.

- **Sales schedule cumulatives**
  Cumulatives (CUMs) are the year-to-date totals for quantities shipped, received, and invoiced. You can use cumulatives to track if the sales schedule is ahead or behind schedule compared to the demand.
- **Adjusting sales schedules**
  Before a non-referenced sales schedule is approved, you can check the sales schedule for underdelivery and overdelivery.
- **Approving sales schedules**
  Sales schedules with the **Created** or **Adjusted** status must be approved before they can be processed. After approval, the sales schedule has the **Approved** status.
- **Reconciling sales schedules**
  Material releases and shipping schedules with non-referenced items can be reconciled, which means that your business partner's **Received CUM** is matched with your **Cumulative Shipped Quantity**. If the cumulatives (CUMs) do not match, disputes are generated that you must resolve.
- **Sales schedules and Enterprise Planning**
  When a sales schedule is approved, planned requirements are calculated and planned supply is generated in Enterprise Planning based on the sales schedule's planned and firm requirements.
- **Sales schedules and Warehousing**
  After the ordered items on a sales schedule line are approved, you can ship them. To ship the items, you must release the sales schedule to Warehousing.
- **Sales schedules and Invoicing**
  After the ordered items on a sales schedule line are partially or fully delivered, you can invoice the delivered goods. To send the invoice, you must release the sales schedule to Invoicing.
- **Processing and deleting sales schedules**
  After the invoice for a sales schedule line is sent, the sales schedule line has the **Invoiced** status. You can process and delete sales schedules that contain lines with the **Invoiced** status.
- **Terminating sales schedules**
  If your relationship with a business partner has ended and you want to change the sold-to business partner specific item data, you can terminate the sales schedule. The status of the linked planned warehouse orders or sales schedule lines can affect the termination process.
- **Sales order/schedule history**
  You use sales schedule history to track the creation and modification of sales schedules. You can keep certain information after the original schedule is completed.

Margin Control

You use margin control to control margins for sales orders and quotations created for standard items. If the net price of the sales quotation or sales order exceeds the defined margins, the appropriate action is performed. For example, if the margin of an order is exceeded, the order is blocked.

- **Setting up margin control**
  Before you can use margin control, you must specify the master data.
- **Specifying types of margin control**
  You can specify the following margin types: (price) margin control, gross margin control at detail level, and gross margin control at header level.
- **Using margin control**
  If margin control is implemented, when a sales order or quotation is specified, several checks are performed and exceeded margins are logged.

Consumption Handling

Consumptions are the warehouse issues of consigned items by or on behalf of the customer. The customer uses these items for purposes such as sale and production. After the items are issued, the customer is the owner of the items and must pay the supplier.

- **Consignment**
  You can use consigned inventory, for which inventory ownership and storage are handled by different parties, and select either a basic or extended consignment setup.
- **Inventory consumption handling**
  In vendor managed inventory (VMI) and subcontracting environments, consumptions are recorded to view and maintain consumption data in the supplier's or manufacturer's administrative warehouse. This warehouse mirrors the customer's or subcontractor's warehouse from which the customer/subcontractor consumes materials supplied by the supplier/manufacturer. Handling inventory consumptions includes the creation and processing of these consumptions.

Retrobilling

If price changes are made to a sales contract or to an item after the renegotiation date, you can use the retrobilling functionality to re-invoice previously shipped items for sales orders and schedules. Price differences are handled through retrobilled sales orders, which have an item quantity of zero and an order amount that shows the price difference.

- **Retrobilling**
  Before you can use retrobilling, you must specify the retrobilling master data. Next, you can generate and invoice retrobilled sales orders.

Commissions and Rebates

Many companies motivate their relations by rewarding their sales performance. This can increase sales, which improves the competitive position of the company.

The following rewards are available:

- Commissions
- Rebates

Commissions and rebates are based on accurate information about sales orders, the relation who is responsible for the sales order, the relation's sales performance, and the link between performance and reward.

- **Master data**
  Before you can use any of the commissions and rebates procedures, you must specify the master data, such as relations, agreement groups, and relation teams.
- **Calculating commissions and rebates**
  If commissions and rebates are used, the calculation of commissions and rebates is a mandatory procedure.
- **Reserving commissions and rebates**
  You can reserve the calculated commissions for Financials and the calculated rebates for Invoicing, or you can reserve them for an external financial package.
- **Paying commissions to employees**
  The payment of reserved commissions to employees is performed by your company's payroll department. You must generate a report that includes the commissions that you must pay to an employee.
- **Commissions and rebates history**
  The historical records pertaining to the calculation of commissions and rebates are stored separately from the commission and rebate records. You can use these history records to determine which actions were performed on the commissions and rebates. Historical records also provide a summary of the paid commissions and rebates.

Statistics

You can use Statistics to gain insight into the intake, turnover, and cancellation of orders and schedules. Statistics controls the activities that are required to define the desired format and layout for transferring historical data or actual data to statistical information. You can create user-defined statistical reports and displays to view this information, which facilitates data analysis.

You can also use Statistics to enter budgets. Budgets are used to compare the actual sales or purchases (statistics) with the estimated sales or purchases.

- **Statistics**
  To use the statistics procedure, you must specify the master data, levels for statistics, parameters, sort codes, budgets, and layout codes. You can then update, print, archive, and delete the statistical results.

Chapter 5
Project

5

Introduction

Use Project to manage your projects through all stages, from estimating tenders to delivery and throughout the guaranteed period.

The main functions and features of Project are described in these topics:

Projects

The project data defines all aspects of the project.

- **General**
  You specify basic information of the project such as project status, currency, type and so on.
- **Contract**
  Contract consists of information about business partners, pricing and funding, shipment and delivery terms.

- **Financial**
  Financial data consists of details about fixed assets, such as asset numbers and extensions. You can define Payment Terms for Financial Analysis.
- **Budget**
  Budget data consists of details of the Budgeting Method, Actuals and Defaults.
- **Planning**
  Planning data consists of details of the Scheduling, Requirements Planning and Shipping.
- **Control**
  Control data consists of details of the Cost Registration, Project Creation and Logging.
- **Interim Results**
  Interim Results data consists of details of the revenue recognition method and the cost of goods sold.

Master Data

In General Project Data, the master data used in LN is centralized for use across projects. Most of these tables are used for grouping, sorting, and reporting projects, and also as various dimensions for financial postings.

- **Projects**
  The project data defines all aspects of the project. The project status is important for following the right course throughout the project lifecycle.
- **Project-PCS relationships**
  This is used to link a project to a PCS (Project Control System) project in Manufacturing. A PCS project can be used to produce a generic item, customized item, or standard item. The relationship between the two project codes is established when you specify a PCS project item on a material budget line in Project.
- **Project interim results**
  View the interim financial results of a selected project. Interim results are the temporary financial results during a project. You can transfer these results to the profit and loss account. Two interim result types exist:
  - Interim Result Costs (transactions associated with costs)
  - Interim Result Revenues (transactions associated with revenues)
- **Plans**
  You can specify the activity structure, schedule, and start and end dates. You can maintain alternative plans for a single project. The active plan is the plan that you use to track your progress.
- **Update work authorization status**
  You use a formal authorization procedure to begin work on a specific element or activity. This process ensures that the authorized work is done at the right time and in the proper sequence.

- **Project - Documents**
  You can maintain details for project-specific documents. Documents are grouped by the defined document type.
- **Project - Third Parties**
  You can maintain project-specific details of third parties. A third party is a person or organization with an indirect or non-contractual interest in a project, for example, a government body or regulatory agency.
- **Extensions**
  Extensions are specific agreements within or in addition to the initial contract. An extension is an agreement that is outside the initial contract with the sold-to business partner. Extensions can be assigned to the bottom-up budget. The relation to the budget is defined in the initial budget and/or the budget adjustment detail lines. There are four extension types:
  - **Scope Change**
  - **Provisional Amount**
  - **Fluctuation Settlement**
  - **Quantities to be Settled**
- **Project deliverables**
  Depending on the **Budget by** setting at the project level, you can define deliverables for an element or activity. If the project is budgeted by element and controlled by activity, you must link an activity to the element project deliverable.
- **Labor**
  You use labor codes to control the costs for a specific labor code or for a group of labor codes. The labor rate determines what cost and sales rates are used in budget lines and in hour's registration.
- **Sundry costs**
  Sundry cost objects can be standard or project-specific. The cost object is related to a control code for cost-controlling purposes.
- **Update project prices and rates**
  You can globally update rates and prices of project-specific cost objects and labor rates. This covers cost objects of types such as labor, subcontracting, equipment and sundry cost.
- **Revenue codes**
  You can specify project-specific revenue codes. These codes relate to a particular project only. Revenue codes are used to group invoiced amounts that have the same invoice type, so that you can analyze revenue history.
- **Surcharges**
  You use surcharges to calculate the indirect costs of the budget in the Budgeting module and/or the actual indirect costs of the budget in the Project Production Control module.
- **Convert project and budget currency**
  You can run a currency conversion for:
  - Project currency
  - Budget line currency
  - Both currencies

- **To use project procedures**
  A project procedure includes the required steps to execute a project. You can specify the steps required to apply and execute project procedures, such as updating budget status, and generating control data.

Contract Management

Use Contract Management to perform contract-related tasks and to retrieve contract-related data. You can view and maintain contract information such as the contract type, the invoice type, the contract amount, and the budgeting method.

- **Contract data set-up**
  You can specify the information about a contract such as deliverables, billing plan, payment terms, business partners, pricing and funding, shipment, and delivery terms. A contract can be linked to one or more projects and can have multiple contract line items.
- **Contract lines**
  You use contract lines to specify detailed information required for a contract.
- **Contract deliverables**
  You can specify information about the contract deliverable. A contract deliverable is a tangible or intangible item that is produced or purchased as a result of a contract. Contract deliverables can be physical items or services such as training and installation.
  - Backorders for Contract Deliverables: If a contract deliverable is partially delivered ered, a backorder is created for the undelivered goods.
  - Return orders for contract deliverables: A return order for a contract deliverable can be manually entered or created from the contract deliverable line, deliverable schedule, contract shipment, or contract invoice.
- **Contract types**
  The contract types or billing terms contain the conditions and agreements to invoice contracts to the customer. You can define these types of contracts:
  - **Fixed Price**
  - **Cost Reimbursement**
  - **Time & Materials**
- **Billing cycles**
  You can create and maintain billing cycles for the contract.
- **Contract Funding**
  In Infor LN, for certain types of contracts (example, aerospace and defense contracts) specific funding limits (amounts) can be defined. Based on these limits, the amount that must be invoiced to the customer is set.
- **Contract line link to project structure**
  Infor LN allows you to link multiple contract lines (CLINs) to a project (element structure/ activity structure). This enables you to track direct costs, compare revenues, and also estimate

indirect costs (such as project management or testing) at the CLIN level. This functionality is applicable for all contract types (**Fixed Price**, **Time & Materials** and **Cost Reimbursement**.

Project Definition

Use Project Definition to maintain project master data. This data is the comprehensive and base data that is used manage the project. Much of the master data is reusable from project to project, for example, labor rates, employee responsibilities, and trade groupings.

- **Creating a project**
  Before you create a project by using either a template or the Projects session, you must define the parameters. Use the project data management session to create your project.
- **Project 360**
  In project-driven companies, regardless of the role, all users access projects to complete their tasks. Typically, different users must perform tasks in different phases of the project. For example, an estimator will estimate a project, a sales engineer will prepare the quotation, the project manager will perform project definition, and the design engineer will set up the budget.
- **Parameters and defaults**
  You can set up general default values and parameters that define how Project works. Where necessary, you can override these values when you are running a project.
- **Sufferance tax**
  A tax or levy that is payable to a local or municipal authority to compensate for a disruption caused by a project. For example, compensation for removing a sidewalk or part of a street to install the water pipes or sewer while constructing a high-rise apartment building.
- **Third party**
  A person or organization with an indirect or non-contractual interest in a project, for example, a government body or regulatory agency.
- **Standard cost objects**
  Maintain standard cost objects for these cost types:
  - Labor
  - Materials
  - Equipment
  - Subcontracting
  - Sundry costs
- **Standard labor**
  Use labor codes to control the costs of a labor code or of a group of labor codes. The labor rate determines what cost and sales rates are used in budget lines and in hours registration.
- **Standard sundry costs**
  Sundry cost objects can be standard or project-specific . The cost object is related to a control code for cost-controlling purposes.

- **Standard cost object mapping with service**
  Cost object mapping is based on project activities only. Materials must either be included in the project budget itself, and handled in Project, or treated as part of the reference activity, and then handled in Service.
- **Buy-from business partner files**
  If a supplier can provide a file with item prices and discounts, you can import this information. You can then define the relationship between supplier codes and your own codes and the relationship between items and the supplier discount groups.
- **Revenue codes**
  Revenue codes are codes that you can use to categorize amounts you invoice to your customer. As with cost objects, you can define both standard and project-specific revenue codes.
- **Standard structures**
  You can define a library of standard elements and activities. You can copy these project structures or template projects.
- **Standard elements**
  You can maintain a library of standard elements that you can copy when you maintain a project.
- **User-defined structures**
  Various additional structures used in projects, either for reporting purposes or for responsibility assignment and subsequent performance measurement, are maintained in user-defined structures.
- **Standard surcharges**
  You can define standard surcharges. Each line in this list refers to a unique combination of company, cost type, sundry cost code, and sequence number.
- **Standard overhead**
  You can define standard overhead costs. Each line in this list refers to a unique combination of company, cost type, overhead cost code, and sequence number.
- **Currencies in project**
  If You can specify the currency to use for a particular project. This currency can be different from the currencies specified for your company or you must specify a currency that is defined for your company.
- **Defining surcharges**
  Surcharges are a means of defining indirect project costs. Typically, surcharges are used to cover general overhead costs, such as storage, handling, maintenance costs, and management overhead
- **Templates**
  Templates provide a user-friendly way to define a project. Use a project template to predefine a set of project types for a company.
- **Costing Breaks**
  For projects involving production or service of an item (such as depot repair service), the user is required to monitor costs at various levels. Costing breaks provide a flexible method to view the breakup of costs at various levels in a project WBS. You can use costing breaks to move

the costs from the top demand project pegs to other project WBS levels. You can also identify other specific cost types such as labor, material, subcontracting, and so on to redirect the costs to the other WBS levels.

- **Project Parameters**
  To enable fees and penalties, you can define the revenue code in the project parameters.
  To enable progress payment, you can define the revenue code in the project parameters.
- **Fees and Penalties**
  The **Fee Revenue Threshold** option is provided to include the minimum percentage of fee revenue, while generating the interim results.
- You can use the **Probability** option to indicate the probability that the fee and penalty is to be awarded to or levied on the contractor.
- **Revenue Recognition**
  The Percentage of Completion option is added to the COGS method, to recognize the revenues and expenses periodically, during the contract period, prior to the completion of the project/contract. When calculating the COGS, Infor LN also considers the loss component.
- **Standard Structures**
  You can define the **Start Percentage**, **End Percentage**, and **Milestone Percentage** for the Standard Activities, to calculate the Earned value of the project.

Estimating

Estimating is usually the first phase within the project. Estimating is often the most critical phase within the project, as correct estimating and bidding will result in obtaining the project contract. You can create an estimate project. For each estimate version, a complete estimate can be simulated.If the estimate is accepted, a bid can be created from the estimate version.

- **Estimate**
  The estimate process prepares a proposal, a quotation, or a bid. The estimate consists of the sales price and information on the proposed scope. The estimate contains information on the project schedule and on the contract.
- **Estimate structures**
  In estimates, estimate version structures are used to order or to classify the estimate. In many cases, you can use multiple estimate-version structures to create different classifications of the estimate data.
- **Estimate line levels**
  An estimate level type determines which estimate lines are used to aggregate totals for a bottom-up structure. An estimate level type determines the top-down amount of a structural element.

- **Launch estimate to budget**
  You can use this option when the work can begin, the bid is accepted, or when you must order items that have long lead times.
- **Using a bid**
  For the preparation of a bid, you must select particular lines of an estimate version. To store the documents that are associated with an estimate, use the standard document management functionality. These templates include a Microsoft Word template, Project Plan, CAD drawings, Microsoft Excel calculation sheets, or any other documents related to the estimate.
- **Aggregate amounts for primary structural elements**
  Aggregate amounts for a range of projects. The totals of the primary structural elements are updated before the totals are aggregated for the primary structure. The process aggregates the amounts in the project currency and all home currencies.
- **Verify top-down estimate consistency**
  Verify whether the top-down estimate based on the primary structure is consistent for either for the specified substructure or the entire structure. The top-down consistency verification is performed for one estimate version only.
- **Prepare bid**
  Select which part of the estimate lines falls into a bid. You can select either the primary structure and the estimate lines linked to the structural elements, or select estimate lines that do not have a primary structure.

Budgeting

Use the Budgeting module to prepare, control, and maintain the project budget throughout the lifetime of the project, as a baseline. Two methods are available to set up the project budget: element-based and activity-based. You can maintain the activity structure, which is required for an activity budget, can be maintained in the PSS module or an external scheduling package, such as Microsoft Project.

- **Budget**
  You can use the Planning module in Project to create, analyze, and maintain a project budget that can be based on elements or activities.
- **Bottom-up budget**
  A bottom-up budget creates a budget for each element or activity in the work breakdown structure, and summarizes these budgets to provide a total project cost budget.
- **Budget adjustments**
  An adjustment is a modification to a frozen bottom-up budget. Specify the adjustment codes, budget type and currency to use for a specific project. Modifications will only increase or decrease the budget.
- **Activity budget**
  View totals by project, cost type, and total number of hours, based on budget cost analysis. Use the tabs to view and maintain details for each cost type. You can run several cost analyses

for the same budget. Each budget is stored with a combined project code and budget cost-analysis code, so you can compare the budgets.

- **Budget cost analysis**
  The Budget Cost Analysis (BCA) facility helps display and print the information you need. You do not analyze the actual budget directly. Instead, you generate a new type of data called Analysis Data, and run inquiries and reports on that derived data. You can think of the analysis data as an overview of the actual budget.
- **Budget cost analysis versions**
  A snapshot of the bottom-up budget. You can run several cost analyses for the same budget. Each budget is stored with a combined project code and budget cost-analysis code, so you can compare the budgets.
- **Generate budget cost analysis**
  Generate a budget-cost analysis. These fields are used to generate the budget cost analysis for the selected analysis code:
  - Exchange rate type
  - Effective date
  - Budget line status values
- **Control budget**
  The control budget is a derived budget that is based on the project budget and surcharges.
- **Generate control data**
  Generate a control budget based on an actual budget of one or more projects. You can do a complete run or a net change run.
- **Purchase budgets**
  A typical actual budget contains items (cost objects) that require a lengthy period of time to purchase. Also, the quantities to be purchased can be uncertain. you may not yet know the quantity to order. If you wait until this information is available, the project could be delayed, which could increase costs. Using purchase budgets, you can procure such cost objects before the project is started.
- **Generate purchase budgets**
  You can generate purchase budgets for one or a range of selected projects, elements or activities, cost components, and extensions.
- **Update prices and rates in budget**
  You can globally update purchase prices/rates and cost prices/rates in the actual budget. The current prices/rates are replaced by the latest ones. If prices are depend on the quantities, the total quantity by cost object is determined from the budget structure.
- **Update budget dates in budget**
  Update the budget date in the bottom up budget (element or activity). When you modify a budget date, the currency rates may change.
- **Check cost object mapping**
  You must use these parameters when using cost object mapping:
  - Whether a reference activity is linked to the project activity for a selected range of projects.

- The mapping data, if defined, for the specified reference activity, in which case the session allows you to check if the resources linked to the specific reference activities are mapped to a project cost object.

- **Top-down budget**
  A top-down budget is used to distribute amounts across an activity structure. The constraint of a top-down budget is that the amount check for lower level elements for the distributed amount is used, and therefore you cannot enter lower level amounts that are higher than the distributed amount.

- **Top-down budget data**
  Display budgeted amounts by activity for the selected top down budget-version and project. Because Infor LN works with a derived-from version structure.

- **Time-phased budget**
  A time-phased budget (TPB) is a time-scaled budget based on activities, created from a top-down budget.

- **Earned value method related data**
  A time-phased method for measuring project performance. The amount of work planned as against the work actually accomplished is used to determine if project costs and schedules are within the budget. The earned value methods of those activity that are used in the time-phased budget for the current version are displayed.

- **Generate time-phased budget**
  You can generate the budgeted amounts by cost-type for a selected time-phased budget analysis code and version.

- **Element structure**
  You can define a parent-child relationship between any two elements in your project. The parent element is at a higher level than the child. Parent-child relationships can be one-to-one or one-to-many.

- **Activity structure**
  The activity structure is a hierarchical structure used to break a project down into time-scaled activities. An activity structure is defined by reference to its top activity. The hierarchy of an activity structure consists of all the activities that appear below the top activity.

- **Progress recording**
  During project execution, you record the degree of completion of all or parts of the project. You can use this information for customer invoicing or for cost control purposes.

- **How to use cost recording**
  During project execution, you want to record actual costs optionally, against the project budget lines. Cost recording can be done in Project, or in Financials and then transferred to Project. Other cost could result from, for example, purchase orders or warehouse orders that are linked to a project.

- **Element-based budget lines**
  If you create elements for your project, and link them in a multilevel hierarchical structure, you can create the element budget. Enter budget lines for each element by using cost objects to the elements.

Planning

The Planning module contains the scheduling information for projects. You use this module to define project plans and the associated activities and milestones.

- **Plan**
  The planning parameter plans cover the default project plan and details that relate to the external scheduling package, including currency, time unit, and details of code lengths.
- **Milestone**
  An activity of zero days that usually represents a significant event in the project is called a milestone. In many cases, a milestone is the completion of a phase for a major deliverable. Milestones can be used to trigger invoicing and the calculation of earned value.
- **Activity relationships**
  An activity relationship indicates that a certain activity (successor) cannot start or end until another activity (predecessor) starts or ends. The activities must be sequenced accurately to provide realistic schedules.
- **Baselines**
  The baseline is a snapshot of the active plan's scheduled activities' start and end dates.
- **External scheduling package**
  Project uses external scheduling packages, for example, Microsoft Project to determine scheduling information of the activity structure. You can use this scheduling information for an activity budget and a time-phased budget.
- **External scheduling interface**
  Export a project to an external scheduling package such as Microsoft Project by using an XML file. After you maintain the project plan in the external scheduling package, you can import the updated scheduling information to LN.

Requirements Planning

Use the Requirements Planning module to generate planned orders for material, equipment, and subcontracting, by using data supplied from the Budgeting and Planning modules and project planning.

- **Generate planned PRP orders**
  A planned PRP order comes from a budget requirement and is an order advice that you can transfer to a purchase or a warehouse order.
- **Rescheduling messages**
  Rescheduling messages are displayed when you change the planning or the delivery dates. You can specify whether to cancel or reschedule the orders.

- **Planned PRP purchase orders**
  You can create and control planned purchase orders, purchase schedules, and requests for quotations in Procurement. You can use planned orders for material, equipment, and subcontracting (standard and project cost objects).
- **Planned PRP warehouse orders**
  Planned warehouse orders are the recommended orders based on the projected budget and projected start date. You create or confirm a planned warehouse order to reserve inventory in any warehouse. If a customized item is manufactured using a production order, the item is stored in a warehouse after it is finished.
- **Warehouse order - Phantom item link**
  You can view the details of phantom items that are linked to warehouse orders.
- **Order history**
  In Project, you can examine the order history of a project's purchase and warehouse transactions. In addition, you can view the purchase transactions for equipment and subcontracting.
- **Delivered order lines (Material)**
  You can view the cost-object transaction history for material. You can track all purchase orders in Procurement, and track transfer orders in Warehousing. These purchase and transfer orders are delivered to or taken from the project or project warehouse.
- **Generate service orders**
  Service orders are generated in Project. These orders are based on the budget lines created based on the reference activity linked to the project activity.
- **Cost peg supplying relationships**
  You can establish a link between the cost pegs of the project/ company that supplies and receives the project deliverables. This allows you to monitor all the related costs and transactions.

  To transfer the cost pegs from the project:
  - The status of the receiving project must be **Free** or **Active**.
  - The **Project Pegging** check box must be selected in the Implemented Software Components (tccom0100s000) session for the receiving company.
  - The item must be cost pegged. If the required item is not cost pegged, Infor LN generates an error message.
- **Integration of Project with Service**
  Based on the contract, you may need to provide service requests associated with completed projects. To handle these requests, the project details such as the structure and the materials consumed during the project are transferred to the Service module.

Project Progress

The Project Progress module is used to measure, record, and monitor the progress of a project.

- **Progress**
  You can use Project Progress to register and control the project data during the course of the project. The Monitoring part of the module combines information from Project Progress to generate project monitoring reports and financial statements. These reports are based on quantities and amounts, and can be presented for any project level. There is a wide range of selection criteria to ensure that the right data is received by the right people; for example, including or excluding expected costs (commitment accounting), current or accumulative period, and with or without final result forecasts. Budgets and performed costs are compared with the actual data. You can view the consequence of this comparison. You can also see the estimated cost at the end of a project during its execution.
- **Physical progress**
  You can track the physical progress of the project by monitoring the progress of the elements and activities at the cost object level, for all cost types.
  You can perform the following tasks:
  - Generate physical progress master data: You can create master-progress data for elements and activities at the cost object level. You can only generate master data if both the project and the elements and/or the activities for that project meet the required conditions.
  - Generate physical progress by element/cost object: You can globally change the progress for a range of elements. You can then monitor the result in the Project Progress module. You can maintain the progress of elements if both the project and its elements meet the required conditions.
  - Generate physical progress from planning: You can copy the progress of the activity (planning) to the activity and element progress (production). In addition, cost objects are copied from the control data.
  - Print physical progress: You can print a form that shows progress details for elements and activities. You can then use this form for recording details on-site. You can enter the current progress in the work center manually, either daily or weekly.
- **Costs**
  During project execution, you can record the actual costs. Cost recording can be performed in Project or in Financials, or be the outcome of logistical processes like procuring goods or services, and then transferred to Project. You can specify the level at which the project costs are recorded. .
  To track the progress of the costs, you can use these features:
  - Costs: You can view, compare, and maintain the costs incurred for a project for all cost types. You can view the cost transactions that are not yet processed to Financials. If costs are the result of actions in Financials, Manufacturing or Order Management, these transactions are automatically created and processed. In addition, cost transactions that are manually entered can also be maintained.
  - Using commitments: To keep your project control up-to-date you must ensure that the right costs and future costs are entered, for example, your monthly reports. Commitments are financial obligations that represent future costs. When costs are incurred, the commitment is replaced by the actual cost.. Commitments can be booked in two ways: manually and automatically. This depends on the specified parameters. The commitments are booked as soon as the purchase order is created and/or the goods receipt is registered

in Procurement. you can track soft commitments, and hard commitments. You can also print the actual costs and commitments, and compare them.

- Cost history: You can view and maintain the history data of project and contract costs for the different cost types.
- Cost forecast: To generate or view the cost forecast on your project, you can use either cost objects or cost types. If you use cost objects, you can maintain the cost forecast for all cost objects related to elements and activities. If you use cost types, you can only maintain the cost forecast for activities. You can use a forecasting method to predict changes to the budget, or to predict extra costs or to predict the total project cost. These forecasts are displayed in performance measurement and monitoring.

- **Revenues and revenue history**
  You can manually register project revenues or the revenues can be registered through project invoicing. If a project invoice is posted to Invoicing, project revenues are available in Project. In addition, you can maintain the forecast deviations of the revenues by element and activities against the contract, which allows you to monitor the result in the Monitoring module. You can enter revenues in different currencies. To register revenues, you first must record cost control periods for the project. The control period is used for registering the revenues. You can modify the project revenues coming from the Invoicing module. You can also enter additional revenues. You must confirm the revenues and then process the registered revenues to the project history and to Financials. You can also view and maintain the history data of revenues. This includes invoice data and posting data.
- **Financial result**
  You can view the financial results of the project costs, revenues, and profits. You can view over/under billing, and over/under costs, as well as revenues. You can also track interim financial results and IFRS WIP balances.
- **Extension transactions**
  You can track the progress of the project extensions. These type of extension transactions are supported:
  - Fluctuation settlement: Use this extension type to indicate the price fluctuations' influence for invoicing purposes. You cannot define this extension type for Cost Plus projects and for projects with Invoicing Method set to **Unit Rate**. There are two types of fluctuation settlements: Index fluctuation settlements and Price fluctuation settlement.
  - Provisional amount: Use ths extension type if you do not know a certain part of the project costs when you develop your project. You can settle the differences with the provisional-amounts budget and the actual costs at a later stage.
  - Quantities-to-be-settled: Use this extension type to invoice the difference between the budgeted quantity and the actual quantity for a range of cost objects. Use this type when you are unsure of the quantities that you will spend in the project.
- **Processing progress**
  You can approve all the transactions related costs, commitments, and revenues for the project. You can post confirmed transactions to the project history, and to Financials (by using the accounts that are selected in the Financials Integration). You can also globally confirm costs, revenue transactions, and interim results. Costs are transferred to Invoicing and to project history. You can also undo the confirmed transactions.

Project Accounting

The Project Accounting module is used to create and maintain transactions for costs, commitments, revenues, overheads, extensions, financial results and so on.

- **Costs**
  During project execution, you can record the actual costs. Cost recording can be performed in Project or in Financials, or be the outcome of logistical processes like procuring goods or services, and then transferred to Project. You can specify the level at which the project costs are recorded.
  To track the progress of the costs, you can use these features:
  - Costs: You can view, compare, and maintain the costs incurred for a project for all cost types. You can view the cost transactions that are not yet processed to Financials. If costs are the result of actions in Financials, Manufacturing or Order Management, these transactions are automatically created and processed. In addition, cost transactions that are manually entered can also be maintained.
  - Using commitments: To keep your project control up-to-date you must ensure that the right costs and future costs are entered, for example, your monthly reports. Commitments are financial obligations that represent future costs. When costs are incurred, the commitment is replaced by the actual cost. Commitments can be booked in two ways: manually and automatically. This depends on the specified parameters. The commitments are booked as soon as the purchase order is created and/or the goods receipt is registered in Procurement. You can track soft commitments and hard commitments. You can also print the actual costs and commitments, and compare them.
  - Cost history: You can view and maintain the history data of project and contract costs for the different cost types.
- **Revenues and revenue history**
  You can manually register project revenues or the revenues can be registered through project invoicing. If a project invoice is posted to Invoicing, project revenues are available in Project. In addition, you can maintain the forecast deviations of the revenues by element and activities against the contract, which allows you to monitor the result in the Monitoring module. You can enter revenues in different currencies. To register revenues, you first must record cost control periods for the project. The control period is used for registering the revenues. You can modify the project revenues coming from the Invoicing module. You can also enter additional revenues. You must confirm the revenues and then process the registered revenues to the project history and to Financials. You can also view and maintain the history data of revenues. This includes invoice data and posting data.
- **Financial result**
  You can view the financial results of the project costs, revenues, and profits. You can view over/under billing, and over/under costs, as well as revenues. You can also track interim financial results and IFRS WIP balances.

- **Extension transactions**
  You can track the progress of the project extensions. These type of extension transactions are supported:
  - Fluctuation settlement: Use this extension type to indicate the price fluctuations' influence for invoicing purposes. You cannot define this extension type for Cost Plus projects and for projects with Invoicing Method set to **Unit Rate**. There are two types of fluctuation settlements: Index fluctuation settlements and Price fluctuation settlement.
  - Provisional amount: Use this extension type if you do not know a certain part of the project costs when you develop your project. You can settle the differences with the provisional-amounts budget and the actual costs at a later stage.
  - Quantities-to-be-settled: Use this extension type to invoice the difference between the budgeted quantity and the actual quantity for a range of cost objects. Use this type when you are unsure of the quantities that you will spend in the project.
- **Processing progress**
  You can approve all the transactions related costs, commitments, and revenues for the project. You can post confirmed transactions to the project history, and to Financials (by using the accounts that are selected in the Financials Integration). You can also globally confirm costs, revenue transactions, and interim results. Costs are transferred to Invoicing and to project history. You can also undo the confirmed transactions.

Monitoring

Monitoring combines information from Project Progress to generate project monitoring reports and financial statements. These reports are based on quantities and amounts, and can be shown for any project level.

- **Monitoring**
  Monitoring is concerned with building actual cost control, controlling inquiries, reports, and performance measurement.
- **Posting types**
  Posting types are used to recognize transactions. Posting types indicate the origin of transactions. In project history, related posting types are combined. For example, you can use the posting type to determine the cost origin of sundry costs.
- **Control inquiries and reports**
  During the execution of a project, control inquiries, and reports are used to monitor projects. You can make inquiries and print reports for project control purposes. Data is extracted from several other modules for control overviews. The project control inquiries and the project monitoring reports include the budget, budget adjustments, and budget extensions, combined with the costs, revenues, commitments, actual progress, and forecasts for final results. You can display and print control data on various levels, and view recorded data in a number of ways and at several levels.

Following features are supported:

- Build actual cost control: You can select the projects for which you want to display the actual cost control data. You can use this data for project monitoring. The budget, budget adjustments, budget extensions, costs, revenues, commitments, actual progress, and forecasts for final results are used to fill the monitoring tables in the Project Progress module. Once this data is generated, it can be used in all project control inquiries.
- Control inquiries: You can monitor the projects that are executed. The actual cost control is aggregated at the project level. This is one in a range of sessions that are available in the Project Progress module for monitoring projects. Each of the sessions provides a different level of detail.
- Display financial analysis: You can create a graph of the progression of costs and revenues during the project execution time. By analysis of the costs and revenues within a specific period, you can make a planning of the required or remaining amounts in the future.
- Print control reports: You can print control reports for Cost Control, Hours Control, Project Control, Management Report, Expected Profit/Loss and so on.

- **Performance measurement**

  Following are the features supported by this module:

  - Performance measurement: You can measure the performance of a project by generating performance measurement data up to a specified period. Four levels of measurement are available: activity, activity/cost type, project OBS, and OBS/cost type. Performance measurement can also be generated against the old baseline and old version, if available.
  - Earned value method: Earned value is a time-phased method of measuring project performance. Planned work is compared with completed work to determine if project costs and schedules are within budget. Usually contrasted with more conventional bottom-up performance measurement techniques.
  - Calculating the performed: In performance measurement and monitoring, LN calculates the performed, in different ways, depending on a number of settings. Performed is the budgeted costs according to the progress at the end of the current period. In most cases, LN calculates the performed as follows:

    ```
    performed = budgeted amount * progress
    ```

  - Cost forecast: To generate or view the cost forecast on your project, you can use either cost objects or cost types. If you use cost objects, you can maintain the cost forecast for all cost objects related to elements and activities. If you use cost types, you can only maintain the cost forecast for activities. You can use a forecasting method to predict changes to the budget, or to predict extra costs or to predict the total project cost. These forecasts are displayed in performance measurement and monitoring.

Invoicing

The Invoicing module in Project is used to collect invoice data and transfer it to the Invoicing package for final editing and printing. If the project and the budget are at the actualization stage, you can choose the appropriate sessions in Invoicing to invoice the costs.

- **Project invoicing**
  Project Invoicing collects invoice data and transfers it to Invoicing for final editing and processing. Project Invoicing customizes invoice addresses, invoice layout, net amounts and/or gross amounts. Provisions are also made for holdbacks. After the invoice details are transferred to Invoicing, the invoices are modified, finalized and printed . Finally LN sends the invoice revenues to the Project Revenue in Project Accounting and to Financials. When you post an invoice, Invoicing sends its status to Invoicing.
- **Installment invoicing**
  Installment invoicing is used to generate and control installments and progress invoice specifications. Installments are partial contract amounts that you send at regular intervals.
- **Project shipments**
  LN allows you to link the project shipments to the installments. In some projects, the business partner releases a shipment when an installment is paid.
- **Progress invoicing**
  Progress Invoice is an invoice type that resembles the Installment type. In this procedure, the installment amount depends on the project's progress and the element's sales rates. Progress invoice specifications involve invoicing partial contract amounts at agreed intervals, for example, every four weeks. You then release this data to the Invoicing module.
- **Unit rate invoicing**
  You can base the unit rate invoice on the sales price of an element or an activity. The amount to be invoiced equals the sales price multiplied by the physical progress quantity.
- **Cost plus invoicing**
  You can maintain and control the invoicing of cost plus projects and extensions in Project. Invoicing amounts are based on the actual costs plus a markup, or the sales price/rate for the product or the service extended to the customer. LN gathers the billing amounts and quantities based on the effort spent on cost reimbursement and time and material contract lines. You can create a business partner's invoice only when you incur the actual costs.
- **Delivery-based invoicing**
  Delivery-based invoices are based on the sales amounts of the contract deliverables. Delivery-based invoice specifications involve invoicing the customer, based on the shipment or delivery of the service to the customer.
- **Using advance payment requests**
  Advance payment requests are amounts paid by the business partner before the project starts. You can use these amounts to buy, for example, project materials. Advance payment requests can be made for all of the invoice types. If several customers are involved, the advance must be linked to one of the contract lines. You can link an advance to an element or activity. If the invoice type of a project is Installments, you can also link the advance to an installment. You can use this installment to settle the advance. If the advance is not linked to an installment, settle the advance in the next invoice or define a liquidation percentage on the contract line.

- **Using holdback**
  The holdback or retainage is a percentage amount withheld by the customer on payments. The customer pays the holdback amount after the project activities have been performed satisfactorily. In Project, holdback can be used for these invoice types:
  - **Installment**
  - Progress Invoice
  - **Unit Rate**
  - **Cost Plus**
  - **Extension**

Overhead

Overhead represents indirect costs, for example electricity, that impact all manufacturing costs, except for direct labor and direct material that change depending on production volume. Overheads are those costs required to run a business, but which cannot be directly attributed to any specific business activity, product, or service. Overhead costs do not directly lead to the generation of profits.

- **Overhead costs**
  Overheads are costs or expenses such as G&A costs, deprecation, energy, administration, insurance, rent, and utility charges, that relate to an operation or the company as a unit, that do not become an integral part of a good or service, unlike raw material or direct labor and that cannot be applied or traced to any specific unit of output.
- **Setting up overhead application bases**
  Overhead application bases are used to make batch overhead applications and to set up bases on which pre-determined overhead rates are calculated.
- **Calculating and applying overheads**
  Overheads are calculated for all application bases, based on the postings in projects and the defined overhead application bases. You can manually start or schedule the jobs to calculate and apply overheads.

Chapter 6
Planning

6

Introduction

Enterprise Planning performs and controls the planning process in multisite and single-site environments. The planning run supports master planning and detailed order planning for production, purchase and distribution. The planner can use extensive analysis tools, such as scenarios, planning signals, and performance indicators to evaluate the plan.

The main functions and features of Enterprise Planning are described in these topics:

- *Enterprise Planning Master Data (p. 55)*
- *Master Planning (p. 57)*
- *Order Planning (p. 58)*
- *Vendor Managed Inventory (p. 59)*
- *Resource Analysis and Optimization (p. 59)*
- *Plan Transfer (p. 59)*

Enterprise Planning Master Data

You set up the planning structure in master data. The structure consists of simulation scenarios, plan items, capacity resources and plan units. Additionally the rules for supplier and distribution sources can be set up for lot size values.

- **Scenarios in Enterprise Planning**
  Scenarios are used to simulate planning runs for various business situations. Only one scenario can be the actual scenario, representing the actual plan that is transferred to production, purchase and warehousing.

  The scenario-planning horizon can be divided in to plan periods of various lengths. This allows forecasting and planning in small periods on the short-term and in longer periods in the longer-term. The scenario can be defined as rolling, which will periodically redivide the

scenario-planning horizon in plan periods starting with the current date. This offers a consistent period division for the planner as time passes.

Static data such as supplying and sourcing strategies and dynamic data such as planned orders can be copied between scenarios. Relationships between a central scenario and local scenarios in a multisite environment can be defined, this allows a central planning run that triggers the local planning runs. Data, such as forecast and orders, can be aggregated and disaggregated between the local scenarios and central scenario.

- **Item data**
  The planning settings for an item is defined in Item Planning Data, which is an aggregate of multiple plan items. Another important setting is the default source, which determines if the item is supplied by production, purchase or distribution. When selecting the default source production/purchase the actual source is determined by the Date-Effective Item Data session. The horizons to generate planned orders and plans for each plan item can be defined. Additionally it can be defined whether or not a plan item has an item master plan and the types of capable-to-promise that are used for promising the item to customers.

- **Resources in Enterprise Planning**
  In Enterprise Planning, production facilities are referred to as resources. A resource in Enterprise Planning corresponds to a work center in Manufacturing. Every work center in Manufacturing is defined as resource in Enterprise Planning. Resources are used to provide information about available capacity, capacity utilization, the resulting free capacity and capacity capable to promise.

- **Plan units in Enterprise Planning**
  Plan units are used to manage interdependencies that exist in constraint-based production planning. A plan unit groups plan items that must be planned together because of capacity or material constraints. Plan units are only necessary for workload control.

- **Sources of supply: production, purchase, or distribution**
  Sourcing is the method to determine the source of supply for a plan item to satisfy demand.

  Sourcing can be defined on two levels:

  - **Source strategy**
    This strategy determines if the item is produced, purchased or distributed. Defining a sourcing strategy is not a requirement, if the sourcing strategy is not defined the default source from the Item-Planning data is taken.
  - **Supply strategy**
    This strategy determines the rules that specify which suppliers and warehouses must be selected for purchasing and distribution. For production, no second level applies in the sourcing business object. The supply strategy is optional. If a supply strategy is not defined the suppliers are selected based on the priorities in the Items - Purchase (tdipu0101m000) session. The warehouses are then selected based on the priorities in the Supplying Relationships (cprpd7130m000) session.

  The supplying relationships between clusters can be defined. A cluster is a group of entities without the restriction that the entities are all of the same type and belong to the same financial company or logistic company. These relationships represent the possible supplies between warehouses. Enterprise Planning always translates the cluster to the default warehouse in

that cluster. The supplying relationships are selected based on the supply strategy. If no supplying strategy is applicable, they are based on the priorities in the supplying relationships.

Master Planning

Master Planning calculates and controls the master production schedule, representing the long-term production plan of a company.

The resource master plan is derived from the production plan. This plan represents the capacity utilization of the critical capabilities in a company. The channel plan is derived from the central production plan. This plan contains the forecast, actual sales volumes, and allowed sales volumes from each demand channel.

- **Item planning**
  The master plan for an item can be generated based on the demand, purchase plan, or planned distribution orders, depending on the sources of the plan items. If based on demand, a production plan is created.

  The demand can be of the type: Forecast, Sales Orders, Sales Quotations, Sales Schedules and more.

  Master planning runs from the order horizon of a plan item up to the planning horizon. It can be run in infinite and finite mode by using workload control. Additionally, master planning can be run in regenerative or net change mode. In net change mode, only plan items for which changes have occurred are selected during the run. Signals based on the master planning can be generated that warns the planner of exceptions in the plan.

- **Resource planning**
  For every resource it can be indicated whether a resource master plan applies. The resource master plan is a view on the available capacity, capacity utilization and the resulting free capacity for each plan period as defined on the scenario in which you work. You can view the capacity capable to promise is calculated and displayed in the plan to support order promising. The sources of the capacity utilization, which can be critical capacities, planned orders, actual SFC order, service order, and PCS activities.

- **Channels in Enterprise Planning**
  Enterprise Planning supports the use of channels. A channel is a sales or distribution channel that you use to distribute particular items to particular customers (sold-to business partners). For example, a channel can represent a particular geographical area, or a particular group of customers. Forecasts can be maintained and compared with actual sales in the channel master plan. For each plan item it can be determined if the module is channeled.

  Based on the allowed demand, the channel available to promise is calculated to support order promising. Forecast and allowed demand can also be calculated by using disaggregation from the central item master plan.

Order Planning

Order Planning combines material requirements planning, distribution requirements planning and capacity requirements planning. The entire product structure consisting of supplying relationships and bill of material relationships, is exploded.

The net requirements of each plan item in the product structure are balanced by creating planned orders. The net requirements are based on the netting of firm supply, inventory and demand, which is an integral part of the order planning. Examples of demand types are: forecast, sales orders, and sales quotations, sales schedules.

You can use Order Planning to plan items that have the manufactured, purchased, and generic type. The planned orders for manufactured and purchased items in the actual scenario are confirmed and transferred as actual orders to the shop floor, purchase department and the warehouse. The planned orders for generic items cannot be transferred; they only serve to explode the material requirements on the lower levels in the generic bill of materials.

- **Purchase schedules**
  Purchased items can be ordered by purchase schedule rather than (planned) purchase orders. Purchase schedules support high-volume, repetitive purchase supply based on contracts. When an item is ordered through purchase schedules, based on changed or new demand, the order planning will directly change purchase schedule lines or create new lines, taking into account the supplier's delivery patterns.
- **Resources**
  The planned production orders result in the capacity use of resources. For each resource, the detailed capacity utilization, based on the order planning in the resource order plan, can be viewed and compared with the available capacity. All other sources of capacity use, critical requirements, SFC orders, service order, and PCS activities are shown.
- **Item order plan**
  You can create an item master plan for plan items that is fully controlled by order planning. However, master planning is not required to control a plan. For order-planned items, you can use item master plan-related functions, such as forecasting, inventory planning, and capable-to-promise.

  In addition to the demand forecast in the item master plan, you can use special demand, which is another type of forecast can be used. Consumption of special demand by actual sales demand is supported. To define special demand an item master plan is mandatory.

  The item order plan constrains all demand and supply data of a plan item, and provides a complete time-phased overview for the planner. The item order plan also contains available to promise figures. Therefore it is not mandatory if you want to use capable to promise techniques.

  Lead times, fixed delivery dates, and lot sizing rules are checked for an accurate calculation. In the order horizon of the plan item, these figures serve as input to calculate ATP and CTP to support order promising. The components and capacities to be checked for CTP are part of the bill of material and routing. Materials and capacities can be indicated in the entire product structure of the item that must be checked for capable to promise.

Vendor Managed Inventory

A company can outsource the supply planning for some purchased items. In this case, the company does not send the supplier orders to delivery-specific quantities on specific dates and times. Instead, the supply planning is delegated to the supplier who decides when to deliver what quantity. The customer and supplier have a terms and conditions agreement that specifies all relevant planning parameters. This terms and conditions agreement is linked to a valid sales contract or purchase contract.

Resource Analysis and Optimization

Plan results from the order planning and master-planning run can be evaluated using plan analysis. The analysis consist of exception messages and performance indicators.

A signal represents a warning for the planner that a particular element; a date or quantity, deviates from the desired planning, which facilitates planning by exception, which limits the planning effort for the planner.

Exception messages can be defined by planner. A planner is responsible for a group of plan items and this results in exception messages that are only relevant to that particular planner. Exception messages can be prioritized by defining a time horizon in which they are generated and applying tolerances for each signal. This process customizes messaging for each planner.

More than 40 types of exception message are supported, such as reschedule-in, reschedule-out, and cancel order signals. Signals can apply to order planning, master planning, and to a plan item or a resource.

Exception messages created for planning orders in Enterprise Planning are processed after evaluation by the planner. For example: a reschedule-in signal that is processed changes the planned dates of the planned order to which the exception message applies. This process reduces the efforts for the planner. This functionality applies to planned orders only and not to actual orders.

Performance indicators translate a planning situation into the delivery performance, financial performance, capacity utilization performance and inventory level performance of the scenario, a plan item or a resource within that scenario. You can compare scenarios by using indicators.

Plan Transfer

You use the Plan Transfer module to transfer planned orders from Enterprise Planning to the execution level of LN. In addition, it allows you to transfer production plans and purchase plans.

- **Transferring orders to execution level**
  The plan transfer converts planned orders into actual orders for the shop floor, purchase department, and warehouse. Often, the orders are then handled by individuals other than the

planner, such as the shop floor planner, buyer, and warehouse manager. However, the planner still controls the total plan through the planning views, including the actual order information and the exception message still generated for the actual orders, if required.

- **Order grouping in Enterprise Planning**
  You use order groups are used to limit the handling of individual orders. Packages are created that contain multiple orders that can be handled as one large order. Planned orders can be grouped when they share a particular characteristic.

  Common characteristics can be the work center where the planned orders must be produced, the warehouse to which the orders must be delivered, the date the orders must be produced, the tools used and other selection criteria. Then, the business procedure for these planned orders will be handled on order-group level. This is also valid for the transfer of planned orders, which means that planned orders within one order group are transferred in one action.

- **Release planning**
  You can transfer planned orders can be transferred independent of status, which can be **Planned**, **Firm Planned** or **Confirmed**. You can make the transfer in interactive mode which gives you an overview of the planned orders selected for transfer. In this view the decision can still be made not to transfer particular orders.

  Planned production orders and production plans can also be transferred up to a predefined workload in hours on the shop floor.

Chapter 7
Manufacturing

7

Introduction

You can use Manufacturing to manage the production of items.

Use Manufacturing to:

- Define bills of material (BOMs), routings, and tool requirements.
- Calculate cost and sales prices.
- Plan projects and carry out network planning.
- Control the execution of production orders.
- Configure large numbers of variants of finished products with Advanced Configurator.
- Plan and generate assembly orders.

The main functions and features of Manufacturing are described in these topics:

Engineering Data Management

You can use the Engineering Data Management module in Manufacturing to support the registration of a product's design process; dealing with different versions of the product. In addition, this module is used to transfer the design data to production.

- **Engineering items**
  Items in the process of development. Design changes can be made and several revisions of the item can exist.
- **Engineering BOMs**
  Relationship of components and their parent items, lists parts, raw materials and subassemblies, and revision versions of items in development, changes in the EBOMs can be made Manually, Automatically or Semi-automatically.
- **Finalizing engineering data**
  Allows the copying of engineering bills of material to production bills of material.
- **Revision control**
  Engineering is performed per revision. You can manage and define new revisions in Engineering Data Management

Item Production Data

You maintain general item data for LN in Item Production Data (IPD). The module controls item data that is not application-specific and is used in most of the other LN modules. Each LN application uses its own specific item data module and has access to Item Production Data (IPD).

Item Production Data (IPD) contains information on the following:

- Bill of material (BOM) data
- Routing data
- Backflushing data
- Repetitive item data
- Order parameters
- Routing units

In IPD, you can define production data for a specific item. You can also define default production data for a combination of item group and item type.

Bill of Material

The Bill of Material contains the component items of a manufactured item. Each BOM line contains information about the position of the component item in the BOM, the required quantity, and the expiry date of the component item.

- **Single-level**
  A BOM shows relationships of components to the parent item one level down.
- **Multilevel**
  A BOM shows relationships of components and sub-components on multiple levels.
- **Summarized**
  A multilevel BOM that does not list the levels of manufacture, and lists a component only once for the total quantity used.
- **Critical items**
  An item that can cause a bottleneck in a production process due to a long or uncertain lead time.

Routing

The planning data for the method of manufacturing is defined in Routing. A routing consists of operations, with each operation identifying the last to be carried out in a work center and/or on a certain machine.

Routings can be as follows:

- **Standard routing**
  A generic routing that can be attached to multiple items
- **Item specific**
  A routing that is applied to one item
- **Network routing**
  A routing containing sequentially ordered operations and parallel operations
- **Order quantity dependent routing**
  A routing that is defined for a specific quantity of items

You use the Routing module to record routings for manufactured items. You can define the following:

- **Work centers**
  A work center is where production activities are performed. Resources, such as people and machines, are lined to a work center. A work center is a group of resource units used as a functional planning unit. The operation rate code, which is linked to the work center, is used to calculate the cost price of an item or the estimated and actual costs. The capacity load on a work center is used in the planning of production. Work centers can be part of enterprise units used for multisite modeling purposes.
- **Machines**
  Machines are linked to work centers and are used to plan operations. The rate defined for a machine is used to calculate the actual machine costs. The capacity load on a machine is used for production planning.
- **Tasks**
  Classified according to the nature of the work performed, tasks are used to describe activities that take place on the shop floor. Tasks are linked to operation rate codes, which are used to

calculate the cost price of an item or the estimated and actual costs. Tasks are used in production planning.

- **Operations**
  The operation data for standard and customized manufactured items is maintained with operations. Operation data is stored and maintained for standard items and customized items. A series of operations is performed to manufacture an item. The sequence of operations is defined as a routing in operations. Yield and scrap is defined per operation.
- **Norm times**
  The run time and production rate of an operation are determined using norm tables. After a matrix is defined for two physical characteristics, such as length and width you can maintain a set of standard operation times for the X-Y coordinates. When tasks and routings are defined, the run time and production rate can be calculated by using a norm table.

Assembly Planning

You can use the Assembly Planning module to plan the assembly of product variants, and to generate assembly orders in Assembly Control. Assembly Planning does this for assembly lines in a mixed model flow production environment, which is characterized by high volumes, and many variants of complex products.

- **Sales order entry**
  Sales orders are entered in Order Management for sold products. A product variant is created at sales order entry. By using Product Configuration, the product variant can be configured.
- **Engineering and product configuration**
  Product structures can be defined in Assembly Planning, an external system, or using the Product Configurator in Product Configuration. You can define generic end items, such as a car.
- **Product variants**
  A unique configuration of a configurable item. The variant results from the configuration process and includes information such as featured options, components, and operations.

  A product variant is created on sales order entry. You can reuse a product variant on a different sales order.
- **Flattened parts**
  The content of every module is stored in the flattened parts. This is a one-level BOM that consists of all the assembly parts. You can define the flattened assembly parts in Assembly Planning, from Engineering Data Management, or import them from an external PDM system.
- **Assembly parts requirements calculation**
  The assembly parts requirements calculation process calculates the lower level requirements and sends those requirements to Enterprise Planning. The product variant structure and related flattened assembly parts are input for the assembly part requirements calculation.

- **Assembly order generation**
  Assembly orders are generated and sent to the Assembly Control module. During the generation process, product variant demand, product variant structure and related flattened assembly parts and operations are retrieved.
- **Refresh/freeze assembly orders**
  Assembly orders are frozen within a certain time fence and at the same time, the content of the assembly order is refreshed. You can also manually refresh orders before they are frozen.
- **Unit and date effectivity**
  Unit effectivity is a method to control the validity of variations on an end item. You can use unit effectivity for pegging purposes, or to model exceptions from a standard end item, so that you can make variations without having to define separate item codes. As a result, you do not need to maintain separate BOMs for every combination of variations. End items can be, for example, airplanes or touring cars. The deviations consist of relatively small variations of the end item. For example, fitting red seats instead of blue ones, or a special type of radar, or air-conditioning, in an otherwise standard type of airplane.

  You can use unit effectivity for minor changes to a small subset of the end item that results from customer request, engineering, or production.

Assembly Control

Assembly Control is intended for use by companies that produce many variants of complex products in a flow assembly line, although it can also be used in low-volume assembly environments if order-specific transaction handling is used.

- **Line station variants and line station orders**
  When the order content on a specific line station is the same for multiple orders, that content is only stored once. This similar information is stored in a line station variant. The assembly orders only have a link to Line Station Variants. This feature reduces the data storage and improves performance.
- **Clustered line station orders**
  The material requirements for a line station for a day. A CLSO consists of user-defined buckets. The material requirements are combined for each bucket. In Assembly Control, transactions can be carried out per line station and per period, instead of per order. LN can combine the same materials for a specific period into one material line. The cumulated quantity is stored in the CLSO. This accumulation reduces the number of transactions that are necessary, because the transactions are performed for a specific bucket. CLSOs are used in assembly part allocation and in backflushing to combine materials for a line-station order for a day.
- **Assembly kits**
  A grouping or categorization of parts supplied to a line station is called an assembly kit. Two types of these can be used in LN: line station and product. Line station type assembly kits deliver supplies to a specific line station. The assembly kit is an order-dependant set of

components that is determined by the product configuration and is delivered to the shop floor warehouse for the relevant line station.

Product type kits support only Order Controlled/SILS supply from a warehouse that supplies a shop floor warehouse by warehouse transfer. With this kit type it is possible to assign an assembly kit to a specific end item or an assembly line combination.

- **Partial freeze**
  Assembly orders can be partially frozen, this means that depending on the position of the assembly order in the process, some parts of the assembly order will no longer be refreshed. The frozen parts of the order can still be manually changed.

  Other parts can still be refreshed by linking a time fence to a line segment.

- **Multisite assembly**
  In many mixed-model-flow companies, the assembly process is performed over multiple companies that have their own logistical data set. These companies can have several assembly lines in different logistical companies. A generic subitem is assembled on a supplying line and supplied to the main line on which the final end item is assembled.

- **Line sequencing and rule types in Assembly Control**
  Assembly orders generated by Assembly Planning can be sequenced by using the sequencing engine, resulting in a line mix and line sequence. During this sequencing process, line rules are taken in to account, such as clustering assembly orders based on items characteristics, or blocking assembly orders based on capacity rules.

- **Manual change of the sequence**
  You use a control panel to manually change the generated sequence. You can move orders to a different position in the line or swap the positions of two orders

- **Inventory check**
  An optional inventory check can be performed. A list of problem parts and orders having shortages can be displayed.

- **Work instructions**
  For each operation, work instructions can be printed. This is handled through process-triggered workflow. The user can partially determine what type of information is printed on these instructions.

- **Material supply**
  Assembly Control distinguishes internal and external supply:
  - Internal supply is the movement of assembly parts from a main warehouse to the line.
  - External supply is the movement of goods from a supplier to the line.

  From pulling materials from supplier of warehouse to the correct destination triggers can be used. For some supplying methods these triggers can be based on events in production.

  Different supplying methods can be used and are defined per item/shop floor warehouse combination.

  - **Time phased order point**
    The supply is triggered by a SIC run for the shop floor warehouse involved. When the time phased inventory drops below a certain point, material supply must be performed.

- **Order controlled/batch**
  Material supply is performed anonymously for multiple orders simultaneously based on triggers in the assembly process.
- **Order controlled/supply in line sequence**
  Through this method, you can supply items as part of a kit. Material supply is performed separately for every assembly order based on triggers in the production process, even though a single trigger can be used to generate kit supply for a number of consecutive orders in the assembly schedule.

- **Time-horizon-driven material supply**
  Instead of initiating material supply based on process triggers, this can also do this based on time fences. Material supply is initiated for a line station order when that line station order coincides with a predefined time fence. Several time fences are defined to control the generation and update of supply massages.

- **Closed loop**
  Assembly Control call-offs are stored in sales schedules and sales releases. These releases (shipping and sequenced shipping schedules) are communicated to the supplier through EDI. Additionally, a unique reference per kit, station, and part is included in that information. At the supplier's system, this information is stored in sales schedules and sales releases. After sending the parts, they can be received by reference ID.

- **Progress overview per line segment**
  A planner is responsible for a segment and can be linked to a specific segment. All information related to assembly orders will be visible per segment planner.

  The status/progress overview per segment shows orders on the segment based on line sequence whereby toggle mode is available to show the orders in various modes.

- **Progress overview per buffer**
  A control panel is available on which the schedule orders per buffer are displayed. You can use the toggle function to select different overviews.

- **Progress overview per line station**
  Similar to the progress overview per buffer, the progress can be monitored per line station. This can be used to report which line stations contain work for an order.

- **Processing Trigger Definition**
  In mixed model flow production environments, many activities are based on the progress information of individual orders. When an event selected by the user occurs for an order on a certain line station, another activity can be started. In the system, process triggering covers the automatic start and execution of a process based on an event.

- **Processing backflushed hours**
  The calculation of the man and machine hours that must be backflushed differs for high-volume and low-volume. For high-volume situations, backflushing is based on the rate specified for a line and the number of employees. In low-volume situations, backflushing is based on the duration of every operation and the number of employees required per operation.

- **Line surcharges**
  During the assembly process, line surcharges can be booked. Surcharges booked on an assembly line are:
  - Assembly line for line station based on transaction processing
  - Assembly line and generic item for order-based transaction processing
- **WIP transfer**
  WIP transfers between lines are supported and the following steps are distinguished:
  - Generation of a WIP transfer warehouse order line
  - Issuing of the WIP from the last line station of the line
  - Receipt of WIP on the first line station of the next line

Repetitive Manufacturing

The Repetitive Manufacturing module facilitates production control in a repetitive-type manufacturing environment. The module is used for high-volume production in a multimodel-flow environment. An Repetitive Manufacturing scheduling area can be used as a multimodel flow line.

Repetitive Manufacturing (RPT)

The Repetitive Manufacturing module manages the production of standard products that are produced in large quantities. This module provides a simplified procedure for the production orders in the Shop Floor Control module.

The Repetitive Manufacturing module allows the control of orders for standard anonymous and standard-to-order items. Production is planned an carried out through a schedule, which consists of planned and actual orders with end dates that coincide with a specific period. Production orders are planned based on the capacity of the work center that controls the production rate (bottleneck work center). Production orders are consolidated for the schedule, and then production is controlled by the schedule.

You can process the production data by using production schedules. The production schedule lines are generated by the following modules:

- Master Planning module in Enterprise Planning
- Order Planning module in Enterprise Planning
- Shop Floor Control module in Manufacturing
- Warehouse Orders module in Warehousing

This process is only for order lines relating to repetitive items (RPT items), which you specify in the Item Production Data module. The order type is determined by the module that generated the order. After you release the order, the order status is **Released** and the order type is set to SFC, regardless of the module that generated the order. You can process an SFC order with a **Released** status in the Repetitive Manufacturing and Shop Floor Control modules. The shortest route, however, is the RPT procedure.

Shop Floor Control

The shop floor control module handles the creation of production orders, planning of production orders, and the procedure related to the execution of these orders.

You can manually create and modify production orders in the Shop Floor Control module. To create production orders automatically, you must use Enterprise Planning.

Production typologies

Shop Floor Control handles the actual manufacturing of items. Production orders can be classified and controlled in several ways, depending on the level of customization required for the item or order and the item.

The production typologies possible in Shop Floor Control are:

- **Fully customized, derived from a standard item**
  In this situation a standard item is fully customized to meet customer requirement. This includes customized BOMs, routings, and cost structures that are based on the product structure of the standard item as a template. Afterwards engineering can take place on the customized structure. Through a PCS project, the sales order is then transferred to an shop floor control order. This situation applies to Engineer-to-Order/Make-to-Order. Through the PCS project code, the shop floor control order is pegged to the SLS order.
- **Fully customized, derived from a generic item**
  A sales order is available for a standard generic item, but not FAS. This item is fully customized. Planning, forecasting, and material explosion will be performed in Enterprise Planning. PCF is used for the generation of a customized BOM and a routing for a PCS project through which the sales order is transferred to a SFC order. This situation applies to Engineer-to-Order/Make-to-Order environments with relatively low volumes.
- **Derived from a generic item, without project**
  The production typology is related to the previous one however this situation applies to high volume production environments. For these PCF can be used without using PCS projects.
- **The anonymous production, standard item**
  This typology describes the situation in which production is purely anonymous. Items are produced to stock. Ordering systems can be SIC, MRP, MPS, or manual, for the manufacturing execution on SFC. The only difference in SFC compared to customized production is that no project code is available. Therefore, the SFC order is not pegged to an SLS order.
- **Fully customized, customized item.**
  Customized production is started from PCS and is not derived from a standard item. A project code is printed on the order documents. The SFC order is pegged to an SLS order. This is applicable in real engineer-to-order environments where the design of the item starts from scratch and is based on customer requirements.

Production orders control

A production order is comprised of the order to produce an item and the conditions under which manufacturing takes place, such as the routing that is used, the delivery date and the order quantity.

- **Reporting as completed**
  You can monitor the progress of the production progress, for example, the production orders, quantities, and operations that are complete, and the quantities that are processed in specific operations.
- **Scrap and yield**
  In manufacturing processes it is often necessary to plan the production of more product than you actually need, because some of the product may be outside specification. Some of th components can also break or be unsuitable for production. this effect is modeled by means of scrap and yield.
- **Planning production orders**
  Production order planning provides the facility to modify and preplan the production order. The planning is a process of determining the start and end dates of the individual operation and production order. When the production order is planned, the lead-time of the operations and the production order is calculated. The load on the corresponding machines and work centers is also calculated and displayed.
- **Subcontracting Purchase Orders**
  Subcontracting is a common practice in manufacturing industries.
  - Part of a production process is subcontracted for several reasons:
  - A specialized operation can be needed for which the company does not have the proper facilities
  - Enough capacity is not available
  - The work is large and could be expensive if carried out internally
- **Executing subcontracted operations**
  Production orders executed for the manufacturer are indicated as "subcontracting" production orders. You can receive materials owned by the manufacturer for these orders. Those items are stored against a certain value using the current valuation logic. You can issue items to a subcontracting production order. The actual costs of those items are zero when they are consumed in a production order. The WIP of a subcontracting production order is partially owned by the manufacturer, this is visible to the user.
- **Material issue**
  The entering of issues as part of the order procedure for production orders is required to issue the necessary materials from the warehouse to the shop floor. Issuing can be done manually or by the system while the estimate is being built up. When backflushing applies, issuing of inventory is automatically performed.
- **Backflushing**
  The automatic issue of materials from inventory, or accounting for the hours spent manufacturing an item, based on theoretical usage and the quantity of the item reported as complete.

- **Floor stock**
  A stock of inexpensive material present on the shop floor that can be used in production without recording each issue of material individually. Floor stock is not backflushed and is not part of the estimated costs. To account for floor stock materials, a surcharge is added to the cost price of an end item. A Kanban triggers the supply of floor-stock items to the shop floor. You can create a warehousing order of type SFC Production in which you determine from which warehouse and to what work center the material must be shipped.

- **Using shop floor warehouses**
  SFC warehouses are a special kind of warehouse that store and control the materials needed for production. An SFC warehouse is linked to a work center by which materials needed for operations can be pulled from inventory in the SFC warehouse linked to that operation for example, a location in the line.

- **Production order costing**
  Production order costing deals with the production order costs for all items of all production types whose production orders are handled in the Shop Floor Control module. The costing functionality for order costing of standard items and customized items is the same.

  These can be calculated:
  - Estimated order costs
  - Actual order costs
  - Production results

- **Input / output control**
  You can use input/output control to judge how efficiently your machines or work centers are operating. You can compare actual input with planned input to find out when there is not enough work at a work center or machine, which leads to poor productivity. You can compare actual output with planned output to discover problems at a work center or machine.

- **Order grouping**
  A Shop Floor Control order group is a group of production orders, defined by the user. You can add production orders individually, or specify criteria to ensure the orders with common features are grouped. After a group is formed, you can use it to perform actions on all production orders within the group at the same time, for example, report orders as complete, printing order documents, or close orders.

- **Order-block planning**
  To optimize the use of the various machines available for the production process in a factory and minimize changeover due to other product characteristics, functionality is available to sort production orders based on set-up classes (such as color).

- **Production order splits**
  A production order split allows you to split in-process production orders into multiple production orders. You can select the split-off quantity that goes to the new child order or split off rejected items.

  A split can be required in situations such as the following:
  - The total order quantity cannot be completed in time due to capacity issues
  - Insufficient material is available to complete the total order quantity in time
  - A part of the total order quantity is nonconforming, expedited, or delayed

- **Costing breaks**
  Costing breaks are defined to override a project peg distribution of actual supply orders and move the related costs to different WBS nodes on the same project.

  In the bill of material (BOM), costing breaks can be applied to routings, operations, work centers, or cost types. Multiple costing breaks can be applied to a specific BOM.

Project Control

Project Control (PCS)

Project Control is used for customer-order-driven production. Various project types and item types can be distinguished, which results in different functionality. PCS can perform estimating, planning, and manufacturing of fully customized items and make-to-order items.

Project budget

If you follow a make-to-order strategy, it is easiest to start with a project budget. You can analyze multiple budgets that belong to a single calculation group. After the project budget is established, commercial monitoring occurs in LN. You can then specify information, such as competitors, success percentages, and the reasons why a potential customer accepts or does not accept a quotation.

Project engineering

After the sales order is closed, project engineering starts. For each customer order (project), you can record the appropriate customized bills of material and customized routings. You can also use standard bills of material. Generic items can be configured in Configurator. If necessary, engineering changes can be performed during the course of the project.

Planning

A network planning is established for each project, which enables you to plan and control the activities of a project. You can link critical materials and capacities to certain activities. You can use this to:

- Plan the purchase of purchased parts with long delivery times
- Calculate rough estimates of the capacity needed for manufactured parts

The definition of modules allows you to set up detailed material and capacity requirements based on activities. You can plan these requirements in Enterprise Planning which also generates advices on rescheduling current production or purchase orders, if the plans are altered during the project.

Calculation

You can calculate the estimated and the actual costs of each order. You can compare the actual costs with the budgeted costs and the estimated costs. You can always display the interim results of current orders.

Product Configurator

The Product Configurator allows the specification of features and options for a configurable product or generic item at sales quotation or order entry.

In the **Product Configurator** module, a product model is created that defines all the features of a specific product. The desired product variant is defined by selection the optional features. The translation of requirements into the product structure of the variant is controlled by a set of decision rules and constraints.

The product configurator has two core tasks:

- **Product configuration control**
  To enforce constraints at sales times to guarantee that only buildable products are stated by the selected features and options.
- **Structure generation for product variants**
  To generate the BOM/routings for the product based on the selected features and options.

Product Configurator provides the following:

- **Generic product modeling**
  To define the generic product, its features and options.
- **Generic engineering data**
  To define the rules that transform the selected features and options into bills of materials, routings, item codes, item descriptions and other item properties.

- **Generic product modeling**
  You use generic product modeling to define the generic product. During this process, you create the product structure, specify the components to use, and specify the routing for the components that are used during production. Your company can also established the controls that users can select and rules for components use and routing.

  Product Configurator supports sales and purchase price lists:
  - Base price
  - Option price
  - Price list matrix to calculate surcharges based on a combination of options.
  - Totals and subtotals for reporting
- **Configuration and structure generation**
  A code for the required item is entered in Sales to start the configuration process. The **Product Configurator** module requires the selection of several answers in a sequence predetermined at modeling time. The answers are checked against the constraints until all values are entered and the configuration is saved with the order.

  You can also work with stored variants that are used as a template for quick ordering of similar products.

  The sales order line that contains the desired features and options is used to generate a specific BOM and routing for the order. Depending on the order policy of the top-generic item,

a PCS project is created or used if cost tracking is required. When the order policy is anonymous, a configured standard structure is created.

Prices can be calculated both online and offline after the product is configured.

- **Advanced Configurator Integration**
  The BuyDesign advanced configurator is an interactive configurator that is integrated with LN. As part of the configuration, the BuyDesign configurator will make the relevant chosen features and option available to Enterprise Planning. This information is used to drive the remaining process in PCF. The **Product Configurator** module stores the configuration information required to handle the manufacturing process.

Tools Requirement Planning

The Tools Requirement Planning module is used to integral tooling maintenance and control.

Several types of control are available in LN:

- Purchasing of tools
- Maintaining tools
- Life-cycle management of tools

  Status control refurbishing and scrapping
- Applying tools for production and service

  Printing on production or service order documents
- Planning and tracking of tools

  The Tools Requirement Planning module is used to check the availability of the tools for the planned production orders in Enterprise Planning and Warehouse Management. An availability check is also performed for tools when they are planned for actual production orders in the Shop Floor Control module and the service order in the Service Order Control modules. If applicable, LN automatically displays an alternative tool when the required tool is not available.

When a tool kit is released, all of the relevant tool kits are released simultaneously. By using LN a tool that consists of multiple detachable components can be composed. To perform an operation a complete set of tool components is needed.

Based on the comparison between the planned life (in times used or hours used) and the actual used of the tools LN can automatically generate a service order for the tool that must be refurbished or scrapped. When completing a service order, the tool master data and tool tracking data is automatically updated.

Product Classification

You use the Product Classification module to set up a classification and coding system for item data and to quickly find data. New and existing items can also be classified according to the defined product classification. Searching is performed through a combination of search arguments.

Manufacturing Control

The Manufacturing Control module provides dashboards and stores the as-built structures of production and assembly orders.

- **Dashboard**
  A dashboard is a quick way to access multiple sessions in which an end user can perform specific tasks related to one object such as item, business partner, or order. Relevant details of the object and the available sessions that can be started, are shown on the dashboard.

Chapter 8
Procurement

8

Introduction

You use Procurement to manage purchase activities and maintain the data that is the result of these activities.

The procurement functionality includes several functional procedures that (partly) control the purchase of goods. The main purchase procedure is the purchase order procedure. In most cases, the purchase order procedure does not act as a stand-alone procedure, but is preceded and followed by other procedures.

These procedures (can) precede the purchase order procedure:

- Purchase requisition procedure
- Request for quotation (RFQ) procedure
- Purchase contract procedure

The purchase schedule procedure runs parallel to the purchase order procedure.

The vendor rating procedure follows the purchase order procedure.

The main functions and features of Procurement are described in these topics:

Purchase Master Data

Purchase master data includes mandatory and optional master data functions and features. The mandatory data is required to carry out the procurement procedures. The optional data can be specified for specific use in several procurement processes.

- **Purchase item data**
  In Item Base Data, you can specify items and item data on a general level. Before you can carry out purchase procedures, you must also specify purchase-related item data in Item Purchase Data.
- **Calculating purchase item lead times**
  You can specify and calculate several lead times for a combination of purchased item and business partner.
- **Determining the planned receipt date**
  If you enter a purchase order line, you must calculate a planned receipt date. The planned receipt date is calculated based on the order date, the item lead times, and the horizon. Depending on the horizon, the planned receipt date can be accurately or globally determined.
- **Sourcing**
  Sourcing is the way in which you assign orders to business partners who deliver the same items. You can give suppliers a priority and a sourcing percentage.
- **Purchasing manufacturer's items**
  Companies often order components from purchase business partners who do not produce the components themselves. These intermediate purchase business partners offer equivalent components, which are items that conform to their original item's specifications, from different manufacturers. You can use the multiple manufacturer item functionality or the manufacturer part number (MPN) item functionality to specify, approve, and use manufacturer's items.
- **Planned delivery moments**
  In purchase scheduling, planned delivery moments must be generated for a combination of item, buy-from business partner, ship-from business partner, and warehouse. These moments are used by Enterprise Planning for lead-time offsetting.
- **Purchase organizational data**
  Before you can perform purchase procedures, you must define purchase organizational data, such as the purchase order types that define the mandatory steps in the purchase order procedure, purchase offices that you can use to create purchase contracts, purchase orders, and purchase schedules, and user profiles with user-specific default data.
- **Approval rules**
  You can validate purchase orders against approval rules before their status can become **Approved**. These rules enable you to specify conditions based on which purchase orders are approved.
- **Flexible purchase order processing**
  You can automate the processing of purchase orders. For each activity that is linked to an order type, you can specify its execution mode: automatic or manual.

- **Rate determiners**
  You can use rate determiners to specify which date is used to determine the exchange rates. Amounts in foreign currencies are converted to the home currency based on the valid exchange rate.
- **General purchase data**
  Before you can perform purchase procedures, you must specify general purchase data, such as an approver list for use in the purchase requisition procedure, data to track order changes and to determine the reason for the changes, RFQ criteria sets and criteria, and additional cost sets.
- **Additional costs**
  Cost items are used to define charges such as freight, handling, and administrative fees. These costs can be added to an order so the order accurately reflects charges billed to a customer or charges billed to you by your buy-from business partners. Additional costs can be placed on an order as extra cost (items) after the last item recorded. Several additional cost items can be assigned to an order by bringing them together in a cost set. LN can automatically apply these cost sets to purchase orders.
- **Requisition approver list**
  You can specify a list of valid requisition approvers (individuals or departments) and define a hierarchy in the approval structure.
- **Purchase budget control**
  You can use budget control to check purchase transactions against available budgets. For purchase requisitions, orders, and receipts, you can specify if, how, and when budget checks must be executed.
- **Changing orders**
  A purchase order of one company is always linked to a sales order of another company. Therefore, a change in a purchase order can influence the corresponding sales order, and vice versa. You can specify the handling of change order information.
- **Purchase schedule master data**
  Before you can perform the purchase schedule procedure, you must specify the purchase schedule master data, such as segment set, patterns, and release types.
- **Product catalogs**
  You can specify product catalogs to group items into logical product categories. Catalogs can be structured hierarchically and contain, at the lowest levels, items that can be sold or purchased.
- **Landed costs**
  Landed costs, which can be linked to purchase transactions, are the total of all costs that are associated with the procurement of an item until delivery and receipt in a warehouse. Landed costs typically include freight costs, insurance costs, customs duties, and handling costs. For specific landed costs, separate business partners can be involved. Landed costs give you insight into the real procurement costs of an item.

Purchase Requisitions

The purchase requisition procedure is designed for the nonpurchasing user who may not know the standard procedures in purchasing. For example, engineers can order material or services without understanding the entire purchasing process. Purchase requisitions are used to specify nonsystem planned requirements for various types of items, including inventory items, cost items, and service items.

Purchase requisitions are created in the same way as all other buy and sell documents, such as purchase orders and sales orders. However, there is one significant difference: on a requisition, the item code and buy-from business partner codes can be blank. Therefore, the requester can make a request for a new item or make a request from a new buy-from business partner.

- **Purchase requisitions**
  The purchase requisition procedure includes the creation, approval and conversion of purchase requisitions. In addition, you can copy, cancel, and delete requisitions, and log requisition history.
- **Purchase requisition approval process**
  Before a purchase requisition can be converted to a purchase order or a request-for-quotation, it must be approved by an approver or a list of approvers. An approver is a valid employee or department authorized to approve requisitions that are submitted by requesters. Approvers can approve or reject requisitions.
- **Purchase requisition conversion process**
  If a purchase requisition has the approved status, a buyer can convert the requisition's lines to a purchase order or a request for quotation (RFQ).
- **Purchase requisition statuses**
  The purchase requisition status determines if you can submit, approve, delete, modify, cancel, or copy a purchase requisition.
- **Catalogs in purchase requisitions**
  You can insert items from a product catalog as new requisition lines on purchase requisitions, or you can replace existing requisitions lines.
- **Subcontracted service items**
  In case of operation subcontracting, requisitions can include subcontracted service items. These requisitions can be manually specified or can be generated from a routing operation or a production order.
- **Project pegging**
  To identify costs, demand, and supply for a project, you can peg project costs for purchase requisition lines.

Request for Quotations

With the request for quotation (RFQ) procedure, you can send RFQs to bidders for the procurement of goods. On an RFQ, information regarding items, quantities, and required receipt dates can be specified. The created RFQ can be sent to one or a range of bidders based on the approved source list. After

receipt of the RFQ responses, the results can be negotiated and compared with objective and subjective criteria based on which a purchasing decision can be made. An accepted RFQ can be copied to a purchase contract, a purchase order, or a supplier price book.

RFQs can be generated from planned orders, requisitions, or purchase contracts. They can also be manually specified.

- **Request for quotation procedure**
  The request for quotation (RFQ) procedure includes the creation and communication of the RFQs to the appropriate bidders, and the receipt, negotiation, comparison, and selection of the bidders' responses.
- **Calculating total scoring values per criterion**
  If you sent RFQs to bidders, you can rank the responses that you get back from the bidders to decide from which bidder you will purchase. Before you can rank the responses, LN must calculate the scoring values for each response. The procedure for calculating the total scoring value for each criterion includes several steps.
- **Ranking RFQ responses**
  RFQ responses are ranked based on the total scoring values for bidders.
- **Additional processes**
  A number of processes do not always occur in the RFQ procedure, but can be used optionally, such as printing RFQ reminders, printing letters for unsuccessful bidders, viewing, printing, and deleting RFQ history.
- **Subcontracted service items**
  In case of operation subcontracting, requests for quotation (RFQs) can include subcontracted service items. These RFQs can be manually specified, or can be generated from a purchase requisition with a linked routing operation or production order.
- **Project pegging**
  To identify costs, demand, and supply for a project, you can peg project costs for RFQ lines.
- **Supplier stage payments**
  Supplier stage payments enable customers to pay suppliers before or after the ordered goods are actually received for a purchase order. The payments are spread over a period of time and the amounts must be paid to the supplier on specific dates. The purchase order item's invoice flow is separated from its goods flow. On the RFQ response, you can specify the stage payment lines, which can be copied to the purchase order line during conversion.

Purchase Orders

You can create and modify purchase orders for purchasing goods. For example, if you run out of inventory, you can perform the purchase order procedure to replenish stocks. You can also use the purchase order procedure to purchase, for example, services. After confirmation, a purchase order is a legal obligation to supply items according to certain terms and conditions, including specific prices and discounts.

After an order is processed, the information is used by different departments in the company, such as planning, production, distribution, finance, purchasing, and marketing.

- **Purchase order procedure**
  The normal purchase order procedure includes the creation, approval, printing, release to warehousing, receipt, payment, and processing of purchase orders.
- **Purchase order line and line details**
  A purchase order line can have linked detail lines or back order lines. A detail line can also have linked back order lines. The purchase order line holds the aggregated information of the detail lines/back order lines. Changed fields on the purchase order line are synchronized with the detail lines and vice versa.
- **Purchase order commingling**
  To reduce the number of purchase orders and obtain the best available prices and discounts, you can commingle purchase orders. Commingling enables you to group various purchase orders that originate from different sources into a single purchase order.
- **Direct delivery**
  On a sales order or service order, you can indicate whether you want the sold goods to be directly delivered. In case of a direct delivery, a sales order or service order results in a purchase order. Because the buy-from business partner delivers the goods directly to the sold-to business partner, Warehousing is not involved.
- **Cross-docking and splitting deliveries**
  To fulfill an existing sales order for which no inventory is available, you can take inbound goods immediately from the receipt location to the staging location for issue. To initiate this process, you must generate a cross-docking order. If a cross-docking order exists and a split receipt is required, you can further split up a receipt line into several receipts.
- **Purchase backorders**
  If a final receipt is made for a purchase order (detail) line and only a part of the goods or none of the goods are received, a backorder is created. Backorders can be manually or automatically confirmed.
- **Subcontracted service items**
  In case of operation subcontracting, purchase orders can include subcontracted service items. These purchase orders can be generated from a production order, of from a converted purchase requisition, or request for quotation (RFQ) with a linked production order.
- **Project pegging**
  To identify costs, demand, and supply for a project, you can peg project costs for purchase order lines.
- **Customer furnished materials**
  To call off customer furnished materials required by a production order to produce a customer item, you can use purchase orders of the **Customer Furnished Materials** type. These automatically generated purchase orders inherit the demand peg of the demand order.
- **Consignment**
  You can use consigned inventory, for which inventory ownership and storage are handled by different parties, and choose between a basic or extended consignment setup.
- **Supplier stage payments**
  Supplier stage payments enable customers to pay suppliers before or after the ordered goods are actually received for a purchase order. The payments are spread over a period of time

and the amounts must be paid to the supplier on specific dates. The purchase order item's invoice flow is separated from its goods flow.

- **Integration procurement and freight**
  Freight is the package that handles transportation requirements. Because Procurement is sometimes responsible for the transportation of goods and must consequently collect goods from a supplier, you can generate a freight order from the purchase order.
- **Integration procurement and depot repair**
  Depot repair serves to repair or upgrade parts. An integration is available between Service and Procurement to buy repair parts or to subcontract the repair or upgrade. Service can create a work order that posts its requirements to Procurement. The generated purchase order's origin is **Maintenance**.
- **Printing reminders**
  You can print reminders to inform business partners of undelivered purchase orders.
- **Printing claims**
  Occasionally, during the receipt process, the quantity received does not match the packing slip quantity. If suppliers ship less than what is on their packing slips, claim notes can be printed.
- **Purchase return orders**
  A return order is a purchase order on which returned shipments are reported. A return order can contain negative amounts only. With a purchase return order, you can send back inventory units or return rejected goods to the supplier. Most of the time, these goods are rejected during inspection.
- **Changing prices or discounts after receipt or consumption**
  You can change prices or discounts for purchase orders after receipt or consumption.
- **Copying purchase orders**
  You can copy existing purchase orders to new ones from the actual orders or the order history.
- **Printing purchase invoices**
  You can print purchase invoices to compare the data in your system with the data (invoices) you get from the buy-from business partner.
- **Purchase order history**
  You can use purchase order history to track creations and modifications to purchase orders. You can keep certain information after the original purchase order is removed.

Purchase Contracts

Purchase contracts are used to register agreements with a buy-from business partner for the delivery of specific goods.

These agreements can be registered at the following levels:

- **Purchase contract lines**
  In contract lines, the agreements with a business partner about the delivery of a particular item or group of items for a specified period of time are registered. These agreements are

focused on total quantities, prices, and discounts. You can specify an effective period and indicate whether the minimum quantity to purchase is binding.

- **Terms and conditions agreements**
  In terms and conditions agreements, detailed terms and conditions regarding orders, planning, logistics, invoicing, and demand pegging regarding the sale, purchase, or transfer of goods, are registered. A purchase terms and conditions agreement must be linked to a normal purchase contract before you can use it.

Contract types

You can specify these contract types:

- Normal contracts
- Special contracts

For each purchase business partner, you can close multiple special contracts in one period. In a specific period, you cannot specify more than one normal contract per item or price group for a buy-from business partner.

Purchase contracts are used as the basis of purchase orders or purchase schedules. The data specified in the purchase contract serves as a parent of the data that you specify in the linked purchase order or purchase schedule.

When creating planned purchase orders or purchase schedules from Enterprise Planning, during the supplier selection process, purchase business partners are searched for who can supply the required item. Based on the priority search levels specified on the **Buy-from BP Search for Purchase Schedules** and **Buy-from BP Search Orders** tabs of the Purchase Contract Parameters (tdpur0100m300) session, purchase contracts can be used to search for these purchase business partners. If valid business partners are found, they are sent to and selected by Enterprise Planning.

- **Specifying purchase contracts**
  The normal purchase contract procedure includes the creation of a purchase contract header and purchase contract lines with purchase contract price revisions and logistic agreements.
- **Corporate purchase contracts**
  Corporate purchase contracts are used by multisite companies to negotiate contractual agreements with a buy-from business partner, after which price agreements are centrally specified (by purchase contract line), and logistic agreements are decentrally specified (by purchase contract line detail). Corporate purchase contracts allow you to make keen price agreements on a corporate level and to use these prices on site level.
- **Retrieving purchase contracts**
  How purchase contracts are retrieved depends on whether the contract must be linked to a purchase order or a purchase schedule.
- **Discount schedules on contracts**
  You can link one or more discount schedules to a purchase contract.
- **Delivery contracts**
  If you specify a contract and you know the time-phased delivery details, you can create a delivery contract instead of a purchase schedule. A delivery contract is not a real schedule, but a schedule solution to generate purchase orders on time.

- **Copying purchase contracts**
  You can copy existing purchase contracts to create purchase contracts.
- **Evaluating purchase contracts**
  If a purchase contract is used for a purchase order or a purchase schedule, you can evaluate the purchase contract during and after the purchase order or schedule procedure. During the contract's effectivity period, you can check if the deliveries take place as agreed in the contract. At the end of the contract's effectivity period, you can check if the agreed quantities were met.
- **Purchase contract additional processes**
  You can use several additional processes in the purchase contract procedure, such as activating or deactivating a range of purchase contracts, printing purchase contract acknowledgements, copying quotations to purchase contracts, creating RFQs from purchase contracts, printing termination letters, terminating, and deleting purchase contracts.

Purchase Schedules

A purchase schedule is a timetable of planned supply of materials. Purchase schedules support long-term purchasing with frequent deliveries and are usually backed by a purchase contract. All requirements for the same item, buy-from business partner, ship-from business partner, purchase office, and warehouse are stored in one schedule. Purchase schedules are used instead of standard purchase orders in cases where full visibility and time phasing of material requirement information is required. Therefore, purchase schedules provide a more detailed way to specify the delivery dates/times per item.

The following types of purchase schedules exist:

- **Push schedule**
  A list of time-phased requirements, generated by a central planning system, such as Enterprise Planning or Project that is sent to the purchase business partner. Push schedules contain both a forecast for the longer term and actual orders for the short term. A push schedule is a non-referenced schedule.
- **Pull forecast schedule**
  A list of time-phased planned requirements, generated by Enterprise Planning, that is sent to the purchase business partner. Pull forecast schedules are only used for forecasting purposes. To order the items, a pull call-off schedule must be generated with the same schedule number as the pull forecast schedule. Similar to a push schedule, a pull forecast schedule is also a non-referenced schedule.
- **Pull call-off schedule**
  A list of time-phased specific requirements of purchased items, triggered from Assembly Control, Shop Floor Control, or Warehousing (KANBAN, Time-phased order point). A pull call-off schedule is a referenced schedule.

- **Push schedules**
  The generation and processing of push schedules includes several steps.
- **Pull forecast schedules**
  The generation and processing of pull forecast schedules includes several steps.

- **Pull call-off schedules**
  The generation and processing of pull call-off schedules includes several steps.
- **Constraints for generating nonreferenced purchase schedule lines**
  The following constraints can prevent Enterprise Planning to generate or update non-referenced purchase schedule lines: frozen zone settings, generation horizon of the patterns, expiry date of the contract, and the **Firm Planned** status of the schedule line.
- **Sequence shipping schedules**
  Sequence shipping schedules are pull call-off schedules that are generated from Assembly Control through the order-controlled/SILS supply system. To update a sequence shipping schedule line, the assembly order that generated the sequence shipping schedule line must be changed.
- **Configured items on purchase schedules**
  Configured items can be purchased via purchase schedules, which contain the configuration information (options and features) needed for the supplier to produce the product.
- **Purchase releases**
  A purchase release is used to send out, under one release number, several schedules with similar characteristics.
- **Purchase schedule release types**
  Purchase schedule release types determine the type of purchase release and the requirement types that can be sent.
- **Clustering purchase schedule lines**
  Clustering is used to group several non-referenced schedules lines in one purchase release.
- **Receipts on push schedule lines**
  For push schedules, goods are usually received against a blanket warehouse order and the purchase release usually contains clustered schedule lines. When goods are received, the goods are distributed over the schedule lines with the oldest unfulfilled requirement of the type **Immediate** or **Firm**.
- **Inspecting scheduled items**
  If scheduled items must be inspected upon receipt, approved and rejected quantities are retrieved from Warehousing. The type of schedule, push schedule or pull call-off schedule, determines how the inspection results are communicated to Procurement.
- **Purchase schedule authorizations**
  Suppliers ship purchase schedule items based on the requirement type. The **Firm** requirement type, however, can deviate from the earlier received **Planned** requirement type. If you use authorizations, before the **Firm** requirement type is communicated, a buyer gives a supplier permission to fabricate goods or to buy raw materials up to a certain quantity level. The essence of an authorization is that you bear the risk if you do not need the goods. In other words, you must pay for the fabrication and/or raw materials, whether or not the goods are actually required.
- **Purchase schedule cumulatives**
  Purchase schedule cumulatives (CUMs) are used to do the following: keep track of a schedule's total ordered and received quantities, calculate overdeliveries and underdeliveries for push schedules, and inform the supplier on the received quantity.

- **Project pegging**
  To identify costs, demand, and supply for a project, you can peg project costs for purchase schedules.
- **Purchase schedule history**
  You can use purchase schedule history to track when purchase schedules were created or maintained. You can keep certain information after the original purchase schedule is removed.

Purchase Vendor Rating

If multiple purchase business partners are available from whom you can purchase raw materials and supplies, you must determine which business partner to use. To make an informed decision, you can use the vendor rating procedure to measure the performance of vendors based on a vendor rating.

Objective criteria and subjective criteria can be used to calculate vendor ratings. The objective criteria are ratings generated by LN and only depend on current data and a weighting factor. The subjective criteria ratings are based on data that you specify. The overall vendor rating is calculated by LN.

- **Setting up vendor ratings**
  Before you can use the vendor rating procedure, you must specify the vendor rating parameters, objective scoring schemes, subjective criteria, subjective values, and a classification scheme.
- **Calculating vendor ratings**
  To calculate the vendor ratings after orders are processed and questionnaires are compiled, you must update the vendor ratings. You can do a net update or a full update of the vendor ratings.

Statistics

You can use Statistics to gain insight into the intake, turnover, and cancellation of orders and schedules. Statistics controls the activities that are required to define the desired format and layout for transferring historical data or actual data to statistical information. You can create user-defined statistical reports and displays to view this information, which facilitates data analysis.

You can also use Statistics to enter budgets. Budgets are used to compare the actual sales or purchases (statistics) with the estimated sales or purchases.

- **Statistics**
  To use the statistics procedure, you must specify the master data, levels for statistics, parameters, sort codes, budgets, and layout codes. You can then update, print, archive, and delete the statistical results.

Chapter 9
Warehousing

9

Introduction

Use Warehousing to control item storage and inventory.

Warehousing focuses on handling and replenishing goods under the roof of a warehouse, and the derived tasks to report and analyze inventory movements. Planned and actual inventory transactions are created by a particular demand for receiving or issuing goods. Any inventory movement results in a warehousing order to be implemented.

The main functions and features of Warehousing are described in these topics:

Warehouse Master Data

Warehousing Master Data constitutes the central part of Warehousing, and is used to create master data for the transactions in LN for which a warehouse process is mandatory.

- **Item data**
  In **Items - Warehousing**, you define and maintain warehousing-specific data for all items used in Warehousing. This data is required for all activities involved in warehouse processing. In **Warehouse - Item**, you can define item data for specific warehouses.
- **Serialized items**
  In Warehousing, you can use serial numbers to track serialized items through receipts, transfers, storage, or issues, the latter of which is mandatory. You can also track serialized items back to their source. The source of a serialized item is, for example, the purchase order or the production order that caused the receipt of the serialized item, or the sales order or the work order that caused the issue of the serialized item.

  The need to track items by means of serial numbers mainly arises from the items' cost. The more expensive the item, the more closely you want to monitor the item during its life cycle.

  In general, expensive items are produced and handled in relatively low quantities, whereas the goods flow of less expensive items involves higher quantities. In LN, this concept is modeled in the low volume and the high volume scenarios that provide various options to register serialized items.
- **Lot and serial registration templates**
  Lot and serial registration templates are used to specify the order origins and transaction types for which serial and/or lot registration must take place. This applies to lot and serial numbers that are not registered in inventory but registered during issue or during both receipt and issue.
- **Lot control (not in inventory)**
  Lot control (not in inventory) is a special type of lot control intended for high-volume, low-value items. If you apply lot control (not in inventory) for a particular item, LN does not record the inventory for each combination of lot and warehouse, and location. You can still record information about each lot, such as lot number, buy-from business partner, manufacturer, and certificate number. This information is used for quality assurance.
- **Package definitions**
  A configuration of items and their packaging. A package definition for an item can be, for example, a pallet that contains 12 boxes and each box contains 4 pieces. The package definition specifies how the items must be packed. If you use handling units, the package definition determines the handling unit structure and the packaging details for the handling units that are used to pack the items.
- **Full packaging of material**
  This constraint can be applied to the material quantities and packing method that is received by customers. For example, car manufacturers frequently accept only full packaging material, such as crates, boxes and pallets. At each packaging level in a packaging structure, you can specify whether full packaging is applicable for all the levels within the packaging structure or only for specific levels.

- **Shipping material accounts**
  Shipping material accounts are used to register packaging items issued and received per address, for the purpose of communicating with business partners about the quantities of packaging items and their payments and to monitor packaging material balances.
- **Replenishment matrices**
  Replenishment matrices are used to automatically control the quantity of items on pick locations. Based on a replenishment matrix, you can automatically generate warehouse orders to replenish pick locations, and also directly process the orders. Replenishment matrices are defined by linking pick locations to bulk locations.
- **Warehouses**
  The warehouse is the place where all received goods are stored originating from purchase, production, and so on. These goods are retrieved from the warehouse later on for production, sales, service, or transport to another warehouse. You can optionally divide a warehouse into locations or zones.
- **Locations**
  Locations are the sections of the warehouse where items are actually stored. Locations can optionally be assigned directly to an item or item group, or by means of storage conditions. Note that the use of locations within a warehouse is not mandatory. Locations can have the following types:
  - Receiving location
  - Inspection location
  - Bulk location
  - Staging location
  - Pick location
  - Reject location
- **Zones**
  A zone is a part of the warehouse that can be assigned to specific employees or vehicles. Each location can be assigned to a zone. Locations that work with other locations or locations with identical or similar purposes can be grouped into zones.
- **Warehousing procedures**
  A warehousing procedure includes various steps called activities that control the processing of warehousing orders or handling units.
- **Warehousing order types**
  A code that identifies the type of a warehousing order. Warehousing order types are classified by inventory transaction type. The inventory transaction type that you add to a warehousing order type determines the type of warehousing procedure(s) that you can link to the warehousing order type. The default warehousing procedure that you link to a warehousing order type determines how the warehousing orders or handling units to which the order type is allocated are processed in the warehouse, although you can modify the default procedure for individual warehousing orders or order lines.
- **Assembly kits**
  An Assembly kit is an order-dependent set of items that must be supplied together to the shop-floor warehouse. To specify the items that must be part of an assembly kit, you must

link the assembly kit to a warehouse and item combination. You can only use assembly kits if the supply method for the warehouse and item combination is order controlled/SILS.

- **Forecast methods**
  LN provides various forecast methods, which you can finetune to meet your organization's requirements.
- **Inventory valuation**
  A method to calculate the inventory value. The inventory is valued at either its fixed price or its actual receipt price. Because the inventory value can change with time, the age of the inventory must be recorded. The following inventory valuation methods are available:
  - **Fixed Transfer Price (FTP)**
  - **Moving Average Unit Cost (MAUC)**
  - **First In First Out (FIFO)**
  - **Last In First Out (LIFO)**
  - **Lot Price (Lot)**
  - **Serial Price (Serial)**
- **Label layout and printing**
  You can use label layout and printing to create and maintain labels for different purposes related to different processes in LN.
- **Storage conditions**
  You can use storage conditions to avoid the storage of items at unsuitable locations.
- **Error recovery**
  You can use the following options to recover information that was lost or damaged on account of a calamity:
  - **Rebuild Planned Inventory Transactions**
  - Check and Repair Inventory
  - **Check and Repair Quantity in Transit**
  - Check and Repair Cost Peg Transfer Balances
- **Integration with WMS**
  You can set parameters for integration with the **Infor Warehouse Management System** or any other Warehouse Management System (WMS).

Inventory Planning and Analysis

You can use Inventory Planning to review all planned inventory transactions and handle inventory commitments.

- **Planned inventory transactions**
  Any requirements for inventory issues, receipts, transfers, or item transfers originated by other packages, result in planned inventory transactions in Inventory Planning. When the planned inventory transactions result in actual inventory transactions, a warehousing order is generated.

- **Inventory commitment**
  Inventory commitment allows you to reserve inventory for specific orders. Inventory commitments can be cancelled. You can also use the allocation and hard pegging to allocate inventory to orders, provided that this functionality is in use at your organization.
- **Order Controlled/Single setup and order generation**
  Order Controlled/Single is a demand-pull system that regulates the supply of items to shop floor warehouses. A production order for a specific product pulls the required items from a supply warehouse to the shop floor warehouse. A direct link is established between the production order for which the items are required, and the warehousing order that regulates the supply of the required items to the shop floor warehouse.
- **Generate order advice (SIC)**
  You can use order advice (SIC) to replenish purchased and manufactured items based on the order horizon and reorder point. You can use the orders (TPOP) to replenish the items for a specific warehouse based on time-phased supply system within an order horizon.
- **Generate orders (TPOP)**
  You can use order advice (TPOP) to replenish items for a specific warehouse based on time-phased supply system within an order horizon. The orders are generated based on the safety stock and projected on hand of the item and warehouse combination.
- **ABC analysis**
  ABC analysis is the logistical method of inventory valuation. ABC analysis categorizes the items based on the level of priority and the quantity of their usage.
- **Slow-moving analysis**
  A slow-moving analysis is another logistical method of inventory valuation. slow-moving analysis calculates the turnover rates that are compared with the slow-moving percentage. This calculation results in a classification of items into ten categories in which the best category has the highest ratio of actual issue/inventory on hand.
- **Demand forecast calculation for each period**
  The level of demand that is expected in future periods. The demand forecast is based on historical demand data and can be used to determine the optimal safety stock and reorder point.

  The buffer inventory necessary to meet fluctuations in demand and delivery lead time. In general, safety stock is a quantity of inventory planned to be in inventory to protect against fluctuations in demand or supply. In the context of master production scheduling, safety stock is the additional inventory and capacity planned as protection against forecast errors and short-term changes in the backlog.

  These are the available demand forecast methods:
  - Moving Average
  - Exponential Smoothing
  - Previous Year's Calculation
  - Last Period's Demand

Warehouse Orders

You can use Warehouse Orders to:

- Receive items
- Issue items
- Cross-dock and/ or transfer items between warehouses
- Inspect items
- Adjust inventory
- Perform cycle counts
- Assemble kits

- **Warehousing orders**
  Warehousing order initiates and controls transactions in Warehousing. The transactions can be generated either manually or automatically within other packages or modules. All the inventory transactions in Warehousing are initiated and controlled by using warehouse orders. One or more warehousing order controls the inventory movement and the related inventory movement account from a simple transfer order to a complicated receipt. Inventory Planning of Warehousing tracks planned inventory transactions and also provides the option to generate supply orders through planning methods like SIC (Statistical Inventory Control), TPOP (Time Phased Order Point) and Kanban.

- **Manual entry of warehouse orders**
  You can directly (manually) create warehousing orders, which do not originate from other orders, such as sales orders or purchase orders.

  The following types of manual warehouse orders exist:
  - **Sales (Manual)**
  - **Purchase (Manual)**
  - **Service (Manual)**
  - **Maintenance Sales (Manual)**
  - **Maintenance Work (Manual)**
  - **SFC Production (Manual)**
  - **Transfer (Manual)**

  After you create a warehousing order and an outbound order line and/or an inbound order line, a report can be printed.

- **Inbound order lines**
  Inbound order lines consist of the activities that relate to the receipt of goods in a warehouse. An inbound order line provides detailed information about planned receipts and actual receipts, such as:
  - Item data
  - Ordered quantity
  - Warehouse of issue

- **Outbound order lines**
  Outbound order lines consist of the activities that relate to the issue of goods from a warehouse and the preparation of these goods for shipment. An outbound order line provides detailed information about planned issues and actual issues, such as:
  - Item data
  - Ordered quantity
  - Warehouse and location of receipt
- **Warehousing assembly orders**
  Warehousing assembly orders are used to collect goods in order to assemble them into one item/kit. Warehousing assembly orders transform goods within the warehouse. In a warehousing assembly order you can pick and combine items to produce an end item that remains in the warehouse. When a warehousing assembly order is created, these lines are generated:
  - Outbound-order lines for each component of the kit to be transferred to the assembly warehouse or location.
  - An inbound-order line to store the item to be assembled.
- **Inventory disposition**
  Inventory disposition is an alternative method to handle rejected inventory. After you receive an initial rejection for received items, you can use Inventory disposition to manage follow up activities, such as scrapping, reworking, returning, or using the inventory "as is".

Inventory Change Orders

You can use inventory change orders to:

- Change the ownership of items
- Allocate the inventory
- Generate cost peg transfers

- **Inventory ownership**
  When the ownership of an item changes, payment is due and invoicing is initiated. Inventory ownership change orders are used to change the ownership of the inventory from supplier to customer and vice versa. In traditional, non-VMI business scenarios, the ownership of an item changes from the supplier to the customer after the customer has received the item from the supplier. The customer must pay for the item on receipt of the goods.
  - **Time-based ownership change**
    If the ownership change for consigned goods is time based, according to the contract drawn up between the supplier and the customer, the ownership of the inventory changes after a particular period:
    - After receipt, according to legal requirements.
    - After receipt, as specified in the contract drawn up between the supplier and the customer.

- After the latest transaction. The ownership changes after a number of days in which no receipts or issues have taken place. This applies if the basic ownership rule is consigned, and no receipts or issues (consumptions) have taken place in a particular period specified in the contract.

- **Consumption-based ownership change**
  If the ownership change is consumption based, according to the contract drawn up between the supplier and the customer, the ownership of the goods changes from the supplier to the customer when the customer consumes the items for production or sale. After the customer becomes the owner, the customer must pay for the goods.

- **Allocation change orders**
  Allocation change order is the commission that is used to change the allocation of the inventory. The inventory allocation is changed if the order for which inventory allocated is cancelled. To change the allocated-to inventory, the specification for a particular item quantity in a warehouse must be changed. The items can be contained in handling units.

- **Cost peg transfers**
  Cost peg transfer functionality enables transfer of cost between two different pegs (pegged to unpegged and vice versa) within the same warehouse. The cost peg transfers do not physically move the inventory but only transfer the cost of the inventory. You cannot transfer goods across warehouses.

  Business partner must be defined for the ship-from peg and the ship-to peg for cost peg transfers when the ownership of the inventory is **Customer Owned**. In case of cost peg transfers, the ownership can only be **Company Owned** or **Customer Owned**. The cost peg transfers cannot be generated automatically during the generate outbound advice process for the issue of customer owned materials.

- **Cost peg transfers - borrow/ loan - payback process**
  Temporary cost peg transfer (borrow/ loan - payback) functionality enables you to transfer the inventory between the cost pegs temporarily. In this process, the inventory is borrowed from another peg that has the same item linked, but with a later demand. The borrowed inventory is registered with the lending project cost peg even though the inventory is moved to another project cost peg that has an immediate demand (the inventory is only borrowed).

Cross-docking

Cross-dock orders are used to transfer the inbound goods immediately from receiving location to staging location for issue. Cross-dock order lines are generated only for inbound order lines that have a planned receipt date that matches with the planned delivery date of the outbound order line considering the cross-dock lead time between the two dates. The types of cross-docking:

- Static
- Dynamic
- Direct Material Supply

- **Cross-docking**
  When you use cross-docking, received goods are directly assigned to the shipping process. The cross-docking corresponds to the physical flow of the goods as they are moved directly from the receiving dock to the shipping dock. This prevents superfluous inbound and outbound handling.
- **Cross-dock order priority**
  LN assigns a priority to the cross-dock orders for an item. This priority indicates the order in which cross-dock order lines must be generated for the cross-dock orders. First, cross-dock order lines are created for cross-dock orders with the highest priority. Next, the cross-dock order lines for cross-dock orders with subsequent priority are generated.
- **Cross-dock restrictions**
  For cross-docking, you can define restriction rules. LN uses the set of rules included in a restriction definition to determine whether to create cross-dock orders. The rules are checked one after the other. If a valid condition is met, no cross-dock orders will be created. If no rule applies, LN permits the creation of cross-dock orders.

Direct Material Supply

Direct material supply is a supply method that uses pending receipts and available inventory on hand to meet high priority demand. This method is followed within a cluster of warehouses specific to a user. In DMS, goods are directly shipped to the customer warehouse from the supplier instead of the own warehouse.

Direct material supply (DMS) can be run in several ways:

- Automatically
- Interactively
- Manually

- **Direct material supply (DMS)**
  Direct material supply concept implies that goods received from suppliers or produced in manufacturing shops move directly to their point of consumption without storing it in a ‘storage’ warehouse. The DMS concept uses the Cross-docking concept to avoid storage of goods in the warehouse, and the Warehouse Transfer Order concept to move the goods directly to the point of consumption, which is probably another warehouse.
- **Warehouse supply structures**
  Warehouse Supply Structures are defined for direct material supply, a user-specific cluster of warehouses, which consists of one or more supply warehouses and a number of destination warehouses. Before using direct material supply, at least one warehouse supply structure must be defined.
- **Planning priority rules**
  If you use direct material supply (DMS), you can define planning priority rules for cross-docking. These rules specify conditions that can be applied to a specific situation and a specific order,

and result in a priority figure when applied to a specific order. Aggregating the priority figures of all applicable priority rules results in a planning priority, which in turn is used as the system priority.

- **DMS planning and processing**
  The Direct material supply (DMS) orders require proper planning to ship the goods directly to the customer from the supplier instead of supplier's own warehouse. The received goods are either cross-docked to the customer if urgently required, or putaway temporarily. LN supports three methods of DMS planning:
  - DMS upon receipt
  - DMS upon SFC receipt
  - DMS on inventory

Handling Units

Handling units are used to define the packing structure of items. A handling unit is a uniquely identifiable physical unit that consists of packaging and contents. Every handling unit has a structure for packing materials and items. A handling unit can contain items registered in Warehousing and can contain other handling units. You can manually create a handling unit structure for a given number of items, or you can define a package definition in which you set up a template that determines the handling unit structure for particular types of items.

You can use a handling unit for warehouse processing if the handling unit is linked to the entity that represents the applicable warehouse movement, such as:

- Inbound or outbound warehousing order line
- Receipt header or receipt line
- Inspection line
- Inbound or outbound advice line
- Shipment header or shipment line

- **Handling unit structures**
  A handling unit structure shows how items are packaged by means of handling units. A handling unit can have a hierarchical structure that consists of several handling units that are related in a parent - child structure. A handling unit structure includes these elements:
  - **Top**
    Handling unit that includes the entire structure, such as a pallet.
  - **Parent**
    Handling unit that is linked to the top and includes one or more children, such as a box on a pallet.
  - **Child**
    Handling unit that is linked to a parent, such as items that are packed in a box.

- **Multi-company handling units**
  You can use handling units in multi-company warehouse transfers. If you transfer a handling unit using a multi-company warehouse transfer and the shipment is confirmed, the handling-unit structure of the shipment is copied to the ship-to company.
- **Generate handling units from ASNs**
  You can generate handling units from advance shipment notices (ASNs) in the Shipment Notice (whinh3600m000) and/ or Shipment Notice - Lines (whinh3101m000) sessions. LN allows you to generate handling units if the **Handling Units in Use** check box is selected in the Master Data Parameters (whwmd0100s000) session.

  When a packing structure with an External Handling Unit (the ID of the container provided by the business partner) is linked to the ASN line, LN generates a handling unit structure based on the parent-child relationship between the External Handling Unit(s) and the Parent External Handling Unit(s).

Receipts/ Inspections

A warehouse receipt is the physical acceptance of goods in the warehouse. A receipt registers information such as the quantity of the goods, receipt date, packing slip data and inspection data.

Warehouse inspections can be carried out both for the incoming goods and the outgoing goods. In Warehousing, an inspection is an activity of the warehousing order type that is linked to a warehouse order. The inspections are carried out at a location that is defined as an inspection location. Warehouse inspections can be carried out for virtually all incoming and outgoing goods flows.

- **Advance Shipment Notice (ASN)**
  An advance shipment notice is a notification that a shipment has been sent. Advanced shipment notices are usually sent and received through Electronic Data Interchange (EDI). You can receive advance shipment notices from your supplier informing you that goods are to arrive at your warehouse, or you can send advance shipment notices to your customers that their ordered goods are about to be delivered. ASN’s can also be used later on for recording actual receipts.
- **Goods Received Note**
  A goods received note lists the expected items and their quantities. On a goods received note you can note the item quantities received at the warehouse and compare these with the receiving documents provided by the supplier.
- **Receipt of goods**
  When receipts are created, they must be confirmed before the goods are stored in the warehouse. You can perform the receipt of goods for the following types of records:
  - Advance shipment notices (ASNs)
  - ASN lines
  - Expected orders
  - Expected order lines
  - Handling units

- Loads and shipments

- **Warehouse inspections and order origin**
  Warehouse inspections can be carried out for the goods that are received. Resulting from inbound warehouse inspections, items can be approved, rejected or destroyed.

  LN provides flexibility in setting up inbound inspections. For example, you can specify that inbound inspections are carried out for specific types of warehousing orders by adding the warehouse inspections activity to the required warehousing order types and the applicable order origins of the warehousing orders. However, whether or not a purchase receipt inspection takes place mainly depends on the Item-Purchase and Item-Purchase-Business Partner setup.

- **Receipt and inspection procedure**
  Inbound management ensures that received goods are stored in a warehouse that includes receipt and the inspection procedures. During the inbound process, you can flexibly define, adjust and carry out various activities.

Inbound

The inbound process is used to receive and store goods in a warehouse. To receive and store goods in a warehouse, you can process the inbound order lines on which the goods are listed, or you can process the handling units used to pack the goods. Both inbound order lines and handling units are processed according to user-defined warehousing procedures. If you use handling units to process goods, the order lines related to the handling units are updated in the background.

- **Run number**
  A run number is a code assigned to a group of warehousing order lines when they are advised. LN assigns or generates a run number if a user does not manually enter or select a run number while he generates inbound or outbound advice for a group of warehousing order lines.

  For inbound movements, the user can generate storage lists and confirm storage lists by run. For outbound movements, the user can release outbound advice, generate picking lists, and confirm picking lists by run.

- **Generate and put away inbound advice**
  Inbound advice is a list generated by LN that indicates the location where received goods must be stored, taking into account storage conditions, blockings, and so on. Inbound advice consists of the instructions to move received items into a warehouse. An example of inbound advice line: Take 10 pieces of item A from location Receipt 3 and put them in location Bulk 5.

  Inbound advice is normally generated according to the warehousing procedure defined for the warehousing order lines related to the receipt lines, or handling units for which inbound advice must be created. You can also manually create an inbound advice. For non-location controlled warehouses, LN skips the inbound advice steps.

- **Inbound and outbound procedures**
  User-defined warehousing procedures control the inbound, storage, and outbound goods flows in your warehouse. A warehousing procedure includes various activities that determine

the way goods are processed in the warehouse. The warehousing inbound flow comprises the following default procedures:

- Receipt
- Inspection (this may be an ‘empty’ procedure if no inspection is required)

- **Storage list**
  A storage list states the warehouse locations where goods must be stored. A storage list is used by warehouse personnel to place the received items in the correct bulk/pick location in the warehouse. The storage lists are shown for each run number and for each storage mission. The use of storage lists is optional.

- **Peg distribution in the inbound and inspection processes**
  Receiving project pegged goods into a warehouse results in inventory transactions that are based on the underlying peg distribution of the related receipt line, which in turn are based on the project peg distribution linked to the Warehouse Inbound Order Line. This results in an update of the pegged inventory levels. Planned inventory transactions are also generated for each peg.

Outbound/ Inspections

The outbound process is used to issue goods from the warehouse. To issue and ship goods from a warehouse, warehouse processing is either based on handling units or warehousing order lines and outbound shipments. If you use handling units to process goods, the order lines and/or shipments related to the handling units are updated in the background.

- **Run number**
  A run number is a code assigned to a group of warehousing order lines when they are advised. LN assigns or generates a run number if a user does not manually enter or select a run number while he generates inbound or outbound advice for a group of warehousing order lines.

  For inbound movements, the user can generate storage lists and confirm storage lists by run. For outbound movements, the user can release outbound advice, generate picking lists, and confirm picking lists by run.

- **The outbound procedure**
  The outbound and shipment procedures comprise the activities that you must perform in LN to issue and, if required, inspect goods that you want to ship from the warehouse. This procedure also describes all steps, also called activities, of the outbound and inspection procedures and shows how the steps can be executed. The outbound warehouse inspections can only be approved or rejected.

- **Outbound advice**
  Outbound advice is a list generated by LN that advises the location and lot from which goods must be picked, taking into account factors such as blocked locations and the outbound method. If serial numbers are recorded in inventory, these will also appear on the outbound advice.

Outbound advice comprises the instructions to move items to be issued out of the warehouse. An individual outbound advice line might read as follows: Take 10 pieces of item A from location Pick 3 and put them in location Staging 5.

After the outbound advice is generated for the outbound order lines, you can modify the outbound advice. If the **Full Packages Only** functionality is implemented and the modified advised quantity is not in multiples of full packages, a warning message is displayed. During the confirmation of shipments, you can modify the advised quantity to multiples of full packages.

- **Peg distribution in the outbound process**
  During the outbound process, issuing project pegged goods from a warehouse result in inventory transactions that are based on the peg distribution. During outbound advice and inspections, the outbound order line cost peg distribution is updated with the advised quantities, approved quantities, and the rejected quantities. When the goods arrive at the staging location and are shipped, the actual pegs are created. During the confirmation process, the shipment line peg distribution is created.

- **Outbound Inspections**
  Unlike inbound inspections, the outbound inspection is not a warehousing procedure in its own right, but an activity that you can add to the outbound procedure. Inspections are optional, because not every warehouse and not every item requires inspections.

  If the inspection activity is included in the warehousing procedure, LN creates an inspection record after the outbound advice is released or the picking list is confirmed, causing the items to be moved to the staging location. The status of the related outbound order lines changes to: **To be Inspected**. You can then move the outbound goods to an inspection location where you can approve or reject goods.

- **Picking list**
  A Picking list is a document that lists the material to be picked for manufacturing, shipping, or other orders. This document is used by operating personnel to pick the necessary items and components from the indicated locations. You can generate picking list for every run number and generate a new picking list for a new picking mission.

- **Interchangeable effectivity units for outbound process**
  For project pegged outbound order lines, you can interchange the effectivity units when there is no inventory available for the ordered effectivity unit.

- **CINDI process**
  To order components from suppliers, automobile manufacturers apply various procedures that all automotive suppliers must comply with. One of these procedures is called CINDI, which is an extensive procedure consisting of these aspects:
  - Transport ID
  - Distribution Zone/ Routing Code
  - RAN/ KANBAN number/ Delivery call number
  - Point of consumption/ Point of destination

Shipments

A shipment is a document listing the goods that must be transported to a specific address on a specific date and time by using a specific route.

- **Shipments and loads**
  A load consists of one or more shipments, and a shipment has one or more shipment lines. Loads, shipments, and shipment lines are generated by Warehousing or by Freight. During the outbound procedure, Warehousing generates loads and shipments for outbound order lines with status **Staged**, unless an actual Freight load plan is present.
- **Delivery notes**
  A delivery note is a transport document that provides information on a consignment contained in a single truck or other vehicle and refers to an order or a set of orders for one consignee at a delivery address. It is one of the shipping documents, in addition to packing slips, bills of lading, etc. that can be part of a shipment procedure. You can use various parameters to control the usage of delivery notes or other shipping documents.
- **Advance Shipment Notice (ASN)**
  An advance shipment notice is a notification that a shipment has been sent. Advanced shipment notices are usually sent and received through Electronic Data Interchange (EDI). You can receive advance shipment notices from your supplier informing you that goods are to arrive at your warehouse, or you can send advance shipment notices to your customers that their ordered goods are about to be delivered.
- **Manual shipments**
  In addition to generating shipments for warehousing orders, LN enables you to manually create shipments and shipment lines. Manual shipments are used to ship goods without performing LN warehousing procedures and related financial transactions. You can use manual shipment and shipment lines to register goods transports for items not registered in LN, or goods transports for which no warehouse orders exist. For manually created shipments, you can print delivery notes.
- **The shipment procedure**
  This procedure includes the steps, also called activities, that you must perform in LN to ship goods that were issued from the warehouse by means of the outbound procedure.
- **Shipping Sequence**
  For shipments based on sales schedules, you can view the shipping sequence. The shipping sequence informs you about the sequence in which your ship-to business partner needs the items on the assembly line. Therefore, you must ship the goods in the specified sequence.
- **Consolidation of stockpoints**
  A stockpoint is the smallest inventory level that you can register in LN. It includes data such as the item, inventory date, and, if defined, lot number and location. You can use the **Consolidate Stock Points in one Shipment Line** option to consolidate the outbound advices of an order with different stockpoint details into a single shipment line even if the outbound advice contain multiples of the following:
  - Lots (in inventory)

  - Serials (in inventory)
  - Inventory Dates
  - Effectivity Units
  - E-Item Revision (via the lot)
- **Packaging Reference Distribution**
  When goods are picked and linked to a shipment, the packaging reference distribution is created or updated and is used when handling units are generated for a shipment line. This is applicable only for the shipment lines that are created for a sales schedule. The distribution is created based on the outbound order line reference distribution.
- **Shipment Acceptance**
  Shipment acceptance is part of the shipping process applicable for the Material Inspection and Receiving Report (DD Form 250).

  The report comprises a set of prescribed information relevant to the shipping process and can be used for invoicing. The report is generated as part of the shipping process and includes acceptance of the goods by the customer. This report must be used by the contractors working for the US Government.
- **On-time shipments**
  A stacked bar chart is available for viewing on-time shipments, early shipments, and late shipments for a specific warehouse over a specified period of time.
- **Completed shipments**
  A stacked bar chart is available for viewing completed shipments and unfinished shipments for a specific warehouse for a specified date range.

Cycle counting and Adjustment orders

Cycle Counting is used to count the inventory and verify the registered inventory against the actual inventory at any point in time. You can use cycle count orders to manually count the inventory by stockpoint and subsequently enter the counted quantities into LN.

Inventory Adjustments are used to change the inventory registered by LN manually at a specific stockpoint. Inventory adjustment orders must be created to perform inventory adjustments.

- **Easy Adjustment Entry**
  A user-friendly way to create inventory adjustment orders. If the inventory adjustment is for a serialized item, you must specify the serial numbers for which the inventory variance occurs.
- **Cycle counting variances context application**
  This context application shows a bar chart displaying cycle counting variances by warehouse or by item group for a specific warehouse and a specified date range.

Blocking

You might have to block part of a warehouse or particular items from moving around in a warehouse.

- **Blocking levels**
  You can block inbound movement, outbound movement, transfer (receipt, issue), or assembly of items at various inventory levels:
  - Zone
  - Location
  - Lot
  - Stockpoint
  - Serialized item

  At each of these levels, you can block one or more transactions. You can also block or (un)block inventory at these levels for all transactions simultaneously.
- **Blocking pegs**
  Blockings on peg level are generated when the item is Project Pegged. Whenever the user enters a manual block, blocked inventory is recorded on the project peg level.
- **Generate NCMR for blocked stockpoints**
  You can generate a non-conformance material report (NCMR) for blocked stockpoints. This report identifies non-conformance of material during Warehousing or Quality inspection, or during the movement of the materials and/or when the material is in stock.

  You can view existing NCMR reports and create new NCMR reports for blocked stockpoints.

Inventory Reporting

You can use Inventory Reporting to generate all kinds of reports and inquiries about inventory, specific inventory transactions, and cumulative item issue by period and warehouse. You can also record the current inventory position at various inventory levels and multiple entities.

The inventory position is recorded at the following inventory levels:

- Item
- Warehouse
- Location
- Inventory date
- Lot
- Serial Number

Inventory is displayed for the following entities:

- Multi-company inventory
- Projected inventory
- Rejected inventory

- Consignment inventory
- Negative inventory
- Committed inventory

You can use Lot Control to trace the origin of the incoming and outgoing lot and serialized items and find the location where they are used.

Transactions that influence inventory positions or movements in a warehouse are recorded and archived. You can use this information to track and trace the inventory movement.

- **Negative inventory**
  Negative inventory is displayed for a specific entity. If you allow negative inventory, you can deliver goods for an order when goods are physically available, but not yet registered in LN.
- **Rejected inventory**
  You can use LN to store and handle rejected goods in a warehouse. Rejected inventory can also be stored and handled in a specific location, which is called a reject location. LN handles rejected inventory against the specification as determined in the original purchase order and purchase order line.
- **Inventory disposition**
  Inventory disposition is an alternative method to handle rejected inventory. After you receive an initial rejection for received items, you canmanage follow-up activities such as scrapping, reworking, returning, or using the inventory "as is."
- **Lot control**
  Lot control enables you to trace the origin of incoming and outgoing lots, and to find out where these lots are used. You can record information about each lot, such as lot number, buy-from business partner, manufacturer, and certificate number. This information is used for quality assurance. If the item is not lot controlled, effectivity units are not recorded in the warehouse inventory. There are two types of lot control:
  - **Lot control (in inventory)**
    The lot control (in inventory) method offers a high level of detail. LN generates separate receipt lines, inbound advice lines, outbound advice lines, and shipment lines for each lot. The specific location of the lot in inventory is also known. This method can lead to a administrative burden if mistakes were made in the lot quantities. Therefore, this method is less suitable for high-volume, low-value items, such as nuts and bolts.
  - **Lot control (not in inventory)**
    Lot control (not in inventory) is a special form of lot control intended for high-volume, low-value items. If you apply lot control (not in inventory) for a particular item, LN does not record the inventory for each combination of lot, warehouse, and location. You can still record information about each lot, such as lot number, buy-from business partner, manufacturer, and certificate number information that is used for quality assurance.
- **Serialized items**
  The need to track items by means of serial numbers arises from the items' cost. The more expensive the item, the more closely you want to monitor the item during its life cycle.

  In general, expensive items are produced and handled in relatively low quantities, whereas the goods flow of less expensive items involves higher quantities. In LN, this concept is modeled

in the low volume and the high volume scenarios that provide various options to register and track serialized items.

Inventory Costing

You can use Inventory Analysis to perform these analyses:

- ABC analysis
- Slow-moving analysis
- Inventory valuation method

- **Inventory variance posting**
  The difference between the valuation amount that is recorded after the receipt of goods and the updated value for that particular receipt. Processing of inventory variances results in financial transactions that clear the interim variance account, and if possible assign the variance to inventory.

  An inventory variance can be created under these conditions:
  - Receipt price is changed after the receipt is confirmed.
  - Invoice price differs from the receipt price.
  - Production order is closed and the actual cost price differs from the estimated cost.
- **Inventory valuation**
  You can use different valuation methods in LN such as Fixed Transfer Price (FTP), Moving-Average Unit Cost (MAUC) to perform inventory valuation. Each valuation method results in a particular inventory value in the ledger. The value in the ledger does not always represent the real value of the inventory.
- **Moving Average Unit Cost (MAUC)**
  Moving-Average Unit Cost (MAUC) is an inventory valuation method that is used for accounting purposes. The MAUC is the average value for each unit of the current inventory. Inventory is valued against the average receipt price. For each new receipt, the MAUC is updated. To calculate the inventory value for an item, the MAUC inventory valuation method uses all types of transactions. MAUC is the financial method for inventory valuation.
- **Inventory value**
  - You can view the bar chart for inventory values by warehouse or by item group for a specific warehouse using the Inventory Value (whina8351m000) context application.
- **Inventory turns**
  - You can view the bar chart for inventory turns by warehouse or by item group for a specific warehouse using the Inventory Turns (whina8353m000) context application.

WMS Interface

WMS interface is used to define parameters for integration with **Infor Warehouse Management** or any other WMS.

- **Integration with WMS**
  You can set parameters for integration with **Infor Warehouse Management** or any other WMS. These are some of the restrictions that can be used in WMS-controlled warehouses:
  - Adjustment orders
  - Back flushing
  - Blockings
  - Locations
  - Package definitions
  - Warehouses
  - Warehouse Inspections

  You can activate warehousing orders through the Activate Warehousing Orders (whinh2203m000) session. Order lines that belong to a warehousing order header can be sent at once to the WMS. In other words, the information to the WMS is sent by order.
- **Restrictions for WMS-controlled warehouses**
  LN provides access to the data of the WMS - controlled warehouses that use **Infor Warehouse Management** or any other WMS with some restrictions.
- **WMS and the warehousing reconciliation procedure**
  You can reconcile the data in the Infor LN Warehousing and the **Infor Warehouse Management** or any other WMS. These steps describe the warehouse reconciliation procedure:
  - Initiate reconciliation
  - Reconcile inventory
  - Analyze reconciliation results
  - Process cycle counting order

  The process cycle counting order step updates the inventory only. but not other related orders.

Chapter 10
Freight

10

Introduction

You can use Freight to plan or subcontract the transportation of inbound and outbound goods, which helps you select the most cost-effective way to get goods in and out of the site at the correct times.

Freight supports this functionality:

- Freight order control
- Transport planning
- Subcontracting
- Carrier selection
- Transport costing
- Transport rating
- Invoicing

The main functions and features of Freight are described in these topics:

- *Freight Master Data (p. 109)*
- *Freight Order Control (p. 112)*
- *Freight Planning (p. 114)*

Freight Master Data

Freight Master Data are used to make Freight work in the preferred way. Freight includes the following master data:

- **Shipping offices and planning groups**
  The shipping office and planning group entities play a vital role in freight order grouping and load building. A load is the largest consignment for which Freight plans transportation. A load includes a number of items travelling in a specific type of vehicle to one or more given

destinations on given dates and times via a specific route. Shipping offices are responsible for the planning or subcontracting of transportation of goods listed on orders. Planning groups are used to group freight order lines into shipments and loads or freight order clusters.

- **Addresses**
  The addresses that are maintained in Freight originate from Common. You can add specific freight related data to each address, including:
  - Areas
  - Shipment procedures
  - Lead times, including load and unload date/time tolerances
  - Distances between addresses
- **Address lead times**
  Address data includes loading and unloading lead times and load and unload date tolerances. Address lead times indicate the time required for loading and unloading at addresses, including loading and unloading tolerances. Tolerances indicate the time span by which you are allowed to deviate from planned load or unload dates.
- **Items**
  When sales orders, purchase orders, distribution orders, or warehouse orders require transportation, freight orders are created from these orders. Freight orders are created automatically, per batch, or sometimes manually. During this process, the freight orders are provided with specific freight related information.
- **Transport means groups**
  Transport means groups are used to group items on freight order lines into shipments and loads or freight order clusters, and to determine the costs of transportation. Each means of transport defined in Freight belongs to a transport means group. A transport means group is a classification that subdivides means of transport into groups, such as:
  - Vans
  - Trucks
  - Container ships
  - Cargo aircraft

  For each transport means group, you can define average speed and loading capacity.
- **Combination codes**
  Combination codes are used to prevent the load building and freight order clustering engines from creating loads or clusters for undesirable combinations of items.
- **Transport types**
  A transport type is a code that refers to transport conditions and transport properties. You can use transport types to ensure that the items are transported by means of transport with appropriate conditions and to determine the cost of transportation.
- **Freight classes**
  Freight classes are used to group freight order lines by planning group and to determine an item's transportation price. Freight classes are mainly used in the US. A freight class is the classification of an item in terms of:
  - Product density (pounds per square foot)
  - Stowage (size, weight, and shape)

- Handling
- Liability (the item's value)

- **Freight order types**
  You can use freight order types to classify the freight orders and group freight orders and freight order lines by planning group. This enables the load building engine to build load plans from the grouped freight orders.

- **Freight service levels**
  A freight service level is used to express the agreed duration of transportation. These are added to the freight orders, order lines, and shipments by using freight order types. You can use freight service levels to determine the transportation costs of a load or the freight rate for a freight order.

- **The use of volume and weight classes**
  A volume class is allocated to a range of volumes, for example, from 1 gallon to 10 gallons. Volume classes can be used to determine the planning group of freight order lines. A weight class is allocated to a range of weights, for example, from 10 lbs to 50 lbs. A class code is a code used to identify volume classes and weight classes.

- **Shipping office matrices**
  A shipping office matrix is used to link shipping offices to freight orders. This is an integral part of the load building process. . By means of shipping office matrices multisite freight management and planning scenarios can be supported.

- **Plan matrices and matrix definitions**
  A plan matrix is a set of attributes and values used as selection criteria for a planning group. When a freight order is allocated to a shipping office, the order lines of the freight order are allocated to the planning groups of the shipping office. To determine the planning group for a freight order line, plan matrices are used.

- **Allocate additional costs**
  An additional cost set consists of a code and a description. To each additional cost set, you must link one or more selection criteria and one or more cost items. In the cost items, the actual additional cost amounts are stored. The criteria for shipment lines and cluster lines to be charged with extra costs and the amounts are maintained in additional cost sets. If a shipment line or a cluster line matches the criteria of an additional cost set, extra charges are added to the shipment line or cluster line. These costs usually refer to additional handling costs, toll costs, and so on.

- **Rate basis numbers and rate books**
  A rate basis number in LN is a code that is used to determine applicable carrier transport rates and client transport rates. It represents a combination of one or more of the following attributes:
  - Freight class
  - Transport means group
  - Transport type
  - Planning group

- **Zones**
  Freight rates can be based on distances and/or zones, and a range of other elements, such as weight, and optionally, service level, carrier, and volume. A zone consists of the following elements:
  - Zone identification
  - Zone Type
  - Carrier
  - Zone information
- **Route plans**
  A route plan is a network of loading and unloading addresses, some of which are pooling points. A route plan can consist of more than one leg. Each leg, or part of the route, can be handled differently, depending on the specified transport category and transport group. Addresses are linked to route plans.
- **Standard routes**
  A standard route is a fixed route that is traveled with a particular frequency, such as a truck that visits delivery addresses according to a fixed schedule, a rail service, or a boat service. Usually, transportation via standard routes costs less than travel via non-fixed routes.

Freight Order Control

Freight orders provide information about goods that must be transported, and provide major input to transport planning and subcontracting. The main purpose of the Freight Order Control is to maintain freight orders, and to keep track of freight orders in the course of their life cycle, both before and after their transportation has been planned and executed, or before and after they have been subcontracted.

You can use Freight Invoicing to release invoicing data for transport costs to Invoicing. The invoicing data is used by Invoicing to create invoices for transport costs to internal and external business partners. Some business partners are invoiced for estimated freight costs, others are invoiced for actual freight costs listed on the carrier invoice, and sometimes invoicing is based on other agreements.

- **Create freight orders**
  Freight orders originate from warehouse, sales, purchase, distribution (EP) or service orders, possibly in different logistic companies. Freight order generation can take place automatically or in a batch. You can also manually create freight orders.
- **Freight order statuses**
  After a freight order is created, the freight order will go through several stages until the goods reach their destination and are paid. These stages include both inbound and outbound goods transports. The freight order status shows the current stage of the freight order or freight order line.
- **Invoicing process**
  In Freight Invoicing, you can generate invoices for transportation costs. These can be transports of purchased goods from suppliers or sold goods to customers. Organizations usually subcontract the transportation of these goods to a carrier. Most organizations have agreements

with their customers and suppliers on how much they can charge for transportation: the full amount they had to pay to the carrier, some special rate, or no charge at all.

Invoices for freight costs are based on freight orders. To create invoices, the invoicing information from these freight orders must be released to Invoicing. Here, the invoices are created and sent to the business partners. You can make use of combined invoices containing sales and freight amounts, for example.

- **Invoicing methods**
  The following invoicing methods are used to determine the amount invoiced to business partners for freight charges:
  - **Freight Costs**
    The amount invoiced to the business partner depends on the moment the costs are calculated: before, during, or after transportation takes place. Before: the amount is based on the ordered quantities and the carrier rates. The carrier rates are maintained in the Pricing module. When calculated at some point during or after transportation, the amount charged can be different if the transported quantities, the transportation time, or the transportation mode have changed at the moment the costs were calculated. These changes occur if, for example, the planned transport capacity was unavailable.
  - **Freight Costs (Update Allowed)**
    The freight costs are based on the carrier rates maintained in Pricing, which is the same as for the **Freight Costs** invoicing method.

    If differences occur between the freight cost amount invoiced to the business partner and the transportation costs actually incurred, this invoicing method enables you to send another invoice to the business partner charging him with the difference.
  - **Client Rates**
    Client rates are freight rates agreed on with an organization's business partners. These rates are maintained in the client freight rate books in Pricing. The invoiced amount may be an agreed or even fixed amount based on the client rates, regardless of the actual costs incurred.
  - **Not Applicable**
    No invoicing.
- **Internal and external invoicing**
  In Freight Invoicing, invoices can be created for both internal and external business partners. External business partners are the customers or suppliers on whose behalf the transportation costs are incurred. Internal business partners are departments in larger organizations that can be invoiced internally. The shipping offices arrange transportation on behalf of internal business partners such as:
  - sales offices
  - purchase offices
  - service departments
  - warehouses
- **Calculation of estimated freight costs**
  For loads and shipments, Freight calculates the estimated freight costs of loads and shipments during load building. For freight order clusters (created for subcontracting purposes), Freight

calculates the estimated freight costs during freight order clustering. The Freight calculation engine is also used to calculate estimated freight costs for individual order lines of the following types:

- Sales order lines
- Sales quotation lines
- Freight order lines

- **Subcontracting**
  Subcontracting is the process of offering freight orders to an external carrier for transportation. You can create load plans for the freight orders and offer the planned loads to a carrier, or you can offer clustered freight order lines for which no load building is performed. The freight orders can be clustered based on a range of common criteria, such as delivery dates, service levels, shipping offices, transport means groups, overlapping time windows, planning groups and so on, to be subcontracted to a carrier.

- **Cluster and cluster line status overview**
  A freight order cluster is a group of freight order lines with matching properties that is subcontracted to a carrier. These properties include shipping offices, planning groups, transport means groups, and overlapping time windows.

  Cluster headers and cluster lines have various sets of statuses. Cluster header statuses indicate the progress of the cluster during the freight order cluster subcontracting process. Cluster line statuses have the same status as the corresponding freight order lines.

- **Change freight order clusters**
  Freight order clusters can be frequently changed for various reasons. For example, if a carrier is not available, you must specify a different carrier. Also, if a customer orders more goods, you must create freight order lines. You can rerun the clustering process to include the new freight order lines. Depending on the properties of the new freight order lines, you can add the properties to the cluster, or you can create a new cluster.

- **Confirm delivery/receipt for clusters**
  In Freight, you can set the status of batches of cluster lines to **Shipped** or **Completed**. Using this option, you can indicate the progress through warehousing and transport.

Freight Planning

Freight planning is used to plan the transportation of inbound and outbound goods, which helps you select the most cost-effective way to get goods in and out of the site at the correct times. Freight also provides general overviews of required or available transport capacity for specified periods of time.

- **Rough Planning**
  Rough planning provides estimates of both available transport capacity and required transport capacity in a given period of time. Those responsible for freight planning can use these estimates to see how much transport capacity is available to them, how much they need, and, if necessary, arrange additional capacity from their carriers.

The transport capacity requirement overviews are based on aggregated volume, weight, and floor space figures of selected freight orders for a time span defined by the user. The volume, weight, and floor space figures can be presented in selected measuring units. You can print daily, weekly, and monthly requirement reports over a selected period. You can also display the overviews in a chart.

- **Load building**
  Load Building is the core functionality of Freight. The primary purpose of load building is to plan the transportation of goods from your warehouse to the customer, from your supplier to your warehouse, or from a supplier directly to your customer, in the most efficient and cost-effective manner. Alternatively, you can employ this functionality for goods movements between your warehouses, or from warehouse to production environment and vice versa.

  The load building engine creates a load plan from a range of freight orders and freight order lines selected by the user. A load plan consists of a number of loads. Each load consists of a number of shipments.

  The load building engine offers various planning options and three basic planning methods. You can create various load plans from the same freight orders, each time using a different planning method and/or different planning options, to see which method or options provide the best result.

- **Planning methods**
  Load Building uses the following planning methods, or planning algorithms:
  - **Direct Shipping**
    A shipment is transported directly from the start address to the end address. Order lines can be combined in a shipment if the addresses and the dates match. Each shipment created from the selected freight orders and freight order lines is put in a separate load.
  - **Consolidation**
    Shipments that partially travel the same route are combined. For example, freight order A must go from Amsterdam to Paris, and freight order B from Paris to Geneva. Result:
    - Load A: Amsterdam-Geneva.
    - Shipment A1: Amsterdam-Paris and shipment A2: Paris-Geneva.
  - **Pooling**
    Multiple fixed addresses, such as distribution centers, ports, and so on, are visited. The transport route usually consists of several legs. At one of the legs, shipments travel the same way and are pooled together to go to their destination or to a distribution point. At the distribution point, the shipments are reallocated to various means of transport to be taken to their final destination.

    For example, a shipment of 50 bicycles is sent from Amsterdam to New York, another shipment of 50 goes from Amsterdam to Philadelphia, and a third shipment of 20 bicycles goes from Amsterdam to Pittsburgh. The first leg of the transport route is from Amsterdam to Rotterdam. Rotterdam is the pooling point, where the bicycles are loaded aboard a ship. At the distribution point in New York, they are unloaded from the ship and reloaded onto trucks that take them to their respective final destinations in New York, Philadelphia, and Pittsburgh.

- **Gantt chart**
  The Load Building module provides a Gantt chart that gives a timeline overview of loads and shipments as well as a capacity overview of resources: transport means groups, transport means combinations, and means of transport.

- **Load plan, load, and shipment maintenance**
  In Load Building, you can maintain the load plans, loads and the shipments created by the load building engine. Maintenance activities can include status changes or changes to other settings in the load plans, loads, or shipments.

- **Means of transport selection**
  In Freight you can plan transport for individual means of transport. This functionality supports transport planning for organizations that run their own fleet, but it can also plan for means of transport that are not self-owned. When load building is carried out for a range of freight orders, available means of transport are scheduled for the load created from the selected freight orders. If no means of transport have been defined, loads are created without allocating specific means of transport. After the load building procedure is carried out, you can manually modify the means of transport to loads.

- **To use Freight Management for direct deliveries**
  To use Freight to plan or cluster direct deliveries, freight orders are generated from purchase orders that are linked to direct delivery sales orders or service orders. Since the goods are directly transported from the buy-from business partner to the sold-to business partner in direct deliveries, the warehouses defined in LN are not involved. Therefore, the freight orders, clusters, loads, and shipments are not updated from Warehousing, but only from the direct delivery sales order and related purchase order in Order Management.

- **Freight Management in multisite environments**
  In multisite environments, freight orders can be generated from originating orders created in various logistic companies. The freight orders are planned or clustered and executed in one or more designated freight planning companies. When the freight order generation process is performed, the freight orders are allocated to a freight planning company.

  Actual loads and shipments are sent to the originating companies where Warehousing can execute them. The actual shipping information is then sent back to the freight planning company. In the freight planning company, the loads can be completed and closed. Most freight master data is shared across the logistic companies within the multisite setup.

  All freight planning and executing information is only available in the freight planning company, this is the company of the freight order. The freight planning company can be any logistic company in the multisite structure.

  If any information is requested for a freight order line from an originating company, LN automatically displays or returns the required information from the freight planning company of the freight order line. Similarly, if a process in freight management requires information from or sends information to the originating company, LN automatically goes to the originating company.

Chapter 11
Service

11

Introduction

Excellent service is important to businesses that want to retain their customers' confidence. A good information system can be an advantage in offering such service.

Use the Service package to manage the maintenance, repair, and overhaul of field-based and plant-based products, equipment and systems. Service and maintenance can be provided for many products such as computer equipment, medical equipment, climate control equipment, and automotive products.

The main functions and features of Service are described in these topics:

Master Data Management

Use Master Data Management to maintain Service master data such as:

- **Service type**
  Service type is used to identify the conditions under which a service is provided, such as preventive maintenance (PM), and breakdown-based maintenance. This also provides a basis for planning, and logistic and financial analysis; you can also use service types to differentiate repair warranty application. You can link the warehouse order procedures that have either the Issue or Receipt type to a service type.
- **Tasks**
  A task is a specification of the type of work that is carried out by a service employee. You can use tasks to specify the labor required to carry out an activity. You can link a specific labor rate to a task.
- **Checklists**
  A checklist provides a list of checks to be carried out while performing an activity. These checks can be useful, and can be copied while carrying out service order or work order activities. Checklists are used to group specific tasks so that more than one task can be defined for a reference activity.
- **Coverage type**
  A financial classification that indicates to what extent work is covered under warranty or contract, and what part of the activities can be charged. Coverage types are used to identify coverage under various agreements, such as warranties, contracts, or quotations. A coverage type is also used as a differentiation while defining reference activity.
- **Service department/ Service areas**
  A service department is a department that consists of one or more persons or machines with identical capabilities that can be considered as one unit for the purposes of service and maintenance planning.

  A service area is a specific geographic area that is covered by one or more service engineers (employees). A service area can be linked to a service center.

  Service areas offer the functionality to maintain service engineers, serviceable serialized items, main area, and average travelling time.
- **Skills**
  The specific knowledge or technical expertise that a service engineer must have to carry out service or maintenance activities. For example, knowledge of electricity and specific equipment. Skills can be general skills in nature, such as knowledge in software coding, electrical appliances skills, plumbing skills or can be specific / special ; for example, equipment such as aircraft will require special skills to complete repairs or address problems.
- **Service employee**
  A service employee is a person who works for the service department. Service employees are those used mostly for service-related activities, such as carrying out orders, registering or handling calls, sales representatives for service sales, supervisors, dispatchers, or handlers. Each service employee must be defined with General and People (HR) related details.
- **Service kits**
  A service kit is a mobile warehouse in which components used during service activities are stored. A service kit is defined and used in Service domain, but the inventory transactions are done as in any Normal or Service warehouse, including the replenishments.

- **Location**
  You can assign a location to both service department and the work order. The service department of the location and the work order must be the same. You cannot assign a location to a closed work order or delete a location that is assigned to a work order.

- **Service Item Data**
  Service item data consists of default Service values for items. For manufactured or purchased items, you can define specific details that are used when either maintaining or selling service items. For example, you can specify certain details regarding subcontracting, and logistic details required in the service processes. For subcontracting purposes, you can also define this information for items that have the Service or Cost type. You can define customized items to use while servicing PCS projects that are identified as physical breakdown structure. Items are used at various places in repository definition and transactions. Items can be used in defining the bill of materials, as item breakdown, and in inheriting details into serialized items specified by the customers.

- **Default item data**
  You can define default item data so that the same data is used for similar service items. You can define the default item-data for the combination of :
  - Item type
  - Item group
  - Item category
  - Service item group
  - Serialized item group (optionally)

- **Reference activities**
  In the Activity Management, you can maintain the definitions of all the work that can be carried out for maintenance reasons. You can create a repository of reference activity that contains various types of static information.

- **Master routings and routing options**
  A master routing identifies a collection of operations that must be carried out. You can link one or more master routings to an item. For example, Repair and Overhaul are both master routings that you can apply to a machine.

- **Service inspections and preventive maintenance scenarios**
  Service inspections covers the following functionality:
  - Measurement are used to determine the value of an item's variable (measuring quantity) in a specific situation, for example, tire treads depth. When measurements are registered for serialized items during inspections, maintenance notifications are generated, based on predefined maintenance triggers.
  - Maintenance Trigger Set is a set of maintenance triggers used to trigger maintenance notifications when performing measurements. A maintenance trigger set is linked to a measurement type. A maintenance triggers set can be linked to counter readings that is linked to a serialized item.
  - Counter groups can be used to support advanced measurement scenarios. Counter groups are used for numeric measurement types only. The counter group is used to default the

counter readings when a serialized item is created. On a counter reading, it is possible to determine where the inspections are sourced from.

- Rule book for maintenance trigger sets specifies the use of a particular maintenance trigger set while performing a measurement for a specific position on a product.

- **Service Item Analytics**
  Service item analytics covers the following functionality:
  - Calculate Service Performance Indicators - The following can be calculated on Service installations (Serialized item/Cluster):
    - Availability of the serialized item
    - Mean Time to Repair (MTTR)
    - Mean Time Between Failure (MTBF)
  - Calculate Uptime analysis - You can use this analysis to compare the uptime promised as part of service contract for a serialized item and the actual uptime of the serialized item.
  - Calculate Repair Costs - You can calculate and print the repair costs on calls, service orders, and maintenance sales order for a serialized item/cluster.

Configuration Management

The scope of Configuration Control is to serve the customer, production, or planning department with accurate information on the configuration of assets, called the installed base. These assets can be serialized items owned by customers, or internally owned equipment. The Configuration Control consists of a multi-level configuration structure definition and handling. The functionality allows you to:

- Describe how the configuration or asset is built up, such as assets components, or levels, as defined in the physical breakdown structure.
- Define a warranty for an asset or component. Also define if repair warranty is applicable.
- Define an item breakdown template.
- Generate service configurations from Sales or Project, production bill of material in Manufacturing, or added directly to the configuration structure as a physical breakdown of serialized items. Customized items can also be copied using these processes.
- Copy selected production bill of material as item breakdown structure.
- Present a graphical overview of the configuration.

- **Create physical breakdown**
  Configuration Control features provide the ability to monitor the physical breakdown structure of various customer-owned or company-owned assets. To achieve a logical grouping of serialized item structures, you can group the structures under installation groups, such as a site. You can manually create a serialized item, or modify existing items. Serialized items are the building blocks of physical breakdown structures.

  You can create a breakdown structure from:

- **As-built structure**
  Item breakdown

- Sales order (line)
- ASCII file
- Project-breakdown structure
- Bill of Materials

- **Maintain physical breakdowns**
  You can set up a physical breakdown to manage product configurations (breakdown structures) during service and maintenance activities. The physical breakdown is used to display the relation between serialized items.

- **Delete physical breakdowns**
  You can delete the physical breakdown of the related top-serialized items and all associated child serialized items simultaneously.

- **Item breakdown**
  An item breakdown is a standard item's list of constituent components. The item breakdown can be displayed as a multilevel structure or as a single-level structure, and can be used as input for a physical breakdown.

- **Serialized items**
  Serialized items are customer-specific or owner-specific configurations that consist of items such as photocopiers, computers, air conditioners, forklifts, lathe machines, or aircraft. You can manually create a serialized item, or modify existing items. Serialized items are the building blocks of physical breakdown structures. These serialized items are uniquely numbered and can be status controlled. Each serialized item is life cycle controlled from various parts within Service. Based on this, a serialized item can exist in various locations, such as in configuration, in depot repair, in transit, or in a warehouse.

- **Serialized item groups**
  A serialized item group is a group of serialized items with similar features. Use the Serialized Item Groups session to define a serialized item group.

Contract Management

Service contracts describe the obligations between the service supplier and the external customer. Service contracts make service business more predictable with steady revenue streams. However, the contracts must be handled properly. You can use item price lists to create a quotation for a customer. You can select and customize a contract template. You can define contract terms and conditions such as pricing method, and expiry date for specific business requirements. The contract can be invoiced by installments.

- **Warranties**
  Warranties are agreements out of product assurances made with the sale of various products. The assurance is offered in terms of providing free or discounted service for particular lock-in periods, and then providing free or discounted services for problems that might occur. Warranty details consist of the duration, effective period, and the type of warranty. A warranty can be

offered as an Owner/Manufacturer type, Supplier type, or Non-Specific type. A number of coverage terms to be covered by the warranty can be defined on each warranty definition.

- **Warranty handling on customer claims**
  The cost lines linked to a customer claim can be covered by warranty. The warranty can be a serialized item control warranty or generic warranty. The warranty that is applied to the service order activity can be of type **Serial Warranty** or **Generic Warranty**.
- **Warranty handling on service order/activity/maintenance sales order**
  The cost lines linked to a service order activity or maintenance part lines can be covered by warranty. The warranty can be a serialized item control warranty or generic warranty. The warranty that is applied to the service order activity can be of type **Serialized Item Warranty** or **Generic Warranty**.
- **Contract quotations**
  Through this business asset, you can define and manage quotations for service contracts. Successful quotations result in a service contract; unsuccessful quotations can be canceled. Both types can be posted to contract history.
- **Service contracts**
  A sales agreement between a service organization and a customer for a specific period, that states the configurations (installation groups or serialized item) to be maintained, the coverage terms, and the agreed price.
- **Installment templates**
  A template that specifies an invoice method, the interval between two installments, the installment variant, and the method in which the number of financial periods of an installment should be specified. The template can be used in contract quotations and service contracts.
- **Service-contract templates**
  These templates are generic contract templates and can be made specific to the item with a definition of price per period. These templates are not specific to customers, and do not have specific configuration lines because the templates themselves are specific to items. However, contract templates provide an easy, predefined way to copy terms and agreements into contracts. You can define coverage terms and cost terms within each template, and you can copy these coverage and cost terms into the respective contract configuration line. You can set effective period for templates, so you can always use templates in practice.
- **Coverage terms - phased vs. non-phased**
  A coverage term stores agreements on the duration, the cost covering method, and the costs of these agreements. You can create coverage terms for a service contract or quotation, installation group, coverage type, term type, or sequence number. The cost amounts and sales amounts of the term are also stored. The defined coverage terms are valid for the entire duration of the service contract. You can phase these terms, depending on time or on the value of the main counter of a counter model. The coverage terms can be further specified in the cost terms.
- **Terms in contract management**
  Terms contain the details of the agreements between the business partners. You can define terms and conditions for:
  - A service-contract template

- A service-contract quotation
- A service contract
- A service-order quotation
- **Using price terms and coverage terms**
  You can use coverage terms and/or price terms for a service contract applicable for service orders/maintenance sales orders.
- A warranty

- **Recalculation of sales price and linking of a contract on service order**
  If the pricing data on the Service Order/Service Order Activities is modified, the sales price must be recalculated. You can also link/unlink a service contract with pricing terms to the Service Order.
- **Recalculation of sales price and linking contracts to the MSO**
  If the pricing data is modified on the MSO Part Line and the Coverage Line, the sales price must be recalculated. You can also link/unlink a service contract with pricing terms to the MSO.
- **Linking pricing contract on call**
  You can unlink/link a service contract with pricing terms on a call.

Service Quotations

Use Service Order Control to create the order quotations, plan the order, and monitor the implementation of the order, process the order, book costs, and trigger invoicing. You can also use service orders to perform on-site repair, replace, or upgrade the serialized items or the installation groups. You can define orders such as internal and external orders, orders related to the work performed, scheduled and not-scheduled orders, inspections, preventive and corrective work.

- **Service Quotations**
  A service order quotation is a statement of price, terms of sale, and description of services and materials, that can be sent to a prospective business partner. The business partner data, payment terms, and delivery terms are listed in the header. The data about the activities and materials are specified on the quotation lines.
- **sales quotations**
  A maintenance sales quotation, also known as bid, is a statement of price, the terms of sale, and a description of goods or services offered by a supplier to a prospective purchaser; a bid. The customer data, payment terms, and delivery terms are contained in the header; the data about the actual items is entered on the quotation lines. When given in response to a request-for-quotation, a bid is usually considered an offer to sell.
- **Tax calculation on Maintenance Sales Quotation**
  The amounts specified on the Maintenance Sales Order are transferred to Invoicing for tax calculation. The tax calculation is based on the bill produced. A late payment surcharge must

be levied over the amount which is not received on time. The tax must be paid for this late payment surcharge and Infor LN must calculate and print this surcharge.

Call Management

You can register and handle calls for products. You receive alerts about existing calls on the selected business partner at the time of registration. A central call center with several local call centers in various time zones can be supported. The registered calls can be assigned to any support center or support engineer. When assigned to a specific support engineer, the call is routed to that individual's queue for processing. Calls can also be assigned to a business partner (subcontractor). You can use email to transfer the call. This email has an attachment that contains all relevant call information.

- **Call handling**
  The call handling process steps include registering the call, assigning the call, processing the call, solving the call, and delivering the solution.
- **Escalated and deferred calls**
  Escalated calls refer to all calls that must be processed to avoid escalation. Deferred calls are calls that must be handled. The status of deferred calls does not change within the specified period.
- **Call diagnostics**
  If you register a call, you can enter the problem and the item details. You can then initiate the diagnostic tree specific to the equipment. You can select a potential problem and solution with the help of a diagnostic tree.
- **Diagnostic tree construction**
  A diagnostic tree in Call Management is an information structure that contains a set of questions, along with their expected answers, that is used to help you solve problems. You can attach the expected problem and solution to an answer. A follow-up question can also be attached, which is used to elicit more details before providing a solution. You can also specify an item related to the answer, which enables you to switch to the diagnostic tree of the related item, and search the diagnostic tree's path for a solution.
- **Priorities**
  Call priorities are used to rank calls for call handling purposes. A call has two priorities:
  - Initial priority: When the call is registered, LN calculates the amount of time left to call solution and, based on this value allocates an initial priority.
  - Actual priority: When call processing is initiated and the call timer starts, the actual time left to call solution (start or finish) is determined by LN. Based on this value, an actual priority is allocated to the call by LN.
- **Response time**
  The response time is the time period between the registration of the call and the response. Response times are used to calculate the initial and actual priorities of a call and planned dates.

- **Transfer a call to a service order**
  If a call cannot be solved by the support engineer within the normal service requirements, the call can (with the appropriate authorization) be transferred to a service order.
- **Call invoicing**
  You can use Central Invoicing to invoice the business partner for the service calls that you handle. Before you invoice a call, you must first set the following invoicing parameters in the Call Parameters (tsclm0100m000) session:
  - **Invoice after Call**
  - **Time Interval**
  - **Cost Component**
  - **Coverage Type**
  - **Path for Labor Rate**
- **Statistics - problems and solutions**
  You can maintain call statistics. The statistics data is used in the probability analysis, when a call is solved or a service order activity is completed.
- **Service resolution - probability analysis**
  The service resolution - probability analysis is updated if:
  - A call is solved, and the associated details are added.
  - A service order activity is created either from a call or manually. This history data is updated when the activity is updated.

Preventive Maintenance

Service Planning & Concepts allows you to use Preventive Maintenance (PM) for assets. These assets can belong to the customers or could be your own internal assets. The planned activities can be covered by service contracts and could be agreed upon with the customers and, therefore, must be automatically controlled by the service order system.

- **Preventive maintenance scenario**
  Preventive maintenance scenarios are used as the basis to generate planned activities. A maintenance scenario has scenario lines based on which planned activities can be generated, based on time and usage, according to a predefined pattern.
- **Rule book for maintenance scenarios**
  The rule book is the book that contains rules that define which maintenance scenarios must be used when a maintenance plan is generated.
- **Generate maintenance plan**
  You can plan maintenance activity for the installation group and serialized item that the service organization manages. The maintenance planning provides the maintenance activities that must be carried out in the long term. A maintenance plan can be generated only if a maintenance scenario is defined for the serialized item.

- **Planned activities**
  Planned activities are the fixed moments on which preventive maintenance, by means of planned activities, must be carried out on serialized items/installation groups. Service maintenance planning shows the demand of service activities in the long term and can be used as input for the service order procedure. Maintenance planning can be generated from the maintenance concept.
- **Transfer planned activities to service orders**
  You can create planned activities and transfer the planned activities to service orders.

Territory Planning

Use the Territory planning process functionality to perform territory and preferred engineer simulations. The objective is to reduce travel by clustering the interchangeable work in geographical areas. The territory engine compares the required capacity for the serials, with the available capacity (the engineers or simulations engineers). The process calculates the best possible combination of the required capacity for the serialized item and the available capacity. Optionally, an engineer can made responsible for a territory and the optimal territories can also be calculated.

Group Planning

- **Group planning data set-up**
  The purpose of Group Planning functionality is to assign a service engineer to a service order or a service department to a work order/planned activity. Group planning prepares groups which are containers of work, that can be assigned to a resource.
- **Route-based planning process**
  Group Planning can be used for time-based planning or route-based planning. When a route is planned for group planning activities, travel distances and travel times are calculated for activities. The route can influence the sequence in which the activities are executed. After planning a route, the route planning data is copied from group planning to the original service order activity, when the plan is released from group planning.
- **Resource allocation for group planning**
  The allocation of resources to planned groups and activity sets is the last step in the Group Planning process. Resources can be service engineers or service departments. The allocation of resources can be executed manually, semi-automatically, (wherein LN proposes the resource and the user selects the resource manually), or automatically. The allocation can be based on skills, and/or planning attributes.

Field Service

Use Service Order Control to create the order quotations, plan the order, and monitor the implementation of the order, process the order, book costs, and trigger invoicing. You can also use service orders to perform onsite repair, replace, or upgrade the serialized items or the installation groups. You can define orders such as internal and external orders, orders related to the work performed, scheduled and not-scheduled orders, inspections, preventive, and corrective work.

You can use the Service Scheduler Workbench to manage and perform planning activities.

- **Service orders**
  Service orders are orders that are used to plan, carry out, and control all repair and maintenance on configurations at customer sites or in company.
- **Field change orders (FCO)**
  The production department or marketing department can begin a field change order (FCO). Production errors or component updates can trigger a field change order. The associated configurations or assets are selected. You can inform customers about problems that may occur and an expected time for repairs to equipment. When an FCO is used, costs are charged to the marketing or production department, and customers get the replacements and service activities.
- **Plan and Release Service Orders**
  After you create a service order with the appropriate labor and materials, you can plan the service order's execution. This planning consists of assigning the material, providing for the necessary inventory transactions to ensure that the material is available, allocating engineers, and checking the business partner's credit. Planning consists of two phases: global ERP and detailed ERP. You use Global ERP to make mid-term to long-term plans, such as several weeks or months. You use Detailed ERP to perform detailed planning for a few days or weeks ahead.
- **Service Order Online Marginal Control**
  Online margin control data is used to determine the financial visibility of an order that is proposed by comparing the total cost and the total sales amount. You can view the estimated or actual cost lines for a service order or service order activity. You can view the details related to the estimated or actual costs for all the service orders other than internal service orders.
- **Field service returns**
  Return material can be controlled by the service order. If the service engineer must replace a component at the customer site, the engineer knows the replaced component must be returned. When the parts must be returned, a warehouse order that has the Receipt type is created. You can send these parts back to designated warehouses to be used for work orders to complete repair of parts. Alternatively, the service engineer may have taken excess parts from warehouses to perform replacement activities. In these cases, the excess parts can also be returned to the warehouses.
- **Costing**
  All actual costs such as material labor, tools used, and travel costs can be registered. Declarations, hotel expenses, and so on can also be related to a service order. Expenses

such as hotel invoices can be charged to the service order. Subcontracting costs as well as hours spent on general issues such as car replenishment, car maintenance, and collection of parts can also be charged to a service order.

- **Impact of the Project Link on a Service Order/Activity**
  You can link a service order activity to a project. If a project is linked to a service order activity line, LN defaults the value in the **Project** field in the Service Order Activities (tssoc2110m000) session from Service Orders (tssoc2100m000) session.
- **Service Order - Lines - Synchronization (tssoc0280m000)**
  You can synchronize the service order header data with the activity lines and the material cost lines when the header data is modified.
- **Travel Cost Lines Default Setup**
  Total travel lines are automatically generated along with travel distance and travel time line. You can generate single call-out charge travel cost lines and single or multiple travel distance and time lines.

Depot Repair

Maintenance Sales Control handles depot-related logistic and financial transactions. Maintenance Sales Control consists of features related to Return Material Authorization (RMA).

- **Maintenance sales orders**
  Maintenance sales orders are used to plan, execute, and control the maintenance on customer-owned components, products, and the logistic handling of spare parts. These orders can be registered by entering them directly or transferring the orders from a call. Maintenance sales orders can also be created by transferring the maintenance sales order quotation to the maintenance sales order. Each maintenance sales order can handle a number of part lines.

  Four types of item transactions can be handled within any maintenance sales order:
  - Part maintenance: When a part comes back for repairs, you create a part repair transaction. You must receive the part into a warehouse to successfully carry out repair activities as a part of depot repair. A linked work order is required when repairs are implemented through work orders.
  - Part delivery: If parts must be delivered to a customer, you use a part delivery line to handle the delivery. Customers may require new or upgrade type subassemblies or additional parts.
  - Part receipt: Parts are returned for a variety of reasons, for example, if they are rejected or defective. Outdated parts might also be sold back at reduced prices. You use part receipt lines to manage the return of parts. When a part is exchanged, the parts receipt line and parts delivery lines are combined.
  - Part loan: When a part is not available, you can provide the customer with a part to use on a temporary basis. If the service office decides that the customer does not need to return the part, you can convert the part loan line to a part delivery line.

- **Project pegging in depot repair**
  You can implement cost pegging in the depot repair. You can peg the service cost to a project, element and/or an activity. To peg a project, specify the project, element, and/or activity information for the call, the contract, the maintenance sales quotation, maintenance sales orders or work orders.
- **Service costing break hierarchy and search path**
  The project, element and activity are retrieved from the costing breaks data defined in Project. To retrieve the costing breaks, a hierarchy for the various cost types is followed by LN.
- **Project pegging costing breaks in depot repair**
  The costing break functionality allows you to collect costs at different physical breakdown levels for depot repair to redirect costs from project peg for service contract to another project peg.
- **Work order**
  Orders that are used to plan, carry out, and control all maintenance on items in a maintenance shop or in a repair shop. A work order consists of at least one work order header, and can have a number of activities that must be carried out on a repairable service item.
- **Material allocations, delivery types, and work order (activity) status**
  Work order material resource lines are created when status of a work order or work order activity is free, planned, released, and completed.
- **Subcontracting work order**
  A single company may not deliver the entire range of services. In which case, the company may subcontract the entire service of a product to a subcontractor. In LN, you can enter into a subcontracting agreement with the supplier to carry out the required services as specified in the work order. You must define a cost or service item and a subcontractor on the work order to identify that the work order is subcontracted.
- **Templates**
  To ease work/repair order preparation, templates can be used. With the aid of the reference activities, you can compose a routing, which means that reference activities are copied and put in sequence. You can copy this routing to the work order.
- **Work order structure**
  The carrier for work to be implemented in LN Service is the work order. Work orders can be created in the following ways:
  - A work order is created when the item to repair is received, which is triggered by the maintenance sales order.
  - A user manually creates the work order.
  - A work order is generated in a batch for similar items owned by the organization (internal items) that are defective. This feature is applicable only when the item is serialized in inventory. These work orders are called batch repair work orders. The batch process generates a work order for each item. Work order resource lines with the Batch Repair delivery type are created for the defective serialized items.

- **Cancel work order activity**
  You can cancel work order activities linked to a work order. The work order activities can be canceled only if no actual costs are available on work order activities and the **Work Order Activity Status** is set to **Planned** or **Released** or **Completed** or **Signed-Off** in the Work Order Activities (tswcs2110m000) session. After canceling a work order activity, you can only post the work order activity to history.
- **Internal subcontracting for depot repair**
  It is possibility to create the internal invoice on costing the maintenance work order. When a product is defective, the customer requests a repair and sends the product to the service department. The service department repairs the product, but some part of the repair is subcontracted to another repair center. Because the subcontracted service center belongs to another legal entity, an internal invoice is required to cover the repair costs incurred by the subcontracted repair center. This internal invoice can be based on the actual material used, actual hours booked, and actual other costs such as transportation costs.
- **Internal commercial rates**
  For internal pricing, commercial prices can be used for material and labor. Also, a commercial single fixed price can be specified. This is a fixed repair rate to be paid, on the actual material used and hours spent.

Service Inspection

Use Service Inspection to create/ register inspections, create maintenance notifications, and transfer the maintenance notifications.

- **Preventive Maintenance Scenario**
  Preventive maintenance scenarios are used as the basis to generate planned activities. A maintenance scenario has scenario lines based on which planned activities can be generated; based on time), based on time according to a predefined pattern, and usage based.
- **Rule book for maintenance scenarios**
  The book that contains rules that define which maintenance scenarios must be used when a maintenance plan is generated.
- **Generate maintenance plan**
  You can plan maintenance activity for the installation group and serialized item that the service organization manages. The maintenance planning provides the maintenance activities that must be carried out in the long term. A maintenance plan can be generated only if maintenance scenario is defined for the serialized item.
- **Inspection**
  An inspection is a specific activity that is carried out to determine the condition and the status of a (part of a) configuration or process. Inspection activities can be based on inspection norms that are specified in documents. The inspection activities and inspection intervals are specified in the maintenance program.

- **Maintenance notification**
  Maintenance notifications are generated based on maintenance triggers that are applicable when registering measurements for serialized items during inspection. Based on the measurement type and position of the measurement, the associated maintenance trigger set is determined.
- **Transfer maintenance notification**
  Maintenance notifications can have a follow-up activity defined indicating the next maintenance task that must be performed on the specific serialized item. These maintenance notifications can be transferred to various objects, such as, service orders, internal work orders, service order quotations and maintenance sales quotations.

Subcontract Management

You use Subcontract Management to define subcontract agreements related to the service provider's business partners. For the main contractor, proper registration is required to align the contractor’s service contracts (contract with the customer) with the subcontract agreements (contract with the subcontractor/supplier). Registration is performed for services covered by a subcontractor and some necessary information. With call dispatching, some of this data is used to route a call to the subcontractor. If valid subcontract agreements are defined, calls can be assigned to subcontractors, by sending the problem details via e-mail. If suppliers cannot respond in time, or if the problem is urgent, you can send a reminder to the supplier.

- **Subcontract agreement**
  Subcontract agreements can be either manually defined or generated from a service contract. Subcontract agreement information is usually stored as a header and one or more lines. The header is a statement that lists the subcontractor details, contract details, and the customer details. The line includes the items and service level requirements.

Claim Management

- **Customer claim process**
  In Infor LN 10.2.1, you can register, review and process claims received from customers. A claim can be based on documents such as invoices, service orders, maintenance sales orders, sales orders or a sales schedule. You can manually register a claim or copy a claim from the original document or from a call. After a claim is registered and submitted, you can approve, reject, or cancel the claim. For more information, refer to Customer claim process.
- **Supplier claim process**
  You can register, review and process supplier claims from a customer claim, service order, maintenance sales order. A claim can be based on documents such as invoices, service orders, purchase order or a purchase schedule. You can manually register a claim or copy a

claim from the original document. After a claim is registered and submitted, you can approve, reject, or cancel the claim. For more information, refer to Supplier claim process.

Chapter 12
Quality

12

Introduction

Quality supports quality management throughout the entire company. Quality manages the activities that are required to control the flow of products selected for inspection. It also supports the quality control of intermediate products and end products.

The main functions and features of Quality are described in these topics:

- *Quality Inspection (p. 133)*
- *Non-Conformance Material Report (p. 135)*
- *Corrective Action Plan (p. 136)*

Quality Inspection

Quality inspection governs the activities required to select and control the flow of products selected for inspection. Basic product data structured by characteristics is used to perform quality inspection.

You can perform quality inspections on the following:

- Purchased Products
- Sales Products
- Manufactured Products
- Products stored in Inventory
- Products during Warehouse Transfer

- **Master data**
  You can use master data to define the characteristic of the product that must be inspected, the location of the inspection, and also the effect on the product that must be inspected.

- **Characteristic**
  A characteristic describes an individual feature or property of an item that will be tested. For example, diameter, length, weight.
- **Aspect**
  An aspect defines different occurrences of the same characteristic. For example, the characteristic for a tube diameter can be used to measure both the internal and external aspect of a piece of metal tubing.
- **Quality group**
  Quality group is a group of items with similar quality characteristics. The data defined for a quality group are the default values for the items in that quality group.
- **Algorithms**
  Algorithms are used to perform complex calculations based on measurements required for quality inspections that may include product specifications. Each algorithm is an expression that contains the variables and standard mathematical expressions that can be used in the algorithm, such as logarithms, sine, cosine and so on.
- **Sampling plan**
  A sampling plans determine the sample size and criteria for accepting or rejecting a batch based on the quality of a sample, using statistical principle.
- **Sampling rule**
  A sampling rule defines the standard criteria that is used for the skip lot inspection and to decrease the frequency of inspection. The sampling rule is defined for a combination of Code Letter Table, Sampling Plan, Inspection Level, and Inspection. The sampling rule also defines the alternative sampling plans that is used to decrease or increase the severity of the inspection regime along with the associated rules for switching plans.
- **Item sampling rules**
  The sampling rule is linked to a test group, which is linked to a Standard Test Procedure. The standard test procedure is linked to an item or group of items (via the Quality Group). To manage changes in the inspection regime, item sampling rules are used to store the actual/ current inspection regime at the level of origin/ business partner/ item/ standard test procedure/ test group.
- **Testing combinations**
  A very important functionality in Quality is the Testing Combinations. Use this functionality to link quality IDs to an origin. These testing combinations are the primary input for the creation of inspection orders and consist of three parts:
  - The module from which inspections originate.
  - The item or quality group that applies to the combination.
  - The quality ID that applies to the combination.
- **Inspection order**
  Inspection orders are used to structure the inspection of products that are purchased, produced, or sold. Inspection orders can be generally applied or be order specific.

- **Storage inspections**
  Storage inspections can be used to generate inspection orders that are inventory specific. If a storage inspection is generated for the selected items, these items are blocked for use and are considered as inventory on hold.
- **Export inspection data**
  You can export the inspection data to an external program, for example, MS-Excel.
- **Lots and/or serial numbers not in inventory**
  You can define actual test data for the combination of sample, sample part, inspection order line, test sequence, item, lot, serial number, aspect, and characteristic. You can use sampling plans for the inspection of all lots and/or serial numbers. You can also select and link multiple lots and/or serial numbers to a NCMR.
- **Item revision and effectivity unit**
  This functionality allows you to define the combination of PRP Project, PCS Project, Item Code, Item Revision and Effectivity Unit for all order origins.
- **BOM inspection**
  You can use **Routing** and **Operation** to determine if an inspection is necessary for a component.
- **Inspection orders for multiple lots and serials by business partner**
  For lot controlled and serialized items, Infor LN allows you to generate storage inspection orders for a specific business partner.
- **Validate standard test procedure**
  The **Validate Standard Test Procedure** option in the Testing Combinations (qmptc0111m000) session validates:
  - Whether an item is serialized.
  - Whether the item in the quality group, is serialized.

  If these conditions are met, Infor LN checks if more than one Standard Test Procedure is defined. If yes, Infor LN displays the following message:

  Item (Item code) is serialized and the Test Quantity is greater than one. Test data will be applied to all the serialized items in the test quantity.

Non-Conformance Material Report

Use Non-Conformance Material Report to report and disposition non-conforming material identified during inspection (Quality or Warehouse Inspection) or during the movement of the materials and/or when the material is in stock. The material is inspected to verify that the items conform to the relevant specifications and/or drawings. During the material inspection process, if a non-conformance is detected, the material is immediately isolated. This process is used for various materials, such as purchased materials, materials issued for production orders, finished goods, and materials associated with sales orders.

The Non-Conformance Material Report includes materials from the following, regardless of whether the materials were inspected:

- Purchase
- Sales
- Warehouse Transfers
- SFC Production
- EP Distribution
- Storage Inspection

To retain the traceability, Infor LN allows you to define a parent child relationship between two NCMRs. If you use Split NCMR, Infor LN refers to the existing NCMR as a parent and the subsequent NCMR as a child.

Based on the integration with Warehousing, you can view the NCMR generated for the stockpoint that are blocked in Warehousing. In the Non-Conforming Material Reports (NCMR) (qmncm1100m000) session, the **Origin** field is set to **Warehouse Inventory**.

Corrective Action Plan

This plan details the actions performed to prevent recurrence of non-conformance or failure. The plan is based on the non-conformance material report (NCMR).

- **Create Corrective Action Plan**
  The corrective action plan (CAP) executes the actions required to prevent non-conformance/ failure from recurring.

  Corrective action plan process consists of:
  - Create CAP and CAP tasks
  - Submit the CAP.
  - Approve the CAP.
  - Execute and complete the tasks.
  - Verify and close the CAP.
  - Close the CAP.

Chapter 13
Financials

13

Introduction

Financials provides an effective financial management tool. You can use more than one financial company and control information in the general ledgers, the accounts payable, and the accounts receivable at group level.

You can use user-definable dimensions to view financial information in detail from different angles. With the parent-child structures, you can obtain financial information in the proper structure, regardless of the country or the financial system.

Budgeting and planning features, such as single dimension budgets and activity-based costing, provide you with tools to manage your business. You can use single dimension budgets to control budget amounts and actual cost based on performance measures. The Activity Based Costing tool provides more accurate product costing and gives you better insight into the costs of various activities.

Financials fully supports electronic banking and real-time registration of transactions.

You can use multiple currencies. Financials can handle daily rates and spot rates in various currencies. You can also buy and sell against an agreed rate. In addition, transactions can be recorded in more than one functional currency.

The main functions and features of Financials are described in these topics:

- *General Ledger (p. 138)*
- *Accounts Receivable (p. 139)*
- *Accounts Payable (p. 141)*
- *Cash Management (p. 143)*
- Controlling:
  - *Financial Budget System (p. 145)*
  - *Cost Accounting (p. 145)*
- *Budget Control (p. 145)*
- *Fixed Assets (p. 147)*
- *Financial Statements (p. 148)*

General Ledger

The General Ledger forms the central part of Infor LN Financials and accounts for all transactions in LN that have an accounting impact.

- **Dimensions**
  You can independently define dimensions and use them to prepare analyses of ledger account transactions and balances. You can use up to 12 dimension types. You can define a name and an entire structure of dimension codes for each of these dimension types. There is no relationship between the dimension types. Dimension types and codes can be derived from logistic code tables.
- **Cross validation rules**
  Cross Validation Rules (CVR) functionality allows you to indicate which combinations of GL accounts and dimensional values are valid. Cross validation rules help to reduce data entry errors, enforce segregation of duties, and improve reporting accuracy.
- **Periods**
  Three financial period types exist: **Fiscal**, **Reporting**, and **Tax**.
- **Transaction types**
  You enter transactions based on transaction types. The transaction types are grouped by transaction category.
- **Transaction entry defaults**
  Transaction entry default values set authorizations and provide quick access to transactions types for each user.
- **Transaction templates**
  To distribute a transaction across a number of ledger accounts and dimensions, you can use a transaction template. For each transaction template, you can define one or more transaction template lines to specify the distribution of the main transaction amount across a number of ledger accounts and dimensions.
- **Automatic transactions**
  When a transaction that matches a specified transaction type and ledger account in the master data is finalized, LN generates parallel transaction lines. The amounts will be posted to the specified ledger accounts according to the specified percentages.
- **Account matching**
  You can match credit and debit entries of multiple transactions on the same ledger account with each other. A matching transaction can be generated to post differences that are within the specified tolerances.
- **Cash flow statements**
  A cash flow statement provides information about the history of the cash flow. The statement provides an overview of the sources and uses for cash, and is used to assess the ability of the company to meet its short-term obligations. In some countries, a cash flow statement must be submitted periodically to authorities.

- **Financial integrations**
  In an integrated ERP system, most of the financial postings result from logistic transactions. For example, a warehouse issue is an operational transaction that requires financial postings. For each transaction that must be reflected in Financials, LN generates an integration transaction.
- **Financial reconciliation**
  In addition to general financial analysis of reconciliation areas such as inventory and interim sales, you can perform reconciliation and financial analysis of the Goods Received not Invoiced (GRNI).
- **Journal import**
  You can import journal transactions into LN from an outside source.
- **Recurring journals**
  Recurring journal transactions are journal transactions that LN can generate periodically, based on the transaction details and templates that you set up in the recurring journal master data.
- **Reverse entry**
  You can create transactions to reverse already posted transactions. You can also create additional transactions to correct the transactions you reverse. In the reverse document, you can change the amounts or switch the debit and credit signs.
- **Intercompany transactions**
  In a multicompany environment, transactions between the logistic companies and between financial companies create the need to balance the accounts through intercompany transactions.
- **Intergroup transactions**
  General Ledger transactions can also occur between groups of financial companies that have separate chart of accounts, calendars, and so on, but are affiliated in a multisite structure.
- **Year end process**
  You use the year-end procedure to move the closing balances from one year to the opening balances for the next year. If the books are not final and you require the opening balances for the next year, you can run a provisional year-closing procedure.

Accounts Receivable

Accounts Receivable handles and monitors sales invoices, credit notes, credit checking, credit management, customer balance management, and generates interest invoices.

- **Financial business partner groups**
  Financial business partner groups are used to establish the link between the accounts payable and accounts receivable. These groups are also used to establish a link to the General Ledger. For each business partner group, you must define a set of ledger accounts and dimensions to which transactions are posted.

- **Control accounts**
  Business practices in Japan, Spain, Italy, and other countries require that different types of receivables and payables are posted to different control accounts. You can use multiple control accounts for financial business partner groups to post real trade transactions and other purchase or sales-related transactions to different control accounts.
- **Receipts against shipments**
  You can use the receipts against shipments functionality to generate or enter payment transactions and receipt transactions in Cash Management based on shipment or order information and to maintain the balances by shipment or order.
- **Credit notes**
  If a customer returns part of the goods, or if you create invoice corrections, you or your business partner can create a credit note to correct the amount payable for an invoice. If you automatically process the invoices, LN automatically generates credit notes and assigns credit notes to invoices.
- **Trade notes**
  Trade notes are legally accepted forms of payment such as bank drafts, checks, promissory notes, and bills of exchange. Trade notes can be used instead of cash payments. Because trade notes are negotiable, they can also be used as a credit instrument, for example, for discounting and endorsing. Trade notes can exist on paper and on magnetic supports, according to local business practices and banking standards.
- **Factoring**
  LN supports factoring of your outstanding receivables and payment of purchase invoices to factors used by your suppliers.
- **Problem invoices**
  You can use a problem code to indicate that a problem exists for a sales invoice. If the invoice-to business partner notifies you about a problem with the invoice and does not pay it, you can link a problem code to the invoice.

  In the direct debits procedure, problem invoices are automatically discarded. For each problem code, you can set an option to prevent linked invoices from being selected on reminder letters.
- **Interest invoices**
  You can generate interest invoices for overdue invoices. In addition, after generating and sending an interest invoice, you can generate a subsequent interest invoice for the next period.
- **Reminder letters**
  You can define several reminder letters for each language and level. Invoices are selected based on the due date. When reminder letters are printed, the letter number and date are stored with the reminded invoices.
- **Reminder diary**
  You use the reminder diary to keep track of e-mails, phone calls, or other contacts that you had with your customer regarding open entries.

- **Accounts Receivable 360**
  A single point of access from which you can perform almost all AR-related tasks:
  - **Open Entries**
    View a list of the open invoices for the selected business partner.
  - **BP Statements**
    Print the statement of account for the selected business partner.
  - **Credit Profile**
    View the various business partner's balances, aging analysis, and the full details of the business partner's current credit situation and payment behavior.
  - **Factor Relations**
    Assign a factor to a pay-by business partner if you factor invoices and no default factor exists for the associated partner.
  - **Aging Analysis**
    View or print the invoice-to business partner's aging analysis for the total outstanding balance.
  - **Reminders**
    View the latest selection of invoices that were reminded. You can also view invoices that require reminders.
  - **Schedules**
    If a receipt schedule is linked to an invoice, view the generated receipt schedule lines. You can also manually link a receipt schedule to an invoice.
  - **Interest Invoices**
    Generate interest invoice advice for delayed receipts from the selected business partner.
  - **Overdue Invoices**
    Show the overdue sales invoice details for the selected business partner.
  - **Receipt-related Documents**
    Show the receipt-related documents for the selected business partner.

Accounts Payable

Accounts Payable processes purchase invoices and credit notes, including registration, invoice matching and supplier balance management.

- **Financial business partner groups**
  Financial business partner groups are used to establish the link between the accounts payable and accounts receivable. These groups are also used to establish a link to the General Ledger. For each business partner group, you must define a set of ledger accounts and dimensions to which transactions are posted.
- **Control accounts**
  Business practices in Japan, Spain, Italy, and other countries require that different types of receivables and payables are posted to different control accounts. You can use multiple control

accounts for financial business partner groups to post real trade transactions and other purchase or sales-related transactions to different control accounts.

- **Receipts against shipments**
  You can use the receipts against shipments functionality to generate or enter payment transactions and receipt transactions in Cash Management based on shipment or order information and to maintain the balances by shipment or order.
- **Trade notes**
  Trade notes are legally accepted forms of payment such as bank drafts, checks, promissory notes, and bills of exchange. Trade notes can be used instead of cash payments. As trade notes are negotiable they can also be used as a credit instrument, for example, for discounting and endorsing. Trade notes can exist on paper and on magnetic supports, according to local business practices and banking standards.
- **Factoring**
  LN supports factoring of your outstanding receivables and payment of purchase invoices to factors used by your suppliers.
- **Purchase invoice matching**
  Automatic matching functionality allows users to match purchase invoices to purchase orders or freight orders. Additionally, users can manually match to purchase order, receipt, landed costs, freight orders, or consumption. Multicompany invoice matching is also possible, whereby one company processes purchase invoices for the group company.
- **Self billing**
  For each purchase order header, you can define whether to use self billing.
- **Payment schedules**
  A payment schedule defines agreements about the amounts to be paid by payment period. You can link a payment schedule to the payment terms. Each line of the payment schedule defines a part of the invoice amount that must be paid within a specific period, the payment method used for the payment, and the discount conditions that apply to the payment.
- **Payment authorization**
  In Accounts Payable, in addition to approving the invoices for processing, you can separately approve purchase invoices and costs invoices for payment. Audit information regarding approval of invoices is stored.
- **Authorization of price differences and additional costs**
  Price differences occur if the invoice amount differs from the order amount or the receipt amount. LN detects the price differences when the invoice is matched to the purchase orders or to the receipts.
- **Accounts Payable 360**
  A single point of access from which you can perform almost all AP-related tasks:
  - **Aging Analysis**
    View or print the invoice-from business partner's aging analysis for the total outstanding balance.

- **Match/Approve Invoices**
  Match the invoice lines with purchase orders or purchase receipts and to approve the invoices.
- **Open Entries**
  View a list of the open purchase invoices for the selected business partner.
- **Factor Relations**
  Assign a factor to a pay-to business partner if you factor invoices and no default factor exists for the associated partner.
- **Authorize Purchase Invoices**
  You can perform the following:
  - Approve price differences that exceed the defined tolerances.
  - Create additional costs transactions.
  - Approve invoices for payment.
- **Business Partner Balances**
  View the various business partner balances and aging analysis, and your current credit situation with the selected business partner.
- **Procurement Card Statements**
  If a purchase was paid via a procurement card, view and maintain the procurement card statement details.
- **Payment Schedules**
  If a payment schedule is linked to the invoice, view the generated payment schedule lines. You can also manually link a payment schedule to an invoice.
- **Invoice Information on Purchase Order Lines**
  Show the purchase orders for the selected business partner with the linked invoices.
- **Payment-related Documents**
  Show the payment-related information of the selected business partner.
- **Business Partner Payments - Order Information**
  Show the payment information regarding the purchase order for the selected business partner.

Cash Management

Cash Management manages all cash-related transactions, which mainly consists of payments to and receipts from business partners. All transactions can be entered manually, but electronic banking capabilities are also available for processing automatic payments, direct debits, and electronic bank statements.

- **Payment and receipt methods**
  Several methods are available to pay open purchase invoices and to collect the payments on open sales invoices. For example, you can use bank transfers, checks, trade notes, payment slips, and automatic payments/ direct debits.

- **Bank distribution**
  You can use several bank relations and agree on different terms and conditions separately with each bank.
- **Electronic bank statements**
  Some banks provide bank statements in electronic form, on disk, tape, or provide statements over the Internet or by modem. This electronic bank statement can be imported into LN to enable automatic processing of bank transactions. Bank statement lines and open entries can be matched automatically.
- **Evaluated receipt settlement (ERS)**
  You can initiate payments based on the deliveries done by the supplier. The payments to be made are recorded in advance in a remittance advice EDI message and are sent to the supplier who will subsequently be able to reconcile the relevant open entries.
- **Standing orders**
  You can create standing orders for payments not linked to a purchase invoice, such as cost transactions or advance payments. For example, you can use a standing order to pay rent or vehicle leasing costs every period, without receiving an invoice or if you receive the invoice after the payment due date.
- **Payment authorization in Cash Management – setup**
  In Cash Management, you can set up this authorization data for a user:
  - Maximum amounts which the user can pay to a pay-to business partner.
  - Maximum amounts or full authorization for non-invoice related free payments such as advance and unallocated payments, standing orders and cash transactions.
  - Maximum amounts or full authorization for bank cost amounts.
  - Maximum positive and negative amounts per invoice for which the user can create payment difference transactions.
  - The kind of user for payments and direct debits.
  - Authorizations to approve payment batches created by the same user or the batches created by others.
  - The maximum amount that can be approved by the user for a payment batch.
  - Default tolerances for payment differences for payment batches and direct debit batches by an authorized user.
- **Cash forecast**
  You can generate, view and print a cash forecast based on the following:
  - Manual invoices and interest invoices (based on due date, expected cash date, or average receipt period)
  - Sales orders
  - Project orders (installments that were not yet invoiced)
  - Sales quotations (based on expected quotation’s success rate)
  - Purchase invoices (based on payment schedule, due date, expected cash date, or average payment period)
  - Purchase orders
  - Standing orders

- Budget - To create a cash forecast for a specific purpose, such as salary payments, you must first create the associated budget.

Financial Budget System

The Financial Budget System registers, handles, and monitors all budget amounts and quantities necessary for planning by ledger account or dimension. This allows the planning of overhead costs of cost centers and other dimension types.

- **Allocation relations**
  You can maintain allocation relations between dimensions, carry out allocation procedures according to relations, and integrate the resulting amounts into budgets or actual analyses.

  Cost allocation structures that use the same set of destination dimensions often occur multiple times. Therefore, you can define allocation rule sets to collect rules of different types for the automatic generation of allocation relations.

Cost Accounting

Cost Accounting provides cost analysis and cost allocation functionality on a detailed and summarized level. Cost Accounting registers, handles, and monitors all actual amounts and performance quantities necessary for controlling costs by dimension. Cost accounting calculations result in actual rates and surcharges.

- **Deviations**
  The following deviations may occur between actual and budgeted amounts in the Cost Accounting and the Financial Budgeting System:
  - Occupation deviation
  - Consumption deviation
  - Over-/undercoverage

Budget Control

Budget Control is an integrated information system that tracks and controls budget-related business transactions. Financial health is continuously monitored by capturing sources and uses of budgets as they are committed and realized. Real-time budget checking prevents unauthorized deficits. Budget Control is designed to integrate accounting and budgeting functions into underlying business processes. Accounting distributions are retrieved from the appropriate policy levels, such as requisition entities, vendors, or purchased commodities. The relationship between accounting and budgeted funds is determined through roll-up structures.

- **Budget control policy**
  Budget checking must be executed on documents, such as purchase requisitions, purchase orders, and invoices. The Budget Control Policy indicates if a budget must be checked for a specific document type or business object. Based on a Budget Control Policy parameter, the budget check must be executed for a line when a document line entry is saved or when each line in the document is approved.
- **Budget accounts**
  A budget is constructed in a hierarchy by using budget summary levels (nodes and levels). Each level consists of budget accounts and their budget amounts. A combination of a budget account and a budget amount is also referred to as a bucket. At the lowest level of the budget hierarchy, a budget account is linked to multiple combinations of ledger accounts and dimensions. The determination of the lowest level depends on the level of budget control required. The relationship between budget accounts and General Ledger is maintained in distribution tables.
- **Budget structure**
  Budget structure is the hierarchy that contains all roll-up structures and budget accounts. A budget structure has a minimum of five roll-up structures or summary levels. On each summary level a budget can be attached to a budget account. A budgetary roll-up structure defines the budget accounts and dimensions to which detail accounts used by procurement, receivable, and ledger documents roll up. Budget amounts can be recorded at any level in the budgetary roll-up structure and for multiple branches within the same structure. They can be controlled by period or on an annual basis. The budget currency can be one of the home currencies. A budget account does not have to be linked to the next higher level; it can also be linked directly to the budget structure.
- **Receive exception notifications**
  If an exception occurs, a notification is sent to the all registered users of the budget account. To modify the account, users must have the proper authorization.
- **Budget Manager Dashboard - overview**
  Budget Manager dashboard provides a complete overview of the budget accounts of a budget. Managers can control and monitor all the budget activities of all the budget structures
- **Budget balances**
  You can review the types of budget balances for the selected budget account and budget period in the budget manager dashboard. The budget balances must be updated for a transaction such as budget check, release, amendment and budget transfer.

  The types of budget balances are:
  - **Budget**
  - **Allotment**
  - **Commitment**
  - **Encumbrance**
  - **Receipt Expense**
  - **Expense**

- **Budget transfers**
  Budget transfers are two-sided transactions that shift equal amounts of budgets from one budgetary account to another. Transfers and amendments generate an audit transaction in the budgetary transaction file and can only be executed if the sufficient budget is available. Any transfer of the budget, for example, a transfer budget from one budget pool to another, requires an audit trail. You must specify a reason code for the budget transfer.
- **Budget control adjustments**
  A budget control adjustment is used to retroactively adjust budget transactions which can be an adjustment to a budget balance such as the **Commitment** or **Encumbrance** balance . A budget control adjustment is also used to create opening balances and reservation of budget for a future transaction.
- **Budget amendments**
  Although you cannot update a confirmed budget directly, amendments enable subsequent budgetary updates in a controlled way. All budget amendments must be recorded by a budget transaction. Budget amendments are one-sided transactions that increase or decrease budget amount. After a budget is locked, users must specify a change or reason code to justify the budget. Any amendment of the budget requires an audit trail.
- **Reconciliation of budget balance with GL balance**
  This report reconciles general ledger transactions with budget transactions. The selection input is the budget account (range), period, amount class and summary level. The document reference is used to retrieve the corresponding ledger transactions. The budget transactions with the exception status are included in the selection.
- **Year end process**
  You use the year end procedure to move budget amounts and the related budget transactions to a new budget in the new fiscal year, define a new budget, or copy an old budget transaction and amount to a new budget.
- **Compare budget balance**
  You can view budget balances for the selected budget and budget year.

Fixed Assets

You can use Fixed Assets to manage the fixed assets in your company.

You can perform the following tasks:

- Enter and track data for the property, plant, and equipment used by your organization.
- Enter and capitalize assets, depreciate assets in multiple books, transfer assets within or between companies, and dispose of assets at the end of their life cycle.
- Maintain periods and years of historical asset data through period-end processing.
- Track data to the original document using powerful inquiries within products and across subsystems.
- Use the reporting capabilities supplied with LN.

The results of financial depreciation and revaluation are posted to the General Ledger.

- **Using assets**
  Fixed assets include property, buildings, and equipment that are expected to reduce your company's costs or increase its income. In the Fixed Assets module, you record data about the fixed assets your company owns. You record asset data to keep track of the assets your company uses and to record transactions for the assets.

Financial Statements

In the Financial Statements (FST) module, you can:

- Define financial statements, and link a structure of child statement accounts and parent statement accounts to these financial statements.
- Link ledger accounts and/or dimensions to the statement accounts.
- Link cash flow reasons to cash flow statement accounts.
- Export financial data to FST reporting tables.
- Print reports directly, or use the BIRT report functionality to print to PDF, HTML, and export to Excel or Word.
- **Data drilldown in financial statements**
  You can use various Financial Statements sessions to view transactions in a hierarchical structure. You can also zoom back to the original logistic transaction.
- **Currency calculation**
  In Financial Statements, you can define a statement currency that is not one of the home currencies.

Chapter 14
Invoicing

14

Introduction

You use Invoicing to compose invoice lines from various origins on a single invoice for an invoice-to business partner. Invoice lines can originate from the following sources:

- Sales, for example, sales orders and rebates
- Project
- Procurement, for example, purchase orders
- Warehousing
- Freight
- Service, for example, service orders and service calls
- Interest invoices generated in Accounts Receivable
- Debit notes and credit notes from Cash Management
- Sales invoices manually entered in Invoicing

Invoices are generated for these scenarios:

- **Internal material delivery**
  In a multicompany structure, invoices can be generated for internal trade between warehouses that are linked to different financial companies.
- **External material delivery**
  Invoices can be generated for transactions within a single logistic company that are associated with entities that are linked to different enterprise units.
- **Self-billed invoicing**
  Self-billed invoices can be received from customers and matched with sales orders. After matching, an accounts receivable transaction is created in Financials.
- **Internal invoicing**
  Internal invoices can be sent from:
  - One warehouse to another warehouse for a warehouse transfer.
  - One work center to another work center for a WIP transfer.

  - A purchase office to a sales office for a direct delivery.
  - A warehouse to a sales office, if a warehouse does not belong to the same financial company as the warehouse that implements the order.
  - A shipping office to a sales office, if the shipping office does not belong to the same financial company as the sales office that ships the goods.
- **Intercompany settlements**
  In a multicompany structure, intercompany settlement transactions can be generated instead of regular invoices for transactions between logistic companies that are associated with entities linked to the same financial company.
- **Shipment-based invoicing**
  You can base invoicing on the sales amounts of the contract deliverables that are linked to the contract shipments.

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Invoicing

- **Composing criteria**
  Composing criteria define whether invoice lines can be grouped on an invoice. For example, invoice lines with different invoice-to addresses or different invoice currencies cannot be grouped on one invoice. In addition, to support dimension accounting, invoice lines that must be posted to different dimensions cannot be grouped on one invoice.
- **Manual sales invoices**
  To create invoices for which no related sales order or other type of order exists, for example, the disposal of a fixed asset, you can create a manual sales invoice.
- **Interest invoices**
  You can generate interest invoices for paid invoices, partially paid invoices, and unpaid invoices. In addition, after you generate and send an interest invoice, you can generate a subsequent interest invoice for the next period.
- **Self-billed invoices related to sales schedules**
  For sales schedule-related self-billed invoices, the following is possible:
  - Interim revenue and COGS posting.
  - Approving a self-billed invoice with a price variance.
  - Approving a self-billed invoice with a quantity less than the billable line quantity.
  - Writing off self-billing related billable lines.

Chapter 15
Common

15

Introduction

You use Common to specify data and functionality that can be used in various packages of LN.

The main functions and features of Common are described in these topics:

Calendars and Periods

Calendars define the working hours for resources in the company such as work centers, employees, warehouses, purchase offices, and sales offices. The calendars are used to determine lead times and start/end dates for activities carried out in a company, such as production, purchasing, warehousing, service and maintenance, and project activities.

- **Calendars**
  Calendars can be defined on a high level, such as enterprise unit and company level, and on a detailed level, such as when planning a resource. If a calendar is not found on the resource level, the calendar on a higher level will be used.

Object Data Management

Object Data Management (ODM) provides effective data management solutions in a product development scenario with embedded data management functionality. LN ODM ensures that the product data is handled properly and that the most stringent product lifecycle management processes are applied. ODM provides fully integrated document management, change management and folder management facilities for LN users. The package includes an object browser and an advanced query and report functionality. You can attach documents to LN objects, and view the corresponding files attached to documents.

You can use Object Data Management (ODM) to manage data related to ERP.

The main functions and features of Data Management are described in these topics:

- *Document Management (p. 152)*
- *Change Management (p. 153)*
- *Folder Management (p. 154)*
- *Query (p. 155)*
- *System tables (Setup) (p. 155)*

Document Management

Document Management provides general document management facilities to LN. Document Management ensures the efficient and secure use of consistent and reliable document information.

Document Management provides the following features:

- Controlled access to Document
- Secure storage of document contents
- Document life cycle support
- Management of document revisions
- Viewing and editing the contents of all types of files, for example, CAD files and scanned documents
- Management of the relationships between documents and other objects in the LN database
- **Documents**
  Documents contain physical files or Hard Copies. Hard copies can be attached to a document revision. A document is a logical entity if no hard copies are attached to the document and is used to group other documents.
- **Document Revisions**
  A document revision enables you to track the life cycle status of document. Document revisions are created by default when a document is created. A document revision is uniquely identified by a document ID and document type.
- **Document Life Cycle**
  The lifecycle of a document from concept stage to completion stage. The document lifecycle involves various phases, such as In Design, Submitted, Approved, Released, Withdrawn, Expired, and Rejected.

- **Document Management Configuration Tasks**
  The LN administrator must perform the following tasks related to document management configuration:
  - Miscellaneous tasks
  - Tasks related to registering document hard copy details
  - Tasks related to file management
- **Document Types**
  Assigned to every document. Each document type is assigned a revision mode that is applicable to all documents of that document type. The document mask and document revision mask can be dependent upon the document type. The document types determine whether the hard copies and files attached to document revisions must be assigned revisions. Examples of the type of documents a company keeps can be, safety regulations, assembly documents, wiring diagram, maintenance instructions, drawing documents and standard documents.
- **Files**
  You can save the contents of a document in one or more electronic files. To register any type of electronic file, you can link the electronic file to a document revision with the status In Design. The document type of the document revision determines whether the files are assigned with revisions, if any. The files must reside in directories that are registered in LN by the LN administrator.
- **Import files to ODM**
  The capability to import files to ODM enhances the document management functionality, enabling the user to import the files from a legacy system to ODM. You can link all the imported files to a single ODM Document or can link each of the files to a unique ODM Document. Additionally, you can link ODM Documents to LN entities like service order, purchase order, engineering items and so on.
- **Hard copies**
  A document and the documents contents can be stored as a hard copy in the form of paper, polyester film, and so on. The hard copies are stored in a specific location, depending on the ease of use and requirements. The definition of a hard copy includes the specification of the storage medium and the location.

Change Management

Change Management deals with the fundamental concept of change. This module controls the processes of product changes. Change, particularly in industry, is a constant and critical factor. Effectively, in the real time scenario, the frequent upgrade and customization of products--due to quality improvements, cost reductions, manufacturing innovations, and customer satisfaction issues--requires an accurate and foolproof method to manage the change implementation process.

- **Change Request**
  The change request is the preliminary step in a change process. You can initiate change from various sources (internal or external to the organization) in the form of change request. These requests are processed by eliminating trivial requests, or by combining similar requests. An authorised user can create a change request.

- **Change**
  The change refers to the change header. All related change requests are linked to one change. If you create a new change, the first version of change proposal is created automatically. You can also create a change without a change request.
- **Change Proposal**
  The change proposal is a version-controlled entity of a change. A new change proposal is created by default when a change is created. The proposal can be approved or rejected. When the proposal is approved, the status of change changes to Approved. If the proposal is rejected, the status remains the same (Created). If the proposal is rejected, you can create a new proposal with all the linked entities.
- **Change Order**
  A version of the change proposal has a list of proposed effectivity dates, which are recorded as change orders. A change order can exist independently of a change proposal. Change orders are linked to the change proposal. A change order can be selected for effectivity dates. To control the effective and expire dates of more than one change order, you can define a parent child dependency between two change orders. The hierarchical dependency between two change orders, creates a bill of change orders (BOCO). A BOCO has two levels of hierarchy. You can link the change orders in BOCO to the change proposal.
- **Change committee**
  The committee of a chairperson and reviewers who implement a change using change management. Only authorized users can create a change committee. the reviewers of the change committee submit the change proposal for review. The reviewers provide their recommendations and the final decision lies with the chairperson of the committee.

Folder Management

You can use Folder Management to maintain folders. Folders simplify the management of product information. You can use folders to group-related information of various types, for example, engineering items and drawings, which enables simple and fast information retrieval.

- **Creating and Maintaining Folders**
  The folder is an entity that can contain other LN objects defined in LN ODM. Folders are containers that carry LN objects for communication or grouping purposes. Any LN entity can reside inside a folder. A folder is a data item that can contain a group of related objects.
- **Objects Contained in Folders**
  A folder is a data item that contains a group of related objects. Folder Management includes the following activities:
  - Create a folder: You can create folder and subfolders for various subjects.
  - Delete a folder
  - Link the objects defined in LN ODM. Use the folder content function to place the object in the folder.

- **Folder Status**
  When you create a new folder, the folder receives the Design/Created status and you can change the contents of the folder. If the folder is in Design/Created status, use the content profile to place the objects defined in LN ODM, in the folder. After the initial design stage, you must lock the folder. The folder status changes to Locked and you cannot modify the folder's contents and properties. To change the properties or content of a folder, the folder must be unlocked and the folder status changes to Design/Created.

Query

The Queries and Reports generates timely and essential information, which provides strategic advantage to an organization. Reports help present information in a structured format.

The Queries and Reports module provides the following features:

- Define and execute queries for all ODM objects.
- Define, implement, track, store, and display the query conditions for ODM objects.
- Store the query result sets and re-run the queries on the stored data
- Enabling the filtering of the session data, based on the query result set, for both base and linked queries.
- Enable setting the role assignments based on queries.
- Access reports generated from Change Management, Document Management, and Folder Management modules
- Create, view, or print reports based on objects.
- Display query results in various formats

The main objective of queries is to provide a framework to facilitate query based object search mechanism. The Report functionality enables you to view the results of a query in the form of a report in various formats.

System tables (Setup)

The System tables (Setup) provides administrative facilities for the LN ODM . The ODM configuration sessions enable the **ERP administrator** to maintain tables that contain organization data, and to configure the system to reflect organization requirements, including determining the functions that different types of users can perform on different types of ODM objects.

Some of the ODM configuration objects are specific to the Document Management, some of which are used by multiple modules in the package, and some are LN system configuration objects that are included in the System tables (Setup) module for completeness.

The **ERP administrator** must maintain the following types of configuration data:

- Data related to Document Management tasks
- Data related to Change Management tasks
- Data related to Folder Management tasks
- Data related to query and reports

- Data related to common ODM parameters and external application integrations
- User authorizations based on groups of actions
- Object mask for generating object identifiers
- Valid reasons for performing actions

The **ERP administrator** is also responsible to import and export system data when required.

- **Object Browser**
  Use the object browser to define and categorize relationships between objects in LN ODM. The Object Browser offers a hierarchical view of multiple level objects, and the relations among the objects.
- **Object Links**
  To indicate relationships between objects, you can create links between the objects. You can set up links between objects of the same type, or between objects of different types. The LN ODM system configuration determines the type of objects that you can link.
- **Object Masks**
  Object masks enable you to automatically generate unique object identifiers and with a constant format. The LN administrator sets the object mask configurations to generate identifiers in the format the organization uses.
- **Defining Object Masks**
  You can define mask codes for every object defined in ODM. One or more mask codes can be defined for every object. The mask code is system data that identifies the mask configuration to be used for the object attribute. If more than one mask code is defined for an object, LN determines which mask configuration of the active mask code will be used in each situation. One exception applies to the doc_rev and folder objects that will have two mask codes. These two mask codes are required to generate the temporary revision and permanent revision in case of document revision and folder ID and folder revision in case of folders.
- **Task Group**
  The task group function enables you to maintain the task group and the group's linked tasks. Each task group can have a unique user role, the user role's attached objects, and the summarized attributes of tasks, such as total tasks, tasks completed, estimated cost, and total actual cost.
- **Reviewers List**
  Reviewer are defined for a committee. The committee can be a change committee or a document management committee. A chairperson heads the committee who is authorized to add or delete the reviewers for that committee. This committee can be used in Change Management or in Document Management or in both scenarios.
- **Defining Hosts**
  A computer that the Document Management module accesses is defined as a host. Client computers from which the LN sessions of Document Management module are invoked, computers with file servers, as well as all the computers in which the vault server component is installed are defined as hosts.

- **The Vault Server**
  The vault server is an essential component of file management in the Document Management module. The vault server is responsible for transferring all files to and from the PC's hard drive, mounted drives, and other protected areas. The files are moved and copied between various areas.
- **Defining and assigning areas**
  All directories accessed from document management must be registered as areas. The directories include the directories in which users edit files, as well as the directories that document management uses to store protected files.
- **Mounting Areas and Assigning User Access**
  The mount area is the work area that must be loaded/mounted on the client computer of the user who must access or save the files in that work area. The work area is located on a remote host. When a mounted area is used, the files are registered and saved in the work area specified in the definition of the mount area. The path you see on the local host can be viewed when a mount area is defined.
- **Revision Modes**
  The mechanism used to assign revisions to a document depends on the revision mode that the LN administrator assigns to the document type.
- **Object Families**
  An object family consists of related objects and is used to maintain links between objects. Use the Object Families (dmsys1512m000) session to define a new object family.

People

You use the People package to maintain employee-related data as well as to enter and process hours and expenses. The costs that result from this process are booked to Project, Manufacturing, Service, and Financials.

After the appropriate master data is defined, users can perform the following:

- Enter hours/expenses
- Enter budgets (optional)
- Approve hours/expenses (optional)
- Process hours/expenses
- Update budgets with actual hours (optional)
- Archive hours/expenses

After hours are registered, you can approved and process them. Actual hours can then be compared with budgeted hours.

You use Master Data to register employee information and codes that are used for general hours and expenses. You can also register information about roles, skills, rates, and surcharges.

- **Using hours accounting**
  People facilitates or supports the following:
  - Quick access to and easy registration of hours (manually).
  - Automatic registration of hours using backflushing.
  - Retrieval of tasks from assignments.
  - Time recording

    Direct Time Recording setting in the People Parameters (bpmdm0100m000) session
  -
  - Global update of hours by employees or team leaders.
- **Distributing team hours**
  You can register hours for a team and distribute the hours equally among the individual members. You can specify either the total hours or specify the hours per day.
- **Working time schedules**
  For a single employee or a team, you can use working time schedules to distribute actual hours for a task by generating hours lines for a period range.

Pricing

You use Pricing to store and retrieve pricing information.

In Pricing, you can specify the following:

- Pricing matrices
- Price books
- Discount schedules
- Promotions
- Freight rate books

- **Pricing matrices**
  To retrieve the correct pricing information for calculating the price, discount, or transportation costs of an order, load, or shipment, you can specify pricing matrices. A matrix is a structure in which pricing information is grouped according to particular criteria.
- **Price books**
  You can use price books to store base prices, discounts and other information about items. You can use repair price books to store fixed repair prices for internal subcontracting for depot repair.
- **Supplier price book**
  You can use a supplier price book to quickly retrieve and maintain prices for a buy-from business partner, ship-from business partner, and item combination.

- **Discount schedules**
  You can use discount schedules to calculate discounts for an item. The discounts defined in a discount schedule are expressed as a percentage or an amount and are subject to a minimum or maximum quantity or value.
- **Promotions**
  You can use promotions to apply an additional discount, value off, or premium to a sales order based on predefined order levels of selected items. Two types of promotions exist: order level and line level.
- **Freight rate books**
  You can use freight rate books to store freight rates. A freight rate is used to calculate transportation costs for items listed on loads, shipments, and orders. A freight rate includes, for example, an amount per distance or zone, a weight, service level, or carrier.
- **Retrieving pricing information**
  Retrieval and calculation of prices, discounts, and promotions takes place in one run when an order or contract is saved. Freight costs are calculated when load building is performed, or when the user launches the freight cost calculation process from sales orders, purchase orders, freight orders or shipments.
- **Additional pricing processes**
  You can perform the following:
  - Copy price books
  - Copy quotations to a supplier price book
  - Delete pricing information
  - Display pricing information for a specific line
  - Equate balance of receipts with inventory level
  - Globally update prices and discounts
  - Import prices from item data to a price book
  - Rebuild the generic key
  - Recalculate prices and discounts
  - Simulate prices
  - View and maintain line discounts

Taxation

LN supports value added tax, sales and use tax, and withholding of income tax and social contribution. Tax calculation is based on a flexible, rule-based tax model in which a set of standard tax rules is supported. Together with user-definable exceptions and exemptions, users can model every possible tax situation. In addition to the standard sales and use tax functionality, an interface with Vertex O Series is available for advanced US and Canadian tax calculation. A comprehensive set of standard and user definable tax reports is available for analysis and declaration. Submitted tax declarations can be paid to the appropriate collection offices by the standard payment process.

In addition to tax reporting, European sales listings and European intrastat reporting are available.

- **EU transaction reporting**
  If your organization is based in a European Union (EU) member country, you must report your transactions with other EU member countries. Usually, you must submit monthly reports to the tax authorities that monitor the intercommunity transactions and intercommunity movement of goods.

  You must submit these reports:
  - The Intrastat declaration of import/export statistics.
  - The Sales listing.

Terms and Conditions

If a company uses functionality, such as vendor managed inventory (VMI), subcontracting, and allocations, multiple rules are applicable between business partners. To register all terms and conditions that are applicable between business partners in a particular situation, you can specify terms and conditions agreements.

A terms and conditions agreement is an agreement between business partners about the sale, purchase, or transfer of goods with detailed terms and conditions about orders, schedules, planning, logistics, invoicing, and demand pegging, and the search mechanism to retrieve the correct terms and conditions. For example, you can specify the terms and conditions regarding the financial ownership of goods for a specific functionality.

An agreement includes the following:

- A header with the type of agreement and the business partner(s)
- Search levels with a search priority and a selection of search attributes (fields) and linked terms and conditions groups
- One or more lines with the values for the search levels' search attributes
- Terms and conditions groups with detailed terms and conditions about orders, schedules, planning, logistics, invoicing, and demand pegging for the lines

- **Specifying terms and conditions**
  To use terms and conditions, you must specify master data and set up the terms and conditions agreements.
- **Using terms and conditions templates**
  You can use templates to generate terms and conditions agreements for business partners, update existing terms and conditions agreements, and validate terms and conditions agreements.
- **Retrieval of terms and conditions**
  An extensive search mechanism is used to retrieve the correct terms and conditions from an **Active** contract or enterprise unit relationship for an order or schedule. To view which terms and conditions are effective in a specific situation, you can also simulate the retrieval of terms and conditions.

Unit Effectivity

Unit effectivity is a method to control the validity of variations on an end item. You can use unit effectivity for pegging purposes, or to model exceptions from a standard end item so that you can make variations without having to define separate item codes. As a result, you do not need to maintain separate BOMs for every combination of variations. End items can be, for example, airplanes or touring cars.

The deviations consist of relatively small variations of the end item. For example, fitting red seats instead of blue ones, or a special type of radar or air-conditioning, in an otherwise standard type of airplane.

You can use unit effectivity to apply changes if:

- Few changes are made.
- The changes apply to relatively small subsets of the end item.
- The changes result from customer requests, engineering, or production.

The main concepts in unit effectivity are:

- Effectivity units: An effectivity unit is a code that is linked to an end item for identification, and which can represent the deviation(s) from the standard end item. You can link an effectivity unit to manufactured items and purchased items.
- Requirements: A requirement in unit effectivity is a business reason that you define to describe the modifications and the variations for an item (the exceptions). The requirement is expressed by exceptions, as:
  Requirements can indicate, for example, regulations:
  - USA: USA regulations
  - EUR: European regulations
  - ASIA: Asian regulations

  Requirements can also, for example, concern an item's model:
  - LIGHT: Model with limited features
  - NORMAL: Model with the normal features
  - ADVANCED: Model with advanced features
- Exceptions: An exception in unit effectivity is the definition of a deviation that applies to a unit effective item. An exception indicates, for example, whether a specific BOM line or a specific routing operation is used for an effectivity unit. Exceptions are often created as a result of customer requirements, or technology upgrades.
- Print Pegging by Effectivity Unit (tcuef0412m000): You can use effectivity units for pegging purposes. If an effectivity unit is specified on a sales order line, Enterprise Planning provides Manufacturing, Procurement, and Warehousing with that effectivity unit. In this way you can trace a specific unit effective item.
- Print Progress Report (tcuef0414m000): You can print a report that outlines the progress on PCS activities, sales order lines, installments for sales orders, purchase orders, production orders, and service order activities that are related to an effectivity unit. The progress is indicated in the status column of the report.
- Unit Effectivity Parameters (tcuef0100s000): You can also maintain the unit effectivity parameters.

Example

Your company produces touring cars. The standard configuration of a touring car has blue seats and air conditioning. However, some extra requirements can be built in on customer request. For example, a customer wants green seats instead of blue seats, or the customer wants a television set installed.

If a customer orders two different configurations, two sales order lines must be created. An effectivity unit is generated for each sales order line, for example effectivity unit 4500 (green seats) and 4501 (television set installed). You can configure the touring car from the sales order line. Requirement GREEN SEAT is selected for 4500, and requirement TV is selected for 4501. The effectivity units are used in the order-planning engine in Enterprise Planning. During the BOM explosion in the MRP run, ERP Enterprise determines the validity of each BOM line for effectivity units 4500 and 4501. The effectivity units can be pegged to the resulting production orders and purchase orders, for all BOM levels.

Project Pegging

A production order can be used to meet multiple demands from multiple projects and hence requires pegging distribution at the order level and at order line levels (such as estimated materials, production planning). This process is called (cost) pegging and the attributes are called pegs. If an item is project pegged, you can track the costs at the project, activity, and element level through the complete product life-cycle.

To perform proper (cost) allocation, tracking and tracing, inventory registration, and supply, pegging information must be added to items, inventory, and transactions throughout the entire goods flow, from ordering/receiving to issue/consumption. Because item lines can be split into multiple cost pegs, a peg distribution level is required below the item line. The main purpose of these cost pegs is cost distribution and not the physical movement of items.

- **Planning groups**
  Commingling and cost transfer rules are defined at the planning group level to control supply planning of project pegged items within one or several planning groups. When excess inventory occurs in a project, the inventory can be consumed by other projects when not limited by commingling rules defined for the planning group or project with the excess.

  A cost transfer is a project cost account change and not a physical transfer of items. Cost transfer rules determine under which conditions excess inventory on projects is made available for transfer to other projects, excess inventory from other projects can be received, or inventory from other projects can be received.

  Project requirements for project pegged items can be commingled across project planning groups or can be restricted to a single planning group. You can also exclude project cost accounts from commingling.

- **Borrow/loan and payback**
  To satisfy urgent material requests, parts can be moved between projects as long as the borrowing project pays back and absorbs any additional costs that occur.

  Although inventory physically moves between projects, there is no cost impact. The borrowing project manages the replenishment of the part, after which the part and its costs are paid back

to the lending project. Any additional charges are absorbed by the borrowing project. If the part cannot be paid back before the next billing cycle, an outstanding borrow/loan is converted into a permanent transfer by using the aging process.

- **Cost peg transfers**
  Cost peg transfer functionality enables the transfer of costs between two different pegs (pegged to unpegged and vice versa). The cost peg transfers do not physically move the inventory, but only transfer the costs of the inventory. Cost peg transfers are performed within the same warehouse. You cannot transfer the goods across warehouses.

BOD Messaging

Business object documents (BODs) are XML messages used to exchange data between enterprises or enterprise applications. A BOD is composed of a noun, which identifies the message content, and a verb, which identifies the action to be taken with the document. The unique combination of the noun and the verb forms the name of the BOD. For example, noun ReceiveDelivery combined with verb Sync results in BOD SyncReceiveDelivery.

The BODs are sent to Infor ION.

- **Configuring LN for BOD publishing**
  To exchange data through BODs, specific configuration settings are required in LN and the other application.
- **BOD implementation registration**
  You can specify custom BOD implementations, modify the parameters of standard and custom BOD implementations, and specify whether publishing must occur immediately or must be postponed through a staging mechanism.
- **Publishing staged BODs**
  You can publish staged BODs.
- **BOD Monitor**
  You can view the number of BODs present in the outbox, or staged. You can compare the earliest time stamp of the BODs to the current time. If the age of a BOD exceeds a threshold, an alert is shown.
- **BOD alerter**
  You can compare the earliest time stamp of stored BODs to the current time. If the age of a BOD falls within a threshold range, an email can be sent to a configurable list of email addresses.

Electronic Data Interchange

Electronic data interchange (EDI) is used to exchange business documents between two systems. For example, a customer sends a purchase order to a supplier through EDI after which the supplier responds

by sending an invoice to the customer electronically. Therefore, EDI eliminates the transfer of paper copies of business documents.

Many external standards of these business documents are defined that provide rules to the related business processes, the business document structure, and the content. In Europe, the UN/ EDIFACT standard is used; in the United States, the standard is called ANSI. Moreover, industry-specific standards are also used. For example, SPEC2000 and AECMA for aerospace and defense, and VDA/ODETTE in the automotive industry.

LN has its own internal standard, called BEMIS (Baan Electronic Message Interchange System). LN uses the BEMIS standard to generate and read messages. All external standards can be translated into the internal BEMIS standard or generated from BEMIS by an EDI translator, which uses standard EDI message formats that are supported by your business partners.

- **BEMIS**
  In Electronic Data Interchange, you can specify business documents of various external standards, such as VDA, UN/ EDIFACT, Odette, and ANSI. Baan Electronic Message Interchange System (BEMIS) is the internal LN standard to which external standards are converted. Conversion of the internal standard to an external standard and vice versa is carried out by an EDI translator.
- **BEMIS design principles**
  A BEMIS business document must be designed following a predefined set of rules. If these rules are not met, the business document does not comply with the BEMIS standards.
- **BEMIS - Content**
  Although most of the EDI setup data is user-definable, LN also provides all required EDI data as default data. This information can be exported from the Enterprise Base Data company 050, or downloaded at http://edi.infor.com . The result is an ASCII file, called `defaults.edi`, that can be imported into the companies that use EDI.
- **Setting up EDI**
  Before you can use EDI, you must set up EDI data, such as master data, networks, codes and conversions, conversion setups, import and export data, communications, and messages.
- **Receiving and generating EDI messages**
  You can manually or automatically receive and generate EDI messages.
- **History**
  The history of incoming and outgoing messages is kept so that you can trace specific messages.

Document Output Management

You can use Document Output Management to indicate the form layout and media report forms to use for distribution, for example, for invoicing. Because of statutory or customer-specific requirements, the invoice form layout and required media may differ on a customer-by-customer basis. Different rules for archiving of invoices sent to customers may also exist.

Similar rules may apply to comparable documents such as statements of account, order acknowledgements, and quotations. Regardless of the document output rules, you may want to process invoices in a single batch process.

You can define rules for this information:

- The report form layout to use based on the country and customer group attributes and their associated values, for example, Netherlands or USA, and Commercial or Government.
- The distribution media, for example, paper, e-mail, electronically, or a combination of distribution media.

In addition to this, you can indicate whether copies for an electronic archive are required, and - if so - specify where to store the copies.

Chapter 16
Enterprise Modeler

16

Introduction

The Dynamic Enterprise Modeler can be used before the information system is operational. You use the DEM tool to create business models that are used to implement the ERP application packages. If an organization decides to implement a new information system by using ERP applications, the Dynamic Enterprise Modeler is used to identify and structure the company's information and goods flow using Business Control Diagrams and Business Processes. Use this to perform the actual implementation and optimization of the information system. You can for example build a kernel project model and from this create site-specific project models.

The main functions and features of Enterprise Modeler are described in these topics:

- *Master Data (p. 167)*
- *Model Definition (p. 168)*
- *Model Item Management (p. 169)*
- *Run-Time Model Control (p. 170)*

Master Data

The Master Data is mainly used to set up a working environment.

You can create and maintain the enterprise modeler building blocks, such as business processes, employee groups, and business control diagrams. In the Master Data you can define versions, components, and parameters.

- **Versions**
  Throughout DEM, both modeling and run time processes take place in versions. By using versions, business models and other model items can be made uniquely identifiable. Before you can start modeling, you must first define versions and version authorizations in the master data.

- **Categories**
  You can create categories for model items which are of the same type. Therefore, model items can be labeled and grouped together.
- **Components**
  You can use LN applications and other (Infor) software applications, for example, Infor AutoConnect or Microsoft Excel, to model the business processes. In the Enterprise Modeler, these applications are setup as components
- **Statuses**
  A status can be linked to a model item. The status identifies the current stage in the development of a model item and is used to:
  - Monitor the development progress of a model item
  - Authorize users for the combination of a model item and a status
- **Business process master data**
  While the business functions in the control model only relate to what takes place in an organization, the business processes visualize how the functions must be performed. The processes also present the relevant LN sessions to the users, and the order in which these LN sessions must be used. With the Business process master data you can use AO documents in the business processes and work with Responsibility codes.

Model Definition

In the Master Data, you set up a framework in which business models can be created and maintained. However, to build a business model you must create various model items that comprise a project model or reference model.

- **Repository**
  The buildings blocks to create a business model are set up in the repository. From this repository you can select what is needed to create a business model.

  The main building blocks in the repository:
  - Business Control Diagram

    A graphic design that illustrates the primary process that is performed within an organization and the business functions that are used to control that process.
  - Business Process
  - A graphic design representing the steps the users must perform to realize a business objective.
  - Support Application

    A list of applications that can be linked to a process or a process step to make sure the user has enough information to carry out the process/activity.
  - Role

Except for support applications, you can link text to all model items to provide them with more information. This text can be created both in the repository and in the business model

- Enterprise structure models

  The enterprise structure model shows the multi-site structure of an organization.

  The multi-site concept consists of enterprise units that contain entities that belong to the same financial and logistic company. An enterprise unit's entities must belong to the same logistic company, but a logistic company can be linked to multiple enterprise units. Because enterprise units can be located worldwide and use their own currency, a logical company can include multiple countries.

- Business Models

  A business model is a generic term for both a reference and a project model. Both models are built from a collection of model items created in the repository.

  - A reference model represents a line of business or business typology.
  - A project model represents a customer specific model.

- **Data models**
  A data model is a diagram that illustrates the permanent storage components and their structures on multiple abstraction levels. A Permanent Storage Component is a database table.

Model Item Management

Model item management contains several features regarding utilities for the management of versions, business models, and Help texts. This includes functionality such as copying of business models or ranges of model items from one version to another, exporting and importing of version dependent model items, and creating DEM help files.

- **Version operations**
  You can use several sessions to perform version operations over a range of model items.
- **Version import/export**
  You can copy data from one system or company to another. To import data, you use the Import Version Dump session. To export data, you use the Export Version Dump session.
- **Model operations**
  You can compare business models from the same version or from different versions. To list the differences in a report, you use the Print Differences between Models session .
- **Translation Utilities**
  You use the Translation utilities to export descriptions, model item help texts for translation into languages. After the files are translated, you can import the data again.

Run-Time Model Control

Run-time model control provides the functionality to distinguish between a modeling environment and a final user interface as provided by the Process Browser. You use the run-time model control sessions to determine which project models are applicable to your organization at a certain point in time. The project models that you select as run-time project models determine which business processes and activities users will have in their Process Browsers.

- **Runtime Version, Project Model, and Optimization Phase**
  You can create and maintain run-time project models for a company and a version combination..
- **Print DEM session authorizations**
  You can print an overview of one or more users to see which authorizations are provided when they have access to a certain project model. If you select the Based on Repository check box in the Print DEM session authorizations, the authorizations per user based on a role within a certain DEM version is printed.

Chapter 17
Tools

17

Introduction

You use the Tools package to configure and manage the LN application and to develop or customize LN software components.

The main functions and features of Tools are described in these topics:

Software Installation

After installing LN, you perform various post-installation steps, such as deploying demo data and specifying the alignment of alphanumeric codes. You can also import patches and update data after a feature pack upgrade.

- **Product maintenance and control**
  To help you manage software updates to your LN system, Infor offers the Product Maintenance and Control (PMC) Tool. You can use this tool to manage functional software updates (Feature Packs) and other software updates (Individual Solutions).
- **Data upgrade engine**
  You can use the Data Upgrade Engine (DUE) to update the customer data after a Feature Pack (FP) upgrade.

Application Configuration

To configure LN, you must specify various configuration parameters and settings.

- **Parameters and settings**
  You use this module to maintain system parameters and settings, which impact the system setup for all users. Examples are the setup of timestamps on LN tables, the standard behavior of the LN print server, and the location of the web server for the LN workbench applications.
- **Package combinations**
  A package combination is a collection of various LN software packages. Every package combination has a unique VRC. The package combination links users to a specific version of the LN software. A package combination can be linked to one or more users and to one or more companies. However, a package combination can contain only one version of a package, which is identified by a package VRC.
- **Languages**
  Most LN implementations use several languages simultaneously. LN supports any combination of languages within one LN environment, as long as the languages are supported with LN. The support is restricted to certain databases.
- **Shared memory**
  The shared memory is a part of physical memory intended for common use. Programs communicate with each other through shared memory. Shared memory results in faster access to the components loaded in shared memory. To enhance the performance of your LN system, you can load program objects and report objects into the shared memory. Before you set up and initialize shared memory, you should verify that the hardware and internal memory is sufficient.
- **Sensitivity labeling**
  Sensitivity labeling enables you to provide feedback to the end user about the sensitivity of the information on an LN screen.

- **Multilanguage application data**
  If your LN system uses the Unicode character set, you can run multiple languages of the LN software, such as Chinese, English, and French in one LN environment. Also, you can enable LN to store shared application data in multiple languages. This is useful if users from all over the globe are using the same environment. Depending on the user's software language, the application data can also be displayed in the same language. If a report for a business partner is printed, the layout and data of the report are in the business partner's language.
- **Customer defined fields**
  You can use the Customer Defined Fields (CDF) sessions in the LN software to store additional information in tables without creating customizations.

Application Personalization

Users can personalize sessions and apply special formatting to the data displayed in sessions. The personalizations and formatting settings that are specified by the users are stored on the LN server. Administrators can maintain these settings.

- **Session personalizations**
  Users can personalize sessions in various ways. Web UI users can, for example, hide fields, change labels, customize the toolbar, and move fields to another tab. Administrators can maintain the personalizations defined by the users. For example, an administrator can export personalizations to an XML file, import personalizations from an XML file, and copy personalizations to another user, to a DEM role, or to a company number.
- **Conditional formatting**
  Web UI users can define conditions to apply special formatting to the data displayed in LN sessions. The users can define multiple conditions per session and different types of formatting, such as a specific color for particular fields or rows, and a warning symbol for particular rows. Administrators can maintain the formatting settings specified by the users and can define system-wide formatting settings.

User Management

LN User Management manages the user's profile for end user and developer specific configurations.

You can create LN users and authorize these users to use LN. You can define the authorizations for LN in roles and templates that are linked to the LN users. The role and template concept provides you with a user-friendly method to quickly add new users or update user authorizations.

- **LN user**
  To work with the LN application, a user must have an operating system user account and password, a database user account and password, an LN user account, and the proper LN authorizations. The authorizations are dependent on the user's role in the organization.

- **Database user**
  An LN user must connect to a database to use information from it. The LN user can only access a database with the proper authorizations and rights. To give an LN user these rights, you must link the LN user to a database user.
- **Link between the LN user and the database user**
  An LN user can only use the information in a database if the LN user is linked to a database user. You can link an LN user to a database user in the LN RDBMS Administration.
- **Authorizations**
  For normal users, authorizations are defined for the use of sessions, databases, and libraries. These authorizations are defined in roles that you can link to the user profiles. In addition, you can define authorizations that are not dependent on a role, such as development parameters and device preferences. These authorizations are defined in templates that you can link to the user profiles. Super users do not have any restrictions and therefore are not linked to roles.

Device Management

You can print LN reports on different types of devices, for example output files and printers.

- **Device management procedures**
  You use the device management procedures to create devices, and specify the paper types and fonts for the printouts.
- **Device management maintenance procedures**
  LN Device Management provides functionality to perform maintenance tasks, such as maintaining and purging the device queue and canceling print requests.
- **LN report archive**
  The LN Report Archive solution enables you to archive reports, so you can reprint them, even several years after they are initially printed.
- **Automatic paper selection for Windows printers**
  You can configure LN so that the correct paper type is automatically selected when you print a report to a Windows printer device.
- **Windows printer devices**
  You can define devices of type Windows Printer and Windows Server Printer.
- **Microsoft reporting for LN**
  You can create a device of type **Microsoft Reporting Services**. This device prints LN reports by using report designs that are stored on a Microsoft Report Server. This report server renders the reports.
- **Infor Reporting for LN (IR)**
  You can create a device type to redirect report output to the Infor reporting solution, IR. This device redirects LN output to IR to publish reports.

Job Management

You can use job management in LN to schedule jobs based on your organizational requirements. For example, you can schedule jobs at non-peak hours to improve the overall system performance in a heavily loaded environment. A job consists of one or more sessions or shell commands, or both, that run without user interaction. The sessions and shell commands in a job can be started while you are not logged on to LN. You can schedule jobs to start processes periodically, at a defined interval, or immediately. Typically, you use LN job management for print and processing sessions.

- **Job data**
  To create a job, you must specify basic job data and link sessions or shell commands, or both, to the job. In the basic job data you specify whether the job is periodical. For periodical jobs, you specify how the job will be scheduled.
- **Shared job data tables**
  Typically, each company stores its own basic job data. As a result, a job runs for a particular company. However, in a job, you can also run sessions in more than one company. You can run sessions in multiple companies when the job data tables of the associated companies are physically mapped to a single main company.
- **Job execution**
  Jobs can be started in multiple ways. The job's status defines how you can start the job. You can start the job if the job's status is **In Queue** or **Free**.
- **Job history**
  When the execution of a job stops, for example, when the job completes successfully or when a runtime error occurs, information is written to a history log. The job history contains information, such as the date and time of the execution and the reasons why the job and its associated session ended.

Database Management

LN data is stored in database tables. LN supports several Relational Database Management Systems (RDBMSs). To access a database, the LN users must be authorized to access the RDBMS.

- **Database information**
  You must specify database information for each database type used by LN. During setup you also must create a database definition and assign tables to it.
- **Remote databases**
  The client/server architecture as supported by Tools enables the user to work with several database types. These databases can be distributed over one or multiple systems. A configuration where databases are distributed over multiple systems is called a remote database configuration.
- **Table sharing**
  In an LN installation with multiple companies, you can require two or more companies to share tables to meet a particular business requirement. For example, if several of your companies

purchase items from the same suppliers, these companies can share the business-partner table.

- **Database administration**
  The Database Administrator (DBA) module is used by the database administrator to create, maintain, and view links between LN users and database users, database groups, and the tables and indexes repository in the databases.

Audit Management

Audit management manages and monitors the audit files that contain transactional changes in the LN system. LN audit management is primarily used by LN 's proprietary data synchronization solutions, LN SyncServer and LN Exchange, to exchange the transactional changes across LN systems.

- **Audit configuration management**
  You use LN audit features to fully or partially log changes that users make to the LN database tables when they use LN sessions.
- **Audit trail and audit host settings**
  The audit trail and audit host settings provide the required information to create audit trails.

Text Management

Text management provides the tools to write and maintain text in LN. You can use LN ’s text editor, for example, to write queries in the SQL Queries module. You can also provide information about the data stored in the database tables.

For example, you can link information to a record that defines the contents of the record. You can provide additional information, for example, about an item or a sales order.

- **Text parameters**
  To use text in LN, basic parameters must be specified. These parameters provide the users with the basic requirements to write and edit text.
- **Text maintenance**
  The Text Management module contains sessions to maintain texts. You can remove texts that are no longer used and specify unique text number ranges for the text groups.

Menu Management

LN menus are used to organize the LN sessions in a logical folder / subfolder structure. The folders and subfolders usually represent LN packages and modules. Users can open the folders and subfolders in the menus to find the sessions.

- **Menu customization**
  LN users can have their own customized menus. LN menus are created by LN developers or by LN administrators who have developer authorizations. The start menu for a user must be defined in LN user data.

SQL Queries

You can define stand-alone SQL queries to extract information from the database and present this information in a report or chart. These stand-alone queries are not embedded in any other software component and are executed independently.

- **Query definition**
  You can create stand-alone queries with Easy SQL or with the Text Manager. Easy SQL helps users to define queries in a simple, menu-driven way. Text Manager enables you to create more complex queries.

Application Customization

The LN development environment enables you to customize the LN software. You can create package VRCs in which you can customize various types of software components, such as sessions, forms, reports, multi-language data field labels, questions, and messages.

- **Development parameters and authorizations**
  To maintain or create software components, a developer requires default development settings and parameters and authorization to at least one package VRC.
- **Version and release management**
  Software is constantly changing. Therefore, you must manage various versions of packages, corresponding releases, and all the various customizations on the standard software. Infor Enterprise Server offers a comprehensive solution with a version and release management concept.
- **Software configuration management (SCM)**
  Developers can use the Software Configuration Management System (SCM) to make a copy of the software component and place the component into a dedicated development VRC. The component can then be modified, for example, to fix a bug. If the component is finished and tested, the component can be placed back into the run-time environment. This process is called the check-out and check-in process. The component can still have the same VRC code, but it has a different revision number. Older revisions of the component are still retrievable.
- **Messages**
  Messages are language-independent software components that allow you to customize dialog messages.

- **Questions**
  Questions are language-independent software components that are used to ask situation-dependent questions to which the user must respond. At runtime, the questions are displayed in the language that is specified for the current user.
- **Menus**
  LN users can have their own customized menus. LN menus are created by LN developers or by LN administrators who have developer authorizations. The start menu for a user must be defined in LN user data.
- **SQL queries**
  You can create stand-alone queries with Easy SQL or with the Text Manager. Easy SQL helps users to define queries in a simple, menu-driven way. Text Manager enables you to create more complex queries.
- **Forms**
  The form is the user interface part of the session. Forms, which are presented to users, include data and actions that users can perform on that data. The session and form are integrated; one form per session is defined. The form definition in the session identifies the fields, labels, and options that are available in the session's overview display window and details window.
- **Reports**
  Reports are used to show data on the screen, or print it on a printer or other output device. Reports are used in (print) sessions and SQL queries. A session can have multiple reports. When you run a session that has multiple reports, a list of available reports is displayed. An SQL query can have only one report.
- **Report scripts**
  A report script allows you to customize the processing of the report. A report script consists of event sections in which you program actions to be performed at particular states of execution of the report. The statements programmed in a report script section consist of a combination of 3GL language statements and report script functions.
- **Charts**
  Charts present data in a graphical format to the user. Charts are used in sessions and SQL queries. A session can contain multiple charts. An SQL query can have only one chart.
- **Business object modeling**
  The business object repository (BOR) is a virtual space in which business objects are stored. A business object is an object with a business-oriented user interface, which serves as a single entry point to store all the business-related data and perform operations on this data.
- **Data dictionaries**
  A data dictionary is a collection of descriptions about a data model or system. LN uses two unique data dictionaries: the Runtime Data Dictionary and the Application Data Dictionary.

Application Development

The LN development environment enables you to develop LN software. You can create package VRCs in which you can perform the following:

- Set up a data model, consisting of domains and tables, for an application. To use this functionality, a development license is required.
- Create various types of software components, such as the following:
  - Sessions
  - Forms
  - Reports
  - Report scripts
  - Multi-language data field labels
  - Questions and messages
- Create, edit, and compile UI scripts, DLLs, and DALs. To use this functionality, a development license is required.

- **Domains**
  Domains define common information about data such as data type, length, alignment, valid ranges, display format, and capitalization rules.
- **Table definitions**
  A table definition defines the structure of a table. A table definition contains fields and indices. Table fields are linked to domains that define the data type and several characteristics of the fields.
- **DAL**
  The Data Access Layer (DAL) allows developers to describe rules about data. A DAL is linked to a table, not a session. Therefore, when the table is accessed, the DAL is used. In this way, different sessions can update a table by using the same rules. In addition, integration capabilities use the DAL to ensure updates are also processed with the same rules.
- **Sessions**
  A session performs an activity. Sessions are used to present data, edit data, and process data. Each session has a code. The session code is displayed in the status bar of the session window. A session consists of multiple components that work together, such as a form and an object. A session object is a compiled UI script.
- **UI scripts**
  The default behavior of a session is handled by the 4GL engine. If you require additional functionality or want to bypass the default functionality, you program your changes in the session's UI script (Program script). The UI script is compiled in the session object. The object contains only the exceptions to the normal operating procedures of the system. The 4GL Engine executes the normal operating procedures of the system, and you write the exceptions.
- **Functions**
  Functions allow you to perform a programming task multiple times with different values. A function is declared in the functions section of a script, in a library, or in a separate function script (include).

- **Libraries**
  A library, also called Dynamic Link Library (DLL), provides application-specific functions that can be used throughout the system, by many sessions. A library is a script that is stored in a separate component. The library is compiled independently of the program scripts that use it. Libraries are loaded at runtime by sessions that use them. When a session needs to access a library, the library is loaded, and the relevant routine is executed.

See also *Application Customization (p. 177)*.

Integration Tools

LN contains various integration tools. You can use these tools to integrate your LN environment with other applications or other LN environments.

- **Office integration**
  You use the Office integration to integrate LN with MS Word and MS Excel.
- **Contacts and calendars**
  You use this module to configure the data synchronization between MS Exchange and the LN Customer Relation Management applications.
- **Exchange**
  You use the Exchange module to import and export data to and from LN.
- **Triggering**
  The Triggering module is a small component in LN that is used to notify another site or application of an event in LN.
- **Synchronization server**
  The Synchronization Server implements the publishing of event messages for LN. This is done by creating a synchronization object for a business object. A synchronization object is the selection of a business object, extended with selection of components and attributes and (optionally) a filter. The synchronization object enables the synchronization at runtime for the selected business object.
- **Event publishing**
  Business data and methods in LN are grouped in business objects. A business object, also known as BDE, business data entity, is capable of publishing events when changes occur to its instances. A client application can request changes on such a business object to be published. In this scenario, when an instance of a business object is created or an existing instance of a business object is changed or deleted, a create, change or delete event is published. The Synchronization Server enables publishing of these events from LN.

Translation

LN uses Language Translation Support (LTS) to reduce the language dependency of the LN applications and lower the costs of media creation and distribution.

- **Language translation support**
  LTS provides a mechanism to separate translatable software components, such as labels, questions, and messages from language-independent components, such as form and report layouts. In LTS, the forms and reports only exist in the development language. For example, a sales order entry form contains only identifiers for the associated labels. The form is used by all system languages. At runtime, the translated labels are displayed on the form.
- **Software translation**
  In LN you can export the labels, questions, and messages from a development or translation system and import them into other LN environments. Export and import of labels is performed by using XML-formatted files. Every XML file contains a selection of translatable components based on the user's settings. The translated language files can be imported back into the Infor environment. The import process includes a conversion to runtime. All descriptions are stored as labels which can be handled by the same import and export processes.
- **Verify software components**
  Verify Software Components (VSC) is a tool to perform quality control on the LN 4GL-software. VSC performs various validations, based on the LN design principles. When you use VSC, a list of warnings is generated. For each warning, you can decide whether to accept the warning or solve the problem.

Software Distribution

LN provides tools to export software components from a package VRC to sequential files. You can import these files into a package VRC in another environment.

- **Export and import procedure**
  With the import/export procedure, the software components in a package VRC are exported to sequential files and imported into a package VRC in another environment. If you import the software components into another environment, you must convert them to the runtime data dictionary in the new environment.

eMessage Connector

The eMessage Connector enables you to build several classes of messaging applications within an LN application. LN supports e-mail messages.

With the eMessage Connector, the LN application can perform these actions:

- Send messages with the help of a mail client, for example, through Microsoft Outlook, or another MAPI-compliant mail client.
- Send messages to a server-side service provider (SMTP).

For details, see the *System Administrator's Guide for eMessage (U8307 US)*.