Materials Management (MM)

Curriculum: Introduction to S/4HANA using Global Bike

Teaching material - Information

Teaching material - Version

- 3.2 (May 2018)

- Software used
  - SAP S/4HANA 1709

- Model
  - Global Bike

- Prerequisites
  - No Prerequisites needed

Module Information

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Target Audience

- Beginner

Module Information

Learning Objectives

- Describe the purchase-to-pay business process
- Identify the organizational levels that support the purchase-to-pay business process
- Create a material master record
- Create a vendor master record
- List other vendor-specific master data
- Create a purchase requisition for stock and consumable materials
- Create a purchase order by referencing a purchase requisition
- Post a goods receipt for a purchase order
- Explain the warehouse structure in Warehouse Management (WM)
- Perform a putaway in WM using a transfer order (TO)
- Enter a vendor's invoice
- Process the automatic payment run
- Explain the integration points of the purchase-to-pay business process

Functionality

- Inventory Management

- Purchasing

- MRP

- Physical Inventory

- Valuation

- Service Master

- Invoice Verification

- Product Catalogs

Unit Overview

- Innovations in S/4HANA compared to ERP in Materials Management

- MM Organizational Structure

- MM Master Data

- MM Processes
  - Procure-to-Pay Process

Innovations in S/4 HANA compared to ERP in Materials Management

1) Business Partner (BP) is the Single Point of Entry for master data such as customer, vendor or contact person
   ➡ Transaction BP replaces: FD01, FD02, FD03, FD05, FD06, FD0 FK01, FK02, FK03, FK05, FK06, FK08 MAP1, MAP2, MAP3, MK01, MK02, MK03, MK05, MK06, MK12, MK18, MK19, V-03, V-04, V-05, V-06, V-07, V-08, V-09, V-11, V+21, V+22, V+23, VAP1, VAP2, VAP3 VD01, VD02, VD03, VD05, VD06 XD01, XD02, XD03, XD05, XD06, XD07 XK01, XK02, XK03, XK05, XK06, XK07
2) The maximum length of the material field (material number) has been extended from 18 to 40 characters
3) Data model has been changed significantly
4) Obligatory to use the Material Ledger
5) Simplifications in transactions MM01/02/03
6) Simplification in transaction Request for Quote
7) Cloud Integration: Ariba
8) In Output Management, the target architecture is based on Adobe Document Server and Adobe Forms
9) Change in the data model in MM Inventory Management
10) Transactions for executing and displaying goods movements are replaced by transaction MIGO
    ➡ Transaction MIGO replace: MB01, MB02, MB03, MB04, MB05, MB0A, MB11, MB1A, MB1B, MB1C, MB31, MBNL, MBRL, MBSF, MBSL, MBST, MBSU

Innovations in S/4 HANA compared to ERP in Materials Management

1) The transaction for Business Partner (BP) is the Single Point of Entry for all master data such as customer, vendor or contact person and has replaced over 50 ERP transactions
2) The maximum length of the material field (material number) has been extended from 18 to 40 characters
3) The ERP data model has been simplified in many areas to improve performance
4) Valuation of inventory now uses the Material Ledger which was optional in ERP
5) The transaction for Request for Quote has been simplified and now enables Cloud Integration to Ariba
6) Over 15 transactions for executing and displaying goods movements are replaced by transaction MIGO

Alternative to slide 7

Innovations in SAP S/4HANA
Business Partner

- The core function of SAP S/4HANA is the simplification of data structures
- ➡ various transactions, such as the management of customers or suppliers, are brought together
- It is (so far) still possible to navigate through the well-known Easy Access menu

A unique business partner number is assigned to creditor 114000.
This business partner number is assigned to various roles such as the customer, creditor, contact person.

Relationship: n:m

Innovations in SAP S/4HANA
Business Partner

- There are redundant object models in the traditional ERP system where the vendor master and customer master is used.
  - The (mandatory) target in SAP S/4HANA are the Business Partner approach.
- Business partners can be categorized as a person, group, or organization as follows:
  - An organization represents units such as a company (for example, a legal person), parts of a legal entity (for example, a department), or an association. Organization is an umbrella term to map every kind of situation in the day-to-day business activities.
  - A group represents a shared living arrangement, a married couple, or an executive board.

Innovations in SAP S/4HANA

- The maximum length of the material field (material number) has been extended from 18 to 40 characters
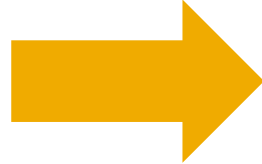

- Simplifications in transactions MM01/02/03
  - Relevant views are displayed only for material type, e.g. Material type SERV (Service material)
  - → New product type group that relates to services

Innovations in SAP S/4HANA

- Data model has been changed significantly
  - the new denormalized table, MATDOC, has been introduced which contains the former header and item data of a material document as well as a lot of further attributes.
  - Material document data will be stored in MATDOC only and no longer in MKPF and MSEG.
  - Actual stock quantity data will be calculated on-the-fly from the new material document table MATDOC
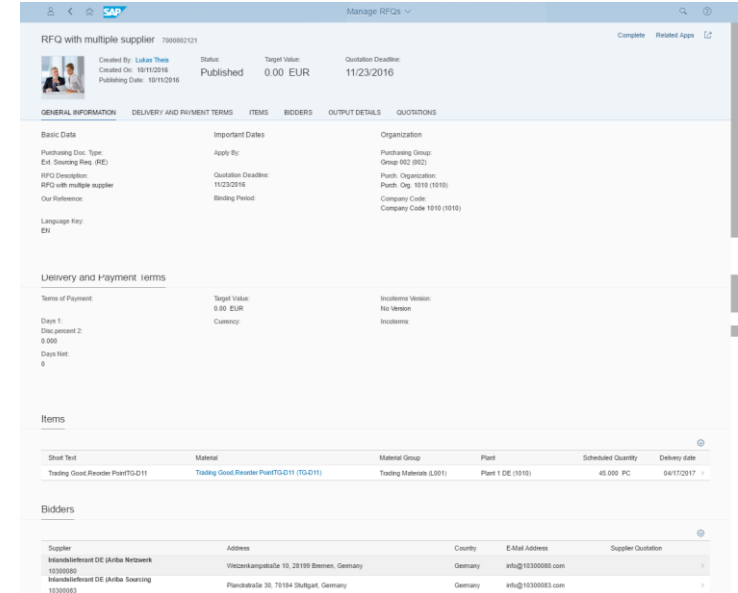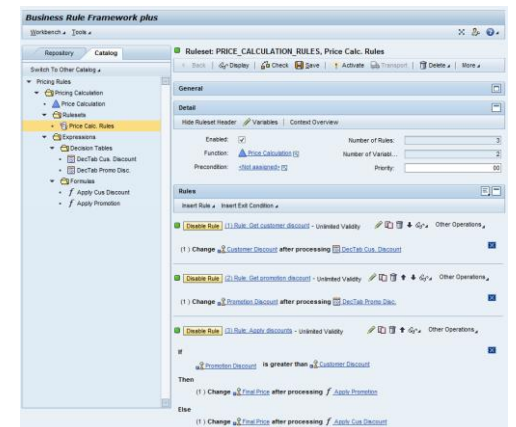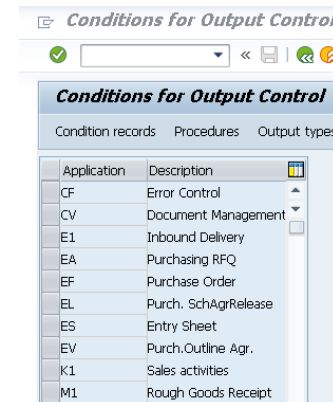 - ➡ With the new MM-IM data model, the system works on database level in an INSERT only mode without DB locks.

- Obligatory to use the Material Ledger

  - This simplification makes it obligatory to use the Material Ledger in all SAP S/4HANA systems.
  - Material Ledger, as the inventory subledger, valuates material inventories in multiple currencies and GAAPs in parallel

  - In addition, Material Ledger is a base prerequisite for the use of Actual Costing.
  - tables need to be updated less often, which leads to a higher throughput due to fewer database locks.
  - In MM02 and MR21, material prices can now be maintained in multiple currencies.
  - The inventory account balances are calculated separately for each currency and result, therefore, in a cleaner and more consistent valuation in currencies other than the local currency.

Innovations in SAP S/4HANA

- Simplification of the Request for Quote transaction
- So far supplier field is mandatory
  - Only one supplier offer per request could be maintained
  - ➡ Now you can send <u>one</u> RFQ via Fiori App to different suppliers

- Output Management in S/4HANA is based solely on Adobe Document Server and Adobe Forms
  - NAST (message control) is not supported any further
  - *BRFplus* (Business Rule Framework plus) is the new standard
  - Intrasystem, can be used by all SAP applications that are based on SAPNetWeaver
  - Also generate web services that can be offered in SOA principle in system landscape, regardless of the software platform
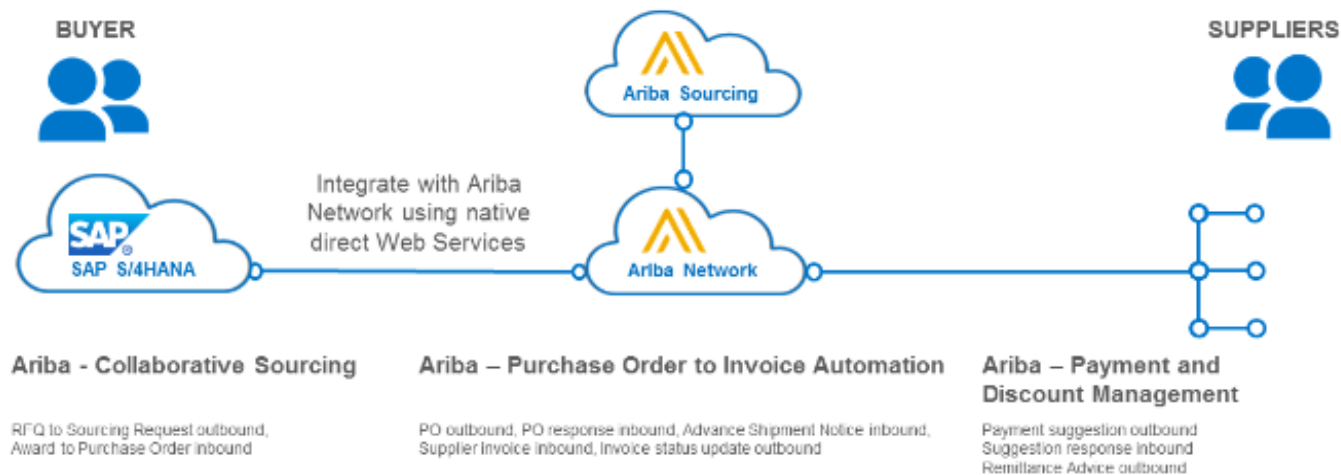
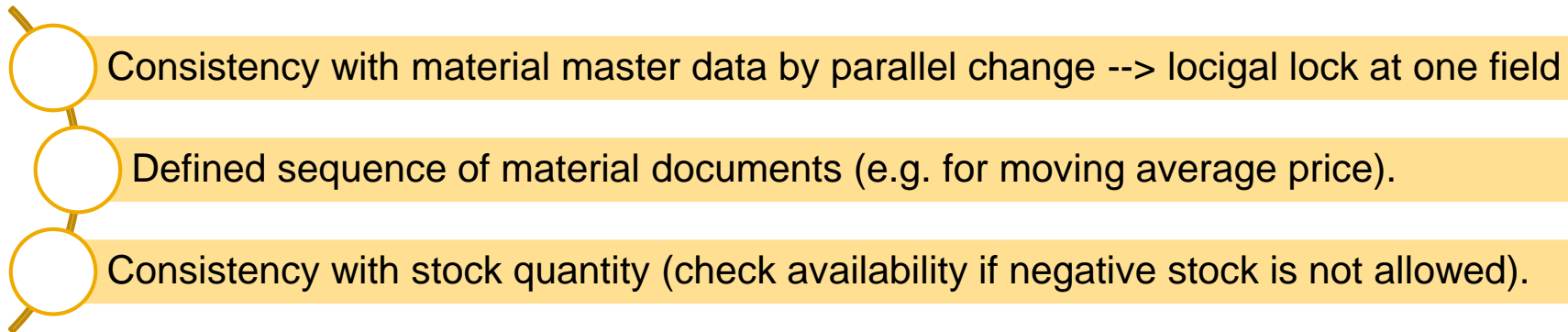# Innovations in SAP S/4HANA

- Cloud Integration: Ariba
  - Ariba allows to discover new suppliers, the streamlining of transaction processes, and the realization of savings with cloud-based procurement software
  - The Ariba network supports the entire source-to-pay process.

Big Picture: SAP S/4HANA cloud integration with SAP Ariba solutions

Innovations in SAP S/4HANA

- Performance optimizations within Material Document Processing - lock behaviour
  - no UPDATE processes on the actual stock quantity fields ➡ INSERT Only
  - from a data base perspective there are no locks ➡ enables - from a DB perspective - parallel execution of material document processing
    - logical locks still required because:

  ○ Consistency with material master data by parallel change --> locigal lock at one field

  ○ Defined sequence of material documents (e.g. for moving average price).

  ○ Consistency with stock quantity (check availability if negative stock is not allowed).

  - The consistency check with master data and stock quantity (1 + 3) is necessary in any case. The defined sequence of material documents (2) is ensured only in the case that exclusive lock is chosen in the customizing
- Transactions for executing and displaying goods movements are replaced by transaction MIGO
  Transaction MIGO replace: MB01, MB02, MB03, MB04, MB05, MB0A, MB11, MB1A, MB1B, MB1C, MB31, MBNL, MBRL, MBSF, MBSL, MBST, MBSU

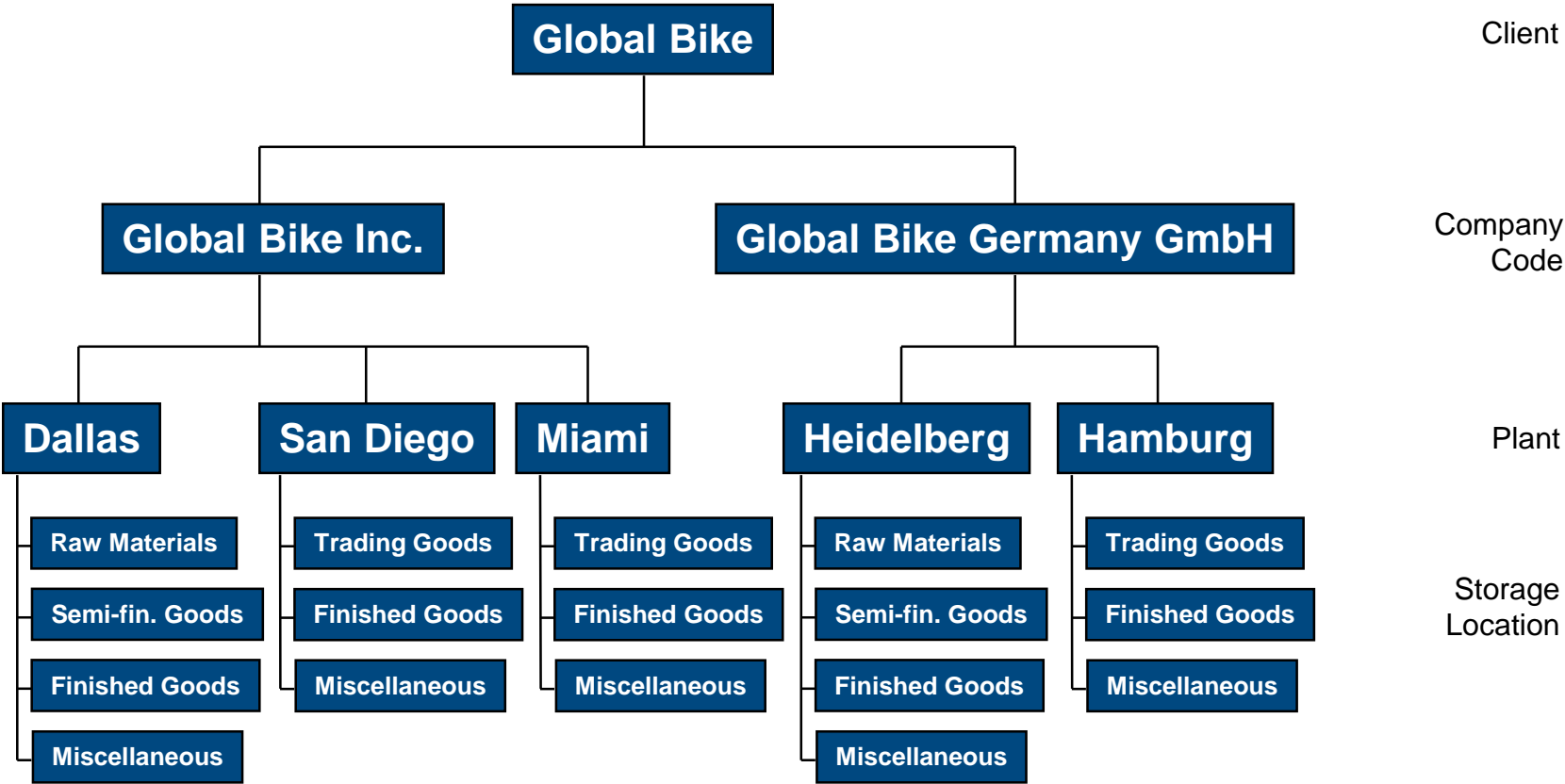# MM Organizational Structure (Materials Mgmt.)

- Client
  - An independent environment in the system

- Company Code
  - Smallest org unit for which you can maintain a legal set of books

- Plant
  - Operating area or branch within a company
    - Manufacturing, distribution, purchasing or maintenance facility

- Storage Location
  - An organizational unit allowing differentiation between the various stocks of a material in a plant
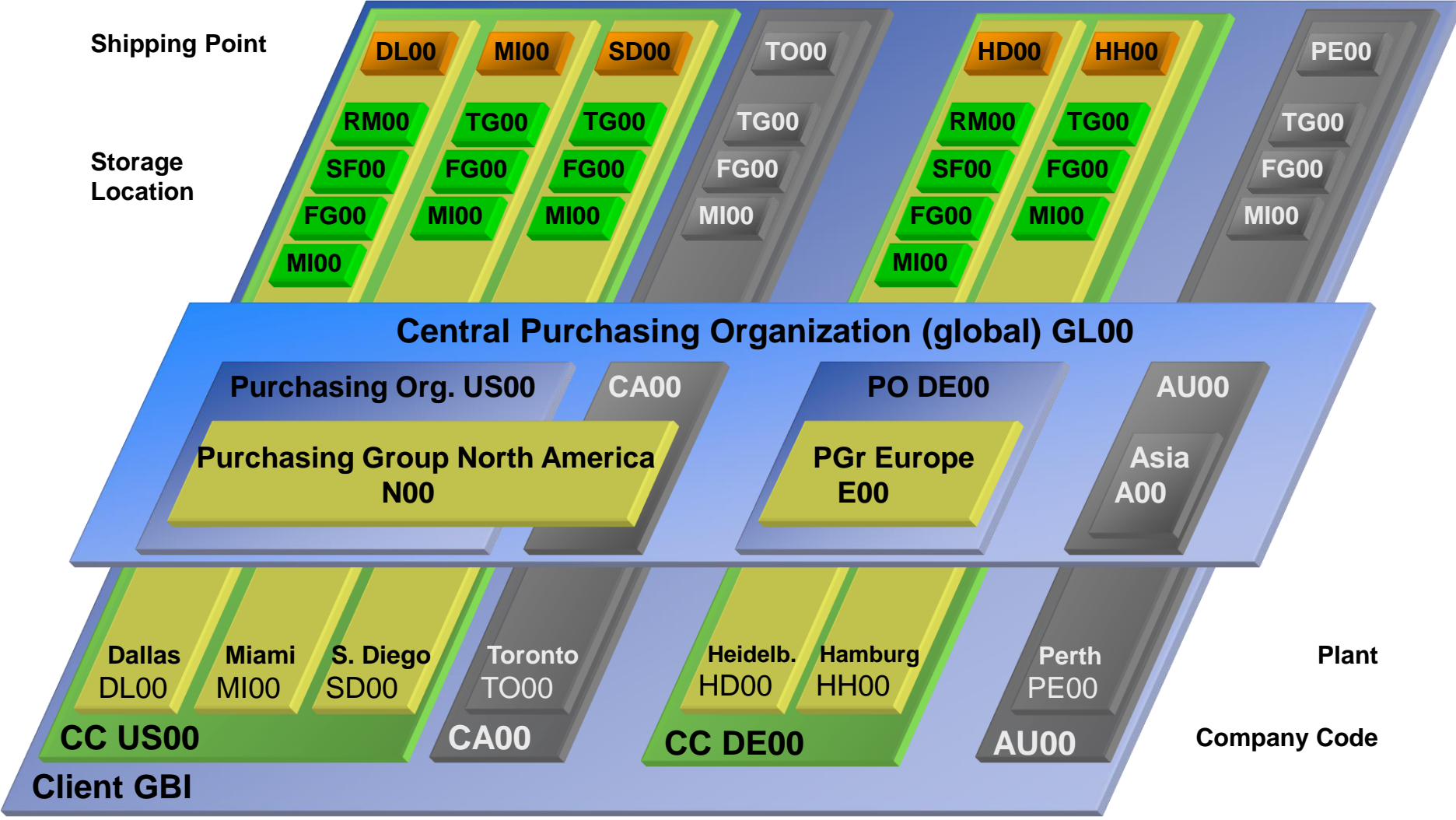
MM Organizational Structure (Purchasing)

- Purchasing Organization
  - The buying activity for a plant takes place at the purchasing organization
  - Organization unit responsible for procuring services and materials
  - Negotiates conditions of the purchase with the vendors

- Purchasing Group
  - Key that represents the buyer or group of buyers who are responsible for certain purchasing activities
  - Channel of communication for vendors

GBI Structure for Materials Management

Global Bike — Client

Global Bike Inc. | Global Bike Germany GmbH — Company Code

Dallas | San Diego | Miami | Heidelberg | Hamburg — Plant

Dallas: Raw Materials, Semi-fin. Goods, Finished Goods, Miscellaneous

San Diego: Trading Goods, Finished Goods, Miscellaneous

Miami: Trading Goods, Finished Goods, Miscellaneous

Heidelberg: Raw Materials, Semi-fin. Goods, Finished Goods, Miscellaneous

Hamburg: Trading Goods, Finished Goods, Miscellaneous

Storage Location

GBI Enterprise Structure in SAP ERP (Logistics)

Shipping Point

| DL00 | MI00 | SD00 | TO00 | | HD00 | HH00 | | PE00 |

Storage Location

RM00	TG00	TG00	TG00		RM00	TG00		TG00
SF00	FG00	FG00	FG00		SF00	FG00		FG00
FG00	MI00	MI00	MI00		FG00	MI00		MI00
MI00					MI00			

Central Purchasing Organization (global) GL00

Purchasing Org. US00   CA00   **PO DE00**   AU00

Purchasing Group North America N00   **PGr Europe E00**   Asia A00

| Dallas DL00 | Miami MI00 | S. Diego SD00 | Toronto TO00 | Heidelb. HD00 | Hamburg HH00 | Perth PE00 | **Plant** |

CC US00   CA00   **CC DE00**   AU00   **Company Code**

Client GBI

Vendor Master Data

- Vendor Master
  - Contains all the necessary information needed to business with an external supplier
  - Used and maintained primarily by the Purchasing and Accounting Departments
  - Every vendor MUST have a master record
    - One-time vendor possible

Vendor Master Views

- Client Level
  - Address
  - Vendor Number
  - Preferred Communication

- Company Code Data
  - Reconciliation Account
  - Terms of Payment
  - Bank Account

- Purchase Org Data
  - Purchasing Currency
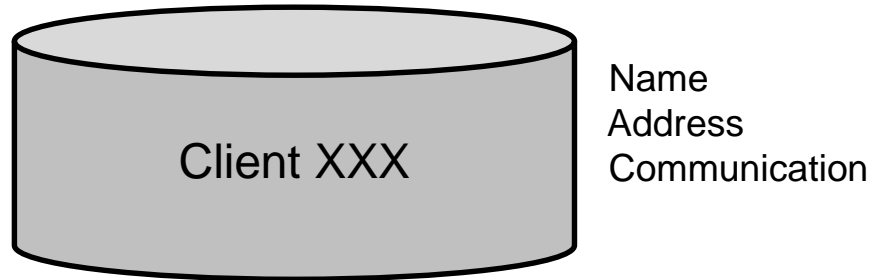 - Salesman's Name
  - Vendor Partners

General Data

Company Code Data
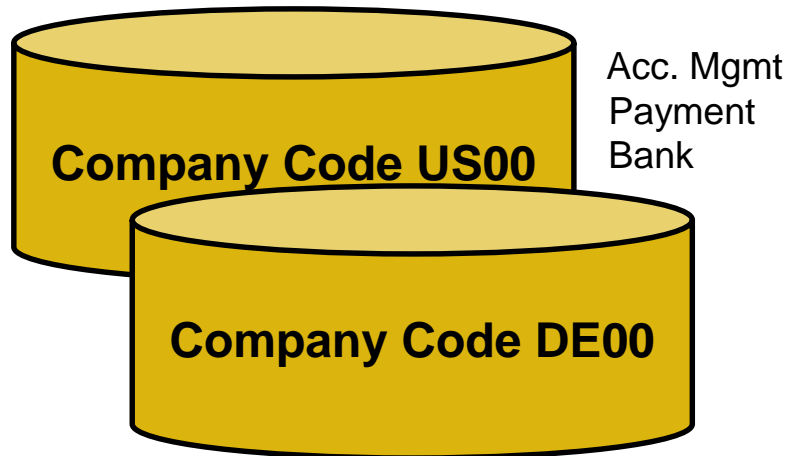Financial Accounting (FI)
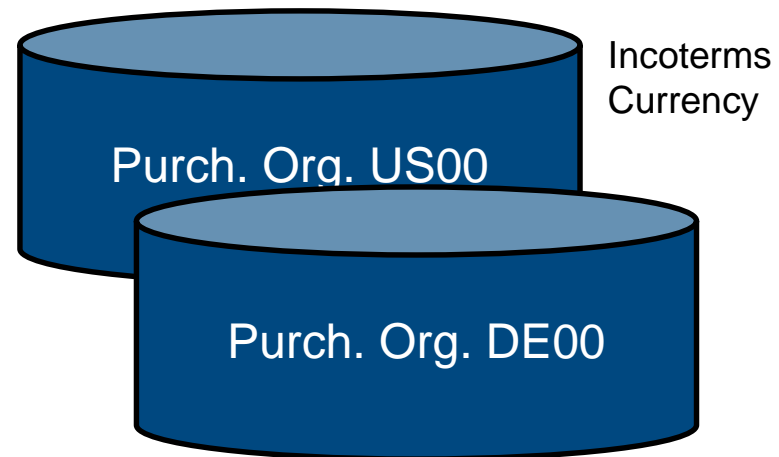
Purchasing Data
Materials Mgmt (MM)

Vendor Master

General Information relevant for the entire organization:

Client XXX

Name
Address
Communication

Company Code specific information:

Company Code US00

Company Code DE00

Acc. Mgmt
Payment
Bank

Purch. Organization specific information:

Purch. Org. US00

Purch. Org. DE00
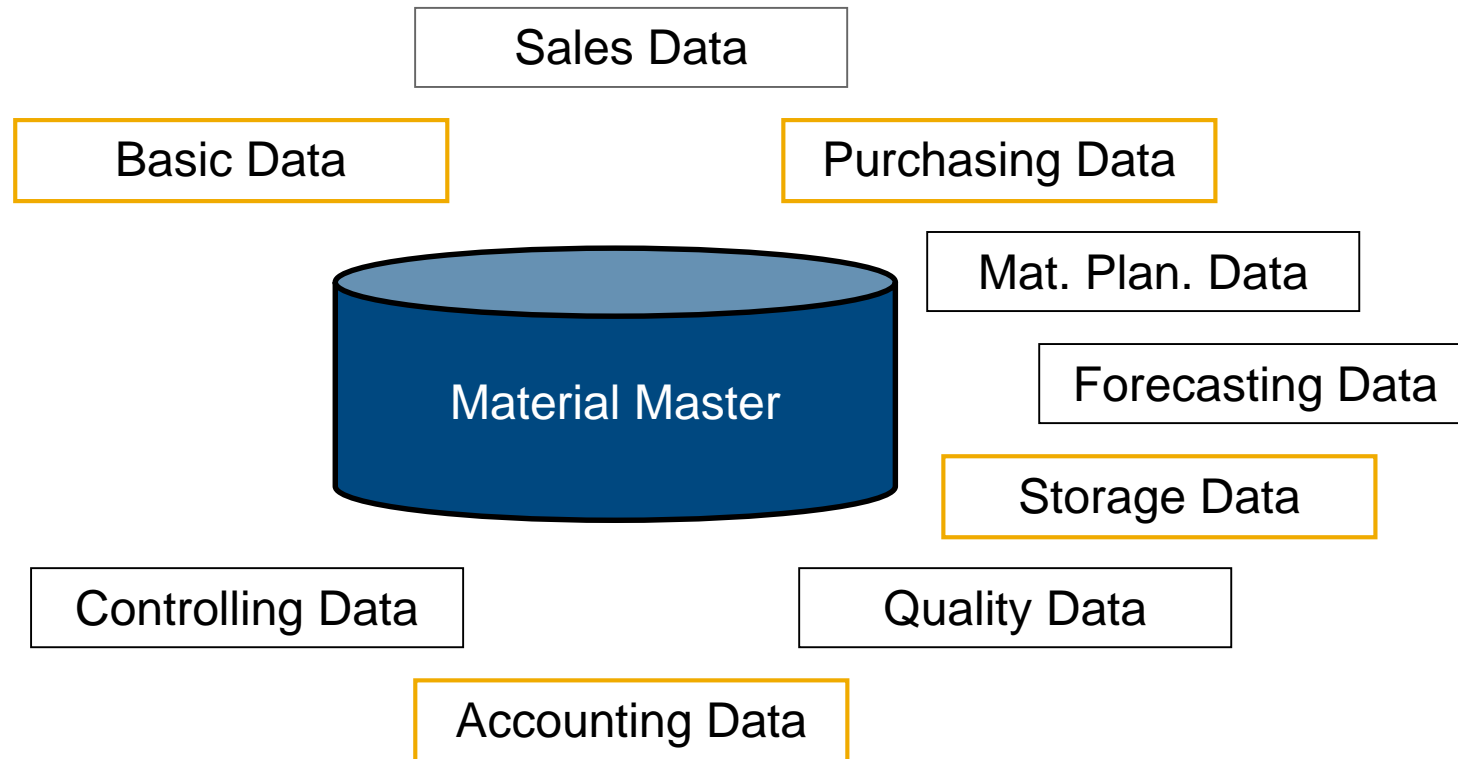
Incoterms
Currency

Material Master Data

- Material Master

  - Contains all the information a company needs to manage a material

  - It is used by most components within the SAP system
    - Sales and Distribution
    - Materials Management
    - Production
    - Plant Maintenance
    - Accounting/Controlling
    - Quality Management

  - Material master data is stored in functional segments called Views
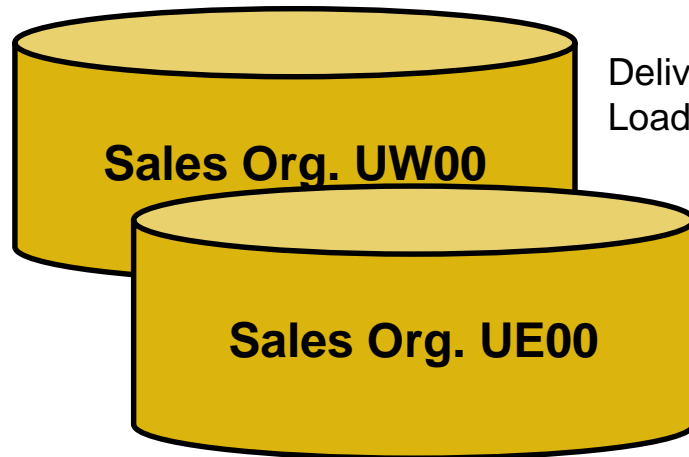
Material Master Views

Material Master

General Information relevant for the entire organization:

Client XXX
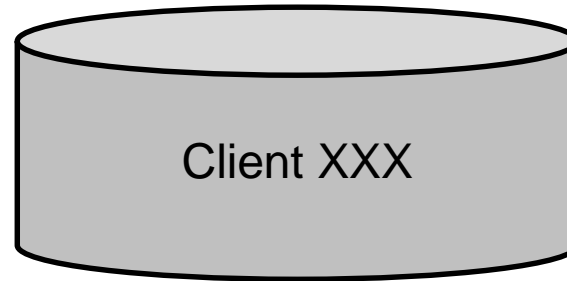
Name
Weight
Unit of Measure

Sales specific information:

Sales Org. UW00

Sales Org. UE00

Delivering Plant
Loading Grp

Storage Location specific information:

Storage Loc. FG00

Storage Loc. TG00
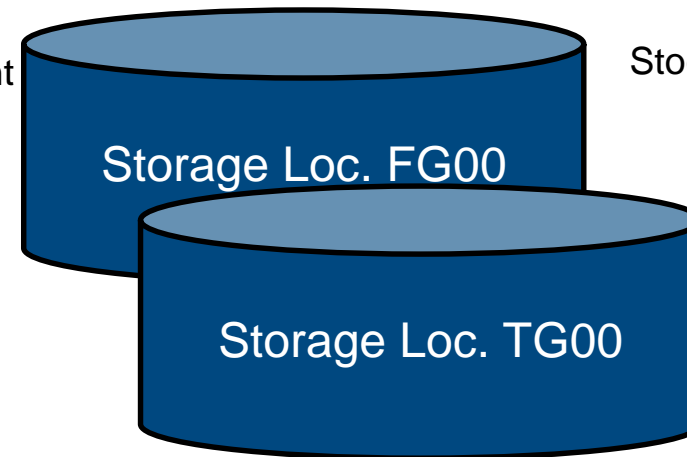
Stock Qty

Purchasing Information Record

- Framework for Purchase Order
  - Contains the relationship between a vendor and a material

- Can be created:
  - Manually
  - Automatically – Quotations and contracts
  - Automatically – Purch. Orders

- Reporting
  - Vendor Evaluation

Purchasing Information Record
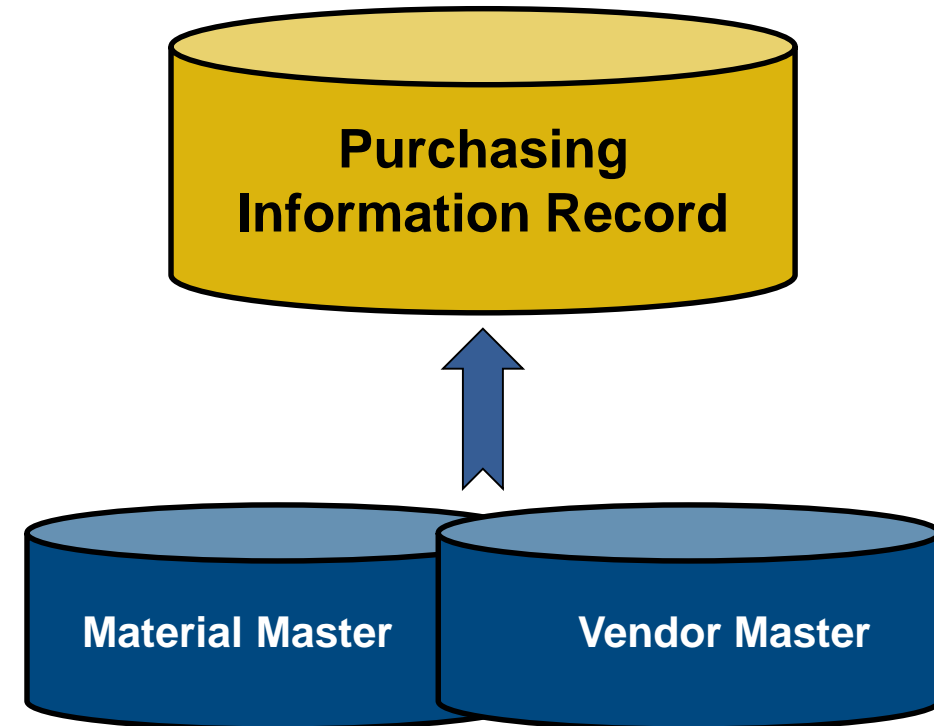
- Allows buyers to quickly determine:
  - Which vendors have offered or supplied specific materials

- Info Records contain:
  - Data on pricing and conditions
  - Last purchase order
  - Tolerance limits for deliveries
  - Specific lead times
  - Availability periods
  - Vendor Evaluation data

- Serves as default information for Purchase Orders

Master Data in Use
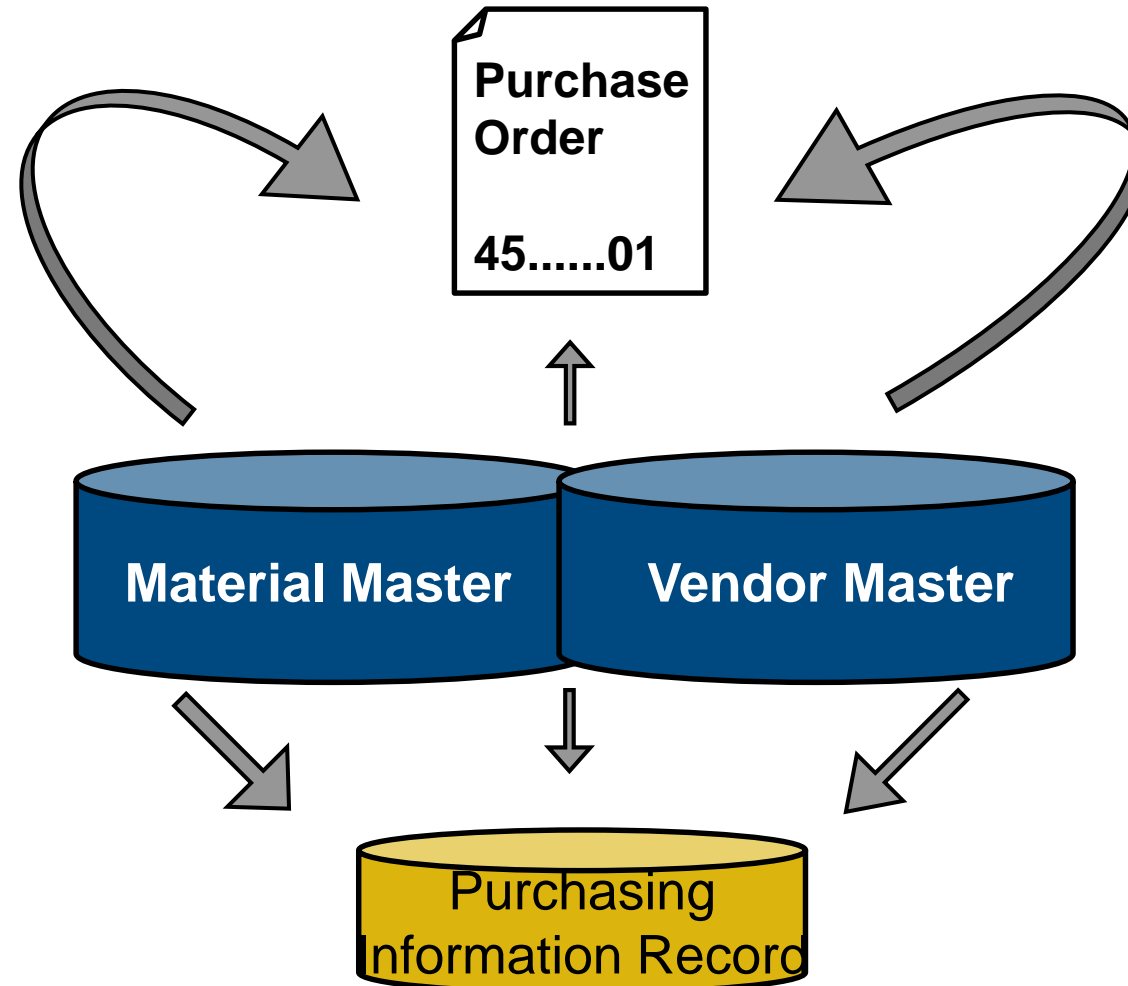
Procure-To-Pay Process

Purchase Requisition

Vendor Selection

Purchase Order

Notify Vendor

Vendor Shipment

Goods Receipt

Invoice Receipt

Payment to Vendor
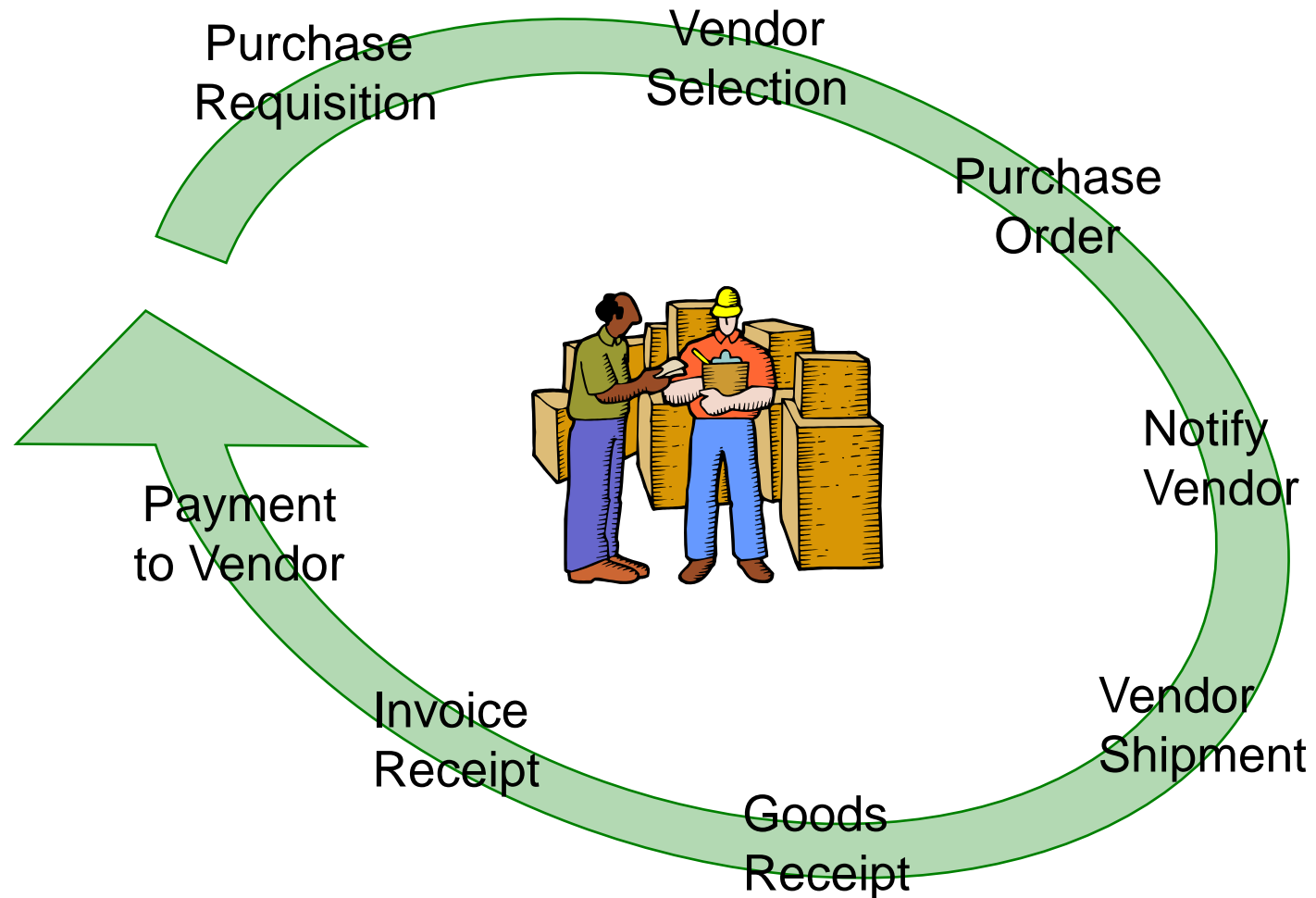
Purchase Requisition

- Internal Document requesting the purchasing department to procure a specific good or service for a specified time

- Requisitions can be created two ways:

  - Directly - Manually
    - person creating determines: what, how much, and when

  - Indirectly - Automatically
    - MRP
    - Production Orders
    - Maintenance Orders
    - Sales Orders

MM Master Data

Vendor Master Data

Material Master Data

Purchasing Info Record

Condition Master Data

Output Master Data

Requisition Sourcing

- Once the requisition has been assigned a source of supply it can be released for processing

- There are a variety of ways that a purchasing department can process a requisition to determine the appropriate Source of Supply:
  - Internal Sourcing Requirements
  - Source List
  - Outline Agreement
  - RFQ

Internal Sourcing

- The requisition for materials could be satisfied by sources within our company.

  - It is possible that a plant within your firm could represent a potential source of supply for the material needed (centralized warehouse)

  - If an internal source is identified the requirement is covered by an internal procurement transaction (stock transport order)

Source List

- A source list is a record that specifies the allowed means for procuring a material for a certain plant within a given time period.

  - If the list contains a sole source the system will assign the vendor to the requisition.

  - If several options exist the system will display a list of vendors for you to choose from.

  - If no source has been established the system will revert to search information records and outline agreements.

Outline Agreement

- Requisitions can be satisfied through existing longer-term purchasing agreements

- These agreements are subdivided into:

  - Contracts
    - Consists of items defining the individual materials, material groups, or services with prices
      - Quantity
      - Value

  - Scheduling Agreements
    - Total quantity of material is spread over a certain period in a delivery schedule, consisting of line items indicating quantities and their planned delivery date

Request for Quotation

- If nothing exists in the system we may need to submit a request for quotation to our vendors. An RFQ is an invitation to a vendor by a Purchasing Organization to submit a bid for the supply of materials or services
  - The accepted quotations will generate Purchasing Information Records
  - Buyers can perform Quotation Price Comparisons
  - Buyers can finally select a vendor quotation
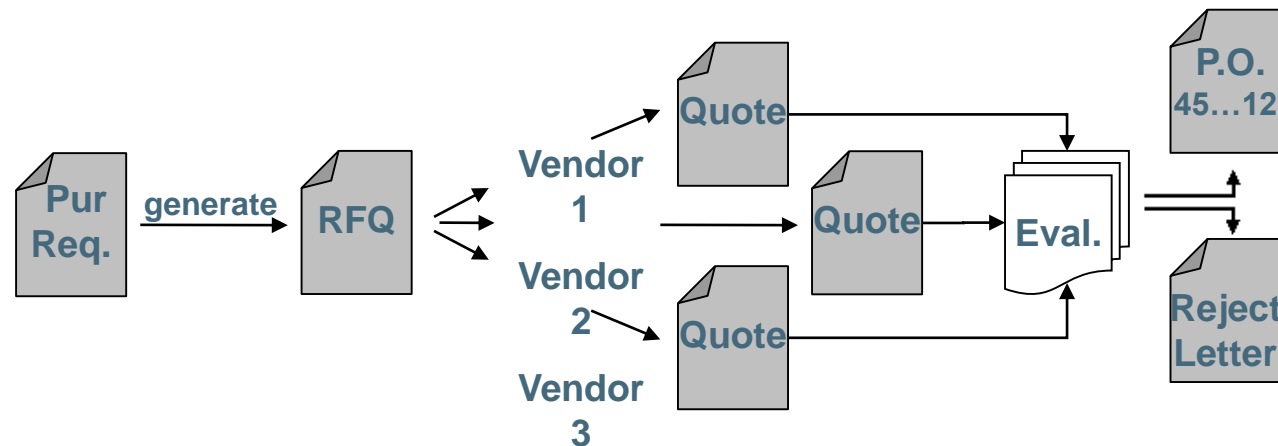
Quotation from Vendor

- The quotation received by your company is a legally binding offer, should decide to do business with the vendor, containing price's and conditions for the materials specified in the RFQ for a predefined period of time.

  - In SAP the RFQ and the Quotation will be become a single document, you will enter the vendor's response in the RFQ you created.

Vendor Evaluation once Identified

- Vendor evaluation helps purchasing evaluate vendors for sourcing while also enabling the company to monitor vendor relationships through performance scores and criteria you put in place.

  - Supports a maximum of 99 main criteria and 20 sub criteria for each main:

    - Price
      - Price Level
      - Price History

    - Quality
      - Goods Receipt
      - Quality Audit
      - Complaints/Rejection level

    - Delivery
      - On-time delivery performance
      - Quantity reliability
      - Compliance with shipping instructions
      - Confirmation Date

  - You then must establish a scoring range (1 -100) and determine the weight factors of scores for each.

Purchase Order

- A purchase order is a formal request to a vendor for a specific material or service under the stated conditions

- Purchase Orders can be created manually
  - Reference a Purchase Order
  - Reference a Purchase Requisition
  - Reference a RFQ/Quotation
  - Without Reference

- Purchase Orders can be created automatically

Purchase Order

- A purchase order can be used for a variety of purposes, the item category (procurement type) defined in the PO will dictate the use of the order and the process that the order will follow:

  - Standard
    - Stock or Consumption

  - Services

  - Subcontracting

  - Third-Party

  - Consignment

Purchase Order Structure

Purchase
Order

45......01

Header

Vendor	Date
Doc. Number	Currency
Terms of Payment	PO Price

Item Overview

Materials	Price/UofM
Quantities	
Delivery Date	

Item Details

PO History	Tolerances
Item Price	
Delivery Schedule	
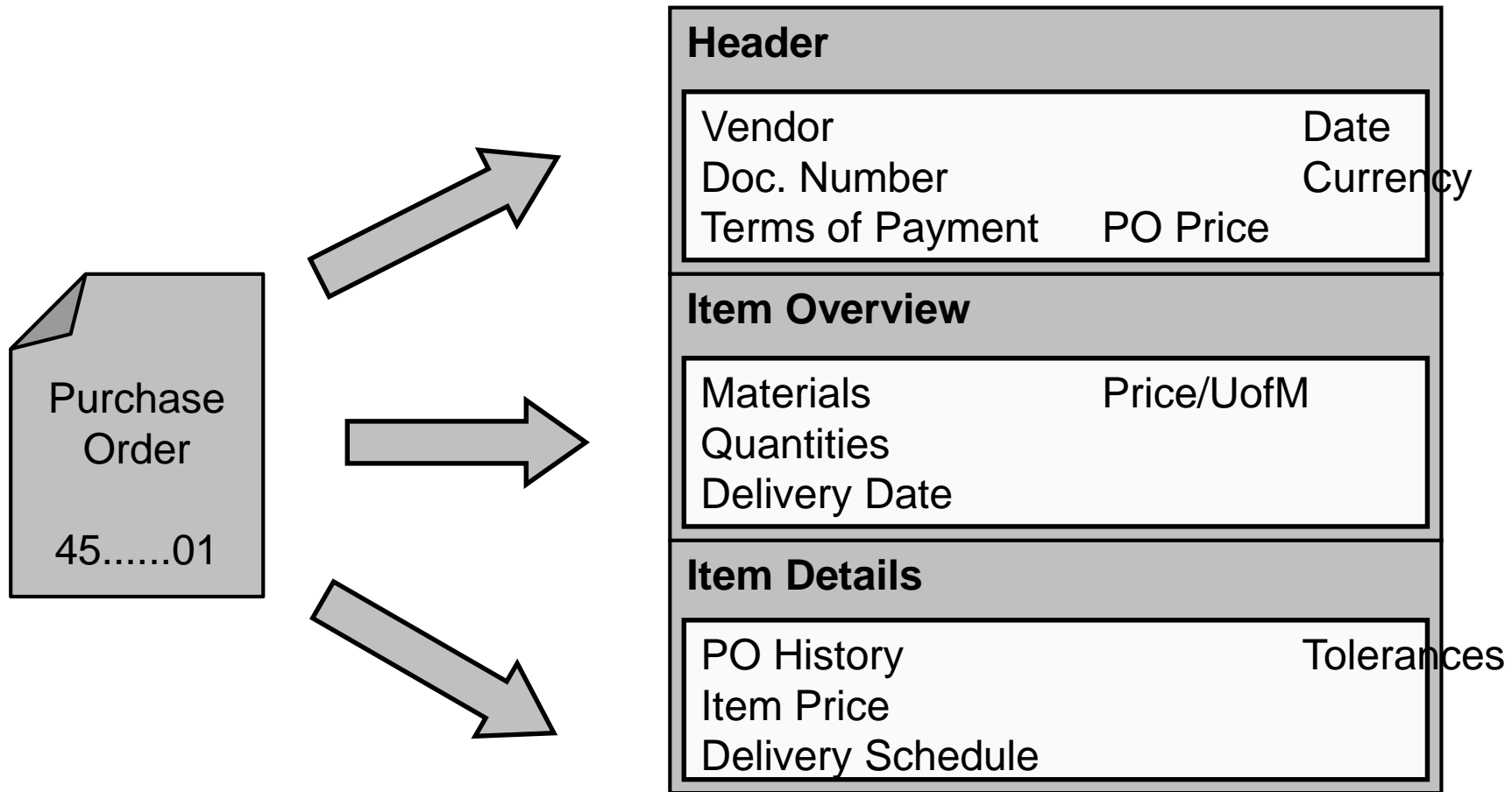
Purchase Order Output

- Once a Purchase Order has been created the vendor needs to be notified
  - Printed
  - E-mail
  - EDI
  - XML

- There are a variety of forms that aid in the purchasing process and are generated from the Purchase Order
  - Purchase Order Output
  - Order Acknowledgement Forms
  - Reminders
  - Schedule Agreements

Goods Receipt

Purchase Order 45.....01

Notify Vendor

Vendor

Shipment
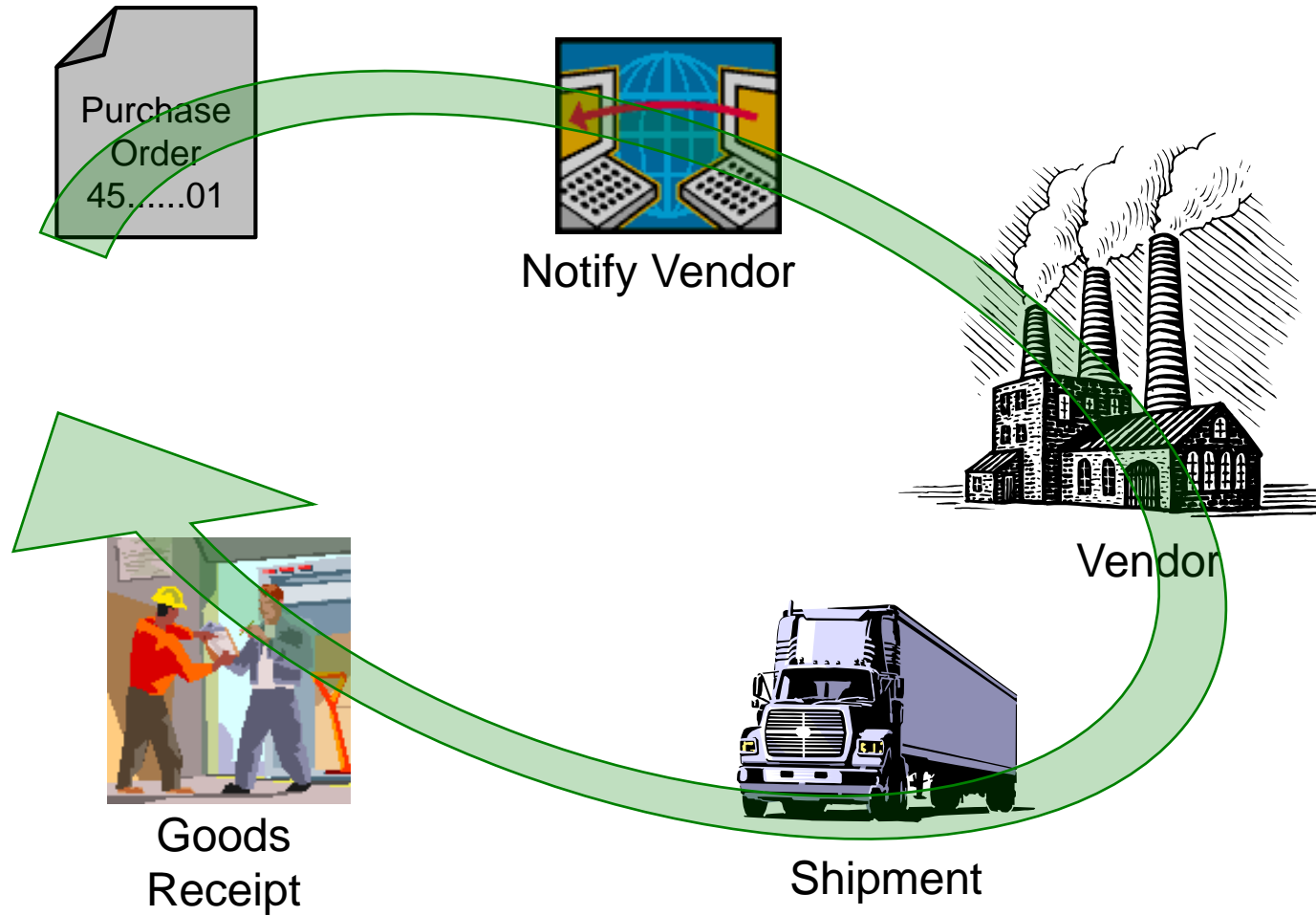
Goods Receipt

Goods Receipt

- Goods movement in which we accept goods into our system

- If materials are delivered against a Purchase Order we will reference that Order
  - Determine if we got what we ordered
  - System can purpose data for us from the PO
    - Material, quantity
  - Purchase Order History is updated with the receipt
  - Updates Physical Inventory
  - Updates Inventory G/L Account

Material Movements

- When a goods movement takes place it is represented by a Movement Type
  - Movement types are three-digit keys used to represent a movement of goods
    - 101 – goods receipt into warehouse
    - 103 – goods receipt into GR blocked stock
    - 122 – return delivery to vendor
    - 231 – consumption for a sales order
    - 561 – initial entry of stock

- Destinations for Receipt of Goods
  - Warehouse – Unrestricted, Quality, Blocked
  - Quality
  - Goods Receipt Blocked Stock

Effects of a Goods Receipt

- When a Goods Movement for the receipt of goods takes place a series of events occur
  - Material Document is Created
  - Accounting Document is Created
  - Stock Quantities are Updated
  - Stock Values are Updated
  - Purchase Order is Updated
  - Output can be generated (GR slip / pallet label)

Invoice Processing

- Incoming Invoices are reference against a Purchase Order to verify their content, prices, and arithmetic.

- If discrepancies arise between the purchase order or goods receipt and the invoice the system with generate a warning or an error
  - Depending on system configuration the difference could cause the system to block the invoice from being paid.

Purchase order
- Target quantity
- Target price

Invoice receipt
- Actual price

Goods receipt
- Actual quantity
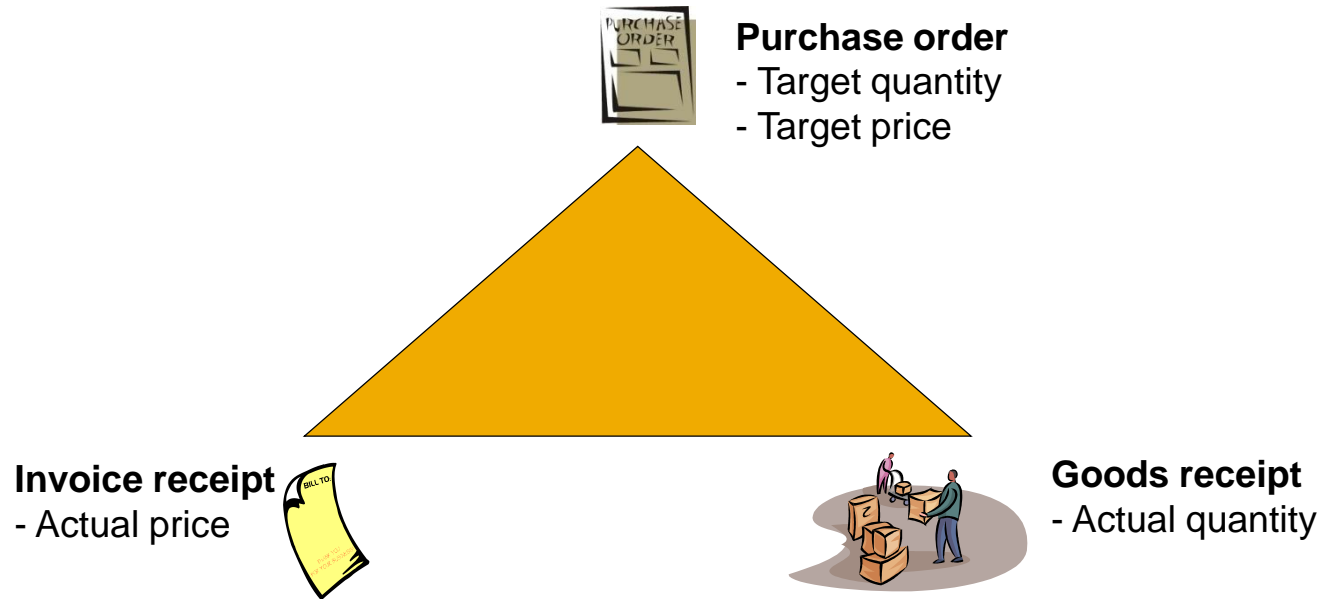
Invoice Processing

- When an invoice is verified, it matches with the liability that was posted during the goods receipt and creates a new entry to pay the supplier.

- Upon verification the:
  - Purchase Order is updated
  - Material Master is Updated (MAP)
  - Accounting Document is created in account ting and an Invoice Document is created in MM

- Once the Invoice has been posted the verification process is completed and the payment process is initiated within Financial Accounting

Payment to Vendor

- Can be done automatically or manually
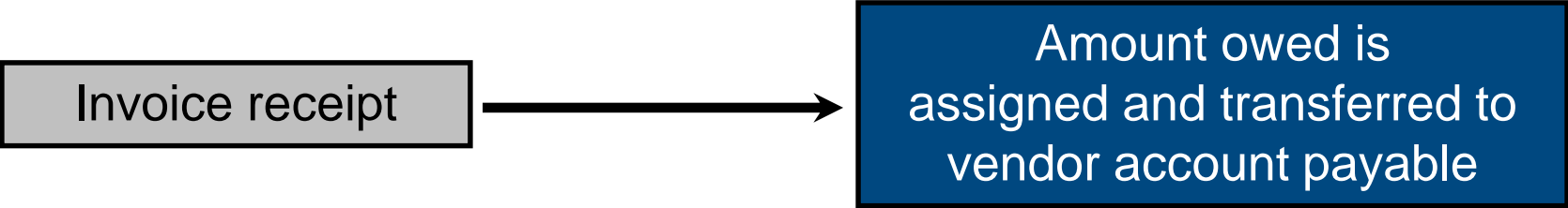 - Post Outgoing Payment vs. Payment Program

- Elements of the Payment Transaction:
  - Payment Method
  - Bank from which they get paid
  - Items to be Paid
  - Calculate Payment Amount
  - Print Payment Medium

- Process will create a financial accounting document to record the transaction

Goods Receipt / Invoice Receipt Reconciliation Account

| Purchase requisition | ┈┈┈⟶ | No impact on Financial Accounting (FI) |

| Purchase order | ┈┈┈⟶ | |

| Goods receipt | ⟶ | Materials Management (MM) and Financial Accounting (FI) via automatic account assignment |

Inventory

Dr	Cr
$100	

GR / IR

Dr	Cr
	$100

Goods Receipt / *Invoice Receipt* Reconciliation Account

| Invoice receipt | → | Amount owed is assigned and transferred to vendor account payable |
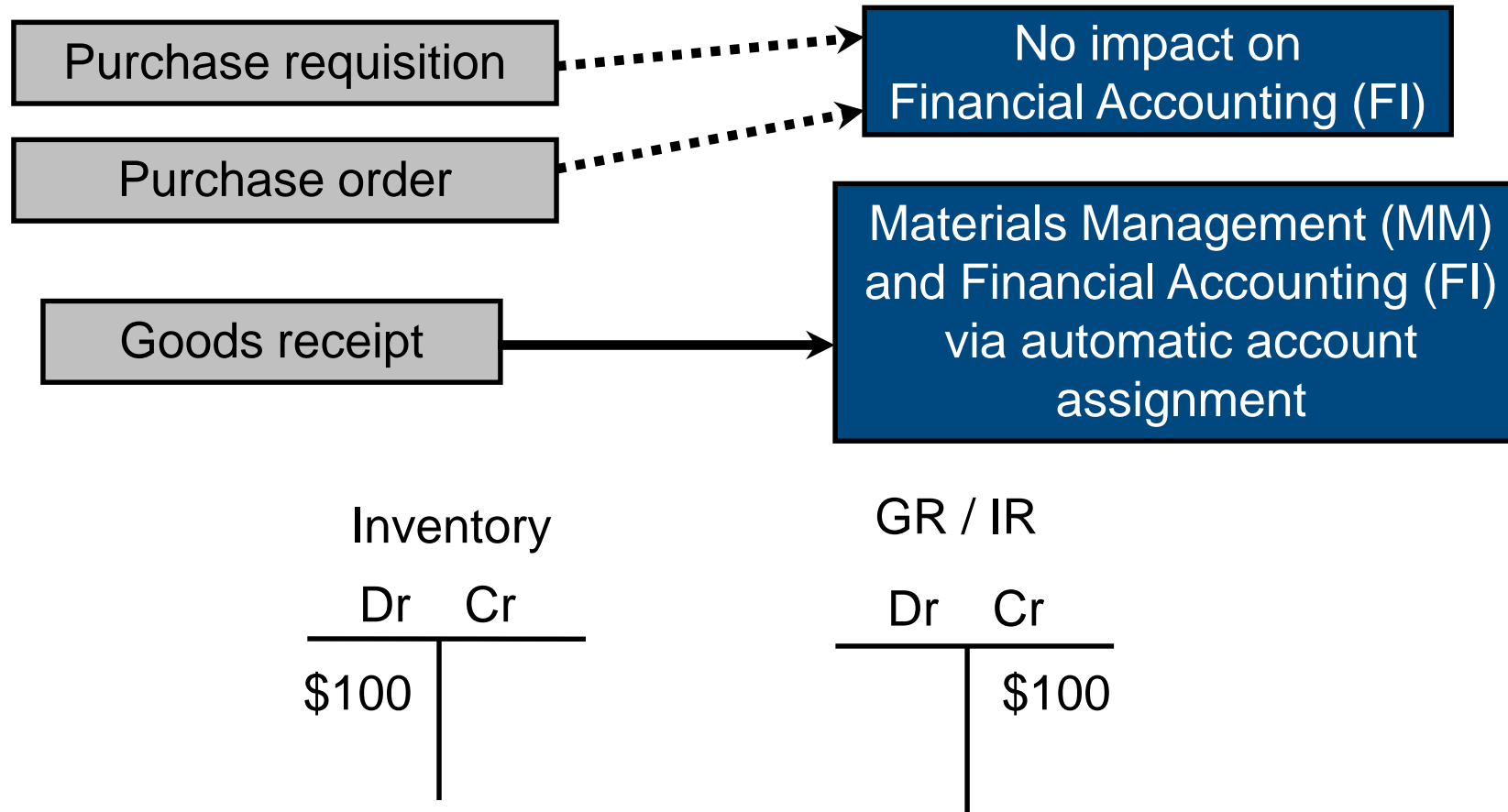
GR / IR

Dr	Cr
$100	

Vendor A/P

Dr	Cr
	$100

Vendor Payment

Bank

Amount owed is paid to vendor and account payable is reduced
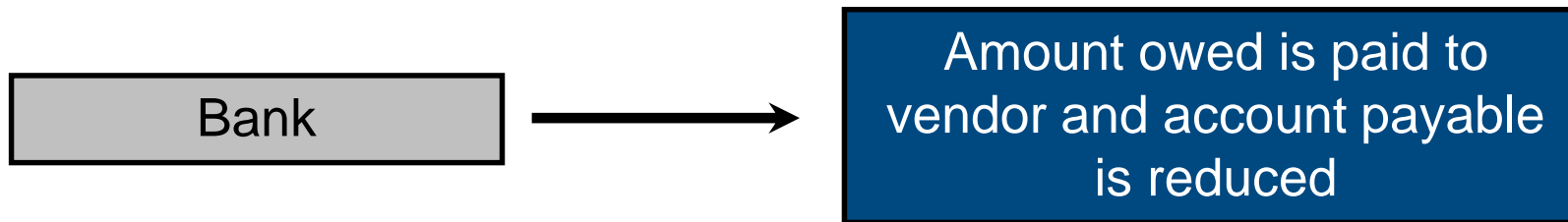
Bank

Dr   Cr

$100

Vendor A/P

Dr   Cr

$100

FI – MM Integration Point

Goods Receipt **Invoice Receipt** **Payment Program**

Inventory		GR / IR		AP (Vendor)		Bank	
Dr	Cr	Dr	Cr	Dr	Cr	Dr	Cr
$100		$100	$100	$100	$100		$100

Thank you!