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ERP Integration, Automate Business Processes between Supply Chain and Finance

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ABSTRACT

SAP is one of the most notable Enterprise Resource Planning (ERP) solution. The uniqueness of SAP is that its various business process is seamlessly integrated. For an example, person posting goods receipt at warehouse is expected to impact financial accounting such as inventory account and account payable account. In normal case, warehouse management system generate message to post appropriate accounting entry in financial applications. In case of SAP, this posting happens in seamless way. The moment warehouse user post goods receipt in system, the financial entry posted. It's so tightly coupled that system ensure both inventory and accounting posting happens together or none. In this paper, we'll discuss general financial concept and SAP MM-FI integration point.

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INTRODUCTION

**Accounting Overview:** Financial accounting is a central system/ application that keep track of all transaction happening in company in turns of currency. Its gives a view of how company is performing. Two important reports are the outcome of financial accounting: Balance sheet and Profit & Loss. These two report talks all about how company is performing in the given financial year. It is also useful to those making investment and credit decisions, who have a reasonable understanding of business and economic activities.

Financial accounts are classified into below types:

- Customer
- Vendor
- General Ledger
- Asset
- Article

Any transaction in a company impact one or more of these accounts.

Double Entry system

General accounting equation is: *Asset = Liability + Capital*

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Double entry system is a mechanism to always keep this equation in balance. It has built in way of checking error in accounting. It is also referred as "T" accounting. In double entry, any transaction will involve two or more accounts. This is in fact the natural way any transaction happens. Example: When you buy grocery from a shop, you pay money and get material. It involves two accounts, that is cash account and material account. Another aspect of double entry is that the amounts entered the general ledger accounts as debits must be equal to the amounts entered as credits. The transaction is recorded as a "debit entry" (Dr.) in one account, and a "credit entry" (Cr.) in a second account, netting each other will result ZERO. Debits are recorded on the left side of a T account in a ledger and Credits are recorded on the right side of a T account in a ledger. Debit is record on left hand side of T account, Credit is record on right hand side of T account.

Account Name

Debit Entry	Credit Entry
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Debit & Credit posting

It is one of the tricky concept for non-financial consultant. Double posting of two account need not be one positive and negative sign, it could be any combination, both accounts with positive/negative or combination positive & negative.

**Example:** Goods receipt post account entry in Stock account and GR/IR account. Increase stock account balance and

increase Invoice receivable (GR/IR) account. Financial accounting is not directly dealing with positive and negative, rather debit and credit. Debit & credit done not directly denote positive & negative, rather the meaning varies depends on nature of account.

There are five fundamental elements within accounting. These elements are as follows: *Assets, Liabilities, Equity (or Capital), Income (or Revenue)* and *Expenses*. The five accounting elements are all affected in either a positive or negative way. These accounts are broadly classified into Debit account and credit account, as below:

Debit	Credit
Asset	Liability
Expense	Revenue
	Capital

For an example: Debit posting into asset account is positive and credit entry into asset account is negative. Same was debit entry into revenue account is negative and credit entry into revenue account is positive.

The mnemonic DEAD-CLIC is used to help remember the effect of debit or credit transactions on the relevant accounts. DEAD: Debit to increase Expense, Asset and Drawing accounts and CLIC: Credit to increase Liability, Income and Capital accounts.

**Asset Account**

Asset accounts are economic resources which benefit the business/entity and will continue to do so. Cash, bank, accounts receivable, inventory, land, buildings/plant, machinery, furniture, equipment, supplies, vehicles, trademarks and patents, goodwill, prepaid expenses, prepaid insurance, debtors (people who owe us money - Customer, due within one year), VAT input etc.

**Liability Account**

Liability accounts record debts or future obligations the business/entity owes to others. Accounts payable, salaries and wages payable, income taxes, bank overdrafts, trust accounts, accrued expenses, sales taxes, advance payments (unearned revenue), debt and accrued interest on debt, customer deposits, VAT output etc.

**Capital/Equity Account**

Equity accounts record the claims of the owners of the business/entity to the assets of that business/entity. Capital, retained earnings, drawings, common stock, accumulated funds, etc.

**Income/Revenue Account**

Income accounts record all increases in Equity other than that contributed by the owner/s of the business/entity. Services

rendered, sales, interest income, membership fees, rent income, interest from investment, recurring receivables, donation etc.

**Expense Account**

Expense accounts record all decreases in the owners' equity which occur from using the assets or increasing liabilities in delivering goods or services to a customer - the costs of doing business. Telephone, water, electricity, repairs, salaries, wages, depreciation, bad debts, stationery, entertainment, honorarium, rent, fuel, utility, interest etc.

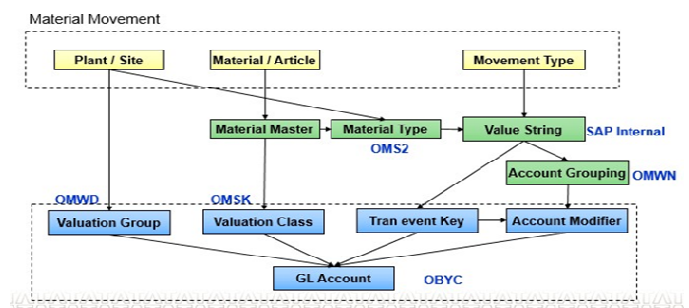
**SAP MM – FI Integration**

Below are the main FI integration points in SAP MM:

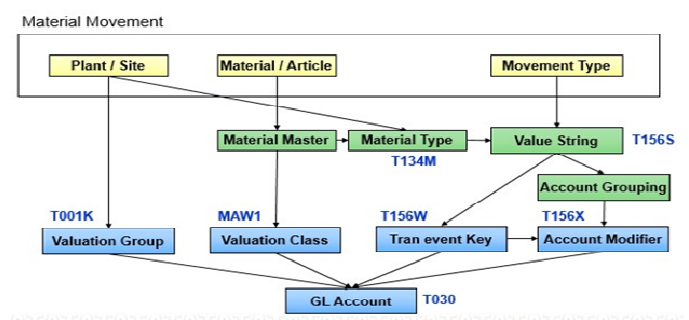
- Movement type
- Valuation grouping code
- Valuation class
- Article type
- Transaction/event key
- Account Grouping (Account Modifier)

Material/Article, Plant/Site and movement type are the primary factor that determines the GL account. Valuation group, valuation class, transaction event key and account modifier are secondary factor and these are indirectly determined by primary factors, i.e: Material, plant and movement type. Below diagram depicts how these factors are related to GL account determination.

**T-Code view:**



**Table View**



**Integration Touch Point**

**Movement Type & Transaction Event Key**

Movement type is the core of inventory management; this denotes the type of transaction. When new transaction is posted in inventory management, user will only enter quantity and the system will automatically determine the account

number. Not all inventory management transaction will result in account posting, it depends on nature of transaction.

Movement type is tagged to value (posting) string and account modifier that in turn used in account determination. Value string is a SAP internal value, it indicates a posting rule that always contains the same account assignment characteristics for a certain transaction or event (for example a goods movement or an invoice receipt). Value string is assigned with set of transaction event keys. These settings are pre-defined in SAP and user can't modify this.

Transaction event key is an SAP internal processing key for account determination. Users will not be able to create or modify this value.

- Movement type and value string mapping is maintained in table T156S
- Value string and transaction event key mapping is maintained in table T156W

T-Code *OMWN* has the assignment of posting string and transaction event key assignment to movement type. T-Code *OMJJ* is used for configuring movement type.

### Valuation Area

The valuation of a material is done at the Valuation Area, which can either be at the Company Code level or the Plant level. The level at which the valuation needs to happen is defined in the customizing. The valuation level once defined cannot be changed. When the valuation is at the Company Code level, then the valuation of a material is uniform across the plants attached to that Company Code. On the other hand, if the valuation is at the plant level, then the value of the material is plant specific and will vary from one plant to another. In SAP retail system, valuation area is always defined at plant/site level. SAP also recommends plan level valuation.

### Valuation Grouping Code/ Valuation Modifier

In simple term, it is a grouping of valuation area. Account determination uses valuation group code. One or more valuation areas that have same account determination attributes are grouped together in valuation group code. It is optional to have valuation group. If activated, account determination happens at group level. Otherwise at individual area level. For the sake of simplicity, valuation group code is maintained. T-Code *OMWM* is used to activate valuation grouping code. In the standard SAP System, the valuation grouping code is set to active. Example: Distribution center (site) are grouped together into one valuation group and stores are grouped together into different group. This way stock posting of DC and store can be posted to different accounts. T-Code *OMWD* is used for assigning valuation grouping code to valuation area. In SAP IS-Retail, this assignment is a master data in *WB01/WB02*.

### Material Type / Valuation Class

Materials will have its say in determining GL account. Example, raw material and finished goods is posted to different material. To facilitate this control, valuation class is used. Valuation class is an attribute assigned in material master to control account determination. In other words, it is a collection of material with same account determination, it's not

possible to assign account assignment for hundreds and thousands of materials. Therefore, valuation class is created as a material grouping field for account determination. Several valuation classes are generally allowed for one material type. A valuation class can also be allowed for several material types. The link between the valuation classes and the material types is set up in configuration via the account category reference. The account category reference is a combination of valuation classes. Precisely one account category reference is assigned to a material type. T-Code – *OMSK* is used to configure possible valuation class for the article types.

### Account Grouping (Account Modifier)

Account modifier or account grouping key is used to differentiate the offsetting account for inventory posting. This key is assigned for movement type and value string combination.

Account grouping has been defined for the following transactions/events:

- GBB (offsetting entry for inventory posting)
- PRD (price differences)
- KON (consignment liabilities)

For example: When you write-off (551 - withdraw for scrap) inventory from a plan transaction key GBB is impacted, and for issuing goods to cost center (201) transaction key GBB is entered. Without considering account modifier, both these transactions will hit same GL account. To facilitate different GL account for offset posting, account modifier is used. In our earlier example, different account modifier will be assigned to movement type 201 (VBR) and 551 (VNG) for transaction event GBB.

For the transaction KEY GBB (offsetting entry for inventory posting), the following account groupings have already been assigned to the relevant movement types:

- AUF: for goods receipts for production orders with account assignment
- BSA: for initial entries of stock balances
- INV: for expense/revenue from inventory differences
- VAX: for goods issues for sales orders without account assignment object
- VAY: for goods issues for sales orders with account assignment object
- VBO: for consumption from stock of material provided to vendor
- VBR: for internal goods issues (e.g., for cost center)
- VKA: for consumption for sales order without SD
- VNG: for scrapping/destruction
- VQP: for sampling
- ZOB: for goods receipts without purchase orders
- ZOF: for goods receipts without production orders

T-Code *OMWM/OMJJ* is used to assign account modifier to movement type/transaction event key.

### Configuration: Activate Valuation Grouping

- It is used to simplify the account determination by combining the valuation areas under one group code

- Its optional to activate the grouping
- T-Code –OMWM

**Activate Valuation Area**

- Valuation area can be company or site
- Retail IS its always at site level
- Once activated cannot be changed
- T-Code –OX14

**Group Valuation Areas**

- Group the valuation areas based on the business requirement
- Example: group DCs in one valuation group and stores in another valuation group or valuation group per region, etc...
- Account determination is defined for the valuation group codes, not for all valuation area
- T-Code –OMWD

**Define Valuation Class**

- Used to control the account determination by article
- Example: inventory for trade article and consumption article can be posted to different stock account
- It is achieved by assigning different valuation classes to article based on the type
- Configuration controls list of possible valuation classes for the article type
- T-Code –OMSK

**Accounting Grouping**

- Applicable only for inventory offset (GBB), price difference (PRD) and consignment liability (KON)
- Allows to subdivide number assignments for each transaction key in account determination
- It's also called account modifier or general modifier
- This activity is not required, if standard settings are used

**T-Code -OMWN**

**Configure Automatic Posting**

- System automatically triggers the account posting for the IM and IV transaction, if required
- It refers the configuration to identify the GL account based on the transaction key, chart of account, valuation group, valuation class and accounting group
- T-Code -OBYC

You can further define the account determination factors in "Rule" option. You can choose whether valuation class, valuation group code and account modifier to be used for account determination or not.

**Sample Posting**

**Goods Receipt**

- Scenario 1: Standard price and no price change
- Scenario 2: Standard price and price change

Stock Account (BSX)	GR/IR Account (WRX)	Price change Account (PRD)
55	50	5

**Scenario 3. Moving Average price and price change**

Stock Account (BSX)	GR/IR Account (WRX)
55	55

**Goods Issue from DC to Store**

DC Stock Account (BSX)	Store Stock Account (BSX)
50	50

**Goods Issue Reversal from DC to Store**

**Scenario 1: Standard price and no price change**

DC Stock Account (BSX)	Store Stock Account (BSX)
50	50

**Scenario 2: Standard price and price change**

Stock Account (BSX)	GR/IR Account (WRX)
50	50
DC Stock Account (BSX)	Store Stock Account (BSX)
55	55
Price change Account (PRD)	Revenue Account (AUM)
5	5

**Physical Inventory**

**Scenario 1: Count On**

DC Stock Account (BSX)	Stock Count Adj acct (GBB/INV)
100	100

**Scenario 2: Count Off**

DC Stock Account (BSX)	Stock Count Adj acct (GBB/INV)
100	100

### Standard Price Change (MR21)

Scenario 1: Price increase (price difference = 100)

Stock Account (BSX)	Revenue from material revaluation (AUM)
100	100

Scenario 2: Price decrease (price difference = 100)

Stock Account (BSX)	Expense from material revaluation (AUM)
100	100

### Conclusion

The paper highlights the needs to tighten the SAP laboratory manuals to the business logic so that the students can understand why they are learning the SAP laboratory materials and how the system actually works, rather than simply following the laboratory manuals and learning to operate on the computers. Learning by doing activities make students motivated to learn new materials by themselves. It is a challenge to balance the two streams and relate the laboratory learning with business process integration in the course. The purpose of the paper is to shift the teaching focus of SAP implementation from SAP technical issues to organization transformation process. The proposed framework takes into consideration of the various disciplines and different types of competencies needed to effectively transform business processes in an organization.

One of the most important features of the comprehensive framework is that it focuses students' attention on the organization transformation process rather than on the technical aspects of SAP systems only. The combination of hands-on laboratory learning and business process concepts learning via reading, discussion, and case study is powerful and effective approach to learn SAP fundamentals. The laboratory manuals focus on step by step instruction on task completion, not on business logic (Scott and Sugar, 2004). Thus, hands-on learning experience has limited value unless it reinforced with the in-class discussion and review. The goal of the paper is to propose a comprehensive teaching approach which ties SAP fundamental knowledge to SAP implementation activities. Hands-on experience learning enables students to navigate in some areas of the SAP system, execute tasks, and learn some SAP technical skills, but provide no understanding of why tasks are being performed.

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This paper is written based on the ongoing research project, along with the authors work following references were referred during research.

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