

# SAP MM As An Organization System

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## Overview:

The goal of this case study is to understand how SAP's material module (MM) uses the concepts of information organization, document engineering and architectural thinking to develop an informational model that is abstract yet specific enough to capture all activities possibly involved in material procurement and management of a company. The sheer size and variety of options available in SAP MM makes it so complex that very few people know its functionality in and out. Hence, I am limiting the scope of this case study by giving an example from my work experience where we tried to consolidate a pharmaceutical company's material data from various different legacy systems into the SAP MM and integrate it with customer and vendor modules.

## What is being organized:

Maintaining and tracking materials was a critical business process for the given pharmaceutical company, given its large size and vast geographic presence. This included data about information on the materials that the company could procure, produce, store or sell. The company had different legacy systems which monitored information about different aspects of inventory management including material description and composition, material's storage location, material requirement planning, quality management, purchase order verification etc. These systems contained duplicate information at different granular levels about master data of its materials, location of a material in different plants, the amount of material available per plant, measurement units etc. They also contained varying degree of supporting information about its vendors (like the amount of material purchased from different vendors and its cost) and customers (like the amount of material sold to different customers and its price etc.).

## Why is it being organized:

Different departments (like sales, operations, production, purchasing) of the company dealt with different aspects of materials (like quality, quantity, price etc.) at different stages of business and hence had different (and often incompatible) document types of purchase orders, inventory catalogs, payment reports, vendor and customer information etc. This prevented time, expenses, and purchases from being aggregated or compared at a company level. SAP MM provided an information model that was generalized yet specific enough to capture all activities possibly involved in material procurement and management in a standardized format. Further, it was closely integrated with other business process modules like Vendor, Sales and Distribution, and Finance that would help in establishing interoperability and automating exchange of information between different units and departments of the company. It would also avoid duplication of effort and ensure that there is never a shortage of materials or any gaps in the supply chain process of the company. SAP MM could speed up the procurement and material management activities thus, making the business run smoothly and efficiently and at the same time become versatile to accommodate changes in daily life.

## How much is being organized:

SAP MM stored the material information in a hierarchy that mapped the storage of physical materials in actual physical locations. For example, a "storage bin" in SAP mapped to an actual unit of space in a warehouse. The address of a storage bin, say 01-02-03 for example, referred to a storage bin in row 1, stack 2, and level 3 of a warehouse, say in Berkeley. SAP MM could also store a bin's various attributes like maximum weight and total capacity. This allowed the company to easily assess supply-demand by tracking availability of materials stored at different locations.

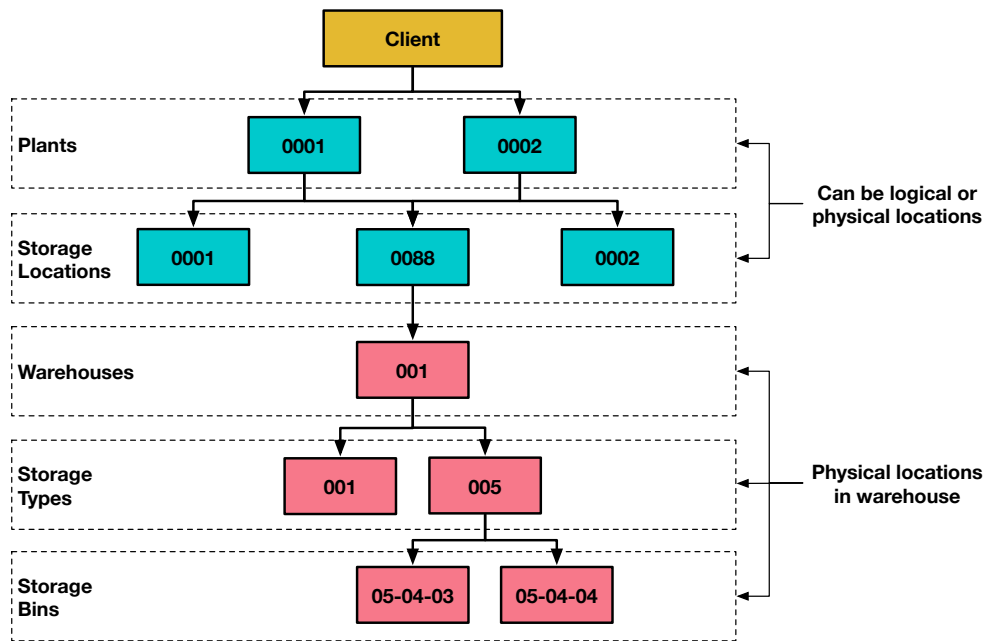
Further, SAP MM used multi-faceted classification of materials (based on different principles and material properties) to determine which materials should be stored in which part of the warehouse. For example, materials could be categorized based on processing level (raw material or finished products) or safety (hazardous or non-hazardous) and hence necessitate different storage locations within the same warehouse. On the other hand, materials that make up a final product are grouped together under a “Bill of Material” for that product and hence tracked and stored together.

In addition, SAP MM incorporated fundamentals of architectural thinking by providing different views (presentation of a sub-set of data stored in different SAP tables) for different departments of the company. For example, the purchasing organization, responsible for procuring raw materials from vendors, was responsible for a purchasing view. The purchasing view created an association between the vendors and the materials/services to be procured. Similarly, a sales view for the sales department created an association between the company’s customers and the final products sold/to be shipped to them. The separate views abstracted and separated sales and purchase activities even though these activities were being performed on the same set of materials in the same plant/warehouse.

For interoperability and flexibility, SAP MM also provided various formats to capture, store and exchange information. SAP MM allowed storing a material’s descriptions in multiple languages. It also captured a material’s default unit of measure and maintained a separate table that allowed conversion to all other possible units of measure. For example, if a material was stored with kilograms as unit of measure, SAP would also allow it to be stored in ounces and pounds but not in liters. This helped in maintaining data integrity and was especially useful in aggregating data from different countries or departments that followed different languages or measurement system.

**How (or by whom):**

As discussed above, the organization system of SAP MM mirrored the way in which materials are actually stored in the company’s warehouses. The following hierarchy is currently being used:



**Figure 1:** Shows the hierarchy in which materials descriptors are stored in SAP MM. This organization mirrors the way materials are stored in their physical locations.

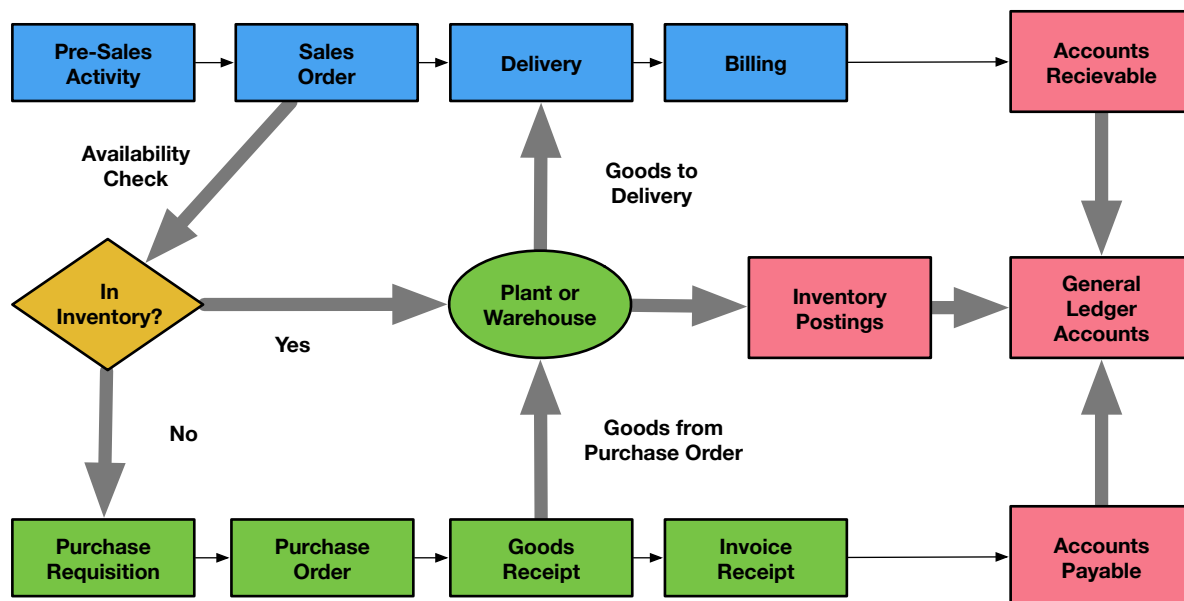
The “client” – in this case, the company – is a unit within an SAP system that is self-contained legal and organizational unit that has its own profit, loss and balance statement. A client can have multiple “plants” under it. A “plant” is a physical or logical unit that produces goods and makes goods available for the company. It is the lowest organizational level at which a material is evaluated (inventory value is established). “Storage location” is a place allotted for a plant where different material stocks are stored. However, it need not be inside that particular plant.

Some materials need to be stored under a controlled environment (like under certain temperature) and hence are stored in a designated part of the plant called a “warehouse”. A warehouse can have different “storage types” according to organizational or technical criteria. Examples of technical storage types are goods receipt area, goods issue area, picking area etc. A storage type can have one or more “storage bins” (or boxes) where the material is actually kept.

Even though the company was constrained to organize its materials (and its descriptors, quantity and other attributes) in the way specified by SAP MM, it opened up more possibilities to track and analyze data. Via SAP MM, the company could now continuously monitor the location, available quantity and current price of any material at any point of the time. This organization, clubbed with the SAP MM’s functionality, allowed the material data to be efficiently extracted, “drilled down” or “rolled up” and exchanged between all possible business processes and departments to meet changing business requirements.

**When is it being organized:**

There are various activities that form an entire cycle that a material must follow (as shown in the picture below) from the instant it enters the SAP system to the moment it is delivered to the intended party and the transaction is complete. The company followed “Materials Requirements Planning” type of planning procedure wherein a procurement proposal was generated only when the intended inventory was triggered by shortage.



**Figure 2:** Shows how SAP MM connects with other modules in SAP. The blue color represents the processes in the Sales and Distribution module, green in the Material module and red in the Finance module.

A sales order in Sales and Distribution module would trigger the Material module to check inventory about the availability of raw materials (in the sufficient quantity) required to complete the sales order. If yes, then the raw materials are used to generate the final product that is subsequently delivered to the customer. The amount charged to the customer is entered in the Accounts Receivable by the Finance module.

On the other hand, insufficient amount in the inventory mandates the purchasing department of the company/plant to create a request for quotation (purchase requisition) in SAP MM. The purchasing group can also program the MM to compare quotes submitted by interested vendors, and thereafter select a vendor based on specific criteria and needs. Once a vendor has been selected for a particular material, a purchase order is generated. On receiving the goods from the vendor, the goods receipt is compared with the purchase order to ensure that the quality and quantity of the received material matches the requested quality and quantity. Only after verification, the inventory is updated with the availability and storage location of the purchased raw materials and the amount paid to the vendor is entered in the Accounts Payable in the Finance module. The new raw materials are used to generate the final product and business continues as usual.

**Other considerations:**

SAP MM works best in conjunction with other SAP modules like Sales and Distribution (SD), Finance and Controlling (FICO), Warehouse Management (WM) etc., because, being part of SAP, they all provide the same degree of flexibility and inter-operability as SAP MM. Hence, once the company started using SAP MM to organize and track its material information, it was slowly tempted to purchase and migrate to other SAP modules as well.

It is a well-know fact that SAP is expensive, complex and requires a lot of user training. But the increase in efficiency, automation, flexibility, scalability and user control that SAP provides justifies the time, money and effort spent in re-organizing business-related information as per the standards set by SAP. In the end, one can say that SAP and its individual modules like MM, have successful applied various principles of organization and architectural thinking, and document-engineering to create a standard information model that applies to 25 different industries.