

Data across the Supply Chain

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Abstract - Organizations rely on ERP (Enterprise resource planning) for their business. ERP, along with their technical capabilities, helps to process data from and for business. One of the big benefits of having an ERP application is if it can provide the required information quick and accurate to the users. It's main role is to integrate and work on a common data and give them a single platform for working. While users working on these ERP rely on information to complete their task, it becomes vital for ERP to provide the data in easiest possible way. works integrating different department or processes of businesses or organization. ERP often has a real time data processing and also stores information of different operations together. The information in database is usually available in form of reports to users which can be planners or buyers. This information can be either historical, current or in process or of a forecast data. Planners, buyers, managers pull all these set of data together so they can be fast in making decisions. Many times, for this data, users do not find all these data together and they have to run number of reports to arrange data they need. This leads to a time and efficiency loss where we have to cross many screens or reports to get our daily work done. Many of the ERPs have different set of standard reports for users however, depending on type of business and mechanism. The report is usually not sufficient even in slightly more complex businesses. So what should be the rule on which a planner or buyer needs information and data to make

decisions on their work. Here we will analyze what function needs a minimum set of data to perform their role.

I. INTRODUCTION

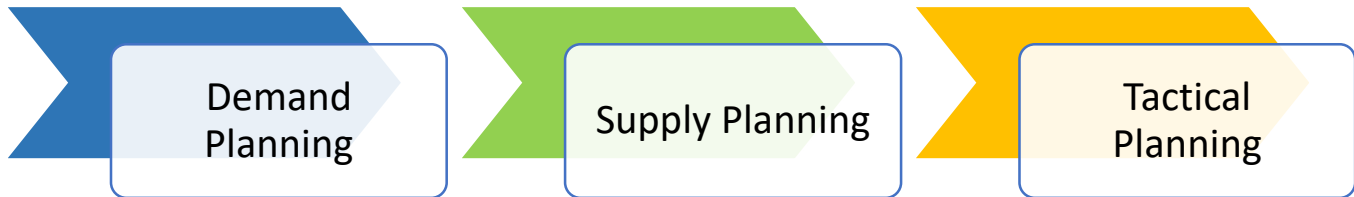
As per APICS, supply chain can be segmented into 6 different job functions. All these functions control different processes of supply chain starting from top end of "plan" till the product is reached to a "customer".

Typical supply chain functions are buyer, demand planner, production planner, order management, transport planner (Sonya karkoff, <https://online.champlain.edu/blog/supply-chain-career-paths>).

1. Plan - This function is the starting point in supply chain. A lot of thought is given to the company strategy and potential plans of the company.
2. Source – This function ensures the required products or components procured for company is at right cost and correct quality.
3. Make – that product is produced as per the quality norms and at the right time and cost.
4. Deliver – Product is delivered to the customer on promised date and quantity.
5. Return – the product is returned from customer
6. Enable – team who manage the entire show of supply chain.



All the above supply chains functions have to interact with different information which can help make decisions. Organization using ERP or other applications have many of the information on their database but sometimes are unable or miss out to present it to users to make work more efficient. Below function which consists of supply chain describe their work and minimum data they use in their work.



A demand planner work is to give a forecast for future. A demand is usually aligned with companies strategic growth as well. Demand planner is usually a monthly process and needs a historical, current and future market conditions to be able to make good forecast. Below data are needed by demand planner. Demand planning generates a time series unconstrained data that is further used by supply planning.

- Historical sales/ Deliveries
- Current market trend
- Market research for future and competitors' products
- Historical returns
- Promotions
- Product Lifecycle

A supply planner is the person who works to fulfil with the forecast received from demand planning. Above demand is said to be a trend or an unconstrained number, however, when we come to supply planning, it gets constrained with capacities and other data.

A supply chain planner has multiple functions and roles, this includes another role of Supply planner also has task to effectively run the movement of semi finished, finished items between demand and supply locations.

A supply planner usually looks at the plant capacities, Vendor capacities and comes up with a more detailed plan within the organization. A Supply planning specialist works with below data.

- Plant capacities at high level
- Warehouse capacities
- Customer demand
- Possibilities of an alternate plants to fulfil the demand forecast.
- Vendor or supplier issues

II. FUNCTION: PLAN

A plan usually consists of 3 levels.

- Demand planning
- Supply Planning
- Tactical planning

- Warehouse distribution demand
- Shelf life capacity
- Inventory
- In-transit inventory

A tactical planner goes into further detail over the supply planning data and results. Below information is received by supply planner. A tactical planner who has capacities upto a plant level breaks down to machine or shopfloor line level for detailed machine, labor capacity planning.

- Machine capacity
- Bottlenecks capacity
- Planned downtime
- Raw Material planning
- Manufacturing process sequencing
- Changeover
- WIP inventory
- Quality on-hold inventory
- Production planned

III. FUNCTION: SOURCE

A sourcing function integrates with plan function ensuring all components, packaging and raw material are available on time to fulfil the plan. In plan, we talk about supply planning and production planning, with an assuming that sourcing can fulfill all those plans. A source function comes with sourcing and procurement. Sourcing and procurement though may sound similar have distinct roles.

Sourcing process is more on a strategist role. A sourcing specialist researches the market for negotiating the contract. A sourcing specialist does a vetting supplier. A sourcing specialist

helps to build the vendor or supplier relationship and helps to maintain the flow of supplies. His/ Her objective is also to perform this operation at a minimum cost and as per the company's policies.

A procurement function on other hand is more tactical in nature, it involves more on related to purchase order and execution part of Buyer function. A procurement specialist has to ensure the commodity is available at right time and right quantity. He/ She deals with high quality good and involves processing of purchase requisitions and purchase orders. A sourcing specialist uses supply system developed by sourcing and perform the procurement based on the interest of requirement.

A source or Buyer's role includes purchasing or sourcing the components, raw materials or packing materials that help to make the products sold by company. Responsibility of buyer also includes to procure the products with good negotiation, correct timings and correct quantity to keep the operations in process under a financial budget. A buyer may also need a foreign exchange conversion and import duty from other country. Nevertheless, procurement lead time and lot size is also one of the factors procurement specialist has to keep in mind.

IV. FUNCTION: MAKE

One the previous functions of Plan and Source have performed their activities, a company has below understanding of situation. Before starting a Make function, source and plan have their work already done with plan what to make and what is needed to make. Below are answers Make has:

- What to manufacture
- When to manufacture
- Where to manufacture
- What components or constituents are needed for manufacturing

A company then starts the process of manufacturing, where it uses it's manufacturing facilities for production. Production is usually carried out based on production plan passed from supply planner or tactical planner based on customer demand.

A manufacturing depends on following subfunctions

- Production
- Quality Assurance/ Quality check
- Machine Maintenance

A manufacturing manager usually needs below data to work on.

- What day production is to be planned (from plan function)

- How much production is to be planned (from plan function)
- Are the components of production or raw material and packaging material available (from source function)
- Is the maintenance completed for the production line
- What capacity to run the production

All the above data is the minimum amount of data needed for a manufacturing function, it may also need what Bill of materials to follow, any drawings needed for production.

A manufacturing has below KPIs which are being continuously monitored

- Yield
- Scrap
- Manufacturing time

A manufacturing function is followed by Quality Management where a quality check is performed. A quality check usually checks has below parameters for it's job role.

- Generation of quality batch samples
- Generation of quality certificates
- Yield parameters
- Required and current process capability of machines and process

Another important subfunction of Manufacturing is plant maintenance where preventive and breakdown maintenance is performed with machines. All these Preventive maintenance are very important.

V. FUNCTION: DELIVER

One the production is done, quality checks are completed, it is time to deliver the product to customer or warehouse. Deliver is a very complex function depending on type of business company in. Companies such as "consumer good" usually work on a forecast or make to stock strategy is chosen, their good movement happens from a production plant to a warehouse followed by a customer. However, in a make to order scenario, delivery is made in most cases directly to a customer.

In make to stock cases, warehouse plays an important role. A produced inventory is placed in a warehouse depending on

- customer demand
- other warehouse distribution demand
- Shelf life of a product
- Transit time to a customer
- Type of truck used to transit a material to customer or other warehouse

- Inventory
- In-transit inventory

A warehouse person usually knows how to manage the warehouse and approaching customer or warehouse demand to manage business.

A transportation on other hand works on below data set.

- Confirmed delivery date as per sales order or sales deeds
- Transportation time needed for a customer
- Truck capacity planning with the required truck load
- Truck route planning
- Weight data
- Packaging data
- Hazardous material information
- Transportation lane
- inventory

A transportation function usually carries a heavy financial cost in the supply chain. A lot of thought is given to lower down the supply chain costs of logistics.

VI. FUNCTION: RETURN

A return function is the quality rejected or customer returned product. Many times it has a quality issues and customer. There is no specific data that is being looked for a return as it is on case to case basis, however, customer returns are taken seriously as the can impact below parameters.

- Damaged goods
- Product recalls
- Warranty returns
- Inventory returns
- Reusable containers/packaging
- Reusable goods
- Seasonal items
- Hazardous material
- Quality checks not performed correctly
- Manufacturing process not followed
- Vendor or supplier products are not to correct grade or quality.



Reverse logistics on other hand is very limited and in only few business. Many companies like coca cola use the glass bottles to recycle or refill back to their bottling facility. This helps to save environment and also maintain lower cost of production. However, this reverse logistics can form a bottleneck in production.

Analysis:

The supply chain can be very complex and with the growing world, it may need even more setoff information for any individual working either downstream or upstream supply chain. In many if the cases the information is passed from one function to another, and the subsequent function uses the input from previous function. As the information is passed from one function to another, the information accuracy matters to get

result in right term. Technology and ERP can enable more output from users if they can provide correct set of information.

VII. CONCLUSION

In recent post covid market trend, incorrect demand signals from the market has lead to huge supply chain issues. Some companies have unnecessary unusable inventory, others company have struggling to get those inventories to run their operations. With a correct data and better visibility to users and supply chain professionals, they can make better decision, case of what an incorrect information ton supply chain professionals. It is very important to provide the supply chain professionals a much accurate and clean data from the ERP or any other application system wisely so that they can perform their work. This would not only make them more efficient but will be able to make more accurate decisions.

With the current globalization of the companies and ecommerce, it may be possible in future the companies not only need data from their own organization, but sharing data from other partner organization would help. Some of the cases of supplier forecast and vendor ratings are such examples.

Even after so much advancement of supply chain and information systems, it is believed that only 6 percent of companies have visibility of supply chain. Providing a correct and crisp data to supply chain users can bring a lot of importance of supply chain.

Emerging methods such as DDMRP if applicable to business can give a real edge to supply chain giving a more better visibility to inventory and demand.

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