

Quality Management:

Importance of quality, Difference between Inspection and Quality control,
Components of total quality, Quality Function Deployment

Quality management is the act of overseeing all activities and tasks needed to maintain a desired level of excellence.

Quality management includes

- The determination of a quality policy,
- Creating and implementing quality planning and assurance,
- Quality control and quality improvement.

Total quality management (TQM) requires that all stakeholders in a business work together to improve processes, products, services of the company.

Inspection and quality control

Inspection is important to maintain a certain quality during the manufacturing of a product.

Quality control is a process by which **customer ensures to receive product free from defects.**

In a manufacturing plant, **Inspection, and quality control** are the most important processes in order to make a high-quality product.

Inspection and quality control ensures the **standard quality** by checking the product during manufacturing at different stages.

If the product is not able to meet the desired quality, the product will be rejected

Inspection

- After manufacturing, the product is required to perform certain functions.
- The process of checking whether the product does so or not is called Inspection.
- Inspection compares the qualities of the product with a standard product during manufacturing.
- In other words, Inspection is a process of checking the acceptability of a manufactured product.

Objectives of Inspection:

- Inspection separates defective components from the non-defective component so that adequate quality can be maintained.
- Inspection locates defects in process or raw material which otherwise causes problems at the final stage.
- It prevents further working on spoiled semi-finished products. It helps the product to be more economical.
- Inspection detects the weak position by checking the design.

Quality control

- Quality control in manufacturing is a process through which a production system ensures that standard product quality is maintained or improved according to customers' needs.
- In other words, it incorporates the testing of units and determines if the product is within the specification for the final production.
- A component is said to be good quality if the component works well for which it is meant.
- On the other hand, controlling is a system for determining – **what to inspect, how to inspect, how often to inspect**. It also finds out the causes for producing a poor product and suggests the corrective action.
- An important aspect of quality control is the **establishment of well defined controls methods**
- Limiting the chances of error and reduce the manufacturing cost to generate more profit.

Inspection Vs Quality Control

Inspection

Starts after production

Segregates good and bad

Responsibility of the inspection department

Quality Control

Starts before & along with production

Ensures that bad things will not happen

Everybody's responsibility

Total Quality Management

Quality refers to a parameter which decides the superiority or inferiority of a product or service.

Quality can be defined as an attribute which differentiates a product or service from its competitors.

Quality plays an essential role in every business. Business marketers need to emphasize on quality of their brands over quantity to survive the cut throat competition.

Total Quality Management

Total Quality management is defined as a continuous effort by the management as well as employees of a particular organization to ensure long term customer loyalty and customer satisfaction.

Quality can be measured in terms of durability, reliability, usage etc

Total quality management is a structured effort by employees to continuously improve the quality of their products and services through proper feedbacks and research.

Ensuring superior quality of a product or service is not the responsibility of a single member.

Total Quality management is indeed a joint effort of management, staff members, workforce, suppliers in order to meet and exceed customer satisfaction level.

Total Quality management originated in the manufacturing sector, but can be applied to almost all organizations.

Total Quality management can be divided into four categories:

Plan

Do

Check

Act

Also referred to as PDCA cycle.

To be successful implementing TQM, an organization must concentrate on the following elements:

Ethics.

Integrity.

Trust.

Training.

Teamwork.

Leadership.

Recognition.

Communication.

Ethics:

Ethics is an individual's understanding of what is good and bad at the workplace. A thin line of difference does exist between good and bad, which is for you to decide. Ethics teach an individual to follow code of conduct of organization and adhere to rules and regulations.

Integrity:

Integrity refers to honesty, values and an individual's sincerity at workplace. One need to respect the organization's policies. Avoid spreading unnecessary rumours about the fellow workers. Total Quality Management does not work in an environment where employees criticize and backstab each other.

Trust:

Trust is one of the most important factors necessary for implementation of total quality management. Employees need to trust each other to ensure participation of each and every individual. Trust improves relationship among employees and eventually helps in better decision making which further helps in implementing total quality management successfully.

Training:

Employees need to be trained on interpersonal skills, the ability to work as a team member, technical know-how, decision making skills, problem solving skills and so on.

Training enables employees to implement TQM effectively within their departments and also make them indispensable resources.

Teamwork:

Team work is a crucial element of total quality management. Rather than working individually, employees need to work in teams.

When individuals work in unison, they are in a position to brainstorm ideas and come up with various solutions which would improve existing processes and systems. Team members ought to help each other to find a solution.

Leadership:

Leadership provides a direction to the entire process of Total Quality Management. Total Quality Management needs to have a supervisor who acts as a strong source of inspiration for other members and can assist them in decision making.

Communication -

Communication binds employees and extracts the best out of them. Information needs to be passed on from the sender to the recipient in its desired form. Small misunderstandings in the beginning lead to major problems later on. Employees need to interact with each other to come up with problems existing in the system and find their solutions as well.

Recognition:

Recognition is the final element of Total Quality Management. Recognition is the most important factor which acts as a catalyst and drives employees to work hard as a team and deliver their lever best.

Every individual is hungry for appreciation and recognition. Employees who come up with improvement ideas and perform exceptionally well must be appreciated in front of all. They should be suitably rewarded to expect a brilliant performance from them even the next time.

Quality Function Deployment

- Quality Function Deployment (or QFD, for short) is a basic TQM tool that systematically develops customers' needs and expectations.
- QFD is driven by what the customer wants, and for this reason, the technique is often described as “deploying the voice of the customer.”
- QFD was developed in Japan by Yoji Akao in about 1966 while working for Mitsubishi. Toyota and other auto manufacturers started using the approach later on.
- Akao described QFD as a **“method to transform qualitative user demands into quantitative parameters, to deploy the functions forming quality, and to deploy methods for achieving the design quality...”**

The QFD four cascading matrices, sometimes referred to as *Houses*, are:

- 1. Product Planning Matrix**
- 2. Part Deployment Matrix**
- 3. Product and Service Planning Matrix**
- 4. Process and Quality Control Matrix**

1. Product Planning Matrix:

- The first phase starts with the collection of the voice of customer (VOC) and translates the customer wants and needs into specific product and service requirements and specifications.
- It also involves a competitive analysis to evaluate how well the competitors fulfill your customer wants and needs.
- The initial design concept is based on the particular product and service performance requirements and specifications.
- This first House is referred to as the house of quality and is the foundation of your QFD process.

2. Part Deployment Matrix:

- During this phase, the assemblies, systems, sub-systems, and components that have the most impact on meeting your product and service design requirements are identified.
- The critical product and service characteristics are translated into critical parts and assembly characteristics or specifications as well as steps of a service process.
- These requirements or specifications are then defined for each relevant functional area.

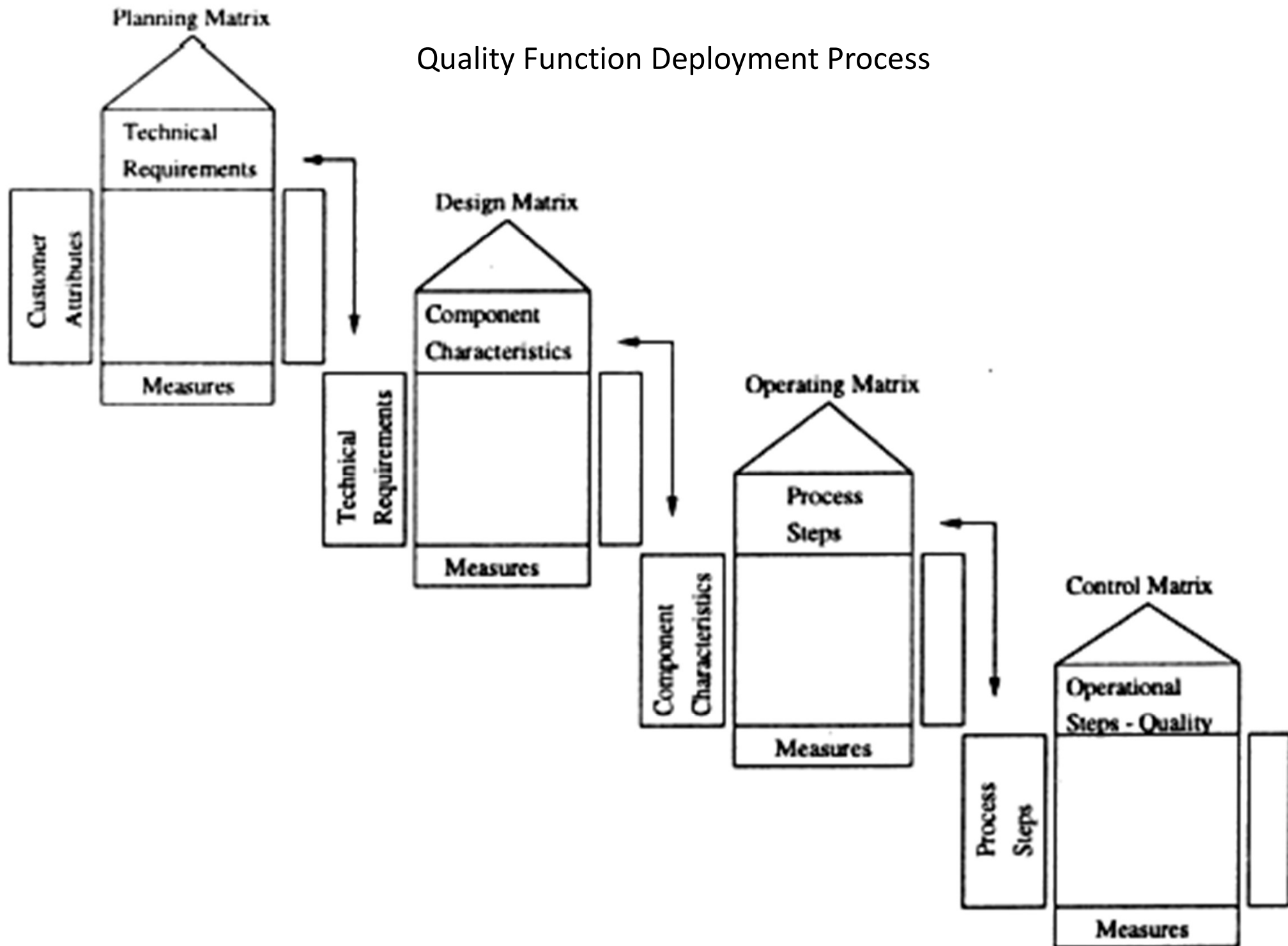
3. Product and Service Planning Matrix:

- During this phase, the manufacturing and assembly processes are designed based on the product and component specifications.
- So far, we have gone from customer requirements to product requirements to process requirements.

4. Process and Quality Control Matrix:

- Before a full product launch, it is good to run a pilot.
- Now the product and process characteristics have been identified and it must be assured that the developed process and product as per the quality controls.
- These can be confirmed during the pilot production.
- Full production should not begin until the process is shown to be in control and that process capability studies have been completed.

Quality Function Deployment Process



Supply Chain Management

Supply chain management is the process of integrating the supply and demand management, not only within the organization, but also across all the various members and channels in the supply chain so they work together most efficiently and effectively.

The **supply chain** includes all the activities, people, organizations, information, and resources required to move a product from inception to the customer.

Why is Supply Chain Management Important?

- Poor supply chain management can result in very expensive delays, quality issues, or reputation.
- In some cases, poor supply chain management can also cause legal issues if suppliers or processes are not compliant.
- Technology advances have unlocked huge potential for supply chain management, enabling supply chain managers to work closely – and in real time – with members of the supply chain.
- With supply chain management, organizations can:
 - Anticipate problems
 - Dynamically adjust prices
 - Improve inventory and fulfillment

Five basic components in a SCM system:

1. Planning

- To meet customer demands, supply chain managers have to plan ahead.
- This means forecasting the demand, designing the supply chain

2. Sourcing

- Selecting suppliers who will provide the goods, raw materials, or services that create the product is a critical component of the supply chain.
- Not only does this include creating the contracts that govern the suppliers, but also managing and monitoring existing relationships.
- Supply chain managers must oversee the processes for ordering, receiving, managing inventory and authorizing invoice payments for suppliers.

3. Making

- Supply chain managers also need to help coordinate all the steps involved in creating the product itself.
- This includes reviewing and accepting raw materials, manufacturing the product, quality testing and packaging.

4. Delivering

- Ensuring the products reach the customers is achieved through logistics and it's fundamental to supply chain success.
- This includes coordinating the orders, scheduling delivery, dispatching, invoicing, and receiving payments.
- Generally, a fleet of vehicles must be managed to ship the products
- In some cases, organizations outsource the delivery process to other organizations who can oversee special handling requirements or home delivery.

5. Returning

- Supply chain managers also need to develop a network that supports returning products.
- In some cases, this may include scrapping or re-producing a defective product; in others, it may simply mean returning a product to the warehouse.
- This network needs to be responsible and flexible to support customer needs.

Scope of Supply Chain Management

- Minimises Operating Cost
- Boosts Customer Service
- Enhance Financial Position
- Manages Distribution
- Bring coordination among partners
- Inventory Management
- Supplier Management

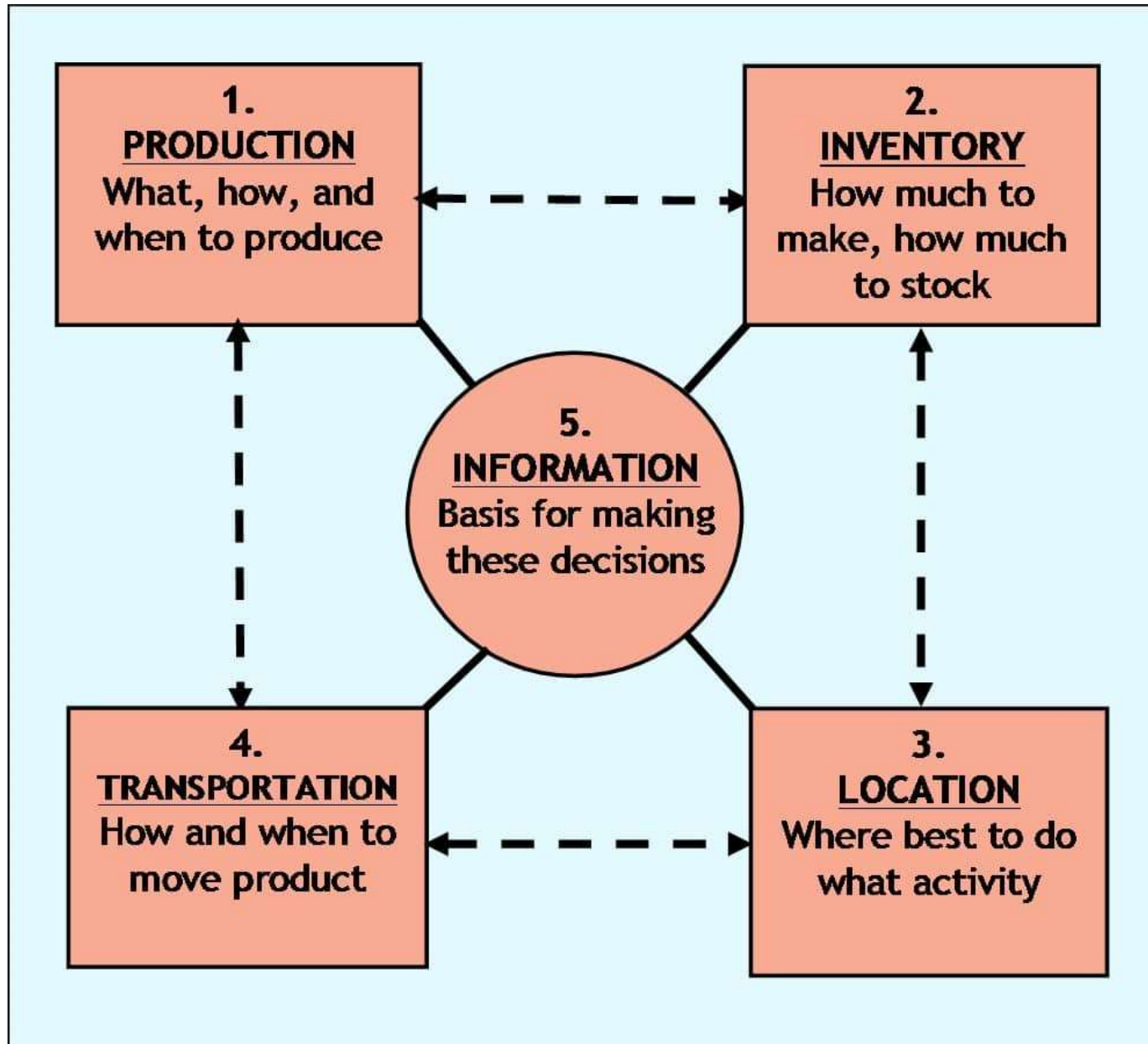
Drivers of SCM

- Supply chain capabilities are guided by the decisions regarding the five supply chain drivers.
- Each of these drivers can be developed and managed to emphasize **responsiveness** or **efficiency** depending on changing business requirements.

- **Responsiveness** to customer demands and expectations drives continuous innovation in products and how customers are served.
- Prioritizing **responsiveness** enables companies to accommodate unexpected fluctuations in the market and changes in customer preferences successfully.
- On the other hand, the push for **efficiency** increases productivity and lowers products' prices, making them available to a broad population segment.

Optimizing responsiveness and efficiency is a continuous battle for most companies.

Drivers of SCM



1. Production

- To achieve a **responsive** supply chain, ensure your factories have excess capacity and use flexible manufacturing techniques to produce a wide range of items.
- Flexibility allows production to pivot to meet fluctuations in consumer demand quickly.
- Additionally, having multiple, smaller production facilities close to distribution centers and customer hubs increases consumer demand responsiveness by decreasing delivery time.
- Alternatively, having production facilities with little excess capacity and optimized for producing a limited range of items increases efficiency.
- Centralizing production in large central plants for better economies of scale furthers efficiency, though delivery times may be longer for some customers.

2 Inventory

- When it comes to inventory, optimizing responsiveness often dictates stocking higher product levels and at more warehouse locations.
- Efficient inventory allows for unexpected fluctuations in demand that can be met promptly. However, this approach incurs higher storage costs and must be weighed against the benefit of widespread availability.

Efficiency in inventory management calls for reducing inventory levels of all items, especially those that do not sell frequently.

Also, stocking inventory in only a few central distribution centers achieves economies of scale and cost savings.

3. Location

- Prioritizing responsiveness for the location driver often involves maximizing convenience by establishing many locations near customer groups. For example, fast-food chains use location to be very responsive to their customers by opening many stores in high-volume markets.
- Many sites allow them to respond quickly to consumer demand but increase operating costs by operating many stores.
- Efficiency is achieved by operating from a select few locations and centralizing activities. An example of efficiency in location would be how e-commerce retailers serve global markets from only a few central locations, performing a wide range of activities.
- While this allows each site to be more efficient, it also makes them susceptible to disruptions, as seen with the coronavirus outbreak.

4. Transportation

- Faster modes of transportation, such as air freight—while often more expensive—allow for shorter delivery times and greater response flexibility. FedEx and UPS are two companies that provide high levels of responsiveness in last-mile delivery by using transportation to deliver products often within 48 hours.

Efficiency in transportation is emphasized by moving products in larger batches, less often, by bulk carriers such as ships or railroads.

This type of transportation is more efficient when products originate from a centralized distribution center instead of multiple separate locations.

5 Information

Information's power as a driver is growing as the technology for collecting and sharing information becomes more widespread, easier to use, and more affordable. Software with analytics uses internal and external data to make decisions that enhance the performance of supply chain drivers.

supply chain should collect and share accurate and timely data generated by the previous four drivers in operation for ultimate effectiveness.

While the cost of the first four supply chain drivers continues to rise, market-leading SCM enable companies to make the best use of information to increase their internal responsiveness and efficiency through collaboration and end-to-end visibility.

Supply Chain Drivers	Responsiveness	Efficiency
1. Production	<ul style="list-style-type: none"> - Excess capacity - Flexible manufacturing - Many smaller plants 	<ul style="list-style-type: none"> - Little excess capacity - Narrow focus - Few central plants
2. Inventory	<ul style="list-style-type: none"> - High inventory levels - Wide range of items 	<ul style="list-style-type: none"> - Low inventory levels - Fewer items
3. Location	<ul style="list-style-type: none"> - Many locations close to customers 	<ul style="list-style-type: none"> - Few central locations serve wide areas
4. Transportation	<ul style="list-style-type: none"> - Frequent shipments - Fast & Flexible modes 	<ul style="list-style-type: none"> - Few large shipments - Slower and cheaper modes
5. Information	<ul style="list-style-type: none"> - Collect & share timely and accurate data 	<ul style="list-style-type: none"> - Cost of information drops while other costs rise

Advantages of supply chain management:

- 1. Higher Efficiency**
- 2. Customer Retention and Experience**
- 3. Better Risk Assessment and Management**
- 4. Improved Relationships**
- 5. Cost-Effectiveness**
- 6. Qualitative Improvements**
- 7. Reduces Legal Liabilities**
- 8. Reduces Delays**
- 9. Uninterrupted Cash Flow**
- 10. Benefits of Technologies**

Disadvantages of supply chain management:

- 1. Longer delivery times**
- 2. communication challenges**
- 3. Complexity**
- 4. Increased costs**
- 5. Lack of visibility and coordination**