**POM-621- Production & Operations Management**

**Answer of the question n. 1**

**Different factors in location:**

The goal of an organization is customer delight for that it needs access to the customers at minimum possible cost. This is achieved by developing location strategy. Location strategy helps the company in determining product offering, market, demand forecast in different markets, best location to access customers and best manufacturing and service location.

If the organization can configure the right location for the manufacturing facility, it will have sufficient access to the customers, workers, transportation, etc.



The factors which influence the decision of establishing an industry are: availability of raw materials, labour, capital, access to markets, availability of abundant power supply, modes of transportation like railways, roadways for transportation of finished goods, and raw materials; and availability of land. Some of them are: raw material, land, water, labor, capital, power, transport, and market. For ease of convenience, we can classify the location factors into two: geographical factors and non-geographical factors.

Characteristics of a site or position, including location identifiers. For example, geographic location, setting, and elements which form a recognisable address or telephone number.

It is common to mention the city, state, or country as a location descriptor. It is also common to talk about landmarks that may be nearby. Another way to describe location is to use reference lines to describe coordinates, or absolute position, on the globe.

Location plays a huge role in attracting and retaining the best employees, many of whom keep a close eye on where they're based in order to optimize work-life balance. Good location decisions can significantly boost a company's long-term performance. Poor ones can cost millions in lost talent, productivity and capital.

Business site location decisions start with economic factors such as transportation, labor, real estate, constructions costs, tax incentives, labor and resource availability, proximity to suppliers or markets, and sustainability.

Location Decision in operation management is finding an **ideal geographical region** to install a Facility or Plant. It is a vital component in facility planning as it greatly impacts the organization’s Profitability, Cost and Success.

Depending on the business and market conditions, the organizations can have all facilities under single or multiple units. It includes both the location of the plant and the facilities within the plant.

Generally, the location decision is taken to set up a new plant, relocate or expand the existing plant.

The decision depends on several factors that impact the business in the short and long run. These factors may be the industry’s size, nature and product.

The goal behind selecting a suitable location is to create accessibility to: Customers, Workers, Transportation, Materials, etc.

Installation of facilities involves massive investment and cannot be changed frequently. Due to poor location decisions, relocating to another place may lead to a heavy investment loss.

Facility location has a significant impact on different types of costs. These costs include Direct, Indirect, Fixed and Variable costs. The organization aims to deliver products at minimum cost to its customers.

Therefore, the industrialists are going for a strategic and logical approach to choose the best location. It also helps in the smooth and efficient working of the organization.

A good site location helps in reducing costs and amplifies the profit earned. The industries invest their valuable time in search of an ideal site for the following purposes: – Revenue Potential from that Site, Availability of Resources,Tax advantages, Reducing Cost and Production Time ,Convenient Transportation Facilities, Suitable Environment for Employees, Meet the Maximum Demands of Customers, Maximum Space Utilization, Criteria.

Facility location is a critical decision area and cannot depend on a single criterion. Essential criteria for selecting the location of a site are as follows: –

Costs: The cost perspective is an essential criterion concerning the location of a facility. Any wrong decision will adversely impact the company’s finances.

Competition: Effective location decision helps in achieving a competitive advantage in the markets. As industries can control costs and offer products at reasonable prices to consumers.

Hidden Effects: The plant’s location affects many factors in the long run in a direct or indirect manner. To remain competitive, organizations must strategically locate their facilities.

**Answer of the question n. 2**

**Capacity:**

Capacity is the maximum level of output that a company can sustain to make a product or provide a service. Planning for capacity requires management to accept limitations on the production process.

The capacity of a business measures how much companies can achieve, produce, or sell within a given time period. Consider the following examples: A call center can field 7,000 calls per week. A café can brew 800 cups of coffee per day.

The term capacity in operations management refers to the highest level of goods or services that a company can produce to meet demand.

An example of this would be a production facility where single serve meal or snack kits are produced. With each kit consisting of meat, cheese, bread and juice, a complex BOM is required to facilitate production of each. This would include the individual food types as well as tray formation and wrapping.

Capacity planning is a process that helps operations managers determine the capacity of their resources and plan for future growth. Businesses can avoid capacity issues and ensure smooth operations by estimating future demand and providing enough capacity to meet that demand. In this blog post, we will discuss what capacity planning operations management is and how it can benefit in business.

Capacity management refers to the wide variety of planning actions used to ensure that a business infrastructure has adequate resources to maximize its potential activities and production output under any condition.

Capacity management theory consists of the planning, IT monitoring, and administration actions undertaken to ensure that information technology resources have the capacity to handle data processing requirements across the entire service lifecycle.
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The goal of capacity planning management is to ultimately balance costs incurred against resources required, and balance supply against demand. The capacity management procedure concerns performance, memory, and physical space, and should cover both the operational and development environment, including hardware, human resources, networking equipment, peripherals, and software.
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The main objectives of project management capacity planning include:
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Identify IT capacity requirements to meet current and future projected workloads

Develop and maintain a capacity management plan

Ensure performance goals are met on time and within budget

Monitor capacity continuously to support the service level management

Assist in diagnosing and resolving incidents

Analyze the impact of variances on capacity and take proactive measures to improve performance where it is most cost-effective.

Capacity management tools and methodologies vary, ranging from manually compiled performance spreadsheets to specially compiled hardware or software that is designed to produce detailed insights on the functioning of computing components. These tools examine the operation of hardware and software, and monitor and measure the volume and speeds at which an organization’s applications move data through the IT infrastructure.
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The software and hardware elements that should be monitored include: cloud services, end-user devices, networks and related communications devices, servers, and storage systems and storage network devices. Information on internal processes of individual components and data movement metrics are extracted from these IT elements. Using this information, an administrator can run a software utility program to measure the transfer rate of data during processing.
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Some proactive capacity management and planning activities include: utilize [network capacity management](https://www.heavy.ai/industries/telecom), production capacity management and storage capacity management tools to predict network, production, and storage needs; implement pre-emptive, corrective actions; identify trends to estimate future utilization requirements; build models based on estimated changes; ensure upgrades are budgeted in a timely fashion; and develop and maintain a capacity plan to optimize the performance of services and increase efficiency.

**Factors while short and long range capacity:**

The most important parts of effective capacity are process and human factors. Process factors must be efficient and must operate smoothly, if not the rate of output will dramatically decrease.

Short-term capacity planning focuses on immediate capacity needs and is usually done daily or weekly. Long-term capacity planning focuses on capacity needs over a year or more over a longer period. It is used to make strategic decisions on capacity expansion or reduction investments.

Short-term capacity planning deals with immediate capacity issues facing your firm, anywhere from the next few days to the next six months. Often these issues can be fixed by reshuffling resources or bringing in an external contractor in the short term.

To help meet demand, assess the service demand factors that can affect capacity, including: Process: Skills, quantity, and quality capabilities. Staffing: Job descriptions, total labor, training, compensation, and turnover rates.

A number of factors can affect capacity—number of workers, ability of workers, number of machines, waste, scrap, defects, errors, productivity, suppliers, government regulations, and preventive maintenance. Capacity planning is relevant in both the long term and the short term.

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Short-term planning evaluates your progress in the present and creates an action plan to improve performance daily. However, long-term planning is a comprehensive framework that comprises of goals to be met within a four- to five-year period.

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For example, if there are workforce gaps leading to project delays, will need to quickly address them to ensure don’t disappoint clients. This can include training or upskilling current staff, offering entry-level internships to support skilled staff, or identifying a specialised contractor with a good reputation on standby to fill in at short notice.

Another important element of capacity planning is managing unscheduled absences. A crucial staff member becoming unavailable at a key stage of a project can derail progress and even cause knock-on delays in other pieces of work.

Aim to streamline the way staff work to create efficiencies, either with technology or better systems that increase productivity.

Plainly, the goals of long-term and short-term capacity are the same.

One key difference between short-term and long-term capacity planning strategies is the scale. Neither is less significant than the other and at the time, can seem like big problems if they occur during high-pressure moments in a project.

Another difference is that long-term capacity planning looks at the overall company growth trajectory, which can include significant changes to firm's structure. Geographical expansion, professional diversification, and technological advancements can all be taken into account, requiring more elaborate, tactical steps.

It’s important to consider both long-term and short-term capacity plans when making resourcing decisions. For example, if consistently using a short-term resourcing solution to make up for a shortfall, it may be that need to consider more long-term options such as making a full-time hire or restructuring staff to better cater for business needs.

**Answer of question n. 3**

**Quality control:**

Quality control (QC) is a process through which a business seeks to ensure that product quality is maintained or improved. Quality control involves testing units and determining if they are within the specifications for the final product.

Quality control usually involves testing every step of a company's manufacturing process. For example, QC employees may begin by testing the raw materials that are used to create a product. They may continue testing at various stages within the manufacturing process to identify where any problems are occurring.

A major part of the quality assurance is the Quality Control defined by ISO as "the operational techniques and activities that are used to satisfy quality requirements. "

They are popularly known as “7 QC tools” or “Seven Basics Tools of Quality”. These 7 QC tools are used for collection, collation, analyzing, interpretation and reporting of data. The data thus reported is used for identifying various issues that are currently or may in future may affect the product quality.

For example, a company that manufactures shoes decides to test every 10th shoe from the production line to ensure each batch meets the company's standards.

The four types of quality control are process control, control charts, acceptance sampling, and product quality control. While a control chart helps study changing processes over time, process control and product quality control help monitor and adjust products as per the standards.

A system of quality control consists of six interrelated elements including, leadership responsibilities for quality within the firm, relevant ethical requirements, acceptance, and continuance of client relationships and specific engagements, human resources, engagement performance, and monitoring.

In order to implement an effective QC program, an enterprise must first decide which specific [standards](https://www.techtarget.com/whatis/definition/standard) the product or service must meet. Then the extent of QC actions must be determined -- for example, the percentage of units to be tested from each lot.

Next, real-world data must be collected -- such as the percentage of units that fail -- and the results reported to management personnel. After this, corrective action must be decided upon and taken. For example, defective units must be repaired or rejected, and poor service repeated at no charge until the customer is satisfied. If too many unit failures or instances of poor service occur, a plan must be devised to improve the production or service process; then that plan must be put into action.

Finally, the QC process must be ongoing to ensure that remedial efforts, if required, have produced satisfactory results and to immediately detect recurrences or new instances of trouble.

**Difference between inspection and quality contrl:**

Quality control refers broadly to the process of managing product quality to meet a desired standard. Inspection is only a part of this process used to identify quality defects in products. Inspection can help find any defects earlier in production before they affect the majority of a shipment.

To succeed in the marketplace, consumer product companies must ensure that their products meet customer standards. As such, may be thinking about measures can take to achieve high [product quality](https://insight-quality.com/what-is-product-quality/) and get great reviews.

A [quality inspection](https://insight-quality.com/what-is-a-product-quality-inspection/) is a process that involves checking products to verify that they meet pre-set standards. A factory, buyer, or third-party inspection company can conduct one.

According to [ISO 9000](https://www.iso.org/obp/ui/#iso:std:45481:en), quality control (QC) is the “part of quality management focused on fulfilling quality requirements.” In other words, it includes all the actions you take to verify that products match specifications.

Quality inspections, which we’ve discussed above, can be a part of your QC system — but your system can include other measures too. For example, you might send your products to an accredited lab to [test them for safety](https://insight-quality.com/how-to-get-a-product-lab-tested/), compliance, or performance.

Essentially, you are doing quality control whenever measure, test, examine, or gauge some aspect of product to verify conformance. Quality inspections make up a part of quality control, but not the entirety of it.

It’s also worth noting that can conduct various types of quality inspections, so let’s talk about a few of them.

A quality inspector can check your goods at different stages of the manufacturing process — before, during, or after. You might choose to conduct any of the following:

[Pre-production Inspection](https://insight-quality.com/services/inspection-services/pre-production-inspections/) – These take place before the factory starts production. They can help you check a prototype, verify that raw materials are high quality, or ensure the factory is ready for mass production.

[During Production Inspection (DUPRO)](https://insight-quality.com/services/inspection-services/during-production-inspections-dupro/) – Items from the production line are checked while the goods are still in production. Checking goods early helps avoid delays if large quantities in continuous production

[Pre-shipment Inspection](https://insight-quality.com/services/inspection-services/pre-shipment-inspections/) – These are conducted once production is complete and goods are at least 80% packed. They allow to check for defects before products are shipped so can rework them at the factory if needed.

Quality management is a critical aspect of any business operation, and it involves monitoring and controlling the quality of products or services from the production stage to the final delivery to the customer. However, people are often confused between the terms “quality control” and “quality inspection.” While these terms are often used interchangeably, they have different meanings and are used in different ways. Understanding the difference between quality control and quality inspection is essential for businesses looking to maintain quality standards and meet customer expectations

In this blog, we will explore the difference between quality control and quality inspection and how they are used in the context of quality management. Through real-world examples and concrete explanations, we aim to provide a clear understanding of these two concepts and their significance in ensuring that businesses provide high-quality products or services that meet or exceed customer expectations.

So, let’s dive into the world of quality management and explore the difference between quality control and quality inspection.

Quality control is an essential component of any business operation that aims to deliver high-quality products or services consistently. It refers to the systematic process of inspecting, testing, and verifying products or services to ensure that they meet specific quality standards

The main objective of quality control is to ensure that the final product or service meets customer expectations in terms of quality, performance, and reliability. This not only helps to build customer loyalty but also helps businesses to enhance their brand reputation and increase market share.

Quality inspection is a process of checking and verifying products or services against established quality standards to ensure that they meet customer expectations. It involves the inspection, testing, and examination of products or services to identify defects, errors, or other issues that may affect their quality.

**Answer of question n. 5**

**Materials management:**

Materials management is the process of planning and controlling material flows. It includes planning and procuring materials, supplier evaluation and selection, purchasing, expenditure, shipping, receipt processes for materials (including quality control), warehousing and inventory, and materials distribution.

Material management is the process of planning, organising, directing and controlling the flow of materials within an organisation. In the manufacturing field, material managers perform a vital role in purchasing, obtaining and maintaining raw materials to use in production processes.

One of the primary objectives of material management is to reduce the cost of materials. It includes reducing the cost of purchasing materials, as well as reducing the cost of storing and handling materials.

So, an effective material management system can help you budget in a way that allows you to solve problems as they arise, minimize delays, reduce costs and improve budget planning and materials tracking.

Materials management is a core supply chain function and includes supply chain planning and supply chain execution capabilities. Specifically, materials management is the capability firms use to plan total material requirements. The material requirements are communicated to procurement and other functions for sourcing.

Materials management is defined as “*the function responsible for the coordination of planning, sourcing, purchasing, moving, storing and controlling materials in an optimum manner so as to provide a pre-decided service to the customer at a minimum cost*”.From the definition, it is clear that the scope of materials management is vast.

Material management is the process of planning, organizing, and controlling the flow of materials from the acquisition of raw materials to the delivery of finished products. The primary function of material management is to ensure that the right materials are available at the right time, in the right quantities, and at the right cost. This involves activities such as material planning and control, purchasing, stores management, inventory control, standardization, simplification, value analysis, ergonomics, and just-in-time (JIT) techniques to minimize waste and maximize efficiency. The ultimate goal is to ensure that materials are effectively utilized and managed to support the production process and achieve organizational objectives.

Organizations use materials management as a way to plan and organize the procedures that manage tangible components in their business processes. A car manufacturing company, for example, needs to buy things like wheels, motors, and windows.

A significant aspect of materials management is verifying the quality and worth of the materials that will be used in production. A company's materials management department is responsible for ensuring that all activities related to material flow are properly planned, organized, and controlled.

The process of planning and controlling material flows is known as materials management. Materials management is an essential component of supply chain management.

**Different methods of inventory control:**

Inventory control is vital to your success when running a business that involves multichannel retailing, wholesale, or e-commerce. But what is inventory control, and why should consider it a priority in business operations? This guide will explore the different methods and explain their benefits and drawbacks. We will also discuss the importance of inventory control and how to overcome some associated challenges.

Inventory control is the process of tracking and managing inventory. This includes the ordering, shipping, and receiving of inventory and storage and disposal of inventory. Inventory control monitors the movement and storage of inventory to ensure that inventory levels are maintained at an optimal level.

The goal of inventory control is to minimize the cost of inventory while maximizing inventory turnover. In other words, inventory control strives to find the perfect balance between having too much inventory and not enough inventory.

It’s important to note that inventory control and inventory management are not the same things:

Inventory management is a broader term that encompasses inventory control and other aspects of inventory such as forecasting, planning, and replenishment.

Inventory control is a narrower term focusing on tracking and managing inventory.

However, despite their differences, both exist to achieve the same goal: to minimize inventory costs while maximizing inventory turnover.

Types of Inventory Control Systems

There are two main inventory control systems: periodic and perpetual systems. Choosing the right inventory control system for your business will depend on various factors such as the type of business, the inventory size, and the inventory turnover frequency.

Periodic Inventory Control

Periodic inventory control systems are systems where inventory is counted and recorded at specific intervals. The most common interval is monthly, but inventory can also be counted quarterly, semi-annually, or annually.

The advantage of periodic inventory control systems is that they are relatively simple and easy to implement. The disadvantage of periodic inventory control systems is that they are less accurate than perpetual inventory control systems and can lead to stock-outs.

Periodic inventory control is best for small companies with minimal inventory and infrequent inventory turnover.

Perpetual Inventory Control

Perpetual inventory control systems are inventory systems in which inventory is continuously tracked and recorded in real-time. This is done through the use of inventory software that is integrated with the company’s point-of-sale (POS) system.

The advantage of perpetual inventory control systems is that they are more accurate than periodic inventory control systems. The disadvantage of perpetual inventory control systems is that they are more complex and can be more expensive to implement.

Perpetual inventory control is best for businesses with multiple locations, large inventory levels, and high inventory turnover. It’s also ideal for businesses that sell fast-moving consumer goods (FMCG) and need to maintain tight inventory levels.

Inventory control is a process that allows businesses to track and manage their inventory. There are different methods of inventory control, each with its benefits and drawbacks. By understanding the different inventory control methods and choosing the one that best suits needs, can improve inventory management processes and bottom line.