Supply Chain management

Unit 1:

Operations Management:

The business function responsible for planning, coordinating, and controlling the resources needed to produce products and services for a company

Operations Management is: ■ A management function ■ An organization's core function ■ In every organization whether Service or Manufacturing, profit or Not for profit

OM Transforms inputs to outputs ■ Inputs are resources such as ■ People, Material, and Money ■ Outputs are goods and services

History of operations management:

■ Industrial revolution Late 1700s

■ Scientific management Early 1900s

■ Human relations movement 1930s-60s

■ Management science 1940s-60s

■ Computer age 1960s

■ Environmental Issues 1970s

■ JIT & TQM* 1980s

■ Reengineering 1990s

■ Global competition 1980s

■ Flexibility 1990s

■ Time-Based Competition 1990s

■ Supply chain Management 1990s

■ Electronic Commerce 2000s

■ Outsourcing & flattening of world 2000s

Types of manufacturing systems:

All manufacturing falls under one of these five major manufacturing systems, running the gamut from bespoke products through mass manufacture to modern mass customization.

Custom manufacturing system

Custom manufacturing describes the production of bespoke products, made to order, usually by a skilled craftsperson. It is a relative rarity in modern society, usually reserved for high-end variants of common products. Tailored suits, handmade furniture, and wedding cakes are all good examples.

Intermittent manufacturing system

Intermittent manufacturing can also be thought of as batch production—limited runs of similar products, usually to fulfill specific orders. Although machinery is often utilized, intermittent manufacturers commonly rely on skilled workers able to switch between different products. Clothing is a large-scale example which is often produced intermittently responding to demand of particular designs.

Continuous manufacturing system

Otherwise known simply as 'mass manufacture', continuous manufacturing is what laypeople tend to think of as manufacturing. Production lines are set to produce the same product, often 24 hours a day, continuously, with the expectation that demand will meet supply. Continuous manufacturing commonly applies the assembly line methodology. The economies of scale make the cost-per-unit as low as possible, making continuous manufacturing incredibly efficient—but only if the quantities can justify the inflexibility.

Flexible manufacturing system

Flexible manufacturing fulfills the same batch quantities as intermittent manufacturing, but with less reliance on skilled labor. Instead, high levels of robotics and automation enable machines to rapidly re-calibrate between different products and lines. Due to the speed of changeover, flexible manufacturing is sometimes referred to as 'agile manufacturing.'

The system requires high levels of initial capital investment, and expansive pre-planning, but can offer a more favorable cost-per-unit—with even greater flexibility—than intermittent manufacturing once the plant is running.

Mass customization

Mass customization delivers individually customized products on a mass scale and production lines may be designed to accommodate simple customization. However, the convergence of digital design and manufacturing may allow customers to design highly complex customizations themselves that are automatically relayed to automated production lines, capable of adapting with no changeover time. As customers increasingly expect personalization—and the technology becomes more capable—mass customization is rapidly becoming the preferred method of production in many sectors.

Roles and responsibilities of operations manager

So operations managers are responsible for managing activities that are part of the production of goods and services. Their direct responsibilities include managing both the operations process, embracing design, planning, control, performance improvement, and operations strategy. Their indirect responsibilities include interacting with those managers in other functional areas within the organisation whose roles have an impact on operations. Such areas include marketing, finance, accounting, personnel and engineering.

Operations managers' responsibilities include:

- *Human resource management* – the people employed by an organisation either work directly to create a good or service or provide support to those who do. People and the way they are managed are a key resource of all organisations.
- *Asset management* – an organisation's buildings, facilities, equipment and stock are directly involved in or support the operations function.
- *Cost management* – most of the costs of producing goods or services are directly related to the costs of acquiring resources, transforming them or delivering them to customers. For many organisations in the private sector, driving down costs through efficient operations management gives them a critical competitive edge. For organisations in the not-for-profit sector, the ability to manage costs is no less important.

Decision making is a central role of all operations managers. Decisions need to be made in:

- designing the operations system
- managing the operations system
- improving the operations system.

The five main kinds of decision in each of these relate to:

1. the processes by which goods and services are produced
2. the quality of goods or services
3. the quantity of goods or services (the capacity of operations)
4. the stock of materials (inventory) needed to produce goods or services
5. the management of human resources.

Product operations and service operations

S.No.	Manufacturing Operations	Service Operations
1.	Manufacturing operations produces tangible output (ie; which can be physically seen) from the the conversion process.	Service Operations produces intangible output(ie; which cannot be physically seen) from the conversion process.
2.	The output from the manufacturing operations can be consumed over a longer period of time.	The output from the service operations is consumed immediately.
3.	Manufacturing Operations are generally based on capital intensive technique as they use more capital(ie; more use of machines and equipments) and less labour.	Service Operations are generally based on people intensive technique as they use more machines and equipment than machines and equipments.
4.	In manufacturing Operations, there is no need to contact customer frequently and no need of customer's participation.	In service operations, there is need to contact customers frequently and need of customer's participation as without customer contact no service can be generated.
5.	In order to measure the performance of the manufacturing operations, sophisticated methods are used.	In order to measure the performance of the service operations, simple methods(fast and easier) are used.
6.	Manufacturing operations covers large area as they produce goods for local level, national level or international level.	Service Operations covers small area as they generally provide services for local people.
7.	Manufacturing operations which includes production of goods and services are generally technology based.	Service operations are mainly knowledge and skill based but sometime technology is also required to produce services.

Current Trends in Operations Management

Operations management (OM) is the administration of business practises within an organisation to achieve the highest level of efficiency possible. It is concerned with converting materials and labour as efficiently as possible into goods and services in order to maximise an organization's profit.

Flexibility-The ability to build different types of products in the same plant or production facility at the same time results in process flexibility. This enables the product mix to be changed during production as demand changes.

When developing their operations and manufacturing strategies, operations managers should include flexibility as a key component to a much greater extent. Flexibility is expensive, but it allows a company to respond to deviations from the norm in an effective and efficient manner.

Total Quality Management (TQM)- Total quality management is the ongoing process of detecting and reducing or eliminating manufacturing errors, streamlining supply chain management, improving the customer experience, and ensuring that employees are properly trained. Total quality management seeks to hold all parties involved in the manufacturing process responsible for the overall quality of the final product or service.

It is used to improve customer service, streamline supply chain management, and ensure employee training. The goal is to continuously improve internal practises in order to improve the quality of an organization's outputs, including goods and services.

Cycle Time Reduction- Cycle time is reduced by decreasing time spent on non-value added activities and simplifying and streamlining the process, lowering the cost of operations.

Benefits of reducing cycle time include faster time-to-market and, if other cost factors are kept in check, the possibility of higher profitability. Reduced cycle time also allows a company to be more competitive with other businesses that offer similar products to the same customer base.

Employee engagement is a vital notion in the endeavour to comprehend and explain the nature of an organization's connection with its employees, both

qualitatively and quantitatively. The direct participation of employees in assisting an organisation in fulfilling its mission and meeting its objectives by applying their own ideas, knowledge, and efforts to problem solving and decision making.

Recent tendencies have been to delegate decision-making and problem-solving responsibilities to lower levels of the organisation. Employee involvement and empowerment are terms used to describe this. Quality circles, for example, and the usage of work teams or quality improvement teams.

Business process re-engineering (BPR)- The radical redesign of business processes to achieve dramatic improvements in critical aspects such as quality, output, cost, service, and speed is known as business process re-engineering. Business process reengineering (BPR) aims to drastically reduce enterprise costs and process redundancies.

It entails a start-from-scratch approach to redesigning business processes.During the 1990s, many companies, including Ford Motors, GTE, and Bell Atlantic, experimented with BPR to restructure their operations. The reengineering process they used made a significant difference for them, dramatically lowering their costs and increasing their effectiveness in the face of increasing competition.

Lean Production is a manufacturing methodology that focuses on reducing waste, with waste defined as anything that does not add value to the customer. Although Lean has its roots in manufacturing, it is applicable to all types of organisations and all of their processes.

It is based on Toyota's operating model "The Toyota Way" from 1930. Toyota has played an important role in the development and application of Lean, and many tools are derived from the Toyota Production System (TPS), which is focused on improving the flow or smoothness of production by eliminating unevenness in the manufacturing process.

Just In Time - JIT inventory is a management strategy that directly aligns raw-material orders from suppliers with production schedules. Companies use this inventory strategy to increase efficiency and reduce waste by receiving goods only as needed for the manufacturing process, which lowers inventory costs. This method necessitates that producers accurately forecast demand. Kanban is a

scheduling system that is frequently used in conjunction with JIT to avoid work-in-process overcapacity.

Computer-Aided Manufacturing- The use of software and computer-controlled machinery to automate a manufacturing process is known as computer-aided manufacturing (CAM).... By generating toolpaths, software tells a machine how to make a product. Machinery capable of converting raw materials into finished goods.

The following are some examples of computer-aided manufacturing machines: CNC Routers: CNC machines use high-speed oscillating components to cut parts and crave out different shapes. Electrical Discharge Machines (EDM): EDMs are machines that use electric discharge to cut out desired shapes from raw materials.

Computer-Aided Design- The use of computers to aid in the creation, modification, analysis, or optimization of a design is known as computer-aided design. This software is used to increase the designer's efficiency, improve design quality, improve communication through documentation, and develop a database for manufacturing.Two-dimensional (2-D) drawings and three-dimensional (3-D) models can be created using CAD software.

In-depth discussion of the advantages of CAD.

Improves Productivity

Designs of Higher Quality

Designs can be reused and easily changed.

Sharing Has Been Made Easier to Read

Factors affecting Operations Management – Pre and Post Covid.

1. Staffing Shortages Are Causing Stress – But They Don’t Have To
2. Acting On Common Motivators For Frontline Employees and Team Leaders
3. Creating A Frontline-First Workplace Experience
4. Prioritizing Employee Wellbeing

5. Automating Processes In The Face Of The Great Resignation

6. Unifying Disparate Systems For A Seamless Frontline Tech Experience

and

1. Health and Safety Emphasis

2. Manual Processes Digitization

3. Company-wide communication streamlining

4. Rapid responsiveness to demand

5. Speedy Issue Resolution

Key milestones achieved in 'Scientific Management'.

In 1909, Taylor published *The Principles of Scientific Management*. In this book, he suggested that productivity would increase if jobs were optimized and simplified. He also proposed matching a worker to a particular job that suited the person's skill level and then training the worker to do that job in a specific way. Taylor first developed the idea of breaking down each job into component parts and timing each part to determine the most efficient method of working. Soon afterward, two management theorists, Frank and Lillian Gilbreth, came up with the idea of filming workers to analyze their motions. Their ideas have since been combined into one process (called time and motion studies) for analyzing the most productive way to complete a task.

Scientific management has at its heart four core principles that also apply to organizations today. They include the following:

- Look at each job or task scientifically to determine the "one best way" to perform the job. This is a change from the previous "rule of thumb" method where workers devised their own ways to do the job.
- Hire the right workers for each job, and train them to work at maximum efficiency.
- Monitor worker performance, and provide instruction and training when needed.
- Divide the work between management and labor so that management can plan and train, and workers can execute the task efficiently.

Taylor designed his approach for use in places where the work could be quantified, systemized, and standardized, such as in factories. In scientific management, there is one right way to do a task; workers were not encouraged (in fact, they were forbidden) to make decisions or evaluate actions that might produce a better result. Taylor was concerned about the output more than worker satisfaction or motivation. Taylor's work introduced for the first time the idea of systematic training and selection, and it encouraged business owners to work with employees to increase productivity and efficiency. And he introduced a "first-class worker" concept to set the standard for what a worker should be able to produce in a set period of time. Scientific management grew in popularity among big businesses because productivity rose, proving that it worked.

Today, an updated version of his original theory is used by such companies as FedEx and Amazon. **Digital Taylorism** is based on maximizing efficiency by standardizing the tools and techniques for completing each task involved with a given job. Every task is broken down to the smallest motion and translated into an exact procedure that must be followed to complete that task. Because everyone is operating in the same mechanistic way, it increases predictability and consistency while reducing errors. It is relatively easy for managers to replace workers and retain the same productivity. The criticism of this type of management approach is similar to that of Taylor's original theory: It reduces worker creativity; it requires management to monitor all aspects of employee behavior; and it is unforgiving to workers who don't meet the standard.

Role if IT in Operations Management – Advantages, Applications etc.

ITOM is responsible for all services and applications, infrastructure, and ensuring that all are stable and available for use.

Network infrastructure management

Includes the equipment that is needed to provide external and internal communications for an organization—this includes setting up remote access networks, regulating communication with external servers via firewalls, maintaining network security, and managing an internal telephone system.

Help desk

ITOM encompasses services and service issues that come from machines, such as servers, networking, and VMs. IT operations managers are responsible for communicating information about incidents, managing data back-ups, implementing disaster recovery plans, and controlling the provision of user profiles.

Server and device management

IT operations teams administer servers, virtual machines, devices, and other endpoints, while playing a key role in the daily management of servers which host company applications. Server-related responsibilities may include patching, upgrading, and maintaining. ITOM teams are also responsible for IT assets like desktops, tablets, mobile devices, phones, and laptops.

Advantages

Effective ITOM provides a range of benefits for organizations. This includes predicting issues, minimizing user impact, automating resolutions, modern DevOps, and data connection.

Predict issues

ITOM systems help collect and interpret data across the IT estate. Data gathered includes data from cloud, IT infrastructure, logs, metrics, events, and container-based resources. AIOps, in conjunction with machine learning, helps to reduce noise, identify anomalies, and avoid time spent on false positives.

Minimize user impact

ITOM makes it possible to prevent certain issues before they occur, at which point ITOM helps you minimize the impact to end users before they ever experience a problem.ITOM allows you to identify root causes more quickly and with improved accuracy, by correlating changes and incidents. You can leverage insights to collaborate across teams while also triggering actions based on guided recommendations to eliminate outages, service degradations and further empower staff members.

Automate workflows across teams

ITOM provides the opportunity to automate cross-team workflows to eliminate unnecessary manual processes and handoffs, empowering your staff with powerful, actionable insights that can be easily shared between teams. A learned-knowledge base shortens recovery times, which simplifies repetitive tasks when you have pre-built playbooks and low code/no code workflows.

Deliver DevOps

ITOM works in partnership with centralized and decentralized teams, and gives DevOps and SRE teams more visibility into microservices which improves observability and increases incident response.

Connect your data

ITOM goes beyond simple IT operations to manage the entire digital life cycle, while also extending your CMDB to create a stronger data foundation.

Tangible Assets

Tangible assets are physical and measurable assets that are used in a company's operations. Assets like property, plant, and equipment, are tangible assets. Tangible assets form the backbone of a company's business by providing the means by which companies produce their goods and services. Tangible assets can be damaged by naturally occurring incidences since they are physical assets.

These assets include:

Land

Vehicles

Equipment

Machinery

Furniture

Inventory

Securities like stocks, bonds, and cash

There are two types of tangible assets:

Current Assets

Current assets include items such as cash, inventory, and marketable securities. These items are typically used within a year and, thus, can be more readily sold to raise cash for emergencies.

Fixed Assets

Fixed assets are non-current assets that a company uses in its business operations for more than a year. They are recorded on the balance sheet as Property, Plant, and Equipment (PP&E), and include assets such as trucks, machinery, office furniture, buildings, etc. The money that a company generates using tangible assets is recorded on the income statement as revenue. Fixed assets are needed to run the business continually.

Types of Companies With Tangible Assets

There are various industries that have companies with a high proportion of tangible assets.

Manufacturing: Companies involved in producing goods have tangible assets, including the automobile and steel industries. The factory equipment, computers, and buildings would all be tangible assets.

Technology: Technology companies that are involved in producing smartphones, computers, and other electronic devices use tangible assets to produce their goods.

Oil & Gas Industry: Companies within the oil and gas industry also own a large number of fixed assets that are tangible. For example, companies that drill oil own oil rigs and drilling equipment. Oil producers are extremely capital intensive companies, meaning they require significant amounts of capital or money to finance the purchase of their tangible assets.

Intangible Assets

Intangible assets are typically nonphysical assets used over the long term. Intangible assets are often intellectual assets, and as a result, it's difficult to assign a value to them because of the uncertainty of future benefits.

Intangible assets are non-physical assets that add to a company's future value or worth and can be far more valuable than tangible assets. Both of these types of assets are initially recorded on the balance sheet, which helps investors, creditors, and banks assess the value of the company**.**

Intangible assets are intellectual property that includes:

Patents, which provide property rights to an inventor

Trademarks, which are a recognizable phrase or symbol that denotes a specific product and differentiates a company

Franchises, which are a type of license that a party (franchisee) buys to allow them to have access to a company's brand and sell goods under their name

Goodwill, which represents the value above and beyond a target company's assets that another company pays to acquire them

Copyrights, which represent intellectual property that's protected from being duplicated by non-authorized parties

Depending on the type of business, intangible assets may include internet domain names, performance events, licensing agreements, service contracts, computer software, blueprints, manuscripts, joint ventures, medical records, permits, and trade secrets. Intangible assets add to a company's possible future worth and can be much more valuable than its tangible assets

Brand Equity

A brand is an identifying symbol, logo, or name that companies use to distinguish their product from competitors. Brand equity is considered to be an intangible asset because the value of a brand is not a physical asset and is ultimately determined by consumers' perceptions of the brand. A brand's equity contributes to the overall valuation of the company's assets as a whole.

Positive brand equity occurs when favorable associations exist with a given product or company that contributes to a brand's equity, which is achieved when consumers are willing to pay more for a product with a recognizable brand name than they would pay for a generic version.

For example, a consumer might be willing to pay $4.99 for a tube of Sensodyne toothpaste rather than purchasing the store brand's sensitivity toothpaste for $3.59 despite it being cheaper. The Sensodyne brand has positive equity that translates to a value premium for the manufacturer.

Negative brand equity occurs when consumers are not willing to pay extra for a brand-name version of a product. For example, producers of commodity products, such as milk and eggs, may experience negative brand equity because many consumers are not concerned with the specific brands of the milk and eggs they purchase.

Since brand equity is an intangible asset, as is a company's intellectual property and goodwill, it cannot be easily accounted for on a company's financial statements; however, a recognizable brand name can still create significant value for a company. Investing in the quality of the product and a creative marketing plan can have a positive impact on the brand's equity and the company's overall viability

Types of Companies With Intangible Assets

Several industries have companies with a high proportion of intangible assets. They include the following:

Technology: Technology companies, particularly within the area of computer companies, copyrights, patents, critical employees, and research and development, are key intangible assets. Apple Inc. (AAPL) would typically have intangible assets.

Entertainment: Entertainment and media companies have intangible assets such as publishing rights and essential talent personnel. Intangible assets in the music industry, for example, involve the copyrights to all of a musical artist's songs. Musicians and singers can also have brand recognition associated with them. The music production company might own the rights to the songs, which means that whenever a song is played or sold, revenue is earned. Although these assets have no physical properties, they provide a future financial benefit for the music company and the musical artist.

Consumer: Consumer products and services companies have intangibles like patents of formulas and recipes, along with brand name recognition, which are essential intangible assets in highly competitive markets. Coca-Cola Company (KO) is an example of an intangible asset with the value of its highly recognized brand name that is virtually inestimable and is a critical driver in the Coca-Cola Company's success and earnings.

Healthcare: The healthcare industry tends to have a high proportion of intangible assets, including brand names, valuable employees, and research and development of medicines and methods of care.

Automobile: The automobile industry also relies heavily on intangible assets, primarily patented technologies and brand names. For example, brand names like "Ferrari" are worth billions.