SNS COLLEGE OF TECHNOLOGY

Coimbatore - 35

23BAT613 – Operations Management

UNIT-III - OPERATIONS AND THE VALUE CHAIN

Facility Location Theories

Presented by

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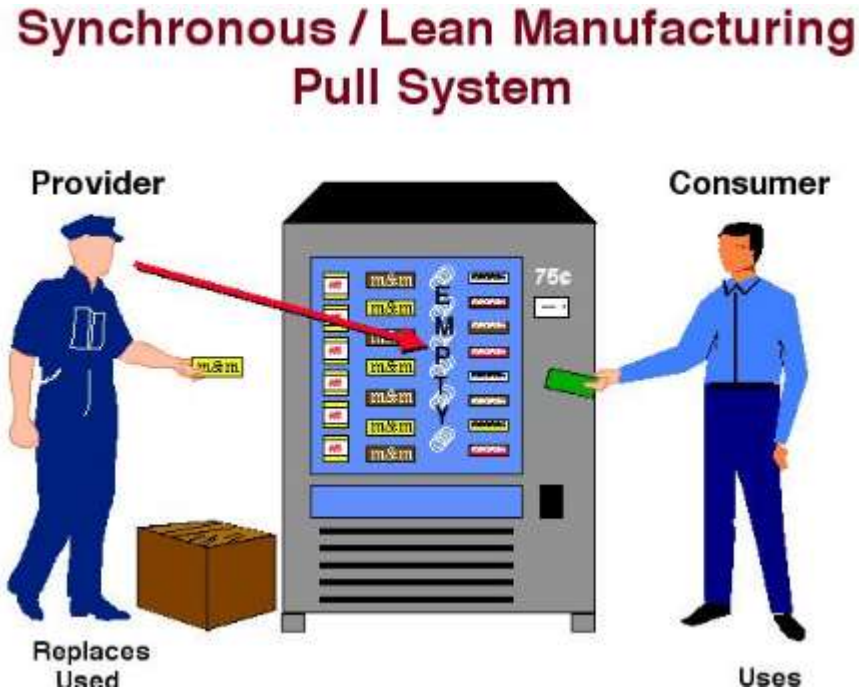
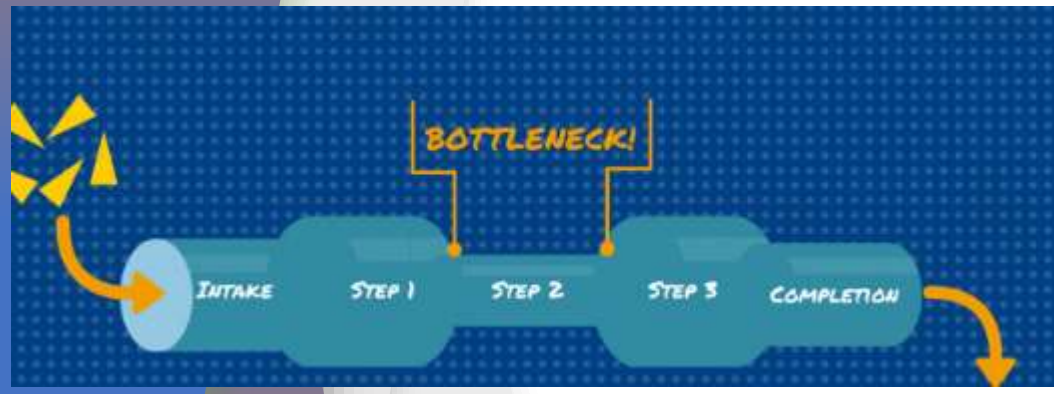
Recap:

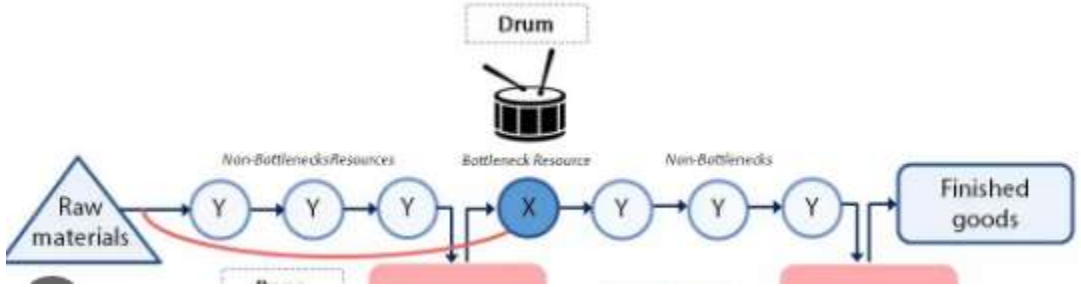
Developing Capacity Alternatives



Today's Topic:

Facility Location and Theories





Facility Location Theories - Meaning

Facility location theories are essential for businesses looking to optimize the placement of their operations to minimize costs and maximize efficiency. Here are some key theories and models used in facility location planning

Facility Location Theories

Weber's Theory of Industrial Location

Developed by: Alfred Weber

Concept: This theory focuses on minimizing the transportation costs associated with raw materials and finished goods. The optimal location is where the transportation costs of raw materials and products are the lowest.

Key Factors: Transportation costs, labor costs, and agglomeration (benefits of being close to other industries).

Application: Manufacturing industries where transportation cost is a significant factor.

Facility Location Theories

Hotelling's Model

Developed by: Harold Hotelling

Concept: This model addresses the location of facilities in a linear market. It suggests that businesses will choose locations that are equidistant from each other to maximize their market share and minimize competition.

Key Factors: Spatial competition, market positioning.

Application: Retail and service industries, where competition and customer accessibility are critical.

Facility Location Theories

Losch's Theory of Profit Maximization

Developed by: August Losch

Concept: This theory emphasizes locating facilities to maximize profits. The optimal location is determined by analyzing the demand and ensuring the facility is placed where the potential for profit is highest.

Key Factors: Market demand, profit zones, competition.

Application: Businesses looking to optimize market reach and profitability.

Facility Location Theories

Central Place Theory

Developed by: Walter Christaller

Concept: This theory explains the distribution of services based on the idea that settlements serve as 'central places' providing services to surrounding areas. It proposes a hexagonal lattice pattern for the optimal distribution of services.

Key Factors: Market area, range, and threshold (minimum market size needed for a service to be viable).

Application: Urban planning, retail, and service industries.

Facility Location Theories

Gravity Model

Concept: This model is based on the gravitational pull concept, where larger and closer markets exert a stronger pull on facility location. It predicts that the interaction between two locations is directly proportional to their sizes and inversely proportional to the distance between them.

Key Factors: Market size, distance.

Application: Retail, logistics, and service industries.

Facility Location Theories

Huff's Model

Developed by: David L. Huff

Concept: This model calculates the probability that a consumer will visit a particular location based on the attractiveness of the location (e.g., size, variety of services) and the distance from the consumer.

Key Factors: Attractiveness of the location, distance decay.

Application: Retail site selection, shopping centers.

Facility Location Theories

Brown and Gibson's Model

Concept: This is a weighted scoring model where different factors such as cost, labor availability, transportation, and community services are weighted based on their importance, and locations are scored accordingly.

Key Factors: Multiple criteria including economic and non-economic factors.

Application: General facility location decisions across industries.

Facility Location Theories

Multi-Criteria Decision Analysis (MCDA)

Concept: This approach involves evaluating multiple conflicting criteria in decision making. It helps in comparing and ranking different location options based on a comprehensive set of factors.

Key Factors: Cost, infrastructure, labor availability, proximity to markets, regulatory environment.

Application: Complex decision-making environments, public and private sector facility location.

Facility Location Theories

Considerations in Facility Location Planning:

Cost Factors: Include transportation, labor, utilities, taxes, and real estate.

Geographical Factors: Proximity to markets, suppliers, and transportation networks.

Economic Factors: Local economic conditions, incentives, and cost of living.

Regulatory Environment: Zoning laws, environmental regulations, and local policies.

Social Factors: Quality of life, community services, and availability of skilled labor.

Risk Factors: Political stability, natural disasters, and economic fluctuations.

ASSESSMENT:

Which of the following best defines capacity planning?

A. Planning for financial resources
B. Planning for human resources
C. Planning for optimizing operational efficiency
D. Planning for aligning resources with demand forecasts

Summary

Selecting the appropriate theory electing the appropriate theory or model depends on the specific requirements of the business, the nature of the industry, and the strategic goals of the organization.

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