

Supply Chain Management

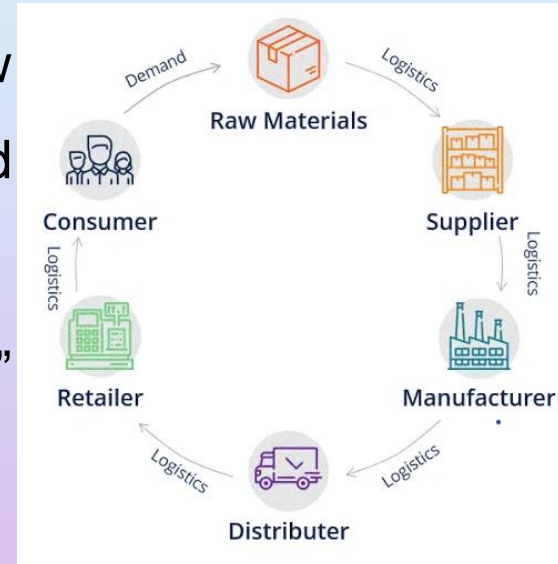
UNIT-1

INTRODUCTION

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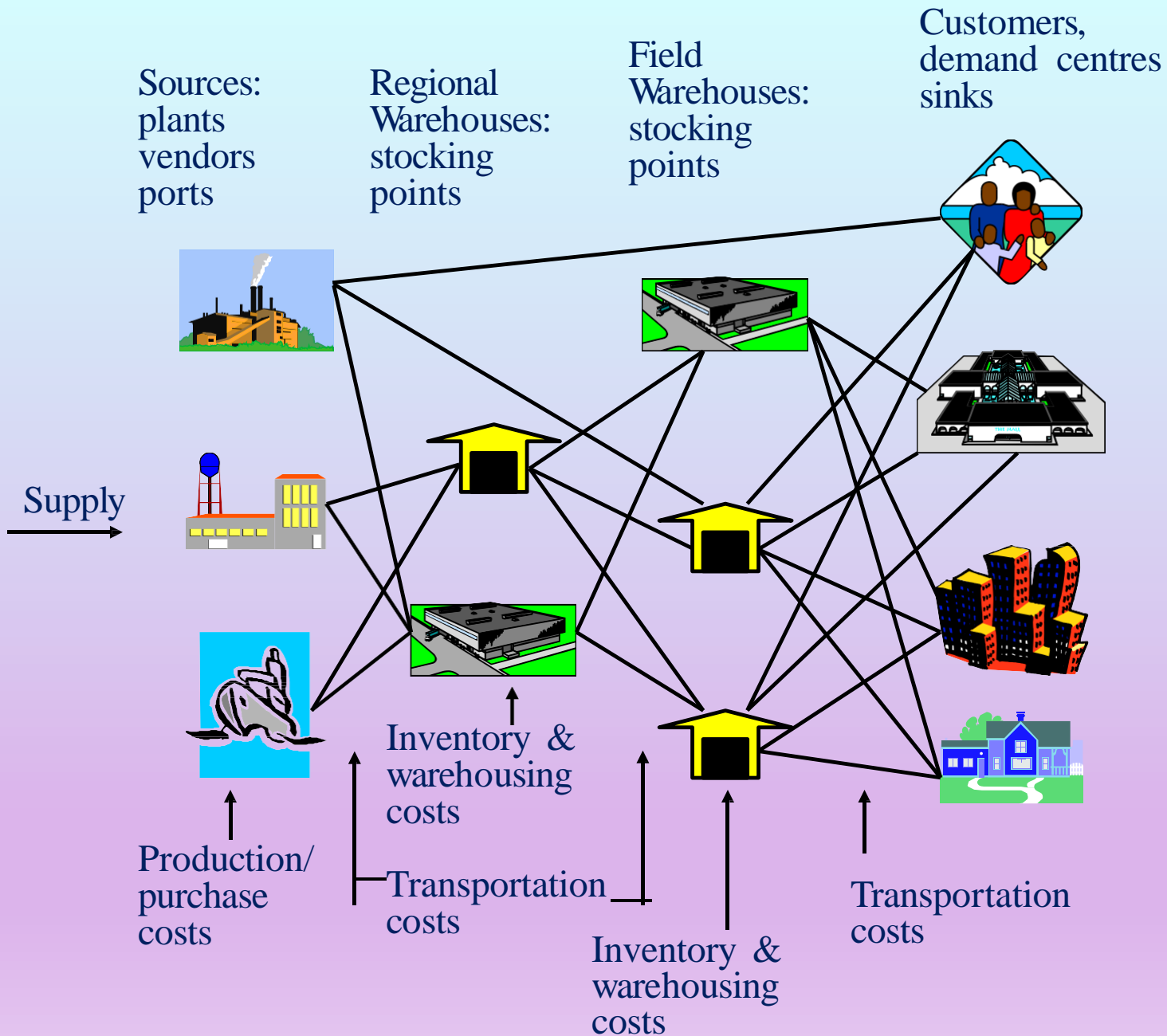
- A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer requirement.
- All facilities, functions, activities, associated with flow and transformation of goods and services from raw materials to customer, as well as the associated information flows.
- An integrated group of processes to “source,” “make,” and “deliver” products.
- Supply chain management involves planning, design and control of flow of material, information and finance along the supply chain to deliver superior value to the end customer in an effective and efficient manner



DEFINITION:

Supply Chain Management is primarily concerned with the efficient integration of suppliers, factories, warehouses and stores so that merchandise is produced and distributed in the right quantities, to the right locations and at the right time, and so as to minimize total system cost subject to satisfying customer service requirements.

Supply chain management has been defined as the "design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally.



OBJECTIVES

The goal or mission of supply chain management can be defined using Mr. Goldratt's words as:

“Increase through output while simultaneously reducing both inventory and operating expense”

The objective of every supply chain should be to maximize the overall value generated. The value a supply chain generated is the difference between what the final product is worth to the customer and the costs the supply chain incurs in filling the customer's request.

1. Cost Efficiency: Supply chains aim to minimize costs associated with procurement, transportation, production, and inventory management. This often involves streamlining processes, optimizing transportation routes, and reducing waste.

2. Responsive to Demand: A successful supply chain can quickly adapt to changes in consumer demand, whether it's an increase or decrease. This requires real-time visibility into inventory levels and demand forecasting.

3. Quality Assurance: Maintaining product or service quality throughout the supply chain is crucial to meet customer expectations and prevent defects or recalls.

4. Lead Time Reduction: Reducing the time it takes for a product to move from the initial order to delivery can provide a competitive advantage by improving responsiveness to customer needs.

5. Flexibility and Adaptability: Supply chains should be adaptable to changes in market conditions, supplier availability, and unforeseen disruptions. This can involve having backup suppliers, diversified sourcing, and contingency plans.

6. Collaboration and Communication: Effective communication and collaboration among all stakeholders in the supply chain, including suppliers, manufacturers, distributors, and retailers, help ensure smooth operations and minimize delays.

7. Optimized Inventory Management: Balancing inventory levels to meet demand without excessive stockpiling helps reduce storage costs and the risk of obsolescence.

8. Sustainability: Increasingly, supply chains are also focusing on environmentally and socially responsible practices. This involves minimizing carbon footprints, reducing waste, and ensuring ethical sourcing.

9. Customer Satisfaction: Ultimately, a successful supply chain aims to meet customer needs and expectations by delivering the right product, in the right quantity, at the right time, and in the right condition.

10. Profitability: While achieving all these goals, the supply chain's overall impact should contribute to the company's profitability and financial success.

So in general, the objectives is to:

- Satisfy the customer needs.
- Maximize the overall value generated.
- Increase supply chain surplus.
- High supply chain profitability.

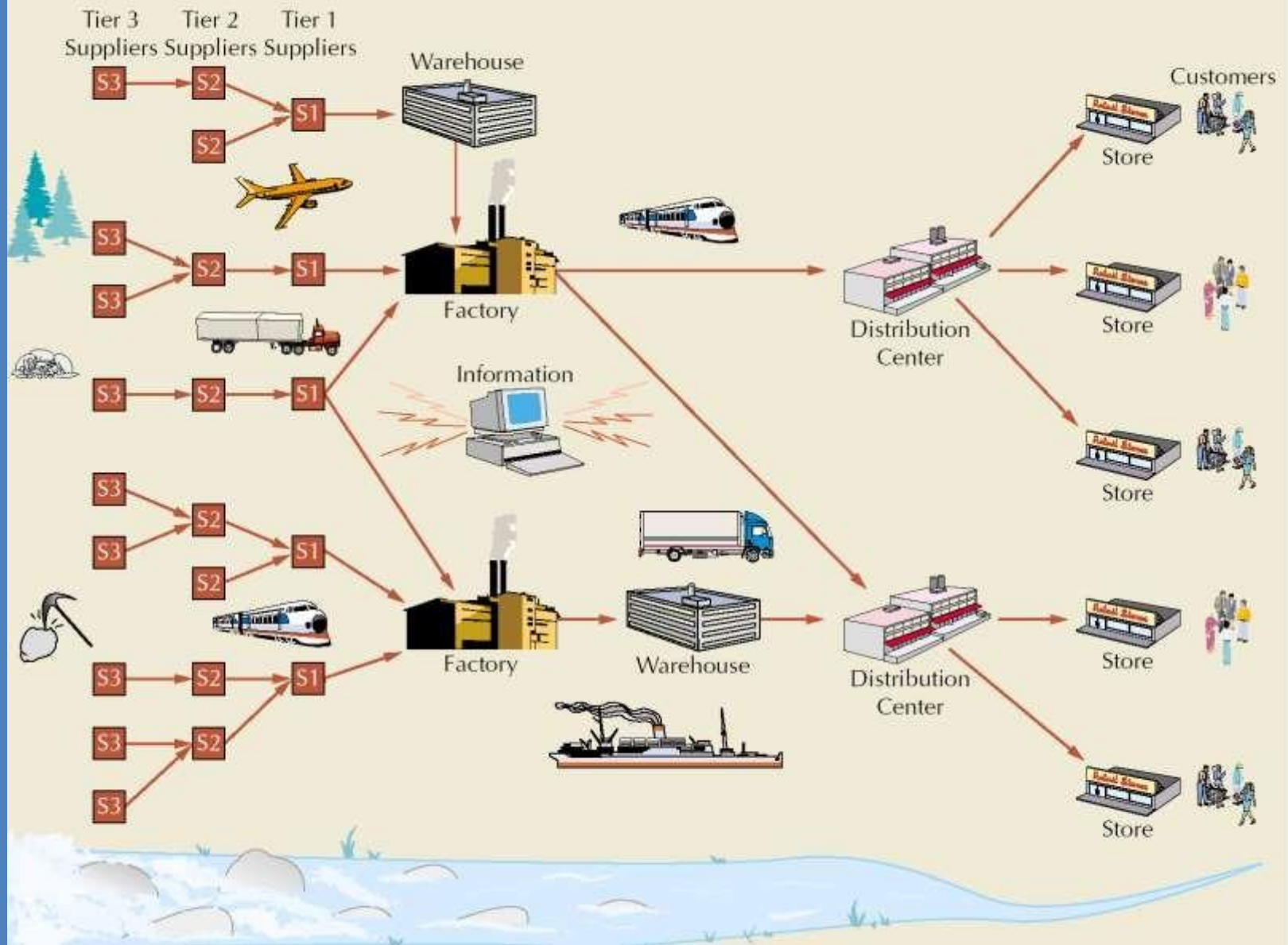
Supply chain profitability is the difference between the revenue generated from the customer and the overall cost across the supply chain. The higher the supply chain profitability, the more successful is the supply chain.

WHAT IS SUPPLY CHAIN MANAGEMENT (SCM)?



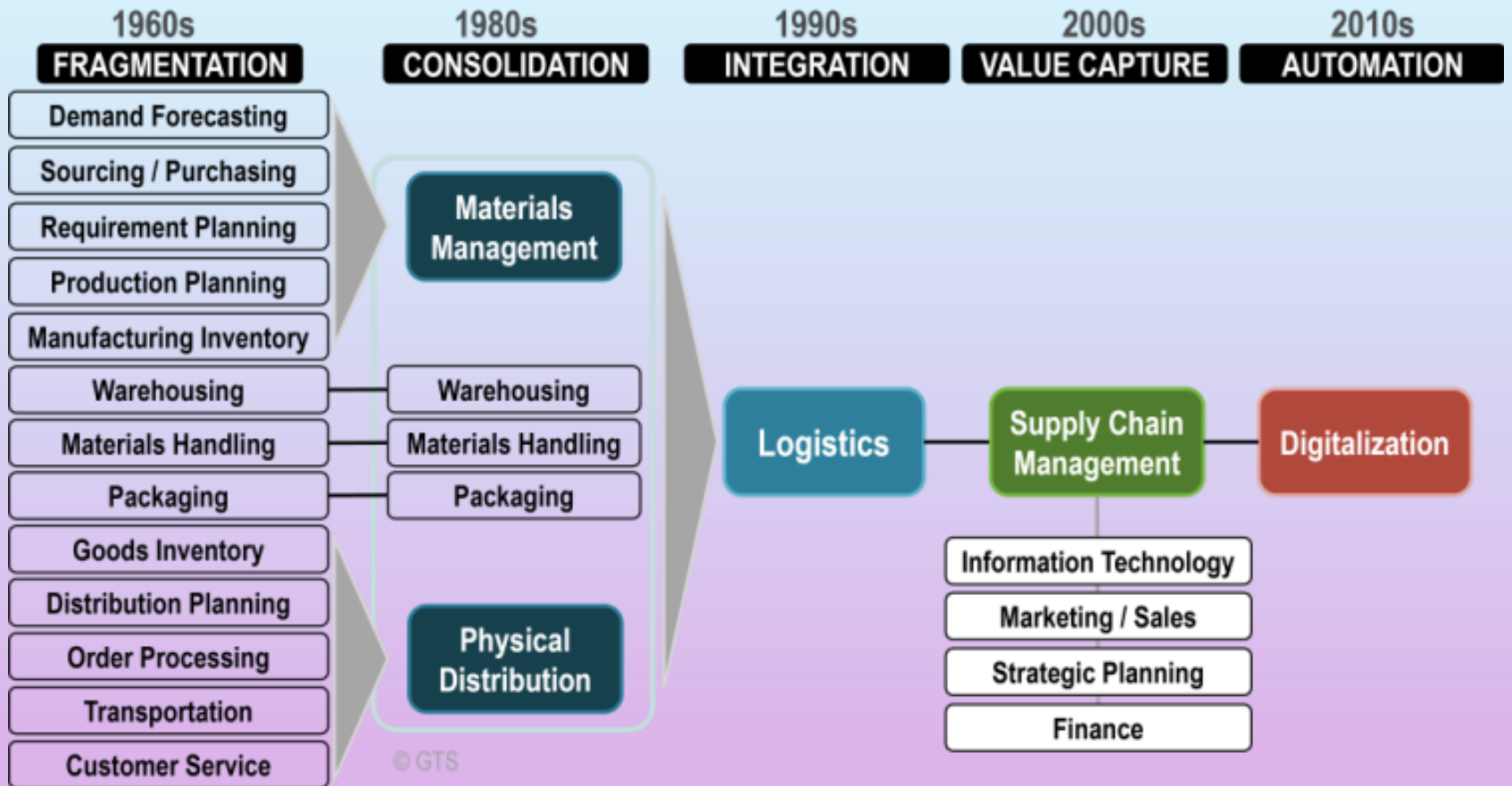
- A set of approaches used to efficiently integrate
 - Suppliers
 - Manufacturers
 - Warehouses
 - Distribution centers
- So that the product is produced and distributed
 - In the right quantities
 - To the right locations
 - And at the right time
- System-wide costs are minimized and
- Service level requirements are satisfied

SUPPLY CHAIN ILLUSTRATION



HISTORY OF SUPPLY CHAIN MANAGEMENT

- 1960's - Inventory Management Focus, Cost Control
- 1970's - MRP & OM - Operations Planning
- 1980's - MRPII, JIT - Materials Management, Logistics
- 1990's - SCM - ERP - “Integrated” Purchasing, Financials, Manufacturing, Order Entry
- 2000's - Optimized “Value Network” with Real-Time Decision Support; Synchronized & Collaborative Extended Network for SCM.



BENEFITS OF SCM



REASONS FOR GROWING IMPORTANCE OF SUPPLY CHAIN

Firms that do not manage their supply chain will incur huge inventory costs and eventually end up losing a lot of customers because the right products are not available at the right place and time.

Five major trends that have emerged to make supply chain management a critical success factor in most industries.

- **Proliferation in product lines** – Companies have realized that more and more product variety is needed to satisfy the growing range of customer tastes and requirements. Companies like HUL, in their personal care products, manage, on an average, 1200 SKU's. Chains like Foodworld manage about 6000 SKU's. With increasing product variety, it becomes rather difficult to forecast accurately. Hence, retailers and other organizations involved in the business are forced to either maintain greater amount of inventories or lose customers.

- **Shorter product life cycles** – With increased competition, product life cycles across all industries are becoming shorter. So a firm like Dell, which has, on an average, just 7 days of inventory, as compared to the industry average of 35 days, does not have to worry about product and component obsolescence. Its competitors with higher inventories end up writing off huge amounts of stocks every year as obsolete.
- **Higher level of outsourcing** – Firms increasingly focus on their core activities and outsource non-core activities to other competent players. This trend towards outsourcing is irreversible but a higher level of outsourcing makes supply chains more vulnerable, thereby forcing firms to develop different types of supply chain capabilities within the organization.

- **Shift in power structure in the chain** – In every industry, the entities closer to customers are becoming more powerful. With increasing competition, a steadily rising number of products are chasing the same retail shelf space. Retail shelf space has not increased at the pace at which product variety has increased. So there have been cases of retailers asking for slotting allowance when manufacturers introduce new products in the market place. Retailers have realized that they are powerful entities in the chain and hence expect the manufacturers to be more responsive to their demands and needs.
- **Globalization of manufacturing** – Over the past decade, tariff levels have come down significantly. Many companies are restructuring their production facilities to be at par with global standards. Unlike in the past, when firms used to source components, produce goods and sell them locally, now firms are integrating their supply chain for the entire world market. This has made managing supply chains extremely complicated.

PARTICIPANTS IN THE SUPPLY CHAIN



- It is not compulsory that all the stages should be present in a supply chain

SUPPLY CHAIN DECISIONS

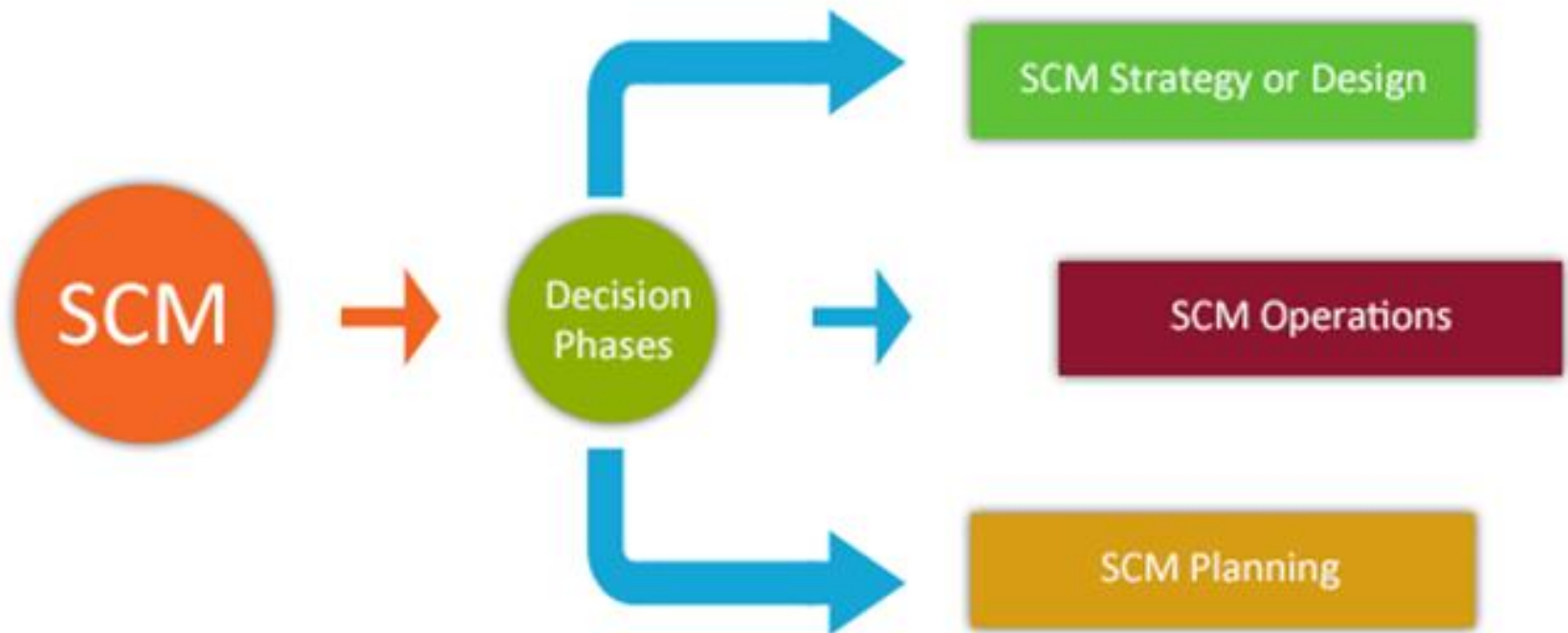
Design > Planning > Execution > Control > Monitoring

- Ensure effective flow of goods and information.
- Clusters of store near the distribution center.
- Collaboration with suppliers.
- Active efforts to steer customer at real time.
- Centralized manufacturing.
- Worth of inventory.
- Manage cash flow.
- Should be flexible.



DECISION PHASES IN SUPPLY CHAIN





1. Supply chain Strategy or Design

- How to structure for next several years?
- What is the chain configuration?
- How resources allocated?
- What process each stage will perform?
- Whether to go with out sourcing?
- What all are the in-house functions?
- Locations and capacities of production and ware houses
- Mode of transportation
- Type of information system



2. Supply chain Planning

- for several months.

- Forecast for the coming year
- Analyses demand in different markets
- Which market? Location?
- Sub contracting.
- Inventory policies.
- Timing.
- Size of marketing.
- Price promotions.





3. Supply chain Operations

- Weekly or daily operation decisions
- Individual customer orders
- Allocation of inventory and production
 - Set dates for activities
 - Generate lists for warehouses
 - Allocation of shipments
 - Schedules of trucks.

IMPORTANCE OF SUPPLY CHAIN DECISIONS

- **Helps in achieving success** – Companies being a leader at using supply chain design, planning and operation help in achieving success.
- **Effective flow of goods and information** – Companies like Walmart who have invested heavily in transportation and information infrastructure help in achieving effective flow of goods and information.
- **Reduces the level of Inventory with the manufacturer** – Dell centralizes manufacturing and inventories in a few locations and postpones final assembly until orders arrive. Thus, Dell is able to provide a large variety of PC configurations while keeping very low levels of inventory.
- **Improved match between supply and demand** – To improve the match between supply and demand, Dell makes an active effort to steer customers in real time, on the phone or via the internet, toward PC configurations that can be built given the components available.
- **Reason for company's success** – For the Companies like Dell, Toyota etc., the supply chain design, and its management of product, information and cash flows play a key role in the company's success.

PROCESS VIEWS OF SUPPLY CHAIN

1. CYCLE VIEW

Process divided in to series of cycles. Each cycle occurs at the interface between two successive stages of the supply chain.

- Customer order cycle
- Replenishment cycle
- Manufacturing cycle
- Procurement cycle

Cycle View of Supply Chain Processes

Customer Order Process

1. Customer Arrival
2. Customer Order Entry
3. Customer Order Fullfillment
4. Customer Order Receiving

Manufacturing Process

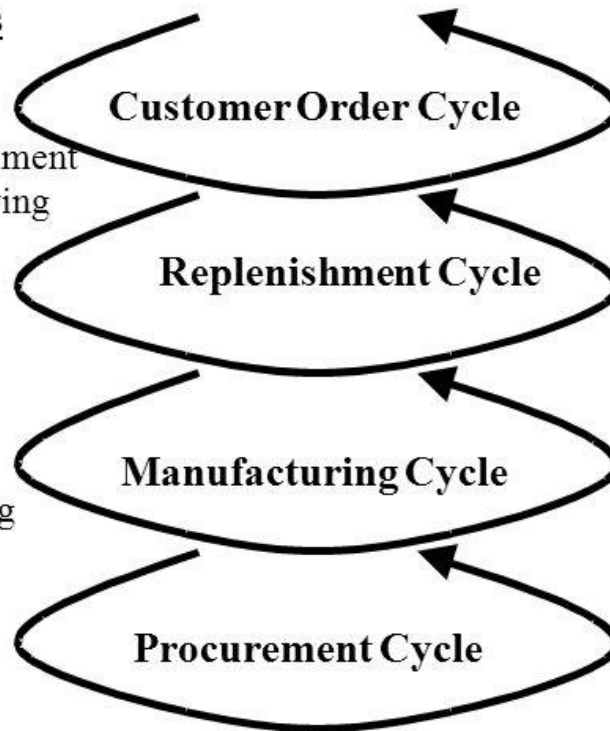
1. Order Arrival
2. Production Scheduling
3. Manufacturing/Shipping
4. Receiving

Replenishment Process

1. Retail Order Trigger
2. Retail Order Entry
3. Retail Order Fullfillment
4. Retail Order Receiving

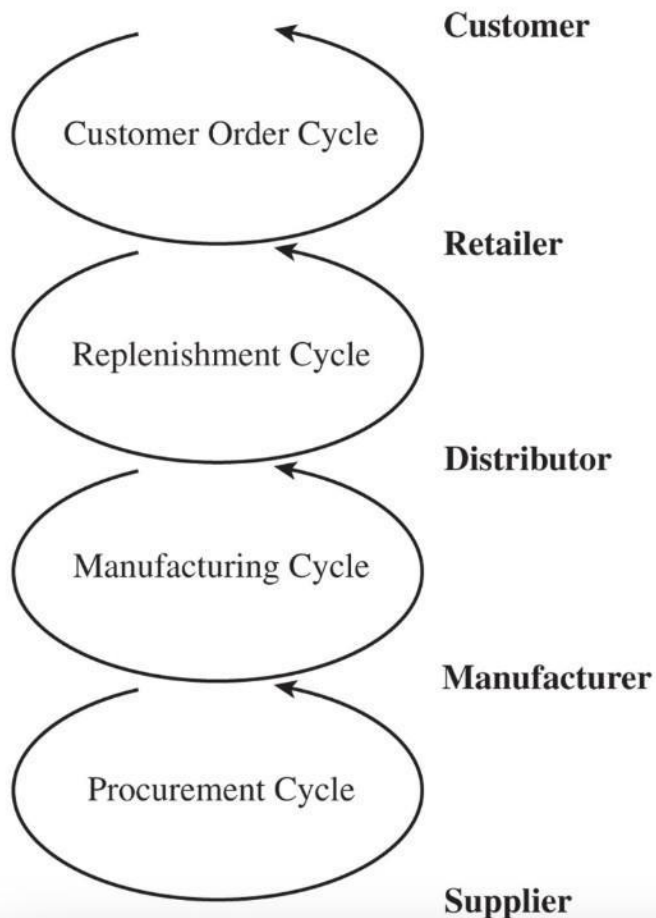
Procurement Process

1. Component Order Arrival
2. Production Scheduling
3. Manufacturing/Shipping
4. Receiving

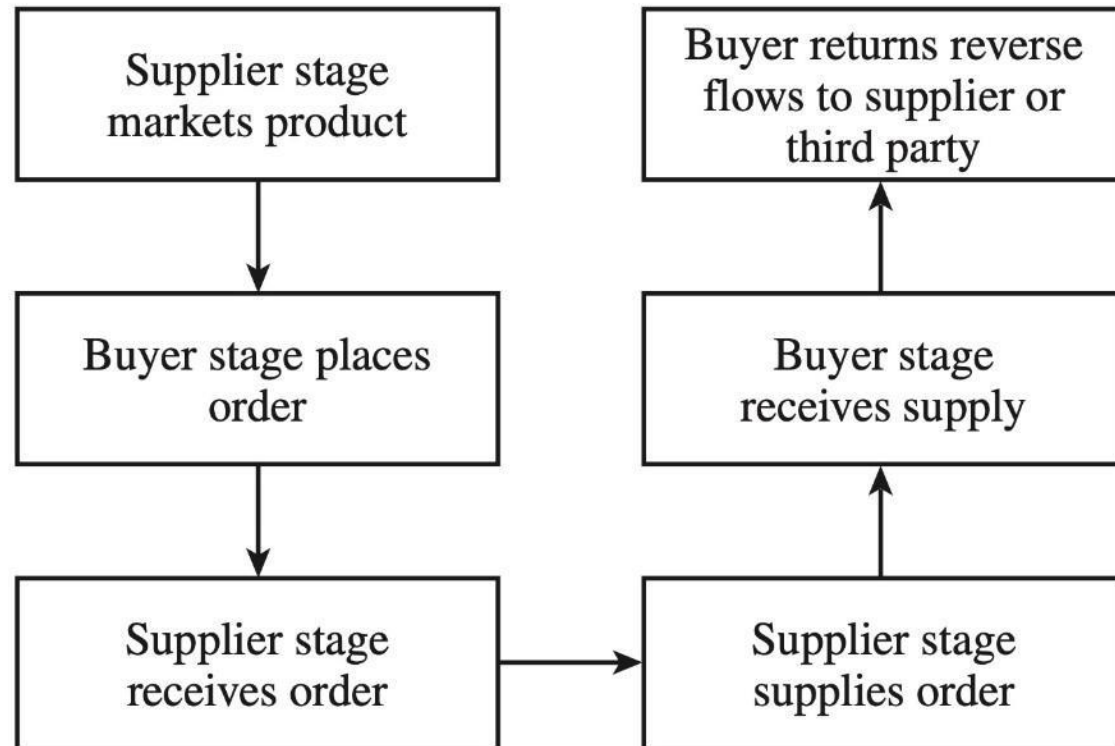


Cycle View of Supply Chain Processes

Supply Chain Process Cycles



Subprocesses in Each Cycle



- A cycle view of supply chain clearly define the process involved and the owners of each process.
- This view is very useful when considering operational decisions because it specifies the roles and responsibilities of each member of supply chain and the desired outcome of each process.

2. PUSH PULL VIEW OF SUPPLY CHAIN

Divided in to two categories..

1. Executed in response to a customer order(pull process)
2. Executed in anticipation of customer orders(push process)

Pull

Push

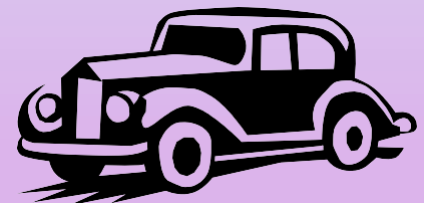


A PUSH VS PULL VIEW OF THE SC OPERATIONS

Generally, a “pull” organization of the supply chain provides tighter control of inventory costs and the ability to support higher levels of product customization.

SUPPLY CHAIN INTEGRATION – PUSH STRATEGIES

- Classical manufacturing supply chain strategy
- Manufacturing forecasts are long-range
 - Orders from retailers' warehouses
- Longer response time to react to marketplace changes
 - Unable to meet changing demand patterns
 - Supply chain inventory becomes obsolete as demand for certain products disappears
- Increased variability (Bullwhip effect) leading to:
 - Large inventory safety stocks
 - Larger and more variably sized production batches
 - Unacceptable service levels
 - Inventory obsolescence
- Inefficient use of production facilities (factories)
 - How is demand determined? Peak? Average?
 - How is transportation capacity determined?
- Examples: Auto industry, large appliances, others?



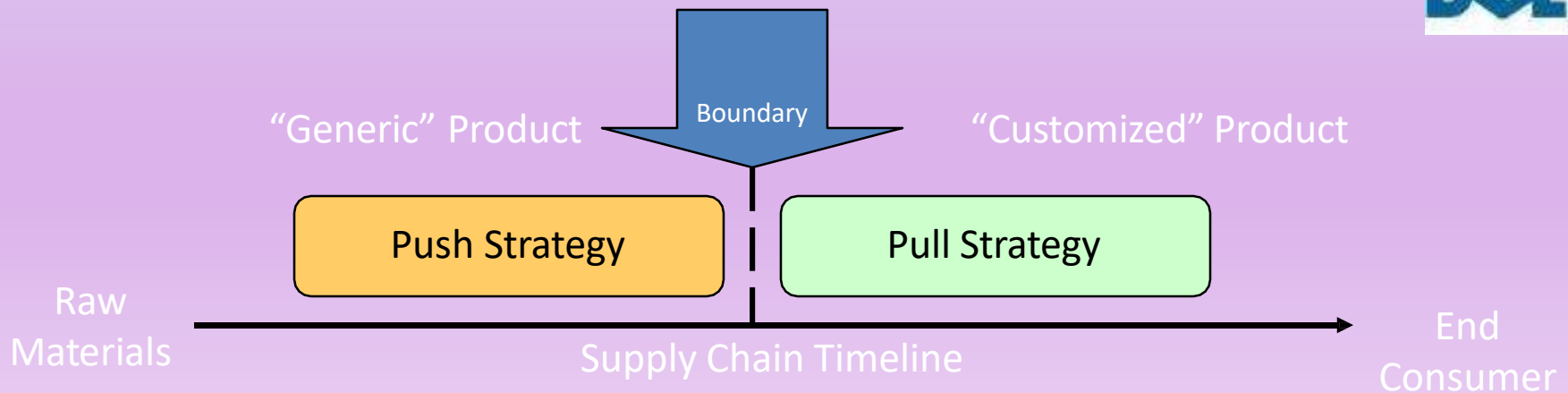
SUPPLY CHAIN INTEGRATION – PULL STRATEGIES

- Production and distribution are demand-driven
 - Coordinated with true customer demand
- None or little inventory held
 - Only in response to specific orders
- Fast information flow mechanisms
 - POS data
- Decreased lead times
- Decreased retailer inventory
- Decreased variability in the supply chain and especially at manufacturers
- Decreased manufacturer inventory
- More efficient use of resources
- More difficult to take advantage of scale opportunities
- Examples: Dell, Amazon

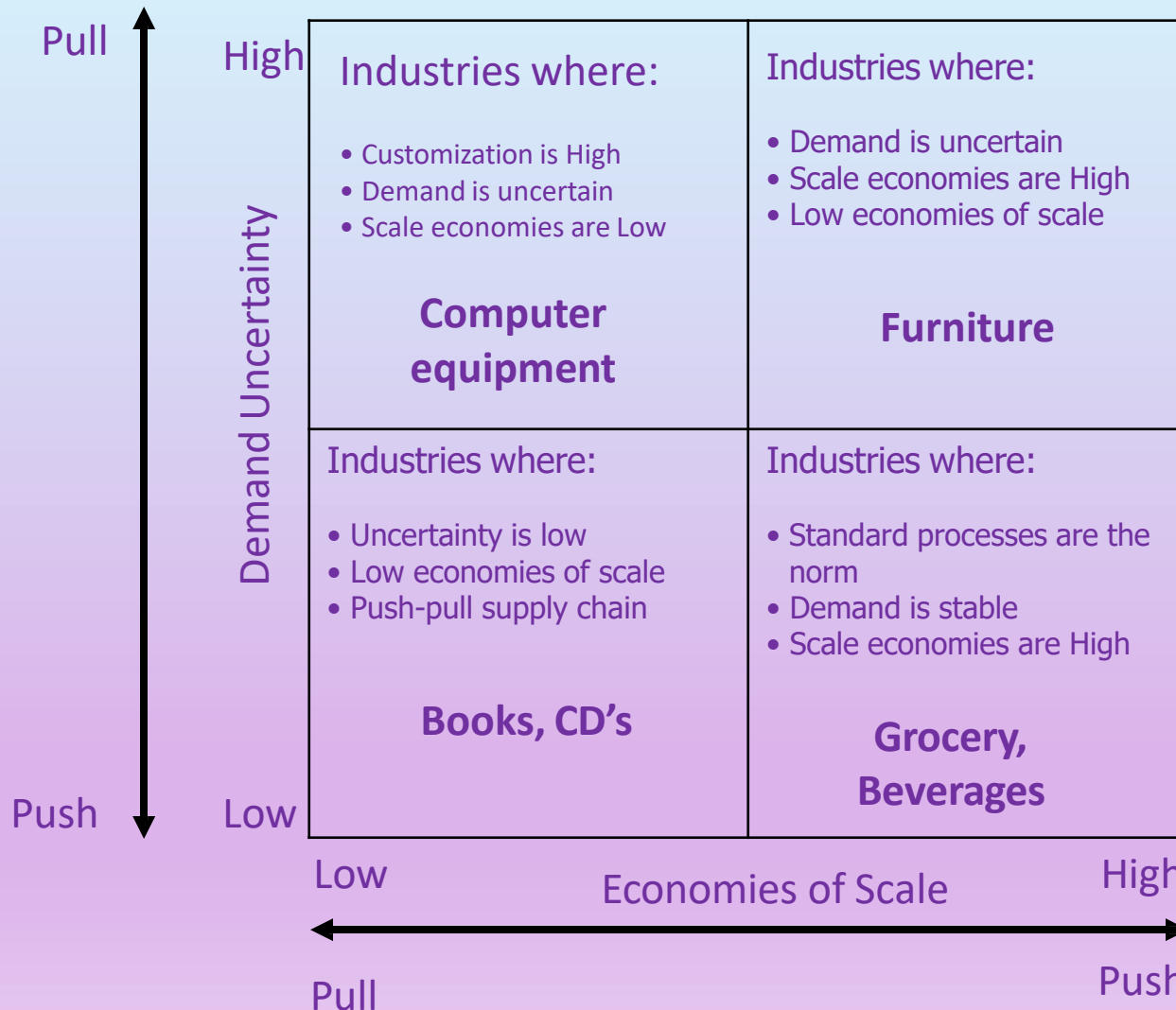


SUPPLY CHAIN INTEGRATION – PUSH/PULL STRATEGIES

- Hybrid of “push” and “pull” strategies to overcome disadvantages of each
- Early stages of product assembly are done in a “push” manner
 - Partial assembly of product based on aggregate demand forecasts (which are more accurate than individual product demand forecasts)
 - Uncertainty is reduced so safety stock inventory is lower
- Final product assembly is done based on customer demand for specific product configurations
- Supply chain timeline determines “push-pull boundary”



CHOOSING BETWEEN PUSH/PULL STRATEGIES



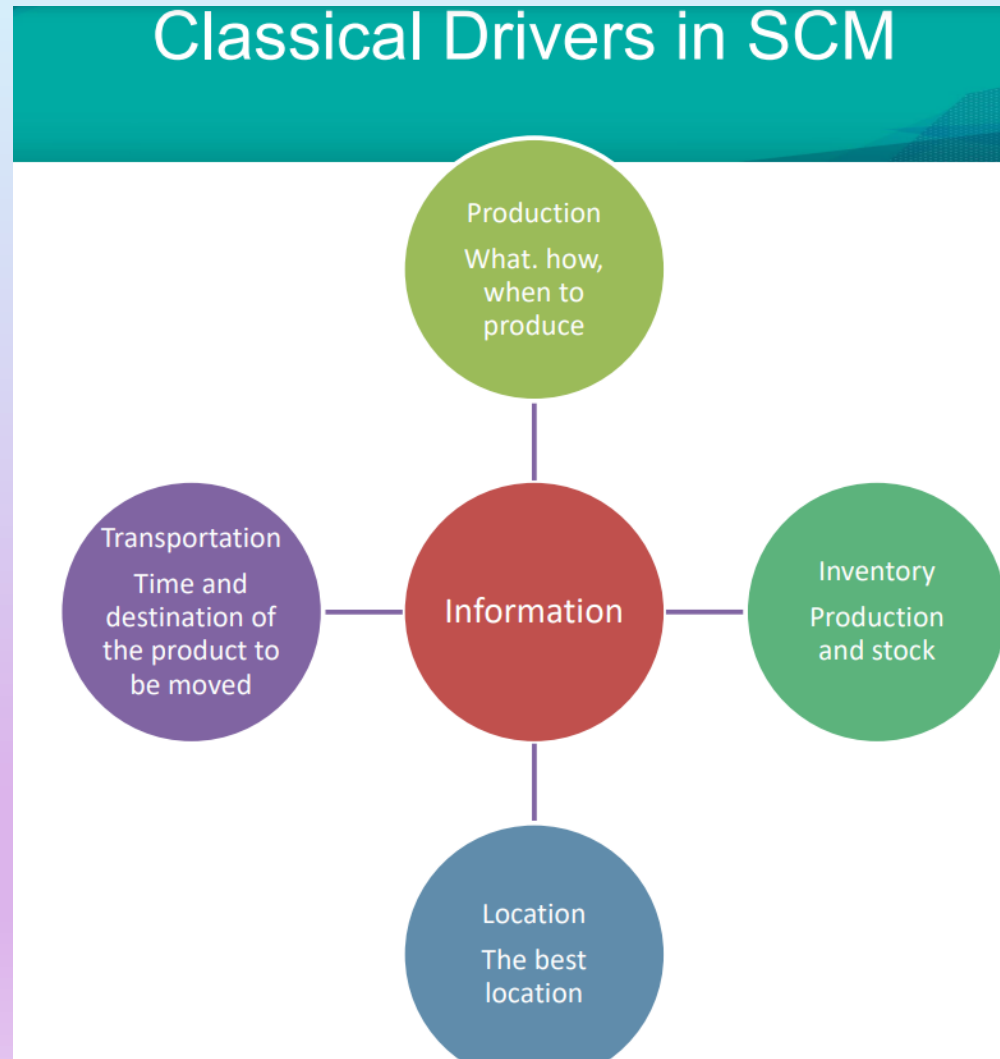
Where do the following industries fit in this model:

- **Automobile?**
- **Aircraft?**
- **Fashion?**
- **Petroleum refining?**
- **Pharmaceuticals?**
- **Biotechnology?**
- **Medical Devices?**

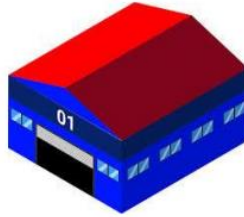
CHARACTERISTICS OF PUSH, PULL AND PUSH/PULL STRATEGIES

	PUSH	PULL
Objective	Minimize Cost	Maximize Service Level
Complexity	High	Low
Focus	Resource Allocation	Responsiveness
Lead Time	Long	Short
Processes	Supply Chain Planning	Order Fulfillment

DRIVERS OF SUPPLY CHAIN PERFORMANCE



Extended drivers in SCM



Facilities



Inventory



Transportation



Information



Sourcing

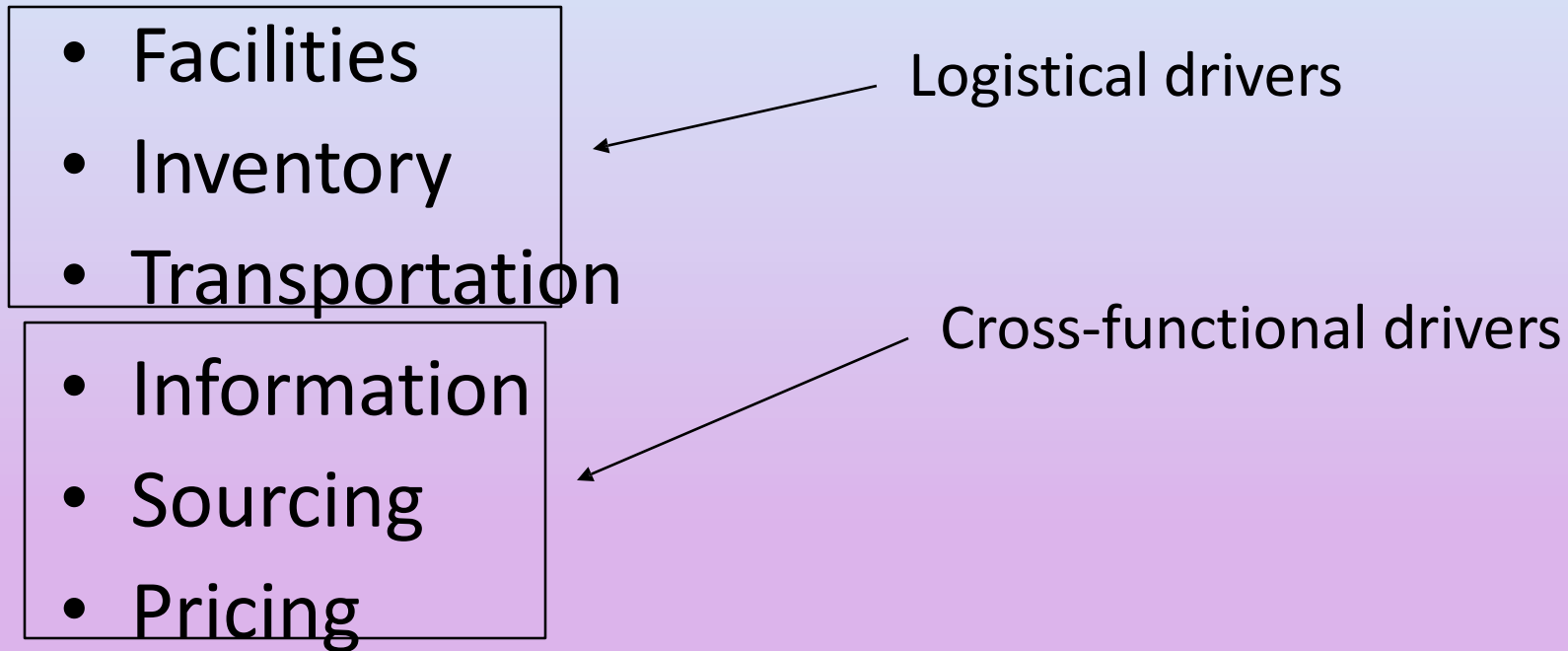


Pricing

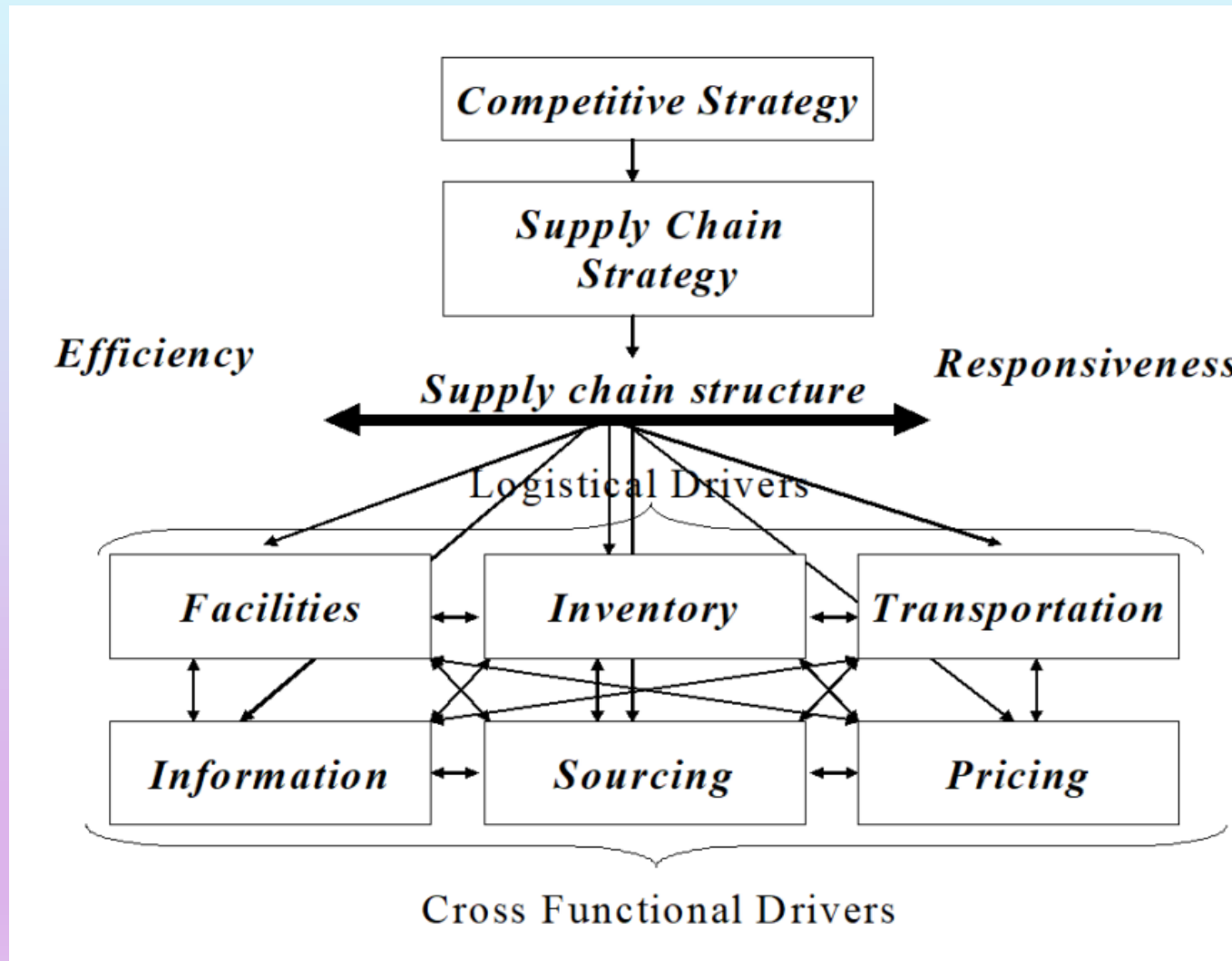
Aim.. responsiveness and efficiency at lowest possible cost.

Drivers are set to improve the supply chain performance.

A framework for structuring drivers



A framework for structuring drivers



DRIVERS OF SUPPLY CHAIN PERFORMANCE

- Facilities
 - places where inventory is stored, assembled, or fabricated
 - production sites and storage sites (distribution facilities/centres (DC))
 - Location, capacity, flexibility
 - Responsive – several DC close to customer v.s. Efficiency- central few DCs
- Inventory
 - raw materials, WIP, finished goods within a supply chain
 - inventory policies
 - Responsiveness – Large inventories, Efficiency – low inventories
- Transportation
 - moving inventory from point to point in a supply chain
 - combinations of transportation modes and routes
 - Transportation choices make big impact on responsiveness

- Information
 - data and analysis and sharing regarding inventory, transportation, facilities, costs, prices, supplier performance, demand forecast throughout the supply chain
 - potentially **the biggest driver of supply chain performance**, affects all other drivers directly.
- Sourcing
 - Sourcing functions that are outsourced, like production, storage, management of information etc.
 - Motorola suffered from responsiveness after outsourcing production to contract manufacturers in china because of long distances, started flying in some of its cellular phones.

- Pricing
 - Price associated with goods and services provided by a firm to the supply chain
 - Affects the behavior of the buyer.
 - Transportation company charging based on lead time provided by customer. Efficiency customers will order early. If the price is not dependent on lead time early orders are very unlikely.

STRUCTURING DRIVERS; WAL-MART EXAMPLE

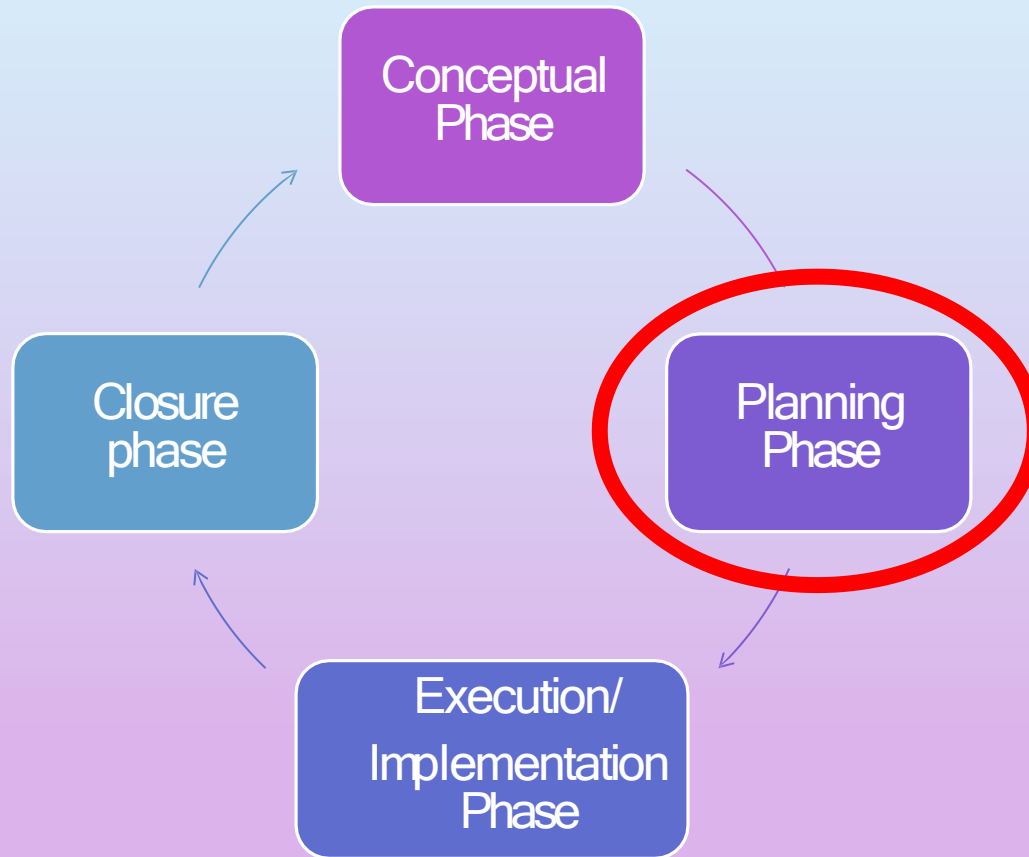
- Competitive strategy; every-day-low-price, reliable product availability, wide-variety.
- Supply chain must be efficient with adequate level of responsiveness
- Inventory – low levels of inventories, cross-docking (no storage at DCs) (efficiency)
- Transportation – owns its fleet of trucks (responsiveness)
- Facilities – Centrally located DCs. Won't open stores until demand justifies several of them and a DC to support them.
- Information – High investment on information technology, sharing sales data directly and timely with its suppliers
- Sourcing – finding efficient suppliers, feeding them with large orders
- Pricing – Every day low price (no sales season), assuring steady demand

Considerations for Supply Chain Drivers

<i>Driver</i>	<i>Efficiency</i>	<i>Responsiveness</i>
1. Inventory	Cost of holding	Availability
2. Transportation	Consolidation	Speed
3. Facilities	Consolidation / Dedicated	Proximity / Flexibility
4. Information	Low cost/slow/no duplication	High cost/ streamlined/reliable
5. Sourcing	Low cost sources	Responsive sources
6. Pricing	Constant price	Low-high price

WHAT IS PROJECT PLANNING?

PROJECT LIFE CYCLE





5 Phases of Project Management

5 Basic Phases of Project Management

Initiation

- Define project goals
- Create a business case
- Complete the project charter
- Draw up the list of stakeholders

Planning

- Define scope
- Create a project plan
- Set a budget baseline
- Define roles and responsibilities

Execution

- Allocate project resources
- Manage project resources
- Build the product or process
- Meet often and fix issues as they rise

Monitoring and Control

- Track effort and cost
- Monitor project progress
- Ensure adherence to plan
- Prevent any chance for disruptions

Completion

- Handover deliverables
- Review project deliverables
- Get project results approved
- Document project learnings

“Project planning is a form of operational planning, whereby the **consecutive steps** to implement the project activities are carefully mapped out, **based on an analysis of relevant information** and linked to the program in which the project takes place and to which it should contribute. Essentially, project planning involves establishing the **scope, aims** and **objectives** of a project, the way in which the project will be performed, the roles and responsibilities of those involved, and the time and cost estimates.” (*Project Management in Public Health in Europe, EU Health, 2011*)

- Planning normally answer the question like what, how, who and when.
- Planning is simply how to seek the balance between project constraints to achieve the set goal.



Inputs in Project Planning



- Project Charter
- Concept proposal

Processes of Project Planning

- Assessment
- Prioritization
- Design of plan using various tools and techniques

Output of Project planning

- Project Plan
(Project requirements, Project Plan of Action and Project Management Plan-Implementation plan, Monitoring and Evaluation plan)

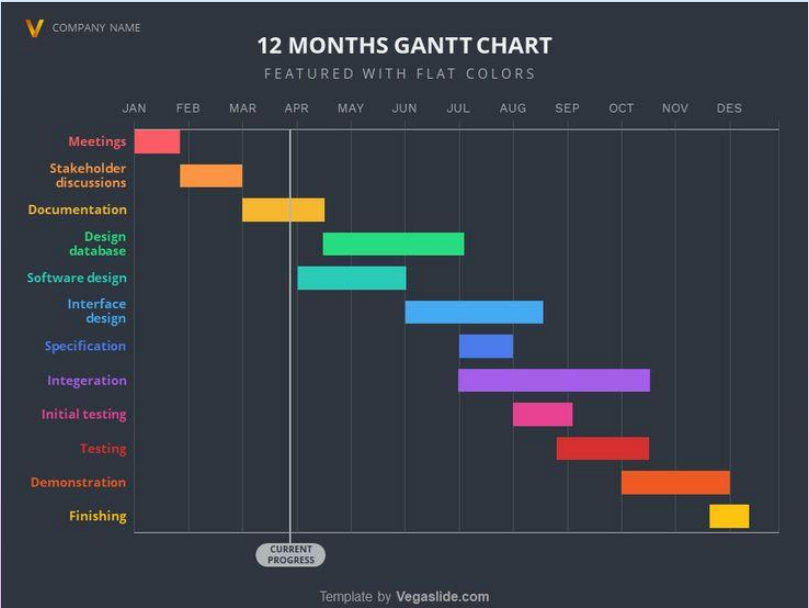
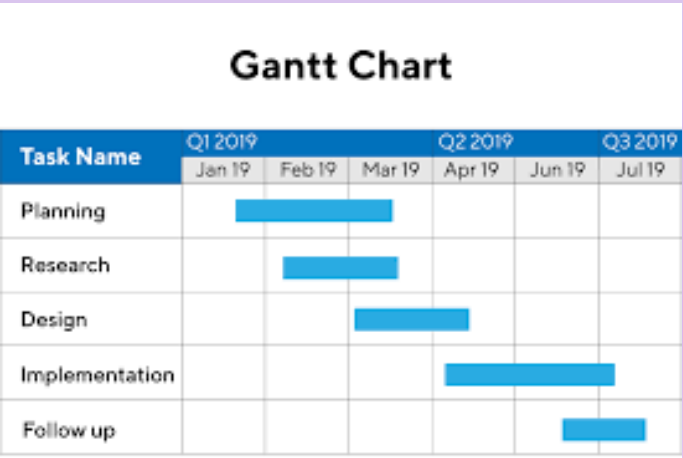
COMMONLY USED TOOLS FOR PROJECT PLANNING

- Gantt Chart
- Problem tree analysis
- SWOT Analysis
- LFA (Logical Framework Analysis)
- PRECEDE/PROCEED
- Intervention Mapping (esp. for health promotion projects)
- Project Managing Softwares

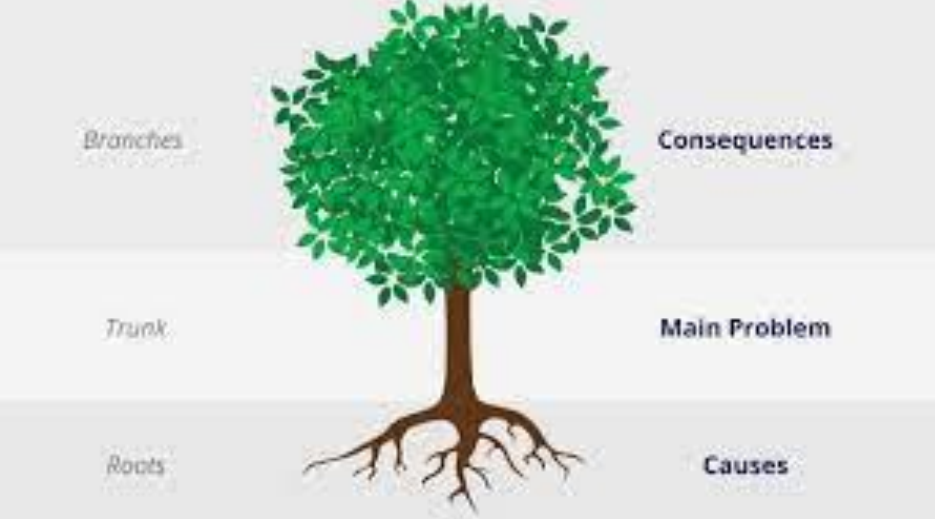
What Is a Gantt Chart?

A Gantt chart is a timeline of a project. It illustrates work completed over a period of time in relation to the time planned for the work. The top of the chart shows the time frame and the left side of the chart lists the project activities.

A Gantt chart shows:
What tasks need to be done to complete the project
When these tasks need to be done



Generalized Activity Normalization Time Table (GANTT)



What is Problem Tree Analysis?

A Problem Tree Analysis is a pictorial representation of a problem, its causes, and its consequences. This analysis tool helps the project team get a quick glance at how a range of complex issues contribute toward a problem and how this problem branches out into a set of consequences. Both causes and consequences are fitted into the diagram on a hierarchical preference basis.



What Is SWOT Analysis?

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a company's competitive position and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.



Strengths

1. What is our competitive advantage?
2. What resources do we have?
3. What products are performing well?

Opportunities

1. What new technology can we use?
2. Can we expand our operations?
3. What new segments can we test?

Weaknesses

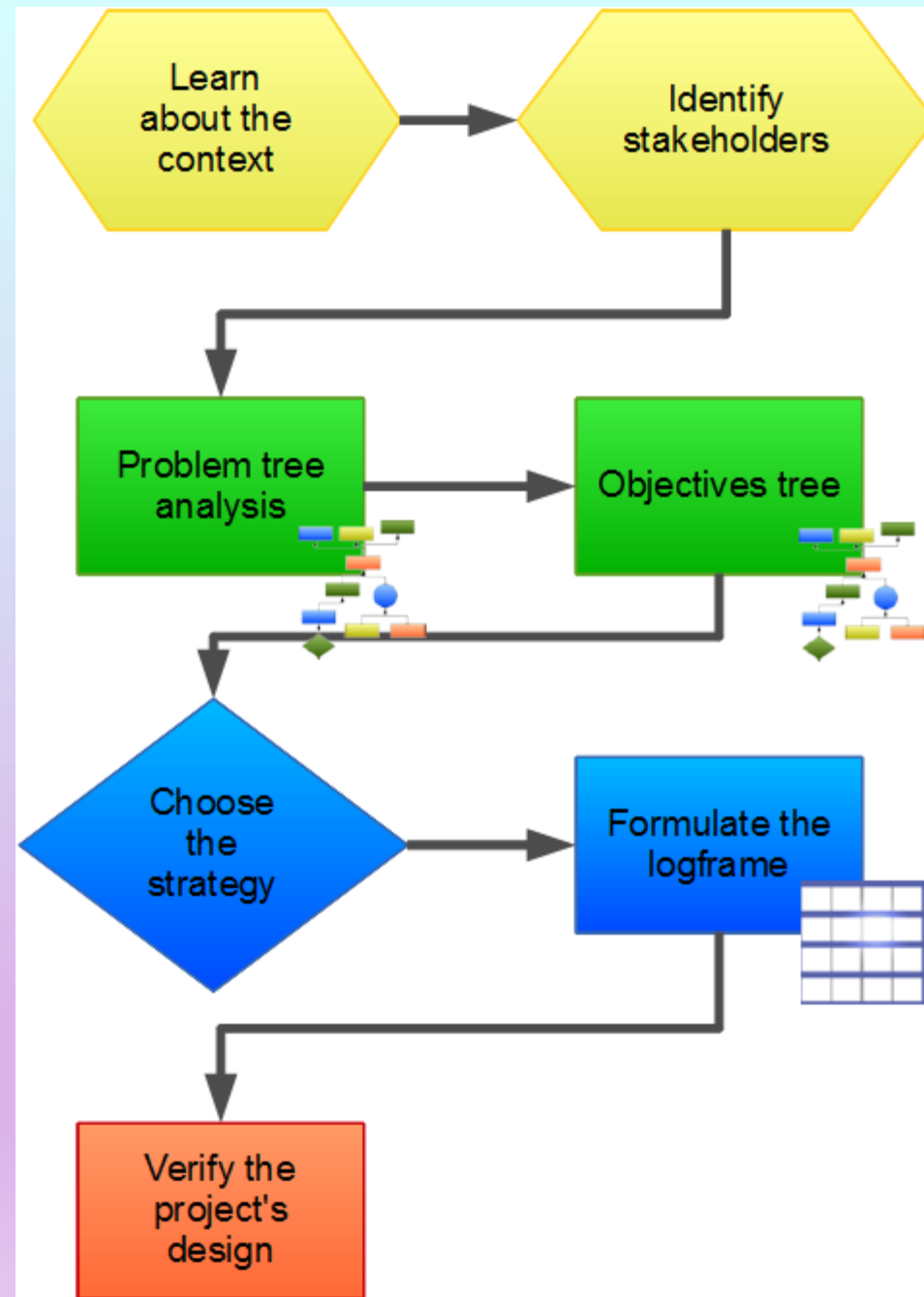
1. Where can we improve?
2. What products are underperforming?
3. Where are we lacking resources?

Threats

1. What regulations are changing?
2. What are competitors doing?
3. How are consumer trends changing?

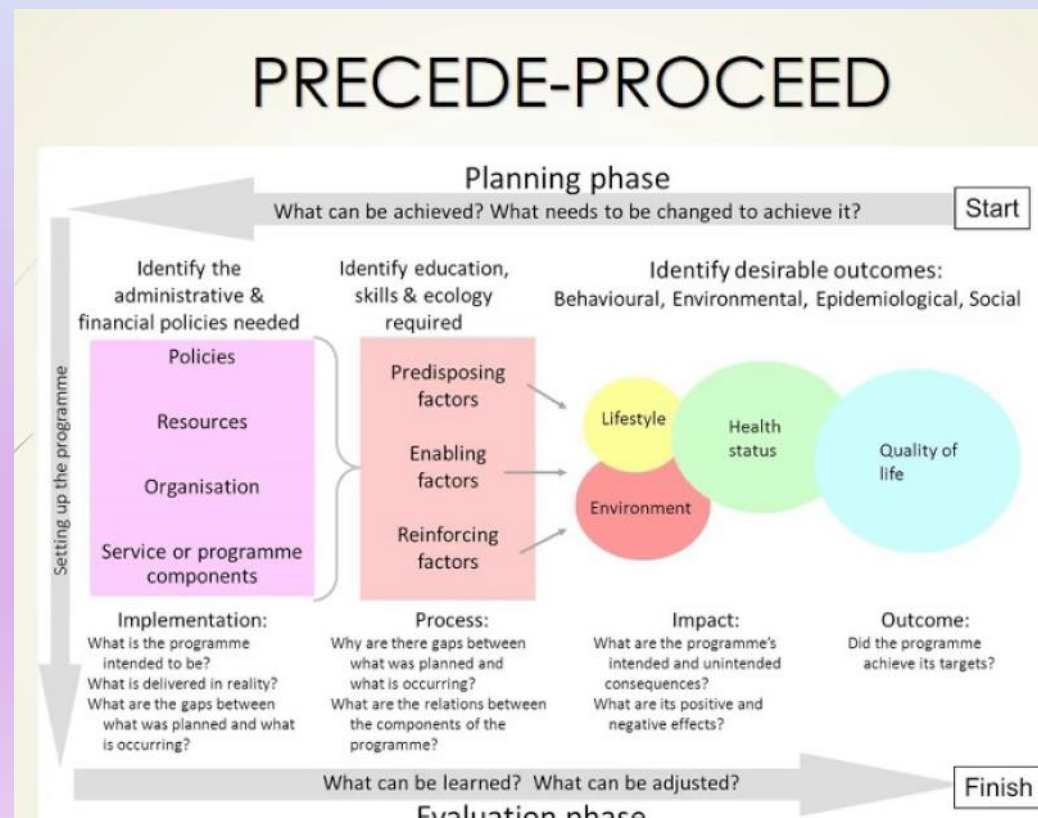
What Is Logical Framework Approach ?

The **Logical Framework Approach** or **LFA** is a systematic and analytical process for objectives-oriented project planning and management. LFA is also known under other names, such as Objectives Oriented Planning or Goals Oriented Planning. It makes use of the basic logframe matrix to design, plan and manage projects.



What is PRECEDE-PROCEED MODEL?

The PRECEDE-PROCEED model provides a comprehensive structure for assessing health and quality-of-life needs and for designing, implementing, and evaluating health promotion and other public health programs to meet those needs. PRECEDE (*P*redisposing, *R*einforcing, and *E*nabling Constructs in *E*ducational *D*iagnosis and *E*valuation) outlines a diagnostic planning process to assist in the development of targeted and focused public health programs. PROCEED (*P*olicy, *R*egulatory, and *O*rganizational Constructs in *E*ducational and *E*nvironmental *D*evelopment) guides the implementation and evaluation of the programs designed using PRECEDE.



WHY IS PROJECT PLANNING IMPORTANT?

Project planning is important at every phase of a project. It lays out the basics of a project, including the following:

- scope
- objectives
- goals
- schedule

It enables project managers to turn an intangible idea into reality. Key purposes of planning include the following:

- Facilitate communication and provide a central source of information for project personnel;
- Help the project sponsor and other key stakeholders know what is required;
- Identify who will perform certain tasks, and when and how those tasks will happen;
- Facilitate project management and control as the project progresses;
- Enable effective monitoring and control of a project;
- Manage project risk; and
- Generate feedback useful for the next project planning phase.

WHAT ARE THE COMPONENTS OF A PROJECT PLAN?

The three major parts of a project plan are the scope, budget and timeline. They involve the following aspects:

- Scope.** The scope determines what a project team will and will not do. It takes the team's vision, what stakeholders want and the customer's requirements and then determines what's possible. As part of defining the project scope, the project manager must set performance goals.
- Budget.** Project managers look at what manpower and other resources will be required to meet the project goals to estimate the project's cost.
- Timeline.** This reveals the length of time expected to complete each phase of the project and includes a schedule of milestones that will be met.

HOW DO YOU CREATE A PROJECT PLAN?



PROJECT PLANNING TOOLS AND SOFTWARE

- **Asana** offers different project views to suit a team's preferences.
- **ClickUp** comes with several Agile-based features, including a custom automation builder that lets users create reusable task templates.
- **Freedcamp** lets users organize their projects using a Gantt chart or Kanban
- **Hive** has a template creation tool in the task management feature that speeds up task creation.
- **Scoro** is a combination of tools and includes customer relationship management
- **Trello** provides Kanban features, budget management, resource management and progress tracking features.
- **Wrike** integrates with tools like Jira, Slack and Dropbox



VALUE ANALYSIS



$$\text{Value} = \frac{\text{Worth to you}}{\text{Price you pay}}$$

The concept of value analysis was developed during World War II by Lawrence D. Miles of General Electric Company.

DEFINITION

A process of systematic review that is applied to existing product designs in order to compare the function of the product required by a customer to meet their requirements at the lowest cost consistent with the specified performance and reliability needed.

Value Analysis is an effective tool for cost reduction and the results accomplished are far greater.

- It improves the effectiveness of work.
- It is an organised approach to a problem.
- It is value applied at the design stage itself.
- It reduces unnecessary costs, obvious and hidden which can be eliminated without adversely affecting quality, efficiency, safety and other customer features.

APPLICATION OF VALUE ANALYSIS

- ✓ Capital goods – plant, equipment, machinery, tools, etc.
- ✓ Raw and semi-processed material, including fuel.
- ✓ Materials handling and transportation costs.
- ✓ Purchased parts, components, sub-assemblies, etc.
- ✓ Maintenance, repairs, and operational items.
- ✓ Finishing items such as paints, oils, varnishes, etc.
- ✓ Packing materials and packaging.
- ✓ Printing and Stationery items.
- ✓ Miscellaneous items of regular consumptions.
- ✓ Power, water supply, air, steam & other utilities

OBJECTIVES OF VALUE ANALYSIS

- 1) To provide better value to a product/service.
- 2) To improve the company's competitive position.
- 3) To ensure that every element of Cost (Labor, Materials, Suppliers and Service) contribute equally to the function of the product.
- 4) To Eliminate unnecessary Cost.

In reality, a complex number of reasons exists that necessitate the structured approach of value analysis as a means of logical cost reduction.

STEPS CARRYING VALUE ANALYSIS

- Establish the objectives (eg, cost reduction).
- Consider a team for marketing, sales, production, purchasing, etc.
- Analyse the production process of the supplier company.
- Decompose various characteristics of purchased product.
- Hold a creative brainstorming session to explore all alternative possibilities.
- Sort the ideas to establish the cost of each.
- Select the best alternative.
- Develop a plan for implementing the change.

SIX “ WHATS OF VALUE ANALYSIS “

- 1) What is it ?
- 2) What does it do ?
- 3) What does it cost ?
- 4) What is it worth ?
- 5) What else will do the job?
- 6) What does that cost ?

TECHNIQUES OF VALUE ANALYSIS

1.Function Analysis System Technique (FAST): FAST is a graphical technique used to break down a product or process into its functional components. It helps in understanding the purpose and relationships of each component, which aids in identifying areas for cost reduction or improvement.

2.Cost-Benefit Analysis (CBA): CBA involves comparing the costs of implementing changes or improvements with the expected benefits. It helps in determining whether the proposed changes are financially viable and if the benefits outweigh the costs.

3.Value Engineering (VE): Value engineering is a systematic approach to optimizing the value of products, processes, or services. It involves brainstorming sessions where cross-functional teams analyze components and processes to identify ways to improve value while reducing costs.

4.Benchmarking: Benchmarking involves comparing the performance of one's supply chain components or processes with those of industry leaders or best practices. This helps identify areas where improvements can be made to match or exceed the industry standards.

5.Supplier Collaboration: Collaborating closely with suppliers can lead to joint efforts in identifying cost-saving opportunities, innovative solutions, and process improvements.

6. Life Cycle Cost Analysis: This technique considers costs associated with the entire lifecycle of a product, including design, manufacturing, distribution, use, and disposal. It helps in making decisions that minimize total cost over the product's life.

7. Pareto Analysis: Also known as the 80/20 rule, Pareto analysis involves identifying the most significant factors contributing to costs or value within the supply chain. This allows focusing efforts on the most impactful areas.

8. Value Stream Mapping: This technique involves mapping the entire process from raw materials to the end customer. It helps in visualizing the flow of materials, information, and activities and identifying areas where bottlenecks or inefficiencies occur.

9. Cross-Functional Teams: Bringing together individuals from various departments and functions within an organization can provide diverse perspectives and expertise, leading to innovative ideas and solutions.

VALUE IMPROVEMENT PROCESS

Performing value analysis or producing the FAST model and analyzing functions with the value analysis matrix are only the first steps in the process. The real work begins with brainstorming, developing and analyzing potential improvements in the product. These subsequent steps are supported by:

- The QFD Concept Selection Matrix is a powerful tool to evaluate various concept and design alternatives based on a set of weighted criteria that ultimately tie back to customer needs.
- Benchmarking competitors and other similar products helps to see new ways functions can be performed and breaks down some of the not-invented-here paradigms.
- Product cost and life cycle cost models support the estimating of cost for the Function-Cost and Value Analysis Matrices and aid in the evaluation of various product concepts.

10. Cost Estimation Techniques: Various techniques, such as cost modeling, should-cost analysis, and cost forecasting, help in estimating costs associated with different components, processes, or changes.

11. Simulation and Modeling: Computer simulations and modeling can be used to analyze different scenarios and their potential impacts on the supply chain, helping in decision-making.

12.Total Cost of Ownership (TCO) Analysis: TCO analysis goes beyond the initial purchase cost to consider all costs associated with owning and using a product or service, including maintenance, operating, and disposal costs.

13. Risk Analysis: Identifying potential risks in the supply chain and evaluating their potential impact on value and costs. This can help in designing risk mitigation strategies.

14. Innovation Workshops: Organizing workshops or brainstorming sessions focused on generating innovative ideas and solutions to enhance value and reduce costs.

- Technology evaluation is leads us to new ways that basic functions can be performed in a better or less costly way. Concept development should involve people with a knowledge of new technology development and an open mind to identify how this technology might relate to product functions that need to be performed. Methods such as the theory of inventive problem solving or TRIZ are useful in this regard.

- Design for Manufacturability/Assembly principles provide guidance on how to better design components and assemblies that are more manufacturable and, as a result, are lower in cost.

THE VALUE ANALYSIS PROCESS

Value analysis is based on the application of a systematic work plan that may be divided into various steps:

- Orientation/preparation
- Information
- Analysis
- Innovation/creativity,
- Evaluation and
- Implementation and monitoring.

The application of value analysis only needs to make use of basic techniques such as matrixes, pareto chart, pert and gantt diagrams, etc.

BENEFITS TO BE ACHIEVED BY VALUE ANALYSIS

- Better purchasing techniques
- Better suppliers & manufacturing methods
- Lower operating costs
- Standardisation & re-evaluation
- Substitution & packaging
- Better material handling
- Better inventory control
- Lower maintenance & overhead cost

VALUE ANALYSIS IN SUPPLY CHAIN MANAGEMENT

Key aspects of include:

1. Cost Analysis: Identifying and evaluating the costs associated with each component and process in the supply chain. This involves analyzing direct costs (such as material costs, labor costs, transportation costs) as well as indirect costs (such as inventory holding costs, warehousing costs, quality control costs).

2. Function Analysis: Understanding the functions and purposes of each component, process, or activity in the supply chain. This helps to determine whether a particular component or process is essential to delivering value to the end customer.

3. Value Identification: Identifying the aspects of the supply chain that directly contribute to customer satisfaction and value. These aspects are the ones that customers are willing to pay for.

4. Cost-Value Reconciliation: Comparing the costs of different components and processes with their corresponding value contributions. This step helps identify areas where costs can be reduced without compromising the value delivered to customers.

5. Alternatives Evaluation: Exploring alternative solutions, processes, or suppliers that could potentially provide the same or higher value at a lower cost.

6. Collaborative Decision Making: Involving various stakeholders from different parts of the supply chain in the decision-making process. This can include suppliers, manufacturers, distributors, and customers.

7. Continuous Improvement: Value analysis is not a one-time event. It's an ongoing process aimed at continuous improvement. Regularly revisiting the supply chain components and processes helps to adapt to changing market conditions, customer preferences, and technological advancements.