

## Unit 3 PRODUCT DESIGN AND DEVELOPMENT Imp Questions

Q.1) List down different methods used for product teardown process and explain anyone

- Product Teardown Methods:
  - Visual Inspection
  - Disassembly Analysis
  - Component Identification
  - Functional Analysis
  - Cost Estimation
  - Reverse Engineering
  - Benchmarking
- Disassembly Analysis: Disassembly Analysis is a method of product teardown that involves physically taking apart a product to understand its internal components, design, and functionality.
- Step involved in Disassembly Analysis:
  - Documentation: Take photos and notes of the product's exterior and interior.
  - Disassembly: Carefully disassemble the product, documenting each step.
  - Component Identification: Identify and document each component, including its function and cost.
  - Analysis: Analyze the product's design, materials, and manufacturing processes.
- Benefits:
  - Improved Understanding: Gain a deeper understanding of the product's design and functionality.
  - Cost Reduction: Identify opportunities to reduce costs by optimizing design and materials.
  - Innovation: Identify areas for innovation and improvement.

Q.2) Describe in detail reverse engineering

- Reverse engineering it gives snapshot of the product how other designers have combined parts to meet the customer needs.
- Steps of Reverse Engineering:
  - Discover operational requirements
  - Examine function of product
  - Determine relationships between component parts of product
  - Determine manufacturing and assembly process used to produce product
- Benefits:
  - Improved understanding.
  - Cost saving
  - Innovation.
  - Competitive advantages.
  - Helps in maintaining and repairing products by understanding their internal components and functionality.
- Limitations:
  - Intellectual Property issues.
  - Reverse engineering can be complex and time consuming process.

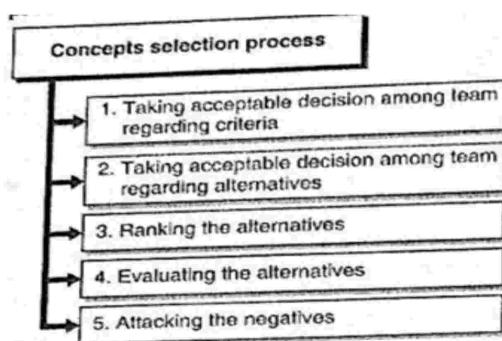
- Reverse engineering can be costly process.
- Reverse engineering may not always produce accurate result.
- Limited access to information.

Q.3) Explain Economic analysis in product analysis.

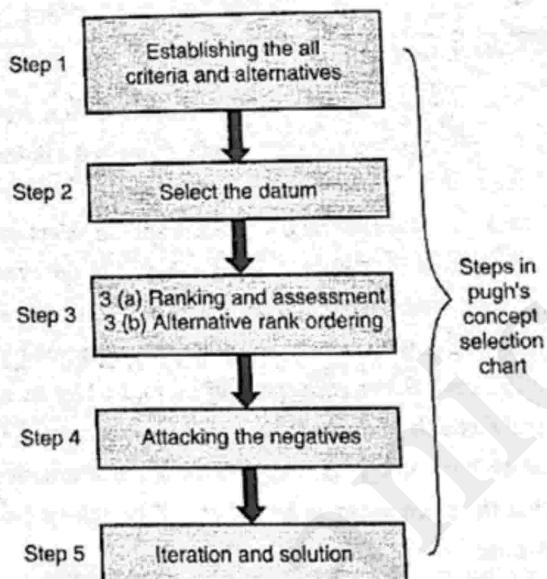
- To achieve a definite objective under the given set of limitations and assumptions, we need to choose systematic approach.
- That systematic approach of deciding optimum use of resource include comparison to or more alternatives.
- This systematic approach is called as economic analysis of product.
- The process of analyzing total cost consist of all parameter of input for any type of product. It consist of two basic type of cost, fixed cost and variable cost.
- Different method of economic analysis:
  - Break even analysis.
  - Return on investment analysis.
  - Investment risk
  - Net present value calculation.
  - Fundamental formulae for a specific time period, usually one year, are listed here:
  - Net Profit = Total Revenues - Total Costs for one year. ( $NP=TR-TC$ )
  - Total Revenues = Total number of items sold  $\times$  Price of each item sold throughout the year. ( $TR=Q \times P$ )
  - $TC=Total\ Fixed\ Costs + Total\ Variable\ Costs.$  ( $TC=TFC+TVC$ )

Q.4) What is concept selection? Explain Pugh's chart with example

- Concepts selection process is a team based decision making attempt.
- There is no any clear solution concept that should be accepted. Various member of teams have strong opinion on various solution and incorrect decision can be expensive.
- The concept selection process is an attempt to handle this uncertainty.
- The concept selection process should be completed in a room with at least three wall that can be written on paper attached.



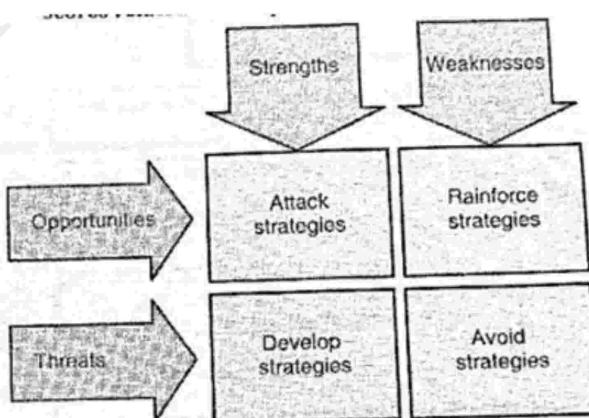
**Fig. C3.1 : Concepts selection process**



**Fig. 3.10.1 : Steps in Pugh's Concept Selection Process**

Q.5) Write a short note on SWOT analysis for a selection of profitable product

- A product swat analysis is an assessment methodology that we can apply to current product or service to better understand them. And if we need that reposition them in the market.
- Conducting a swat analysis of product and how they compare to those of competition will:
  - It will help to clarify where the product stand today vs. where the product would like to be in 3 to 5 years
  - It will make you more aware of how achievable your target positioning about Product
  - It will allow you to figure out what you need to do in order to achieve it



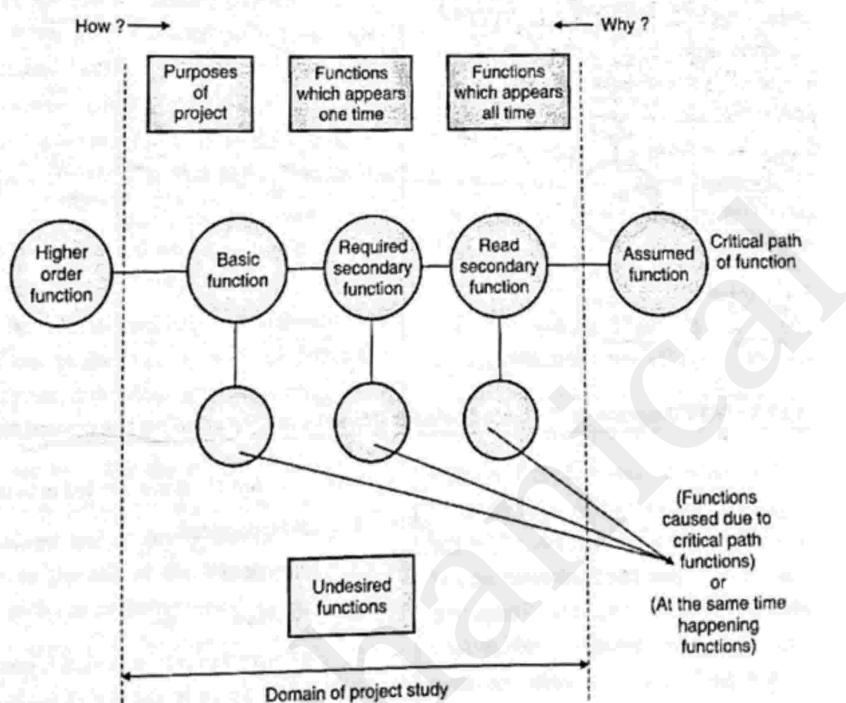
**Fig. 3.8.1 : SWOT Analysis For Product (Template)**

Q.6) What is product policy of an organization? List down various product policies.

- The organization has to keep in mind the product policy decision while introducing a product. As it is a competitive tool in the hands of the marketer. It involves four basic decisions. These are:
  - Individual Product decision:
    - ✓ Product attributes: Refers to quality feature style and design of the product.
    - ✓ Product branding: Only with the help of brand name customer can differentiate the product from the other products.
    - ✓ Product packaging: Packaging act as a silent salesman. It is with the help of the packaging the customer come to know about the product quality, quantity, weight, price etc.
    - ✓ Product labelling: Labels give the customer information regarding the manufacturers name, place, date of manufacturing, expiry date, calories, carbohydrate, nutritional values, etc.
    - ✓ Product support service.: It means the service which are provided to the customer after selling product to the customer, like after sale service installation, etc.
  - Product line decision: The group of product which are closely related to each other. In product line decision, the marketer has to make decision regarding the product land which means the number of product.
  - Product mix decision:
    - ✓ Product mix width: It refers to how many product of company is occurring. Let's say shampoo powder, etc,
    - ✓ Product mix length: refers to how many numbers of item in each product line.
    - ✓ Product consistency refers to how closely the related various product line in end use.

Q.7) Write a short note on FAST method.

- FAST (Function Analysis System Technique) :FAST is a method used to identify, analyze, and organize the functions of a product.
- It helps to define, analyze, and realize product functions and their relationships.
- Main point in a FAST:
  - Identify the basic function of the product.
  - Determine the secondary functions that support the basic function.
  - Create a functional tree diagram by asking "How is this function achieved?"
  - Identify the critical path of functions necessary to achieve the product's purpose.
- Benefits:
  - Helps to understand the relationships between product functions.
  - Identifies the critical functions necessary for the product's purpose.
  - Enables the development of more effective and efficient products.



**Fig. 3.14.2 : The FAST Diagram**

Q.8) Describe in detail benchmarking

- Benchmarking it is a process of comparing our product with competitors.
- Benchmarking provides standard or point of reference and range that can be used to judge quality value of performance.
- The stepwise procedure for benchmarking:
  - Identify the Process or Product to Benchmark:
    - Determine what you want to benchmark, such as a manufacturing process, customer service, or product design.
    - Define the specific metrics or characteristics you want to measure.
  - Research and Select Benchmarking Partners
    - Identify companies or organizations that are known for their excellence in the area you want to benchmark.
    - Research their processes, products, or services to understand their strengths and weaknesses.
  - Collect and Analyze Data
    - Gather data on the benchmarking partner's processes, products, or services.
    - Analyze the data to identify gaps, opportunities, and best practices.

- Compare and Evaluate
  - Compare your company's processes, products, or services with those of the benchmarking partner.
  - Evaluate the differences and identify areas for improvement.
- Implement Changes and Monitor Progress
  - Develop an action plan to implement changes and improvements based on the benchmarking analysis.
  - Monitor progress and adjust the plan as needed.
- Continuously Review
  - Regularly review and refine your benchmarking process to ensure it remains relevant and effective.
  - Continuously seek out new benchmarking partners and best practices to stay ahead of the competition.

Q.9) Explain concept analysis considering functional, marketing, operational etc. aspect.

- Concept analysis is a process of evaluating an idea or concept from different aspects to determine its feasibility and potential.
- Aspects of Concept Analysis:
  - Functional Aspect: How will the product or service work? What features and functionalities will it have?
  - Marketing Aspect: Who is the target audience? What are their needs and preferences? How will we promote and sell the product or service?
  - Operational Aspect: How will we produce and deliver the product or service? What resources and infrastructure will we need?
  - Financial Aspect: What are the costs associated with developing and launching the product or service? What are the potential revenue streams?
  - Technical Aspect: What technology will we use to develop and deliver the product or service? Are there any technical limitations or risks?
- Steps in Concept Analysis
  - Define the concept and its objectives.
  - Evaluate the concept from different aspects (functional, marketing, operational, financial, technical).
  - Identify strengths, weaknesses, opportunities, and threats (SWOT analysis).
  - Determine the feasibility and potential of the concept.
  - Refine the concept based on the analysis and feedback.

