



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore - 641 107

An Autonomous Institution

**Accredited by NBA - AICTE and Accredited by NAAC - UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai**

DEPARTMENT OF MANAGEMENT STUDIES

COURSE NAME : 19BA204 OPERATION MANAGEMENT

I YEAR / II SEMESTER

UNIT 3 - PRODUCT DESIGN AND WORK SYSTEMS



WHAT IS PRODUCT DESIGN?

PRODUCT DESIGN is concerned with the form and function of the product.

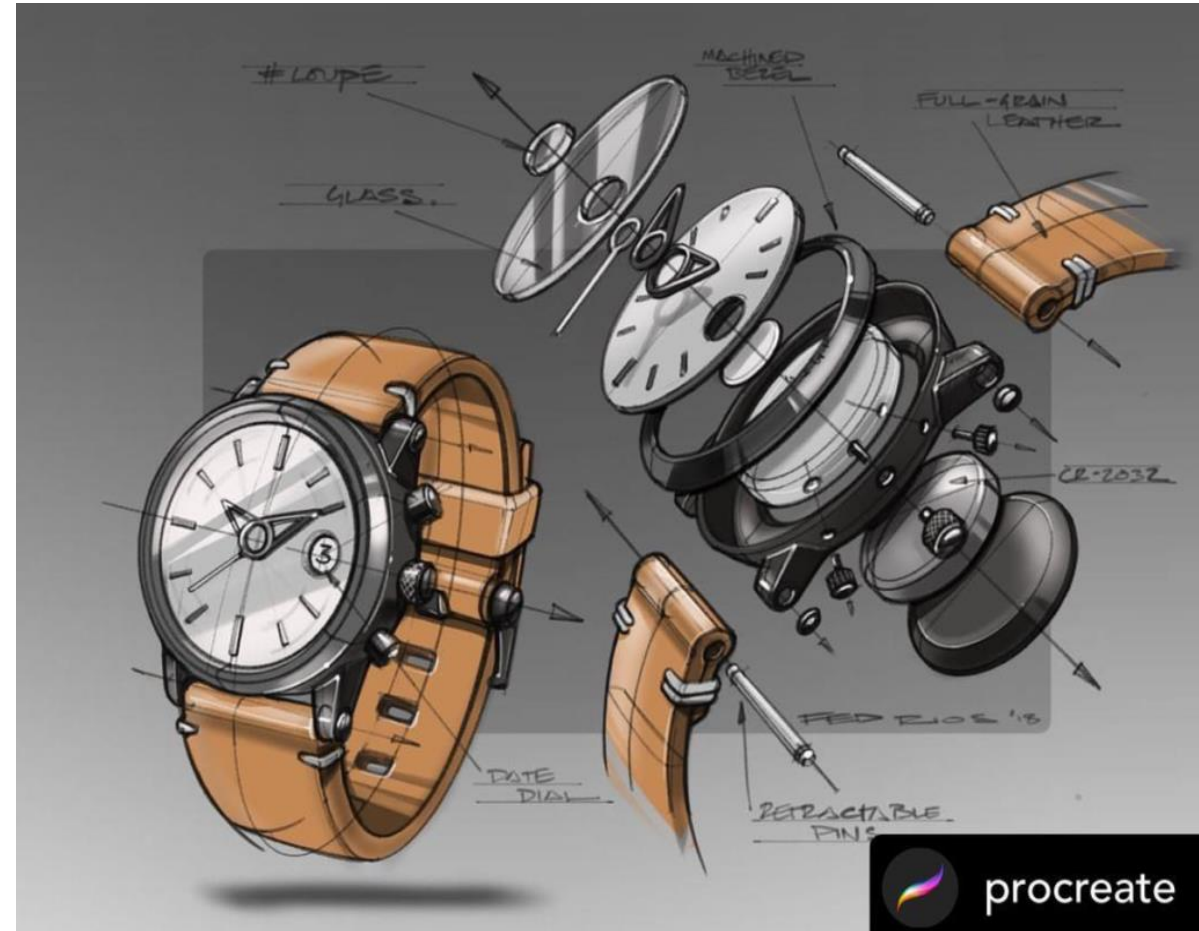
FORM design involves the determination of what the product will look like(Physical Structure).

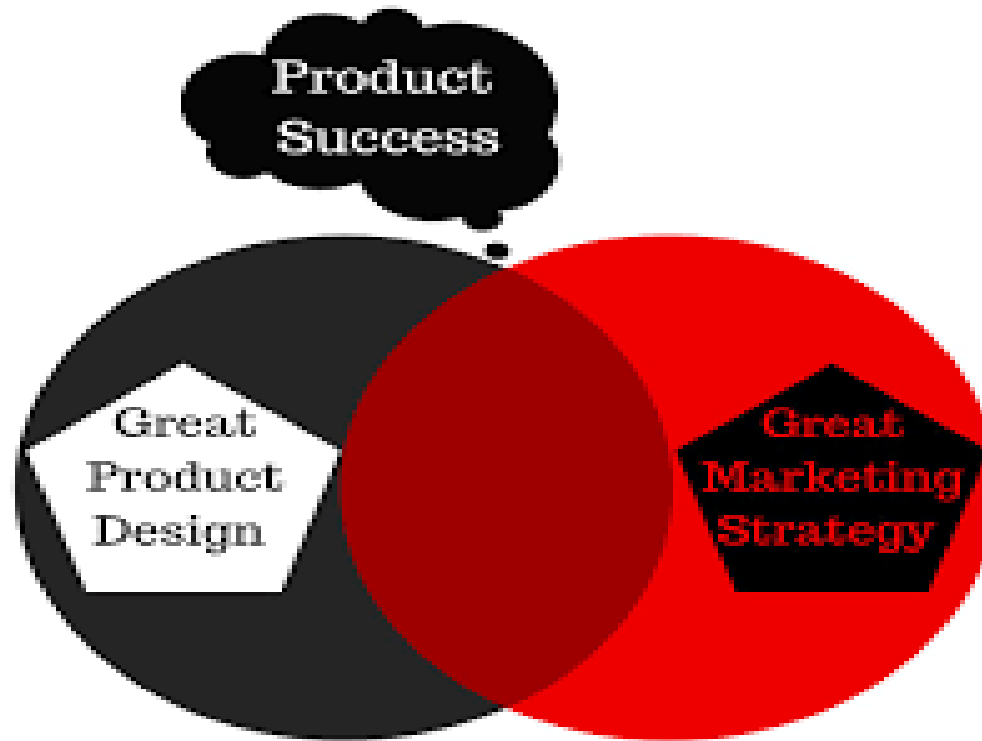
FUNCTION design deals with what function the product will perform and how it performs(what will be the use of Product).

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Product Design

Product design is the process designers use to blend user needs with business goals to help brands make consistently successful products.





 Progressink

Paper Boat Juice Video Design

<https://www.youtube.com/watch?v=bK4kd7ldmOY>

Importance of product design

- A good product design can improve its MARKETABILITY.
- Product design directly affects:
 - Quality
 - Product cost
 - Customer satisfaction



Objectives of Product and Service Design

- Main focus
 - Customer satisfaction
 - Understand what the customer wants
- Secondary focus
 - Function of product/service
 - Cost/profit
 - Quality
 - Appearance
 - Ease of production/assembly
 - Ease of maintenance/service

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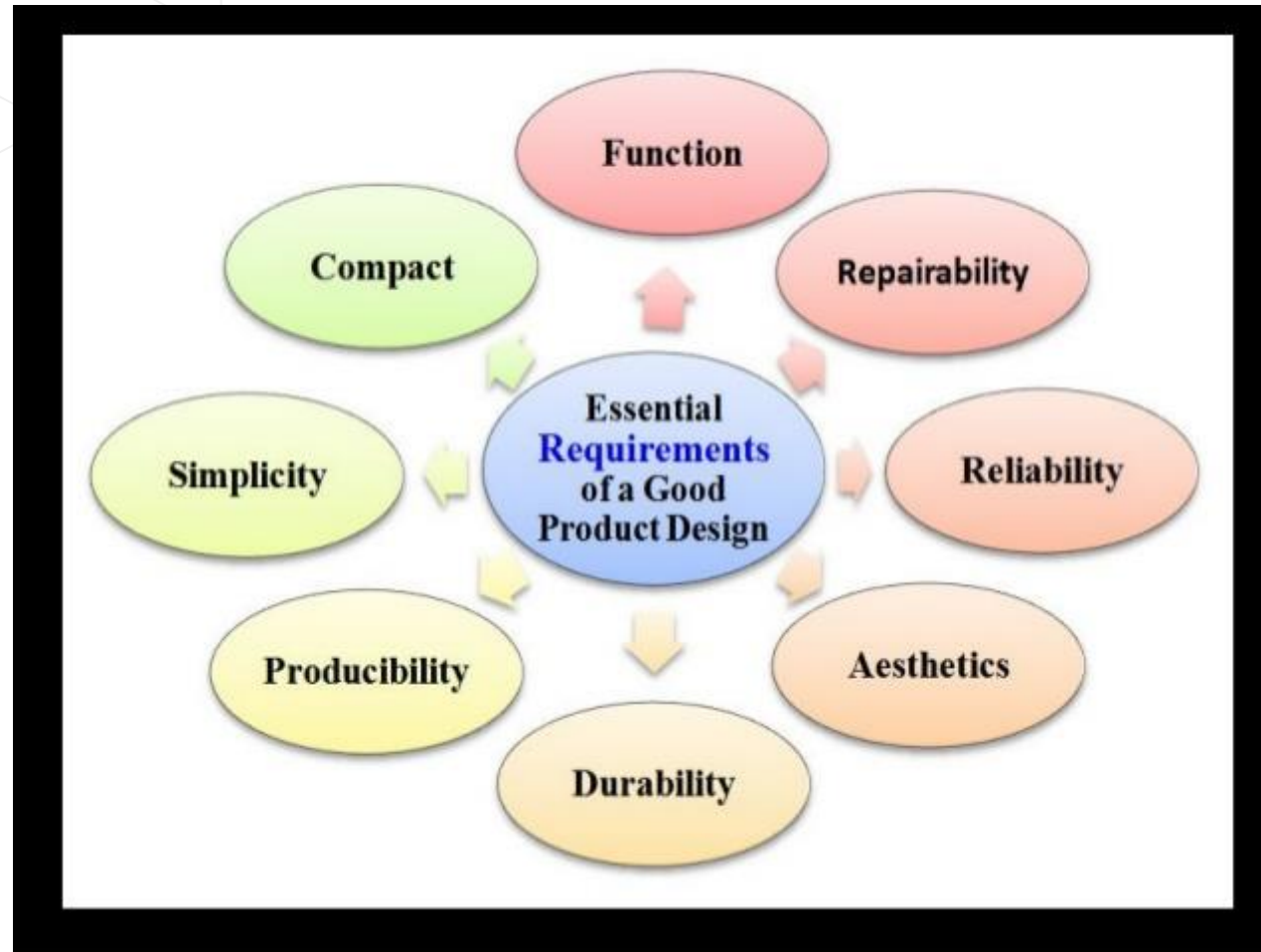
Characteristics of Good Product Design

- i. Function or performance
- ii. Appearance or aesthetics
- iii. Reliability
- iv. Maintainability
- v. Availability
- vi. Producibility
- vii. Simplification
- viii. Standardization
- ix. Specification
- x. Safety



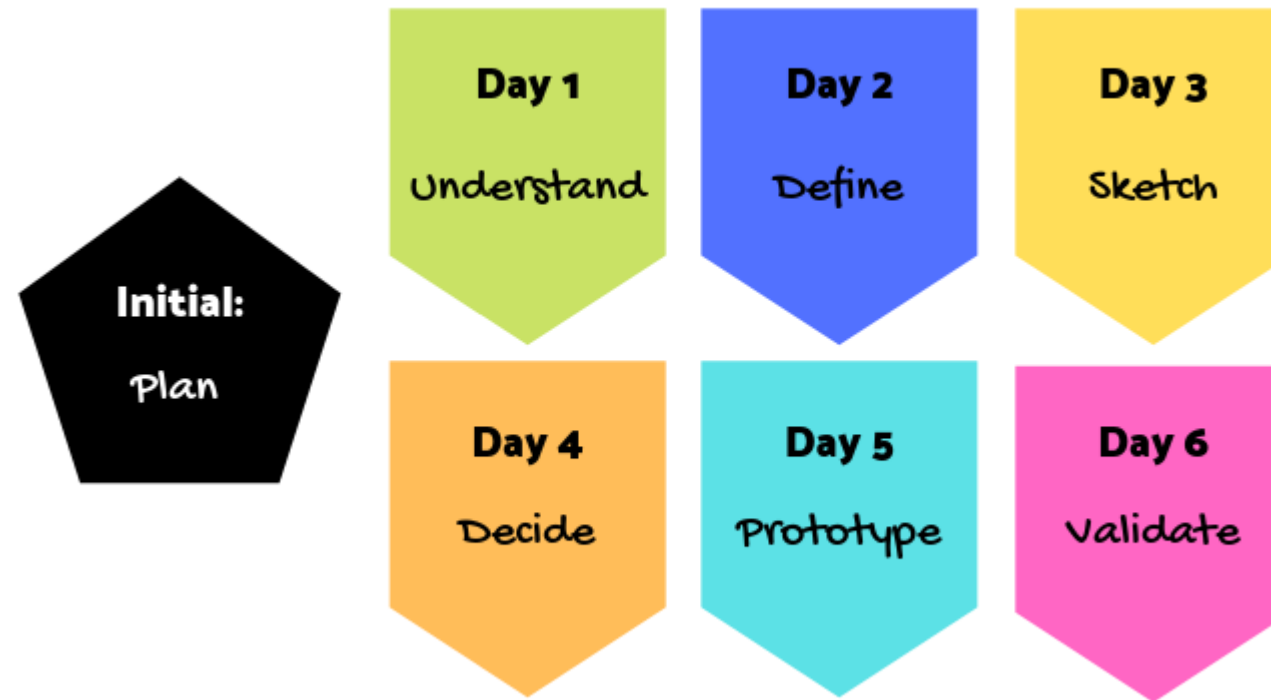
Product Design should

- Ergonomics
 - Ease of use
 - Ease of maintenance
 - User interaction with the product
 - Minimum knowledge of using it safely.
- Aesthetics
 - Amount of product differentiation required
 - The importance of pride of ownership, image.
 - Motivation to the design team (for their pride in product)





Process of Product Design





Product Design Prepare

- ❖ Value
- ❖ Function Cost Matrix
 - ❖ FAST Diagram
 - ❖ FAST Analysis



The Concept of Value

$$\text{Value} = (\text{Performance} + \text{Capability}) / \text{Cost} = \text{Function} / \text{Cost}$$

Value Analysis

What, Why, How, Whom, Who and When

Product Identify

- ✓ Value Added
- ✓ Non-Value Added

Eliminate Non- Value Added

Cost Function Matrix or Value Analysis Matrix is prepared to identify the cost of providing each function by associating the function with a mechanism or component part of a product.

Customer Requirements/ Functions	Importance	Mechanisms				
		Lead	Eraser	Body	Paint	Band
Make Marks	30	⊙ 150	/	/	/	/
Remove Marks	20	/	⊙ 100	/	/	/
Prevent Smudges	15	○ 45	/	○ 45	/	/
Support Lead	5	/	/	⊙ 25	/	/
Improve Appearance	10	/	/	○ 30	○ 30	△ 10
Accomodate Grip	20	/	/	⊙ 100	△ 20	/
Column weight	555	195	100	200	50	10
Mech. weight	1.0	.351	.180	.360	.090	.018
Mech. target cost	2.80	.98	.51	1.01	.25	.05
Mech. actual cost	2.92	1.20	.43	.94	.10	.25

⊙ Strong correlation weight factor = 5

○ Moderate correlation weight factor = 3

△ Weak correlation weight factor = 1

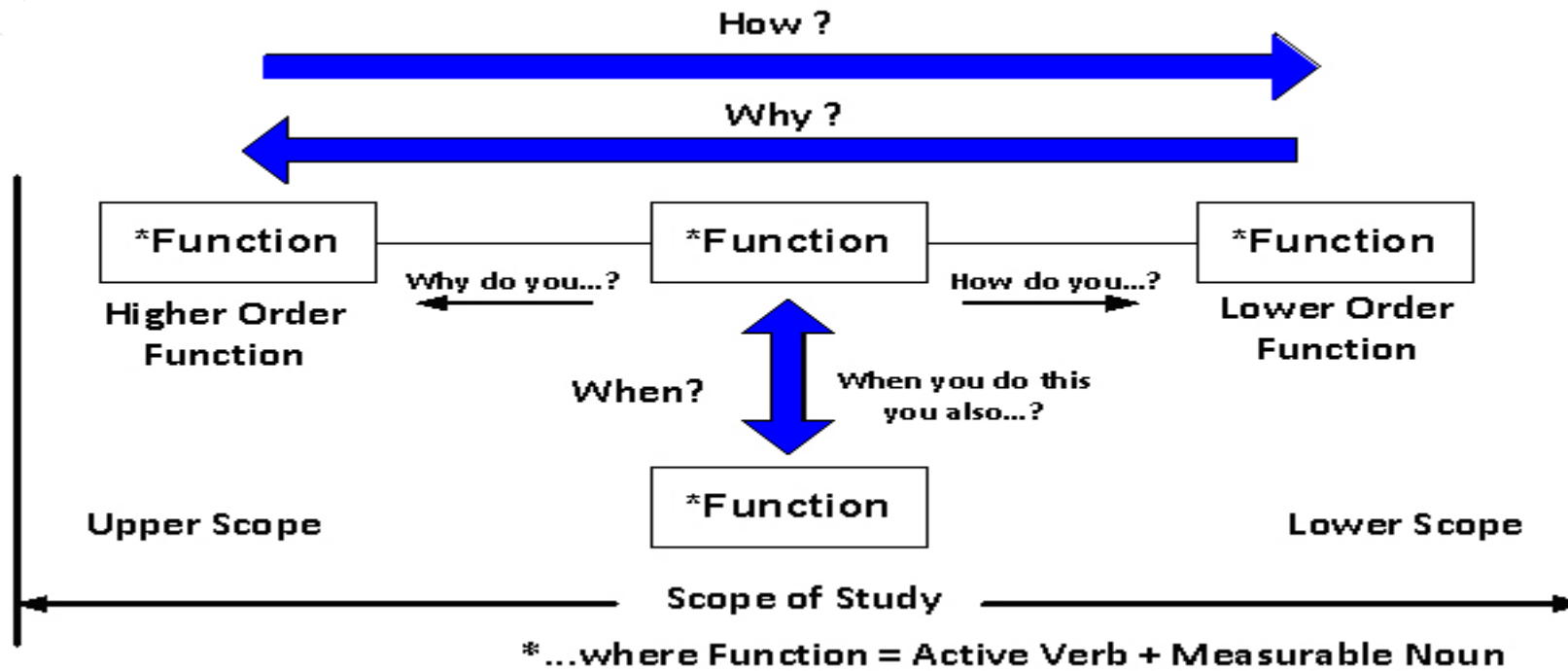


FAST ANALYSIS

1. Bench Marking
2. Counter Part Reduction
3. Weight Reduction
4. Alternative Material
5. Yield Improvement
6. Part Customisation

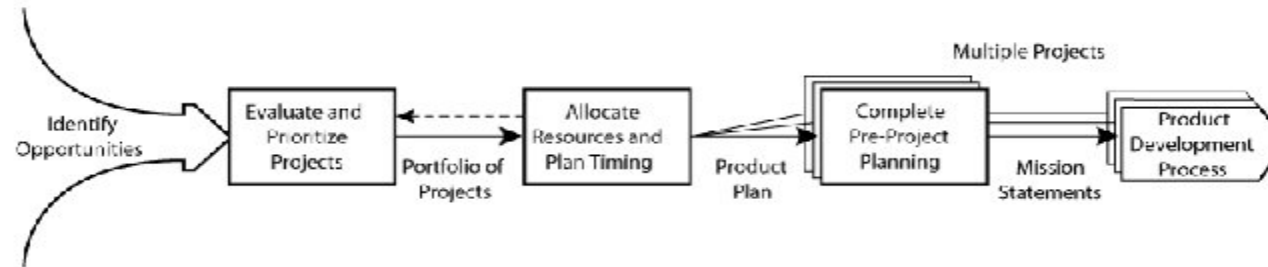
FAST DIAGRAM

The development of a FAST diagram is a creative thought process which supports communication between team members. The development of a FAST diagram helps teams to: Develop a shared understanding of the project. Identify missing functions.



Planning of Product Design

The Product Planning Process



From *Product Design and Development* by Karl Ulrich and Steven Eppinger (McGraw-Hill/Irwin)

1. Identify opportunities.
2. Evaluate and prioritize projects.
3. Allocate resources and plan timing.
4. Complete pre-project planning.
5. Reflect on the results and the processes.

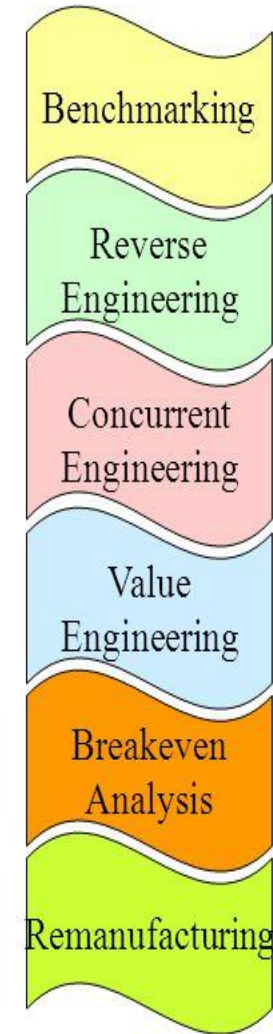
Note: Selecting a promising project is iterative in nature

Product design and process selection

Selecting of Product Design

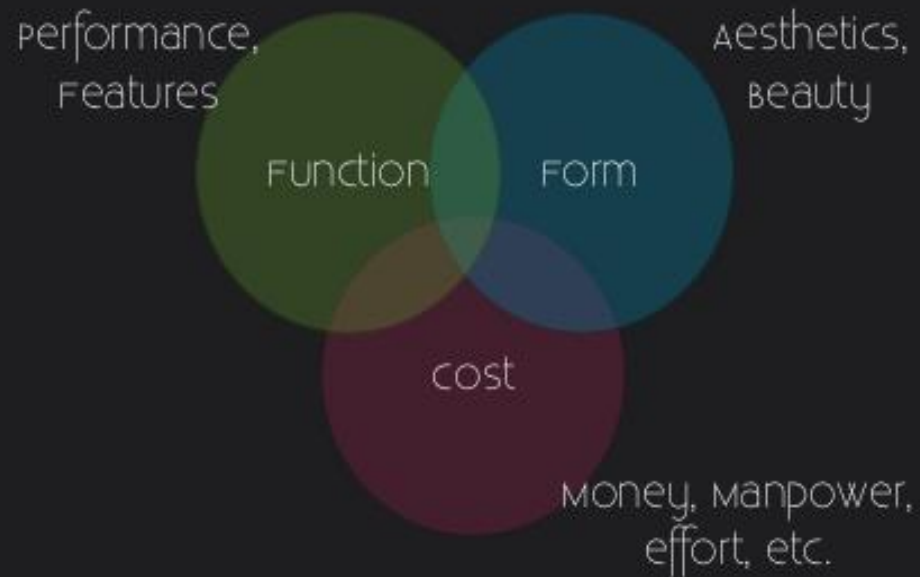
The product development activity links customers needs and expectations to the activities required to manufacturer the product

- Idea development
 - Technology push
 - Marketing pull
- Product screening
 - Marketing criteria
 - Financial criteria
 - Operational criteria
- Preliminary design and testing
 - Prototyping
 - Trial marketing
- Final design



Decision Making of Product Design

Product Parameters





Thank You