SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSE NAME: 19OE116 - PRODUCT DESIGN AND DEVELOPMENT

III YEAR / VI SEMESTER

Unit 2 - Concept Generation and Selection

Topic 3 – Clarification

Clarification on Concept Generation and Selection:

Concept Generation and Selection is a structured process in engineering and product design used to create and evaluate potential solutions to a given problem.

It ensures that the best possible concept is chosen based on specific criteria.

1. Concept Generation (Creating Ideas):

This phase involves brainstorming and developing multiple possible solutions before filtering and refining them.

Key Steps:

- **Define the Problem: Clearly outline the need, constraints, and objectives.**
- **Research and Gather Information: Explore existing solutions, technologies, and market demands.**

Brainstorming: Generate multiple ideas using structured techniques (e.g., Morphological Analysis, TRIZ, SCAMPER).

Develop Initial Concepts: Create rough sketches, system diagrams, or simple models.

Evaluate Feasibility: Assess which ideas are realistic based on technical and economic constraints.

2. Concept Selection (Choosing the Best Solution):

After generating ideas, the best concept must be selected systematically to ensure it meets all requirements.

Key Steps:

Define Selection Criteria: Identify key factors such as cost, efficiency, feasibility, and performance.

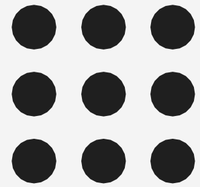
Screen Concepts: Eliminate ideas that do not meet basic requirements.

Use Structured Evaluation Methods:

- Pugh Matrix (Concept Screening): Compare each concept against a baseline.
- Weighted Decision Matrix: Score concepts based on criteria importance.
- Analytical Hierarchy Process (AHP): Rank concepts based on pairwise comparisons.

Prototyping & Testing: Develop preliminary models to test functionality.

Final Decision: Select the best concept based on evaluation results and refine it for further development.



Key Differences Between Concept Generation & Selection

Aspect	Concept Generation	Concept Selection
Objective	Create multiple ideas	Choose the best idea
Focus	Creativity & Innovation	Evaluation & Decision Making
Techniques Used	Brainstorming, TRIZ, SCAMPER, Morphological Analysis	Pugh Matrix, Weighted Decision Matrix, AHP
Outcome	A set of potential solutions	The most suitable concept for development

Why Is This Process Important?

- Ensures innovation and efficiency in design.
- Reduces risk by evaluating multiple options before development.
- Helps in cost-effective decision-making.
- Ensures that the best solution meets both technical and user requirements.

Thank You...