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 4 – Search and Externally & Internally

Concept Generation and Selection are pivotal stages in the product development process, ensuring that the most effective and innovative solutions are identified and refined.

Concept Generation involves creating a broad range of ideas to address a specific problem or need.

This phase emphasizes creativity and diversity of thought, encouraging teams to explore various possibilities without immediate judgment.

Concept Selection follows by evaluating the generated ideas to identify the most promising ones.

This phase employs systematic methods to assess each concept against predefined criteria, ensuring that the selected solution aligns with project goals and stakeholder requirements.

Commonly used tool in the Concept Selection phase is the Pugh Matrix.

This method facilitates the comparison of multiple concepts against a baseline (datum) using a set of criteria.

Each concept is scored relative to the baseline, aiding in identifying strengths and weaknesses.

Important to note that Concept Generation and Selection are iterative processes.

Teams often revisit and refine concepts based on evaluations, ensuring continuous improvement and optimal solutions.

By systematically generating and selecting concepts, teams can develop innovative products that effectively meet user needs and stand out in the market.

Internal sources involve ideas generated within the organization, leveraging in-house expertise, resources, and experience.

Sources of Internal Concept Generation:

- Brainstorming Sessions: Team discussions to generate new ideas.
- R&D (Research & Development): Innovations and discoveries from in-house research.

- **Employee Suggestions: Ideas from engineers, designers, or marketing teams.**
- **Existing Product Improvements: Modifying or optimizing current products.**
- **Company Knowledge Base: Using past projects, patents, and technical reports.**

Concept Selection Methods:

- Pugh Matrix: Compare internal ideas against a baseline design.
- Weighted Decision Matrix: Rate internal concepts based on predefined criteria.
- Prototyping and Testing: Validate feasibility using internal testing.

External Sources in Concept Generation & Selection

External sources bring fresh perspectives by incorporating insights from customers, market trends, and third-party innovations.

Sources of External Concept Generation:

- Customer Feedback & Surveys: Understanding user needs and pain points.
- Competitor Analysis: Learning from existing market solutions.

- **Academic Research & Publications: Utilizing knowledge from universities and research institutions.**
- **Industry Trends & Market Reports: Studying technological advancements.**
- **Open Innovation & Crowdsourcing: Engaging external experts and the public.**
- **Supplier and Partner Input: Collaborating with vendors and manufacturers.**

External Sources in Concept Generation & Selection

External Concept Selection Methods:

- Customer Voting & Preference Testing: Letting users choose preferred concepts.
- Benchmarking: Comparing external concepts with industry standards.
- Cost-Benefit Analysis: Evaluating financial feasibility of external ideas.

Comparison of Internal vs. External Sources

Factor	Internal Sources	External Sources
Creativity	Limited to internal expertise	Diverse and innovative
Feasibility	Easier to implement within the company	May require adaptation
Cost	Lower, uses existing resources	Higher if licensing or outsourcing is needed
Risk	Controlled development	External dependencies and risks
Time	Faster, as internal knowledge is used	May take longer due to external negotiations

A balanced approach combining internal expertise and external insights leads to the most effective concept generation and selection process.

Organizations should leverage internal R&D while integrating customer feedback, market trends, and external innovations for a well-rounded product development strategy.

Thank You...