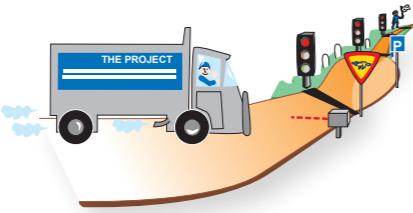


IKOT Road Map

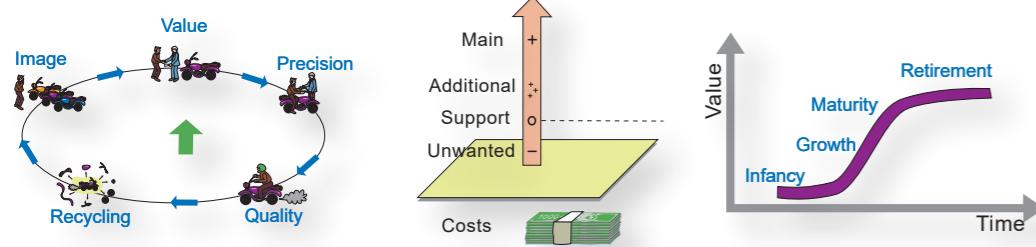
Step 1: Establish the Project

- Organize the team and a plan for taking turns as project leader.
- Outline and agree on project game rules.
- Establish a project definition that includes goal statement, deliverables, and boundaries.
- Define all stakeholders.
- Work with one overall plan and a rolling detailed plan.
- Establish a project control system for reviewing progress, managing risks, and changes.



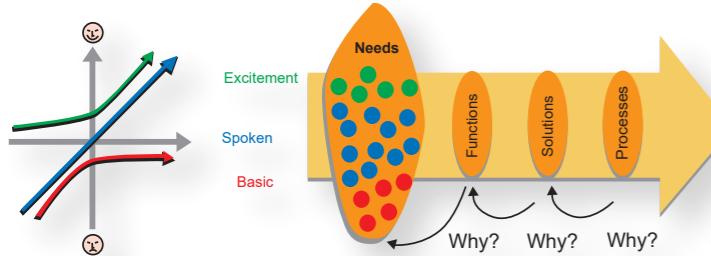
Step 2: Describe the Product

- Analyze the potential to increase customer value at every stage of the customer interaction.
- Formulate the Main, Additional, Support, and Unwanted functions.
- Analyze the position on the S-curve and applicable development strategies.



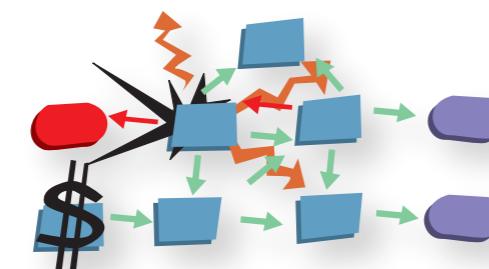
Step 3: Capture the Voice of the Customer

- Identify spoken needs by interviewing and studying customers.
- Identify unspoken basic needs by studying the customer's history.
- Identify unspoken excitement needs by studying pioneers or being a customer yourself.



Step 4: Analyze Alternative Solutions

- Make an inventory of known concepts and ideas, using open sources, patent databases, and internal sources.
- Establish a benchmark by combining the best elements from all concepts and ideas found.
- Estimate the customer value and develop a framework for a target specification.
- Establish measurement methods for functions and costs.
- Draw a functional model and evaluate the contribution of the different subsystems to customer value.
- Add costs and problems to the model and rank subsystems from best to worst.



The objective of this course is to provide students with a comprehensive understanding and hands-on experience of modern methods and tools used in product development.

Implemented as a project-based course, the course challenges existing products by having each team develop innovative concepts. The primary goal is to replicate a real-world project experience by following a structured design process.

Participants are trained to analyze development challenges, formulate specifications, create concepts, and verify them, as follows:

- The ultimate aim is to create a concept that offers unparalleled customer value.
- Throughout the course, students are required to apply their knowledge and skills in areas such as Applied Mechanics, Solid Mechanics, Engineering Materials Science, Machine Elements, and Manufacturing Technologies.
- Early consideration of manufacturing possibilities is crucial to avoid costly changes and delays in the project.
- Teamwork provides students with the opportunity to experience team building and group dynamics.
- Communication skills are honed through both oral and written presentations.

A total of six lectures is included in the course.

Besides lectures, the course also includes tutorials. Before each tutorial, students must read relevant course materials.

Each team must outline and agree on ground rules and establish a plan for taking turns in holding the role of project leader.

A team of specialists across various areas is available to answer technical questions arising in the projects. The purpose of the specialist is to emulate the situation in a real company. Representatives from the company of the existing product are included in the team of specialists.



CHALMERS

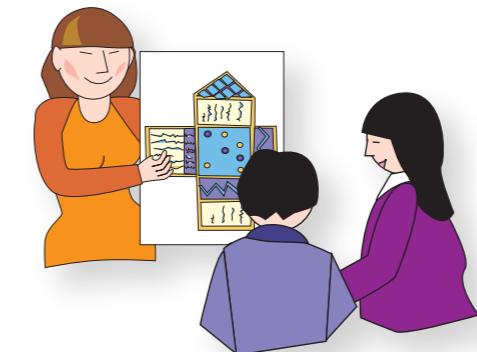
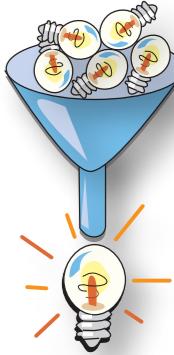
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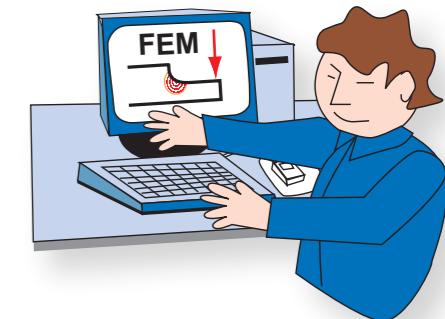
Step 5: Create the Winning Concept

- Generate many alternative concepts with the potential for unrivaled customer value, using the six functional tactics and applying the rules of structured brainstorming.
- Develop the best concepts further through simple sketches and calculations.
- Choose the most promising concept systematically, preferably with the help of a steering committee.



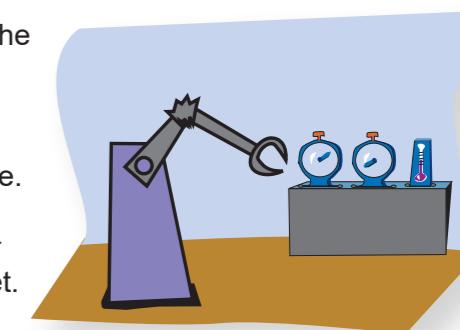
Step 6: Finalize the Target Specification

Establish the optimal target values for functions and costs for the selected concept, accounting for design, technology, and production limitations, as well as customer and market expectations. Show that the customer value of the selected concept is higher than that of the benchmark created in Step 4. If not, consider starting all over from Step 3.



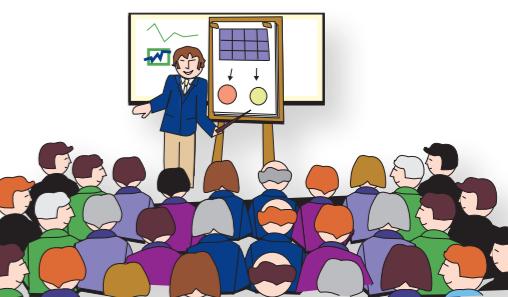
Step 7: Design the Concept and Prepare for Production

- Outline the product architecture and describe all interfaces.
- Design critical subsystems in detail.
- Describe the best production methods for the different subsystems, including advantages and disadvantages.
- Make rough cost estimates for each subsystem and analyze the cost of the complete product.



Step 8: Verify and Evaluate the Concept

- Make sketches, models, or mockups to visualize the concept, using rapid prototyping methods if available.
- Develop a prototype of a subsystem performing main or additional functions and verify performance.
- Analyze the prototypes, manufacturing methods, and cost calculations selected, evaluating whether the requirements of the target specification are met. If not, analyze whether the project should start all over from Step 3.



Step 9: Present the Project and Reflect

- Develop a professional presentation and present it to the steering committee, to convince the committee that the project is worth pursuing or that your recommendation is to terminate the project.
- Select material from the project documentation and write a technical report describing the development of the new product.
- Explain learning outcomes and what needs to be done differently in the following product development project.