Concept Selection

Lecture #5

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Today

- Progress Reports + Quiz
- Patents and other info.
- Chapter 7, Concept Selection

Quiz #1

1. Which of the 7 concept selection methods is explained in detail in Chapter 7?
   - External decision
   - Product champion
   - Elimination
   - Multi-voting
   - Pros and cons
   - Prototype and test or decision matrices

2. List two of your concepts and three selection criteria in table form. First Rate them using relative scoring and then rank them.

Progress Reports

- Be specific.
  - What did you do?
  - What day?
  - When will you be done?
  - Did you work with anyone? Name names.
- Be direct.
- Be honest.
  - Paperwork counts!
- Be succinct.
- Most important things go first...not in chronological order!
- Use Timelines.
- If you put a problem in writing – it becomes permanent.
- BE AWARE that you affect the grade of other members of your team... Ex. Robotic Arm (only 3/7)...

Information

- Meeting Room for the overcrowded.
- PDS and Final Mission Statements Due 02/02.
- Design Show requirements.

Patents, ETC.

- Designer Resources on ME4054 webpage.
- Google scholar
- www.pubmed.gov
Concept Selection
- Agree on Product Design Specifications
- Examine ALL concepts at the same time....

Selection Methods
- External decision
- Product champion
- Intuition
- Multivoting
- Pros and cons
- Prototype and test
- Decision matrices

Structure
- Customer-focused product
- Competitive Design
- Better product-process coordination
- Reduced time to product introduction
- Effective group decision making
- Documentation of the decision process

2 Stages
- Concept screening
- Concept scoring

6 Step Process
- Prepare the selection matrix.
- Rate the concepts.
- Rank the concepts.
- Combine and improve the concepts.
- Select one or more concepts.
- Reflect on the results and the process.

Step #1 - Prepare the Matrix
Pick your medium
Enter concepts and criteria on the matrix
- keep detail uniform
- use written and graphical descriptions.
- if you have >12, use multivoting
Choose one concept as a reference or benchmark against which all others are rated.

- Industry standard
- Straightforward/familiar concept

**Step #2 Rate the Concepts**

**Unweighted Matrix (Pugh)**

Relative score
- 0 = ‘same as’
- (+) = ‘better than’
- (-) = ‘worse than’

**Step #4 - Combine and Improve the Concepts**

- Is there a generally good concept which is degraded by one bad feature? Can a minor modification improve the overall concept and yet preserve a distinction from the other concepts?
- Are there two concepts which can be combined to preserve the ‘better than’ qualities while annulling the ‘worse than’ qualities?

**Step #5, Select one or more concepts**

- Determine if further benchmarking, research or background is required.
- Determine if resolution of your screening matrix is good enough – continue to update criteria to reflect new knowledge.
Step #6, Reflect on the results and the process

- ALL TEAM MEMBERS SHOULD
  “See EYE TO EYE”
  “BUY-IN”
  “BE ON THE SAME PAGE”
  “Be prepared to take a bullet”
  “Be able to stand up and give solid reasons why this makes sense.”

Concept Scoring

Prepare the selection matrix
Rate the concepts
Use a finer scale: 1-5 (page 135)
Rank the concepts.
Combine and improve the concepts
Select one or more concepts
Reflect

Common Pitfalls

- Not doing it
- Running with the first idea
- Selection chart criteria don’t correspond to PDS
- Letting an “experienced” designer make the choices
- Going by gut feel
- Letting a manager decide
- Not buying into the process as a team
- Forgetting the customer

Final Words: Concept Gen & Selection

- Write the PDS first!!
- Generate lots of ideas!
- Resist temptation to run with first idea
- Use a selection process
- Check “Common Pitfalls” lists: Is your group “guilty”?

Contributions to Your Report

- Concepts Appendix
- Selection Chart
  - Unweighted: Chap. 6, Appendix A
  - Weighted: Chap. 6, Appendix B

02/02/06 Lecture #6 Concept Selection

- Product Design Specification (due 02/02).
- Mission Statement (due 02/02).
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  Electronic to Wei and to
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- Read Ulrich and Eppinger Text,
  Chapter 16, pg. 334-352