Concept Selection
Product Development Process

Planning
- Mission Approval
- Concept Development
- Concept Review
- System-Level Design
- System Spec Review
- Detail Design
- Critical Design Review
- Testing and Refinement
- Production Ramp-Up
- Production Approval
Concept Development Process

- Identify Customer Needs
- Establish Target Specifications
- Generate Product Concepts
- Select Product Concept(s)
- Test Product Concept(s)
- Set Final Specifications
- Plan Downstream Development

**Perform Economic Analysis**

**Benchmark Competitive Products**

**Build and Test Models and Prototypes**
Concept Selection Process

- Prepare the Matrix
  - Criteria
  - Reference Concept
  - Weightings
- Rate Concepts
  - Scale (+ – 0) or (1–5)
  - Compare to Reference Concept or Values
- Rank Concepts
  - Sum Weighted Scores
- Combine and Improve
  - Remove Bad Features
  - Combine Good Qualities
- Select Best Concept
  - May Be More than One
  - Beware of Average Concepts
- Reflect on the Process
  - Continuous Improvement
Selection Process Outcomes

- Team Consensus on Superior Concept
  - “Green Light”
  - Everyone “On Board”
- Conditional Consensus
  - More Information on some Criteria
  - Market or Technical Feedback
  - Consensus on Disagreement
- No Consensus
  - Criteria not Understood
  - Back to Needs
## Example: Concept Screening

<table>
<thead>
<tr>
<th>SELECTION CRITERIA</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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**Selection Criteria:**
- **Ease of Handling**
- **Ease of Use**
- **Number Readability**
- **Dose Metering**
- **Load Handling**
- **Manufacturing Ease**
- **Portability**

**Rating Scale:**
- **+** (Strongly Agree)
- **0** (Neutral)
- **–** (Strongly Disagree)
## Example: Concept Scoring

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<th>Selection Criteria</th>
<th>Weight</th>
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<th>Weighted Score</th>
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**Total Score** | 2.75 | 3.45 | 3.10 | 3.05

**Rank** | 4 | 1 | 2 | 3

**Continue?** | No | Develop | No | No
Concept Selection Exercise: Mechanical Pencils
Retail Prices of Five Pencils

- Classic $ 13.26
- Side Fox $ 2.55
- Retro $ 0.93
- Plasma $ 6.55
- Flex Fit $ 4.85
Remember…

The goal of concept selection is **not** to

- **Select** the best concept.

The goal of concept selection is to

- **Develop** the best concept.

So remember to **combine** and **refine** the concepts to develop better ones!
Caveats

• Beware of the best "average" product.
• Perform concept selection for each different customer group and compare results.
• Check sensitivity of selection to the importance weightings and ratings.
• May want to use all of detailed requirements in final stages of selection.
• Note features which can be applied to other concepts.
Next Week

- Tuesday: Teams 1 to 5
  - No Class for Teams 6 to 9
  - Use this time for team meeting!

- Thursday: Teams 1 to 9
  - No Class for Teams 1 to 5
  - Use this time for team meeting!
  - Nokia?
PD Efficiency

The right questions will improve PD efficiency

- Identify risk in your project
- Formulate questions, that if answered, will reduce/eliminate risk
- Use models/prototypes to get the answers
- Target individual questions at first.

Repeat as necessary.
Can use other tools to answer questions.
Further Reading

- Stuart Pugh
  “Total Design”