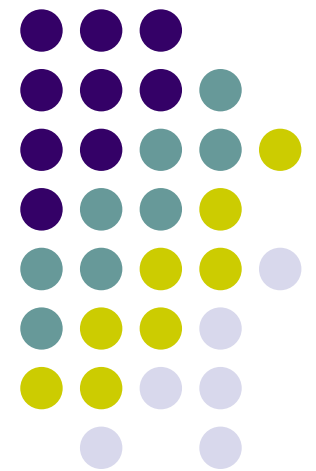
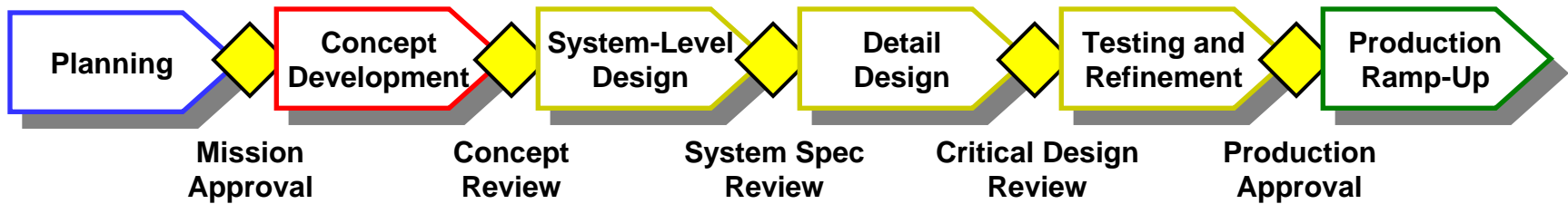
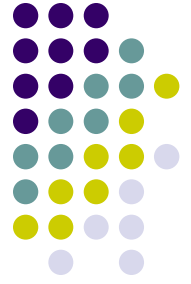


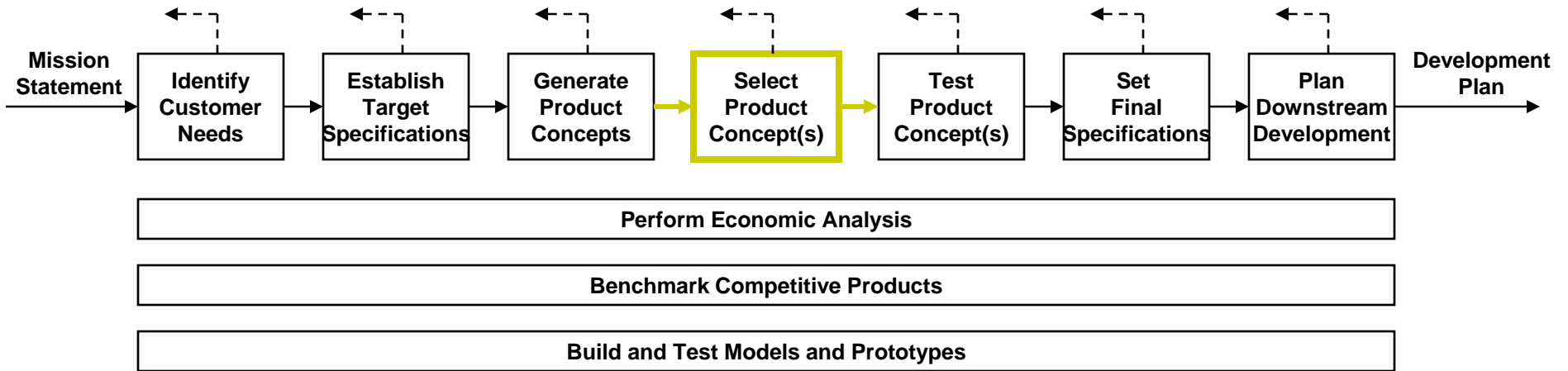
Concept Selection



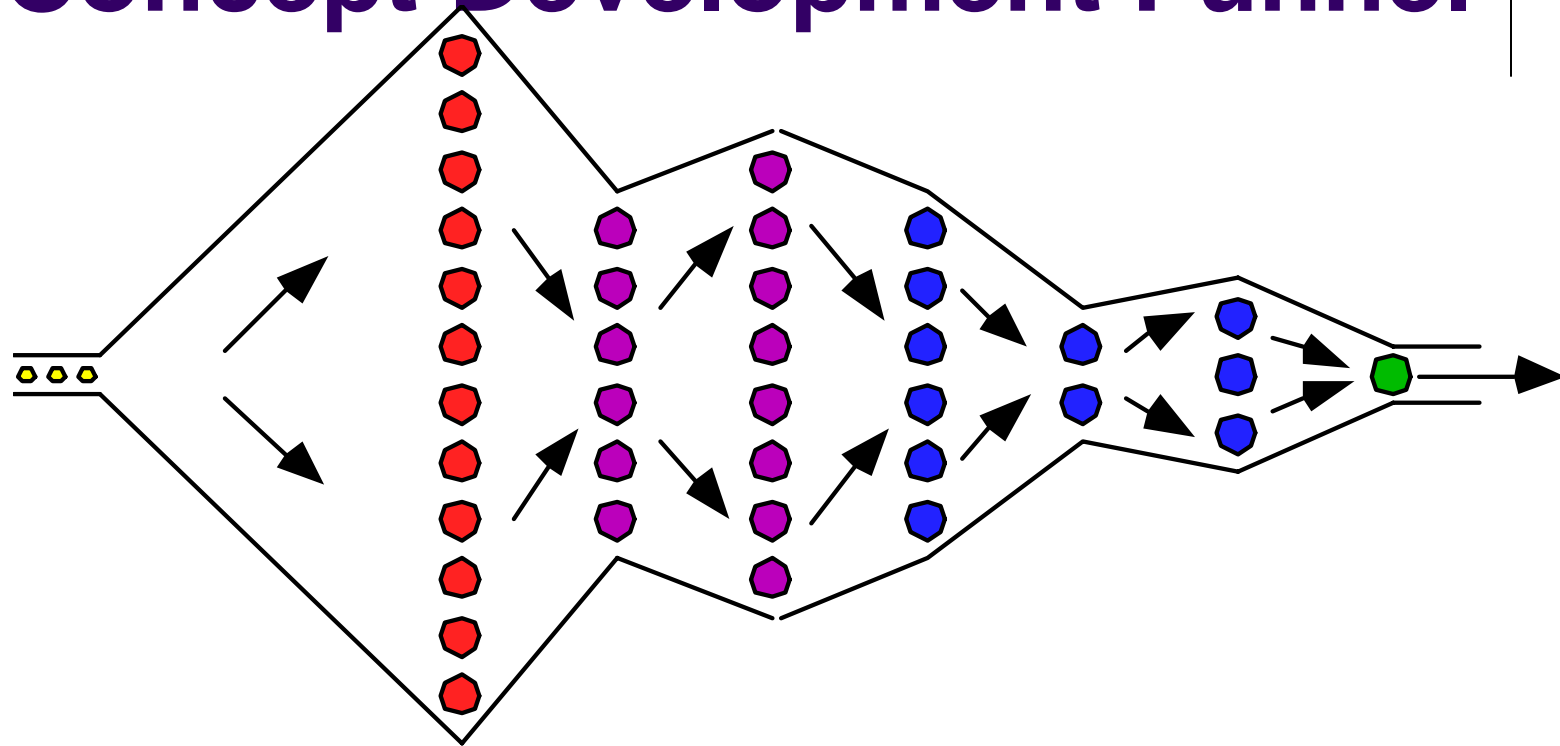
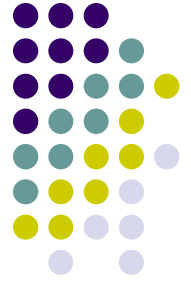
Product Development Process



Concept Development Process



Concept Development Funnel



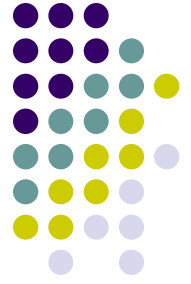
concept generation

concept screening

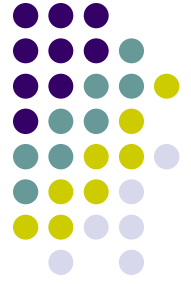
concept scoring

concept testing

Concept Selection Process



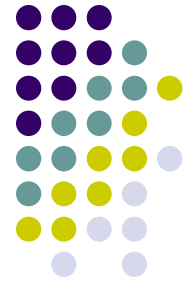
- Prepare the Matrix
 - Criteria
 - Reference Concept
 - Weightings
- Rate Concepts
 - Scale (+ – 0) or (1–5)
 - Compare to Reference Concept or Values
- Rank Concepts
 - Sum Weighted Scores
- Combine and Improve
 - Remove Bad Features
 - Combine Good Qualities
- Select Best Concept
 - May Be More than 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



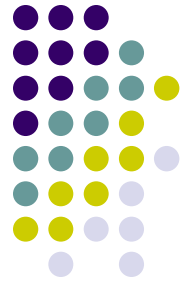
| SELECTION CRITERIA | CONCEPT VARIANTS | | | | | | | REF. |
|--------------------|------------------|-----|----|----|-----|----|-----|------|
| | A | B | C | D | E | F | G | |
| Ease of Handling | 0 | 0 | - | 0 | 0 | - | - | 0 |
| Ease of Use | 0 | - | - | 0 | 0 | + | 0 | 0 |
| Number Readability | 0 | 0 | + | 0 | + | 0 | + | 0 |
| Dose Metering | + | + | + | + | + | 0 | + | 0 |
| Load Handling | 0 | 0 | 0 | 0 | 0 | + | 0 | 0 |
| Manufacturing Ease | + | - | - | 0 | 0 | - | 0 | 0 |
| Portability | + | + | - | - | 0 | - | - | 0 |
| PLUSES | 3 | 2 | 2 | 1 | 2 | 2 | 2 | |
| SAMES | 4 | 3 | 1 | 5 | 5 | 2 | 3 | |
| MINUSES | 0 | 2 | 4 | 1 | 0 | 3 | 2 | |
| NET | 3 | 0 | -2 | 0 | 2 | -1 | 0 | |
| RANK | 1 | 3 | 7 | 5 | 2 | 6 | 4 | |
| CONTINUE? | Yes | Yes | No | No | Yes | No | Yes | |

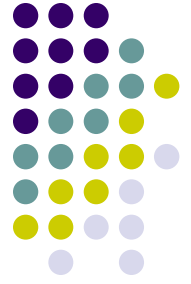


Example: Concept Scoring

| | | Concepts | | | | | | | |
|-------------------------|--------|-------------------------------------|----------------|------------------|----------------|-----------------|----------------|-------------------|----------------|
| | | A (reference) Master Cylinder | | DF Lever Stop | | E Swash Ring | | G+ Dial Screw+ | |
| Selection Criteria | Weight | Rating | Weighted Score | Rating | Weighted Score | Rating | Weighted Score | Rating | Weighted Score |
| Ease of Handling | 5% | 3 | 0.15 | 3 | 0.15 | 4 | 0.2 | 4 | 0.2 |
| Ease of Use | 15% | 3 | 0.45 | 4 | 0.6 | 4 | 0.6 | 3 | 0.45 |
| Readability of Settings | 10% | 2 | 0.2 | 3 | 0.3 | 5 | 0.5 | 5 | 0.5 |
| Dose Metering Accuracy | 25% | 3 | 0.75 | 3 | 0.75 | 2 | 0.5 | 3 | 0.75 |
| Durability | 15% | 2 | 0.3 | 5 | 0.75 | 4 | 0.6 | 3 | 0.45 |
| Ease of Manufacture | 20% | 3 | 0.6 | 3 | 0.6 | 2 | 0.4 | 2 | 0.4 |
| Portability | 10% | 3 | 0.3 | 3 | 0.3 | 3 | 0.3 | 3 | 0.3 |
| Total Score | | 2.75 | | 3.45 | | 3.10 | | 3.05 | |
| Rank | | 4 | | 1 | | 2 | | 3 | |
| Continue? | | No | | Develop | | No | | No | |

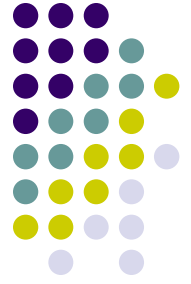
Concept Selection Exercise: Mechanical Pencils





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

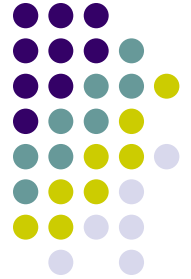
- Select the best concept.

The goal of concept selection is to

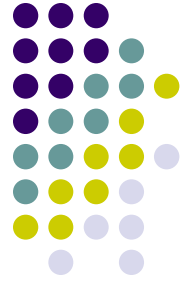
- Develop the best concept.

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.

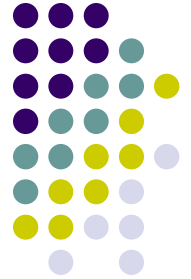


Next Week

- 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”

