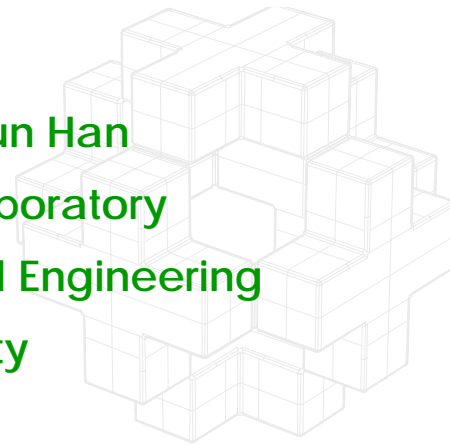
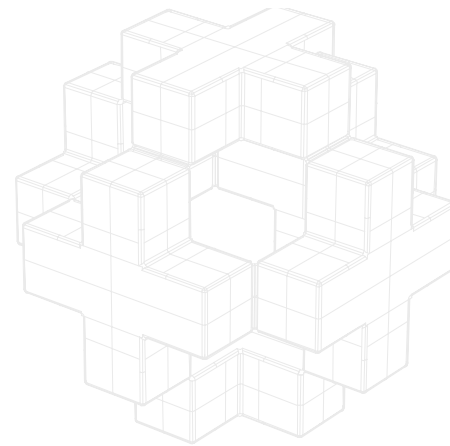

Chemical Product Design

Sungwoo Cho and Chonghun Han
Intelligent Process Systems Laboratory
School of Chemical and Biological Engineering
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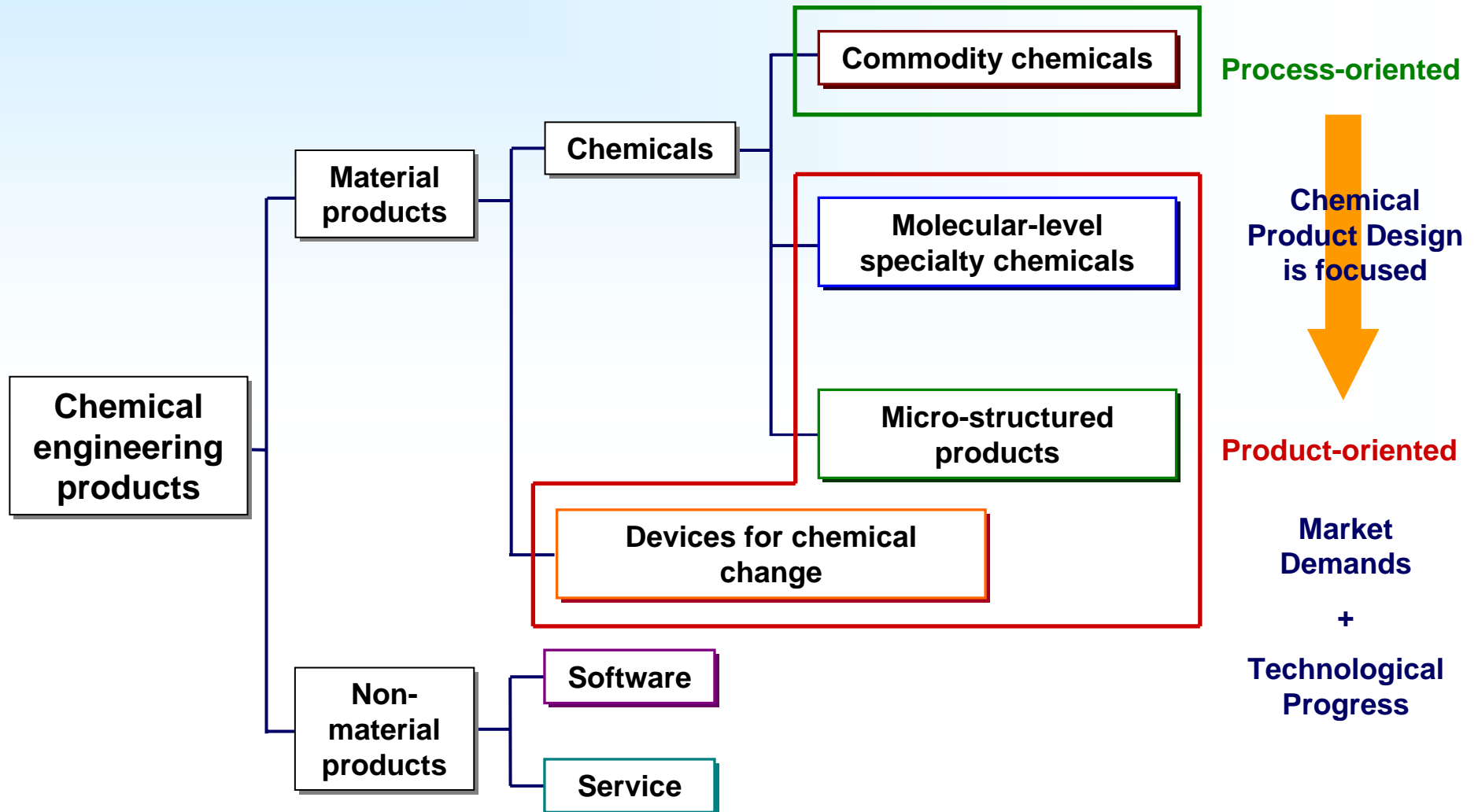


PART II. Chemical Product Design

- Chemical Engineering Product
- Procedure



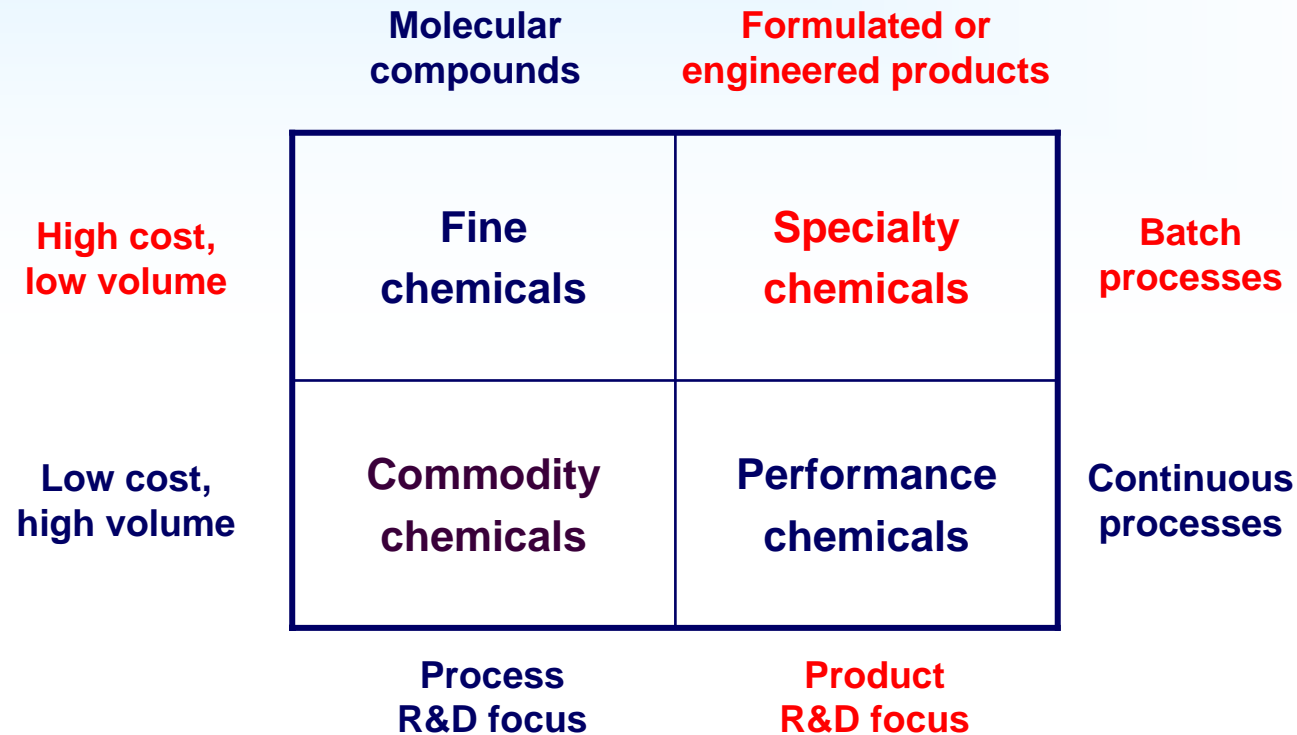
Chemical Engineering Product



Chemical Engineering Product

Chemicals

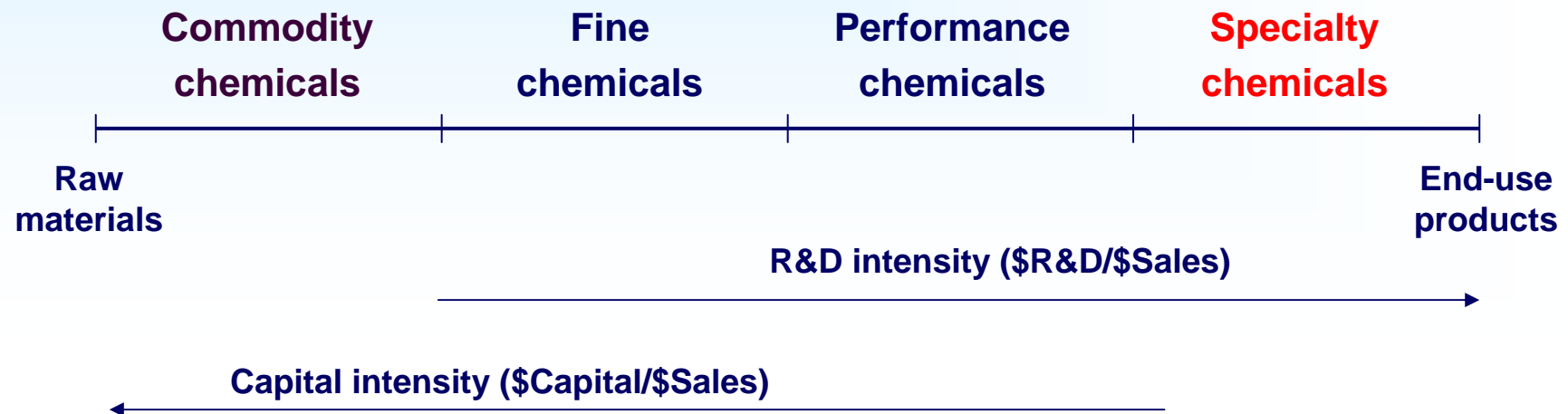
L.Louis Hegedus, "Chemical Engineering Research of the Future: An Industrial Perspective," *AIChE Journal*, **51**, 1870-1871 (2005).



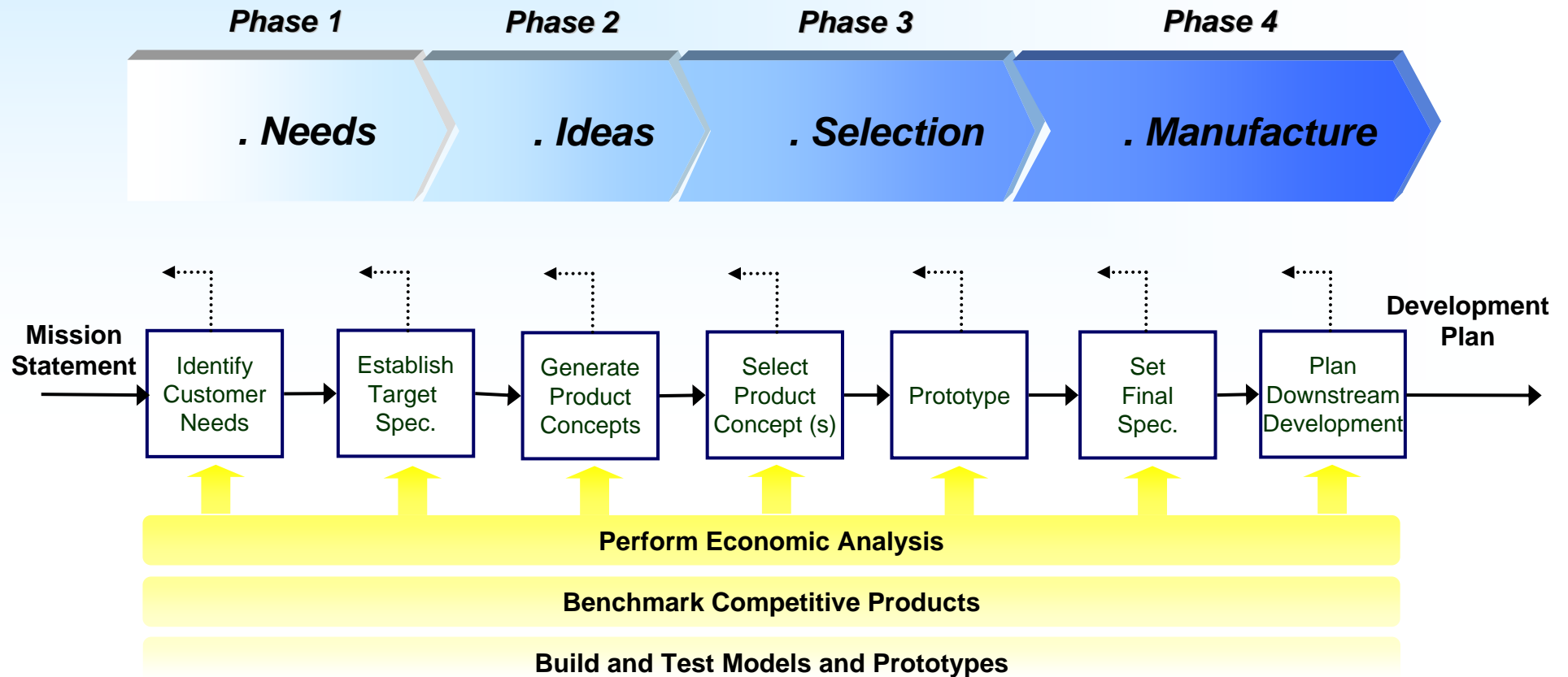
Chemical Engineering Product

Chemicals

L.Louis Hegedus, "Chemical Engineering Research of the Future: An Industrial Perspective," *AIChE Journal*, **51**, 1870-1871 (2005).

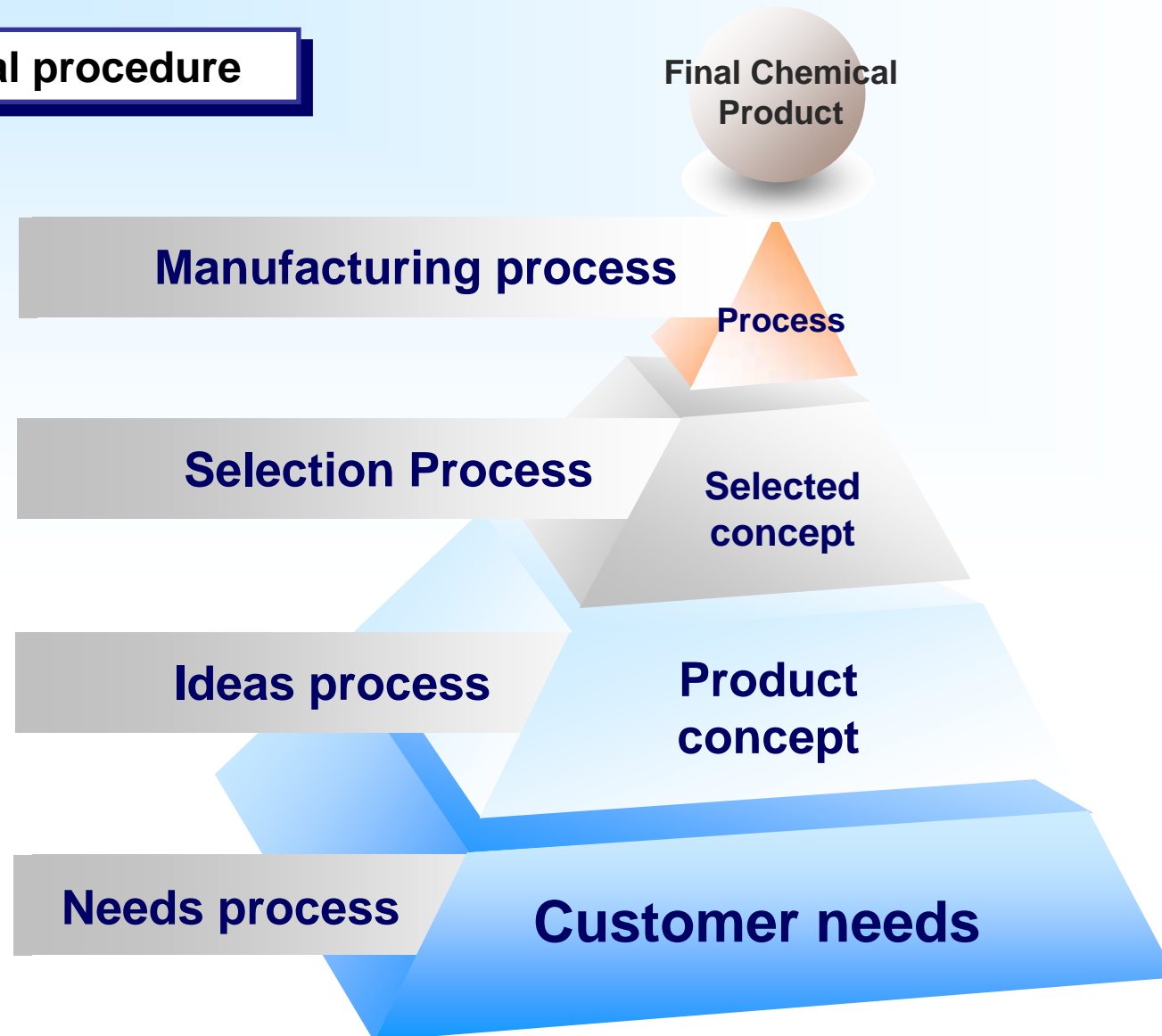


Product design procedure



Product design procedure

Hierarchical procedure



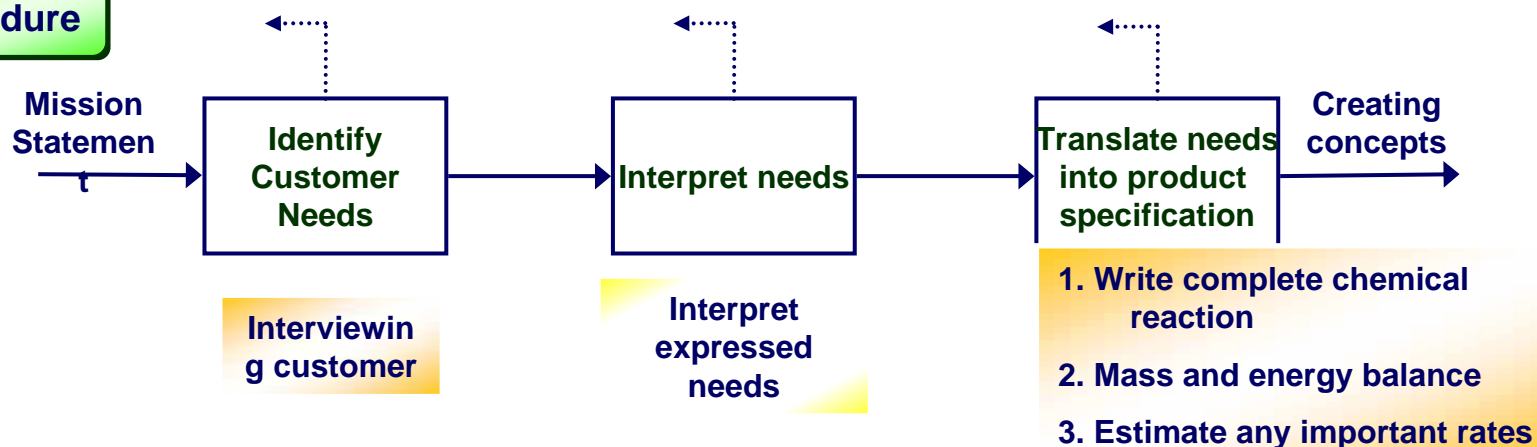
Chemical product design procedure

Need

Goals

- Ensure that the product is focused on customer needs.
- Identify latent or hidden needs as well as explicit needs.
- Provide a fact base for justifying the product specifications.
- Create an archival record of the needs activity of the development process.
- Ensure that no critical customer needs is missed or forgotten.
- Develop a common understanding of customer needs among members of the development team.
- Convert needs into particular product specification

Procedure



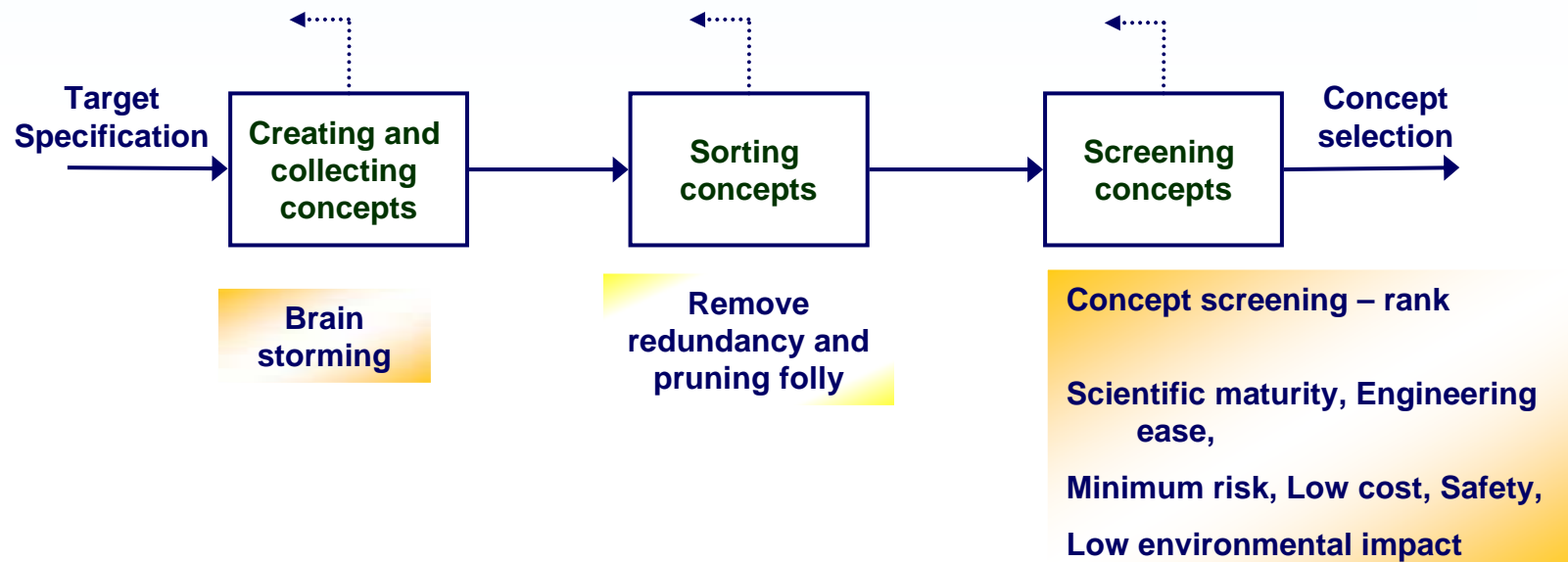
Chemical product design procedure

Idea

Concept generation

- DuPont – 300 ideas to get a good product, 3M – says 10 ideas, Zeneca & Pfizer – says 100 ideas
- Sources vary – customers, consultants, coworkers, literature such as patent and archival

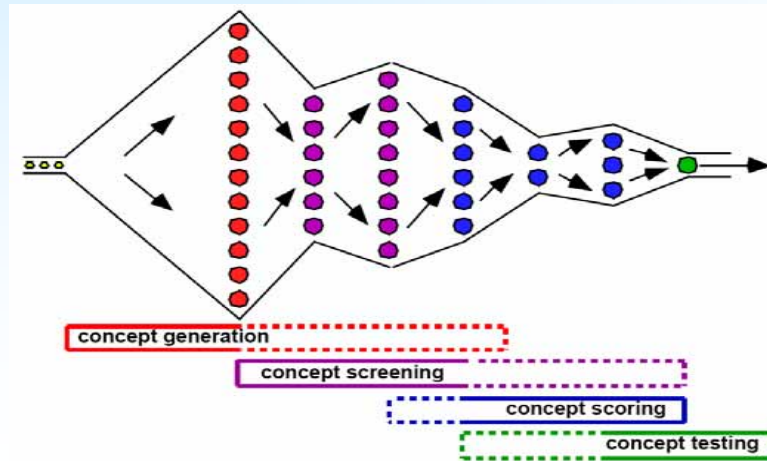
Procedure



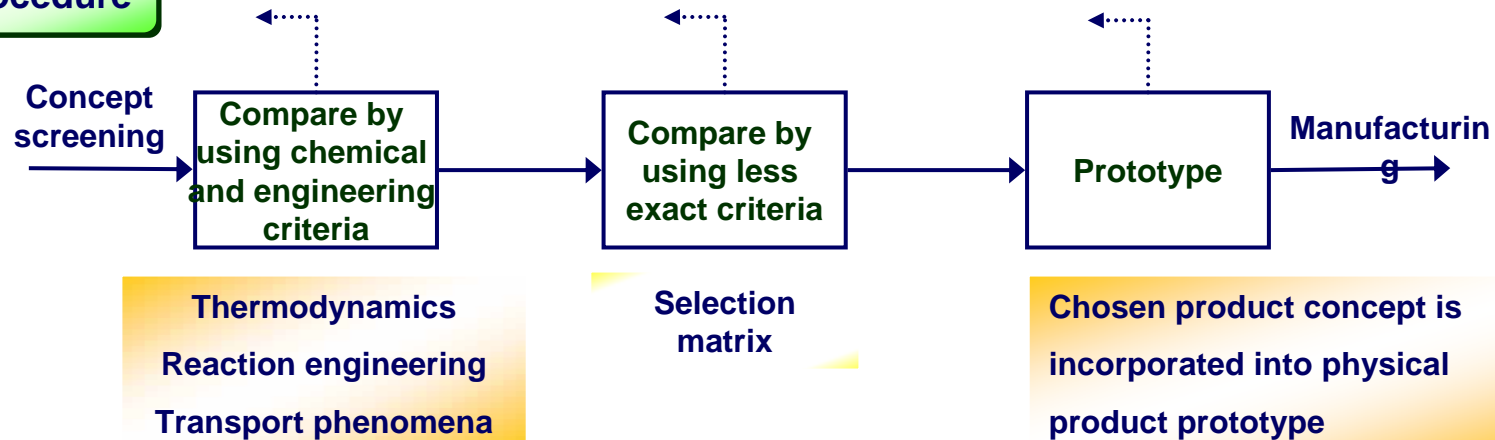
Chemical product design procedure

Selection

Concept Selection



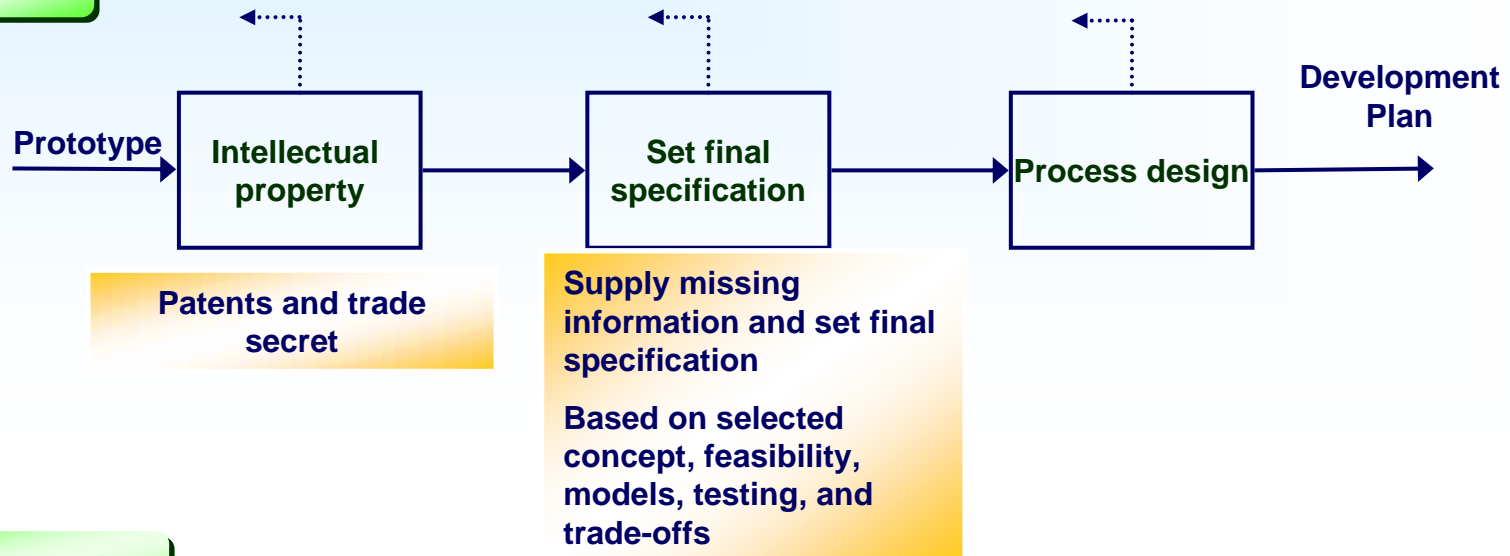
Procedure



Chemical product design procedure

Manufacture

Procedure



Process design

- Generic equipment which is used for several different products
- Not optimized for one product but designed for flexibility
- Different reaction do not use several different reactor
- Suspicious of any improvement of process
- Separation : crystallization and adsorption