Process Selection and Product Design

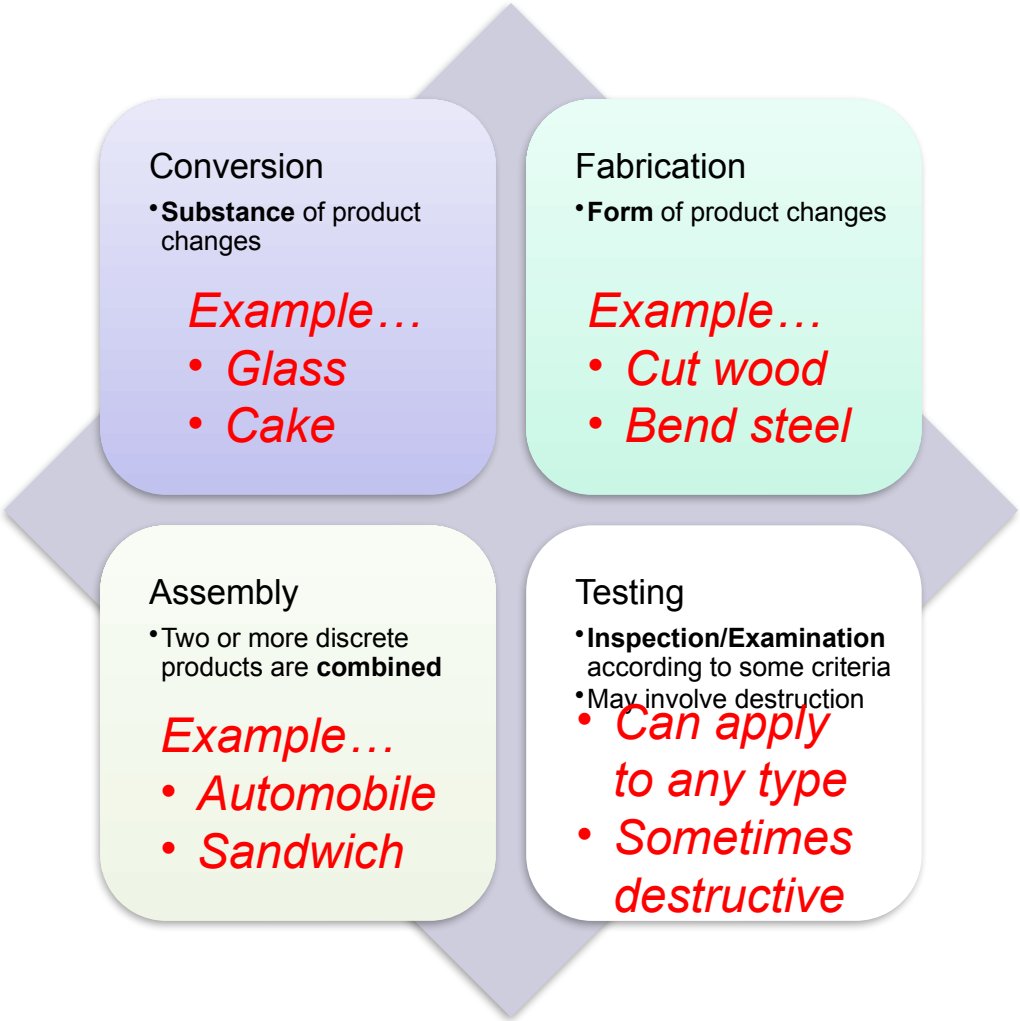
KELLEY SCHOOL OF BUSINESS

INDIANA UNIVERSITY

Reminders/Announcements

- ???

Types of Processes



Process Flow Structures

Job Shop

- Made to order
- Wide variety of products in a variety (usually low) of quantities, jumbled flow

Batch

- Wide variety (standard subset) of products, moderate quantities, jumbled flow with some dominance

Assembly Line

- Low variety, high volume, dominant line flow
- Similar output or process

Continuous Flow

- Commodity product, highest volume, dominant flow

An organization may use many structures; one is generally dominant…

- Custom cake
- Car repair

- Bakery
- Clothing

- Appliances
- Fast food (Subway)

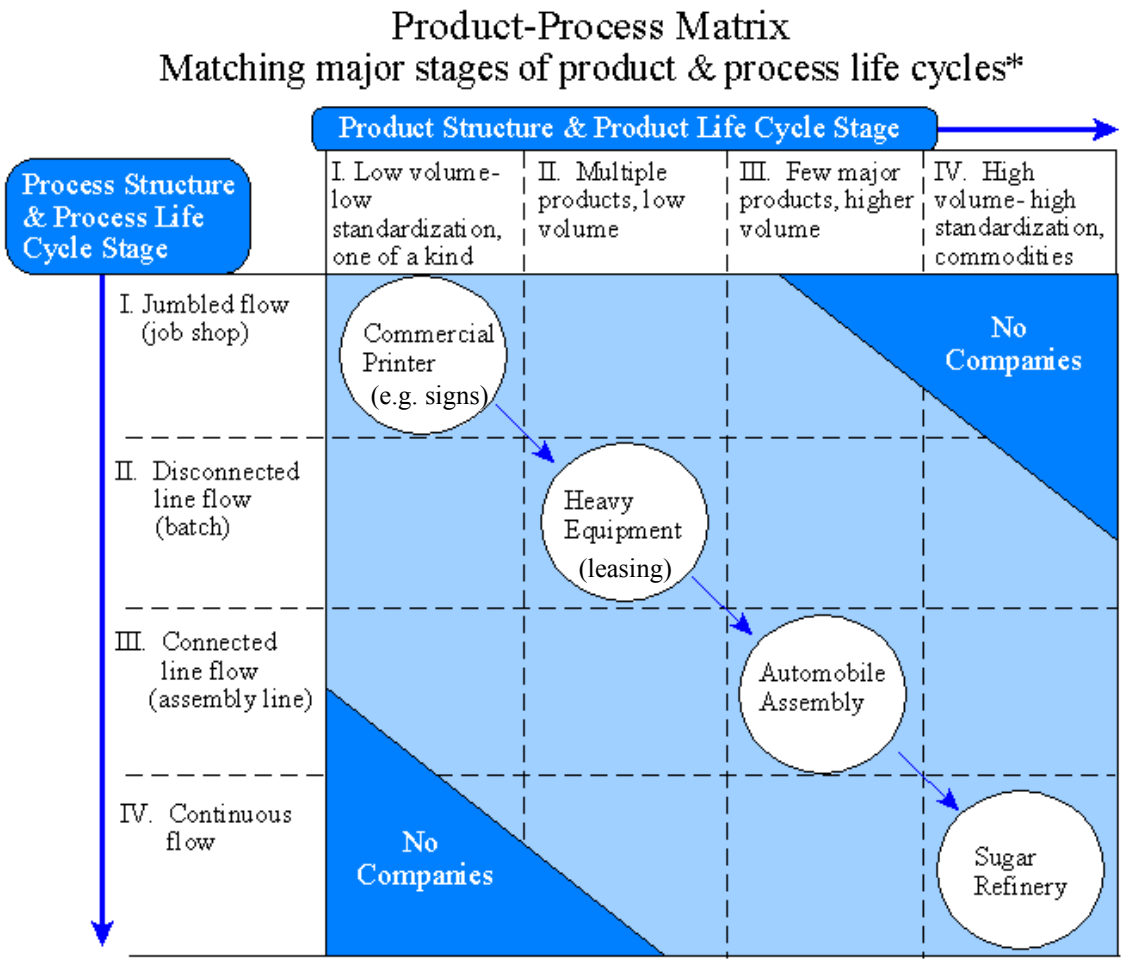
- Electricity
- Petroleum

Process Flow Type Characteristics

Attribute	Job Shop/Batch	Assembly/Continuous
Volume/Variety	Low/High	High/Low
Capacity Measured	Inputs *(how many can we make?)*	Outputs *(how much do we need?)*
Competition	Non-cost	Cost
Process Stages	Separate, flow varies	Linked, standard flows
Equipment	General	Specialized
Work In Process	High	Low
Size *(not always…)*	Small	Large
Flexibility	Very/Somewhat	Limited/Not at all
Labor Content	High	Low

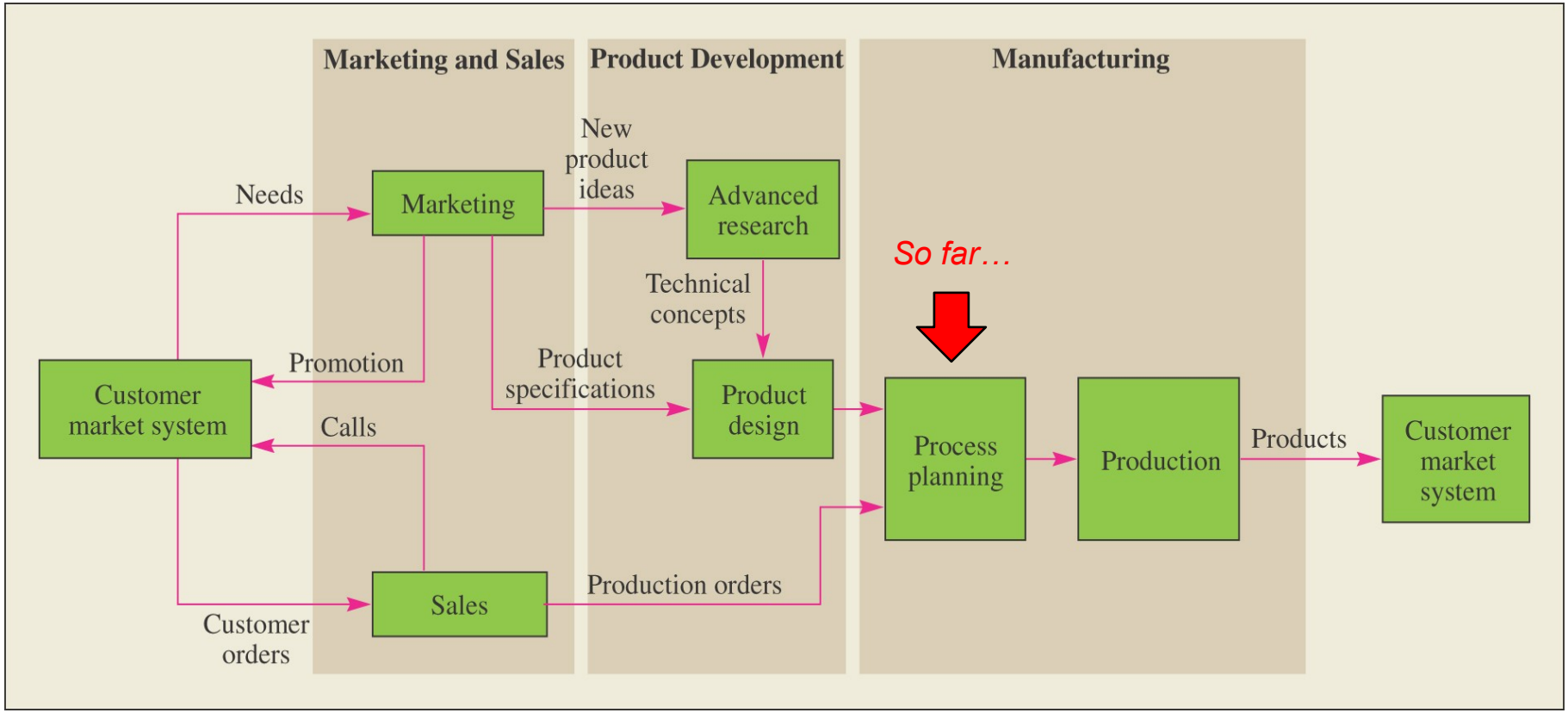
The Product-Process Matrix

- **Efficiency "rides the diagonal"**
- **Watch out for "drift"**



* Adapted from Hayes & Wheelwright, Exhibit 1, p. 135.

Product Development Process



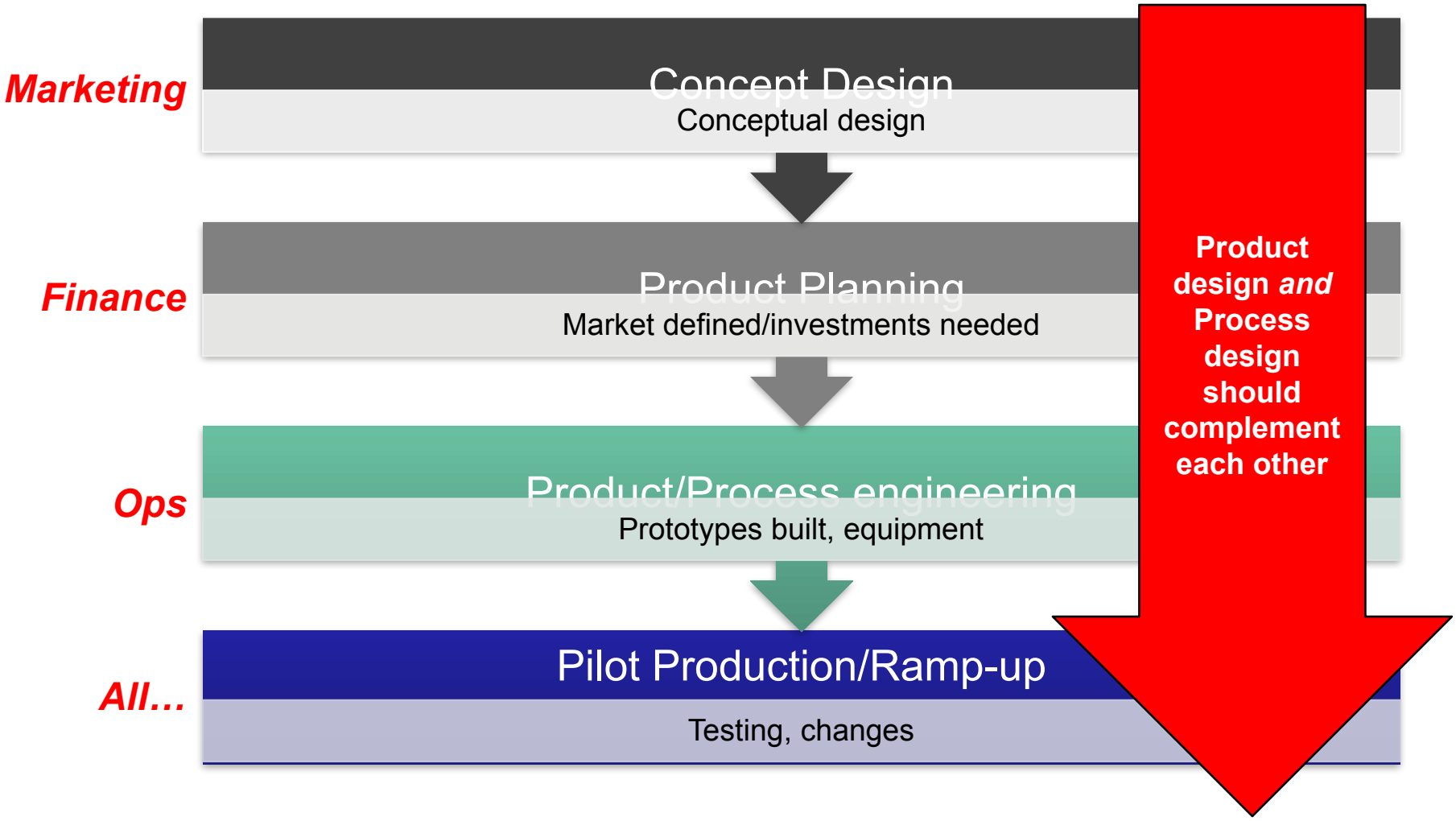
Multi-functional…

Marketing…
- What does the customer want?
- Volume of demand?
- Variety? Low cost? …?

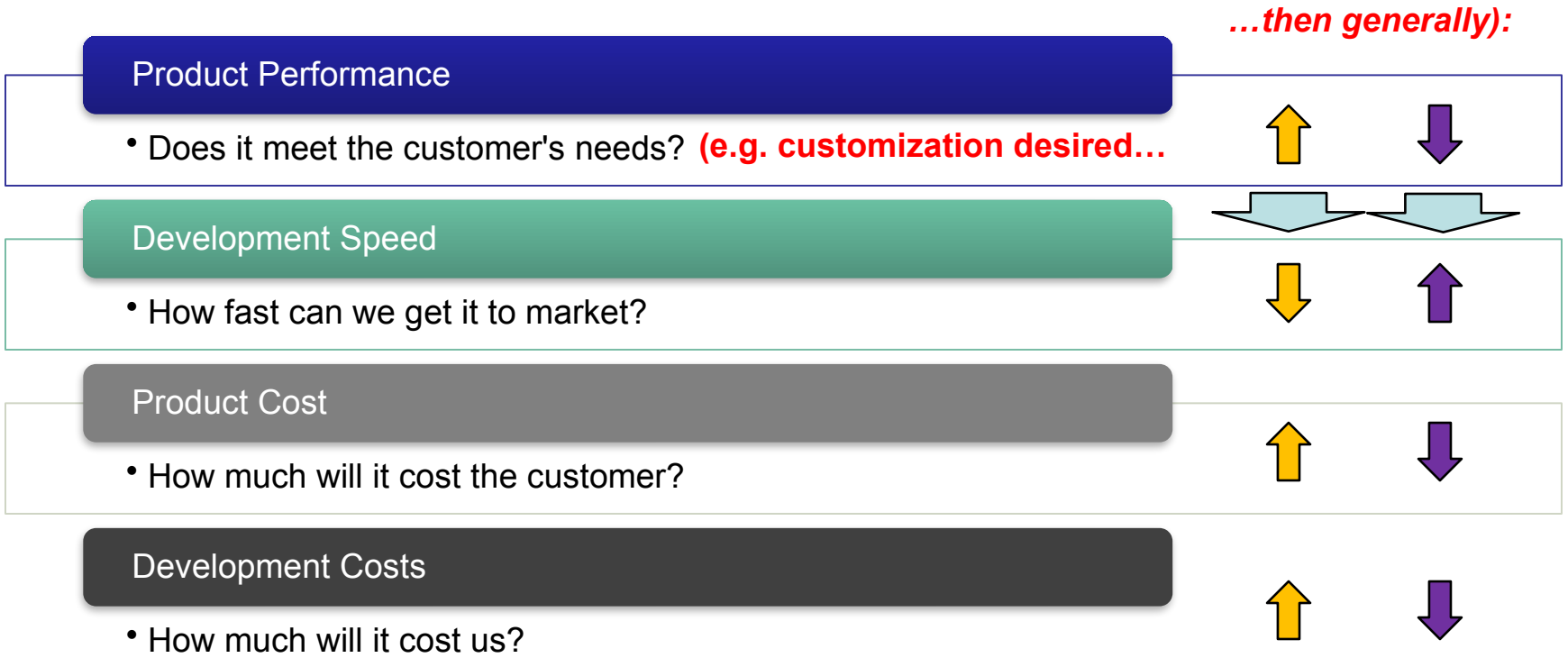
Finance…
- What investments are needed?
- Profitability requirements…?

Operations…
- What kind(s) of process(es) are needed?
- How will we source and make this?

Product Design Process



Product Development Tradeoffs



How do you manage these decisions as you go…?

Quality Function Deployment (QFD)

Requires the use of cross-functional work teams

Uses customer needs/desires/requirements

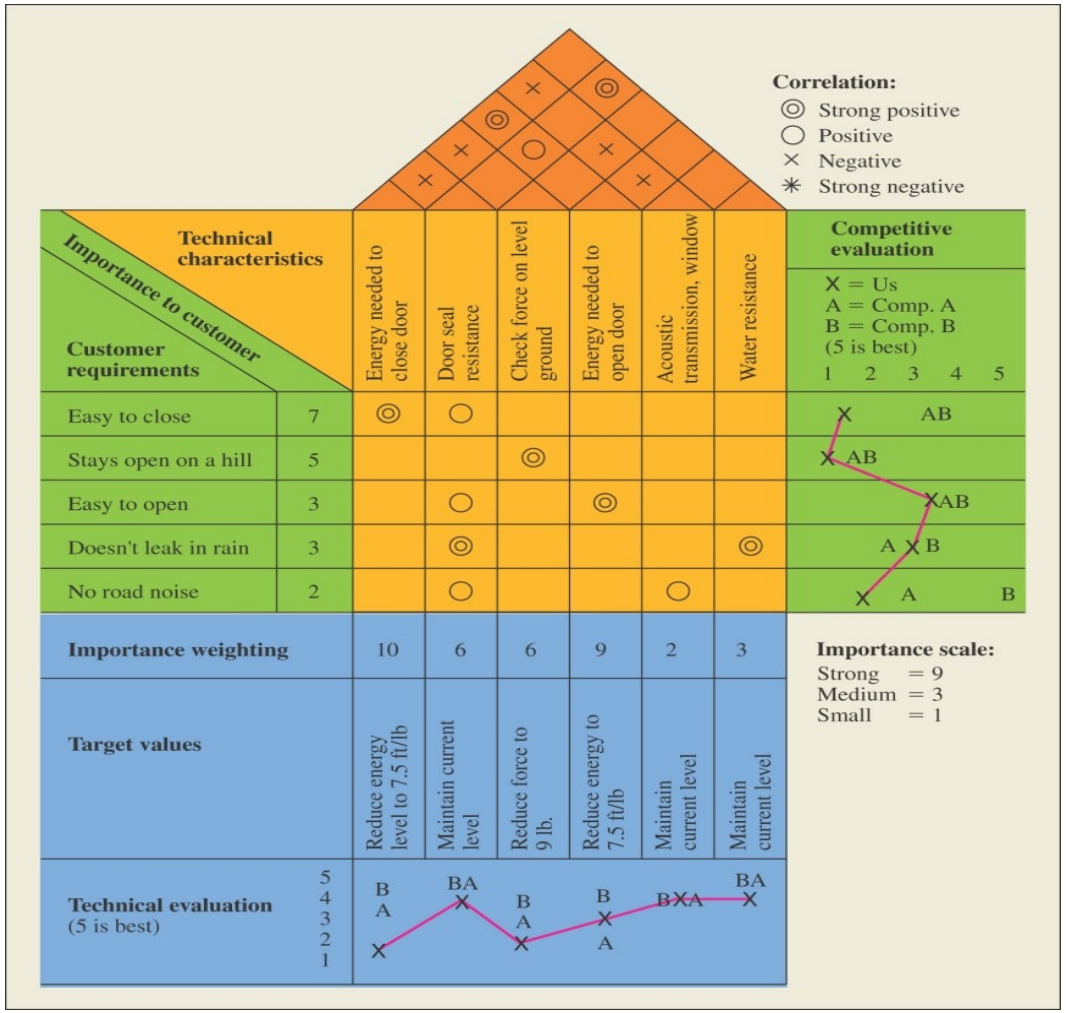
Primary tool is the House of Quality

Gives common ground/language to the development process

Quality Matrix for a Car Door

Walkthrough…

- Customer rates “easy to close” at the top (7) – MKTG
- Strong positive correlation with “energy needed to close door” tech characteristic – MKTG/OPS
- (Off chart) Finance might help with a cost/benefit to improve performance – FIN
- Engineering gives this an importance of 10 (probable because we’re behind the competition on this important attribute) – OPS/MKTG
- Engineering sets a target value (7.5 ft/lb); work on the product and process design improvements needed – OPS



Linking Design and Manufacturing

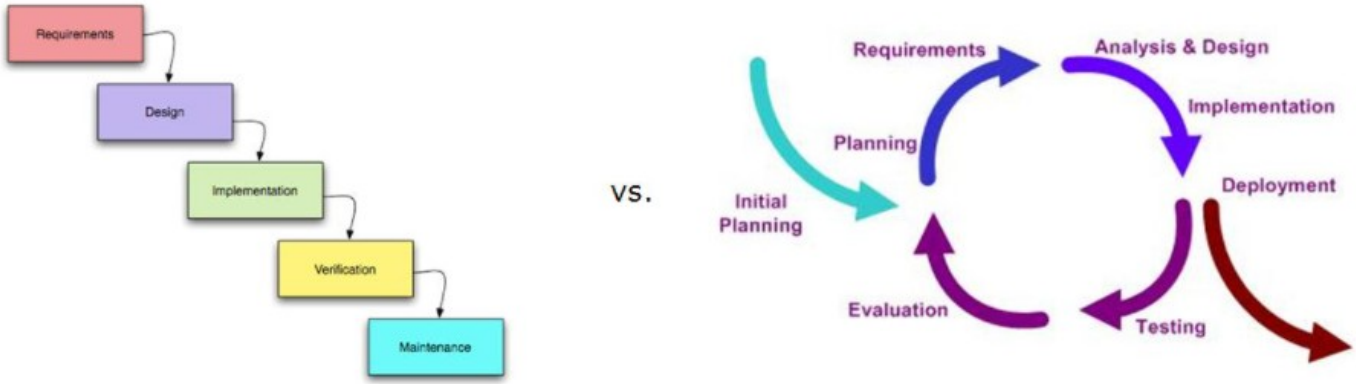
Design for Manufacturability

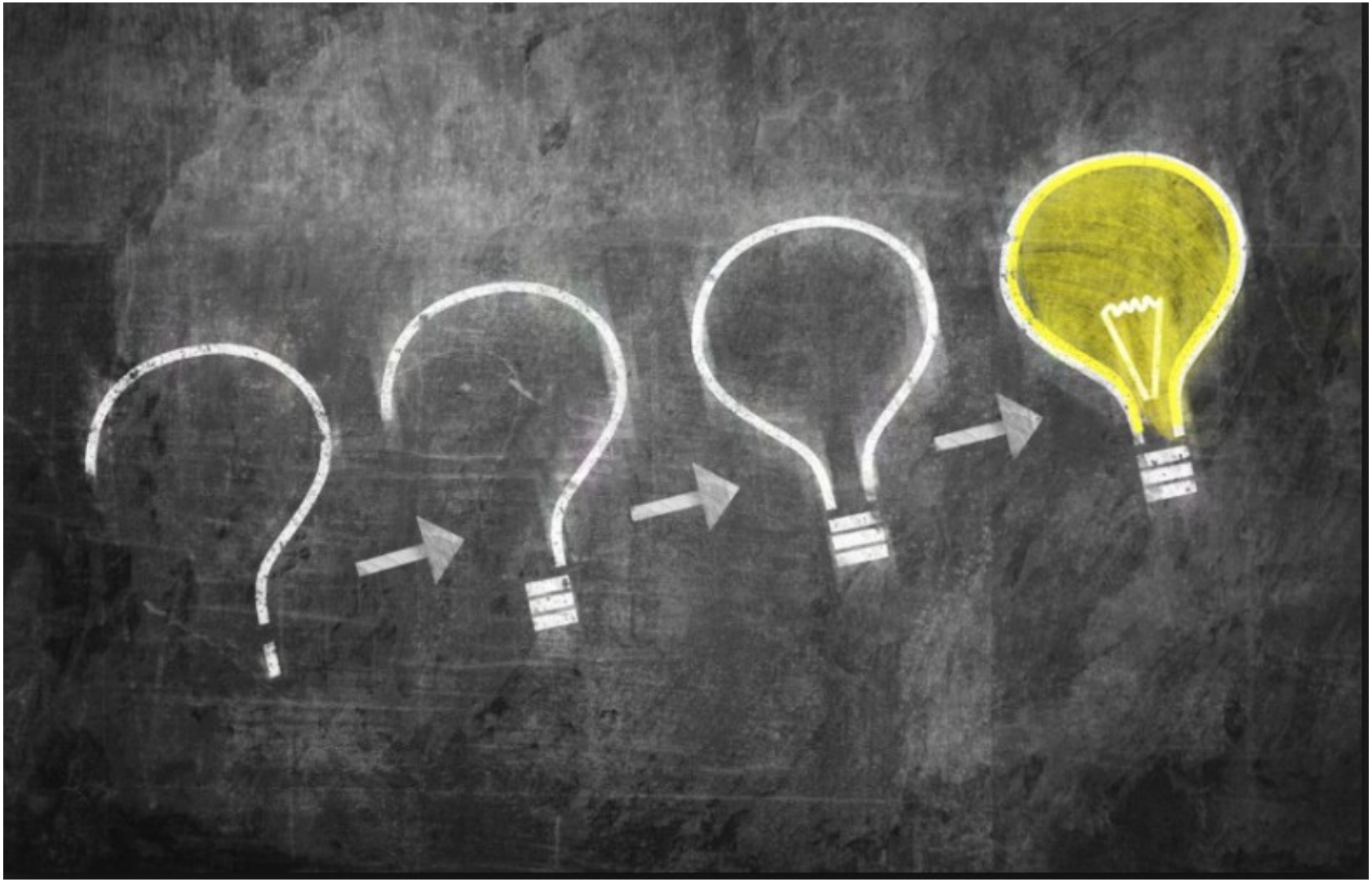
Frequency of Design Changes

Opportunity for Product Design Changes

Concurrent Engineering

Traditional vs. Concurrent Engineering:





Reminders

- Week 3 quiz and industry article **due midnight Sunday**
- Prep for next lecture: Service System Management