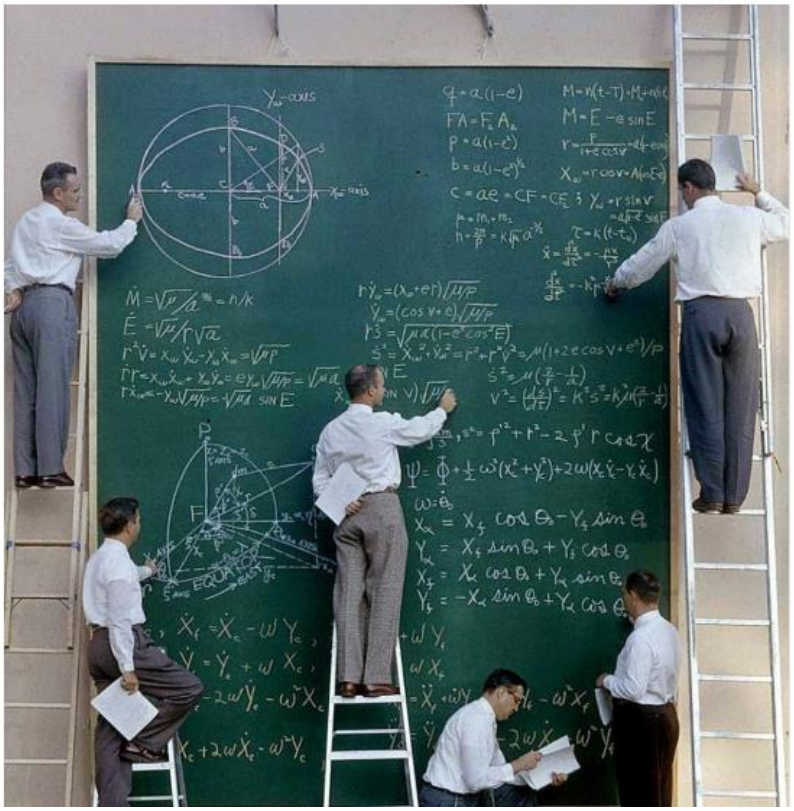
Why new product development (NPD) is important

NASA scientists with their board of calculations, 1961



Through NPD, a need can be realized into a physical product

Need for complex calculations → Physical product

Why new product development (NPD) is important

Economy

Supreme Court orders sale of only BS VI compliant vehicles from April 2020

Which component(s) would require most changes??

BS IV → BS VI

In order to continuing selling products, companies would have develop new product owing to regulatory needs

Why new product development (NPD) is important

Ford
EcoSport

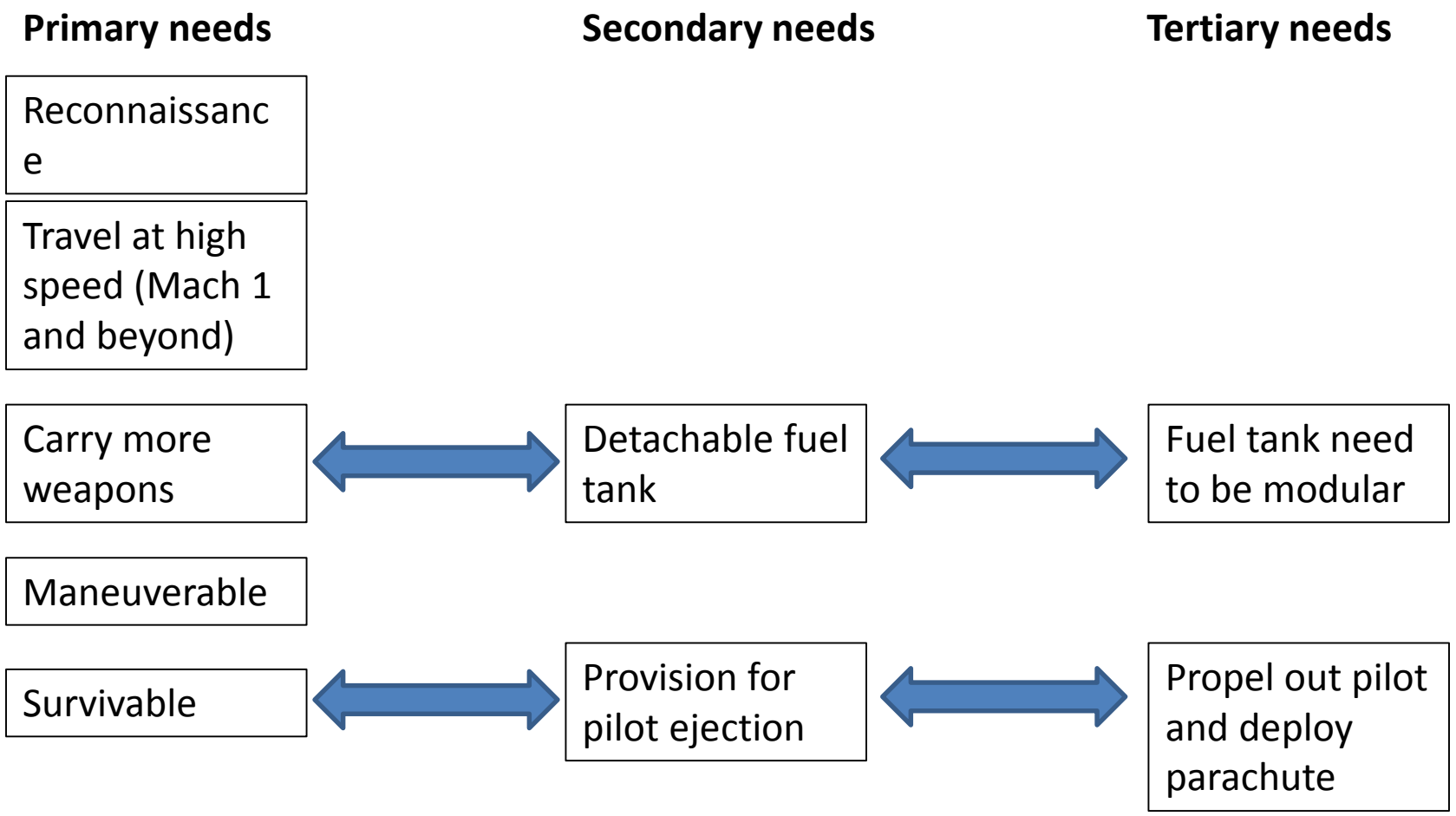
Tata
Nexon

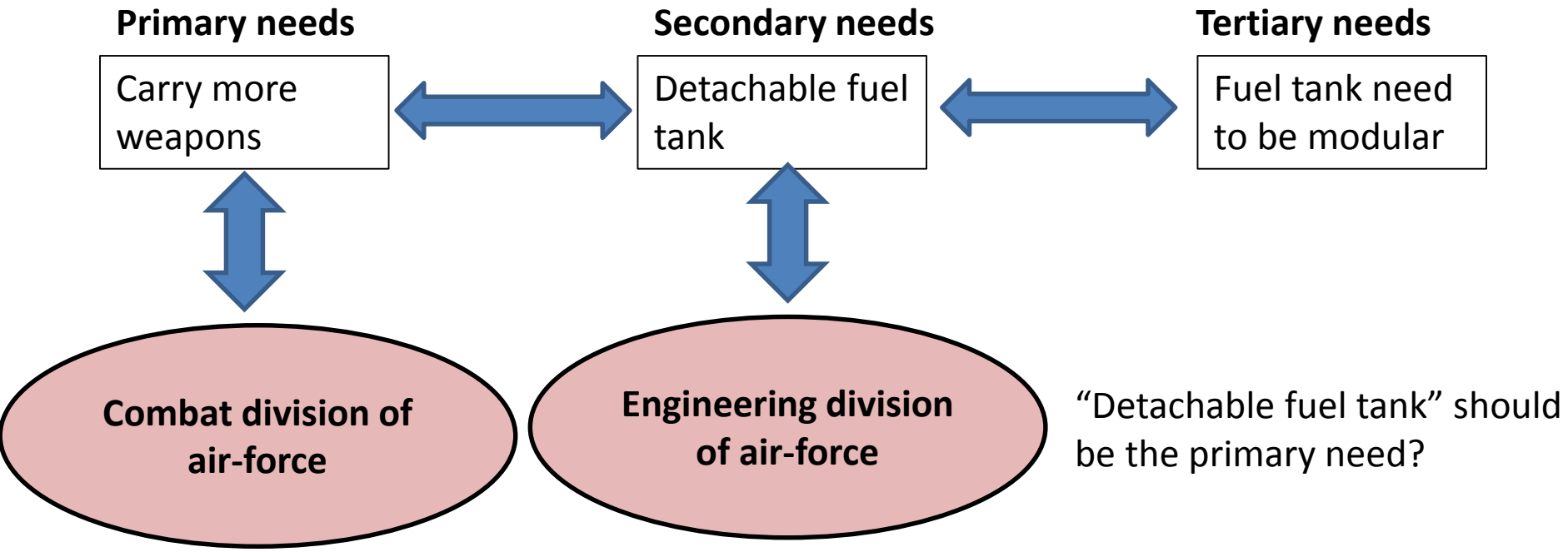
In order to gain competitive advantage in the new market segment, it is imperative to manufacturers to carry out new product development

F-18 vs Sam

https://www.youtube.com/watch?v=P37ONmUq7aY

Customer needs





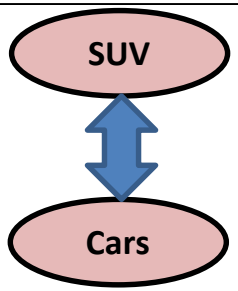
Customer needs and their respective level must be defined from the perspective of primary user

The Generic product development process

Abstract product

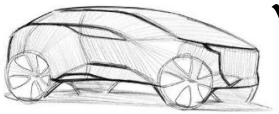
Concrete product

Planning & need identification



- ✓ Market size estimation
- ✓ Need assessment etc.

Concept development



- ✓ Industrial design concepts
- ✓ Tentative specifications

System-level design

- ✓ Finalizing the broad specifications of individual system (Fuel tank, Tires etc.)

Detail design

- ✓ Detailing individual systems/component/parts
- ✓ Engineering drawings, manufacturing instructions

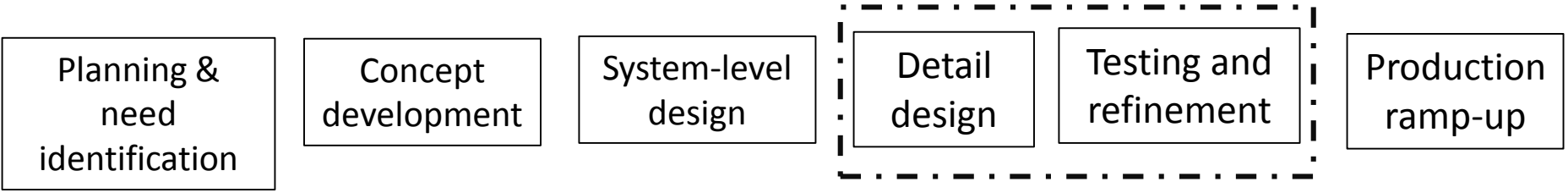
Testing and refinement

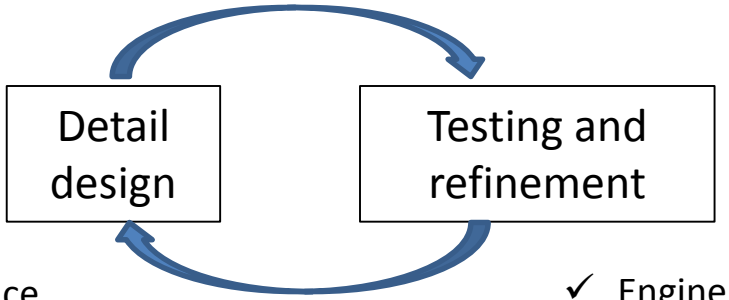
- ✓ Prototype testing
- ✓ Internal trail/customer trails

Production ramp-up

- ✓ Mass production

Spiral product development





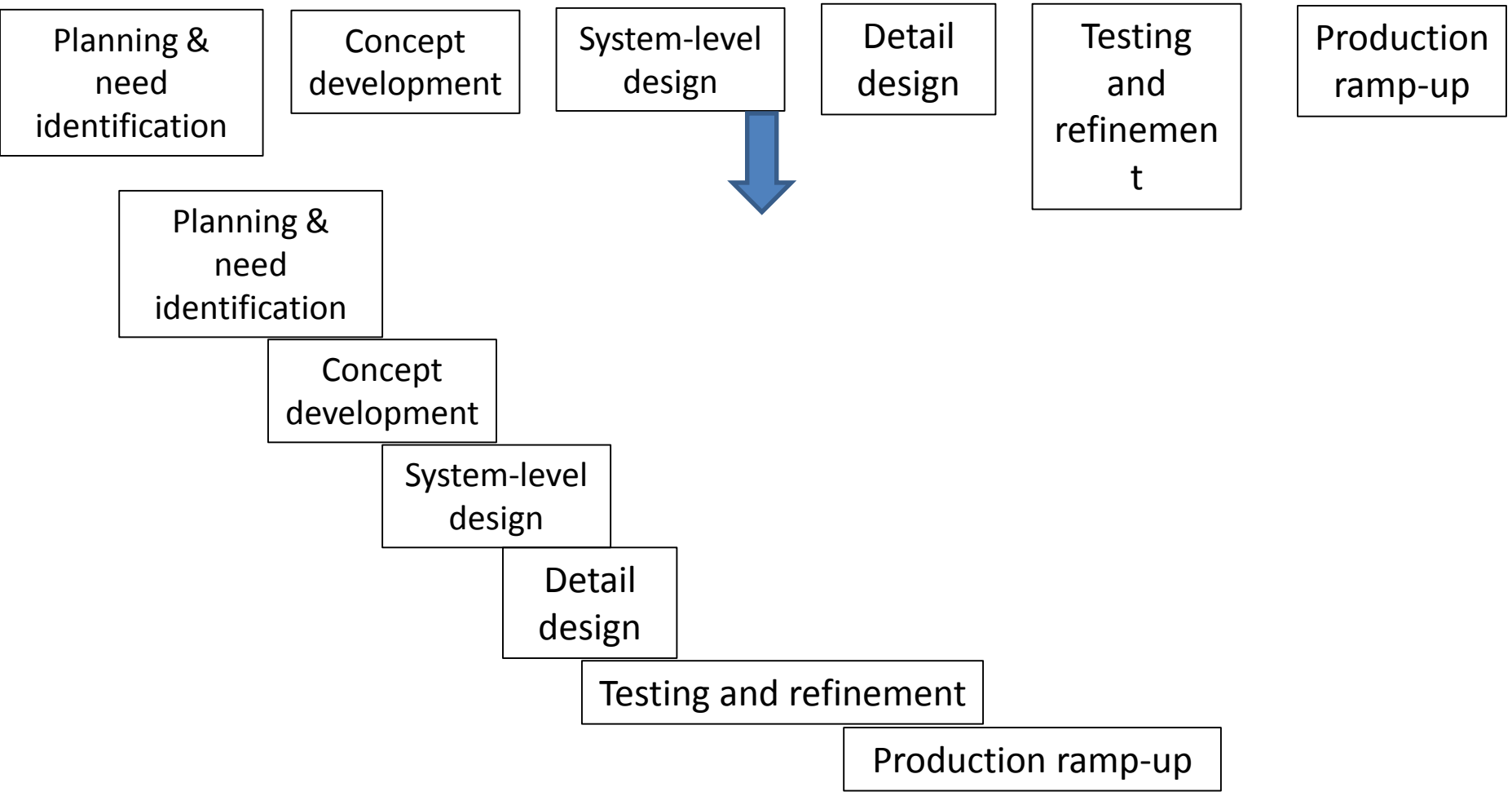
- ✓ Introduce additional cooling
- ✓ Turbo model of operations

- ✓ Engine overheating
- ✓ Low acceleration

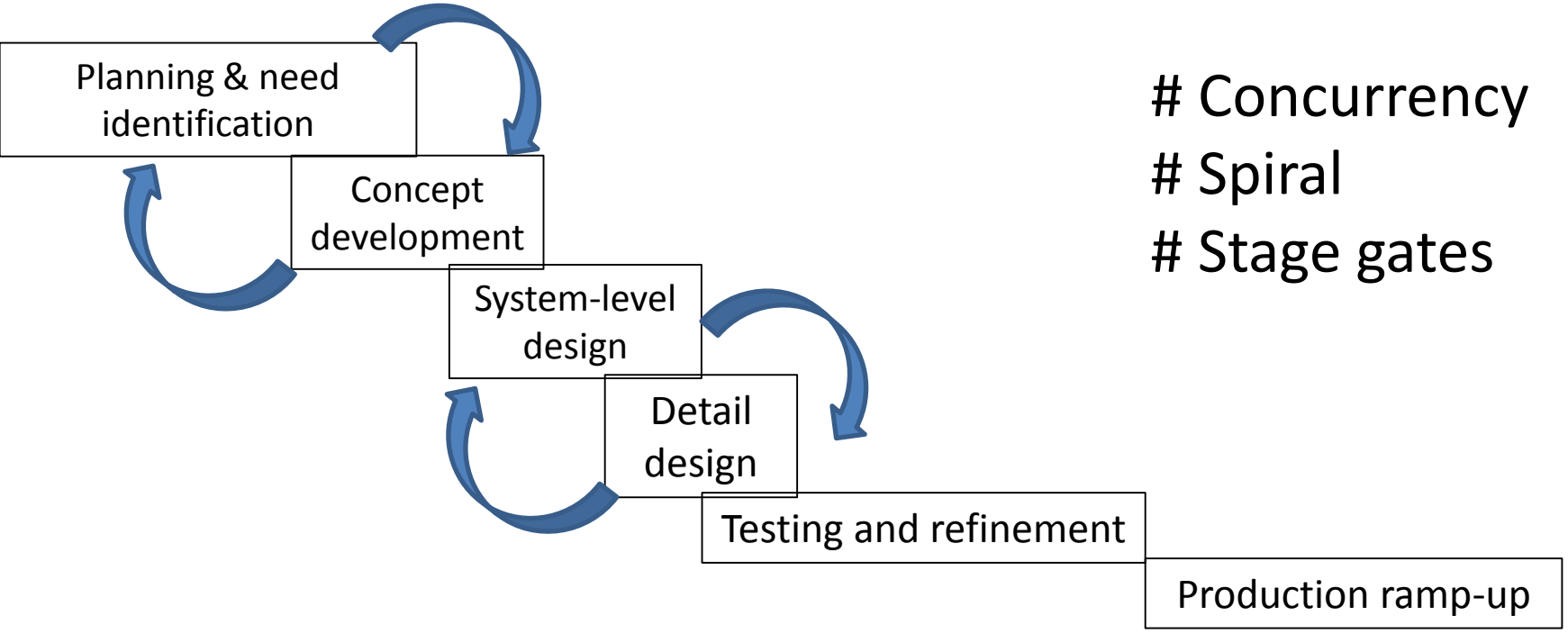
Intermittent stages might have many iteration cycles

Concurrent product development

Generic product development process – stage gate process



Product development process in reality



Concurrency
Spiral
Stage gates

TTM (Time to market)

Generic product development

vs.

Concurrent product development

Major benefit out of concurrent product development?

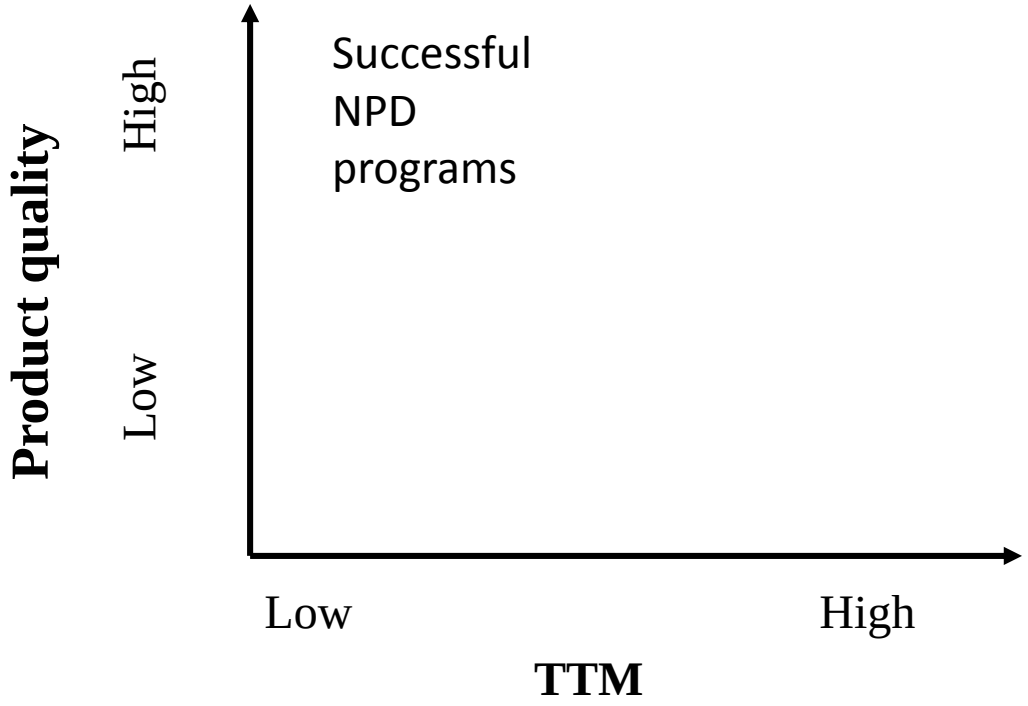
TTM (time to market)

Time from project initiation to availability of product in the market

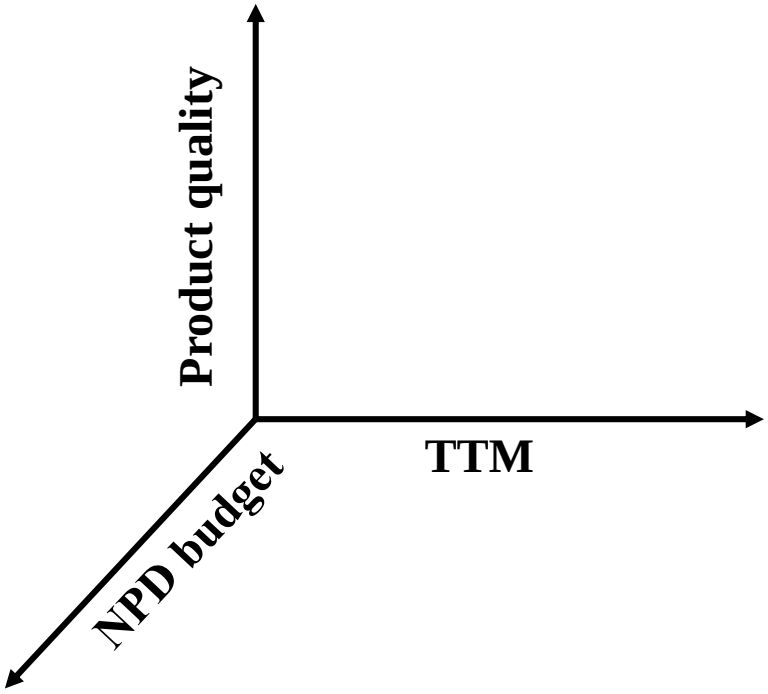
Implications of being late to the market

TTM and other factors

Can you view TTM in isolation as far as product development success is concerned?



TTM and other factors



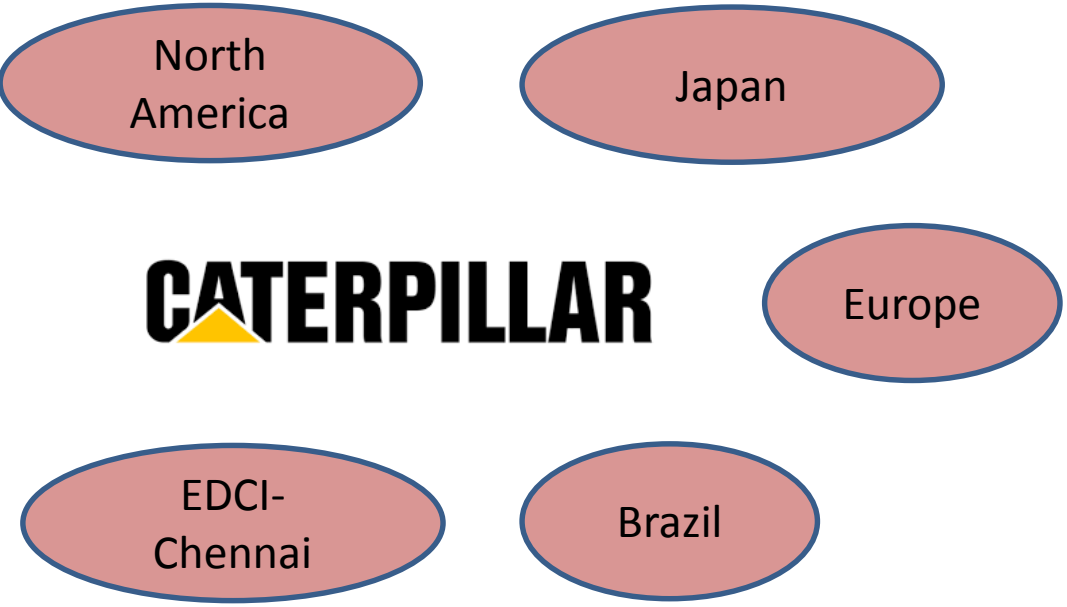
Best case for a NPD program??

Case 1: Fast TTM and overbudgeted NPD

Case 2: Late to market and underbudget/right on budget NPD

In a market with 20% annual growth and 12% price-drop per annum, technological products which arrive on the market six months late but on budget generate 33% less profit over five years, whereas getting the product to market on time but 50% over budget only reduces profits by 4% (Ali et al., 1995)
 # Journal of Product Innovation Management

The Product development team



- ✓ Access to information about regional markets
- ✓ Distributed technical expertise
- ✓ Cost savings through lower wages
- ✓ Outsourcing to increase product development capacity

Distributed product development team

Product complexity

Excavators

Wheel-loader

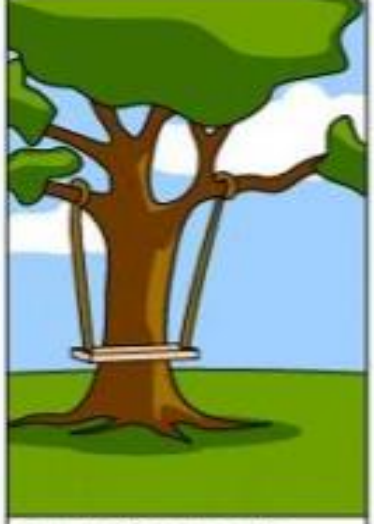
Backhoe-loader

Given everything remaining same, which set of products the OEM is likely to make?

Wheel tractor scraper

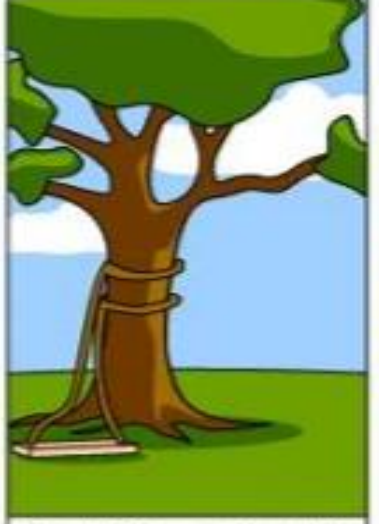
Dozer

How the customer explained it



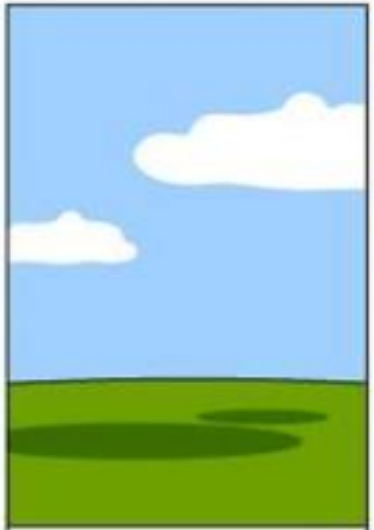
How the Project Leader understood it

How the Analyst designed it

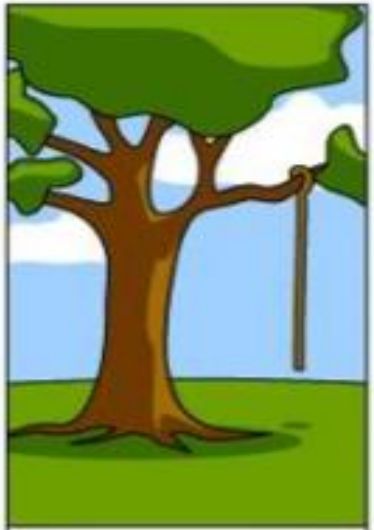


How the Programmer wrote it

How the Business Consultant described it

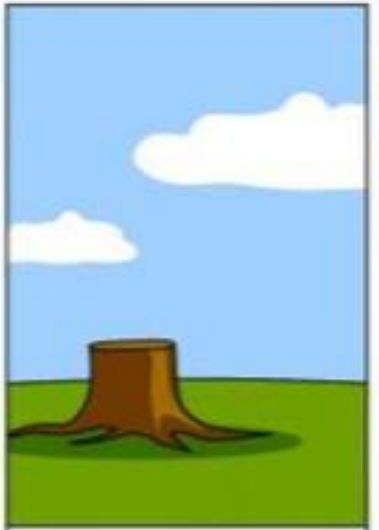


How the project was documented



What operations installed

How the customer was billed



How it was supported

What the customer really needed

Bad Design Can Kill You!

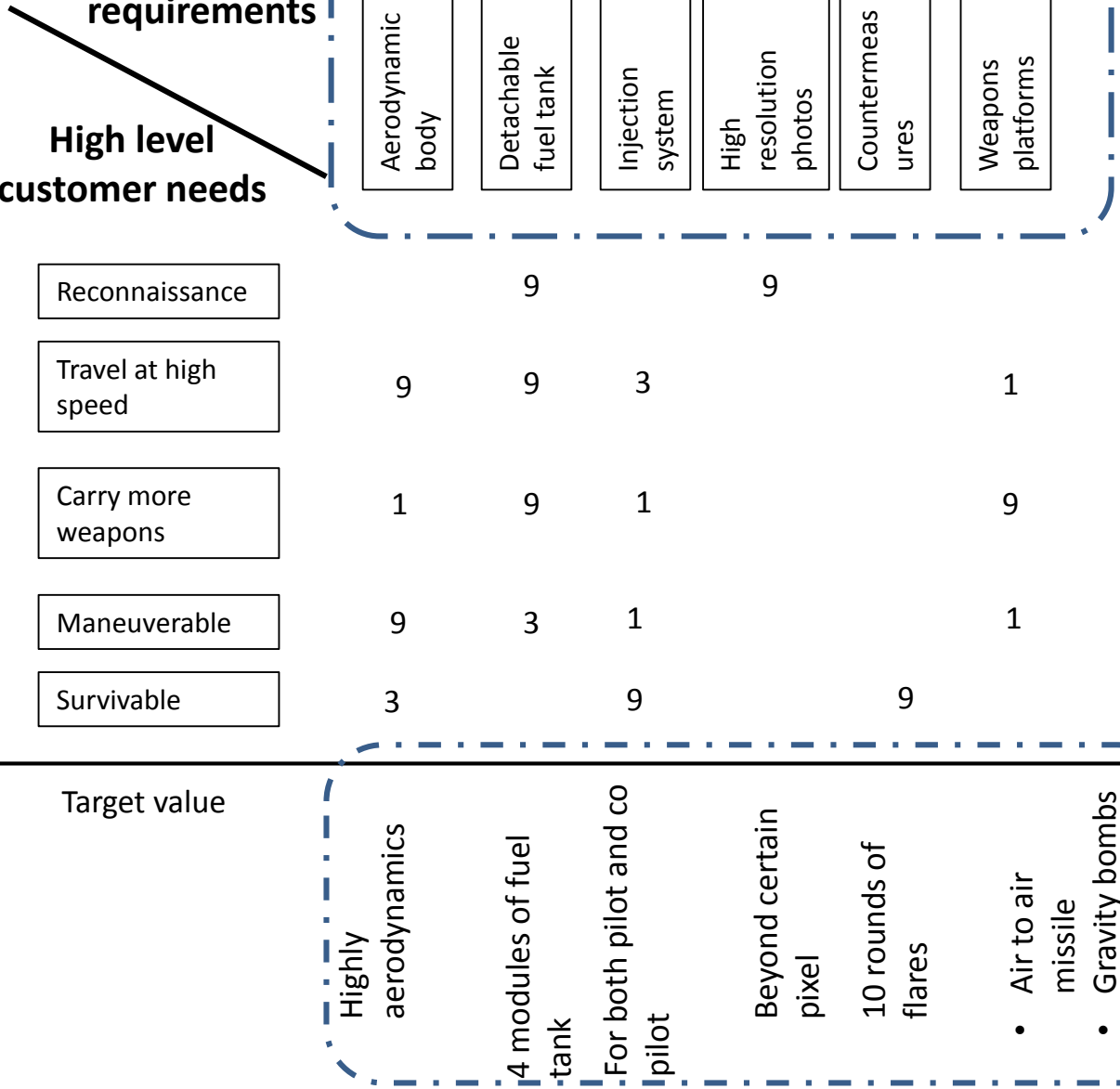
So What Can We DO?

- So we need a process to better understand what is needed ….
- We need to make sure our design will meet the goal of the customer.

Requirements Specifications Process

QFD (Quality function deployment)

QFD (Quality function deployment)

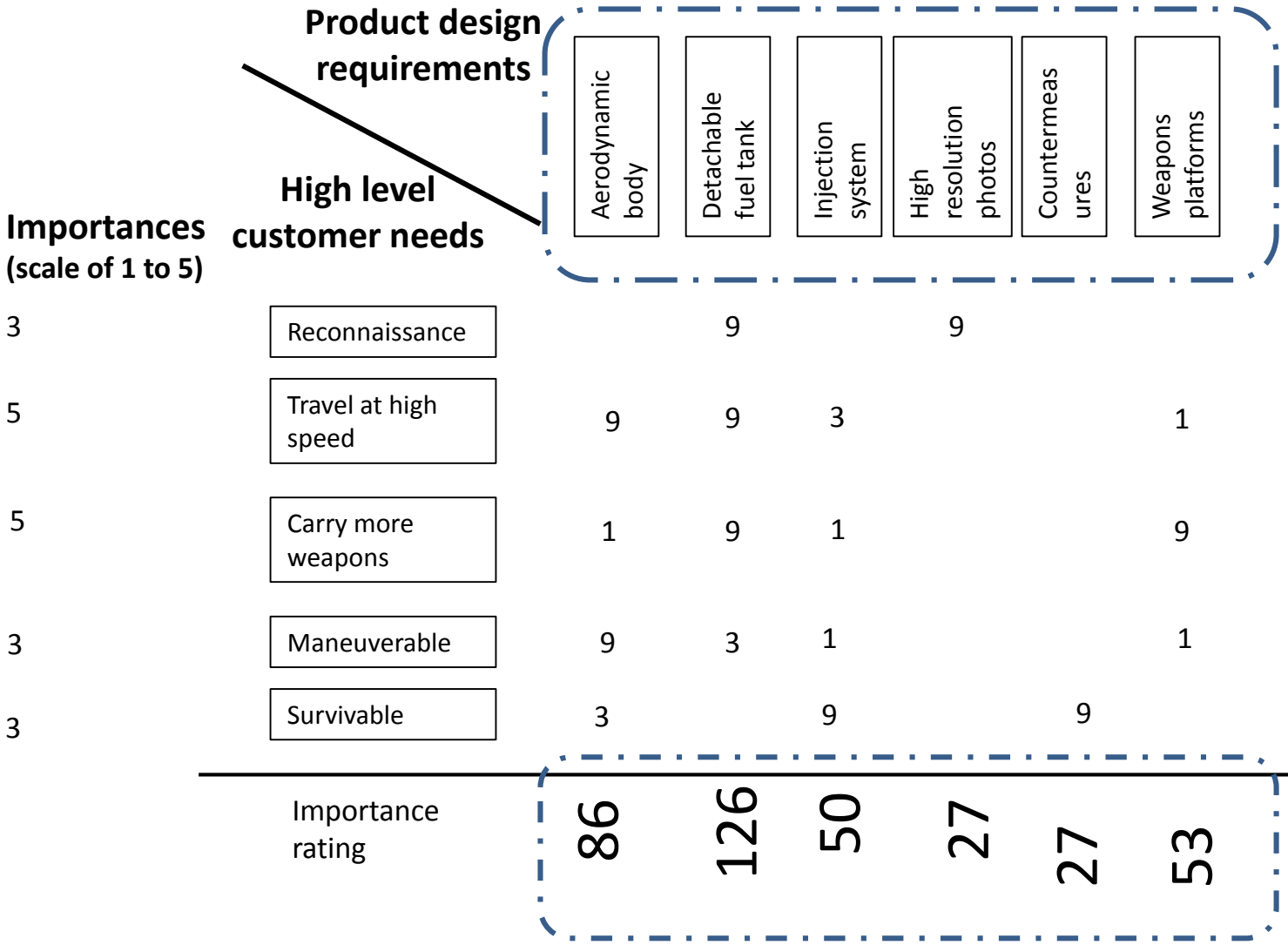


SR – Strong relationship (**9**)
MR – Medium relationship (**3**)
WR – weak relationship (**1**)

1) Extent to which customer needs are related to individual product design requirements

2) Importances customer place on individual customer needs

3) Specific target values of the requirement

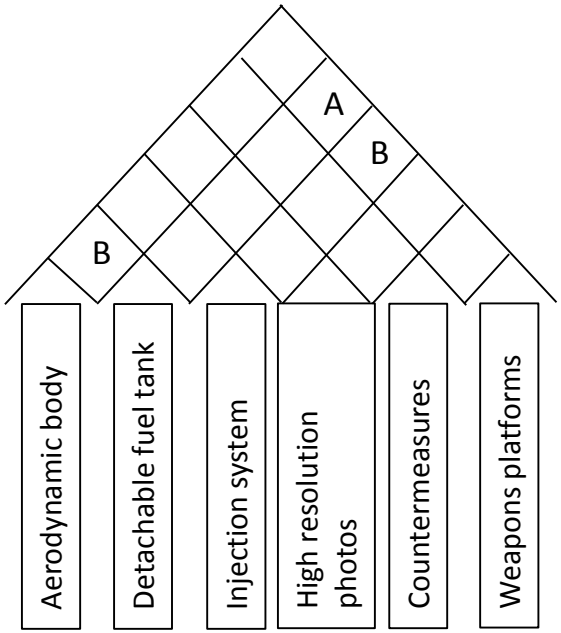


SR – Strong relationship (**9**)
MR – Medium relationship (**3**)
WR – weak relationship (**1**)

4. Priority of individual product design requirements

5. Relationship amongst different product design requirements

Product design requirements



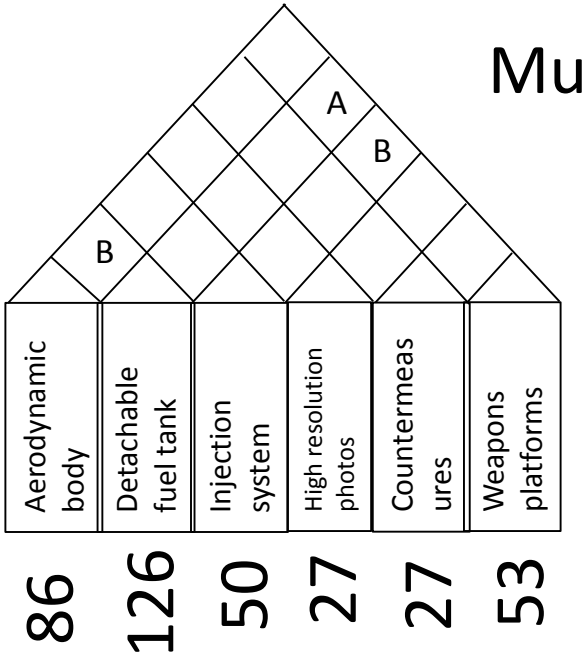
A – Strong negative

B – Mild negative

C – Mild positive

D – Strong positive

Multi-role fighter jet



Mid air refueler

QFD should not performed for a product in isolation. One also need to see other products in the portfolio and their interactions