Design for Low Cost

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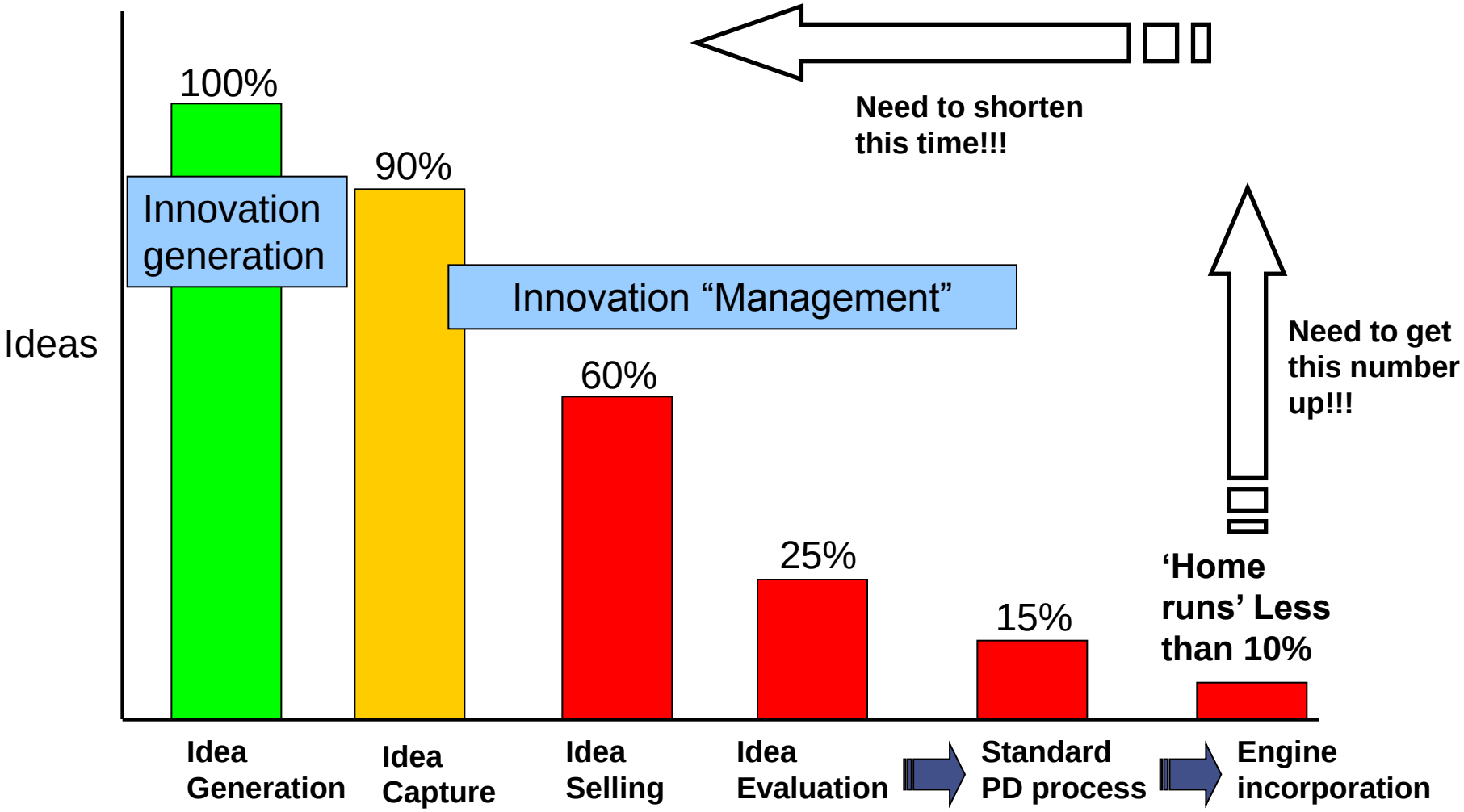
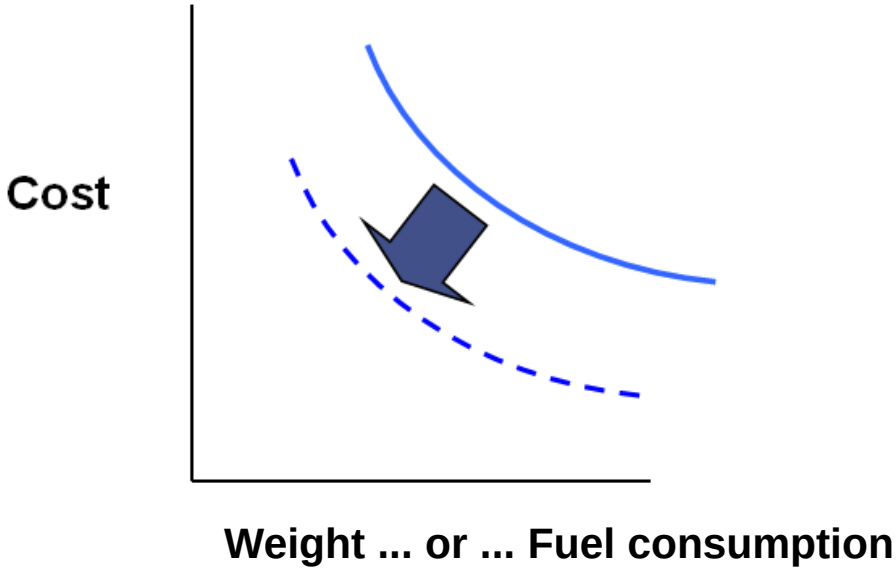
Challenge 1 - Idea Mortality



Challenge 2 – win-win v. trading of attributes

- Move away from viewing the only way of improving Cost is by trading for another parameter e.g. weight, or performance
- Continue to make Cost more numeric, more articulate to facilitate those trades
- Need to recognise that there are numerous WIN – WIN ideas out there…. we just have to find them …
- Generate innovative designs, aligned to optimum manufacturing methods to produce better – more cost efficient designs …..
- BUT with the same part / system functionality …. or better!



Overview of toolsets

Product Tear Down

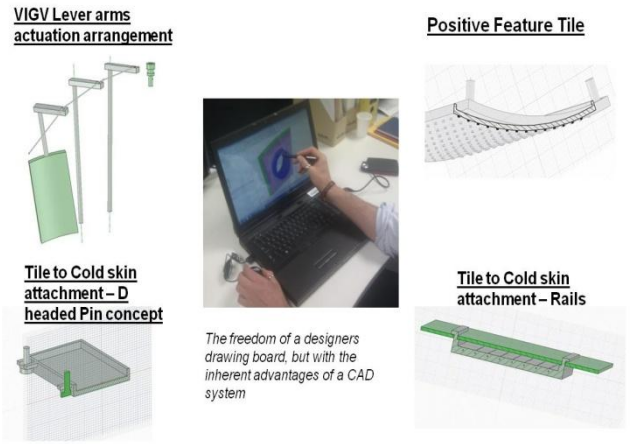
The tear down really makes you think differently !!

1-2-1 Brainstorming

128 ideas from 1-2-1 paired teams

One to one brainstorming is a better method than in groups !!

Real time Concept Design



Fast, real time computer aided concept design provides an order of magnitude decrease in time & resource

Rapid Prototyping

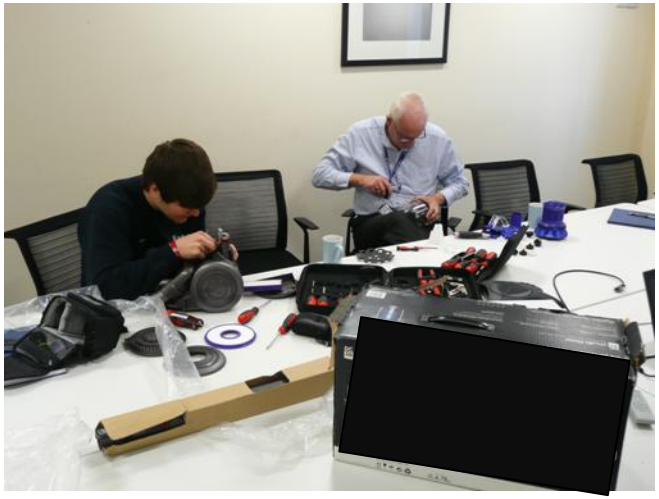
SCU Engineering Exec: "Im impressed …. I want regular updates of where these ideas are"

IPT meetings have halved in time because of the RP model

Toolset 1 – Product tear down

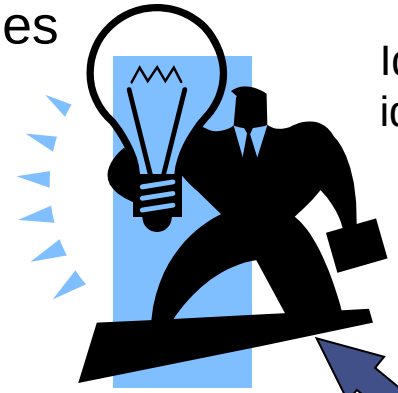
Why a tear-down can help your teams to identify cost reduction opportunities

- Cost is a team sport
- Enhances Innovation
- Good engineering practice
- Direct Lessons
- IT IS FUN



Toolset 2 - 1-2-1 Brainstorming

- Work in pairs
- Eliminates dominate personalities
- Involves everyone



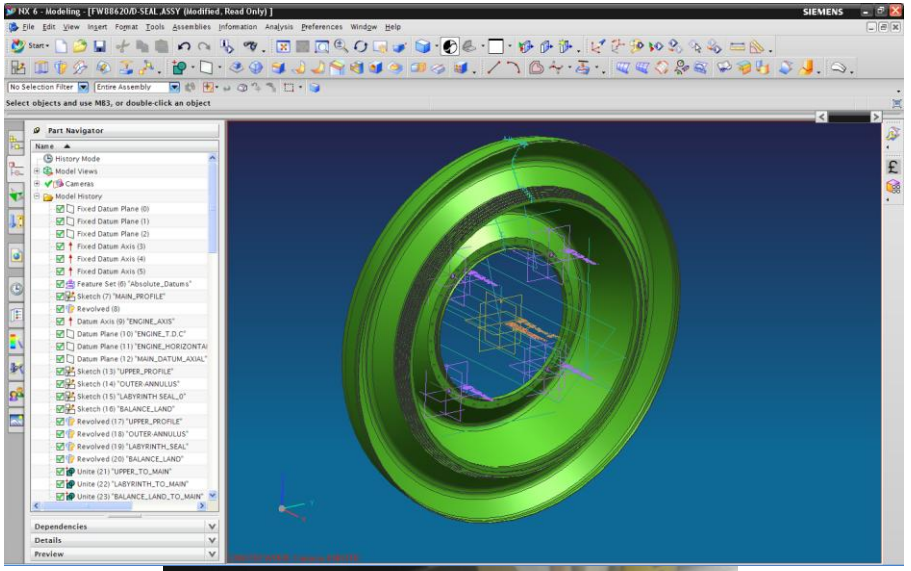
Idea 3 ... Breakthrough idea !!!!

Idea 1 ... Wont work but sparks ...

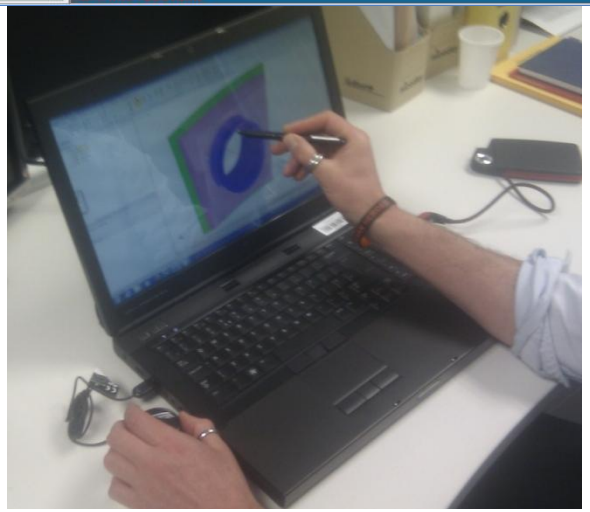
Idea 2 ... Wont work but sparks ...

Toolset 3 - Concept Design tool

- Feature Based systems e.g. NX have a history, and have “features”
- The first thing you should do in a Feature based system is think about the parameters and which you want to control – this is fine if you know what the end result is ... I,e, suits stage 3 modelling when the concept is fixed, but is less than useful in the conceptual “free thinking” phase



- DIRECT modelling systems are feature-less, history-less. Do not retain “sketches”
- This means you don't need to stop and think about what parameters are important
- *Nearest description is the freedom of a designers drawing board, but with the inherent advantages of a CAD system*



Toolset 4 - Rapid Prototyping

“Show and tell” capability
Faster and richer idea evaluation
Improved idea selling / communication

Example - DfLC Pilot with Combustion and casing 2011

	Current	New
Fasteners:	**120**	**80**
Part count:	**225**	**120**
Welds:	**40**	**None**
Assembly:	**Front**	**Rear – 10 x reduction in assy time**
Cost Delta:	**Datum**	**£900 redn.**
Weight Delta:	**Datum**	**3.5 lbs redn.**

Deleted Parts / Manufacturing ops

40 x bolt / washer assy
40 x EDM hole & tap ops.
40 x inspection ops.
40 x assy. opn.
40 x tack weld op for above
40 x Location ring
Letter box slot, cover and 4 x rivets, inspection, & assy

Design for Low Cost - Summary

- Radical improvements in unit cost requires smarter thinking, faster and simper tools and techniques, and **INNOVATIVE people** ...

- **Product Tear downs**
  - Removing physiological inertia, opening our minds

- **1-2-1 brainstorming**
  - Right people, intense, focussed, rapid, quality idea generation

- ***Concept Design* CAD kit** – faster, easier to use, stimulates creativity …doesn't stifle it –aligned to diverse design concepts
  - Instant availability of model for concept evaluation

- **Rapid prototyping**
  - Brings the ideas to life, much better engagement and idea selling

More innovative, cost effective solutions incorporated