2.009 Product engineering processes

life is not a dress rehearsal

Rose Tremain, author
2.009 Product engineering processes today

**review feedback** learn and keep improving

**build challenge!** testing ideas
but first

some logistics

think ahead to the next milestone, wait for feedback (by Tuesday AM)

sketch review timesheet midnight Friday

peer review 1 is due 9 PM Wednesday

team review A is due 9 PM Wednesday

notebooks and milestone reflection next week (except Tuesday)
sketch model phase

objectives

Develop a deeper understanding of the problem/opportunity context (e.g., marketplace composition, benchmarking, patents)

Identification the top few user/purchaser needs

Preliminary exploration of product vision, or ways to address needs

Address key risks or unknowns
sketch review
what’s the point?

A motivational target, manage timeline, typical milestone
Summarize exploration of the design space and what has been learned
Communicate for the purpose of obtaining feedback
Identify additional challenges early
Discover what you don’t know
Learn from seeing what others are doing

Practice early design exploration strategies and presentation techniques

Grading?
Learn, do it for real, and grades will take care of themselves
Feedback: sketch model phase
some good examples
learning

green B: glass catch

present design rationale!
Feedback: sketch model phase
some good examples

sketch models

pink B: Walk-n-roll

red A: Ember shield
Feedback: sketch model phase

some good examples

sketch models

blue A: Safe blade
Feedback: sketch model phase
some good examples

option exploration

yellow B: Caireen
Feedback: sketch model phase

some good examples

need articulation

orange B: thermaFloat

600
Deaths from hypothermia in water annually in US

"Fisherman sacrifice their time in crashing waves and icy conditions. Accidents will always happen...and minutes in the cold water equate to matters of life or death."

Lt. Brandon Aten
Chief Incident Management Division

pink B: brakeSafe

Problem

• Bikers going over handle bars

• >500,000 injuries requiring hospital emergency department in 2013
  • >55% from falls from bike and flipping over handlebars
Feedback: sketch model phase

some good examples

need articulation

orange A: Ultra
Feedback: sketch model phase
some good examples

engaging

silver A: fast forte
Feedback: sketch model phase
some good examples

product vision

orange B: smart sprinkler
Feedback: sketch model phase
some good examples

benchmarking

red B: u-lock

<table>
<thead>
<tr>
<th>Product</th>
<th>Durable</th>
<th>Flexible</th>
<th>Storage</th>
<th>Ease of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chain</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>U-Lock</td>
<td>+</td>
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<tr>
<td>Folding Lock</td>
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<tr>
<td>You-Lock</td>
<td>+</td>
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</tbody>
</table>
Feedback: sketch model phase
some good examples

honesty

green A: easy cane

green B: Stumper
Constructive feedback

put the following discussion in context

name a team characteristic that has negative correlation with success

excessive praise!
Feedback: sketch model phase reflection

timing! most teams!

slides are cues. don’t memorize!
Feedback: sketch model phase

reflection

remoting

many presenters!
Feedback: sketch model phase reflection

blocking (good)

purple B
Feedback: sketch model phase

reflection

blocking (not good)

many sections
Feedback: sketch model phase
reflection

blocking (good)

red b: u-lock

the models are tools to explain your design
Feedback: sketch model phase reflection

blue B: rinse-right

memorable (good)

“need to learn how to turn a faucet on…”
Feedback: sketch model phase

reflection

yellow a: canopy

memorable (less good)
Feedback: sketch model phase

reflection

yellow a: X safe

memorable (less good)

demo live!
Feedback: sketch model phase reflection

teams that embraced sub themes tended to have new interesting ideas

descriptive product names are appropriate at this stage of the process
Rankings
reviewer average

2 hours of discussion. 22 course staff and mentors.
Use to reflect upon what worked well, what did not.

Not a grade.
It is the first impression to a group of people versed in the discipline.

Opportunities with lots of potential may have not ranked as highly do to mix of factors, and vice versa.

Idea-specific feedback over the next few days.

a lower number is a higher rank!
Rankings
reviewer average
incoming instructions!
dangles still in captivity
the dangles are in desperate need of rescue!

you must use your special vehicles to cross the danger dump while transporting your nifty sircle shooter

and free the dangles by shooting at david danger’s den

are you ready?
there’s more...

you may only use the team vehicle to cross the danger dump

only two (2) people may cross the danger dump in the team vehicle at a time - denoted with numbered stickers - carrying two (2) loaded ball magazines, each with four (4) balls

if your team’s vehicle comes equipped with a balloon shield, one (1) additional person may join the journey solely to protect the two people operating the vehicle

power the vehicle to david danger’s lair (while avoiding any obstacles)
you may only use the team vehicle to cross the danger dump.

only two (2) people may cross the danger dump in the team vehicle at a time - denoted with numbered stickers - carrying two (2) loaded ball magazines, each with four (4) balls.

if your team’s vehicle comes equipped with a balloon shield, one (1) additional person may join the journey solely to protect the two people operating the vehicle.

power the vehicle to david danger’s lair (while avoiding any obstacles)
note:

sircle shooter magazines
are filled in the team area

they are then inserted into the
shooter at the target zone
there’s still more...

once you reach the lair...

load a magazine
one person aims…

and the other controls the circle trigger

after switching magazines…

switch roles too!
aim for the center of your team’s target when both magazines are exhausted…

drive back to your team area!
once back in the team area...

two (2) people wearing dangle safety vests can go retrieve missed circles

refill the magazines and when the circle retrievers are back, the next pair of riders can head out
fill up the meter…

to free the dangles!

**but wait…**

return the vehicle to the team area before you rescue the dangles!
the wacky inflatable dude will **deflate**…

giving you the signal to retrieve your very own mini-me dangles

then go back to your team area…

grab your team flag…

and run to lobby 10 steps
plant your flag

then go and cheer on other teams
(or help them collect missed circles)

once the last team finishes…

everyone runs up lobby 10
steps together
in case your vehicle fails
move vehicle to the circle shooting area
and two (2) people wearing dangle billboards can go by foot
but can only shoot one ball per magazine per trip
in case your shooter dies

throw with your arms
there are lots of ways to **participate**!

- **ride** in the vehicle
- **collect** balls
- **cheer** on teams
- **load** magazines

*enjoy* build challenge :)

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[Image -122x450 to 19x483]
logistics
relay race

be the **fastest** to finish

or have the **most spirit**!
logistics
and finally…

the awards ceremony!
and after…

team pictures!
+
help bring stuff back to Pappa!
Pledge

I will be aware of those around me and play safely

I will not be a maniac

I will save the dangles
your challenge

quick synopsis

use stickers for your relay order. If you don’t want to take a turn, cheer on the teams

at the start gun, shoot at the target using your vehicle as intended

slalom around your obstacles

once the dangles are released, the vehicle is back in the team area, and the wacky dude has deflated, as a whole team, run your team’s flag to the awards table

cheer on other teams until the last wacky dude has deflated

all teams run to lobby 10 steps with the final team’s flag