2.009 Product engineering processes

the only thing worse than no help is unreliable help
2.009 Product engineering processes today

tech logistics getting ready for Thursday

final presentation looking ahead
Assembly quiz
last class
Assembly quiz

types of fasteners

number of different kinds

number of students

1-5
6-10
11-15
16-20
21-25
26-30
many, ???
Assembly quiz

total number of fasteners

number of students

total number of fasteners

0-10 11-20 21-30 31-40 41-50 51-60 61-70 71-80 81-90 91-100 >100
Assembly quiz

total number of improvement suggestions

number of students

emily berzolla
fiona mckellar
Assembly quiz
list 4 design for assembly guidelines

- Reduce part count
- Reduce part types
- Eliminate adjustments
- Design parts to be self-locating
- Consider access & visibility
- Design parts to be easy to handle
- Design parts to be only installed correctly
And now...
when a product fails during testing...

describe the faulty behavior in an ______________ — ______________ form
## Mini quiz  Key attribute and specification

**high percentage in correct format**

<table>
<thead>
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<th>Attribute</th>
<th>Specification</th>
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<td>reduce footprint compared to current boutiques</td>
<td>footprint</td>
<td>2'x2'x4' area?</td>
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**Mini quiz**  
**Key attribute and specification: lifeline**

**Need** | **Attribute** | **Specification**
--- | --- | ---
reduce footprint compared to current boutiques | footprint | 2’x2’x4’

Everything that is needed together | total footprint | in-use reach radius? | 2”x1”

---

**calypso**

---

**calipso**
**Mini quiz**  Key attribute and specification: lifeline

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<td>can stop pipes from freezing</td>
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<td>max user exertion when?</td>
<td>&lt;= 30lbs</td>
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**Mini quiz: Key attribute and specification: lifeline**

- **Need**: High percentage in correct format
- **Attribute**: Area
- **Specification**: 2’x2’x4’ area?

**Calypso**
- **Need**: Reduce footprint compared to current boutiques
- **Attribute**: Footprint
- **Specification**: 2’x2’x4’

**Calypso**
- **Need**: Everything that is needed together
- **Attribute**: Total footprint
- **Specification**: 2’x1’

**Drip**
- **Need**: Stop pipes from freezing
- **Attribute**: Can stop pipes from freezing
- **Specification**: Yes it can stop pipes from freezing

**SimpleHive**
- **Need**: Accessibility ease box access
- **Attribute**: Force needed to open remove box?
- **Specification**: 10 lbs < 10 lbs

**SimpleHive**
- **Need**: ??
- **Attribute**: Max user exertion when?
- **Specification**: <= 30 lbs

**Mini quiz**

**Lifeline**

- **High percentage in correct format**
- **Area**: 2’x2’x4’
- **In-use reach radius?**: 2’x1’
- **Ambient pipe temp for freeze**: < ??? degrees C
- **Remove box?**: < 10 lbs
- **User exertion when?**: <= 30 lbs
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<td>the user needs to be able to carry the board comfortably</td>
<td>total weight of the board must be</td>
<td>&gt; 10 lbs !</td>
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Logistics

Tech review details

Detailed tech review schedule will be posted on the website (15 minutes on, 15 minutes off)

Tentative review locations

Red: Killian court
Green: Pappalardo parking lot
Blue: Pappalardo parking lot
Yellow: Z center
Pink: Z center
Orange: Pappalardo south conference room
Purple: Pappalardo parking lot
Silver: Team area
Logistics
Tech review contract plotting

scheduler posting this weekend for Wednesday evening, strictly self-serve Thursday

have a well prepared 5 minute demo for your video

email final contract by midnight Thursday
2.009: a product development story

realistically know where the problems are!
Prototype Launch!
aka 2.009 final presentations 2019

a polished event

seating for 1100

~250 in little theatre
live webcast, 40,000 unique IPs for 15+ min

you will receive email to invite people
Final presentation

general format

a new product launch
but more technical and less sales

7 minute presentation
4 minute discussion
5 minutes for transition

a reception
Final presentation expectations

good product
good presentation
design, testing, (a lot of) practice

compendium of 2018 presentations
Final presentation

timing

presentations start a 7:30 PM sharp, December 9

scheduled run-throughs 3-6 PM in auditorium

reception (with dinner) at 10:00 PM, mingling at booths

program is not over until the guests leave

details will be posted on course website
Final presentation

general format

all should attend and be on time

display the merits of your design:
  the prototype
  key needs and user experience
  technical innovations
  business case
  outstanding issues

design of the presentation and its execution is graded
Final presentation
review form

Guest: ___________________________________________ Team: Blue
Project Name: ______________________________________

1. Quality of Presentation (25%)
Was the overall structure of the presentation honest and effective?

Was the customer need clear?

Was the market clear?

Was the product concept clear?

Was the presentation of technical challenges clear?

2. Business Assessment (15%)
Was the manufacturing cost assessment plausible and meaningful?

Was the development plan and market assessment plausible?
Final presentation review form

3. Technology (25%)  
Were major technical challenges/innovations identified (one or two)?

Were the challenges appropriately understood and engineered?

4. Prototype (35%)  
Were design details well executed?  
(e.g., structures, bearings, actuators, controls)

Were the human interfaces well resolved?

Were subsystems well defined, integrated, and reliable?

I believe the prototype could be refined to become a real product.

5. Overall Comments:
Final presentation

time allocation (not prescribed order!)

- the product, where and how it is used, use experience
- who it is for and why should we care
- how it works, principle of operation
- market and preliminary business model
Final presentation

typical presentation media

demonstration/role playing

slides

video if needed

animations

examples in gallery
Final presentation
presentation props/set

Think about what type of setting you would like

Provide a context and demo platform

Abstracted to not compete

Self contained and rolling, transport constraints

I will lead on implementation, with help

Meeting with your teams Tuesday after Tech review
Final presentation

booth/reception area

locations after thanksgiving
Final presentation

typical booth

background set to frame product

an online brochure, URL and QR code in brochure

name tags for all team members
(with timeline and instructions)
And finally

dis week +

keep your team working effectively
if your task is done and you have time, offer to help

Pappalardo 9-5 Saturday and team area 10-5 Monday

machine shop 6-9 PM T, W

30 minute design reviews Monday after tech review

no lecture Wednesday, watch for emails

team pictures and video Friday after tech review