DEFINE PROBLEM
Determining Customer Needs
Setting Product Requirements

Please sit with your team

Ref: Chap. 4, Ulrich & Eppinger text
Ref: Chap. 5, Ulrich & Eppinger text

Office Hours: T. Kuehn, Fall, 2010

- Monday: 9:00-10:00
- Wednesday: 11:00-12:00
- Thursday: 11:00-12:00
- Friday: 2:00-3:00
DETERMINING CUSTOMER NEEDS

As practiced in ME 4054

(Ref: Chap. 4, Ulrich & Eppinger text)

Some ways to determine needs…

• My advisor said, “Do it this way”
• Marketing said, “Here are the specs”
• Team member Sam said, “Gosh, I would buy one!”
Another way to determine needs...

• Determine who the customers are
• Determine what information should be gathered from customers
• Determine how that information should be gathered

And then, translate that information into product requirements and engineering specifications

Within teams, list main customers

Suggestion for today’s group meeting

• Refine your customer list
• Prioritize your list
Example

- Project Scope: Develop a Calibration Reference Device for ASHRAE Standard 52.2 Filter Test Facilities that can be replicated and used in test facilities to check the accuracy of pressure drop and particle capture efficiency measurements.
Example

• Customers:
  – Test facility operators
  – ASHRAE Technical Committee 2.4 (Particulate Air Contaminants and Particulate Contaminant Removal Equipment)
  – ASHRAE Standards Committee 52.2
Step 1:
Gathering customer information

- Depth interviews of potential customers
- Surveys
- “On the job” observations
- Focus groups

Gather and report raw data, no interpretations…yet!

Depth interviews

- Great for getting lots of info quickly
- Can go into the “why”
- Have an interview script…clear with team and with advisor
- Take notes…of everything, not just what you want to hear…record direct quotes
- Can be difficult to schedule
- Be mindful of people’s time; ask for a specific amount of time and stick to it
- Do over telephone or in person
Surveys

- Difficult to create a good questionnaire
- Keep it short
- Minimize essay questions (interview instead)
- Need large N for quantitative data
- Screen respondents…you want the right sample
- Mail surveys…time scale wrong for ME4054
- Web surveys…only if you direct people to it

Observations

- GREAT method!
- Be a “fly on the wall”
- Observe environment where design will be used
- Take notes
- Best way to understand the user
- Important for engineers to observe…and not simply rely on what others say
Focus groups

- Generates group discussion
- Can resolve conflicting views
- More than just getting people together
- Needs a skilled moderator
- Sometimes done in special facility with 1-way mirror and design team watching
- Requires planning, scheduling
- Logistics challenging for 4054 project

What to do with the information…

- Collect information as raw data, do not interpret as you take notes
- See text for some great methods to organize and translate raw data into info you can use to design your product
- Always check info against your common sense
Example: Design of a Cordless Screwdriver

Steps:
1. Gather data from customers
2. Translate into “needs”
3. Organize into a hierarchy
4. Establish relative importance

Step 1: Gathering Raw Data from Customers

- Interviews
- Surveys
- Focus groups
- Observing the product in use
Step 2: Translating Information into Customer Needs

<table>
<thead>
<tr>
<th>Customer Statement</th>
<th>Interpreted Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>I need to use lights instead of hands</td>
<td>The SD can use lights instead of hands</td>
</tr>
<tr>
<td>Sometimes do not work, use vent to make repairs</td>
<td>The SD needs a method to make repairs</td>
</tr>
<tr>
<td>A few of electrical switch, instead of outside switches</td>
<td>The SD needs an electrical switch</td>
</tr>
<tr>
<td>Likes—External Tool</td>
<td></td>
</tr>
<tr>
<td>The push/pull grip is best</td>
<td>The SD is a push/pull grip</td>
</tr>
<tr>
<td>I like the magnetized SD</td>
<td>The SD has a magnetized feature</td>
</tr>
<tr>
<td>Dislikes—Current Tool</td>
<td></td>
</tr>
<tr>
<td>I don't like it when the tip pops off the screen</td>
<td>The SD remains attached to the screen</td>
</tr>
<tr>
<td>I would like the tip to be both felt and used with a light battery</td>
<td>The SD needs a light battery</td>
</tr>
<tr>
<td>Can't use scissors with hard wood</td>
<td>The SD can cut through wood</td>
</tr>
<tr>
<td>Sucks in and stays tough access</td>
<td>The SD can access through tough areas</td>
</tr>
</tbody>
</table>

Step 3: Organize the needs into a hierarchy

1. Print each statement on a card or Post-It note
2. Eliminate redundant statements
3. Group the statements according to the similarity of needs they express
4. Choose a label for each group
5. Consider “supergroups” of 2-5 groups
6. Review and edit the organized needs statements
Step 4:  
Establish the relative importance of needs

- Two basic approaches
  - Consensus of team
  - Further customer survey
- A numerical ranking process is a common tool. 
  For example:
  1. The feature is undesirable
  2. The feature is not important
  3. The feature would be nice to have, but is not necessary
  4. The feature is highly desirable
  5. The feature is critical

Step 5: 
Reflect on the results and the process

- Have we included all of the important types of customers?
- Did we miss anything in our information gathering process? Any follow up interviews needed?
- What do we know now that we didn’t know when we started? Any surprises?
- How can we improve the process?
It makes no sense to create a design that nobody other than the design team wants!

Gathering “voice of the customer” is a *continuous process*