DEFINE PROBLEM
Determining Customer Needs
Setting Product Requirements

Please sit with your team
Access your Google site

Ref: Chap. 4, Ulrich & Eppinger text
Ref: Chap. 5, Ulrich & Eppinger text
DETERMINING CUSTOMER NEEDS

As practiced in ME4054

(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
Gathering customer information

• Depth interviews
• 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 hard to schedule
- Be mindful of people’s time
- Do over telephone or in person
Surveys

- Hard 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. Interpret as a “need”
3. Organize into a hierarchy
4. Establish relative importance
## Interview with Customer

### Customer Information
- **Customer:** Bill Esposito  
  - **Address:** 100 Memorial Drive, Cambridge, MA 02139  
  - **Telephone:** 617-864-1274  
  - **Willing to do follow-up:** Yes

### Interviewer Information
- **Interviewer(s):** Jonathan and Lisa  
  - **Date:** 19 December 2002

### Currently Uses
- **Type of user:** Craftsman Model A3  
  - **Usage:** Building maintenance

### Question/Prompt | Customer Statement | Interpreted Need
--- | --- | ---
Typical uses | I need to drive screws fast, faster than by hand. | The SD drives screws faster than by hand.
| | I sometimes do duct work; use sheet metal screws. | The SD drives sheet metal screws into metal duct work.
| | A lot of electrical; switch covers, outlets, fans, kitchen appliances. | The SD can be used for screws on electrical devices.
Likes—current tool | I like the pistol grip; it feels the best. | The SD is comfortable to grip.
| | I like the magnetized tip. | The SD tip retains the screw before it is driven.
Dislikes—current tool | I don’t like it when the tip slips off the screw. | The SD tip remains aligned with the screw head without slipping.
| | I would like to be able to lock it so I can use it with a dead battery. | The user can apply torque manually to the SD to drive a screw. (!)
| | Can’t drive screws into hard wood. | The SD can drive screws into hard wood.
| | Sometimes I strip tough screws. | The SD does not strip screw heads.
Suggested improvements | An attachment to allow me to reach down | The SD can access screws at the end of the screwdriver handle.
## Translating Information into Customer Needs

<table>
<thead>
<tr>
<th>#</th>
<th>Need</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maintains power for several hours of use</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>The SD fits into a toolbox</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>The SD works with a variety of screws</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>The SD makes a pleasant sound when in use</td>
<td>3</td>
</tr>
</tbody>
</table>
Are you done?

- After you have a concept, or a prototype, get reaction from customer(s)
- Bring the prototype or drawing

Gathering info from customer is a continuous process
The bottom line…

It makes no sense to create a design that nobody other than the design team wants!