OUTLINE

- Announcements
  - EE15N Canvas is up
  - Pejman’s Talk & Book List are posted
  - Problems to Solve Spreadsheet is posted: will discuss during break

- Project deadline – Next Wednesday
  - Form teams, decide project, 1 paragraph project problem statement due 1/23 at midnight!

- Lecture
  - The Design Process

- Speaker
  - Martin Casado, Andreessen Horowitz
THE DESIGN PROCESS
IDEAS ARE NOT PRODUCTS

What is missing from this picture?

Problem Statement

[Diagram with arrows labeled "Ideas" moving towards a funnel labeled "What gets built"]
FROM IDEA TO PRODUCT

Problem Statement

Design Process
ORIGIN OF IDEA

Designer – Client – User Triangle
THE DESIGN PROCESS: 5-STAGE DESCRIPTIVE MODEL

Client Statement

PROBLEM DEFINITION

CONCEPTUAL DESIGN

PRELIMINARY DESIGN

DETAILED DESIGN

DESIGN COMMUNICATION

Final Design

Research
INFORMING A DESIGN PROCESS

- Thinking Strategically
  - Decompose larger problem into smaller sub-problems

- Formal Design Methods
  - Objective Tree
  - Pairwise Comparison Charts (PCC)
  - Metrics
  - Functional Specifications
  - Performance Specifications
  - Morph Charts
INFORMING A DESIGN PROCESS (cont)

- Acquiring Design Knowledge (Research)
  - Literature – including Codes & Regulations, Patents, etc.
  - Benchmarking (competitive products)
  - Reverse engineering
  - Interviews – informal & formal
  - User surveys & questionnaires/Focus Group
  - Brainstorming
INFORMING A DESIGN PROCESS (cont)

- Analysis & Testing
- Getting Internal Feedback
  - Regular Scheduled Meetings & Formal Design Reviews
- Getting External Feedback
  - External experts
  - Focus groups
Simple, straight-forward design objective
LADDER TYPES

9 Types of Ladders according to the American Ladder Institute:

- Articulated Ladder
- Combination Ladder
- Extension Ladder/Extension Trestle Ladder
- Fixed Ladder
- Job-Made Wooden Ladder
- Mobile Ladder
- Platform Ladder
- Single Ladder
- Step Ladder/Step Stool Ladder
LADDER TYPE BY DUTY RATING

Source: http://www.thepaintedsurface.com/images/ladderrating.gif
<table>
<thead>
<tr>
<th>LADDER TYPE</th>
<th>MAX LENGTH</th>
<th>SPECIAL REQS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section Ladder</td>
<td>30’</td>
<td>Wider than 12”</td>
</tr>
<tr>
<td>Extension Ladder</td>
<td></td>
<td>Overlap stops required. Wider than 12”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Section</td>
<td>48’</td>
<td></td>
</tr>
<tr>
<td>&gt; 2-Section</td>
<td>60’</td>
<td></td>
</tr>
<tr>
<td>Step Ladder</td>
<td>20’</td>
<td>Insulating, nonslip pads. Locking device.</td>
</tr>
<tr>
<td>Platform Ladder</td>
<td>20’</td>
<td></td>
</tr>
<tr>
<td>Trestle Ladder/Extension</td>
<td>20’</td>
<td></td>
</tr>
</tbody>
</table>
LADDER MARKET

A Quick Check on lowes.com website:

- Over 300 Types of Ladder
- Least Expensive Ladder - $29.98
- Most Expensive Ladder - $1,949.99

Suddenly designing a safe ladder seems much more complicated than it first appeared...
1 Paragraph statement: What is the problem your project is solving?

Choose appropriate scope

Be specific

Do not include the solution in the problem description

Due Next Wednesday – 1/23 – at midnight
THIS WEEK’S ASSIGNMENT

- Form Team
- Choose Project
TODAY’S SPEAKER

MARTIN CASADO
Andreessen Horowitz