Lecture 13: Accessibility

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Project Status

Framing the problem
- User research
- Competitive analysis
- Data analysis and summary

Exploring the solution space
- Brainstorming
- Ideation through sketching

Finding a good solution
- Scoping
- Consideration of constraints
- Scenarios, storyboards, personas
- Design rationale

Refining the solution
- wireframes
- lo-fi prototypes
- early evaluations
- mockups/mid-fi prototypes
- additional evaluations
<table>
<thead>
<tr>
<th>Date</th>
<th>Events</th>
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<tbody>
<tr>
<td>May 13</td>
<td>3a - Paper Prototype</td>
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<td>May 14</td>
<td>Accessibility</td>
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<td>May 15</td>
<td>3b - Heuristic Evaluation</td>
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<td>May 16</td>
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<td>Reading 3: Usability Testing</td>
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<td>3c - Usability Testing Check-In</td>
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A Basic Tenet of Design

You are not designing for yourself

You bring a lot of background to the table
That background is your asset
But you also need to be mindful of it

You need to understand the context of your design and the people who will use it

What this means can vary widely
And may be beyond what you can or will do
Pinkification

Understanding others' needs is really complicated

And there is no shortcut

We will start with an example:

Do you like the pink color?
Finally! For years I've had to rely on pencils, or at worst, a twig and some drops of my feminine blood to write down recipes (the only thing a lady should be writing ever). I had despaired of ever being able to write down said recipes in a permanent manner, though my men-folk assured me that I 'shouldn't worry your pretty little head'. But, AT LAST! Bic, the great liberator, has released a womanly pen that my gentle baby hands can use without fear of unlady-like calluses and bruises.

Thank you, Bic!
It is very, very hard to imagine that the people who made the decision to launch “Bic for Her” were the same women expected to buy them.

http://www.forbes.com/sites/davidvinjamuri/2012/08/30/bic-for-her-what-they-were-actually-thinking-as-told-by-a-man-who-worked-on-tampons/
(Bic for Her)
Kodak, 1926

Kodak launched this black camera in 1926

It was successful, but was selling more to men

Engaged Walter Dorwin Teague to design a model that would appeal to women

Kodak Vest Pocket Series III (1926)
Kodak, 1926

Kodak launched this black camera in 1926

It was successful, but was selling more to men

Engaged Walter Dorwin Teague to design a model that would appeal to women

His solution was to release the camera in 5 different colors, each packed in a pseudo-silk lined box, where the box and liner matched the color of the camera
Walter Dowrick Teague

Vanity Kodak (1928)
Apple launched this white iPod in 2001.

It was successful, but was selling more to men.

**NEED:** design a model that would appeal to women.

Their solution was a selling the iPod in 5 new different colors.
Jonathan Ive
Apple iPod Mini
(2004)
Jonathan Ive
Apple iPod Mini
(2004)

Walter Dowrin
Teague
Vanity Kodak (1928)
Observations by Buxton

Same basic design brief

- Same use of color
- Same number and choice of colors
- Same simultaneous release of colors

Teague / Kodak example is a classic

- Known to any trained industrial designer
- Jonathan Ive is an extremely well trained designer
- Draws inspiration from the past
"That is simply good, intelligent design in action. It is also a very good lesson: an obsession with the new and original, without a deep literacy and appreciation for the past, leads to a path of missed opportunities."
Design, preferences and choice
Abandoning “One Best Design”

People have different preferences
  We can study these preferences
  We can even predict these preferences

A design that emphasizes one preference will generally disadvantage some other preference
  Not always, because software is malleable

How should we think about differences
  One powerful viewpoint is social justice
People with Disabilities

1 billion people worldwide
   15% of the population

50 million people in US

Including yourself if you are fortunate to live to develop disabilities
A Social Justice Problem

1 billion people worldwide
15% of the population

50 million people in US

Including yourself if you are fortunate to live to develop disabilities

16% of people in the US
10% of workforce
5% of STEM workforce
1% of PhDs in STEM
A Social Justice Problem

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Including yourself if you are fortunate to live to develop disabilities

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Are we reinforcing this or are we working against this?
Accessibility

Designing products/services that are accessible to people with disabilities

Different types of accessibility
- Web / Mobile (aka Digital)
- Physical
Accessibility is the Law

Americans with Disabilities Act (ADA), 1990

Requires accessibility in employment, public entities and public transportation, public accommodations and commercial facilities
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Americans with Disabilities Act (ADA), 1990

Requires accessibility in employment, public entities and public transportation, public accommodations and commercial facilities

Rehabilitation Act, 1973 (+ Rehab Act, Section 508, 1998)

Mandates federal procurement of accessible electronic and information technologies
Accessibility is the Law

Americans with Disabilities Act (ADA), 1990

- Requires accessibility in employment, public entities and public transportation, public accommodations and commercial facilities

Rehabilitation Act, 1973 (Section 508, 1998)

- Mandates federal procurement of accessible electronic and information technologies

National Federation of the Blind vs. Target, 2006
Universal Design vs. Assistive Technology
Accessible design

Creating tax returns is always connected to hours of work and preparation. Even if you have hired a tax accountant, there will still be a lot of effort ahead of you. You will have to collect and organize all of your tax-related documents like receipts or invoices at once, tie up time and money by preparing all of those documents beforehand and software can help you doing so.

Go paperless and save valuable time

Filing and archiving all of your documents like bank statements, bills or receipts takes hours. Searching back through the mountains of paperwork to find the documents you need for your tax return can seem like a burden. To bypass this exhausting procedure, start going paperless by scanning all of these documents with Scanshot. Just scan the relevant paperwork when you receive it. This will only take a few seconds and save you time when it comes to preparing your annual accounts.
<table>
<thead>
<tr>
<th></th>
<th>Permanent</th>
<th>Temporary</th>
<th>Situational</th>
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<tbody>
<tr>
<td><strong>Touch</strong></td>
<td>One arm</td>
<td>Arm injury</td>
<td>New parent</td>
</tr>
<tr>
<td><strong>See</strong></td>
<td>Blind</td>
<td>Cataract</td>
<td>Distracted driver</td>
</tr>
<tr>
<td><strong>Hear</strong></td>
<td>Deaf</td>
<td>Ear infection</td>
<td>Bartender</td>
</tr>
<tr>
<td><strong>Speak</strong></td>
<td>Non-verbal</td>
<td>Laryngitis</td>
<td>Heavy accent</td>
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**Inclusive**
A Microsoft Design Toolkit

Microsoft, 2016
Personal Texting by Deaf People

Teletypewriter (TTY) used by deaf people in their homes circa 1970

1990s TTY with built-in acoustic modem

SMS texting
What have the tech industry done?

MS Word Accessibility checker (video)

Chrome Console/Audit Tools (video)

Accessible Graphics by SAS (DUB seminar)

Apple promotes 2017 capabilities (video)
Current State of Devices

- **General**
  - *Vision*
    - VoiceOver: Off
    - Zoom: Off
    - Magnifier: Off
    - Display Accommodations: On
    - Speech
    - Larger Text: Off
    - Bold Text
    - Button Shapes
    - Reduce Transparency: Off
    - Increase Contrast: Off
    - Reduce Motion: Off
    - On/Off Labels
    - Face ID & Attention
  - *Interaction*
    - Reachability

- **Accessibility**
  - Screen readers
    - Select to Speak
      - Off / Hear selected text
    - TalkBack
      - Off / Speak items on screen
  - Text-to-speech output
    - Display
      - Font size
      - Default
    - Display size
      - Default
    - Magnification
      - Off
    - Color correction
      - Off
    - Color inversion
Equal Access to Information

Are these designs promoting equal access?
Equal Access to Information

Are these designs promoting equal access?

Some dimensions to consider

Cost
Speed
Accuracy
Ease

Simply being possible is not enough
A Closer Look at Text Entry
Contrast with Braille Input
Contrast with Braille Input
Perkinput

Azenkot et al, GI 2012
Perkininput

I can use two phones to go f
Ability-Based Design

States that all interfaces make assumptions about the abilities needed to use them

Any one-size-fits-all design is therefore inaccessible to many people

Instead of asking people to struggle to adapt, asks that interfaces adapt or be adaptable to match the abilities of each person
Speech Input
“Sometimes you don’t follow along as well unless [you are] one on one.”

Eyes-Free Yoga, Rector et al, ASSETS 2013
Accessibility is More than Text Entry

Eyes-Free Yoga, Rector et al, ASSETS 2013
Accessibility is More than Text Entry

Eyes-Free Yoga, Rector et al, ASSETS 2013
Accessibility is More than Text Entry
Accessibility is More than Text Entry

How do you find a bus stop?

Azenkot et al, CHI 2011
Accessibility is More than Text Entry

"I have to ask people for information a lot. Sometimes I call Metro to figure out where the stop is [located] approximately, but they still can’t exactly tell you (...)"
Accessibility is More than Text Entry

Project Sidewalk - projectsidewalk.io

Let's create a path for everyone
Accessibility is More than Text Entry

Project Sidewalk - projectsidewalk.io
What is Disability?

The old model is medical, focused on the individual with a mindset of “fixing” an impairment.

Current model understands disability is imposed by society and design not accounting for diversity:

“Disability is thus not just a health problem (...) [it is] the interaction between features of a person’s body and features of the society in which he or she lives. Overcoming the difficulties...requires interventions to remove environmental and social barriers.”
What is Disability?

Impairment
a problem in body function or structure

Activity Limitation
a difficulty encountered by a person in executing a task or action

Participation Restriction
a problem experienced by a person in involvement in life situations
A Social Justice Problem

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Including yourself if you are fortunate to live to develop disabilities

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Diverse participation is critical in effective design!
Team activity

With your project team, identify one disability your current design is creating!
Ask me something!