



University of Washington iSchool

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# Real-Time Captioning Process Book

Team HeisenBARK: User-Sensitive Inclusive Design

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INFO 360B



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## Introduction

I will honestly admit that at the beginning of this quarter, I was arrogant in thinking that this class would probably not be too difficult. Up until this autumn, my experience in Informatics had been focused more on the technical aspect of actual coding. Coding is something I find challenging yet enjoyable and rewarding at times, so in my naiveté the thought of design sounded rather easy due to its more abstract nature. But as I sit here reflecting on the design process ten weeks later, I cringe at how poorly mistaken I was.

With every passing class of INFO 360, it became more apparent to me that software engineering – or any engineering for that matter – is void without acute design thinking. I have come to realize that it's something that the general population takes for granted with myself included. Too many times I think people are concerned with how some technology functions, and they fail to understand the architecture of the experience that had to be designed first. As a result of this class, my mind has been conditioned to think of such subtleties more and more often whether I'm using a computer, a microwave, or even a door.

In this process book, I would like to take the time to reflect on how I have reached this appreciation, seeing as how I used to be on the opposite end of the spectrum. It has been quite a journey for myself, not only learning design principles but also having the hands on opportunity to apply them in my own way with our real-time captioning project. Because much of the knowledge was fostered by the overarching process itself, I have decided to break down my reflections on a biweekly basis for each major step of the design process. Each is unique in its own right yet impossible to reach without the previous. Let's begin!

INFO 360 Folder Week #1



INFO 360 Folder Week #9





## Understanding the User – Weeks One and Two

### Our Expert user, Laura

Within a week's time, we had already been split into groups of four in preparation for the final project in which we would be designing a real-time captioning device for a disabled "expert user". For the first four or so classes, the focus was on identifying our intended audience and their needs as well as other stakeholders who could be affected by our design. This entailed interviewing Laura, our half-blind and half-deaf expert user who would be working with us for the remainder of the quarter. In doing so, our goal was to get the best idea of her not only as a user, but also as a person.

In preparation for this activity, our group decided to first come up with interview questions individually that we thought could be relevant and would later aggregate the best ones into a final list. While working on my own interview questions, I thought a "bottom up" approach would be the most effective. I tried to specify certain aspects of what I wanted to learn from Laura as a user and a human being, building questions around them. Such aspects included identifying her familiarity with technology in general, her specific habits in navigating computers, and any trend in personal complaints she had across different devices. When completed, each member submitted their list onto a shared Google document, and we later combined and omitted questions into a final refined list that we would follow when interviewing Laura.

### The Design Approach

In addition to being assigned an expert user, we were also appointed a design approach to follow – ours being "user sensitive inclusive design" – which I can best concisely define as "design for as many people as reasonably possible". We interpreted this with the intention of working particularly close with our expert user, all the while being aware of the decisions we were making that the broader user base would be sensitive to. That being said, our project of a real-time captioning device didn't seem to lend itself to a terribly large population, at least in our eyes. For example, why would an able-bodied user want to caption a conversation when he or she can already see and hear? In our next assignment of creating personas, I took it upon myself to address this concern along with incorporating our design approach.



Figure 1: The persona of Steve



Each group member invented a stakeholder in our design, and I had come up with the persona Steve (figure 1), someone who often travelled internationally for business. The idea was that he could be a potential member of our non-disabled user population that would have a reason to use our device for translating conversations with foreign clients. We considered each member's created persona, ultimately cutting those that we felt would be out of our scope. But because we could envision Steve being a realistic member of our non-disabled target users, the concept of a translation feature was kept to keep consistent with our design approach – including a broader population in our design process.

Starting on the next page, a narrowed down version of our final interview questions can be found. They were included on the criteria that they were most helpful in our discovery of "The Three Commandments of Laura" after analyzing the results. Also included is the persona write-up for Steve.

**Some of our final interview questions:**

- What is your opinion of the user interface of the device that you are currently using?
- What would you consider as a successful outcome?
- What type of phone do you have? What do you like about it? What don't you like about it?
- What phone applications do you use most frequently? What do they do for you, and are there any features you wish they had?
- What is a "bad" experience for you with a mobile device or application? How frequently do you find yourself having such an experience? Where do you go to help get yourself comfortable the device/app? At what point do you abandon it?
- When you need some kind of functionality, do you prefer getting a specialized device or a new app for your phone?
- Are there any ways that you interact with your phone that is unique from other users, even with a similar disability?
- What are some times/situations you feel uncomfortable using your device? Why?

**The Three Commandments of Laura:**

1. The design needs to be effortlessly intuitive.

*Laura does not own a smart phone, so we want the design to be understood from the first experience, regardless of the user's background in technology.*

2. Achieving tasks should be succinct.

*In order for the application to be practical, the amount of time it takes for the user to accomplish a desired objective needs to be minimal or else the user is wasting effort or missing information, especially in the case of captioning.*

3. Using the device should not draw much attention.

*Laura made it clear that aesthetics are important to her; she's reluctant to use technology that gives away her disabilities, so we want the design to be as subtle as possible.*

These are Laura's three main concerns that we found in analyzing the results of the first interview and would serve as the rationales in many of our design decisions.

**User Sensitive Inclusive Design Persona – Steve (from figure 1 on page 4):**

Meet Steve. Steve is a 36-year-old nondisabled businessman that handles international sales and has done so with the same company for about eight years. As by his facial expression in this photo, he takes his work very seriously. He is punctual to meetings and always sticks tight to his schedule. To him, time is money. When he needs to get work done, you can trust him to get it done – even if it means staying around the office for a few extra hours.

Steve's occupation often requires him to travel to foreign countries and in general, communicate with other businesspeople that do not speak English. Being such a busy man he has little time (nor the patience) to learn multiple other languages. His free time is his free time, and he understandably does not like to devote any of it to anything work-related. As a result, he is often in need of a several human translators to travel with him, which is sometimes a costly resource to the company.

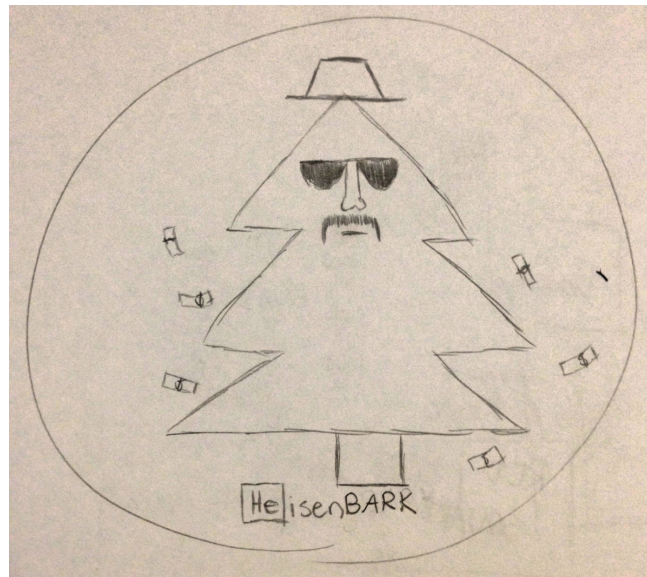
Like most businesspeople in 2005, he was an avid user of his Blackberry phone, using it for things such as standard calls, e-mails, and the occasional text message and was comfortable with the device. A few years later, his company jumped on the iPhone game and recalls being thrilled about the transition, as it was little tough for him. He is not terribly tech-savvy; his at the time 9-year-old nephew could have probably navigated his device as well as he could have. But given the five or so years that he has been an iPhone user, he has learned to become very comfortable with it and is able to take advantage of features he couldn't before. Though with every major annual update, it takes him about a month or so to re-familiarize himself with the new overhauls.

**Reflection – Weeks One and Two**

For the first two weeks, much of the learning I came across was actually about myself. I have always felt inept and nervous when conversing under formal circumstances, for example when interviewing. I had never really been in the position of the *interviewer* up until then, but after a handful of mockup interviews with fellow classmates, the activity became less and less stressful for me. I remember learning not to treat it so much like a structured process and rather like a guided conversation, along with the "sweet spot" interview question paradigm. Questions need to be specific enough to get the desired information, yet open ended enough for the interviewee to have anything valuable to say. Needless to say, both of these practices have served me well, and I feel that they are reflected in the quality of our assessment from her responses.

As previously stated, I initially had many underestimations about this class. But after a single week I felt like I was already getting whipped into shape by the situation we were put in, and the pressure I was feeling was unexpected to say the least. Grouped with three strangers, working with a disabled user we had just met, under a design approach we knew little about, and expected to produce a final project that had just been assigned, it seemed at the time that the odds were against us.

However I was lucky enough to experience this design process with my group members Ryan Rinaldi, Kevin Le, and Amy Chiu. At the time of meeting each other, it was pretty clear that none of us had group experience of this type of fidelity, which at times was reflective in the difficulties we experienced. All are unique and talented in their own ways, lending themselves to different aspects of the project. By no means were we a dream team though; we had our share of mishaps along the way that will become apparent later in this process book. But we have learned from each other every step of the way, and it would be difficult for me to wish that I had a different group.



Team HeisenBARK logo conceived the day our group met  
(Heisenberg + Brett, Amy, Ryan, Kevin)  
Breaking Bad enthusiasts



## Sketches on Sketches – Weeks Three and Four

### Visualizing Ideas

Come week three, the time had come to start getting visual ideas of what the design would look like. Given the feedback we got from Laura's interview, each member in our group was to come up with thirty sketches that in some way addressed at least one of The Three Commandments of Laura (from page 6). As you may be able to tell, this would be a recurring theme in our group's design practice:

*Receive user feedback → Individual ideas → Aggregate Ideas → Refine Results → Repeat*

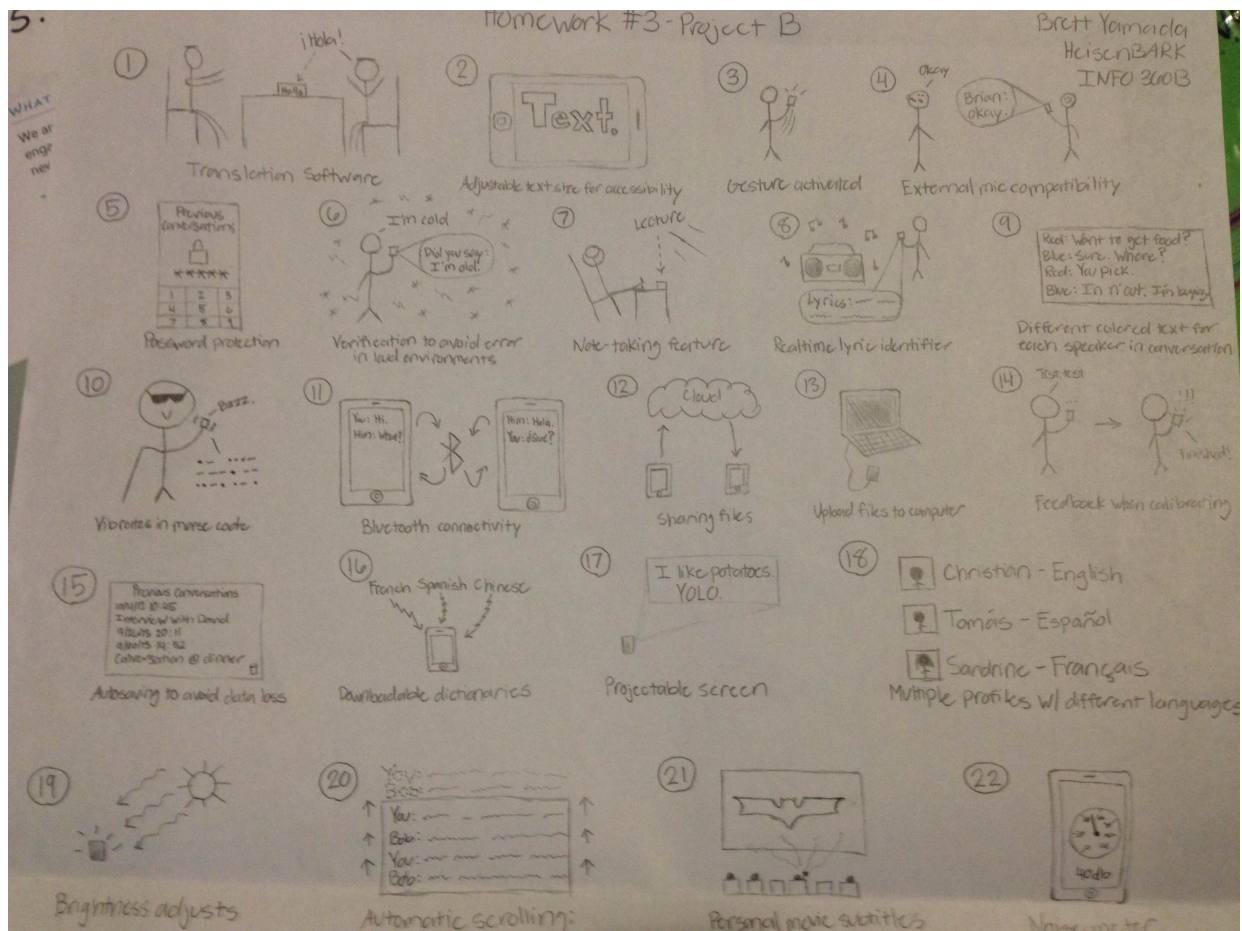


Figure 3: Some of my 30 sketches, maybe a quarter of which made it into the final design

For my first ten sketches (refer to figure 3), I tried to think of what *I* would find practical in this device just to get a start despite it not necessarily being designed for myself. This translated to sketching up features that a general user would probably be interested in, including things such as gesture activation, the ability to save and share files, background functionality, etc. The next fifteen sketches were dedicated specifically towards Laura's needs or our design approach like adjustable text size, external microphone compatibility, and a note-taking ability.

At the time it occurred to me that what I had come up with was already somewhat conventional, so in hopes of differentiating our design from others I wanted to devote at least five of my thirty sketches to any sort of crazy idea I could think of. This I found particularly difficult: thinking outside the box when there were already standard methods out there that I knew worked. Nonetheless, I thought of including a projectable screen and even the ability to caption song lyrics as well as identify songs in real-time, though neither of which we ended up keeping.

## Narrowing It Down

After sharing sketches amongst ourselves, I found that several of my ideas were either the same or very similar in nature to those of my partners. Consequently, a handful of my sketches were able to feed others that would eventually come into fruition. We talked about them, kept the ones we liked, changed ones were on the fence about, and omitted those we felt unnecessary for the needs of a typical user (or Laura specifically) in order to keep consistent with our design approach.

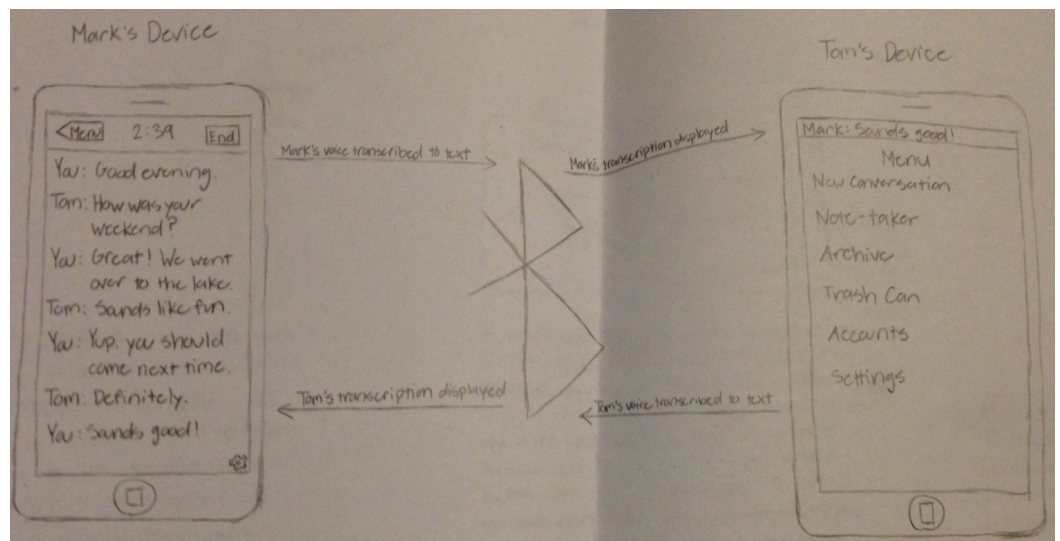


Figure 4: One of our final four sketches, picked because I feel that it is most representative of our final design

By the time we got to meet with Laura again, there were four main sketches that we felt would represent the desired design, one of which is displayed above. Because they were molded from Laura's initial feedback from the first interview, she seemed to be very supportive of what we had. Though she obviously did have feedback to give, and as



expected, we took special note of her suggestions while proceeding into the next stage of the design process: simulating the experience.

### **Reflection – Weeks Three and Four**

When assigned with individual work, our group had no trouble producing their own ideas to bring to the table. During the sketching phase, we had a total of 120 solid visualizations to work with, but the ultimate goal was to slim that down to four. This is where our group was lacking the most: in making decisions.

For some reason this was particularly challenging for our group. Perhaps because nobody felt comfortable throwing out the ideas of others, or maybe there was just a mutual indifference, I'm not sure. I recall several times trying to get feedback from my group when discussing sketches but just getting blank stares in response.

Prior to this class I had never been one to lead a team – at least I would never be the first to volunteer. A major theme we were learning was that each step of the design process expands on the last and fosters the next. So our indecisiveness going in to week four had me worried that it would result in a poor final product at week ten. This fear pushed me in a way to sort of take it upon myself to lead the group, though I think “lead” is too harsh of a word. I like to think that I took the opportunity to *guide* the project in the most modest way. Every one of our members was capable, pulled their own weight, and deserves credit in their contributions; we just didn't quite mesh right out of the gates and rather needed a nudge in the forward direction.

With this, I think I applied much of what I learned from the previous two weeks: guiding a discussion among our group and not so much forcing it, along with suggesting topics when we hit a blank. In doing so I do feel like I was able to get better feedback from my fellow members to the point where we felt qualified enough to make decisions.

From this stage in the process I have learned to have confidence and trust in your own instincts while designing but being careful to never get too particularly attached to any one idea. This was very much reflective in the sketching phase as I know one or two of my group members (and maybe myself) were a little disappointed to see their sketches nixed the following meeting. Though this had to be done in hopes of better meeting the users' needs. But the other side of this coin is to also have confidence and trust in your teammates. After all, the design isn't for just one person, so it wouldn't make much sense to shut them out – especially when there is a shared interest. Keep an open mind, but don't be foolish. Trust yourself, but don't be stubborn. Yes it sounds cliché, but I think by abiding to these rules, not only has our design itself become stronger but more importantly our *ability* to design.



## Simulating the Experience – Weeks Five and Six

### All the Feels

Now that we had an idea of what the design would *look* like, the next step was to get a rough idea of what the design would *feel* like. I say “rough” because this entails prototyping on a very low level. With prototyping especially, it is important to keep the initial investment low (hence “low-fidelity prototype”) in order to preserve malleability should it be discovered that elements in the design need to be adjusted.

But before we could even allow ourselves to get that far, each person’s first course of action was to create a storyboard for a use case we thought Laura and the average user would typically find themselves carrying out. These included activities like translating a conversation between two users, captioning a lecture on a single user’s device, and reviewing a saved file (figure 5). In my eyes, storyboarding was basically applied sketching, though the importance was now in the subtext of *several* sketches as opposed to the visualization of just one.

It really can’t be stressed enough:

*Receive user feedback → Individual ideas → Aggregate Ideas → Refine Results → Repeat*

We analyzed and altered each other’s storyboard to the point where we felt the designed experience reflected Laura’s most recent feedback: that the time between identifying a task and doing said task should be as minimized as possible. With that, we were finally able to begin the low-fidelity prototype. In our case, it was completely paper based (figure 6); we produced on 3x5 index cards drawings that represented different screen orientations the user would see, depending on which use case was being simulated. Thankfully, this was fairly easy for us to accomplish because the paper prototype was derived almost entirely from the storyboards.

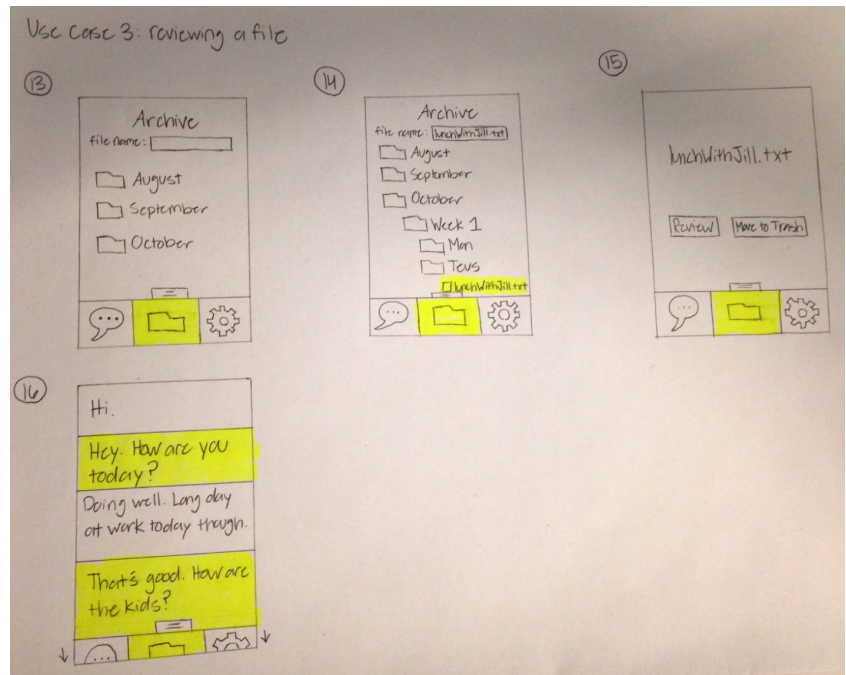


Figure 5: Storyboard for reviewing a file, which would translate directly over to the paper prototype

## Paper Prototype Disclaimer

To reiterate, this prototype was not meant to be a terribly accurate representation of the final product by any stretch of the imagination. In parallel, it was expected that Laura would have her fair share of issues, which she did. She had specific concerns regarding error recovery, but due to the natural limitations of the paper prototype, we simply could not get a good idea of how this would actually handle. It was designed to be experienced in a very linear fashion, and this would've required dozens and dozens of more index cards – unrealistic for us due to the constraint of time, although we took special note of this concern for future testing.

However, we were relieved to learn that Laura liked the interfaces for the most part, explaining that they were easy to understand. With this knowledge, we had the confidence in knowing that we were at least taking baby steps forward in that we had satisfied Commandment #1.

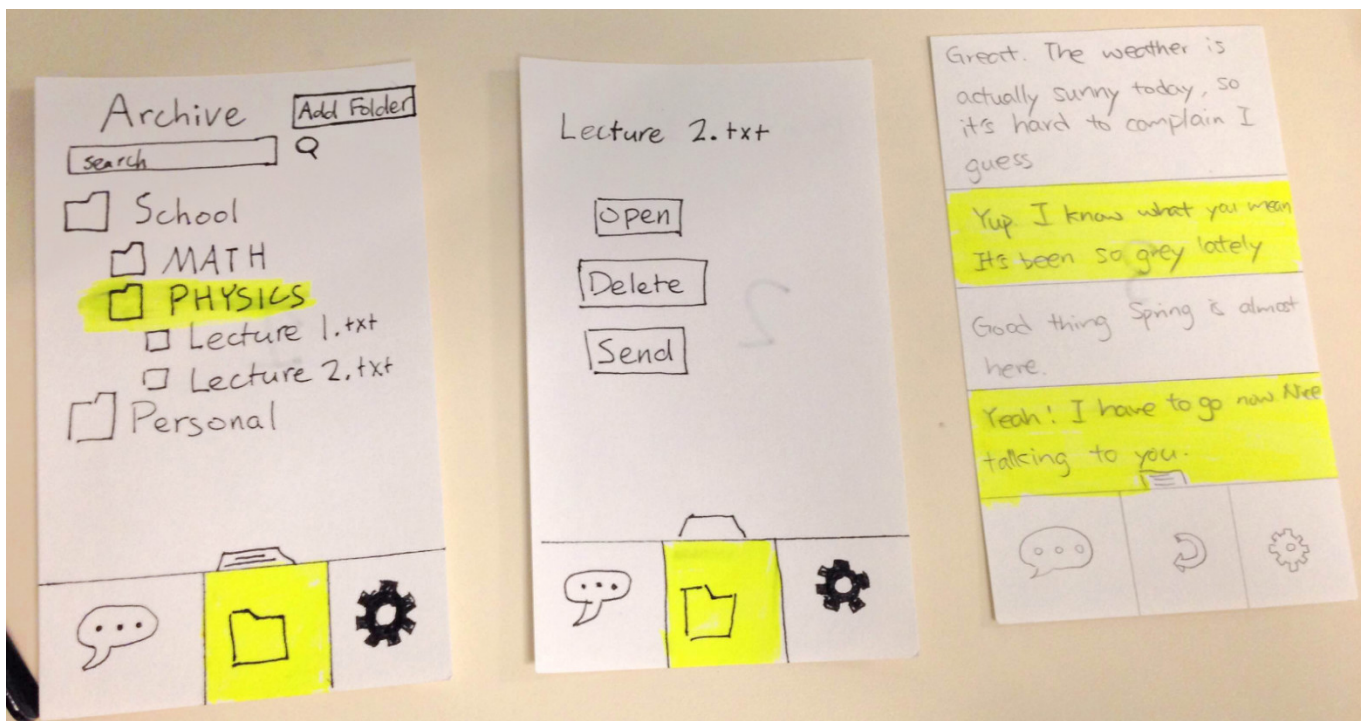


Figure 6: Paper prototype index cards for reviewing a file, taken almost verbatim from the storyboard (figure 5)



## Reflection – Weeks Five and Six

I have always considered myself a visual and spatial learner, which is why I think the sketching portion of the design process came easier to me than low-level simulation. With sketches, it's easy for me to see results immediately and therefore make assessments. Duh, right? It's a drawing.

But at this point, the issue at hand was no longer visual and was instead very focused on something more abstract – making it the toughest two weeks of the class for me. From assigned readings, we were taught that what we are really designing is an interaction, and the final physical product is just the mediator between the user and the experience. That's pretty philosophical in my opinion.

Okay. Well, what does “experience” *look* like? How to do you *draw* an experience, let alone one you're trying to construct? Frustration began to build being unable to find answers, and here I was thinking that design was going to be easy. These are questions I still don't know myself, and I honestly don't think I will ever be able to find a one-sentence answer for. But I do think that asking myself these open-ended questions has engrained a designer's mentality in me and has caused me to look deeper than just the surface.

Additionally during this stage, we were promoted to come up with a formal rationale of the design decisions we had made thus far. This was easier said than done for our group. We had been adding, changing, and deleting features around user feedback and our design approach all quarter. Yet for some reason the rationale was very difficult for us to put into words more meaningful than just “because it works” or “because Laura said so”.

I think this resulted because our group was not as meticulous about documenting the adjustments as we should have been at the time. What we should have done was keep track of a running list of all components of the design. As a result, some important reasoning had sort of fell through the cracks, and we were actually finding ourselves asking why some things we were even included in the design.

This led us to have a major reevaluation of our project and get into the real nitty-gritty of our design. We asked ourselves specifically how certain aspects met Laura's needs from the initial meeting, linking each back to at least one of her Three Commandments. These connections served as the foundation of our rationale, which we then saved to a shared document and began updating ever since. The design rationales for our most prominently pushed features can be found below:



### Designing as a Phone App

Being user sensitive inclusive designers, we are trying to design for as many people as reasonably possible. Seeing as how many people now own smart phones, both disabled and nondisabled alike, we initially thought the obvious choice was to design the project as a mobile application for a phone as opposed to its own standalone device – it was consistent with our design approach. However, the only problem was that Laura does not own a smart phone, as previously mentioned. For awhile we debated if the project should run on its own hardware, and it finally boiled down to this:

*We could either design a unique device that would work extremely well for our expert user but maybe not others, or we could design an app on a conventional medium that would work extremely well for others but not maybe not our expert user.*

Remembering from the assigned readings that the tester does not always directly benefit from the final design, we bit the bullet and opted for the latter option. That being said, we are still designing with Laura in mind, taking her feedback into close consideration and making decisions as if she *did* own a smart phone in order to accommodate her specific needs as much as possible.

### Minimalist Home Page

Our home page is where the navigation to start recording and captioning a conversation begins so that the user can pull it out and start using it as quickly as possible. This is the first thing the user will see when they open this device up granted that they did not previously log out manually. Our expert user wanted two things: simplicity and quickness. Thus, we only have a few features available from the home screen.

### Phone Connectivity

Virtually every smart phone comes with Bluetooth technology, allowing two devices to directly on their own network. We decided to take advantage of this existing technology in our addressing of issue #3. The initial idea was that the captioning would take place on a single device, meaning that the user would have to pass their phone to another person to speak in to and would then pass it back to the user so that he/she could read the caption. We later decided this method to be rather tacky, awkward, and it just looked weird from an outsider's perspective, which conflicts with issue #3. So instead of running on a single phone, we had the idea that phones connect via Bluetooth. This way each person is comfortably speaking into his or her own device without the conversation being interrupted. The conversation is able to play out organically how one normally would and as a result, does not draw unwanted attention like the previous design.



## HiFi Prototyping Magic – Weeks Seven and Eight

### **From Lowest of Lows to Highest of Highs**

One last time for good measure:

*Receive user feedback → Individual ideas → Aggregate Ideas → Refine Results → Repeat*

As stated previously, Laura gave us the impression that she was satisfied with the overall design. Therefore we wanted to mimic the general experience in proceeding. The goal for the next meeting was to have a high-fidelity prototype that Laura could test in the most hands-off setting as possible, entailing that it be more dynamic and interactive to account for potential errors that she could make when testing.

With that our group shifted focus to a wireframing program called Balsamiq, a canvas that allowed us to build such a prototype. All members were responsible for creating mockups for a different component of the design while making the agreed changes to button placements, orientations, wordings, etc. based on Laura's feedback. My particular job was to work on the settings menu portion (figure 7) where I had run in to a bit of a problem. The logout button was initially located here, which Laura had trouble finding. She suggested that it be always present on screen, but we had our concerns with this advice.

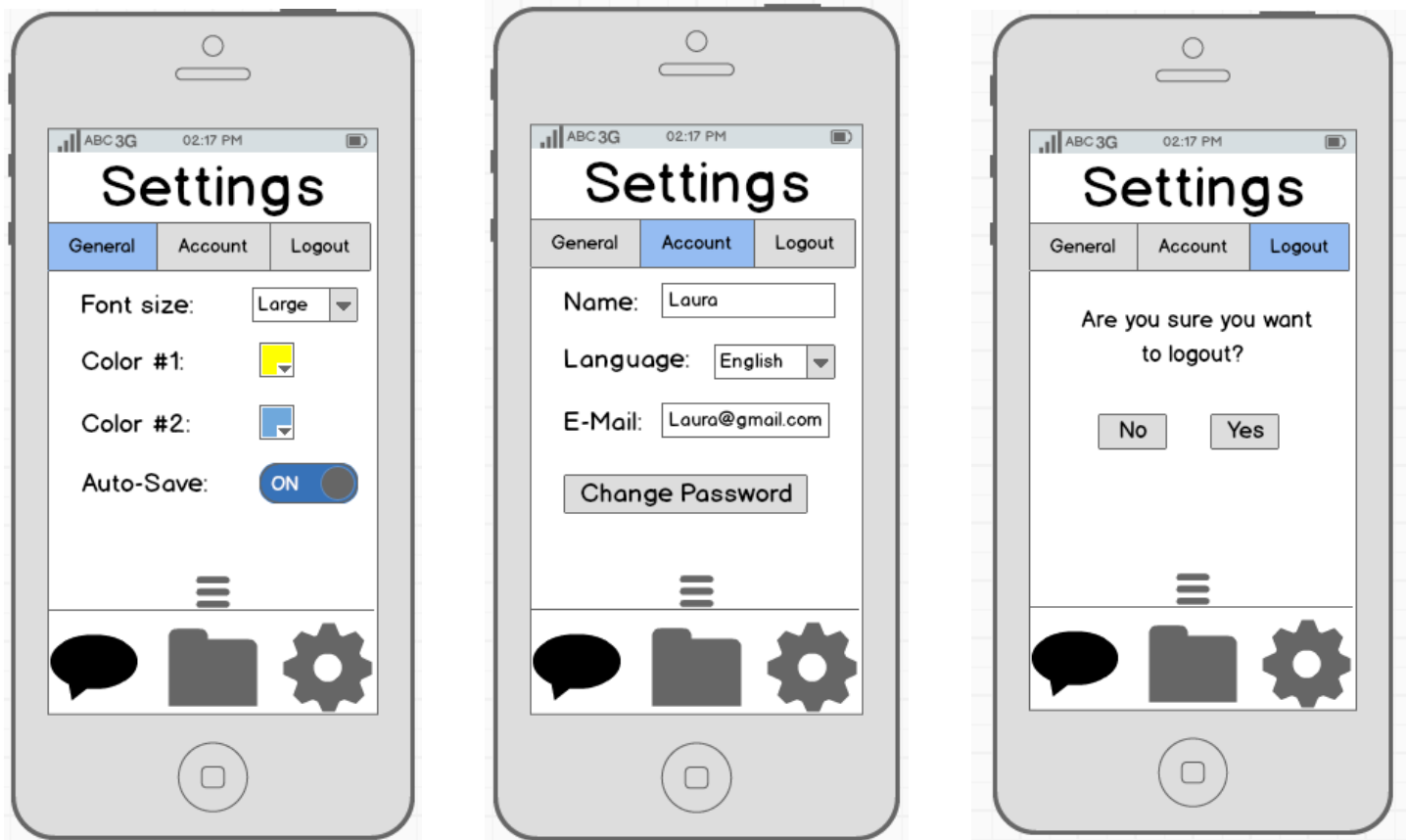
### **You Can't Please Everyone**

As much as we valued listening to our expert user, we were still trying to accommodate for the average user under our design approach. We felt that by keeping the current location of the button, this would be preventative of many users accidentally logging out and avoiding the arduous recovery process of having to log back in. Plus by having it in just one spot, we were intending to keep the interface clean, a concern of her own. Despite her issue, it was by this rationale that we kept the position of the logout button.

In preparation for the next meeting, it would not be enough to simply have the high-fidelity prototype itself. Because we were trying to get the most accurate experience of the final product as possible, we wanted to offer Laura as little help as possible when testing. This lent itself to designing a series of hypothetical scenarios that we envisioned either Laura or another user could be in (these can be found on page 18). The idea was that they would be specific enough to isolate a certain function we wanted to test while being vague enough not to give it away. From there we could deem each scenario a success, failure, or neutral based on the amount of help we had to give, while hopefully shedding light on the flaws in our design.



Figure 7: A few of my created Balsamiq wireframes for settings; all of these would make it almost directly into the final design



1) General Settings

2) Account Settings

3) Logout

1) General Settings: Here the user can change the general appearance of the interface. "Color #1" and "Color #2" refer to the background color of the text for the user and the other person respectively when captioning. These would later be changed to "My Color" and "Friend's Color" for clarity. The ability to change font size was very important to Laura, as she can find small text especially difficult to read being half blind. The auto-save feature was also included with power users in mind, speeding up the experience.

2) Account Settings: The user is free to change their name to a completely ambiguous alias, user their first name only, or include their full name to their own privacy leisure. The associated email address and password with the account can also be changed here for the user's security.

3) Logout: This is the location for the logout button, chosen for reasons previously explained.



High-fidelity prototype testing protocol:

Explained scenario:	Task being tested:
1. You would like to start captioning with the application but realized you have somehow forgotten your password.	Signing in given that the user has forgotten their password (resetting password)
2. You are at a loud restaurant with a friend and are having trouble hearing what they're saying.	Captioning dialogue on just the user's device
3. You are watching a short video on the Internet that's entirely in German, but you would like to know what's being said	Captioning translated dialogue on just the user's device
4. You are meeting Amy, who only speaks German, for the first time. She also has a device with the same application.	Captioning a translated conversation for two users (connecting devices)
5. Amy forgot to save her file of the conversation and asks that you please give her yours.	Ending a caption, saving the file, and sharing the file
6. Memory is low on your device, and you decide that those saved conversations with Sam are not important.	Deleting a folder
7. You know you will need to caption many conversations w/ Jessica soon, and want to be able to save them in the same place.	Adding a folder
8. You want to review that captioned math lecture from Oct. 21 but forgot where you saved it.	Searching for files via the search bar
9. The text is appearing small and difficult to read, probably because your eyes are strained from excessive use.	Changing font size
10. You changed your e-mail from Google to Yahoo and would like to login with the new address from now on.	Changing the e-mail address associated with the account
11. Your password was reset previously because you forgot it and want to change it to something you'll remember.	Changing the password used to sign in
12. You are done with the session and would like to exit out of the application.	Logging out



## High-fidelity prototype testing results:

Scenario #:	Summary of results and observations:
1.	<b>Success</b> – Laura immediately navigated to the “forgot password” link, quickly followed the provided steps, and logged in with a new password.
2.	<b>Neutral</b> – One minor hiccup: Laura was unsure of whether to turn translation on since we did not clarify in the scenario that her friend does indeed speak English. Other than that, it was a success.
3.	<b>Success</b> – In this scenario it was more obvious that Laura would need translation on. Though she seemed a little startled by the screen change when she turned translation on, she was still successful without help.
4.	<b>Success</b> – Though again, she seemed a little bit startled by the screen change when connecting to another device. The translation bit went much more smoothly this time than scenario #3, however.
5.	<b>Success</b> – No hiccups along the way with this one. Laura said she liked the “file options” drop down menu, having all the options available in the same place.
6.	<b>Success</b> – Deleting is accessed from the same menu as sending, so Laura was able to figure this one out right away.
7.	<b>Success</b> – Again, adding a folder is accessed the same way as deleting and sending, so Laura was able to accomplish this with ease.
8.	<b>Neutral</b> – Laura made the mistake of thinking “search” could be found via the “file options” drop down menu. She quickly realized what the magnifying glass represented when we nudged her in the right direction.
9.	<b>Success</b> – We never mention anything about settings in the scenario, but she was able to navigate there after a bit of playing around with the interface to change the font size.
10.	<b>Success</b> – Laura commended the organization of general settings and account settings to make things easier to find.
11.	<b>Success</b> – Laura also appreciated the feedback when making account changes. She said that it would be helpful in identifying/avoiding something unintended.
12.	<b>Failure</b> – It wasn’t immediately apparent that logging out was done from settings. She suggests there be a button for this at all times, but we’re unsure of this in order to keep the interface as clean as possible.



## Reflection – Weeks Seven and Eight

To me, this was the most mechanical part of the design process. Much of the stress here did not come from designing itself. Rather it was due to the hectic nature of having to learn and familiarize ourselves with brand new software and make a useful prototype in two weeks time. Balsamiq did allow us to account for more situations that our initial paper prototype could not, but to our dismay we eventually decided that it too was not robust enough to represent our final design. As a result, we were scrambling to transfer our entire prototype over to Axure, a more interactive wireframing program (it should be noted that Ryan is a champion for getting this done entirely on his own).

As if that wasn't challenging enough, Laura was also ill and unable to show at our scheduled final meeting. There were just two weeks left, and every day was huge to us – we had gone from being on top of our work to being dreadfully behind in a matter of one class period.

Fortunately though we were able to meet up within decently reasonable time. Acting as our own project managers we had to reach out to Laura ourselves to set a new time and date. In doing so, our group was (un?)lucky enough to experience this applicable caveat of working with a client, which certainly was not directly intended by the professor.

Four days later when Laura got to test our prototype, she seemed really impressed with what we had to the point where she was at a bit of a loss for words in suggestions. While she was verbal about only a few things, we felt that she had maybe one more issue that she didn't actually realize herself, based on our observations. From both scenarios #3 and #4 (on page 18 and 19), there was an instance where Laura would press a button and new options would show up on screen that she didn't seem to be anticipating. We considered changing making such impending options visible, though faded out until the corresponding button is pressed. This way the user could better predict what a feature will do before actually engaging it.

Overall, we thought our user test a success based off of Laura's feedback as well as the results. Reiterating, as user sensitive inclusive designers our main priority was to listen closely to Laura, and she did an exceptional job in eliciting her thoughts. We think this is why we were able to foster a design that Laura approved of and were looking forward to making the final tweaks.



## Getting Specific – Weeks Nine and Ten

### Working Out the Final Kinks

For the few concerns with the high-fidelity prototype that Laura had, they were for lack of a better term “nitpicky”. But I mean that in a good way. How you ask? At this point in the design process, we honestly *wanted* nitpicky – nitpicky is a good sign. Nitpicky suggests there are only minor kinks left that are relatively easy to fix. There are no drastic issues with the overarching design that could lead to its significant reconstruction. Though that’s not say that they are to be taken lightly, as the accumulation of the smallest of things are often what break the bigger experience. Once the corresponding final touches were made to the Axure prototype, we were able to proceed with the design specification – a document that would mimic our design being passed on to engineers for actual construction. The spec loomed over us for the past nine weeks and was the final testament to what we had been working for all quarter.

This required each member to put our whole design into perspective all at once, which in retrospect is something we didn’t do often enough along the way. Ever since about the low-fidelity paper prototyping phase, each person was mostly responsible for somewhat of a “sub-design” of the project (while still having influence on other aspects). Looking back now, this is a bit of a caveat that we should’ve been more aware of with our design philosophy. I know – I lied. But seriously, one last time:

*Receiving user feedback → Individual ideas → Aggregate Ideas → Refine Results → Repeat*

### Mixing it up for a Change

In approaching the design specification, we basically decided to reverse the order of “aggregate ideas” and “individual ideas”. The hope was that the result would feel more like a representation of *our* design as opposed to the combination of four separate but related designs. As a group, we did our best to rationalize each major feature in its most specific form light of Laura’s Three Commandments, her feedback, and the design approach. If it agreed with intentions of the group member who was responsible for that particular part of the design, then the nitty-gritty implementation details and rationale were added to the spec.

Thankfully we found only a few design choices were made outside of the knowledge of the rest of the group, so the spec was relatively straightforward in assessing. Ultimately, I don’t think this “ease” came by some stroke of luck or coincidence; it was very much the result of the non-ease from the nine prior weeks. The whole quarter we were putting the pieces in place and conditioning ourselves to this type of work that when it came time to deliver, we were prepared. An example of the spec can be found on the next page.

**Design Spec for General Settings:**

- Adjusting font size
- Customizing caption colors
- Toggling auto-save

Adjusting font size

Our expert user suggested this feature, finding it useful as a half-blind user. Font size is chosen via a drop down menu with the available choices being normal, large, and extra-large. These should equate to standard font size 12, 14, and 16 for body text respectively, and standard font size 28, 32, and 40 for headings. These values were chosen because we have found them to work best given the screen size. Anything larger and margin/spacing errors begin to appear. Upon selection, the font size should adjust immediately – no need for a confirmation window to show up.

Customizing caption colors

This was also suggested by our expert Laura due to her difficulty in making out certain colors. “My color” constitutes to the background color of the text for the user when captioning and likewise with “Friend’s color” but for the person the user is talking with. Both should be selected by a dropdown color slider like in figure 2 but running vertical instead of horizontal.

Toggling auto-save

This should be implemented as a simple on/off switch and should be off by default. Should the user turn it on, when a user ends a conversation a “Do you wish to save?” pop-up no longer appears. Instead, the user is taken to the begin caption menu and the file is immediately saved in folder called “Auto-saves”.

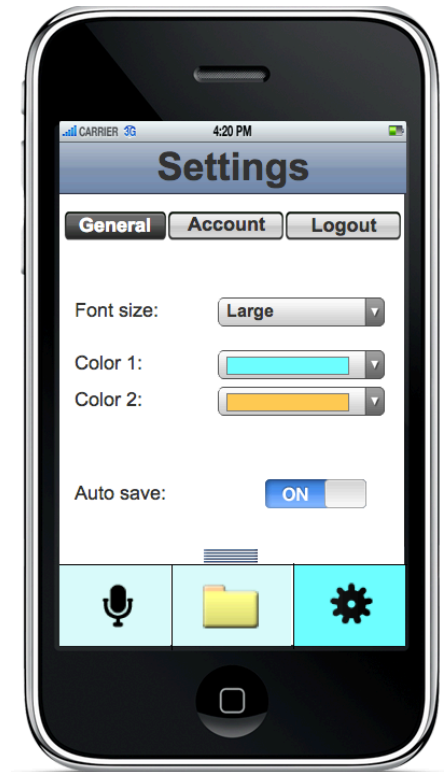


Figure 1: General Settings

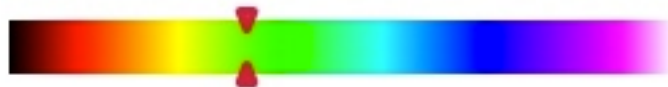


Figure2: Color Slider



## Final Reflection

This is week ten we're talking about here, so needless to say we were all dead tired as if that was helping anyone. I speak for myself, but at the time I truly was not looking forward to the design specification. To me it felt like the bulk of the work had already been done and seemed a bit redundant at this point to re-list our decisions. Me being a brat, I remember being envious of the students whose professor made them do no such thing – but hindsight is always 20/20.

I'm not just saying it because it's what I'm supposed to say, but I really I am glad the design spec was within our class's curriculum for a handful of reasons. For one, it's an authentic scenario. The design process doesn't just dissolve after the prototype is made. And you would think that a designer's job ends when the design is completed, but I have found this to be a false wish. It's also within their duty to convince the stakeholders of its merit in order to even be considered for production.

Secondly, it made us look at our project within the scope of more than just ourselves or even our intended users for the first time. We now had to view it from the perspective of *engineers* – arguably the hardest people on the planet to please. This brings me back to the point I was trying to make in the introduction. Being of technical background, I didn't want to admit the complexity of designing in comparison to the required engineering, and for my ignorance, I deserve to have had my butt kicked by this class.

Having seen both sides, I better understand the complications that are unique to both. They are different on so many fronts, yet each is nullified without the other. This is why I think the spec is so valuable. It serves as the bridge between design and engineering, subtly demonstrating their symbiotic connection, and I think this quality is often overlooked.

Lastly, I feel like writing the spec together is where we got to bond the most as a team. Between this and all of our other classes, every one of us was stressed as could be. Even given the circumstances, it was uplifting for us to finally have the final components in our design. Maybe we were all a little sleep deprived at the time of finishing our project, but whatever the case, the group seemed to be more chatty than usual. Amy, Kevin, Ryan, and I got to connect on a deeper level than just teammates, and I'm thankful for that.

Looking back, it's interesting to see how our design has reflected our group's relationship. It had gone from isolated and uncomfortable to slightly disconnected though with potential, and it finished – in my opinion – unified and whole. This is certainly one of the few projects I've worked on where I can say that I'm truly proud of not only the result but also the people that I've worked with, though I'm sure this class has paved the way for me to experience more of this integrity.