B7G Spring 2017 portfolio piece

**Goal:** capture all the work we’ve done, so that we can show it to potential employers ASAP as we interview this summer. Content can also be used for the website, and we can update it throughout the summer. **Sections include:**

**Problem Space**

SME interviews - **NORA**

Question-storming (can include kickoff meeting too if desired) - **NORA**

**Literature Review**

Emerging Tech Survey - **CLARE**

Sensemaking “affinity” of hella papers - **EMILY**

**Empathy Exercise**

Experiment - **CONRAD**

Medium post - **JAYANTH**

**Contextual inquiry**

PWVI interviews + interpretations - **EMILY**

Finance interviews + interpretations - **NORA**

Affinity Diagram - **CLARE**

Wall-walking, visioning charette - **EMILY**

**Books (x2)**

Secondary research report (insights, visual design) - **CONRAD**

Spring book (insights, visual design) - **CONRAD**

**Presentation design**

Spring presentation (visual design, guiding principles) - **JAYANTH**

**Next Steps**

Guiding Principles/Future Opportunities - **CLARE**

Visioning session w/ BB - **JAYANTH**

**For Each Section:**

Roughly 1 paragraph describing what we did. Less is more (especially for smaller segments of work), so props if you can tell a section’s story more quickly. Try to find a picture or two that could be used, and write captions for them. You can also make quick visualizations if you’d like, as well, if you’re feeling ambitious, but no pressure.

Put your parts into corresponding sections starting on the next page (gill sans, 12, regular, for consistency, if you would!) For images, please do the following:

1. Place images in folder w/ your name <https://drive.google.com/drive/u/0/folders/0BydD14xNnK9bWEdGcWFDLXlkTkk>
2. Label the image somewhat usefully
3. Write the picture name and caption in the sections with the text:

**JayanthEatingABurrito.jpg**

We ate at 15 different taco trucks in February and did a competitive analysis.

**Let’s get stuff in here by 5/22!**

**Problem Space**

**SME interviews - NORA**

To begin understanding the complex space of accessibility, data visualizations, and expert finance decisions, our team interviewed ten subject matter experts (SMEs). Our interviewees ranged from accessibility and emerging technology academics to finance and accessibility industry professionals. Along with our literature review, we used these interviews to learn more about the current state and future of assistive technology, the benefits and challenges of using different modalities for communicating data, and current efforts to make financial data used for decision-making more accessible.

**Question-storming (can include kickoff meeting too if desired) - NORA**

Our team conducted a question-storming session with our client to kick off the project. Question-storming allowed us to quickly generate a large number of research questions and align our team’s goals with our clients’. To focus our question storming, we asked the client to create a short and bold statement that represented the large problem space. From this prompt came: “Bloomberg’s products provide too much information, making it difficult for visually impaired people to get to the “nub” of the data.” and “Sighted people are privileged because financial tools are designed for sighted people.”

Inspired by the two statements now up on the whiteboard, our design team and clients spent time generating individual questions. Like in brainstorming, we encouraged everyone to avoid censoring themselves or others and be as creative and inclusive as possible. After all questions were up on the board, each person quietly walked for 10 minutes and starred five questions that most excited them. Discussing our top starred questions, we were able to identify and scope to major problems to guide our research, including:

* How do the mental models and workflows of people with visual impairments differ from sighted people?
* How might a non-visual tool benefit different audiences?
* What financial data is essential for decision-making?

**Emily and Clare Questionstorming.jpg**

Our team completed a question storming session internally to build team consensus and pilot the activity before our client meeting.

* How can we as sighted designers understand the mental models of visually impaired people?
* What ways do visually impaired people feel limited compared to sighted people
* Do visually impaired people feel disadvantaged
* Pros and cons of using each sense?
* Are there advantages to using tools for unsighted people when you are sighted
* What heightened skills from visually impaired people can be leveraged
* Could non visual tools greatly impact the way sighted people use data
* How do unsighted people use an information dense app?
* What is the workflow of a visually impaired financial analyst? How do we build upon this existing workflow
* What are hacks that visually impaired people are using to solve problems?
* What tools do visually impaired people use to get summaries?
* How hard is it for unsighted users to recover from errors?
* How do people get to the “nub” of data?
* What is essential info?
* Who/what decides what information is essential?
* What is context for understanding?
* What is the mental model for people who haven’t seen a thing/have never been sighted vs low vision vs formerly non impaired
* How do you convey info which is not typically communicated (e.g., facial expressions)
* Who is our actual audience? Do they really want this tech?

**Literature Review**

**Emerging Tech Survey - CLARE**

Clare conducted an emerging tech survey to get our team on the same page about new and emerging technologies, especially ones we might use in the project. She presented this to the team and we had a Q&A session about the nuances of each technology.

Here is what we covered:

*EmergingTech-01.png*

**Sensemaking “affinity” of hella papers - EMILY**

Our team split up dozens of research papers on topics ranging from accessibility and cognitive science to data visualization, we came together as a team over several sessions in order to develop a shared understanding of the research space. After creating detailed notes for each individual paper of interest in a spreadsheet, we described the takeaways to the team and printed out the discrete points of interest onto individual notes. We then clustered these notes to see what themes emerged in each research space. We digitized these higher level themes into the clusters shown below.

*Secondary-affinity: Thematic clusters of concepts from secondary research*

*Clare-secondary: Clustering team insights from secondary research*

**Empathy Exercise**

**Experiment - CONRAD**

As a team we felt it necessary to try to put ourselves in the shoes of a PWVI. However, it was important to develop empathy specifically in the context of our research, rather than just simulating blindness. After doing research on how to effectively design an empathy exercise, we wrote our own experimental protocol. In this exercise, we first learned the basics of the Apple Voiceover screen reader, and then used it to navigate our bank accounts on both our laptops and iPhones.

**Empathy Exercise.jpg**

**Medium post - JAYANTH**

After doing this research and conducting our empathy exercise, we decided to share our knowledge on why and how to run an empathy exercise in a user centered design process. Take a look at our article here: JAYANTH.COM. This article received accolades from the community and sparked conversation about empathy exercises

**Contextual inquiry**

**PWVI interviews + interpretations - EMILY**

Because we were initially uncertain of how many people with blindness worked with financial data, we created an online screener survey through Google Forms and cast our net wide, leveraging the networks of subject matter experts in accessibility to distribute the survey. Our survey screened for skilled people of blindness who use many of the same tools as finance workers, such as spreadsheets and programming languages. In total, we received 198 responses: 189 of these were legally blind, ranging from moderate to total vision loss with no light perception. We were encouraged to see that a significant number of these respondents regularly engaged in tasks relevant to our project: over 40% of respondents had checked financial securities in the last 30 days.

*task-chart: The breakdown of data and finance tasks from our screener survey. Note: the 203 total includes 5 duplicate responses.*

From this list of survey respondents, we scheduled remote and in-person interviews with 10 PWVI: five with congenital blindness, and five whose vision declined later in life. Our interviews were structured around observing how our interviewees accessed financial data in real time. For those who didn’t feel comfortable sharing their financial information, we asked them to recount a recent interaction for tasks such as using spreadsheets to analyze data, or checking their stock portfolios, and asked probing questions to uncover the pain points. After each interview, three members of the team gathered to go over the notes and recordings, parsing out the findings into discrete notes and visual models of the workflows described.

*bluetooth keyboard*: *One of our interviewees customizes his bluetooth keyboard with tactile stickers to find his place while typing.*

**Finance interviews + interpretations - NORA**

Using contextual inquiry methods, our team interviewed six finance experts about their use of data and visualizations for decision-making. We focused on interviewing people who actively managed investments and frequently made buy/sell decisions. Four out of six finance experts professionally invest and two actively manage personal investments. Roles included stockbrokers, the president of a capital management firm, and analysts, and MBA students.

Our goals were to learn more about the workflows of high performing users and identify what data is and is not important for guiding their steps and decisions. Our team held an interpretation session after each interview to create notes for affinity diagramming and sequence and flow models to illustrate our participants’ workflows.

Financeinterpretation.jpg

Many of the people we interviewed told us that they have their own idiosyncratic workflows. To capture how they follow the information scent, we create sequence model.

**Affinity Diagram - CLARE**

Using the notes taken in our interpretation sessions, our team began constructing what is known as an affinity diagram. An affinity diagram is a tool to gather large amounts of data and organize that into groupings in order to come to higher level insights. We printed all of the notes from our interpretation sessions and began physically clustering them in our office. Unlike traditional affinity diagrams, we decided to print all of our notes from sighted financial professionals on purple paper and all of our notes from visually impaired users on blue paper so that we could easily see what groups were most influencing particular insights. Out of this affinity diagram, we derived 6 major insights:

1) People who help me are interfaces too.

2) My assistive technology can only provide one piece of information at time.

3) I use charts as a communication tool.

4) There is no normal.

5) Changing technology is difficult, so it better be worth it.

6) I use visuospatial metaphors as mnemonics.

**Wall-walking, visioning charette - EMILY**

We spent several team sessions “walking the wall,” a process during which team members, first silently, then through discussion, annotate the affinity diagram with questions, breakdowns, and design ideas. From here, we began ideating on possible solutions. As part of this process, we also created early prototypes to explore the forms of potential solutions. We experimented with tactile materials and audio cues, testing internally with blindfold simulation to identify directions for higher fidelity prototyping and user testing with visually impaired users. We also considered the feasibility of our top design ideas, the input and output of each idea, and what impact the idea would have on blind and sighted users, respectively.

*Design-ideas: A digitized list of design ideas generated by “walking the wall” of the affinity diagram*

*Design-ideas-matrix: Top design ideas plotted in terms of estimated difficulty of implementation and impact of final solution, annotated with input and output modes*

*early-prototype-foamcore:* *An early prototype for a dynamically generated tactile chart, mocked up with foam core and straws during a rapid prototyping session*

**Book (x2)**

**Secondary research report (insights, visual design) - CONRAD**

We conveyed our findings to our client through our secondary research report, offering five insights to help guide our contextual inquiry, as well as our future product designs.

1) “Don’t move my stuff.”

Spatial representations of an interface or an environment work very well, but only if things stay the same - even small visual changes can be detrimental to such a model.

2) “I want to use the same stuff as everyone else.”

People with visual impairments don’t want to stand out more than they need to.

3) “Don’t fix what isn’t broken.”

Learning new technologies takes a great deal of time - leave PWVI the opportunity to leverage their existing skills.

4) “So what product are you making?”

People with visual impairments have a tendency to approach user studies with the assumption that they are testing a final product, as opposed to having a conversation about research, or giving feedback on a prototype.

5) “I do a lot of additional work others don’t know about.”

The concept of invisible work inspired our team: a PWVI necessarily conducts additional work to create an accessible space.

**Secondary cover.jpg**

**Secondary chapter.jpg**

**Secondary body.jpg**

For our visual design, we chose a layout suitable for a research report. We also developed a style guide that was formal, but still offered a bit of flair.

**Old style guide.jpg**

**Spring book (insights, visual design) - CONRAD**

We presented our research to our client in our spring book, “What Am I Missing?” We offered six insights, told from the perspective of a PWVI:

1) People who help me are interfaces too.

The transfer of information by a sighted person is subject to that person’s interpretation and expertise.

2) My assistive technology can only provide one piece of information at time.

It’s hard to view all parts of the puzzle at once because screen readers only provide one piece of information at a time.

3) I use charts as a communication tool.

Highlighting visual cues in charts is the easiest way to persuade colleagues and clients of investment decisions.

4) There is no normal.

Both PWVI and finance experts depend on their idiosyncratic workflows to get things done.

5) Changing technology is difficult, so it better be worth it.

A product must offer a meaningful improvement to justify altering a hard-earned workflow.

6) I use visuospatial metaphors as mnemonics.

Visual and spatial reference points help bridge communication between sighted and blind colleagues.

**Spring cover.jpg**

**Spring toc.jpg**

**Spring chapter.jpg**

**Spring insight.jpg**

We also refined our branding, adopting a more corporate grid and layout, as well as using a style guide with a high contrast color palette for visual accessibility.

**newstyleguide.jpg**

**Presentation design**

**Spring presentation (visual design, guiding principles) - JAYANTH**

We presented our research findings for the semester to Bloomberg, presenting to their accessibility, UX, and software teams. We chose to hone in our presentation on four specific areas:

1. Giving our audience an understanding of our problem space
2. Showing our 6 insights from our research
3. Presenting guiding principles for the future
4. Displaying possible prototyping directions for the future

We gave our audience an understanding of our problem space through a small activity to help foster empathy to the use of screen readers to solve problems. We read off a table of data from a screen reader and asked our audience to make a decision.

Afterwards, we presented our six insights from above

1) People who help me are interfaces too.

The transfer of information by a sighted person is subject to that person’s interpretation and expertise.

2) My assistive technology can only provide one piece of information at time.

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A product must offer a meaningful improvement to justify altering a hard-earned workflow.

6) I use visuospatial metaphors as mnemonics.

Visual and spatial reference points help bridge communication between sighted and blind colleagues.

In addition, we presented some guiding principles for the future

1. Do not sacrifice power for ease of use
2. Allow for jumping around different levels of data
3. Support direct access to data for interpretation

Finally we presented opportunities for the future

1. Context for Visualizations
2. Control in Data Navigation
3. Confidence in Data Accuracy
4. Communication of Data

We also focused on tightening our visual design for our final presentation. We reduced the different styles of slides down to 7 different templates. In addition, we created an updated color palette for our final design.

**Next Steps**

**Guiding Principles/Future Opportunities - CLARE**

Moving forward, there are a few guiding principles we want to keep in mind:

1. Do not sacrifice power for ease of use
   * Changing tools is nontrivial ask for PWVI but revolutionary powerful tools are worth the learning curve
2. Allow for jumping around different levels of data
   * Visually “jumping around” is crucial to forming an market understanding for necessary investment decision making. However, we know that current AT like screen readers only provide one piece of info at a time.
3. Support direct access to data for interpretation
   * We also know that there is no normal when it comes to interpreting data. For a finance professional, it’s not enough to simply view a financial chart. It’s by getting direct access to the underlying data and analyzing it in their own unique ways that finance professionals gain a competitive advantage in making investment decisions. We can see this in the way that Bloomberg clients engage with the terminal, asking for access to data feeds and be able to extract and manipulate data points.

We also have a few opportunity areas we think would be viable to explore:

1. Context for Visualizations
2. Control in Data Navigation
3. Confidence in Data Accuracy
4. Communication of Data

**Visioning session w/ BB - JAYANTH**

After presenting our work to Bloomberg, we ran through a visioning session with our client. We used a creative matrix to rapidly generate ideas on various vectors. We tried to generate ideas at the intersection of senses and opportunities from earlier. After generating ideas from this structure, we judged the ideas on high impact/low impact to get an understanding of how valuable these ideas would be.