

U-M Precision Health

UX Research and Requirements Report

A short, thick yellow horizontal bar.

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SI 487

Project Description

Client Mission

U-M Precision Health's mission is to take an in-depth and data-driven approach to developing unprecedented insights into human disease and public health issues. Precision Health's research helps treat currently ill patients while also maintaining a focus on discovering new, unique ways to treat diseases, implement these findings in regional hospital settings, and increase public knowledge of treatments they hope will eventually be used nationally.

Project Description

U-M Precision Health's website has a plethora of information available to its researchers and study participants. However, the site is designed in such a way that hides this important functionality beneath layers of navigation. Users are unable to quickly find the resources they need to do their job or stay informed. Additionally, the website is extremely content-heavy. This decreases glanceability and makes it hard for users to skim the site and quickly find what they're looking for.

Throughout this project, we will be focusing on improving the usability of the site as a whole. Our main focus will be on improving ease of access to resources for the ongoing Michigan Genomics Initiative and the Data Analytics & IT page, which provides datasets and tools to Precision Health researchers.

Project Background

The current U-M Precision Health website was created in WordPress and designed with little consistency throughout. The website has not been modified since its creation, and as more and more content is added, our client is noticing an increase in the number of usability issues that site users are encountering. As the organization continues to grow, it is important that all site content is organized logically. For example, our client has expressed frustration with how difficult it is to navigate to their Data Analytics & IT page, one of their most used resources. Our client is aware that their site contains numerous issues like the aforementioned navigation flaw and initiated this project to get our help in creating a new and improved website design.

Project Goals

1. Create a design that differentiates itself from other Precision Health programs and competitors
2. Design 3 prototypes, as requested by our client in order to provide a variety of options for them to choose from
3. Improve the consistency between pages throughout the website
4. Increase the number of overall users
 - a. Target audience - researchers and participants
 - b. Secondary audience - general public
5. Highlight UM Precision Health's main functionalities and goals

Research Goals and Questions

We hoped to gain a holistic understanding of the usability issues and pain points felt by the U-M Precision Health website users through our research. Additionally, we wanted to identify which resources found on the site are most valuable to researchers.

Research Questions

1. Which aspects of the site do users use most often?
2. Which aspects of the site are redundant or unnecessary?
3. What are the users main goals when using the site?
4. What are the main pain points of the users?
5. Who are the main users of the platform?

Research Plan and Methodology

We began our research with a heuristic evaluation that we conducted on our own, independent of any actual site users. This acted as a "primer" for the rest of our research. From here, we connected with actual site users through surveys to gain a better understanding of their goals, needs, and pain points. Lastly, we worked with site users to conduct a card sorting activity to assess the issues with the overall site architecture and content organization.

UX Methods

Heuristic Evaluation

Purpose

Research question(s) informed by method:

- Which aspects of the site are redundant or unnecessary?
- What are the main pain points of the users?

Our team conducted a heuristic evaluation of the University of Michigan's Precision Health website in order to assess the site's shortcomings in terms of usability. This allowed us to understand how the site complies or diverges from Nielsen's heuristics. One of our research goals is to ensure a more seamless experience for users that increases efficiency and reduces errors, so this method helped us address that. The information we gathered from this evaluation expanded our understanding of the site's usability and will allow us to apply these findings to our prototype designs.

Methodology

In order to run the heuristic evaluation, we used Nielsen's Heuristics as a guideline to pinpoint the main usability issues with the site. We began on the landing page and worked through the navigation of the site to analyze how Precision Health handles consistency, efficiency, aesthetics and visibility to name a few. We then measured the severity of each problem on a scale from 0 to 4 in order to categorize which issues are most problematic.

Surveys

Purpose

Research question(s) informed by method:

- Who are the main users of the platform?
- What are the users main goals when using the site?
- Which aspects of the site do users use most often?

Our team sent out surveys to contacts provided to us by our client in order to gain some quantitative and qualitative insights into the varying needs of our users. We gained a baseline understanding of how people interact with the site based on their previous experiences with it. This survey gave us a better understanding of who our users are and what their needs are while using the site.

Methodology

We sent our survey to approximately 50 Precision Health users provided to us by our client. We included questions about their demographics (ie. education background, employment, age etc), their site usage (ie. frequency, main purpose etc.) and additional features they believe the site is lacking.

User Research Materials

See Appendix A.

User Interviews

Purpose

Following our survey, we planned on conducting user interviews with 5-10 users. That being said, we decided (with the consent of our client) to not conduct these interviews at this point in time. Because receiving feedback and survey answers from Precision Health users was incredibly difficult, we have decided to hold off on interviews and usability testing until we have a working prototype. Our users' time is very valuable and we think it'd be more beneficial to contact them later on in the process during usability testing.

Card Sorting

Purpose

Research question(s) informed by method:

- Which aspects of the site are redundant or unnecessary?

We conducted card sorting with the current navigation bar on the website. Card sorting lets us see what users think is the most intuitive way to organize site navigation. Based on the results, we are better able to cater to their needs, see which categories and pages are most important, and see what content is redundant and can be removed.

Methodology

We conducted 6 card sorting activities with users who were familiar with the site and users who were not. We used <https://www.optimalworkshop.com/> to conduct this remotely. We designed the card sorting activity by including the current categories and pages. The respondents were able to create their own categories or use the existing categories, then place the pages in the categories they saw fit. For example, the categories on the current navigation bar include "Home," "About," "MGI," "MIPACT," "News/Events," "Get Involved," "Grants," and "Workgroups." These were labeled as current categories, and respondents could choose to either continue to use those categories or make/organize their own. Then, the respondents placed the rest of the cards (the pages in the drop-down menu of the categories) in the categories they created.

Research Results

Heuristic Evaluation

Our team conducted heuristic evaluations of the site by working through the home page and the navigational system as specified in the methodology. This evaluation revealed a number of heuristic violations. The heuristics we found to be most severely violated were: aesthetic and minimalist design, consistency and standards, and flexibility and efficiency.

The first heuristic we found to be violated fell within the aesthetic and minimalist design category. We classified this as a severity of 3 (major usability problem) out of 4 due to the information overload caused by the text-heavy pages, lack of whitespace and a poor use of images. Our recommendation is to consolidate the text on pages and add relevant pictures to increase page interest.

The second heuristic we analyzed was consistency and standards. This was also classified as a severity of 3 (major usability problem) out of 4 as the site lacks navigational consistency and there is minimal commonality across pages. Moving forward, we recommend creating a uniform page layout and navigational structure.

The final major heuristic we evaluated falls within the category of flexibility and efficiency. We ranked this as the most severe violation, a 4, as this is imperative to fix. Precision Health's information hierarchy fails to highlight their most important features on the site including their Data and Analytics page. The structure of the navigation is both redundant and poorly organized, causing severe issues for users.

Survey

We sent out our survey to 50 Precision Health users as mentioned in our methodology. We had a 12% response rate (6 responses). Despite the seemingly low response rate, the quality of the responses we *did* get were in-depth, demonstrated patterns across responses and supported our hypotheses regarding who our users are and how they interact with the Precision Health site.

All of our respondents have a notable academic background, with at least a PhD in fields relating to science or statistics. Of the responses we received, all but one were in the age range of 26-35, the outlier being in their 40s. All respondents were at least somewhat familiar with the U-M Precision Health website but only use the site once or twice a month.

When asked about their typical visit to the site, we received a variety of responses, including searching for news and events, exploring information about grants, and looking up data provided on the site.

Our following question asked about which specific pages of the website they used most often. Again, we got a variety of responses, but the two most popular features of the site were the Tools & Resources tab and the News & Events tab (**Appendix B, Figure 1**).

Next, we asked our respondents to rank a list of website features in order of importance to better understand which parts to highlight when moving forward with the redesign. Information for researchers was the most important feature to most respondents (**Appendix B, Figure 2**).

Our last question asked respondents if there were any specific features that seemed to be missing on the website. For this question, we only received 2 responses. One response gave an example of how a different website organizes their public data. The other response found it difficult to find specific information about past scholar's programs, which was their main reason in visiting the website. We will be taking these recommendations into consideration when designing our prototypes (**Appendix B, Figure 3**).

Card Sorting

In total, we received 6 responses from users who are both familiar and unfamiliar with the site. The responses we did receive gave us quality insight as to how users of the site would like the navigation bar arranged.

On the current website, there are a total of 8 different navigation categories. According to our respondents, having this many categories is excessive. 50% of our respondents only created 5 categories. The largest amount of categories created was 7. (**Appendix C, Figure 1**).

Three participants made "Tools & Resources" its own category on the navigation bar, with the "Data Analytics & IT" page within said category. We expected this result because our client has continually expressed concern about the current location of the "Data Analytics & IT" page and would like to move it to the forefront. Currently, the page is located under the "Workgroups" category and takes 3 clicks to get to, so seeing that the respondents created an entire category dedicated to the site's resources is helpful for when we brainstorm the redesign. (**Appendix C, Figure 2**).

Another main takeaway from the card sorting activity was that many of the responses we obtained were specific to the "About" category. The responses included many pages that aren't currently under the "About" category, such as "FAQ" and "Features." Initially, we didn't think the "About" category would be of primary concern, but based on these results, we are going to be giving more attention to reorganizing that category. (**Appendix C, Figure 3**).

The other main navigation categories, "Get Involved", "News & Events", and "Workgroups" all included pages that were already currently under those tabs, so when redesigning, we should keep those categories similar if not the same. Overall from these responses, we can gather that users would prefer for the new site to consolidate the amount of categories in the navigation

bar, and would like some pages under the categories rearranged in order to make the site more efficient.

Analysis

Analysis Methods

Our team used empathy maps to gain a more holistic understanding of our users. Our empathy maps were created from the information we received from our surveys. By designing and using these empathy maps we were able to analyze our findings by documenting and categorizing how the users feel, what they think, hear, say, see and do. This method helped us understand the pains and gains of different users.

Our survey results also told us that many of the users primarily use the site for the “Data Analytics & IT” page, so creating a category in the navigation bar solely for “Tools & Resources” would make it easier for users to get to that specific page.

Themes & Insights

Through gaining an understanding of the typical uses of the Precision Health site, the heuristic issues with the site, and the flaws within the navigation we were able to find common themes within the responses and techniques we conducted. Our methods presented us with a variety of insight that will help us moving forward when designing our wireframes and prototypes.

By conducting our heuristic evaluations and card sorting, it is clear that there are issues within the site that fail to align with heuristic expectations. The inconsistencies with the navigation were brought to light through these research methods. Our prototypes will use a revamped navigational system to highlight the main sections that were mentioned within the survey responses and repair the inconsistencies.

We hope to find additional insights and confirm the themes we found through our research methods following our interviews.

Overall, we confirmed the navigational flaws as the main theme we will be addressing in the designs of our prototypes. We will highlight the features mentioned as users’ main resources on the site and will continue to improve upon the additional heuristic issues we have highlighted.

User Personas and Journeys

Primary Persona

Our primary persona is James, who is an instructor/researcher. Based on our survey responses, the largest amount of users comes from those directly involved in Precision Health. From our survey, we found that our primary user generally uses the site to input and find data about specific ongoing projects. James represents a group of people who are highly educated in their respective field and use the U-M Precision Health website as a tool to aid their research.

(Appendix D, Figure 1)

Scenario

James is a professor at the University of Michigan also involved in research with U-M Precision Health, specifically researching new ways to treat mental health issues. He is highly educated and has exposure to different types of database software. Because he is a researcher, his work focuses greatly on data collection and analysis, and he needs to ensure that this data is inputted accurately and is easily accessible to him and his team. James uses the U-M Precision Health website to search and input this information to keep his research organized.

Secondary Persona

Our secondary persona is Teresa, a student at the University of Michigan who is also involved in research with U-M Precision Health. From our survey results, we found that another main focus of the site is the offerings of grants and scholarships. Teresa represents a group that is interested in furthering her education and conducting research but as a student she needs to keep her costs as low as possible. **(Appendix D, Figure 2)**

Scenario

Teresa is a student currently working on her PhD in human genetics. She is a research fellow in the Health Implementation workgroup within U-M Precision Health, and is interested in looking into their scholar's program to aid her with tuition. While she has used the Precision Health website to explore her options, she is still aware of all the programs she is able to apply to, but is unable to take full advantage of them because the navigation of the site is poor.

Tertiary Persona

Our third persona is Kevin, who is a software engineer in the Ann Arbor area. He isn't currently involved in U-M Precision Health at all and is unfamiliar with the work they provide. U-M Precision Health is interested in sharing their projects with the general public more as the

organization grows. Kevin represents a group of people who are unfamiliar with the organization and its site, but are looking to learn more about it. (**Appendix D, Figure 3**)

Scenario

Kevin is a software engineer in Ann Arbor who is an advocate for mental health awareness. He would like to get involved in organizations outside of work, specifically those aiding people suffering from mental health issues. He has heard of U-M Precision Health before, but isn't super familiar with their work. Although he doesn't have background in the medical field, he would like to learn more about what the organization does, its events, and if he can potentially get involved.

UX Requirements

Based on our research findings, we've outlined the following UX requirements to clearly articulate our users' needs:

User Story Title	User Story Description	Priority
Tools & Resources	Users want to access the Tools & Resources page directly from the site home page. Reasoning: 50% of survey respondents ranked this as their most used feature (Appendix B, Figure 1).	Must Have
Simple Navigation	Users want to access the Data Analytics & IT page more readily. Reasoning: 50% of card sorting participants made this category more accessible than it currently is in the navigation (Appendix C, Figure 2).	Must Have
Navigation Consistency	Users want navigation to stay consistent throughout every page. Reasoning: Heuristic evaluation demonstrated consistency is violated	Must Have
Mission Statement	Users want to be able to get a general idea of what U-M Precision Health does based on content on the home page or about page. Reasoning: Highlighted in client meetings as a priority.	Must Have

Historical Precision Health Scholars Data	<p>Users want to be able to easily access information about past Precision Health scholars.</p> <p>Reasoning: Requested by survey participants (Appendix B, Figure 3).</p>	Should Have
Navigation Hierarchy	<p>Users want pages to be prioritized for them.</p> <p>Reasoning: Card sorting results highlighted the need to rearrange the navigational system (Appendix C, Figure 1).</p>	Should Have
Membership	<p>Users want to easily become a member of U-M Precision Health.</p> <p>Reasoning: Highlighted in client meetings as a priority and business driver.</p>	Should Have
Standard Page	<p>Users want consistency between how the content on each page is laid out so that they can easily find what they're looking for.</p> <p>Reasoning: Heuristic evaluation demonstrated consistency is violated.</p>	Nice to Have
Visuals	<p>Users want visual content to break up large chunks of text-only content.</p> <p>Reasoning: Heuristic evaluation demonstrated consistency is violated.</p>	Nice to Have
Data Showcase	<p>Users want access to coding schemes and summary statistics without having to access Data Direct.</p> <p>Reasoning: Requested by survey participants (Appendix B, Figure 3).</p>	Nice to Have
Aesthetics	<p>Users want an aesthetically appealing site that's comparable to other Precision Health initiative websites.</p> <p>Reasoning: Highlighted in client meetings as a potential benefit.</p>	Nice to Have

Appendix A: Survey

Recruiting Users: Client will be providing current site users and we will be sending to friends and family to complete the survey as the general public.

Survey protocol

This survey is being conducted by University of Michigan students for a capstone project involving UM Precision Health. We are gathering data on people's use/opinions of the Precision Health website

Survey Introduction/Recruitment Message:

This survey is about UM Precision Health's current website. Please answer questions to the best of your ability. Thank you in advance for taking the time to complete this survey, we greatly appreciate your response.

Questions

1. How old are you?
 - a. insert
2. What's your profession?
 - a. Insert
3. What is your academic background?
 - a. Associates
 - b. Bachelors
 - c. Masters
 - d. Phd
 - e. Doctorate
 - f. Other
4. What is your specialization/major?
 - a. insert
5. How familiar are you with U of M's Precision Health program?
 - a. Likert scale
6. How often do you use UM Precision Health's website?
 - a. Very often (multiple times a week)
 - b. Somewhat often (~once a week)
 - c. Not very often (~once/twice a month)
 - d. Never
7. Have you used a different school's Precision Health website (Stanford, Indiana, Texas, etc.)
 - a. Yes ____
 - b. No

8. If you have visited Precision Health's website in the past or are a frequent user, what is the typical purpose for your visit?
 - a. Fill in
 - b. N/A, I have never used the site before
9. Which features of the website do you use most often? (select all that apply)
 - a. Analytics platform
 - b. Tools and Resources
 - c. Michigan Genomics Initiative
 - d. Information about membership
 - e. Information about workgroups
 - f. Other _____
10. Please rank the following information in order of importance in regards to Precision Health (1 = most important, 7 = least important)
 - a. About
 - b. Workgroups
 - c. Researcher information
 - d. Participant information
 - e. initiative/current projects
 - f. Getting involved
 - g. news/events
 - h. Analytics platform
11. What is one feature you wish the UM Precision Health website had that isn't currently available?
 - a. Insert

Appendix B: Survey Results

Figure 1

Q9 - Which features of the website do you use most often? (Select all that apply)

Page Options ▾

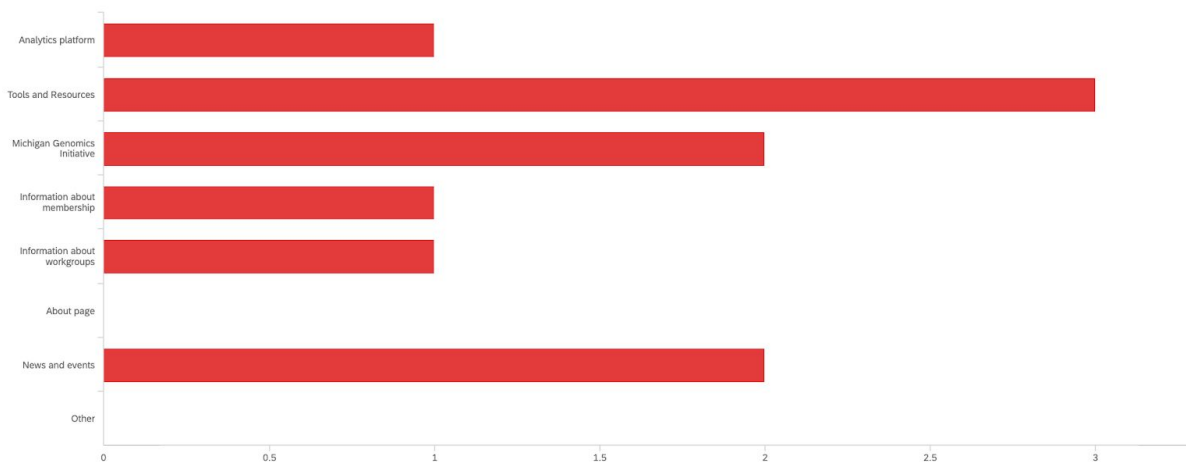


Figure 2

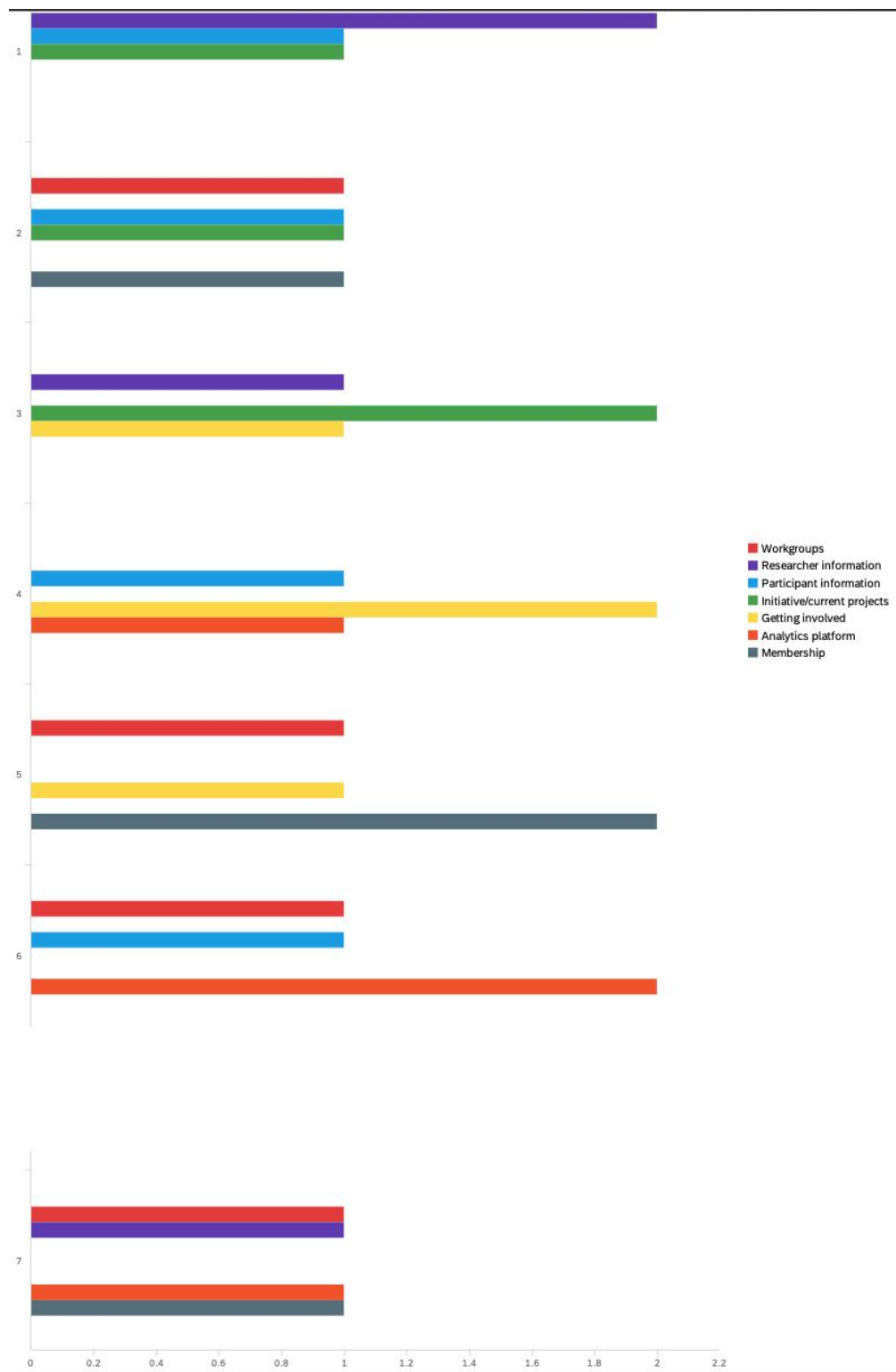


Figure 3

Q11 - Are there any features you wish the U-M Precision Health website provided that it does not already have?

Are there any features you wish the U-M Precision Health website provided t...

Hard to access information about precision health scholar's program in past

Something like <http://www.ukbiobank.ac.uk/data-showcase/> that shows coding schemes, summary statistics etc without accessing Data Direct

Appendix C: Card Sorting Results

Figure 1

<input type="checkbox"/>	Participant	Time taken	Cards sorted	Categories created	Categories named
<input type="checkbox"/>	Participant 1	00:07:51	100%	4	100%
<input type="checkbox"/>	Participant 2	00:05:22	100%	5	100%
<input type="checkbox"/>	Participant 3	Abandoned	0%	0	0%
<input type="checkbox"/>	Participant 4	Abandoned	0%	0	0%
<input type="checkbox"/>	Participant 5	00:04:19	100%	5	100%
<input type="checkbox"/>	Participant 6	00:04:28	100%	7	100%
<input type="checkbox"/>	Participant 7	00:01:01	100%	5	100%
<input type="checkbox"/>	Participant 8	00:03:22	100%	6	100%

Figure 2















	Category	 Contains 	Cards	 Show all 	Freq	 Avg pos 	Created by 
	 Tools & Resources	3 different cards	Precision Health graduate certificate program	1	3.0	1 participants	
			Tools and Resources	1	2.0		
			Analytics Platform	1	1.0		
	 tools & resources	3 different cards	Tools and Resources	1	3.0	1 participants	
			Data Analytics & IT	1	2.0		
			Analytics Platform	1	1.0		
	 Tools and Resources	1 different cards	Tools and Resources	1	1.0	1 participants	

Figure 3

Category

Contains

Cards

[Show all](#)

Freq

Avg pos

Created by

About

11 different cards

FAQ	6	2.7
National Advisory Board	4	2.8
Tools and Resources	3	4.7
Staff & Committees	3	3.7
Features	3	2.7
Precision Health graduate certificate program	2	3.5
Leadership	2	1.5
Data Analytics & IT	1	6.0
Support Our Initiative	1	2.0
Analytics Platform	1	2.0
Education & Training	1	1.0

[Show fewer cards](#)

6 participants

Appendix D: Personas

Figure 1

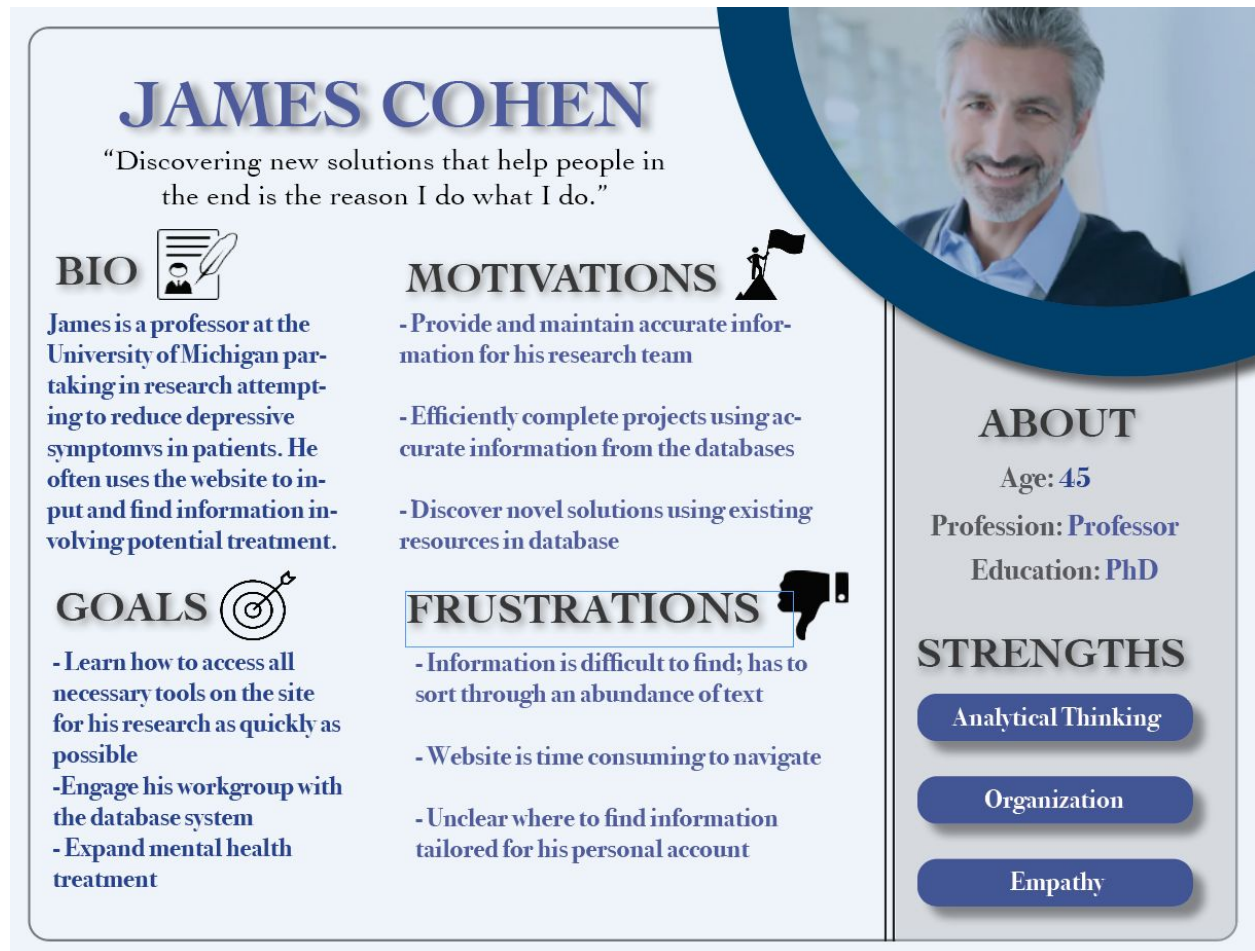


Figure 2

TERESA SMITH

"I love to learn, but the price of education is steep."



BIO



Teresa is a PhD student at the University of Michigan studying genetics. She is involved with Precision Health as a research fellow in the Health Implementation workgroup. Education is important to her, but saving money is too.

MOTIVATIONS



- Further her education in her respective field
- Get professional experience in her field by researching for U-M Precision Health
- Keeping her academic costs as low as possible

GOALS



- Explore U-M Precision Health's website for scholar's programs/grant information
- Get experience working in the medical field in a niche, novel way
- Lower her tuition costs

FRUSTRATIONS



- Unable to find information on past programs similar to ones she is looking at
- Would like more instruction in how to apply for academic programs
- Poor overall organization of the site
- Not exactly sure which programs she is qualified for

ABOUT

Age: 29
Profession: Graduate Student
Education: PhD


STRENGTHS

- Problem Solving
- Collaborating
- Time Management


Figure 3

KEVIN HARRIS

"Mental health is an important topic that needs to be talked about."




BIO




Kevin is a software engineer in the Ann Arbor area. While he isn't directly involved in the medical field, the topic of mental health awareness resonates with him and he would like to get involved in an organization that helps those in need.

GOALS




- Educate himself on projects U-M Precision Health does
- Build respect/understanding of the health field
- Apply for membership on the U-M Precision Health website

MOTIVATIONS



- Getting involved in his community
- Utilize his technical background to those in need/involved in U-M Precision Health
- Expand his knowledge on topics in the health field

FRUSTRATIONS



- Isn't sure where to look to get involved/doesn't know what the best option for him is
- Not exactly sure on what all the programs in Precision Health entail
- Gets confused when using the website due to the amount of content

ABOUT

Age: 26
Profession: Software Engineer
Education: Masters

STRENGTHS

- Data Manipulation
- Detail Oriented
- Diligence