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Improving Human Subjects Research Office at RIT's Website

By

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Abstract

All students and faculties at RIT who are planning to conduct research with human subjects need to seek approval from the Human Subjects Research Office (HSRO). HSRO's website is the major source of all the information regarding the application and required forms. However, the current website presents some usability problems which might slow down the application process. When essential information could not be found, the staff of HSRO will have the responsibility to provide assistance to applicants. A new design for this website has the potential to speed up the application process and reduce staff's workload. This project aims to improve how users receive information from the website by providing a clear visual hierarchy and enable users to access the website through different devices by applying responsive web design. The new design will be based on the results from usability testing and prototyping.

1. Introduction

1.1. Background

All researchers conducting research activities involving human subjects or human material at Rochester Institute of Technology (RIT) must gain approval from Human Subject Research Office (HSRO) before they begin their research. The purpose of the review is to protect the rights, safety, and welfare of every participant taking part in the research. It is a serious matter, so the reviewing process is thorough. Therefore, preparing the application and collecting all required documents could be time-consuming and intimidating for researchers.

HSRO publishes all information related to human subjects research on their website. Researchers planning to submit their applications to HSRO are recommended to visit the website for guidance. The HSRO website plays an essential role in providing information to researchers and research participants. However, the overall design of the website was made more than 10 years ago. The old design could cause issues for users nowadays creating problems and hindering their application process. A new design with user experience in mind could help researchers find information on the website more efficiently. HSRO could also benefit from receiving fewer questions from confused users.

1.2. User-Centered Design (UCD) Procedure

User-centered design is defined as "an approach to design that grounds the process in information about the people who will use the product. UCD processes focus on users through

the planning, design, and development of a product."(Keinonen, 2008) What sets the user-centered design apart from other design methodologies is representative users are welcome to actively participate in the design process(Kemnitzer, 2005). This project used a user-centered design approach to renovate the HSRO website. Participants were invited to join different design activities to offer feedback.

a. Interviewed the manager at HSRO

   The director of HSRO, Heather Foti, personally handles the website and all application paperwork, so she is an excellent source of the background and structure of HSRO.

b. Developed user personas

   Idoughi et al. (2011) defined user persona as "a descriptive model of the user, encompassing information such as user characteristics, goals and needs." Personas help designers build connections with users to focus on users' needs and avoid self-referential design (Miaskiewicz & Kozar, 2011). The personas in this project were developed based on feedback from users and HSRO.

c. Usability test 1 (Current website)

   Knowing how users interact with the current website and identifying existing issues provide valuable data, which could help develop the new design.

d. Developed navigation structure

   The navigation structure is crucial for a website's success because, when done properly, it could lead users to the information they seek and make the process easy and smooth(Machlis, 1998).

e. Design document

   The design document includes wireframes, audience definition, and competitive analysis. The prototype and website were built based on this document. It could also become a resource for people who would like to further develop the website in the future.

f. Prototypes

   One prototype for desktop computers and one for smartphones were made for the following usability tests. The prototype was enhanced after each test.

g. Usability test 2 (on the prototype)

   6 participants were invited to perform various tasks on the prototype to uncover issues and provide inputs for the next prototype.

h. Making adjustments

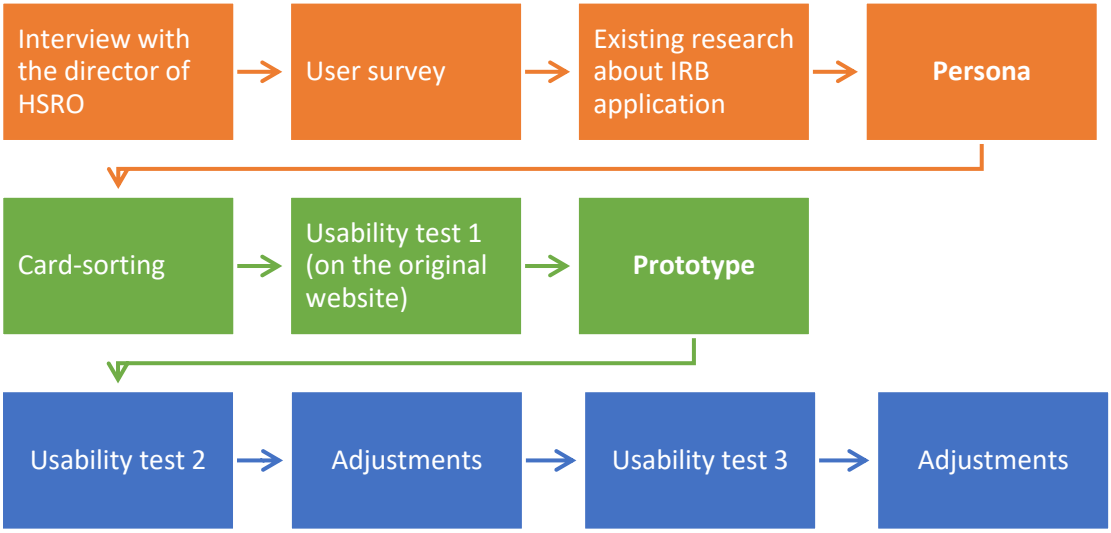
   Based on issues found in usability test 2, adjustments and bug fixes were made accordingly. The adjusted prototype was tested in usability test 3.

i. Usability test 3

   The usability test was conducted to validate the changes made after usability test 2 and uncovered more issues.

j. Made adjustments

   Based on usability test 2 and usability test 3, adjustments and bug fixes were made accordingly.



1.3. Goals

- Provide a prototype and a design document for mobile devices.
- Develop a new navigation structure and limit the number of items in the new menu to under seven (Saaty & Ozdemir, 2003).
- Use an interface design that is consistent with the current RIT website style.

2. User Research

Existing materials, questionnaires, and observations are all common ways to collect data to develop personas (Nielsen, 2013). In this project, users' information was collected through:

- Interview with human subjects research office
- Existing research about IRB (Institutional Review Board) applicants
- Qualitative survey

2.1. Interview With Human Subjects Research Office

The interview was conducted via Zoom, and a list of questions can be found in Appendix 1.

HSRO is currently managed by the director, Heather Foti, who is also in charge of the website and application. She has worked in HSRO for 15 years, so she is experienced in different aspects of the business in HSRO. As far as director Foti could remember, the HSRO website has used the same design for over ten years. Sometimes staff from Information and Technology Office would help with routine maintenance, but director Foti is in charge of updating content on the website. In general, the website needs to be updated about three to four times a year, depending on any policy changes, but updating the website is not always easy for director Foti. Director Foti mentioned that the control panel of Drupal[1] is not very intuitive, which makes it difficult for her to manage the website. Even though she would like to change the layout and include more multimedia content on the website, she needed more technical support.

For director Foti, the website's goals were to educate people on how to conduct human subject research and why these procedures are essential. Director Foti believed that adding enhancements could help present information to the users better, such as more video descriptions, slides, presentation recordings, documentation, and multimedia materials. A reorganized menu and the latest news box could help users navigate through the website. Director Foti also mentioned a platform for researchers to recruit potential participants since finding enough participants seemed a common challenge.

Some people had reported to HSRO that old application forms existed somewhere on the web, so some could still download the outdated forms, but ITS and director Foti could not resolve the issue. Some other issues included broken links.

[1] Drupal is a free and open-source web content management system (CMS) written in PHP and distributed under the GNU General Public License.

After the interview, it is easy to see the reason behind the current presentation of the website. It was developed 10 years ago when mobile devices were not as prevalent as nowadays, so there was little demand for a mobile version. The default web content management system for RIT's website, Drupal, also caused Director Foti many troubles. Although this project focused more on the user experience of this website's audiences, this issue also needs to be addressed because it stops the content manager from releasing multimedia materials that could benefit target audiences.

2.2. Qualitative survey

The survey (Appendix 2) focused on getting users' opinions and their experiences on using the HSRO website. Aside from background information questions, the survey consisted of 5 multiple choice questions and four open-ended questions. The survey link was posted on social media such as Facebook groups and WhatsApp for five days to find students who had visited the HSRO website before. Although the response rate was low, the answers were consistent. There was a total of 4 effective responses, excluding unfinished ones.

Even though the number of responses could not provide a statistically significant result, frequent issues in the responses also deserved attention.

When asked about the overall experience of using the website, their responses were mostly negative. None of them thought the HSRO website was easy to use, and 3 out of 4 were somewhat dissatisfied with the website. 3 out of 4 responses described their first impression of the website as "old" or "outdated," and 1 described it as "messy." Only Response 1 was somewhat satisfied with the website and said, "Though seemed outdated, I got all the documents (forms) I needed without too much difficulty. The checklist also helped." The other three responses did not provide anything they liked about the website. two main issues were mentioned more than once in the question about the least likable part of the website. First, two respondents felt the navigation, or the side panel was irritating and annoying, especially on mobile devices. Second, the content was described as "wordy" and "complex." When asked about how this website compared to their expectations, the responses were mostly negative. 2 respondents said HSRO's website's style was inconsistent with other RIT websites. 2 respondents complained about how exhausting and time-consuming it was to find information on

the website. Response 1 even said, “I wouldn’t want to visit the website again because it’s wordy. Writing IRB application is a tiring task, using the office of human subjects research’s website makes it more tiring.”

2.3. Existing research about IRB applicants

Whitney et al. (2008) conducted a survey with 28 responses from US-based principal investigators. Although all participants agreed on the importance of protecting the rights of human subjects, there were still many negative comments about IRB. For example, more than half of the responses criticized informed consent. They thought informed consent was “unlikely to be read” or “incomprehensible.” IRB also gave out an impression of slow and cumbersome. A major source of investigators' dissatisfaction results from extended waiting time for IRB's approval While waiting for IRB’s decision, It is common for investigators to experience anxiety when preparing their IRB applications (Sutton, 2020). However, Investigators also bear the responsibility of slowing down the IRB reviewing process by not providing adequate supporting materials (Liberale & Kovach, 2017).

2.4. Personas

A persona is a popular tool for user experience design and interaction design (Idoughi et al., 2011). Personas are like realistic imaginary users created based on user research. Designers could develop the product surrounding the characteristics of personas. Depending on the size of the project, a project could have over ten personas, but in general, at least two to three personas are needed to represent the user groups (Cooper, 1999).

The HSRO website provides particular information that only applies to the RIT community, such as application forms, so it is safe to assume that the target audiences are members of RIT. According to the interview with Director Foti, applications were from both faculty and students, so the personas included two different roles, student and professor. According to the user survey, mobile users were likely to experience severe usability issues, so one persona reflected the characteristics of a smartphone user to make sure the designer considered mobile device users' needs. Any other conditions that would affect user experiences, such as eye problems, prior application experiences, were also reflected in the personas.

2.4.1. Persona 1: Ronald Brown: An experienced professor

Professor Ronald Brown has been teaching politics for 25 years, during which he conducted and supervised multiple human-subject research. Many students in the politics department are also doing human-subjects research, and they would come to him for advice. Even though Professor Brown is quite familiar with the IRB application process, he usually would advise his students to check out the website for information. He, himself, also has a habit of making sure all information is up to date before telling his students.

Professor Brown is 58 years old. He noticed he had presbyopia in recent years. He could not read clearly when the books were close, but when he moved the book further away, the letters became too small. A bigger font size could help him read more comfortably.

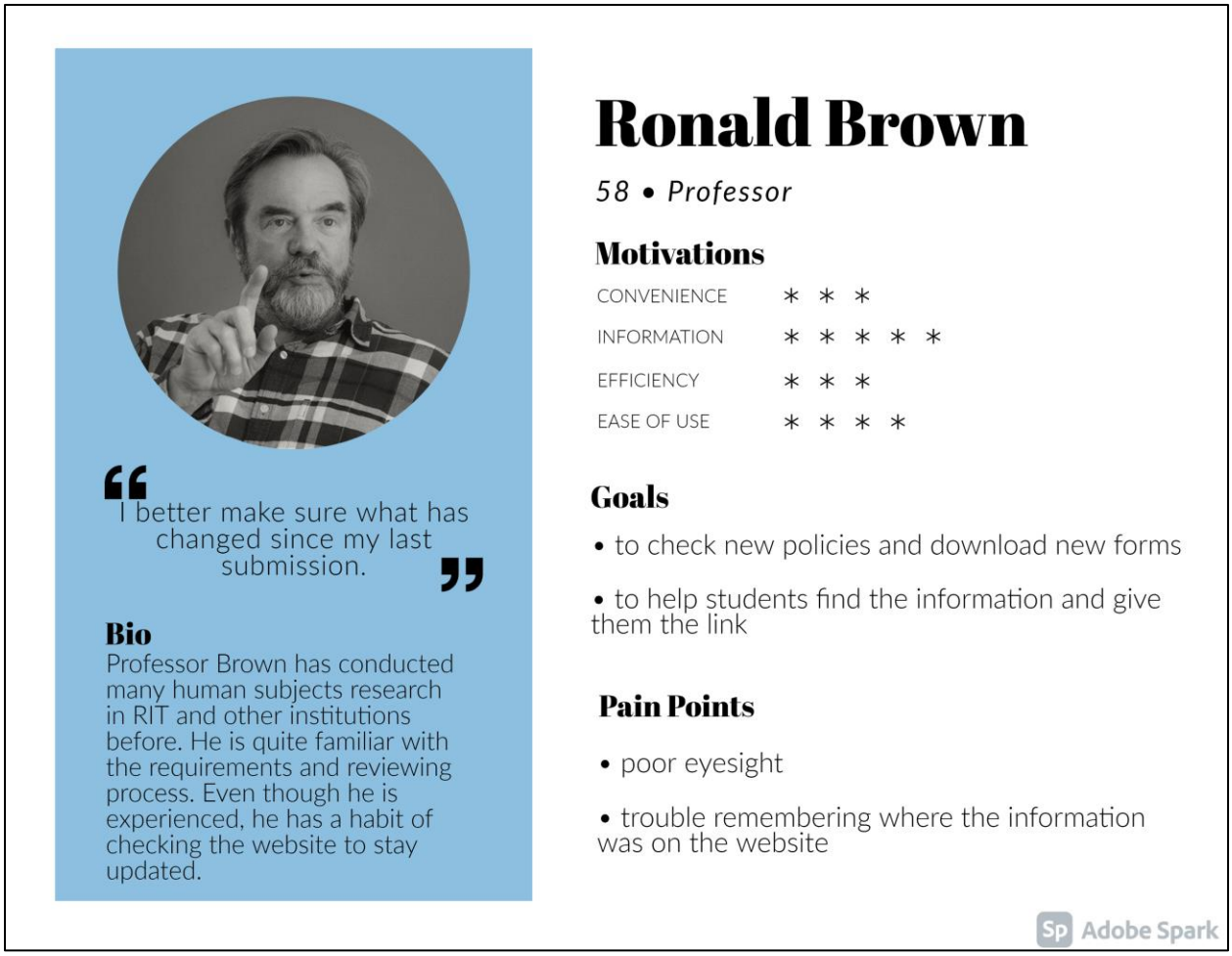


FIGURE 1 RONALD BROWN: AN EXPERIENCED PROFESSOR

2.4.2. Persona 2 Varun Kapoor: a time-conscious graduate student

Varun Kapoor is a second-year graduate student in Human-Computer Interaction. He is busy working on his capstone project about how students use their smartphones to participate in an online class. He is planning to interview ten students on campus, but before that, he needs to get approval from HSRO.

Varun gained knowledge about IRB from his research methods class, but he has never interacted with HSRO or IRB before. Although he has little experience submitting his application to HSRO, he is really good at searching for information on the internet. However, the application process differs from institution to institution. He has to visit the HSRO website to make sure he does not make any mistakes that would hinder his project. He wants to get this project done and graduate as soon as possible, so he could not afford any delays. He hopes that the information on the HSRO website is up-to-date and correct.

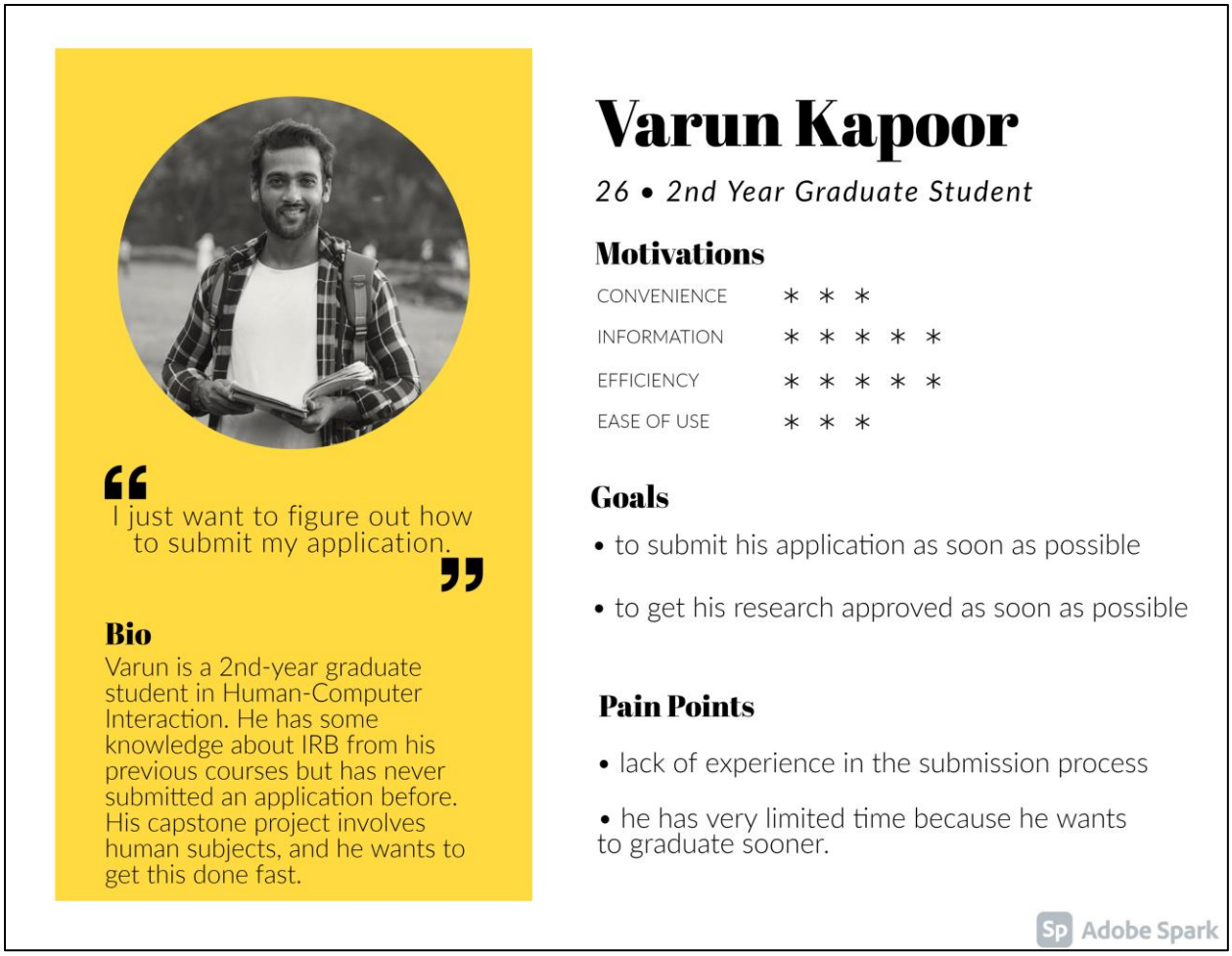


FIGURE 2 PERSONA 1 VARUN KAPOOR: A TIME CONSCIOUS GRADUATE STUDENT

2.4.3. Persona 3: Ngoc-Bich Nguyen: A diligent research assistant

Ngoc-Bich is a fifth-year senior student. She is an excellent student and frequently makes it to the dean's list. She plans to keep pursuing a graduate degree in the future, so she got a research assistant job on campus, trying to gain more experience in scholarly work. She is excellent at her work, and her professors trust her with different tasks.

Ngoc-Bich sometimes will assist a professor working on human subjects research. Since she holds herself to a high standard, she would like to educate herself more about human subjects research. As a Gen Z student, she is used to watching video tutorials and infographics. She finds visual and audio inputs help her understand content more efficiently. For Ngoc-Bich, the mobile phone is not only a device for communication and entertainment, but also is a great tool for education. She would appreciate a more mobile-friendly website.

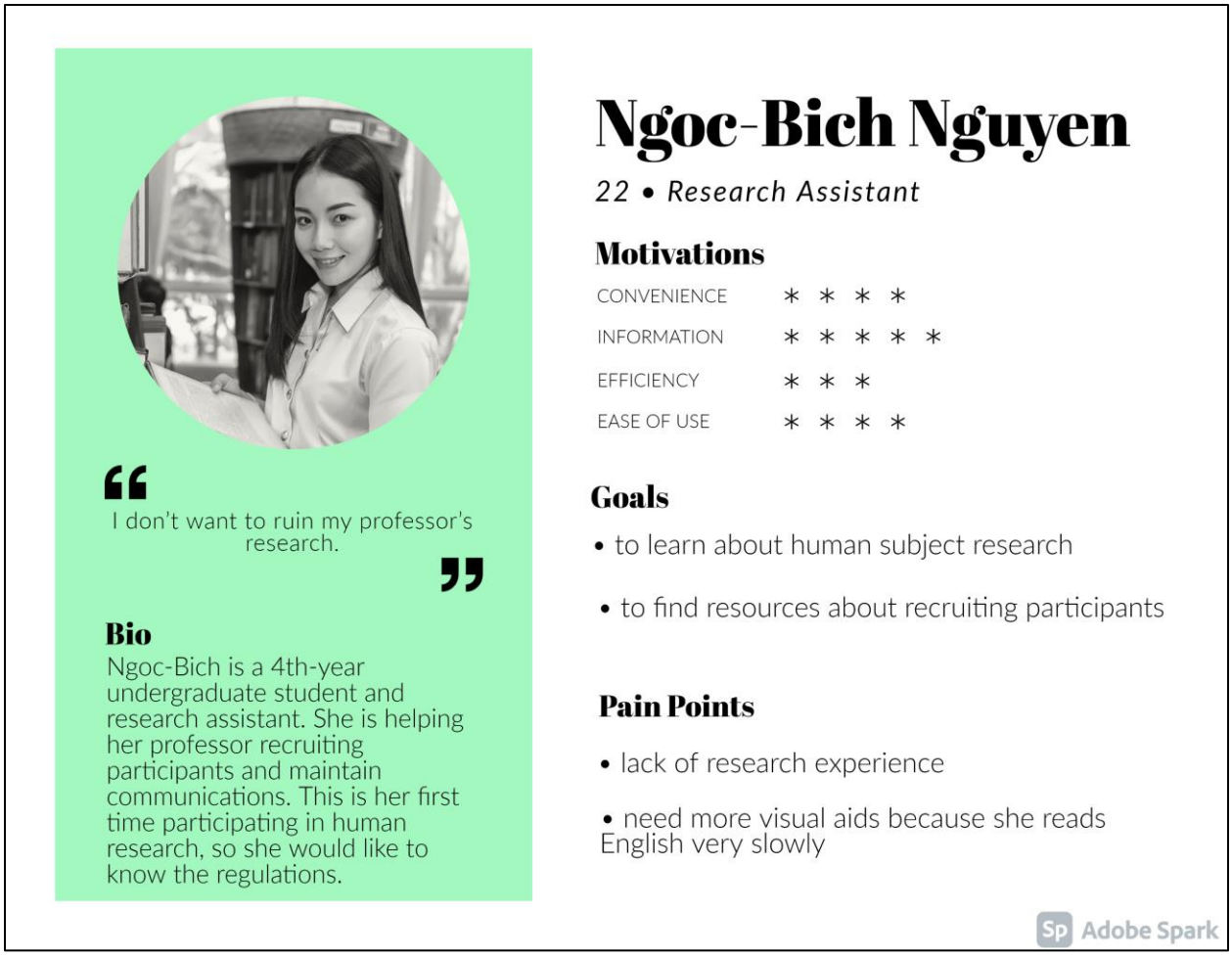


FIGURE 3 PERSONA 3: NGOC-BICH NGUYEN: A DILIGENT RESEARCH ASSISTANT

3. Developing the Navigation Structure

3.1. Unmoderated Open Card Sorting

Card sorting is used by information architects to organize information items, features, and functions in a way that is easy for users to find. An open card sorting usually starts by asking participants to sort the cards prepared by researchers into piles that make sense for the participants. And then, the participants will be asked to name each pile. A closed card sorting is when participants are invited to sort the cards into a set of pre-existing categories or structures (Wood & Wood, 2008)

In this study, the card sorting was unmoderated. Participants were asked to complete the activity on their own through UX Metrics. The recruitment message was posted on social media.

Twenty-eight cards (Appendix 3) were created based on the original menu items on the HSRO website. Descriptions were provided to some terminologies to help users understand the content.

3.2. Card sorting results

Five responses were collected. The medium time to complete is 24 minutes 3 seconds. Thirty-five unique groups were created. After merging conceptually similar groups, such as sample and samples, informed consent and consent, there were twenty-five unique groups left. One participant did not name his/her groups, so eight groups were simply named G1 to G8.
Some cards are frequently grouped together, although under different group names.

Five participants grouped these cards.

Group Name	Cards
Informed consent; SAMPLE; G7	• Informed Consent Sample for Non-Exempt Research • Exempt Informed Consent Samples
Definition; I don't know	• Definition of Research and Human Subjects • Definition of NIH-Funded Clinical Research
Assent; The informed Consent Process with Children; G5; Informed consent	• Assent Tips • Sample Assent Form

Four participants grouped these cards.

Group Name	Cards
HSRO; Background information	• Background of IRB Committees • Background of HSRO • HSRO's responsibilities
Background information; Information; QUESTION; basic information; G3	• FAQ • Contact Information
Informed consent; SAMPLE; G7	• Consent Form Requirements for Non-Exempt Research

	• The Informed Consent Process with Children • Informed Consent Sample for Non-Exempt Research • Exempt Informed Consent Samples

Three participants grouped these cards

Group Name	Cards
Application processes	• Submission Checklist • Tips for completing the application form • Training Information • Procedures for submitting application
METHOD; Review; Definition	• Types of Review • Principles for Reviewing Research • Identifying Risks in Research
Informed consent; SAMPLE	• Exempt Informed Consent Samples • Waiver of the Requirements to Obtain Informed Consent • Consent Form Requirements for Non-Exempt Research • The Informed Consent Process with Children • Informed Consent Sample for Non-Exempt Research

The reason why the results did not seem quite conclusive could be because: 1) Not enough responses; 2) Participants were not given a specific context. When the participant was sorting with a mindset that was different from real-world tasks or they only considered surface characteristics, such as similar wordings, the result may not be usable (Spencer & Warfel, 2004).

FIGURE 4 THE SUBMENU OF ABOUT THE HSRO ON THE WEBSITE

On the current HSRO website, *About the HSRO*, *Office Role and Responsibilities*, *Contact Information*, and *IRB Committees* were in the same submenu. However, according to the card sorting result, only one out of five participants grouped Contact with the other three cards, and four out of five participants grouped *Contact* with *FAQ*.

Even though this card sorting activity collected only five responses, thirty-five groups were created, which means participants had little agreement on how to group the cards and name the groups. An alternative approach would be conducting a hybrid card sorting, which combines open card sorting and closed card sorting. The activity could start with open card sorting to determine initial categories. Then more participants could sort cards into pre-defined categories or create their own categories. In this way, relevant concepts are not excluded because participants are still allowed to create new categories. The existing structure could also be validated or enhanced throughout the activities (Conrad & Tucker, 2019).

4. Usability Test (on the current HSRO website)

4.1. Task Design (Appendix 5)

The scenario set is an inexperienced student trying to submit an IRB application from determining what kind of project is required to be reviewed by the HSRO to actually submit an application. The participants were asked to think aloud while completing the tasks, so they were encouraged to share their thoughts, feelings, or even suggestions with the moderator. Total 6 participants were invited to the test. All tests were held remotely on Zoom or Google meet; 3 used their laptop or desktop to test; 2 used a smartphone; 1 used an iPad.

Task 1 asked participants to determine if a given project need to be reviewed by the HSRO. They were free to visit any page on the HSRO website to look for information. A participant was successful in completing task 1 when they reached the pages containing information explaining what types of projects needed to be reviewed, and the participant could make an informed decision on whether the given project required to be reviewed by the HSRO. On the other hand, if the participant could not reach the page containing the key information, or the participants reached the page but did not find the information and still could not decide on whether the given project required to be reviewed by the HSRO.

Continuing task 1, task 2 asked the participant to imagine the situation in which they could not find the answer for task 1 on the website and how they would seek help. If the participants could find an email address or phone number to ask for further assistance, task 2 was completed.

In task 3, the participant was told that the project needed to be reviewed by the HSRO, and they were asked to demonstrate how to proceed with the project. The purpose of this task was to see if the instructions on the website were sufficient and how the participant would do to start an application. The task was successfully completed when the participant found the essential materials and information to start an application, including application forms, required training information, etc.

Task 4 asked the participant to find a piece of information to answer a question on the application form based on the instruction provided. The question and instructions were from the actual form. The task was deemed a success as long as the participant reached the page following the instruction. They did not have to read and understand the content on the page.

Task 5 was designed to see if users could find instructions on drafting parental informed consent on the website. The participant completed task 5 when they found parental informed consent samples and basic elements of a consent form.

Task 6 asked the participants to find resources on the website to help them do a final checkup before submitting. The participant completed task 6 when they found the submission checklist.

Before the participant could send out the whole application to the HSRO, they had to know where to send it, so the participant needed to figure out where or how to complete task 7. HSRO used an email inbox to collect all applications, and the email address was provided in multiple places on the website. As long as the participant found the email address with descriptions stating that the address was for submission, task 7 was completed.

4.2. Usability Test 1 Results

All 6 participants were aged between 20 to 40 years old and had not visited the HSRO website before. Three of them were RIT students, and the other three were recent college graduates and school faculty. Three participants successfully completed seven tasks (Appendix 5).

In task 1, only 50% of the participants (three people) were able to find the information and decide if a project needed to be reviewed by the HSRO or not, task 1. Two participants found the information in *FAQ*, and one found it on the *Submitting Your Research* page. The page containing a detailed description of human subjects research that needed to be reviewed was on the *Is it research?* page. However, none of the participants reached this page. The reason could be the title of the page, is it research, did not reflect its content.

All six participants were able to finish task 2 and task 6 promptly without encountering any difficulties. Task 2 and task 6 were designed to see if people could find the contact information of HSRO and the submission checklist. Since contact and checklist were both on the main menu and not hidden in submenus, most participants could find the information on their first click. One participant took longer than others because he scrolled down to the bottom of the page before he clicked on *Contact* because, based on his experience, the contact information is usually at the bottom. When he realized the contact information at the bottom was the general contact for Rochester Institute of Technology, not the HSRO, he quickly found *Contact* in the menu without any issues.

Task 3 was one of the harder tasks because only 4 participants completed it. P3 failed to complete task 3 and clearly said that it was not easy for her to scan the *Submitting Your Research* page. P2 and P3 both expected to see clear step-by-step instructions in the *Submitting Your Research* page. They felt they read a lot but still had no clue where to start. Three participants' first click was *Submitting Your Research*, and they showed confusion when they experienced the malfunction in the menu. Another issue was that the descriptions of *RIT Form A* and *NTID Form A* was not evident, so people often missed them. All 6 participants did not know what *NTID Form A* was when they saw two different form As at first sight. The orange links quickly grabbed their attention because they were looking for download links, so they missed the descriptions on top. P2, P4, and P6 expressed that they expected to see a link directing them to

form A when form A was mentioned on the website, so they would not have to spend extra effort to find it.

Participants were given an instruction copied from the application form to find a specific table on the HSRO website in task 4. Most participants were able to follow the instructions and found the table. One participant did not read the whole paragraph, so she did not complete this task.

Task 5, which were about parental consent also had the lowest success rate at 50%. The reason could be that the navigation system did not match users' expectations. In task 5, four participants clicked *Informed Consent*, expecting to find parental informed consent, which was consistent with card sorting results. The majority of participants grouped informed consent samples with requirements of informed consent in card sorting. However, on the HSRO website, informed consents for different kinds of research were separately placed in two submenus, one under informed consent and one under resources.

Task 7 was designed to see how people find the email address to submit their applications. One major issue was the email address did not stand out from other irrelevant contents when participants were on the right page. Therefore, they either missed the information or spent extra time looking for the specific information in the paragraphs.

FIGURE 5 THE WEBSITE IS NOT RESPONSIVE.

Some more issues were observed during usability test 1.

P4 and P5, who used smartphones to test, noticed the website was not responsive immediately. They both showed frustration when reading on the website because they had to scroll left and right to see the full content (Figure 5), and the menu would slide open unexpectedly.

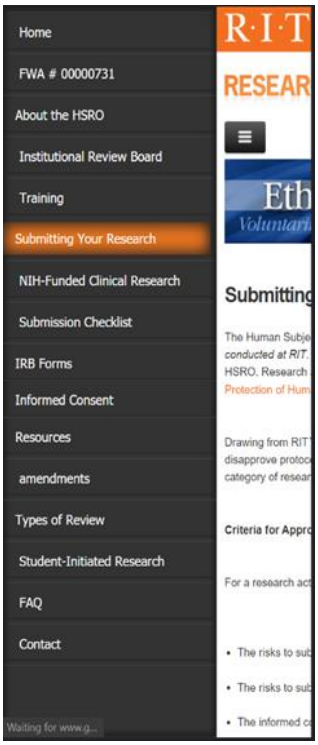


FIGURE 7 THE SUBMENU OF SUBMITTING YOUR RESEARCH WAS NOT DISPLAYED IN THE SIDEBAR MENU.

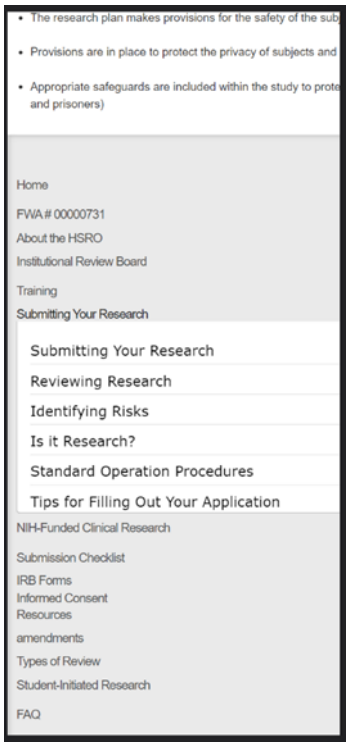


FIGURE 6 THE SUBMENU WAS SHOWN AT THE BOTTOM OF THE PAGE, WHICH WAS NOT EASILY NOTICEABLE.

When users clicked the hamburger menu icon, a black sidebar menu would appear. However, the menu did not show all items (Figure 7). Missing items in the mobile menu contained crucial information for users. Although a complete menu could be found at the bottom of the page (Figure 6), the placement was not consistent with most users' experience, so both P4 and P5 did not notice the menu at the bottom.

Many issues were observed when participants were using the main menu. For example, P3 found two different *Contact* in the menu and was confused. P4 saw "*FWA # 00000731*" in the menu and clicked on it, and still had no idea what it was. During task 5, P1 and P3 failed to find the

sample of parental informed consent because they thought parental informed consent would also be on the *Informed Consent* page. However, the sample was in *Resources*. Because similar contents were not grouped together, when users read the content in *Informed Consent*, they might think that was all the information about informed consent on this website and stopped looking. However, the samples and templates were in another place, the *Resources* tab.

All participants, at some point during the test, complained that the website had too many words. P2 specifically said that without bullet points and large headings, it was hard to locate information. P4 also said, "the submission link and email are essential information. They should be more obvious and easier to find." Their responses were consistent with responses in the user survey, which described the website as "wordy" and "complex."

Although only P3 complained that the font size was too small, the font size was a real issue on this website. According to (*Accessibility at Penn State | Font Size on the Web*, n.d.), 12pt (=16px) is generally recommended for body text. However, the font size on the HSRO website was 13px, which was smaller than recommended.

5. Developed Prototype

A prototype was made, based on the findings from the user survey, interviewing the director of the HSRO, card sorting, and usability test 1, for future usability tests to validate the design changes. The prototype was developed using Figma (*Figma: The Collaborative Interface Design Tool.*, n.d.). Figma is a web-based user interface design app. It is known for its web-based and collaborative nature, allowing multiple users to edit the same project directly on the browser without installing extra software.

Due to COVID-19, all usability testing had to be conducted online, so a good online prototyping tool and usability testing tool were essential for this project. Designers could create clickable objects and connect different frames to have a realistic prototype to test on. Maze (*Rapid, Remote Testing for Agile Teams*, n.d.) is an online usability testing tool that can be easily integrated with Figma. Maze would record participants' clicks, flows, and times then generate heat maps. In usability 2 and 3 in this project, a moderator was present during all usability

testing, but if a moderator was not available, Maze was designed to allow participants to participate individually on their own devices.

The user survey revealed that the HSRO website did not conform to the RIT website's style and looked outdated. It is also common for an organization to use the same color scheme and style. Therefore, the new design will adopt the RIT website's style and follow RIT branding's style guide. Similar to the original HSRO website, the dominant colors on the RIT's main website were orange, white, and black. However, the original HSRO website had a large grey background in the menu section. Grey was only used sparingly on the RIT website. Another noticeable difference was in the layout. The original website placed the menu on the left side; however, the RIT website placed the menu at the top center and anchor links on the left.

5.1. Design Example

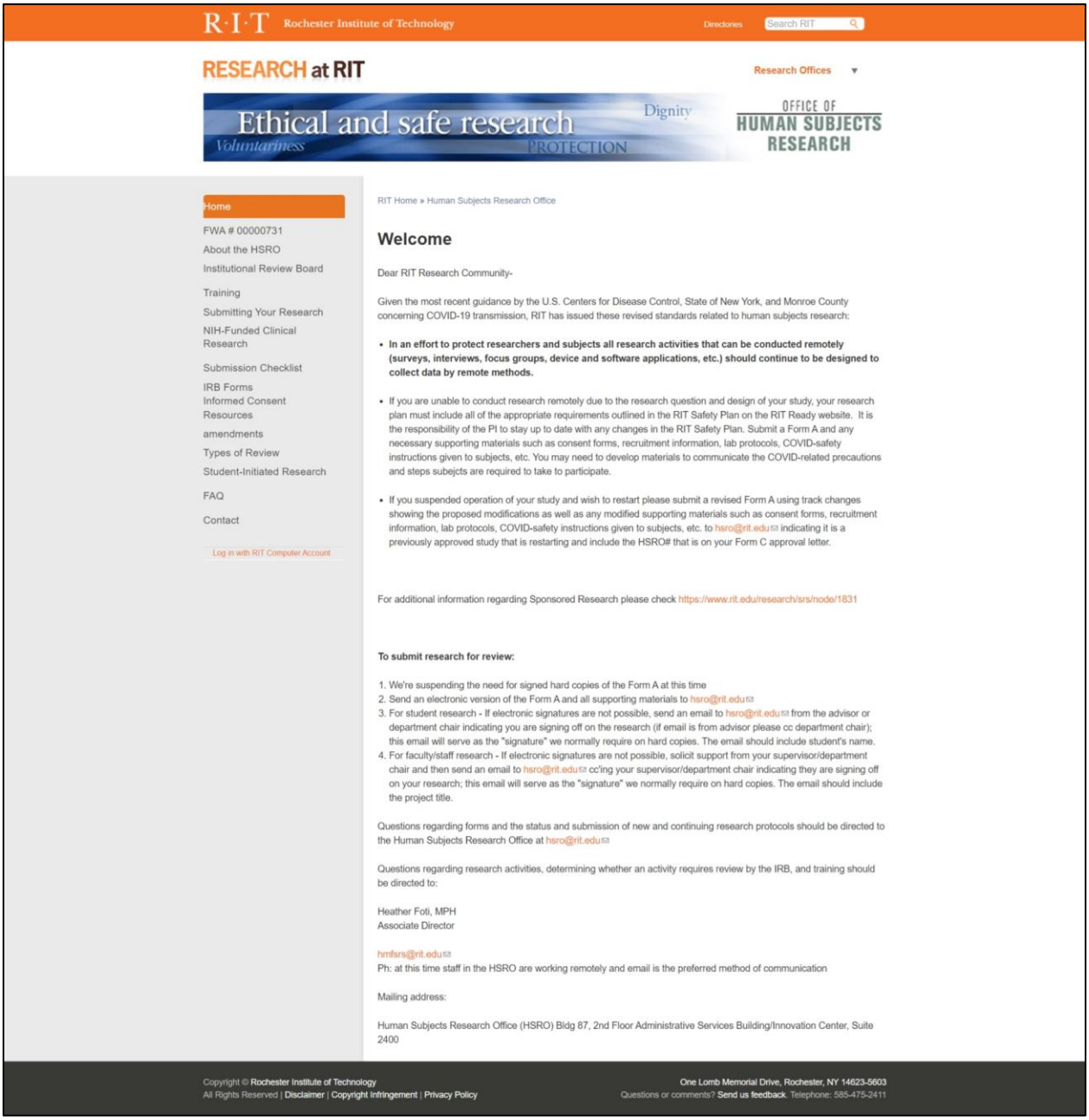


FIGURE 8 THE ORIGINAL HSRO WEBSITE LANDING PAGE

Figure 8 is a screenshot of the landing page of the original HSRO website, and Figure 9 is a new design of the same content in Figure 8. RIT's landing page usually consisted of a large banner image, and the messages were concise, easy to absorb by users and accompanied with pictures or icons. However, the landing page on Figure 8 only had texts, and the information was mainly

about the COVID-19 updates, so a link to this page, instead of the whole content, was provided on the new landing page.

A clear and descriptive title and a relevant image of *COVID -19 Updates* were added to the page (Figure 9). The first part of this page was about three revised standards. Instead of simply listing them out with bullet points using the same font, the new design includes a bolded summarize line after each bullet point, so users could read the bolded line then decide if they need to read the whole paragraph. Every *Form A* on this page has turned into a hyperlink to help users locate the application form. On the old website, contact information stuck right after the submission process, so the paragraph looked long. Separating contact information and the submission process into two different sections could help users locate the information more easily.

Aside from the header, footer, and banner, the new HSRO website landing page consisted of three parts, the latest announcement, popular resources, and contact. Some common components on RIT's landing pages are news, events, featured works, and some numbers to highlight prominent achievements. The news and contact information was on the original landing page, so they were preserved on the new landing page as well. The menu items were reduced from more than ten to six, so some of the items were in the dropdowns, meaning some items, such as application forms and the checklist, could not be directly accessed in the top-level menu. Therefore, a new section, popular resources, was added to the new landing page for quick access. The popular resources section consisted of essential materials for applications.

The new menu was considerably shorter than the old one. The new menu items were *About*, *Submission*, *Informed Consent*, *Review*, *FAQ*, and *Contact*. *FAQ* and *Contact* were in the old menu as well, and they remained the same in the new menu. Under *About*, there was background information, explanation of the office's role and responsibilities. The arrangement of the about section was similar to the original website and was consistent with the card sorting result. The differences were: 1)contact information was removed from the about section 2)everything was combined into one long page with anchors, instead of several short pages. The submission section was a collection of essential materials for submitting am application, including a step-by-step guide, which participants in the usability test 1 requested. According to the card sorting result, participants often placed informed consent requirements and samples in one group; assent

procedures and samples in another group. However, assent was a smaller subject that only a few projects would need to prepare assents, so it did not make sense to have it in the top-level menu. Therefore, the informed consent section included requirements and samples for both informed consent and assent. Review sections contained information related to how the committee review projects.

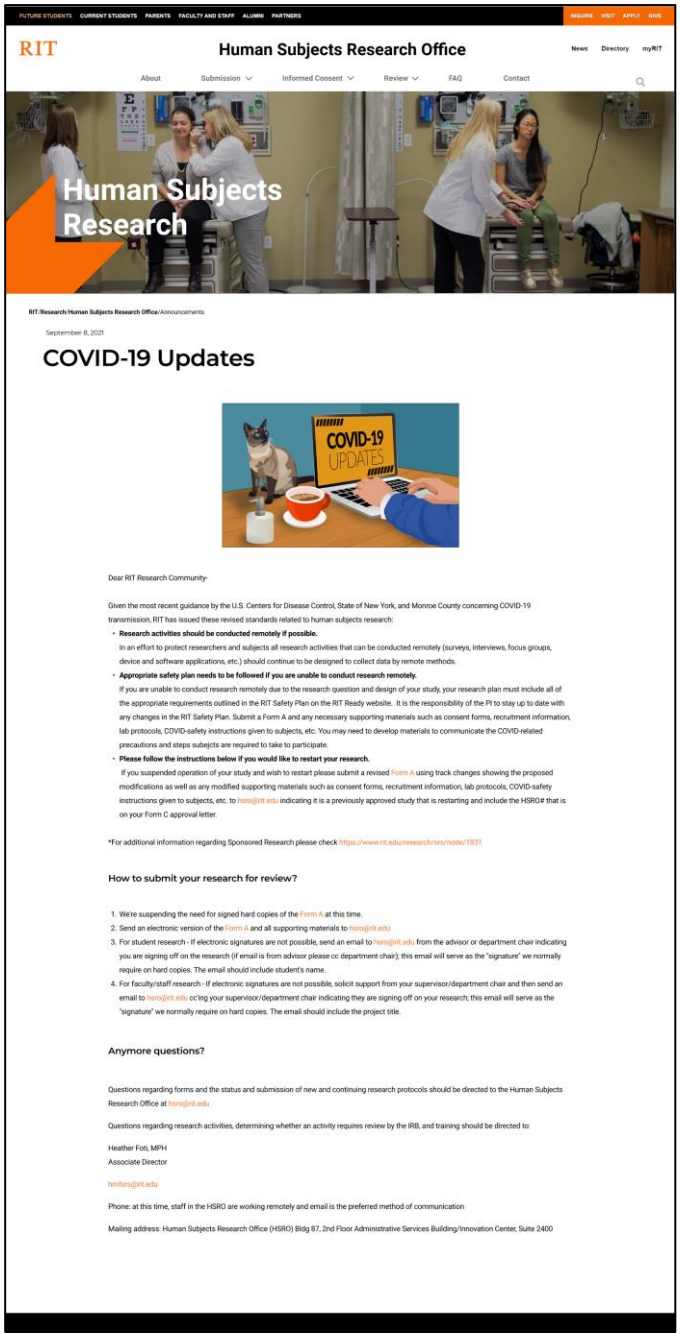


FIGURE 9 SCREENSHOT OF THE PROTOTYPE

6. Usability Test 2 (on the prototype)

In usability tests 2 and 3, participants were asked to perform the same tasks as in usability test 1. A group of 6 new participants were invited to each round of test, so total 18 participants were recruited to participate in the 3 usability tests. Just like usability test 1, 3 participants were asked to test the desktop version, and the other 3 participants were asked to test the mobile version. Participants' think-aloud processes were recorded on zoom or google meet, and participants interacted with the prototype through Maze (*Rapid, Remote Testing for Agile Teams*, n.d.). Maze determines a task is successful or not by if the user reaches specific destinations on the website. However, in this usability test, the goal was not only to reach certain contents on the website; the goal was for the users to actually see the information. Therefore, some adjustments needed to be made to have the test run smoothly. A green finish button (Figure 10) was added on the upper right corner of the prototype where no content was blocked. When the participants found the key information or they would like to give up, they could click the green finish button, and it would lead to the next task.

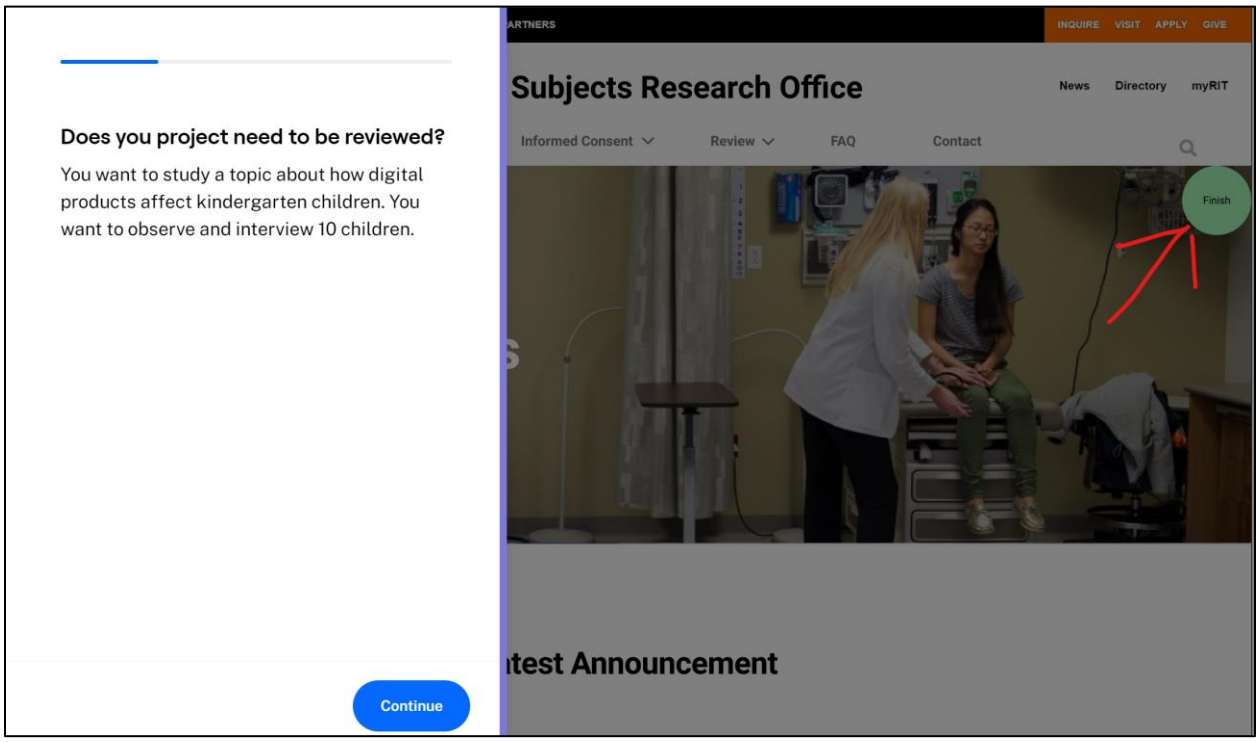


FIGURE 10 THE GREEN FINISH BUTTON ON THE PROTOTYPE

6.1. Usability Test 2 Result

In usability test 2, all 6 participants were between 20 to 40 years old, including undergraduate and graduate students and high school teachers. Three participants successfully completed all seven tasks. The other 3 completed six out of seven tasks, which was an improvement from usability test 1. However, the participants seemed to spend even more extended time on each task. That was because Maze started recording when participants began reading the task descriptions, so if the participant had further questions for the moderator, the time recorded would be much longer. In addition, participants were thinking aloud during the usability test. The time recorded was not an ideal reference of how fast they completed a task.

The success rate of task 1 improved from 50% to 67% in usability test 2, but it still had the worst success rate among the seven tasks. Total two participants failed to complete task 1. One participant explained that she did not think the submission in the menu included the process of deciding a submission was needed or not, so she did not try the link. Another participant was testing on the mobile site and was unfamiliar with the prototype, so she did not know the hamburger menu was expandable.

All participants completed task 2 without a problem. Some people took longer to finish the task because they explained what they would do before reaching out for help. Some said they would check out the FAQ, and some said they would read more articles on the website before contacting the office. The contact page on the prototype was different from the original website. The contact page on the original website only had the director's contact information, but the prototype included both the HSRO's and the director's email. These two different email addresses had different purposes. When a person sees the first email on top and does not see the other one at the bottom, the person will likely assume this is the only one and directs all questions to the first address.

All six participants completed task 3, and only four completed it in usability test 1, which was a great improvement. A step-by-step submission guide, which participants in usability 1 requested, was added to the prototype. People could find instructions and links to all the essential materials on the *Step-By-Step Guide* page.

Task 4 was relatively easy because instructions were provided, so all participants completed the task.

In usability test 1, only three people, 50%, successfully completed task 5, which was about finding parental informed consent materials. In usability test 2, five participants completed task 5; only one failed. The only participant who failed was able to find the informed consent for exempt research, and he assumed parental informed consent was also on the page, so he did not spend more time to find parental informed consent.

Even though that submission checklist was not in the top-level menu anymore, links to the checklist could be found in the popular resources and step by step guide, so all participants were able to find it in task 6.

The email for accepting applications was provided in the *Step-By-Step Guide*, but three participants chose to go to contact to find the email while doing task 7 (Figure 11), which was entirely reasonable. However, two email address descriptions are presented in two long sentences that are hard to read, and they did not clearly state which one was for receiving applications.

During usability 2, some other issues were observed. One of them was internal inconsistency. Internal inconsistency. "*Who needs IRBs?*", "*Definition of research and human subject*" and "*Do you need IRB review*" all lead to the same page, "*Do you need IRB review?*" The differences could cause confusion. Additionally, none of the testers used the link in popular resources on the home page in task 1. This means they either did not see it or could not connect its title with its content.

The overview page might not provide enough introduction to the whole section. Three participants chose to read the higher-level information in the overview part of the submission section and informed consent section before digging deeper. However, there were no links to navigate users to other topics on this website about submission or informed consent. For example, on the *Informed Consent Overview* page, users could not see the introduction about exempt research, non-exempt research, research with children, so users would still be confused when they see those terminologies in the menu.

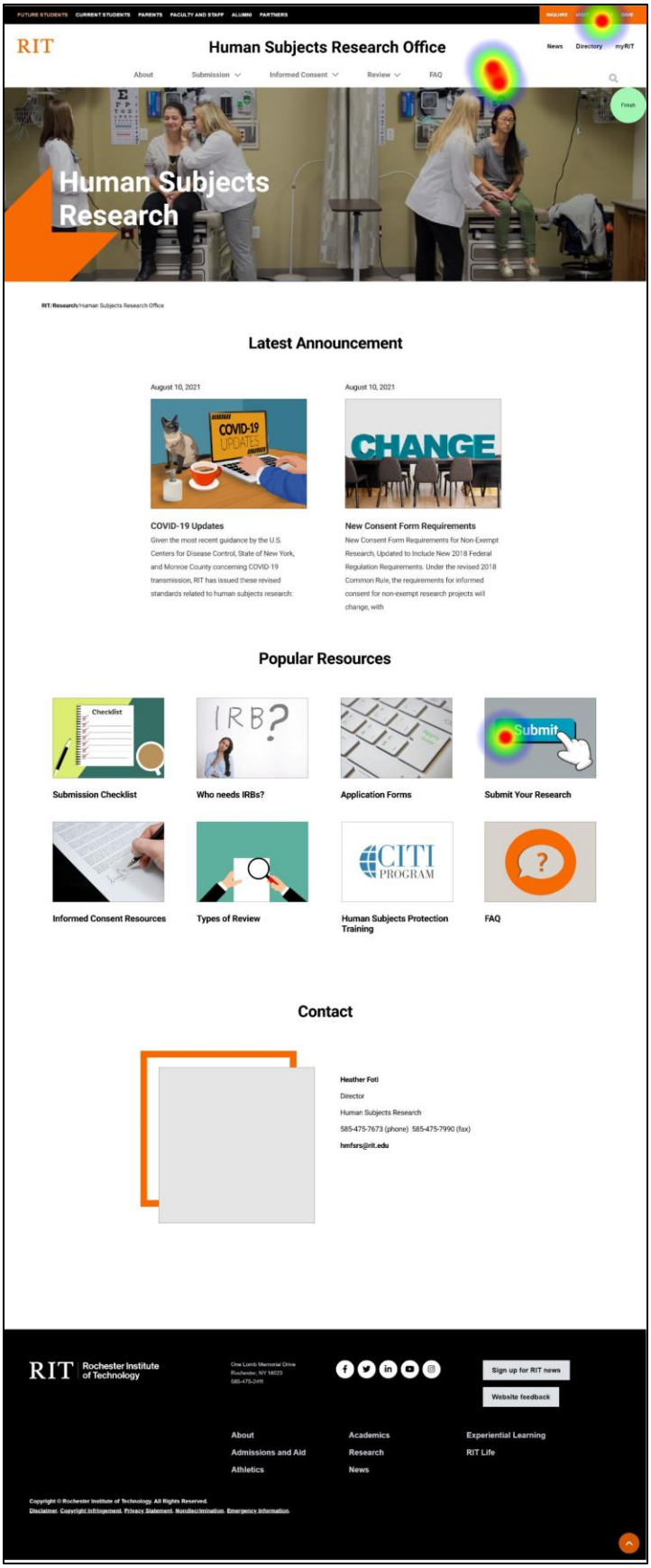


FIGURE 11 CONTACT WAS A POPULAR DESTINATION TO FIND THE SUBMISSION EMAIL.

Three participants (two desktops, one mobile) did not perceive the header on top as a link back to the home page of the HSRO Website. One participant commented, “It does not look like a link.” The header of HSRO does not have an underline or any hover effect (Figure 12), so it is understandable why the participants did not consider it a link. Using the header as a link is actually a common practice across different websites, e.g., Harvard CUHS (Figure 13).

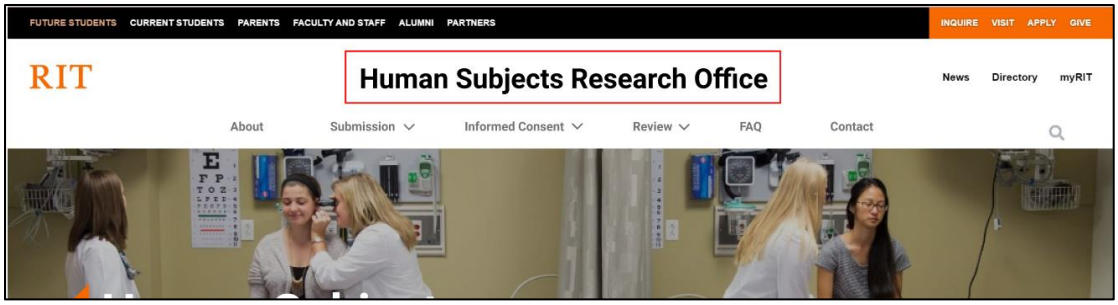


FIGURE 12 THE HEADER DID NOT LOOK LIKE A LINK FOR SOME USERS.

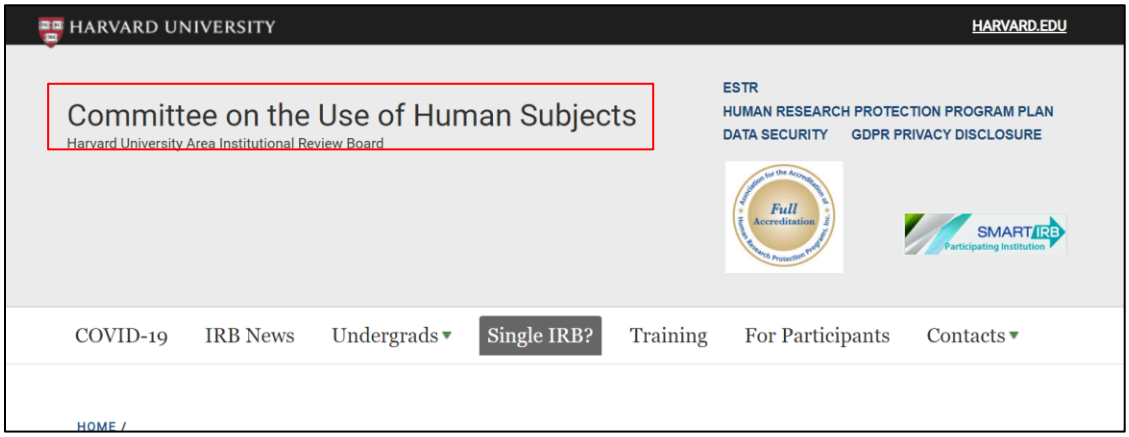


FIGURE 13 THE HEADER ON THE HARVARD CUHS WEBSITE IS A LINK

6.2. Design Changes Based on Usability Test 2

6.2.1. Contact Page

In usability test 2, task 2, and task 7, where participants went to the contact page for contact information, participants encountered problems that might hinder their process. The director's contact information might get overlooked because it was placed at the bottom. Therefore, two email addresses, one for the office and one for the director, were moved to the top of the page so that people could easily see them. The two grey boxes were links to the respective contact details at the bottom. Instead of using one sentence to describe multiple purposes for each email, the sentence was broken down into several bullet points, making it easier to read.

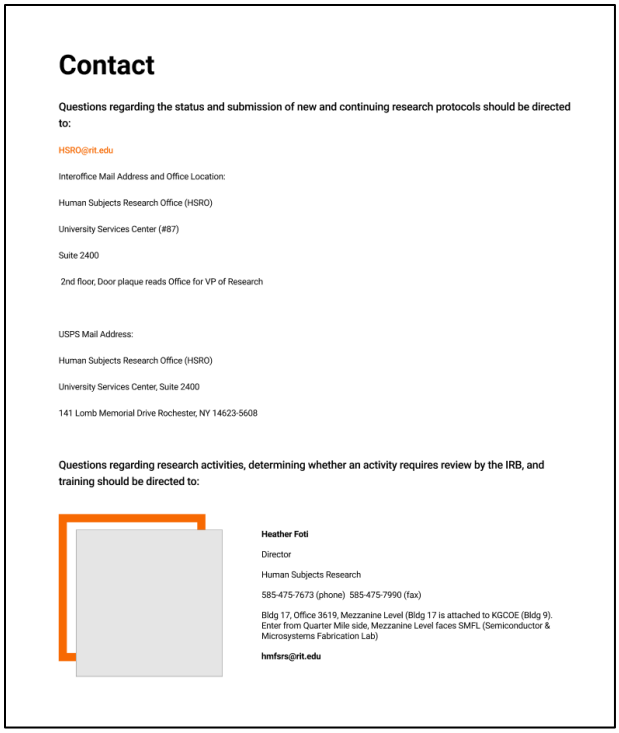


FIGURE 14 OLD DESKTOP CONTACT PAGE

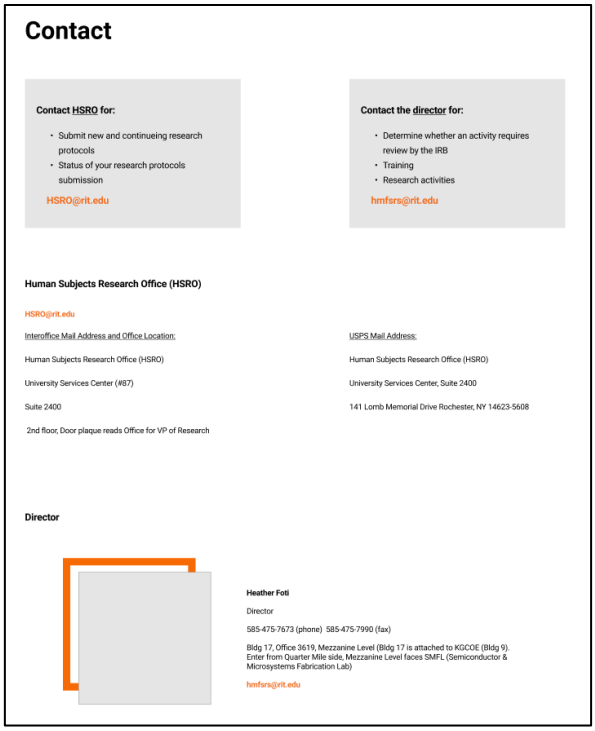


FIGURE 15 NEW DESKTOP CONTACT PAGE

Contact

Questions regarding the status and submission of new and continuing research protocols should be directed to:

HSRO@rit.edu

Interoffice Mail Address and Office Location:
Human Subjects Research Office (HSRO)
University Services Center (#87)
Suite 2400
2nd floor, Door plaque reads Office for VP of Research

USPS Mail Address:
Human Subjects Research Office (HSRO)
University Services Center, Suite 2400
141 Lomb Memorial Drive Rochester, NY
14623-5608

Questions regarding research activities, determining whether an activity requires review by the IRB, and training should be directed to:

Heather Foti

Director

Human Subjects Research

585-475-7673 (phone) 585-475-7990 (fax)

Bldg 17, Office 3619, Mezzanine Level (Bldg 17 is attached to KGCOE (Bldg 9). Enter from Quarter Mile side, Mezzanine Level faces SMFL (Semiconductor & Microsystems Fabrication Lab)

hmfsrs@rit.edu

FIGURE 16 OLD MOBILE CONTACT PAGE

Contact

Contact HSRO for:

- Submit new and continueing research protocols
- Status of your research protocols submission

HSRO@rit.edu

Contact the director for:

- Determine whether an activity requires review by the IRB
- Trining
- Reseach activities

hmfsrs@rit.edu

Human Subjects Research Office (HSRO)

HSRO@rit.edu

Interoffice Mail Address and Office Location:
Human Subjects Research Office (HSRO)
University Services Center (#87)
Suite 2400
2nd floor, Door plaque reads Office for VP of Research

USPS Mail Address:
Human Subjects Research Office (HSRO)
University Services Center, Suite 2400
141 Lomb Memorial Drive Rochester, NY
14623-5608

Director

Heather Foti

Director

585-475-7673 (phone) 585-475-7990 (fax)

Bldg 17, Office 3619, Mezzanine Level (Bldg attached to KGCOE (Bldg 9). Enter from Quarter Mile side, Mezzanine Level faces SMFL (Semiconductor & Microsystems Fabrication Lab)

hmfsrs@rit.edu

FIGURE 17 NEW MOBILE CONTACT PAGE

6.2.2. Overview Page

In task 5, when asked about informed consent, three participants chose to go to the overview page and expected to learn some general knowledge and get a better idea of where to start. However, when they scrolled to the end and wanted to see more on certain topics, they had to go back to the menu and start over.

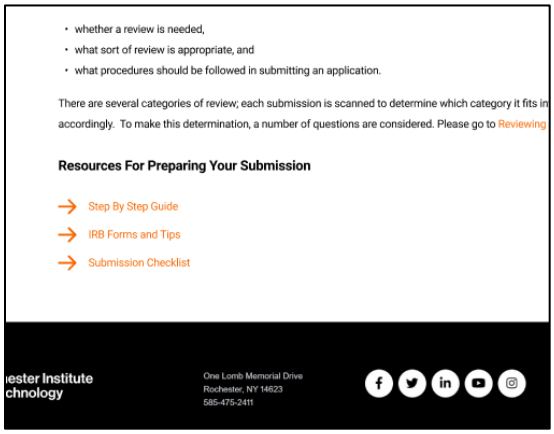


FIGURE 18 HYPERLINKS UNDER SUBMISSION OVERVIEW

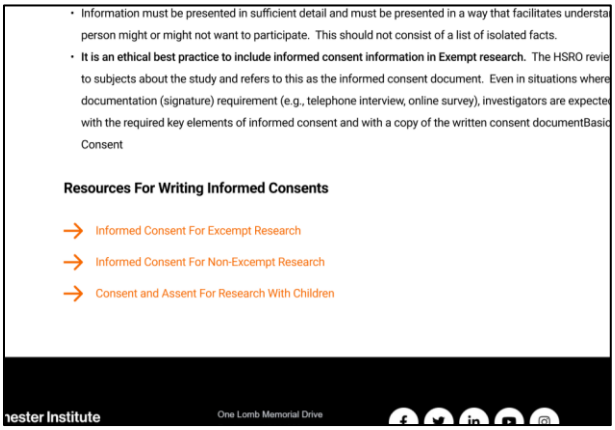


FIGURE 19 HYPERLINKS UNDER INFORMED CONSENT OVERVIEW

6.2.3. Change Titles

Task 1, determining if a project needs to be reviewed, and task 5, finding parental informed consent, were two of the hardest tasks for participants. One possible reason could be the title of the page did not represent the content well. When people saw them, they had no clue what was inside, or the content did not match what they thought it was. Participants 12 in usability test 2 said she was looking for the keyword *informed consent* or *parent*, so she did not make the connection between *research with children* and *parental informed consent*.

Some changes were made to address the issue. All links to Do you need IRB review were made the same to ensure internal consistency. The items in the informed consent submenu were made more descriptive, for example research with children was changed to consent and assent for research with children (Figure 20).

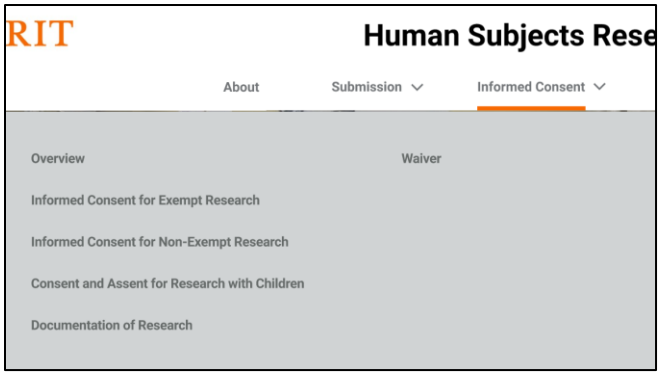


FIGURE 20 MORE DESCRIPTIVE TITLE

7. Usability Test 3 (on the prototype)

Usability test 3 was similar to usability 2. The only thing that changed was the prototype. Six new participants were invited to this test, different from participants in usability 1 and 2. They were between 20 to 40 years old, including undergraduate and graduate students and RIT faculty. Three participants tested the desktop version, and the other 3 tested the mobile version. This test aims to validate the changes made after usability test 2 and to find more issues.

7.1. Usability Test 3 Results

Six participants all successfully completed seven tasks without any fail, which is an improvement from the original website and the first prototype. Usability test 2 and 3 both used Maze to record participants' clicks and completion time. The usability test 3 result showed improvement in completion time. However, the completion time included the time when participants were reading task descriptions, asking the moderator questions, and thinking aloud. Hence, it was not an accurate measure of how fast a participant could complete a task.

In usability test 2, one participant did not realize that the hamburger menu icon was clickable, so she could not complete task 1. In usability test 3, all participants were reminded at the beginning of the test that the menu was expandable to avoid the same mistake from happening again.

Some participants took longer to complete task 1, and task 2 due to personal habits, but they could find the information without a problem. For example, P13 and P16 preferred to quickly view the menus when entering an unfamiliar website. Even though participants could all find

contact information easily, P13, P16, P17, and P18 would rather check out the *FAQ* and do some research before reaching out for help.

In task 3, five participants chose *Step-By-Step Guide* as their starting point when preparing their submission. It was an improvement because they did not need to go to separate pages to collect forms and instructions, as they did on the original HSRO website.

P13 was almost not able to complete task 4 because she did not read the instruction. After the moderator reminded her to check out the instructions, she found the required information.

Task 5 was once the most challenging task for participants in usability test 1 with only a 50% success rate. In usability test 3, the success rate improved to 100%, and it only took 61 seconds for participants to complete the task on average. After usability test 2, Research With Children was changed to *Consent And Assent For Research With Children*, which better represented its content.

All participants were able to find the *Submission Checklist*. However, P16 made a mistake and clicked *Review* before she found the submission checklist because she perceived review differently from the designer. Menu items are usually short and concise to save space and to reduce the user's cognitive load. However, when the phrase is too short, it could be confusing. For example, the review on the main menu meant IRB's assessment on applications, but P16 pointed out that she thought the review in the menu was to review her application package before submission. P14 also said she was not sure what was in the review tab because she could think of more than two possible meanings of review in this circumstance.

In task 7, there were many ways to find the email address for submitting applications. Four participants found the email in the *Step-By-Step Guide*; one found it at the bottom of the *Submission Checklist*; one found it in *Contact*.

8. Future Work

The director of HSRO, Director Foti, mentioned that she had some ideas of enriching the website with more multimedia content. However, she did not have enough technical support to do so. For easier future maintenance, the content management system needs to be more user-friendly, or RIT should provide more workshops, training courses for faculties who need to manage a website. Since people have become very reliant on websites and web applications to acquire information, they become very impatient with errors and slow response times (Duan & Chen, 2007). In the usability test on the current HSRO website, participants frequently encountered errors and verbally expressed their frustration which meant the website already lacked maintenance. No matter how good a web design is, it will not last long without regular maintenance.

Creating new content and features was out of this project's scope, but some features are worth considering for future developers. For example, Director Foti mentioned a platform for researchers to find potential participants. According to director Foti, many researchers had problems recruiting participants. Penn State University has a platform called StudyFinder (**Error! Reference source not found.**), which is specifically for clinical research. Different studies need different types of participants. Some have age limitations; some are looking for people with specific conditions. Therefore, they set up a filter to help volunteers to find suitable studies to participate in.

Several universities, such as Harvard University, the University at Buffalo, and the University of Rochester, use electronic research submission software, e.g., Click IRB, to manage applications. Electronic research submission software provides a convenient way for prime investigators and reviewers to keep track of the progress of each submission. Applicants could also find forms and templates in the system.

Any changes made after usability test 3 were not validated by another usability test yet. One more usability test is needed to make sure there are no further issues.

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10. Appendix

10.1. Appendix 1: HSRO Interview questions

- What are the goals of this website?
- Who are your target audience?
- How often do you update the website?
- How do you update the website? Drupal?
- How could this website help your job?
- Do you want any new features? What kind?
- Anything that you want to change about the website?
- Did you receive any complaints/compliments about the website? Please provide examples.
- Please let me know your expectations about the website, or anything that you would like to mention about this website and this project.

10.2. Appendix 2: User Survey Responses

	Response 1	**Response 2**	**Response 3**	**Response 4**
How easy was it to use HSRO's website?	Neither easy nor difficult	Somewhat difficult	Somewhat difficult	Somewhat difficult

How satisfied were you with HSRO's website?	Somewhat satisfied	Somewhat dissatisfied	Somewhat dissatisfied	Somewhat dissatisfied
What was your first impression when you entered the website?	It looks outdated. I was worried whether it'd be difficult to find the information I needed.	Messy, hard to read on mobile	The information seemed outdated based on the design of the page as compared to the rest of the RIT website	Old, lots of text
What do you like the most about this website?	Though seemed outdated, I got all the documents (forms) I needed without too much difficulty. The checklist also helped.			
What do you like the least about this website?	The outdated look made me wonder if it was deprecated and the "real" website was somewhere else. This kind of things often happens. Also, it's wordy.	Irritating side panel, complex information	Navigation, especially on mobile, is annoying. The contents are pushed to the side and one has to scroll horizontally to see all the information.	I hope there are shorter answers
How did your experience on this website compare to your expectations?	"It was okay. I got the information I needed and completed my application. But I wouldn't want to visit the website again because it's wordy. Writing IRB application is a tiring task, using the office of human subjects research's website makes it more tiring. "	Unsatisfactory. Took very long to figure out what I needed to send	I expected a more mobile friendly and updated appearance that follows the more common RIT design encountered on www.rit.edu	This website does not look like other RIT websites at all.

10.3. Appendix 3: The Full List of Cards In The Card Sorting Activity

1. RIT's Federalwide Award Number

2. News

3. Definition of research and human subjects

4. Consent Form Requirements for Non-Exempt Research

5. Contact Information

6. FAQ

7. Identifying risks in research

8. Exempt Research

9. Background of IRB Committees

10. Principles for Reviewing Research

11. Definition of NIH-Funded Clinical Research

12. Exempt Informed Consent Samples

13. Background of HSRO

14. Procedures for submitting application

15. Information for Single IRB (sIRB) Requirement3

16. Waiver of the Requirements to Obtain Informed Consent

17. HSRO's responsibilities

18. Tips for completing the application form

19. Submission Checklist

20. Documentation of Research 21. Training Information1

22. Types of Review2

23. IRB Application Forms

24. The Informed Consent Process with Children

25. Informed Consent Sample for Non-Exempt Research

26. Sample Assent Form4

27. Assent Tips4

28. Review Categories5

10.4. Appendix 4: Card Sorting Result

Group Name	Created by	Cards added	Frequency
Informed consent	3 Participant	Assent Tips	2 time
		Sample Assent Form	2 time
		Documentation of Research	1 time
		Waiver of the Requirements to Obtain Informed Consent	2 time
		Consent Form Requirements for Non-Exempt Research	3 time

Group Name	Created by	Cards added	Frequency
		The Informed Consent Process with Children	2 time
		Informed Consent Sample for Non-Exempt Research	2 time
		Submission Checklist	1 time
		Exempt Informed Consent Samples	2 time
Application processes	3 Participant	Documentation of Research	2 time
		Submission Checklist	3 time
		Tips for completing the application form	3 time
		IRB Application Forms	1 time
		Training Information	3 time
		Procedures for submitting application	3 time
Definition	3 Participant	Definition of NIH-Funded Clinical Research	3 time
		Principles for Reviewing Research	1 time
		Review Categories	1 time
		Types of Review	1 time
		Exempt Research	1 time
		Information for Single IRB (sIRB) Requirement	1 time
		Definition of research and human subjects	3 time
		Identifying risks in research	1 time
IRB	2 Participants	Information for Single IRB (sIRB) Requirement	2 times
		IRB Application Forms	2 times
		Review Categories	1 time
		Background of IRB Committees	1 time
I don't know.	2 Participant	Definition of research and human subjects	1 time
		Exempt Research	1 time
		Identifying risks in research	1 time
		RIT's Federalwide Award Number	1 time
		Definition of NIH-Funded Clinical Research	1 time
HSRO	2 Participant	HSRO's responsibilities	2 time
		Types of Review	1 time
		Background of HSRO	2 time
		Background of IRB Committees	1 time
		Principles for Reviewing Research	1 time
SAMPLE	2 Participant	Waiver of the Requirements to Obtain Informed Consent	1 time
		Exempt Informed Consent Samples	2 time
		Exempt Research	2 time
		Consent Form Requirements for Non-Exempt Research	1 time
		The Informed Consent Process with Children	1 time
		Informed Consent Sample for Non-Exempt Research	2 time
Background information	2 Participant	Background of IRB Committees	2 time
		RIT's Federalwide Award Number	1 time

Group Name	Created by	Cards added	Frequency
		Background of HSRO	2 time
		Contact Information	1 time
		News	1 time
		HSRO's responsibilities	2 time
		FAQ	1 time
Information	1 Participant	FAQ	1 time
		Contact Information	1 time
		RIT's Federalwide Award Number	1 time
Assent	1 Participant	Assent Tips	1 time
		Sample Assent Form	1 time
News	1 Participant	News	1 time
The informed Consent Process with Children	1 Participant	Waiver of the Requirements to Obtain Informed Consent	1 time
		Sample Assent Form	1 time
		The Informed Consent Process with Children	1 time
		Assent Tips	1 time
METHOD	1 Participant	Principles for Reviewing Research	1 time
		Identifying risks in research	1 time
		Training Information	1 time
		Tips for completing the application form	1 time
		Review Categories	1 time
		Types of Review	1 time
INFORM	1 Participant	IRB Application Forms	1 time
		Contact Information	1 time
		Information for Single IRB (sIRB) Requirement	1 time
		Procedures for submitting application	1 time
		News	1 time
QUESTION	1 Participant	FAQ	1 time
		Documentation of Research	1 time
		RIT's Federalwide Award Number	1 time
basic information	1 Participant	Contact Information	1 time
		News	1 time
		FAQ	1 time
Review	1 Participant	Review Categories	1 time
		Identifying risks in research	1 time
		Types of Review	1 time
		Principles for Reviewing Research	1 time
G1	1 Participant	Submission Checklist	1 time
		RIT's Federalwide Award Number	1 time
		Review Categories	1 time
G2	1 Participant	Background of IRB Committees	1 time

Group Name	Created by	Cards added	Frequency
		Background of HSRO	1 time
G3	1 Participant	Training Information	1 time
		Contact Information	1 time
		FAQ	1 time
		News	1 time
		Principles for Reviewing Research	1 time
G4	1 Participant	Sample Assent Form	1 time
		Waiver of the Requirements to Obtain Informed Consent	1 time
		IRB Application Forms	1 time
		Documentation of Research	1 time
G5	1 Participant	Tips for completing the application form	1 time
		Assent Tips	1 time
		Identifying risks in research	1 time
G6	1 Participant	Procedures for submitting application	1 time
		Definition of research and human subjects	1 time
		Definition of NIH-Funded Clinical Research	1 time
G7	1 Participant	The Informed Consent Process with Children	1 time
		Exempt Informed Consent Samples	1 time
		Consent Form Requirements for Non-Exempt Research	1 time
		Informed Consent Sample for Non-Exempt Research	1 time
		Exempt Research	1 time
G8	1 Participant	HSRO's responsibilities	1 time
		Information for Single IRB (sIRB) Requirement	1 time
		Types of Review	1 time

10.5. Appendix 5: Usability Test Tasks

Imagine you are a freshman who has minimal knowledge of research or human subjects research…

#	Task description	Task goal
1	Do you need to submit your project for review? You want to study a topic about how digital products affect kindergarten children. You want to observe and interview 10 children. You are not sure if your project needs to be reviewed by HSRO, so you go to Human Subjects Research Office website to find out.	Users can find information about if they need or need not submit their research for review when they have a research idea in mind.

#	Task description	Task goal
2	What if, after reading the definition of research and human subjects, you still have some doubts. What would you do next?	Users can find contact information and seek help.
3	Now, you know you need to submit your research for review. What will you do next?	Users can find submission information.
4	You are working on the application form, and you see this question on the application form: "If you believe your project qualifies for Exemption, which exemption number(s) apply? *The RIT Institutional Review Board (IRB) categorizes Human Subjects Research into three Risk Types (Exempt, No Greater than Minimal Risk, and Greater than Minimal Risk). The IRB makes the final determination of risk type. For classifications, please see the RIT HSRO website Types of Review." Please find the exemption numbers on the website.	Users can find the information to fill out the application form based on the instruction provided.
5	You realized that you need to collect parental informed consent; how would you start?	Users can find instructions on drafting parental informed consent.
6	You have all your application forms, consent forms, and supporting materials ready. You would like to check if any document is missing. What could you do?	Users can find the submission checklist.
7	Great! You have everything ready. Where would you send your application to?	Users can find the email to send their applications to.

10.6. Appendix 6: Usability Test 1, Number of Participants Who Failed

#	Task description	Number of participants who failed
1	Do you need to submit your project for review? You want to study a topic about how digital products affect kindergarten children. You want to observe and interview 10 children. You are not sure if your project needs to be reviewed by HSRO, so you go to Human Subjects Research Office website to find out.	3
2	What if, after reading the definition of research and human subjects, you still have some doubts. What would you do next?	0
3	Now, you know you need to submit your research for review. What will you do next?	2
4	You are working on the application form, and you see this question on the application form: "If you believe your project qualifies for Exemption, which exemption number(s) apply? *The RIT Institutional Review Board (IRB) categorizes Human Subjects Research into three Risk Types (Exempt, No Greater than Minimal Risk, and Greater than Minimal Risk). The IRB makes the final determination of risk type. For classifications, please see the RIT HSRO website Types of Review." Please find the exemption numbers on the website.	1
5	You realized that you need to collect parental informed consent; how would you start?	3
6	You have all your application forms, consent forms, and supporting materials ready. You would like to check if any document is missing. What could you do?	0
7	Great! You have everything ready. Where would you send your application to?	1

10.7. Appendix 7: Usability Test 1 Results Note

	P1	**P2**	**P3**	**P4**	**P5**	**P6**
	Desktop	Desktop	Desktop	Smartphone	Smartphone	iPad
1	448 seconds Fail P1 clicked *Home*, *Types of Review*, *Institutional Review Board*, but she could not find the information, so she started to click the menu one by one. P1 found *Submitting your research*, but P1 was still not sure. P1 said, "At this point, I think I would be inclined myself to contact somebody in the office."	492 seconds Success P2 clicked *Home*, *About HSRO*, *Institutional Review Board*, *Checklist*, and then he found "How do I know if my project needs to be reviewed?" in *FAQ*.	692 seconds Fail P3 clicked *Types of Review* and spent some time *Exemption Category*, *Expedited Category*, and *Review Categories* but still unsure.	515 seconds Success P4 clicked *Institutional review board* and was frustrated with the menu showing up when unneeded. P4 was not happy that the website was not responsive, so she switched to landscape view. She clicked *Submitting your research* and found a line on the page with an answer.	605 seconds Fail P5 first clicked *Training* but did not find anything useful. She then clicked *Types of Review*. After reading the information on the *types of review* page, P5 thought a review would be needed, even though P5 was still not sure.	99 seconds Success P6 read the bullet points on the home page and then went to *FAQ*. He immediately found "How do I know if my project needs to be reviewed?" on the page.
2	6 seconds Success P1 clicked *Contact* on the menu and found the email and numbers.	54 seconds Success P2 scrolled down because he expected the contact information would be at the bottom. He did not notice *Contact* in the menu, but he remembered seeing the information in *About*	5 seconds Success P3 clicked *Contact* on the menu and found the email and numbers.	12 seconds Success P4 clicked *Contact* on the menu and found the email and numbers.	10 seconds Success P5 clicked *Contact* on the menu and found the email and numbers.	3 seconds Success P6 clicked *Contact* on the menu and found the email and numbers.

		the HSRO and found it.				
3	287 seconds Success P1 clicked *Submitting Your Research* and read the procedures. Then, she found the application forms and training info successfully.	288 seconds Success P2 saw *Form A* in the *Checklist* but was not sure what Form A was. He went to *IRB Forms* and used ctrl+f to find *Form A*. P2 found two different Form As, so he downloaded both to see the difference.	600 seconds" Fail P3 clicked *Submitting Your Research*. P3 expected to see clear Step 1, 2, 3, but the information was in blocks of texts. "It is not easy for me to quickly scan the page." When I told P3, "there is an application form on the website," P3 clicked the directory on top, which is actually for RIT's website, not HSRO. Then P3 found the checklist and Form A.	747 seconds Success P4 clicked *Submitting Your Research* in the hamburger menu. The submenu did not show properly on mobile devices, so P4 did not notice a submenu. And then she went to *Checklist*. P4 saw Form A and expected a link to it, but links were not provided. P4 went to *Resources* and then *IRB Forms* to find Form A. P4 eventually found 2 Form As but did not know the difference.	418 seconds Fail P5 clicked *IRB Forms* and then downloaded *Submission Checklist*. P5 went to download Form A according to the checklist but did not know what NTID Form A was. P5 believed that the checklist did not provide enough guidance for her to complete the submission.	199 seconds Success P6 clicked *Submission Checklist*. P6 saw Form A on the checklist and went to *IRB Forms* to find download links.
4	30 seconds Success P1 clicked *Types of Review* and then *Exemption Categories*.	83 seconds Success P2 clicked *Types of Review* and then *Exemption Categories*.	37 seconds Success P3 clicked *Types of Review* and then *Exemption Categories*.	26 seconds Success P4 clicked *Types of Review* and then *Exemption Categories*.	158 seconds Fail P5 went to *About the HSRO* and couldn't find the exemption numbers, so P5 decided to give up and contact the office.	112 seconds Success P6 clicked *Types of Review* and then Exemption Categories.
5	138 seconds Fail	147 seconds Success	83 seconds Fail	106 seconds Success	122 seconds Fail	98 seconds Success

	P1 found general guidelines about informed consent but did not find parental informed consent samples.	P2 google searched "RIT parental informed consent."	P3 first checked *Informed Consent* and found *Exempt Research Informed Consent Example*. P3 thought this could be useful for drafting a parental consent and did not continue looking for the parental informed consent sample.	P4 clicked *IRB Forms* but did not find anything. She then went to *Resources* and found the information.	P5 clicked *Informed Consent*, but the information was too general. P5 thought there was no sample on the website and was frustrated.	P6 clicked *Informed Consent* and then *Informed Consent Process with Children*. After I told P6 that there was a sample on the website, P6 went to *Resources* and found samples.
6	3 seconds Success P1 clicked *Submission Checklist* in the menu.	5 seconds Success P2 clicked *Submission Checklist* in the menu.	8 seconds Success P3 clicked *Submission Checklist* in the menu.	5 seconds Success P4 clicked *Submission Checklist* in the menu.	3 seconds Success P5 clicked *Submission Checklist* in the menu.	5 seconds Success P6 clicked *Submission Checklist* in the menu.
7	120 seconds Success P1 went to *Submitting Your Research* and then *Institutional Review Board*, where she found a broken link. She went to *Standard Operation Procedures*. It took P1 30 seconds to locate the email address on this page.	186 seconds Success P2 first went to *Checklist*, expecting submission detail, but it was not there. Finally, P2 found the email in *IRB forms*	200 seconds Success P3 remembered seeing the information before but could not find it anymore. Finally, P3 found the email in the *FAQ*.	220 seconds Success P4 clicked *Submitting Your Research* and expected to see a submit button. P4 noticed the submenu at the bottom and found the email in *Standard Operation Procedure*.	10 seconds Fail P5 decided to send the application to the person in *Contact*.	209 seconds Success P6 clicked *Submitting Your Research* but could not find a link to submit the research. He then clicked *Institutional Review Board* and then *Home*, where P6 found the email for submission.

Note		P2 expected to see a download link when seeing Form A. P2 preferred to see clear step1,2,3 instructions.	P3 said the font size is too small. "Too wordy. I don't know where to start." P3 found 2 "Types of Reviews" in the menu and was confused.	P4 said, "Information is hidden in wordy paragraphs." P4 did not want to download the checklist. When P4 saw the checklist, she immediately asked, "Where is Form A? What is Form A?"	P5 complained about how difficult it was to browse the website on her phone and felt irritated. P5 preferred to see the checklist on the website, not on a pdf document. P5 was expecting a page for all downloadable content on the website.	P6 said, "Probably helpful if there was a link to Form A."

#	**Task description**	**Number of participants who failed**
1	Do you need to submit your project for review? You want to study a topic about how digital products affect kindergarten children. You want to observe and interview 10 children. You are not sure if your project needs to be reviewed by HSRO, so you go to Human Subjects Research Office website to find out.	3
2	What if, after reading the definition of research and human subjects, you still have some doubts. What would you do next?	0

#	Task description	Number of participants who failed
3	Now, you know you need to submit your research for review. What will you do next?	2
4	You are working on the application form, and you see this question on the application form: "If you believe your project qualifies for Exemption, which exemption number(s) apply? *The RIT Institutional Review Board (IRB) categorizes Human Subjects Research into three Risk Types (Exempt, No Greater than Minimal Risk, and Greater than Minimal Risk). The IRB makes the final determination of risk type. For classifications, please see the RIT HSRO website Types of Review." Please find the exemption numbers on the website.	1
5	You realized that you need to collect parental informed consent; how would you start?	3
6	You have all your application forms, consent forms, and supporting materials ready. You would like to check if any document is missing. What could you do?	0
7	Great! You have everything ready. Where would you send your application to?	1

10.8. Appendix 8: Usability Test 2 Results Note

	P7	P8	P9	P10	P11	P12
	Desktop			Smartphone		
1	685.3 seconds Success P7 spent some time exploring the website before she began. Her first instinct was to click *About* because she thought if she knew what this office was doing, then she would know if her project was part of their business.	482.1 seconds Fail P8 clicked on every item in the main menu. She thought S*ubmission* could help her with the submission process but not to decide whether she needed to submit or not.	100.6 seconds Success P9 used the popular resources on the home page and clicked *FAQ* to find the answer.	254.1 seconds Success When P10 visited a new website, he usually would scroll around to see big titles on the page. He did not find the information in *Informed Consent* and *Submission Overview*, so he said he would use ctrl+F or search to find the keyword.	170.4 seconds Success P11 clicked the menu to see what was in there. P11 thought the font was too small, so he enlarged the window. He clicked the *Step-by-Step Guide* and found the answer in Step 1.	40.5 seconds Fail P12 scrolled to the Popular Resources section and said, "They don't seem relevant to this question." She then clicked *Finish* because she did not realize the hamburger menu was working.
2	22.9 seconds Success P7 clicked *Contact* immediately, but she spent some time reading the descriptions on the page.	548.4 seconds Success P8 would rather carefully read everything in the *About* section before reaching out for help. When I asked her to contact the office, she immediately found the Contact page. She felt that the purposes for the two emails could be more precise.	117.7 seconds Success In the beginning, P9 could not find his way back to the home page. After a short while, he found *Contact*.	60.6 seconds Success P10 usually would go to *FAQ* or *Contact* when he has questions, and he found both.	27.1 seconds Success P11 went to C*ontact* and found the phone number. He preferred a phone number because it was faster to get an answer from a person.	122.5 seconds Success P12 preferred to read everything on the website before reaching out for help. When I asked her to call the office, she immediately found the contact information.
3	26.0 seconds Success P7 went for the *Step by Step Guide*.	21.5 seconds Success P8 read the submission overview and then went to the *Step by Step Guide*	139.3 seconds Success P9 found links to the application forms on the home page.	54.3 seconds Success P10 quickly clicked Step by Step Guide in the menu.	68.3 seconds Success P11 went to *Forms and Tips*. Since he has seen the *Step by Step Guide* in previous tasks. He would	63.2 seconds Success P12 tried to click *Apply* on top of the menu, but that was for RIT admission. She clicked *Submit Your Research* in *Popular*

	P7	P8	P9	P10	P11	P12
					choose to download the forms now.	*Resources* and found the *Step by Step Guide*.
4	197.2 seconds Success P7 clicked *Submission* at the beginning. After I reminded her to read the prompt, she found the information on the *Review* page.	61.9 seconds Success P8 saw *Types of Review* in the prompt, so she clicked *Review* in the menu and then *Types of Review* and finally *Exempt categories*.	46.8 seconds Success P9 quickly found *Types of Review* in the popular resources section.	82.7 seconds Success P10 found "Types of Review" in the menu, but he spent some time looking for the "Exempt" section on the page.	344.3 seconds Success P11 spent some time in the "Informed Consent" section. Later, he realized what "Review" means and found the exemption numbers.	179.9 seconds Success P12 would like to figure out what IRB means, so she clicked "Do you need an IRB?" and then she found "Types of Review" in "Popular Resources."
5	285.2 seconds Success P7 went to *Documentation of Research* because she assumed this page would contain comprehensive information of informed consent.	19.9 seconds Success P8 remembered seeing this while completing previous tasks, so she found the information instantly.	20.2 seconds Success P9 clicked *Informed Consent* on the menu and found parental informed consent guidelines in *Research with Children*.	43 seconds Success P10 clicked *Informed Consent* on the menu and found parental informed consent guidelines *in Research with Children*.	98.7 seconds Fail P11 clicked *Informed Consent*. He saw too many words on the Exempt page, but he believed the answer was somewhere in the paragraph.	573.1 seconds Success After P12 read *Informed Consent Overview* and *Documentation of Research*, she still couldn't find the information, so she said she would choose to use the magnifying glass to search on the website. Later, she found *Research With Children* on the menu.
6	202.5 seconds Success P7 remembered seeing the checklist but could not remember where it was.	91.7 seconds Success P8 did not understand the prompt at the beginning. After some explanation, she remembered seeing the checklist during previous tasks and found it.	139.1 seconds Success P9 used the link on the home page and found the checklist.	30.4 seconds Success P10 found the *Submission Checklist* in the menu.	16.2 seconds Success P11 remembered seeing the checklist in previous tasks, so he found it immediately.	39.3 seconds Success P12 found the *Submission Checklist* in the menu.
7	334.9 seconds	179.0 seconds	143.2 seconds	42.4 seconds	32.0 seconds	109.1 seconds

	P7	P8	P9	P10	P11	P12
	Success P7 immediately went to *Contact* for the email address. She did not find a clear answer, so she went to *About*. She eventually found the information in *Step by Step Guide*	Success P8 first tried *Apply* on the upper-right corner, but that apply button was for RIT's admission. She went to the *Contact* page and found the email.	Success P9 clicked *Submit Your Research* link in popular resources on the home page and found the email in the *Step by Step Guide*.	Success P10 clicked *Submit Your Research* link in popular resources on the home page and found the email in the *Step by Step Guide*.	Success P11 chose to go to *Contact* and send his application to the first email on that page.	Success P12 clicked *Submit Your Research* in popular resources on the home page and found the email in the *Step by Step Guide*
	P7 clicked the go back button in her browser several times, but the prototype did not support it. P7 could not find the link back to the home page.	P8 was confused with the two email addresses on the website. She thought the difference could be made more evident.	P9 did not expect the header to be a link back to the home page. Although according to P9's experience, download links are usually at the bottom, he thought placing links on top also makes sense because not everyone needs to read the instructions.	P10 thought the title in the orange box was clickable, but it was not. When P10 was on the *Types of Review* page, he scrolled over the exempt section several times, but he did not see the link to exemption categories.	P11 mentioned that he would use Ctrl+F to look for keywords to save time. The difference between the two emails could be more evident on the *Contact* page.	P12 said all the abbreviations, such as IRB and HSRO, on the website, are confusing. P12 said it was hard to make the connection to parental informed consent with *Research With Children*.

#	Task description	Number of participants who failed
1	Do you need to submit your project for review? You want to study a topic about how digital products affect kindergarten children. You want to observe and interview 10 children. You are not sure if your project needs to be reviewed by HSRO, so you go to Human Subjects Research Office website to find out.	2

#	Task description	Number of participants who failed
2	What if, after reading the definition of research and human subjects, you still have some doubts. What would you do next?	0
3	Now, you know you need to submit your research for review. What will you do next?	0
4	You are working on the application form, and you see this question on the application form: “If you believe your project qualifies for Exemption, which exemption number(s) apply? *The RIT Institutional Review Board (IRB) categorizes Human Subjects Research into three Risk Types (Exempt, No Greater than Minimal Risk, and Greater than Minimal Risk). The IRB makes the final determination of risk type. For classifications, please see the RIT HSRO website Types of Review.” Please find the exemption numbers on the website.	0
5	You realized that you need to collect parental informed consent; how would you start?	1
6	You have all your application forms, consent forms, and supporting materials ready. You would like to check if any document is missing. What could you do?	0

#	Task description	Number of participants who failed
7	Great! You have everything ready. Where would you send your application to?	0

10.9. Appendix 9: Usability Test 3 Results Note

	P13	P14	P15	P16	P17	P18
	Desktop			Smartphone		
1	250 seconds Success P13's habit was to click all items in the menu when encountering a new website. Then, he clicked *Step-by-Step Guide* and followed the link in *Step 1*and found the answer.	73 seconds Success P14 used *Do you need IRB review* in the popular resources section and found the answer.	102 seconds Success P15 usually would visit the *About* page when encountering a new website. Then she clicked *Submission,* and *Do you need IRB review?*	221 seconds Success P16 did not understand the question and did not know the hamburger menu on the left was clickable, but after a while, she found *Do I need IRB review?* in the menu.	94 seconds Success P17's habit is to quickly scan the website when encountering a new website. She clicked *Do you need IRB review?* in *popular resources*	54 seconds Success P18 clicked *Submit Your Research* in *popular resources* and found the answer in *Step 1*.
2	177 seconds Success P13 would prefer to read more content before reaching out for help. He checked out *Checklist, IRB*	39 seconds Success P14 clicked to *Contact* and found the director's email.	39 seconds Success P15 clicked *Contact* and found the director's email.	72 seconds Success P16 would email the office only if she could not find the answer herself. When I asked her to find the contact	73 seconds Success P17 would first go to *FAQ* for more help. If she could not find the answer in *FAQ*, she would contact someone in	147 seconds Success P18 would try to find more information on this website. He clicked *Submission Checklist*. If he

	P13	P14	P15	P16	P17	P18
	Forms, and *FAQ*. He said he would use google to find more information. Contacting the office would be the last resort.			information, she scrolled to the bottom but could not find it. Then she clicked *Contact* in the hamburger menu.	the office, so she found the contact information on the home page.	still could not find the information, he would contact the office.
3	388 seconds Success P13 explored the *Informed Consent* page and *Review* Page before he actually clicked *Step by Step Guide* and found the instructions	43 seconds Success P14 clicked *Submission* and *Step by Step Guide*	71 seconds Success P15 clicked *Submission*, then *Overview*, then *Step by Step Guide*. She also said that she would download or bookmark the checklist for later use.	78 seconds Success P16 said she would appreciate a step by step instruction, and then she found the *Step by Step Guide*	56 seconds Success P17 clicked the *Submission Checklist* in the *Popular Resources*	84 seconds Success P18 clicked *Application Forms* in the *Popular Resources*
4	220 seconds Success P13 did not read the instructions to the end, so he couldn't find the information at first. I asked him to read it again, then he found exemption numbers.	134 seconds Success P14 clicked *Submission* and could not find relevant content and then clicked *Informed Consent*. She found *Exempt Research Category* in the *Informed Consent for Exempt Research*.	64 seconds Success P15 clicked *Review* and then *Types of Review* and found exemption categories.	48 seconds Success P16 clicked *Review* and then *Types of Review* and found exemption categories.	72 seconds Success P17 clicked *Types of Review* in *Popular Resources* and found exemption categories.	29 seconds Success P18 clicked *Review* and then *Types of Review* and found exemption categories.

	P13	P14	P15	P16	P17	P18
5	35 seconds Success P13 remembered seeing this in previous tasks, so he found the information immediately.	27 seconds Success P14 clicked *Informed Consent* and then *Consent and Assent for Research With Children*.	18 seconds Success P15 clicked *Informed Consent* and then *Consent and Assent for Research With Children.*	89 seconds Success P16 clicked *Informed Consent* and then *Consent and Assent with Children*, but she did not see parental informed consent at first.	106 seconds Success P17 clicked *Informed Consent Resources* in *Popular Resources*. She read the page and clicked *Consent and Assent for Research With Children.*	91 seconds Success P18 clicked the *Overview* in the *Informed Consent* section to see what informed consent is. Then he went to *Informed Consent for Exempt Research*. He read the content and was not satisfied, and then he clicked *Consent and Assent for Research with Children*.
6	95 seconds Success P13 would go through *Step by Step Guide* again before using the checklist.	43 seconds Success P14 clicked *Submission* and then *Submission Checklist*	24 seconds Success P15 clicked *Submission* and then *Step by Step Guide* and found *Submission Checklist* in *Step 3*.	52 seconds Success P16 clicked *Review* because she thought the review meant reviewing her application package. Then she clicked the *Submission Checklist* in the menu.	50 seconds Success P17 clicked *Submission Checklist* in *Popular Resources*.	24 seconds Success P18 clicked *Submission Checklist* in *Popular Resources*
7	23 seconds	39 seconds	28 seconds	65 seconds	58 seconds	388 seconds

	P13	P14	P15	P16	P17	P18
	Success P13 went to *Step by Step Guide* and found the email in *Step 3.*	Success P14 assumed that the email would be at the bottom at the checklist, and she found it.	Success P15 clicked *Submission* and then *Step by Step Guide* and found the email in *Step 3*	Success P16 would go to the *Contact* or *Submission* to submit her application. She eventually found the information in *Contact*	Success P17 clicked *Submit Your Research* in *Popular Resources* and found the email in *Step 3.*	Success P18 clicked *Submit Your Research* in *Popular Resources*, but he did not see the email in *Step by Step Guide* at first. He then went to the *Overview*, *Informed Consent*, *Training* trying to find it. He eventually found the email in *Step by Step Guide*.
		"You said exemption categories are under review, but my brain didn't trigger the word, *review*."		*Review* means to review the submission package for P16. When P16 saw *Consent and Assent for Research With Children*, she did not think of parental informed consent at first glance.	She mentioned that using accordions to organize longer content would be nice.	P18 did not know how to go back to the home page.

#	Task description	Avg. Completion time: Test 2	Avg. Completion time: Test 3
1	Do you need to submit your project for review? You want to study a topic about how digital products affect kindergarten children. You want to observe and interview 10 children. You are not sure if your project needs to be reviewed by HSRO, so you go to Human Subjects Research Office website to find out.	302.6 seconds	132.3 seconds
2	What if, after reading the definition of research and human subjects, you still have some doubts. What would you do next?	155.9 seconds	91.2 seconds
3	Now, you know you need to submit your research for review. What will you do next?	62.1 seconds	120 seconds

#	Task description	Avg. Completion time: Test 2	Avg. Completion time: Test 3
4	You are working on the application form, and you see this question on the application form: "If you believe your project qualifies for Exemption, which exemption number(s) apply? *The RIT Institutional Review Board (IRB) categorizes Human Subjects Research into three Risk Types (Exempt, No Greater than Minimal Risk, and Greater than Minimal Risk). The IRB makes the final determination of risk type. For classifications, please see the RIT HSRO website Types of Review." Please find the exemption numbers on the website.	152.1 seconds	94.5 seconds
5	You realized that you need to collect parental informed consent; how would you start?	188.3 seconds	61.0 seconds
6	You have all your application forms, consent forms, and supporting materials ready. You would like to check if any document is missing. What could you do?	86.5 seconds	48.0 seconds

#	Task description	Avg. Completion time: Test 2	Avg. Completion time: Test 3
7	Great! You have everything ready. Where would you send your application to?	140.1 seconds	100.2 seconds

Introduction

Human Subject Research Office (HSRO) at RIT reviews all research activities involving human subjects. The purpose is to protect the rights, safety, and welfare of every participant taking part in the research. When human subject researchers submit their application to HSRO for review, they must fill out an application form, complete training, provide informed consent forms, etc. The entire process could be complex and intimidating for first-timers or even experienced researchers.

Human Subject Research Office Website is usually the starting point for people who plan to submit their research for review. The most recent application forms, new policy changes, or any other essential information can all be found on the website. Therefore, the website is loaded with detailed documentation for different kinds of research. Keeping all those documentation organized and easy to find on the website is a challenge.

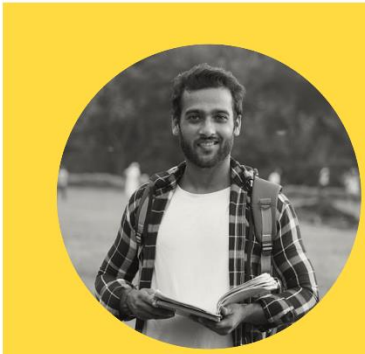
The Human Subject Research Website is currently managed by the director, Heather Foti. She is also the only one in charge of updating and maintaining the content on the website. The overall design of this website was made over ten years ago when the technology was not as advanced as nowadays, so it is easy to see that the website was not developed for multimedia materials and mobile devices.

However, a mobile-friendly responsive web design and rich visual aids are essential for today's users. Therefore, a makeover of the HSRO website is needed to provide a better experience for users.

Site Goals

- To educate people about the importance of protecting human rights during research
- To educate people about how to protect human rights during research
- To provide instructions on how to submit research for review

Audience definition (Personas)



Varun Kapoor

26 • 2nd Year Graduate Student

Motivations

CONVENIENCE	* * *
INFORMATION	* * * * *
EFFICIENCY	* * * * *
EASE OF USE	* * *

Goals

- to submit his application as soon as possible
- to get his research approved as soon as possible

Pain Points

- lack of experience in the submission process
- he has very limited time because he wants to graduate sooner.

"I just want to figure out how to submit my application."

Bio

Varun is a 2nd-year graduate student in Human-Computer Interaction. He has some knowledge about IRB from his previous courses but has never submitted an application before. His capstone project involves human subjects, and he wants to get this done fast.

Adobe Spark

Ronald Brown

58 • Professor

Motivations

CONVENIENCE	* * *
INFORMATION	* * * * *
EFFICIENCY	* * *
EASE OF USE	* * * *

Goals

- to check new policies and download new forms
- to help students find the information and give them the link

Pain Points

- poor eyesight
- trouble remembering where the information was on the website

"I better make sure what has changed since my last submission."

Bio

Professor Brown has conducted many human subjects research in RIT and other institutions before. He is quite familiar with the requirements and reviewing process. Even though he is experienced, he has a habit of checking the website to stay updated.

Adobe Spark

"I don't want to ruin my professor's research."

Bio

Ngoc-Bich is a 4th-year undergraduate student and research assistant. She is helping her professor recruiting participants and maintain communications. This is her first time participating in human research, so she would like to know the regulations.

Ngoc-Bich Nguyen

22 • Research Assistant

Motivations

CONVENIENCE	* * * *
INFORMATION	* * * * *
EFFICIENCY	* * *
EASE OF USE	* * * *

Goals

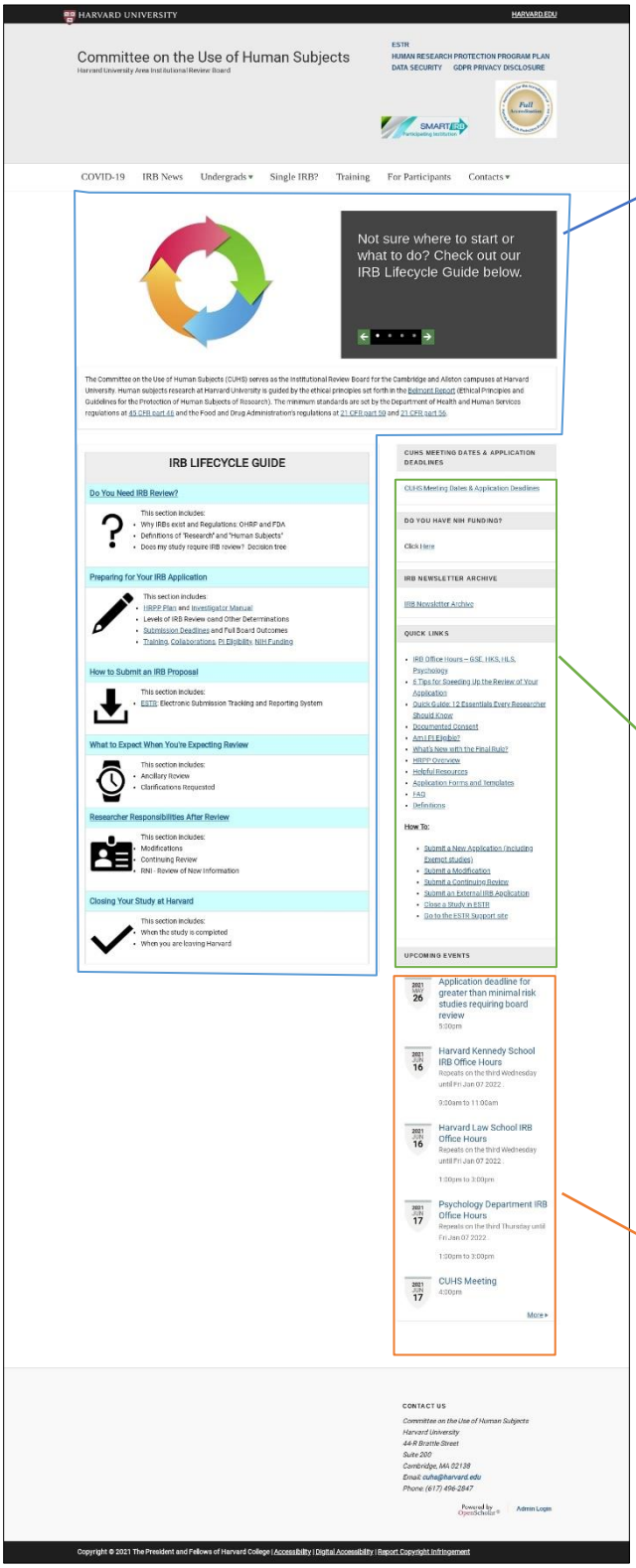
- to learn about human subject research
- to find resources about recruiting participants

Pain Points

- lack of research experience
- need more visual aids because she reads English very slowly

Competitive Analysis

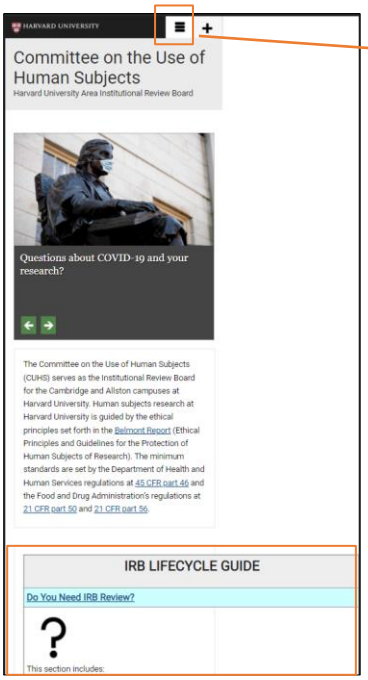
1. Harvard - Committee on the Use of Human Subjects (https://cuhs.harvard.edu/)



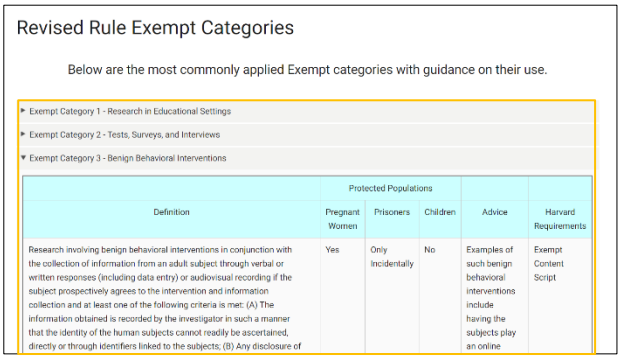
At the center of the Harvard Committee on the Use of Human Subjects website, there is a news slider, and the first slide is about the IRB lifecycle guide, which is placed right below the slider. This is a great approach because users can easily see the application process. The content in each step is broken down into several bullet points so users could get an idea of what is in the link before clicking on it.

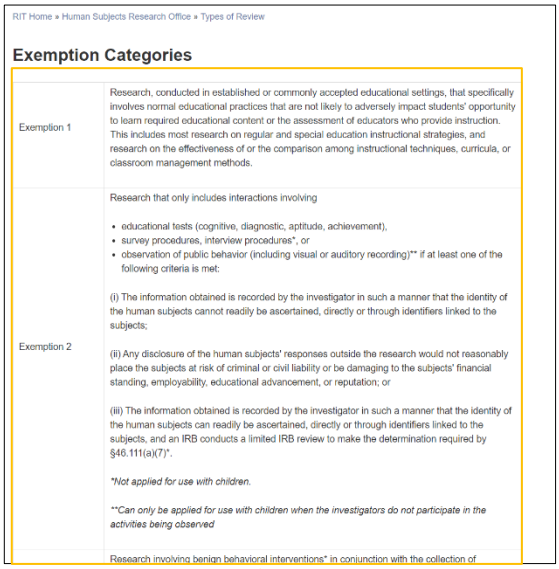
If categorization is appropriately used, it will help users find information quickly. However, the top three categories on the right only contain one link, and quick links section is clustered with many unordered links.

Although the upcoming events section is located at a less noticeable position, the date and the event are clear and easy to navigate.



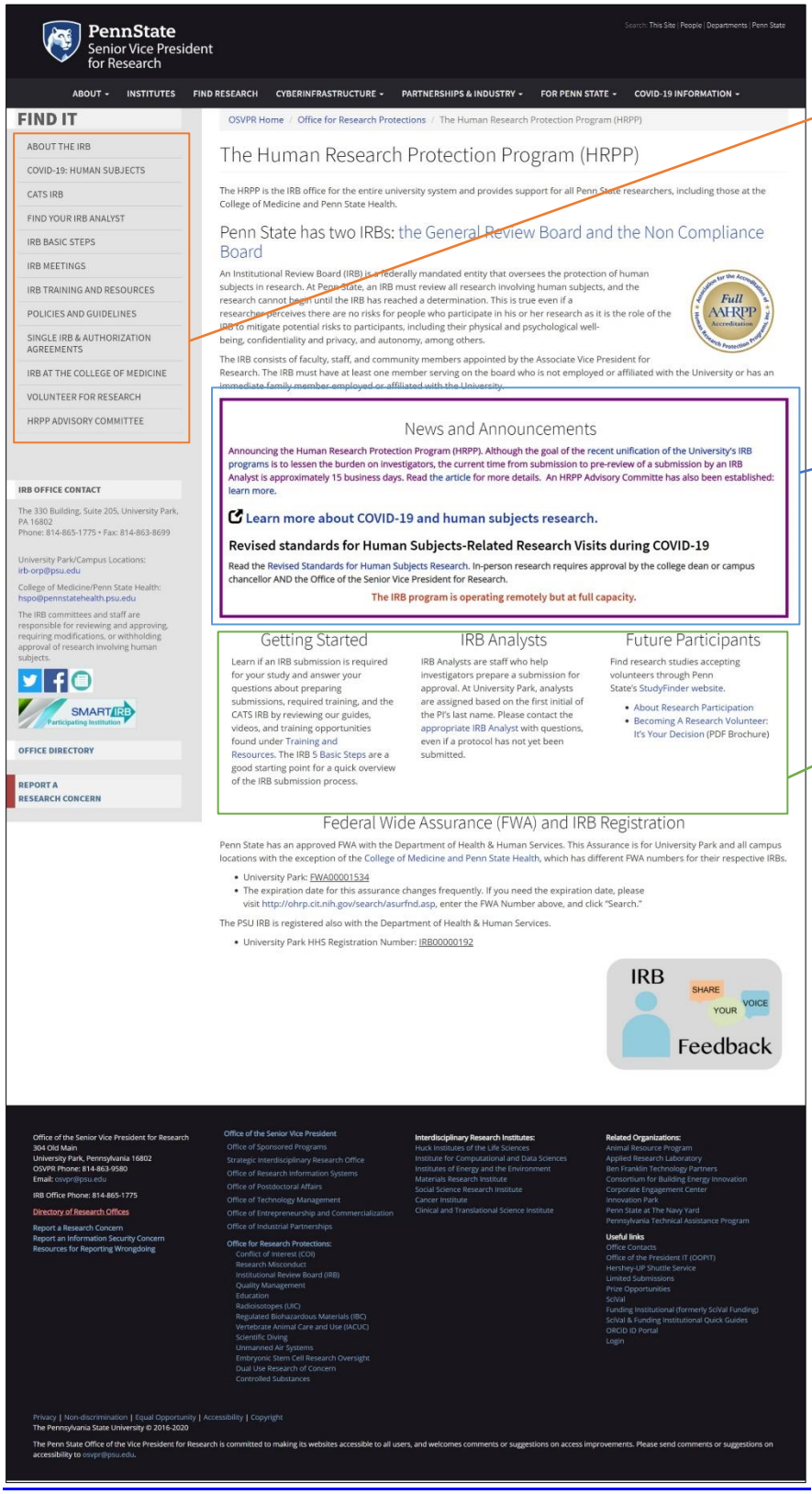
Harvard's website uses a hamburger menu for mobile versions, but part of the website was not responding to screen size changes.





Instead of showing everything in every category in the same table, Harvard's website uses accordions which make the page look cleaner and prevent overloading users.

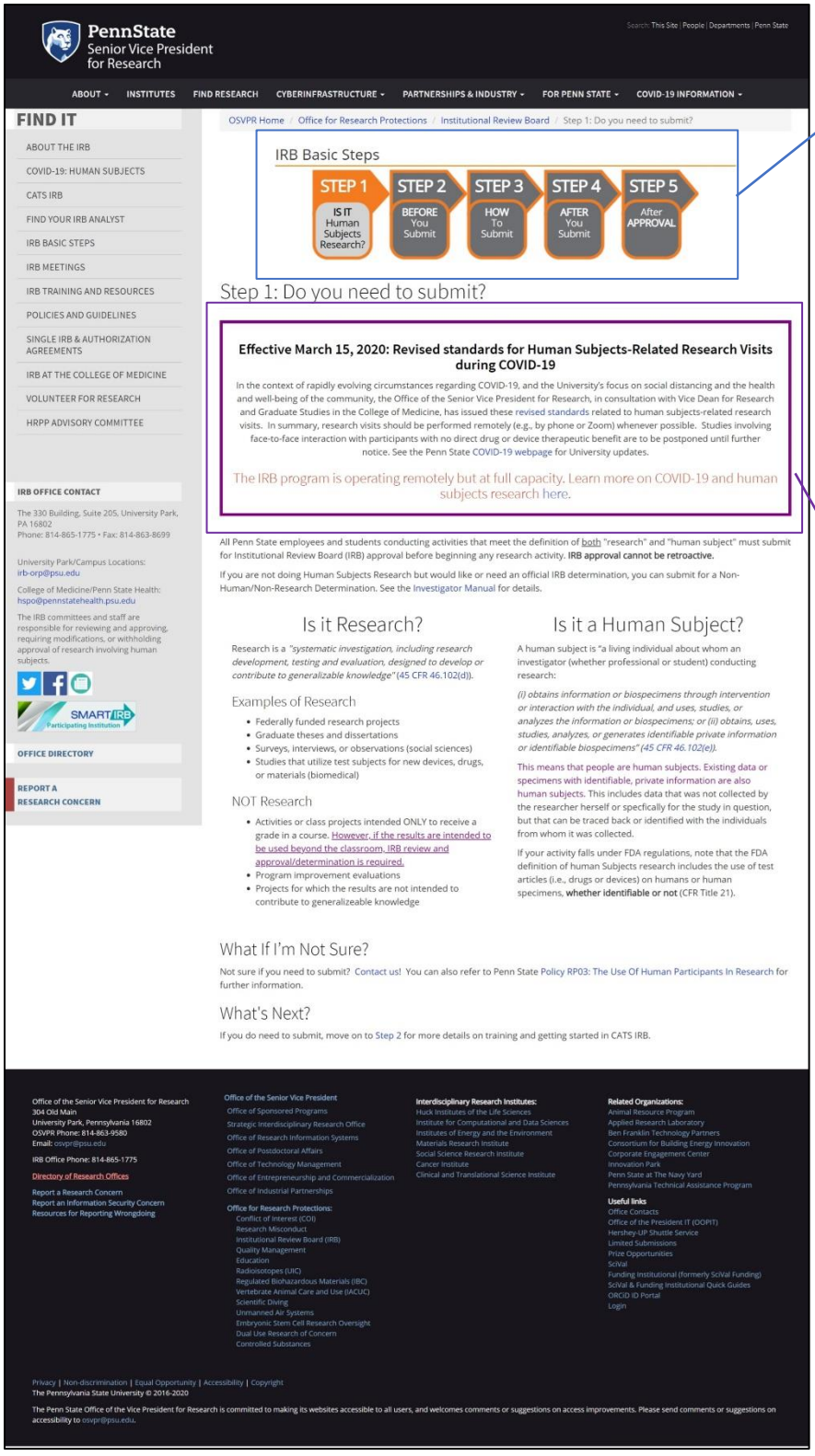
2. Penn State University - The Human Research Protection Program (HRPP) (https://www.research.psu.edu/irb



12 unorganized items in the menu could take users more time to process.

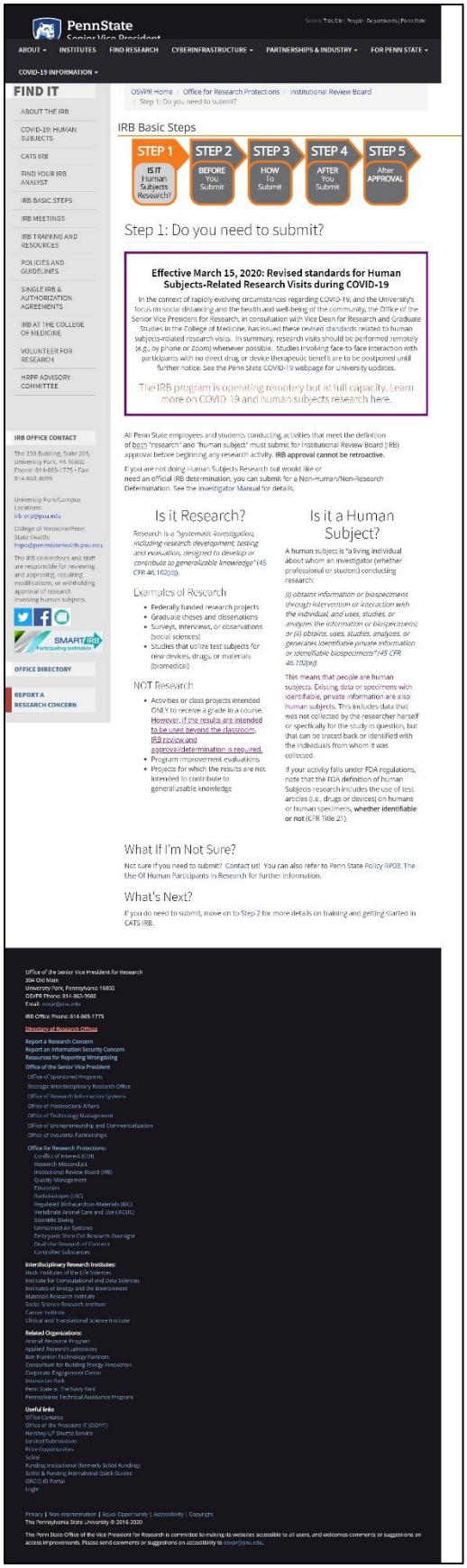
The new announcements are placed on the main page inside a purple box.

This section looks just like other parts of the page, same color, size, and style. However, the information here could be very helpful for first-time users. Links are also provided in the paragraphs.



Clear step 1, 2, 3 signs on top, which are easy to follow for users. Each block is also a link to detailed instructions.

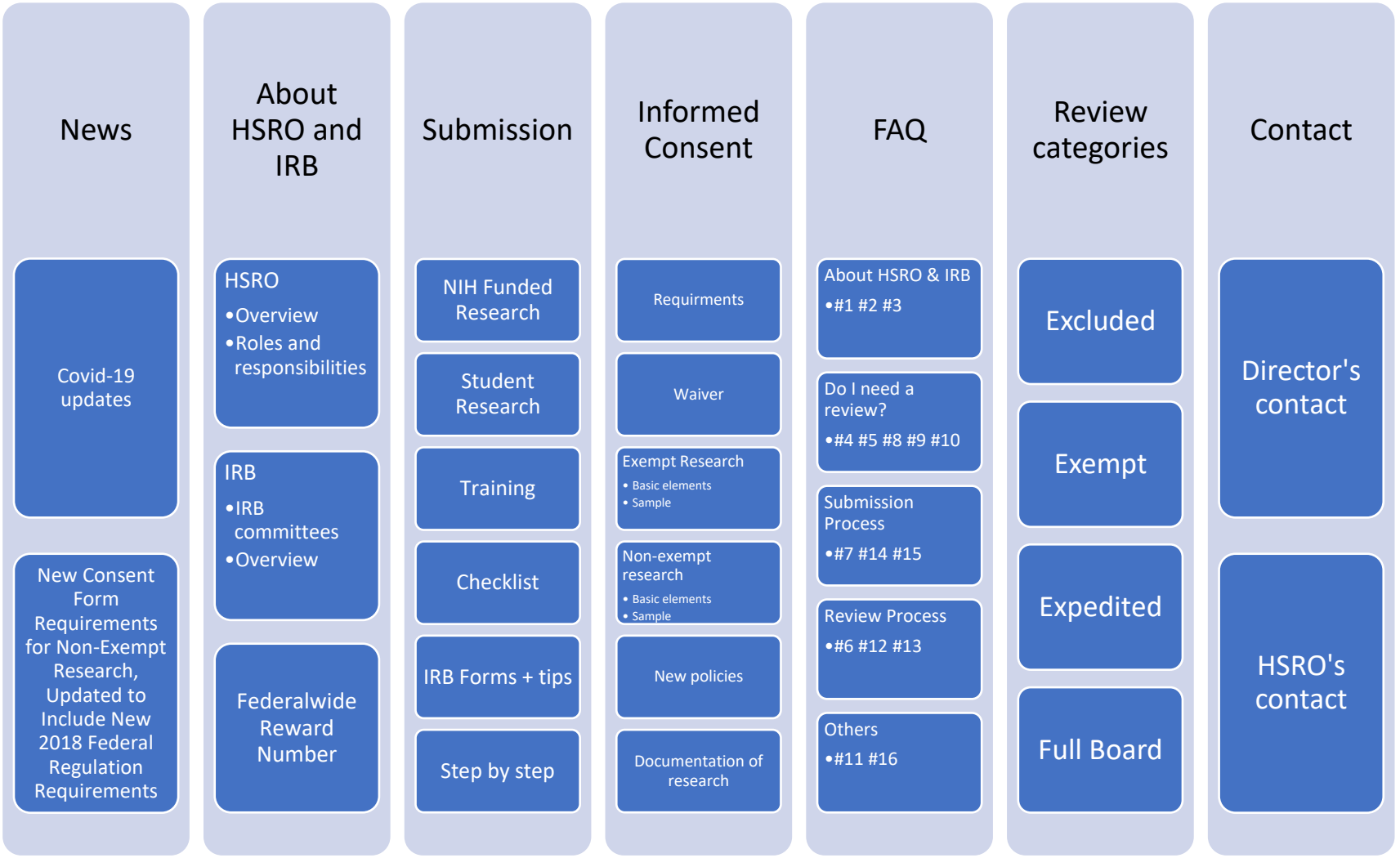
Important messages are placed in a purple box, which is consistent with the main page.



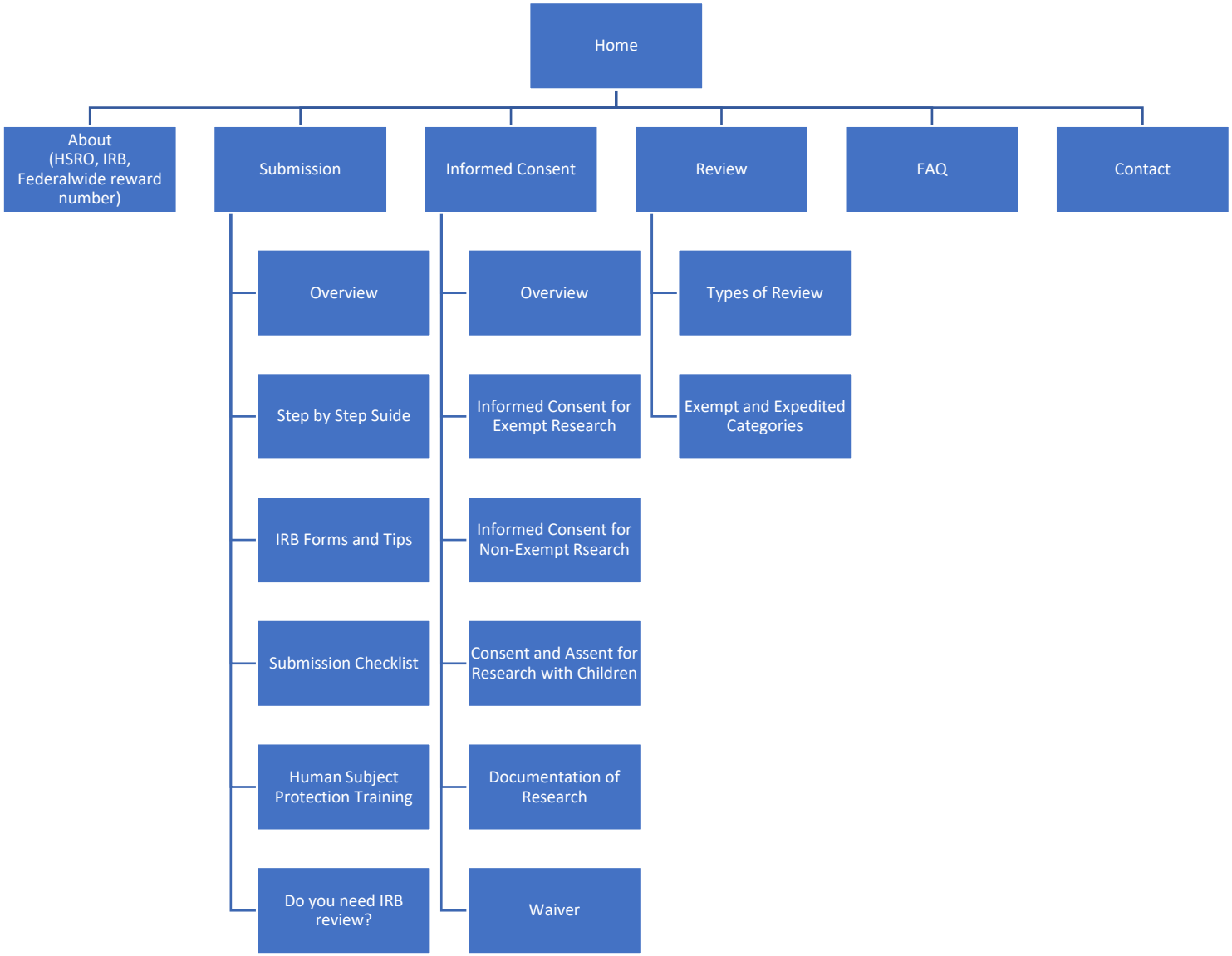
This website is not mobile-friendly, which could be a severe usability issue. When you visit the website on an iPhone X, the website would look like a smaller desktop version. The font would look very small unless you enlarge it. There is no hamburger menu or any other similar approaches to collapse the menu.

Site Content

1. **Content Grouping and Labeling**

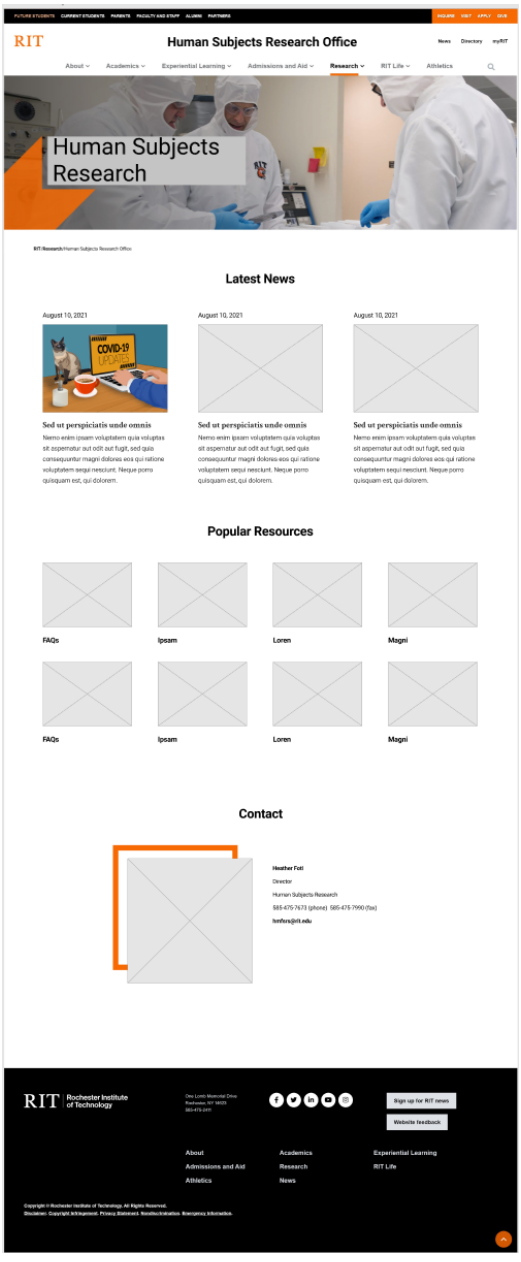


2. Site Map


Home
About (HSRO, IRB, Federalwide reward number)
Submission
Informed Consent
Review
FAQ
Contact
Overview
Step by Step Suide
IRB Forms and Tips
Submission Checklist
Human Subject Protection Training
Do you need IRB review?
Overview
Informed Consent for Exempt Research
Informed Consent for Non-Exempt Rsearch
Consent and Assent for Research with Children
Documentation of Research
Waiver
Types of Review
Exempt and Expedited Categories

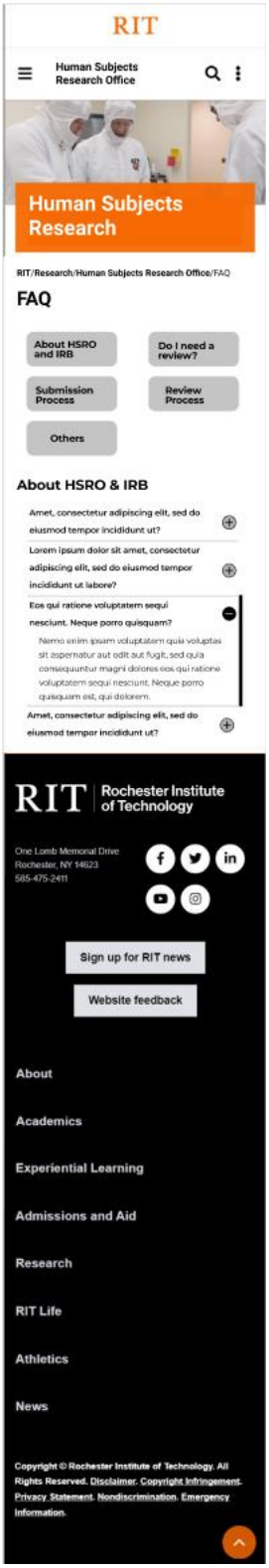
Design

- Home page

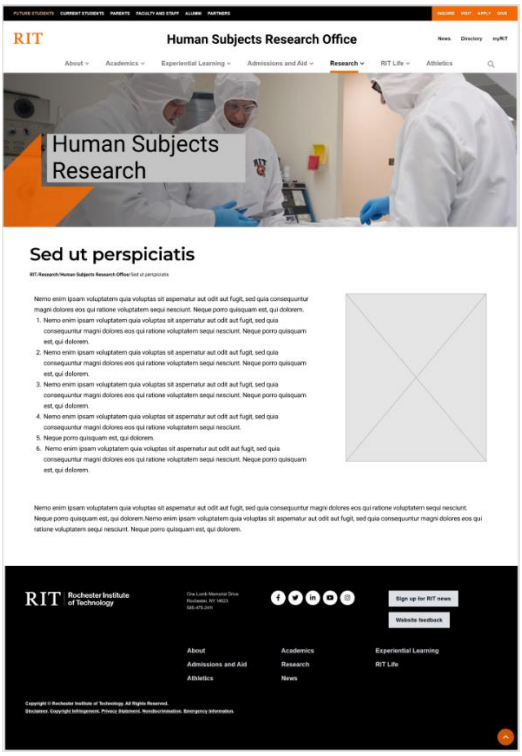


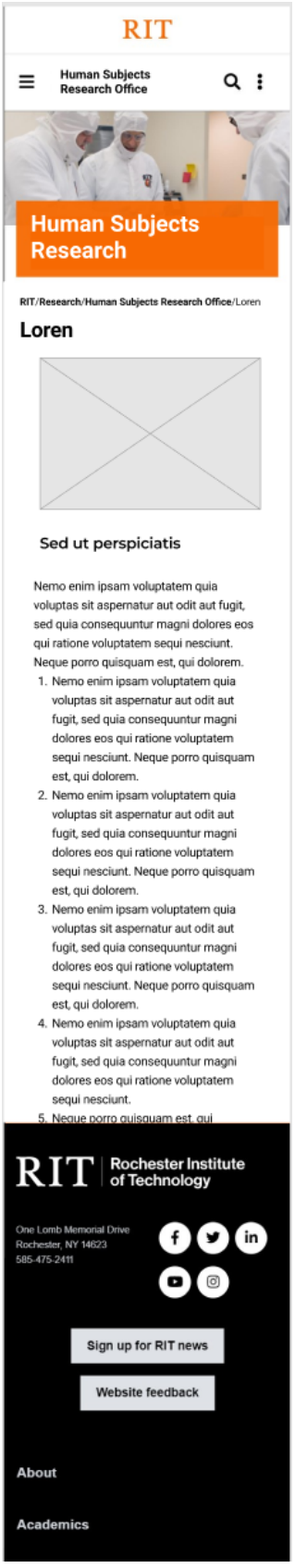
- This frame can be used for a page with a lot of similar items, such as exemptions.

- Frequently asked questions will be sorted into five categories, and users could use the links on top to jump to the specific topic.

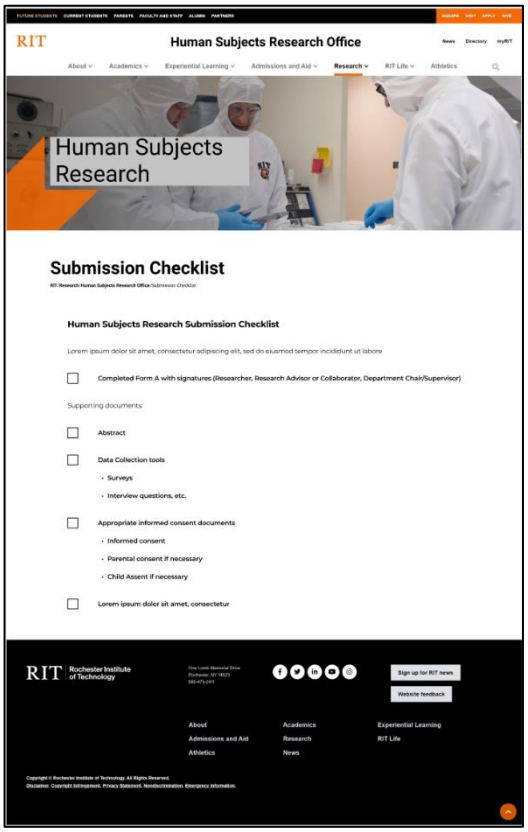


- This frame can be used on any page with an article and a picture.

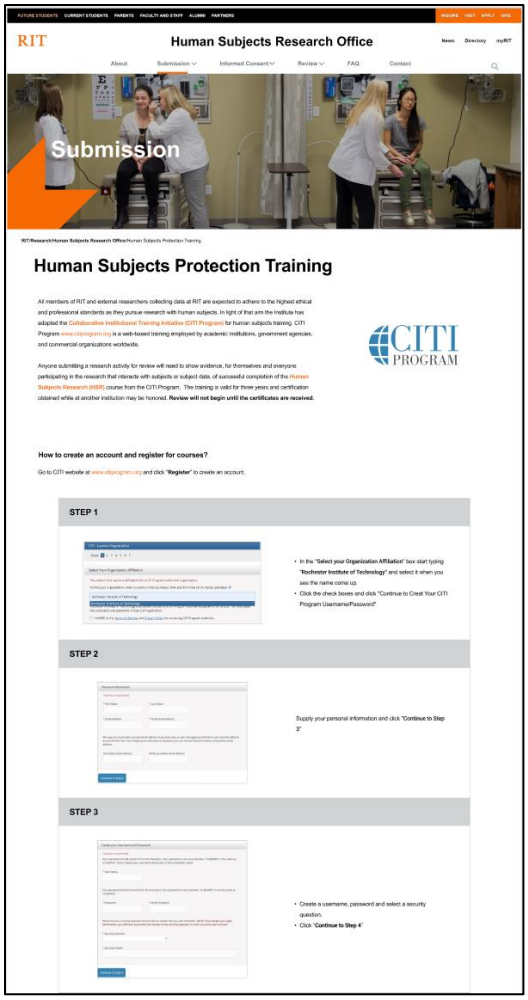




- The entire checklist and a downlink can be displayed on the website.



- Step by step guide.



Style Guide

The style of the HSRO website should follow the RIT theme to maintain a consistent RIT style so that users would not mistake it as other institution's website.

RIT website's style is listed in Brand Portal | RIT and the following paragraph is .

a. Typography

RIT's major typeface is Neue Haas Grotesk and Milo Serif. You can see it in the headlines, body copy, and captions with different weights. Sometimes Arial and Georgia are used to substitute Neue Haas Grotesk and Milo Serif when Neue Haas Grotesk and Milo Serif are not available.

For web use, RIT Brand Portal suggested "**font-family: "Helvetica Neue", "Helvetica", "Roboto", "Arial", sans-serif**"

b. Color

The new design will also follow RIT's color palette, and the colors on the current HSRO website that are not consistent with RIT's color palette will be replaced.

The website will primarily use the RIT orange and white as its background color.

The hyperlinks and email address in the body copy will also be orange.

RGB 247/105/2
HEX #F76902

RGB 255/255/255
HEX #FFFFFF

The primary text color will be black. Different hues can be used to create more effects.

RGB 00/00/00
HEX #000000

RGB 162/170/173
HEX #A2AAAD

RGB 208/211/212
HEX #D0D3D4

RGB 124/135/142
HEX #7C878E

If more colors are needed for this project, RIT also has an accents palette, but they should be used carefully.

Requirements

1. Essential Requirements
    a. Responsive web design
    b. Restructure the navigation system
    c. Bug fixes (Broken links, collapsible menu, duplicated menu items)
    d. Clear step by step instructions for application submission
2. Desirable Requirements
    a. A page for current researchers to look for participants
    b. Multimedia materials
    c. Internal site search
3. Global/Accessibility Considerations
    a. The current font size in the body copy is too small. It needs to be 16 px at least.
    b. When the RIT orange is used on a web font size smaller than 18, the color should change to #C75300.
    c. All videos and pictures should be captioned.

Conclusion

The HSRO website is the major source of information for people conducting human research at RIT. Even though the content is up-to-date, the style is not. The HSRO website was built when mobile devices were unpopular, so it is not responsive to different screen sizes. To accommodate users of various devices, responsive web design is a staple for modern websites. RIT's main website has made several style changes during the past ten years, so the style of the HSRO website is not consistent with the main website. The new design will consider the mobile version and use styles

similar to RIT's main website.