

Design Document Part 2

2.1 Requirements & Constraints

- **Functional requirements**

- a. Survey Participants should be able to see their result at the end of each survey, and view results from past surveys
- b. Participants, INSPIRE Admins, Program Coordinator, and Researchers should be able to login/signup on the website using SSO or through their email
- c. INSPIRE Admins should be able to create and edit surveys, invite or remove users, send out surveys, and monitor results.
- d. INSPIRE Admins should be able to grant specific permissions to Participants or Researchers.
- e. Researchers are able to view/download survey results, submit requests for new survey questions, request to edit current questions and assign students to surveys.
- f. Have INSPIRE staff be able to create/edit/delete surveys, store/view data results, share/download data, and methods to visualize the survey

- **Resource requirements**

Frontend: React.js, Next.js, Chakra UI, Formik

Backend: Node.js, Express Framework, Next Auth, MySQL, PGAdmin, Jest

Cloud: AWS ECS: AWS Secrets Manager, S3 buckets, Github Actions

- **UI requirements**

- a. Need a different dashboard for every user type
- b. Login page
- c. Register page
- d. Logo for the home page
- e. Color theme
- f. navbar with home, survey(which will have different options based on the user type) and about
- g. revamp the survey itself:
 - make buttons and text larger and easier to read
 - have a progress bar
 - "save" button so participants don't have to do the survey all at once
 - "Previous" button so participants can edit/view their answers from the previous page
 - break up the survey into "like" sections and give a description for each section
 - Use different input types for different questions. (i.e. number input for your age instead of text, a slider instead of a bunch of radio inputs, etc..)

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2.2 Engineering Standards

Q1) Briefly describe, in your own words, the importance of engineering standards.

IEEE standards play an important role in ensuring that modern technology and infrastructure operate efficiently and safely. These standards provide comprehensive guidelines across many sectors, establishing the foundation for quality and interoperability. In transportation, for instance, IEEE standards are integral to the development and safety of electric vehicles, guiding everything from battery performance to communication protocols for charging stations. In healthcare, they support the reliability of smartwatches, telehealth systems, and medical devices, which supports patient safety and care.

In software development specifically, IEEE standards establish best practices in coding, testing and cybersecurity. These standards ensure that the software products are reliable, robust and secure. By setting consistent standards across the various fields of Engineering, IEEE standards facilitate the advancement of technology and help create a more efficient and safe world.

Q2) Select at least 3 standards that appear, based on their descriptions, to have relevance to your project

IEEE 26515-2018 - Agile Development Cycle

This standard is about ensuring flexibility in the development process. It focuses on using Agile methods to allow teams to adapt quickly to changes in project requirements based on stakeholders providing feedback during the project. The main goal is to keep the development process responsive and collaborative, allowing for continuous improvement over time rather than waiting until the end to make changes. This is particularly useful when working on projects where user needs may evolve over time, ensuring that the final product meets expectations.

IEEE 829-1998 - Software Test Documentation

This standard is all about organizing and documenting the software testing process. Its purpose is to ensure that every part of the system is tested properly, and that the results are clearly tracked. By following this standard, teams can easily see what has been tested, what the expected outcomes are, and what still needs to be done. It helps ensure the system behaves as intended, making it easier to catch issues early and maintain high-quality standards throughout development.

IEEE 1448a-1996 - Standard for Information Technology: Software Life Cycle Processes

This standard provides a structured framework for managing software throughout its life cycle, from acquisition to maintenance, based on ISO/IEC 12207. It defines clear processes and terminology for developing, operating, and maintaining software products, including firmware. IEEE 1448a adds compliance methods and clarifications to make the life cycle processes more adaptable to business practices, offering guidance on things like development strategies and software reuse. Its goal is to ensure consistency, quality, and flexibility in software projects.

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Q3) After reviewing some of the technical details of the three published standards, do you believe it to have relevance to your project? Why or why not? Be specific.

Yes we saw a lot of relevance to our project, especially for the Agile Development Cycle Standards. Our project is heavily focused on user experience and we will have constant iterations of Agile Cycles to continuously improve on our original design. We plan on conducting numerous interviews with our clients to gain feedback on our design. This aligns with the Agile Standards of stakeholder feedback. Our design will be responsive and collaborative as well. IEEE 829-1998 - Software Test Documentation has a lot of relevance to our project as well. We have many modular parts of our software and each element needs to be tested individually as well as testing of the entire system as a whole. With so many different test cases documentation is vital to the organization and efficiency of our testing efforts. We want to follow all standards for testing documentation to ensure full testing coverage of our Web application.

Q4) Review with your team the standards that each of you have selected. What other standards did some of your team members choose that are different?

Another standard we chose was the IEEE 1621-2006 (IEEE Standard for User Interface Design and Management). We chose this standard because it provides guidelines for creating usable, accessible and consistent user interfaces. This is especially relevant to our project since a large portion of our work involves redesigning the UI of the currently existing web application in order to improve overall user experience.

Q5) What modifications do you intend to make to your project design to incorporate these standards?

To align with the IEEE 26516-2018 (Agile Development Cycle), our team will use Kanban boards to report their work and their previous work. This will allow us to ensure that our project can be adaptable and meet any user needs. Each week we will have a meeting to discuss what we did the previous week and what we will be doing the next week. This way our team can all be on the same page throughout the entire project. During these meetings we will also have time for feedback so that each member of the team can have the chance to give feedback to the other group members. This system also allows the advisors to be able to give us feedback on our work week by week.

For IEEE 829-1998 (Software Test Documentation), our team will implement a comprehensive testing framework. With this we will have detailed test documentation which will include, test plans, test cases, and test logs for each project component. Our team will also have automated testing tools during development to ensure consistency in its functionality. All of this will be documented and reviewed by our team members each week and will be discussed during our weekly meeting.

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To meet the requirements of IEEE 1488a-1996 (Software Life Cycle Processes), our team will be structuring our project into phases. These phases include, requirements, design, development, testing, deployment, and maintenance. By following this structure we can ensure that we can trace any issue through the project's cycle. We also have discussed a clear maintenance plan for each group in our team so that we can have someone look at any errors we face. This project's cycle will be documented by at least one team member from each group so that, if needed, we can refer back to what we did and when it happened. By having this plan we will meet the requirements of this IEEE standard.