Delphi Web Tool

Project Requirements and Specifications

Scalable Algorithms for Data Science Laboratory (SCADS)

Cyber 3

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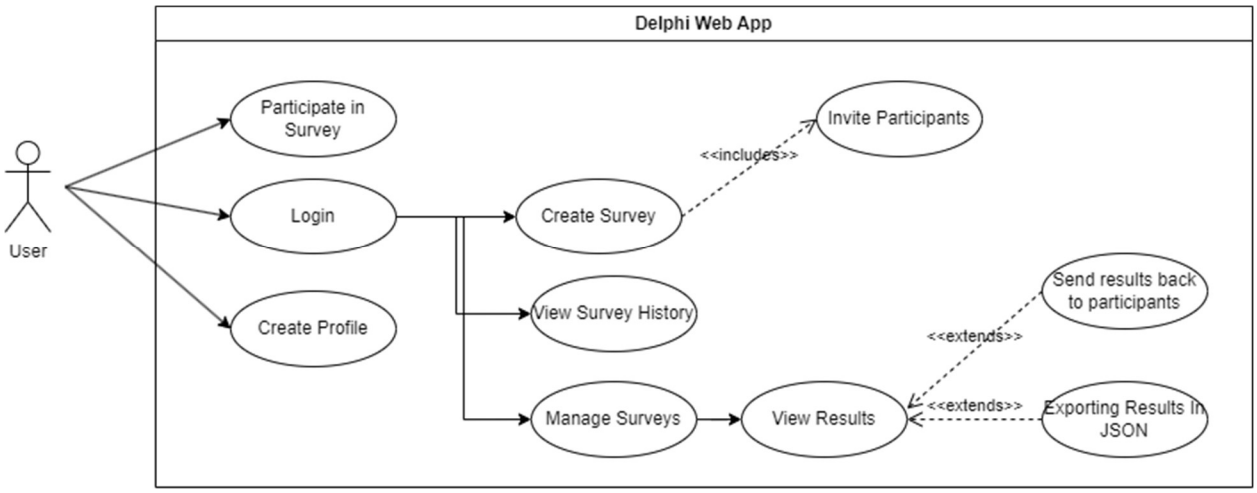
I. Introduction

Our team plans on developing a web application designed to support research using the Delphi method, a scientific process for achieving consensus among subject matter experts. This method incorporates participant anonymity amongst the panel to ensure the integrity of participant responses. Administrators refine and adjust surveys using the results of previous rounds in an iterative process until consensus is reached by the experts. Our platform aims to offer cybersecurity educators and researchers a tool with safeguards that follow the principles of cybersecurity along with a smooth, intuitive experience for both survey administrators and participants. Security and safety will be key features for the site.

II. System Requirements Specification

II.1. Use Cases



1. **User Login UC01**

Use Case: User Login

- **Actors**: User, System
- **Preconditions**: The user has an internet connection and access to the website.
- **Main Flow**:
    1. The user navigates to the login page.
    2. If the user is new, they choose to create an account by providing an email, password, and non-required personal details that may include name, institution, and position.
    3. The system verifies the required details and creates an account.
    4. If the user is returning, they enter their login credentials (email and password). The system authenticates the credentials and logs the user in.
- **Alternative Flow**: If the user enters invalid credentials, the system displays an error message and prompts the user to try again or reset the password.
- **Postconditions**: The user is logged in to their account.
- **Related Requirements**:
    1. User Log In

2. **Account Creation UC02**

Use Case: Create Profile

- **Actors**: User, System

- **Preconditions**: The user has an internet connection and access to the website.
- **Main Flow**:
    1. The user navigates to the registration page.
    2. The user provides an email and a password that meets specifications.
    3. The user may provide additional personal information (name, institution, position, etc.).
    4. The system authenticates the provided credentials and logs the user in.
    5. The user is redirected to the homepage.
- **Alternative Flow**: If the user inputs an invalid email or password, the system will display an error message that prompts them to fix the issue.
- **Postconditions**: The user has successfully created an account and is logged in to the website.
- **Related Requirements**:
    1. Profile Creation

3. **Create Survey UC02**

Use Case: Create Survey

- **Actors**: User, System
- **Preconditions**: The user is logged in to the website.
- **Main Flow**:
    1. The user navigates to the survey creation page.
    2. The user chooses to create a new survey.
    3. The user develops their desired survey.
    4. The user saves their survey at the end of their session.
- **Alternative Flow**: The user can choose to edit an existing survey to develop their new survey.
- **Postconditions**: The user has created a new survey which is saved to their account.
- **Related Requirements:**
    1. Create Survey

4. **Invite Participants UC04**

Use Case: Invite Participants

- **Actors**: User, System, Participants
- **Preconditions**: The user has logged in and has created a complete survey.
- **Main Flow**:
    1. From the home page the user clicks the “My Surveys” button which will take them to the page that lists all the surveys the user has created.
    2. The user can then click on one of the surveys which will take them to the page where they can manage the survey.
    3. From there the user can click on the “Invite Participants” button.
    4. In the pop-up modal the user can choose to enter an email address to send an invite link, or they can generate an invite link which the user can then use to send to participants.
- **Alternative Flow**:
    1. From the home page the user can click on the profile icon in the top right corner.
    2. Then they can click on the “My Surveys” button in the drop-down menu which will take them to the page that lists all the surveys the user has created. They can then continue from main flow number 2.
- **Postconditions**: The user has the ability to invite anyone to participate in the survey.
- **Related Requirements**:

1. Token Generation
2. Distribute Survey

5. **View Survey History UC05**
Use Case: View Survey History

- **Actors**: User, System
- **Preconditions**: User is logged in to the website and user is on the home page.
- **Main Flow**:
    1. The user clicks the user icon in top right corner.
    2. In the drop-down menu the user clicks the “Past Surveys”.
- **Alternative Flow**: From the main user profile page there will also be a “Past Surveys” button which will take them to the past surveys page.
- **Postconditions**: User can see the list of previous surveys if they exist.
- **Related Requirements**:
    1. Result Analysis
    2. User Log In

6. **Manage Surveys UC06**
Use Case: Manage Surveys

- **Actors**: User, System
- **Preconditions**: User is logged in and is on the home page
- **Main Flow**:
    1. From the home page the user clicks the “My Surveys” button which will take them to the page that lists all the surveys the user has created.
    2. The user can then click on one of the surveys which will take them to the page where they can manage the survey.
- **Alternative Flow**:
    1. From the home page the user can click on the profile icon in the top right corner.
    2. Then they can click on the “My Surveys” button in the drop-down menu which will take them to the page that lists all the surveys the user has created. They can then continue from main flow number 2.
- **Postconditions**: The user has found the page where they can manage the survey.
- **Related Requirements**:
    1. Distribute Survey

7. **Viewing Survey Results UC07**
Use Case: View Results

- **Actors**: User, System
- **Preconditions**: The user is logged in and has distributed a survey to participants.
- **Main Flow**:
    1. The user navigates to the Surveys page.
    2. The user selects the survey results they wish to view.
    3. The user is redirected to the survey results page for the chosen survey.
    4. The real-time results of the survey are published for the user to view.
- **Alternative Flow**:
    1. The user can click the profile icon in the top right corner.
    2. The user can select the “My Surveys” button.
    3. The user will be taken to the page that lists their surveys and they can continue from number 4 in main flow.

- **Postconditions**: The user has successfully viewed the real-time results of participants' responses.
- **Related Requirements**:
    1. Result AnalysisUser Log In
    2. Result Analysis
    3.
    4.

8. **Send Results Back to Participants UC08**

Use Case: Send Results Back to Participants

- **Actors**: User, System, Participants
- **Preconditions**: User has logged into the web application, has completed a survey, and is on the home page.
- **Main Flow**:
    1. From the home page the user clicks the "My Surveys" button which will take them to the page that lists all the surveys the user has created
    2. The user can then click on one of the surveys which will take them to the page where they can manage the survey.
    3. On that page the user can select the button "share results"
    4. On the pop up modal, the user can enter an email address of who they want to send the results to or there will be a button that says "Share with all participants"
- **Alternative Flow**:
    1. From the home page the user can click on the profile icon in the top right corner.
    2. Then they can click on the "My Surveys" button in the drop-down menu which will take them to the page that lists all the surveys the user has created. They can then continue from main flow number 2.
- **Postconditions**: The user has the ability to share the results via email with anyone.
- **Related Requirements**:
    1. Result Analysis

9. **Export Results UC09**

Use Case: Exporting Results in JSON

- **Actors**: User, System
- **Preconditions**: User has an internet connection, is logged in, and has results from a completed survey.
- **Main Flow**:
    1. The user navigates to the Surveys page.
    2. The user selects the survey that they wish to export.
    3. The user is brought to the survey results page for the selected survey.
    4. The user clicks the 'Export Results' button.
    5. The results are exported in JSON format for download.
- **Alternative Flow**:
    1. The user can click the profile icon in the top right corner.
    2. The user can select the "My Surveys" button.
    3. The user will be taken to the page that lists their surveys and they can continue from number 4 in main flow.
- **Postconditions**: The selected survey results are exported in JSON format for the user.
- **Related Requirements**:
    1. Result Analysis

10. **Participate in Survey UC10**

Use Case: Participate in Survey

- **Actors**: User, System
- **Preconditions**: The user has an internet connection and is logged in to the website.
- **Main Flow**:
    1. The user navigates to the survey creation page.
    2. The user chooses to create a new survey.
    3. The user develops their desired survey.
    4. The user saves their survey at the end of their session.
- **Alternative Flow**: The user can choose to edit an existing survey to develop their new survey.
- **Postconditions**: The user has created a new survey which is saved to their account.
- **Related Requirements:**
    1. Participate in Survey
    2. Participate In Survey

II.2. Functional Requirements

II.2.1. User Authentication

Profile Creation:

Description	The users should be able to create profiles within the web application. With a profile the user should be able to create surveys, see survey history, and see surveys which they are invited to participate in. The user is required to make a profile to create surveys.
Source	Team-based requirements gathering process identified from client needs.
Priority	Priority Level 0: Essential, required functionality

User Log In:

Description	Given that the user has already created/registered a profile, the user will be able to log on to their profile using the correct credentials.
Source	Team-based requirements gathering process identified from client needs.
Priority	Priority Level 0: Essential, required functionality

II.2.2. Survey Management

Create Survey:

Description	The main functionality of the web application will be to create surveys. The user must be able to customize the content of the survey along with being able to define the Delphi process.
Source	Team-based requirements gathering process identified from client needs.
Priority	Priority Level 0: Essential, required functionality

Distribute Survey:

Description	The creator of a survey must be able to distribute the survey to participants. They should also be able to define how the results are distributed to the participants in between the Delphi rounds.
Source	Team-based requirements gathering process identified from client needs.
Priority	Priority Level 0: Essential, required functionality

II.2.3. Survey Response

Token Generation:

Description	To verify that survey participants are authorized to participate, tokens will be generated and given to the participant. When the participant tries to access the survey, the web application will check the token to make sure it matches the token generated.
Source	Team-based requirements gathering process identified from client needs.
Priority	Priority Level 0: Essential, required functionality

Participate in Survey:

Description	Participants who are invited by the survey administrator should be able to receive the invitation and participate in the survey. The results should be stored for the administrators' use. Users should be able to participate in the survey without creating a profile in the web application.
Source	Team-based requirements gathering process identified from client needs.
Priority	Priority Level 0: Essential, required functionality

Result Analysis:

Description	The results of the survey, both at the end and in between the Delphi rounds, should be processed and displayed in an easily ingestible manner for the administrator of the survey. The administrator should also be able to share the result analysis with the participants if the administrator desires.
Source	Team-based requirements gathering, identified from client needs.
Priority	Priority Level 2: Stretch goal or extra feature

II.3. Non-Functional Requirements

Web Accessibility:

Description: The web application shall be contained within the browser environment. It should be accessible to internet capable devices, with responsive web design for users on mobile or desktop devices.

Ease of Use:

Description: In all aspects of the web application the web application should be easy to navigate and use. Creating and administering surveys should feel intuitive for the user so that there is little confusion about how to prompt the user about the correct information. Survey participants should feel like it is easy to fill out the survey and respond correctly to the prompts.

Good Looking:

Description: The web application should be considered good looking by our users. When it comes to web applications, looks can be a huge factor when users decide whether to trust and use the application.

Privacy:

Description: Keeping user data safe and anonymous is a major goal when designing this web application. The users, which include survey administrators and survey participants, should not have to worry about their personal information being stolen or leaked. Survey participants' data and responses should also be kept anonymous from the other survey participants.

Portability:

Description: The web application should be able to perform across different browser types and on desktop and mobile devices. This is ideal for survey participants since they need to be able to participate from any device and browser.

Capacity:

Description: The web application should have the storage in place to store hundreds or thousands of different surveys, user profiles, and survey responses.

III. System Evolution

We will rely on feedback from internal testing and our clients to refine our project. While our use cases and design decisions are well-defined at this stage, we recognize that the project foundation may evolve as development progresses. One key area likely to change is the user interface (UI) and user experience (UX). Based on feedback from clients, users, and testers, we will iteratively refine the UI/UX to create a smooth, intuitive user experience that maximizes engagement and accessibility.

As the application is browser-based, we do not anticipate hardware limitations. However, potential issues with browser compatibility and mobile interaction may arise. Although compatibility is not the project's primary focus, ensuring accessibility for all users is essential to maximize participation for the best results for our clients.

Given our emphasis on security, we must ensure that all packages, libraries, and tools utilized in our application are secure and as free from vulnerabilities as possible. We will regularly update these tools and adjust our workspaces as necessary to maintain the security and integrity of the platform. We recognize that the use of open-source tools can carry a degree of risk and will maintain communication with our client to ensure that needs and responsibilities are met in this regard.

IV. Glossary

JSON (JavaScript Object Notation): A text-based, human-readable format used for structuring data, that represents data as attribute-value pairs.

UML (Unified Modeling Language): A visual modeling language used by software developers to illustrate software designs [2].

V. References

[1] GeeksforGeeks. “Use Case Diagrams: Unified Modeling Language (UML).” GeeksforGeeks, July 15, 2024. https://www.geeksforgeeks.org/use-case-diagram/.

[2] “What Is UML? Everything You Need to Know about Unified Modeling Language.” Gliffy by Perforce. Accessed September 30, 2024. https://www.gliffy.com/blog/what-is-uml-everything-you-need-to-know-about-unified-modeling-language.