THOMPSON RIVERS UNIVERSITY

SENG 3210 - Applied Software Engineering

VoxChoice - Empowering Voices, Shaping Choices

Landon McKay (T00576244)

Junpeng Jiang (T00657653)

Marcus Hoang (T00646542)

March 4, 2024

Table of Contents

List of Figures

List of Tables

1 Introduction

The VoxChoice application is to address the challenge of reaching a consensus among diverse student groups in planning a Summer study tour outside of Canada. With varying opinions and preferences among students, it becomes essential to provide a platform that empowers users to express students' opinions remotely on specific topics. Furthermore, the application aims to facilitate administrative tasks for instructors, allowing them to create new topics for discussion and monitor real-time statistics on voted topics.

As a member of the SENG 3210 class, our team produced the design, implementation, and testing of the VoxChoice application. This report outlines the key features, non-functional requirements, and design considerations that guided the development process. Additionally, we provide insights into the design decision matrix and different solutions during the project's design.

The VoxChoice application aims to empower voices of different choices, enabling users to participate actively in decision-making processes regardless of users' physical location. Through a user-friendly interface and transparency in decision-making within academic settings and beyond.

2 Design Problem

2.1 Problem Definition

Given a Summer study tour and proposing different locations as potential venues. When having a diverse student group, the abundance of perspectives and opinions proves highly advantageous for addressing various topics. However, this diversity also introduces a challenge when attempting to reach a consensus. With VoxChoice its primary objective is to conduct a poll to determine the most favored decision within a discussion. VoxChoice will accomplish this by facilitating an online voting process, that empowers students to express their opinions remotely on specific topics, which will usually start with the selection of the study tour destination. Additionally, the system should provide instructors with administrative powers such as the ability to create new topics or polls for voting on various matters.

The group has designated the responsibility for developing an application named VoxChoice, aimed at empowering voices for shaping choices.

2.2 Design Requirements

2.2.1 Functions

1. **The system should allow users to access the platform remotely.**
    a. Students and Instructors should be able to access the application remotely from various areas without the need for the Internet.

2. **The system should allow instructors to manage discussion topics.**
    a. Instructors should be given administrative powers to create and manage polls or discussion topics.

3. **The system should provide instructors with a real-time dashboard.**
    a. The system should offer a comprehensive summary of the current statistics for voted topics or polls.

2.2.2 Objectives

1. **The system should be secure:** VoxChoice should be able to handle the sensitive personal information of users and must be secure to prevent the disclosing of information and safeguard data against unauthorized actions..
2. **The system should be customizable:** VoxChoice should be able to contain multiple polls on various topics at once for each planned trip with different characteristics.
3. **The system should be user-friendly and accessible:** VoxChoice will have users of this software from diverse groups. The application will have an intuitive user interface.
4. **The system should be fast:** VoxChoice is not a strict real-time system and is on various devices. The system should be able to update the polls relatively quickly.
5. **The system should be reliable:** VoxChoice should be available throughout the trip and avoid any downtime or issues.

2.2.3 Non-functional requirements and constraints

1. **Technology Constraint:**
    a. The VoxChoice application must be developed using Android Studio, the official IDE for Android app development.
    b. Compatibility with mobile devices running Android API level 19 (KitKat) or higher is a requirement.
2. **Performance:**
    a. The VoxChoice application must adhere to the performance standards expected of mobile applications.
3. **Security and Integrity:**
    a. Implement functionalities to safeguard data against unauthorized modification or misuse, incorporating robust user authentication and privacy mechanisms.
4. **Modifiability:**
    a. VoxChoice should facilitate the addition of new UI components with minimal development effort.

3 Solution

This section will provide an account of some solutions your team brainstormed to implement the project. Some solutions might not have all the desired features, and some might not satisfy the constraints or both. These solutions come up in your mind while you brainstorm ways of implementing all the features while meeting the constraints. Toward the end, select a solution that you think has all the features and satisfies all the constraints. Remember that an engineering design is iterative in nature!

3.1 Solution 1

Write a brief description of your first solution and provide the reasons for not selecting this one.

3.2 Solution 2

This is an improved solution but might not be your final solution. Give a brief description of this solution here.

3.3 Final Solution

This solution is the final solution. Explain why it is better than other solutions. You may use a table for comparison purposes. After providing the reason for selecting this solution, detail it below.

Table I Decision matrix chart for the considered alternatives

		Solutions					
		Solution 1		Solution 2		Final Solution	
Criteria	Weight	Score	Partial Score	Score	Partial Score	Score	Partial Score
Criterion 1	0.40	6/10	0.240	6/10	0.240	7/10	0.280
Criterion 2	0.25	3/5	0.150	4/5	0.200	5/5	0.250
Criterion 3	0.20	9/15	0.120	12/15	0.160	9/15	0.120
Criterion 4	0.15	9/10	0.135	6/10	0.090	8/10	0.120
Sum	1.00		0.645		0.690		0.77

3.3.1 Features and the software architecture

Discuss all the features of your final solution. Describe the functionalities of the top-level components and how they will be used for enabling those features. The product features may be tabulated (with a title) for improved comprehension. Use component diagrams to model the internal structures (i.e., sub-components or second-level components) of two major components. Describe the functionalities of the sub-components and the interactions (e.g., the interfaces) between the sub-components. Explain the interfaces between the top-level architecture and the internal structures (i.e., explaining how the internal structures interact with other top-level components).

3.3.2 The system interfaces

Describe the temporal events (i.e., the time-triggered events) and the signal events (i.e., events received from external components) for the intended application. Describe the expected response of the system to each event.

3.3.3 The user interface design

Design the user interface components. Describe the user interface components, the possible business events, and the responses to the triggered events.

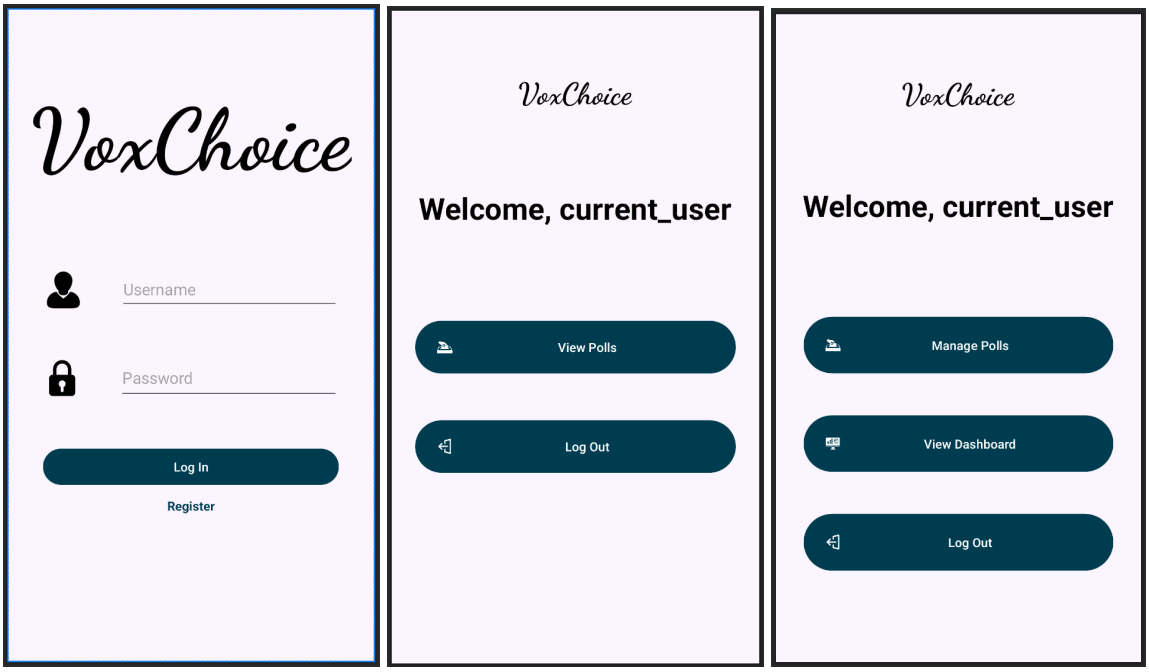

Figure 1. VoxChoice UI Initial Design

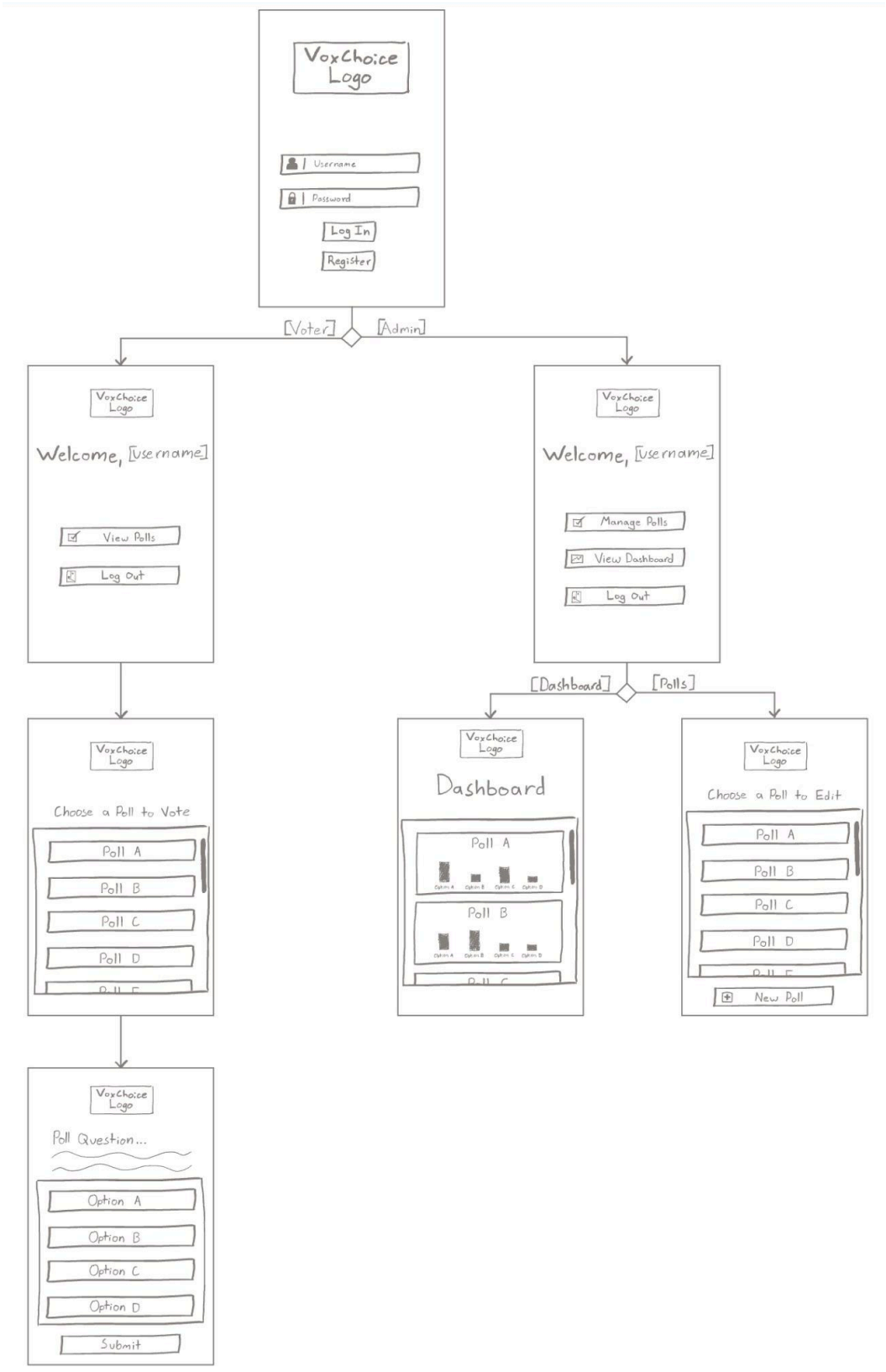

Figure 2. VoxChoice UI Design Mockup

3.3.4 The requirements traceability matrix

List the system's requirements and map the requirements to the corresponding design component, code component (e.g., java class file or XML configuration file), and the required testing scenario.

3.3.5 Environmental, Societal, Safety, and Economic Considerations

Explain how your design project considered environmental, societal, and economic considerations. It may include how your implementation has positive contributions to the environment and society. What type of financial decisions did you make? How did you make sure that the implementation is safe to use?

1 Environmental considerations

Explain how your design project considered environmental considerations.

2 Societal considerations

Explain how your design project considered societal considerations.

3 Safety considerations

Explain how your design project considered safety considerations.

4 Economic considerations

Explain how your design project considered economic considerations.

3.3.6 Limitations

Every product has some limitations, and so is the case with your design product. Highlight some of the limitations of your prototype here.

4 Team Work

4.1 Meeting 1

Time: February 15, 2024

Agenda: Brainstorming, Distribution of First Tasks

Team Member	Previous Task	Completion State	Next Task
Landon McKay	N/A	100%	Problem definition and objectives
Marcus Hoang	N/A	100%	Introduction and non-functional requirements
Junpeng Jiang	N/A	100%	Functions and constraints

4.2 Meeting 2

Time: February 17, 2024

Agenda: Initial Design Development

Team Member	Previous Task	Completion State	Next Task
Landon McKay	Problem definition and objectives	100%	Initial Design of the UI
Marcus Hoang	Introduction and non-functional requirements	100%	Initial Design of the UI
Junpeng Jiang	Functions and constraints	100%	Initial Design of the UI

4.3 Meeting 3

Time: March 3, 2024

Agenda: Initial Design Development

Team Member	Previous Task	Completion State	Next Task
Landon McKay	Initial Design of the UI	100%	Implementation of the UI

Marcus Hoang	Initial Design of the UI	100%	Implementation of the UI
Junpeng Jiang	Initial Design of the UI	100%	Implementation of the UI

4.4 Meeting 4

Provide a similar description here.

5 Conclusion and Future Work

- Summarize the experience gained in the project. Mention all the design functions and objectives that you achieved while satisfying the constraints.
- While keeping the limitations of your prototype, provide recommendations for future design improvements. Indicate how your program can be extended and improved if more time is allowed.

6 References

- Use the IEEE reference style.
- Do not put any reference if it is not cited in the text.

7 Appendix

Include the screenshots of the results of executing your program captured from the screen, and the program code screenshots. If you want to provide additional information, use this appendix.