Project Deliverable 1: Develop Software Specifications

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***Abstract*—The First Deliverable of COEN 6311 Summer 2024 Project which aims to develop Software Specification for a Software System called 'Department Direct' which is a Question and Answer for Orientation for future prospective students**

Keywords— Department Direct (DD), Software Engineering, SCRUM, Agile Modeling.

I. Introduction

An essential opportunity for prospective students and their families to become familiar with Concordia University is open house day. Future applicants, along with their family and friends, interact with faculty members at several department booths across campus during these events to get their questions answered. Although professors give thorough answers, the absence of a digital system to record and archive these exchanges means that important information is not examined in order to improve open house planning for the future, improve response guidelines, pinpoint the requirements of potential students, or come up with strategies for improving departmental applications.

The Department Direct system is being developed as part of this project to try and address these issues. Future applicants' queries will be easier to collect because to this approach, which also enables departments to post updated online responses. In addition, it will examine these exchanges in order to enhance the standard of answers and pinpoint critical needs.

Future candidates will have access to news updates, event notifications, and the opportunity to ask questions and get timely responses through Department Direct. The questions can cover a wide range of topics, including as using online resources, understanding course prerequisites and sequences, and using resources for career advancement.

Using DepartmentDirect, each department will be enabled to customize a version that is specific to their degree program, such as DepartmentDirect - CSE or DepartmentDirect - ECE. DepartmentDirect will allow directors of degree programs, administrative officers, and support personnel to post events and update content. Users will have flexible access to the system as it may be implemented as a chatbot, desktop software, online app, or mobile app.

This project intends to enhance the open house experience at Concordia University by leveraging digital tools to capture, store, and analyze interactions, thereby continuously improving the quality of information and services provided to prospective students and their families.

II. Core features/scenarios

A. Scenario 1 (S1)

Scenario 1 deals with future applicants of Concordia University who would register, manage their accounts, and customize their experience on the Department Direct platform.

B. Scenario 2 (S2)

Scenario 2 would allow for the implementation of a system which would enable users to ask questions and receive answers from department faculties and staff, with the ability to categorize and prioritize questions.

C. Scenario 3 (S3)

Scenario 3 would allow departments to manage and update content, including event notifications, news updates, and resource information.

D. Scenario 4 (S4)

Scenario 4 would implement data analytics, providing tools for analyzing user interactions, questions, and feedback to improve the quality of answers and identify high-priority needs.

III. Epics and User Stories

A. Epic 1: User Registration and Account Management

1. **User Story 1.1:** Registration
   Priority: 5
   Difficulty: 3
   Story: As a future applicant, I want to create an account so that I can ask questions and receive updates.

2. **User-Story1.2: Updating**
   Priority:4
   Difficulty:3
   Story: As a future applicant, I want to manage my profile information so that my data is accurate and up to date.

3. **User Story 1.3:** Resetting
   Priority:4
   Difficulty:4
   Story: As a future applicant, I want to reset my password if I forget it so that I can regain access to my account.

4. **User Story 1.4:** Administering
   Priority:4
   Difficulty:3
   Story: As an admin officer, I want to manage user accounts so that I can ensure the integrity of the system.

5. **User Story 1.5:** Subscribing
   Priority: 4
   Difficulty: 5
   Story: As a future applicant, I want to subscribe to notifications and event updates so that I stay informed about important events.

6. **User Story 1.6:** Deleting
   Priority: 4
   Difficulty: 3
   Story: As a future applicant, I want to delete my account if I no longer wish to use the service so that my data is removed.

B. Epic 2: Question and Answer System

1. **User Story 2.1:** Categorization
   Priority: 5
   Difficulty: 3
   Story: As a future applicant, I want to ask questions in different categories so that I can get specific information.

2. **User Story 2.2:** Responding
   Priority: 4
   Difficulty: 4
   Story: As a department staff member, I want to provide detailed answers to questions so that future applicants have the information they need.

3. **User Story 2.3:** Searching
   Priority: 4
   Difficulty: 4
   Story: As a future applicant, I want to search for previously answered questions so that I can find information quickly.

4. **User Story 2.4:** Organizing
   Priority: 4
   Difficulty: 3
   Story: As an admin officer, I want to categorize questions and answers so that they are easier to manage and access.

5. **User Story 2.5:** Notification
   Priority: 4
   Difficulty: 5
   Story: As a future applicant, I want to receive notifications when my question has been answered so that I can stay informed.

6. **User Story 2.6:** Updating
   Priority: 3
   Difficulty: 4
   Story: As a department staff member, I want to edit or update answers so that the information remains current and accurate.

C. Epic 3: Content Management

1. **User Story 3.1:** Notifications
   Priority:3
   Difficulty:5
   Story: As a department staff member, I want to post event notifications so that future applicants are aware of upcoming events.

2. **User Story 3.2:** Announcements
   Priority:3
   Difficulty:3
   Story: As a department staff member, I want to update news and announcements so that future applicants stay informed about relevant information.

3. **User Story 3.3:** Resource Management
   Priority:4
   Difficulty:4
   Story: As a department staff member, I want to manage resource information, such as course sequences and prerequisites, so that future applicants have accurate information.

4. **User Story 3.4:** Content Approval
   Priority:4
   Difficulty:3
   Story: As an admin officer, I want to approve or reject content updates so that only verified information is published.

5. **User Story 3.5:** Content Browsing
   Priority:4
   Difficulty:4
   Story: As a future applicant, I want to browse and access the latest content updates so that I have the most current information available.

6. **User Story 3.6:** Scheduling
   Priority:4
   Difficulty:4
   Story: As a department staff member, I want to schedule content postings so that information is released at appropriate times.

D. Epic 4: Data Analysis and Reporting

1. **User Story 4.1:** Analysis
   Priority:3
   Difficulty:5
   Story: As an admin officer, I want to analyze the questions and answers data so that I can improve future open house preparations.

2. **User Story 4.2:** Reporting
   Priority:3
   Difficulty:4
   Story: As a department head, I want to generate reports on user interactions so that I can identify trends and areas for improvement.

3. **User Story 4.3:** Feedback
   Priority:4
   Difficulty:4
   Story: As a future applicant, I want to provide feedback on the answers received so that the system can be improved.

4. **User Story 4.4:** Analytics
   Priority:4
   Difficulty:4
   Story: As a data analyst, I want to access detailed reports and analytics so that I can make data-driven decisions.

5. **User Story 4.5:** FAQ Identification
   Priority:4
   Difficulty:4
   Story: As an admin officer, I want to identify the most frequently asked questions so that I can create guidelines for standard answers.

6. **User Story 4.6:** Engagement Monitoring
   Priority:4
   Difficulty:4
   Story: As a department head, I want to monitor user engagement metrics so that I can measure the effectiveness of our content.

IV. SOFTWARE

A. GITHUB

Definition: GitHub is a web-based platform that provides hosting for software development and version control using Git. [1]

1. **Version Control:** Tracks changes in source code during software development, allowing multiple developers to collaborate on projects.
2. **Collaboration:** Provides tools for code review, pull requests, and issue tracking, facilitating collaborative development [2].
3. **Hosting:** Offers repositories for storing project code, documentation, and other files, with both public and private options.
4. **Continuous Integration:** Integrates with various CI/CD tools to automate testing and deployment.
5. **Project Management:** Includes features like project boards and wikis to manage development workflows and documentation [1] [2].

B. JIRA

Definition: JIRA is a proprietary issue tracking product developed by Atlassian that allows bug tracking and agile project management [3].

1. **Issue Tracking:** Manages and tracks issues, bugs, and tasks across development projects.
2. **Agile Project Management:** Supports agile methodologies with features like Scrum and Kanban boards, sprints, and backlog management.
3. **Workflow Customization:** Allows customization of workflows to fit specific project needs and processes.
4. **Reporting:** Provides detailed reports and dashboards to monitor progress, performance, and productivity.
5. **Integration:** Integrates with various development tools, including Bitbucket, GitHub, and Confluence, to streamline workflows [4].

C. PyCharm

Definition: PyCharm is an integrated development environment (IDE) developed by JetBrains specifically for Python programming [5].

1. **Code Editing:** Offers advanced code editing features like syntax highlighting, code completion, and refactoring.
2. **Debugging:** Provides a powerful debugger with features like breakpoints, watches, and variable inspection.
3. **Testing:** Supports various testing frameworks and offers tools for running and debugging tests.
4. **Project Management:** Manages project files and dependencies, including support for virtual environments and package management.
5. **Integration:** Integrates with version control systems like Git and various databases for seamless development workflows.

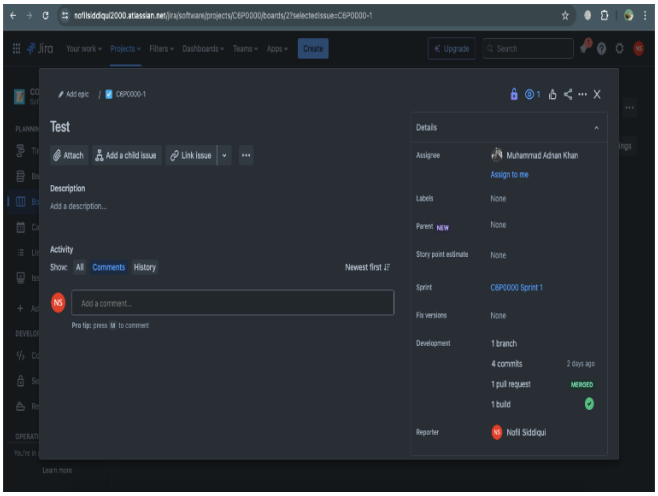
D. VSCode

Definition: Visual Studio Code (VSCode) is a free, open-source code editor developed by Microsoft. [6]

1. **Code Editing:** Offers robust code editing features including syntax highlighting, intelligent code completion, and code snippets.
2. **Extensions:** Supports a wide range of extensions to enhance functionality, including language support, debuggers, and tools for various frameworks and technologies.

3. **Debugging:** Provides an integrated debugger for multiple languages, allowing for breakpoints, step-through debugging, and variable inspection.
4. **Version Control:** Integrates with Git and other version control systems for seamless source code management.
5. **Customization:** Allows users to customize the editor through themes, keybindings, and workspace settings to suit their development preferences.

The project management tool utilized for this project was JIRA, which was seamlessly integrated with GitHub repositories. As shown in below figure



V. DIAGRAMS

A. *Hierarchy Diagram*

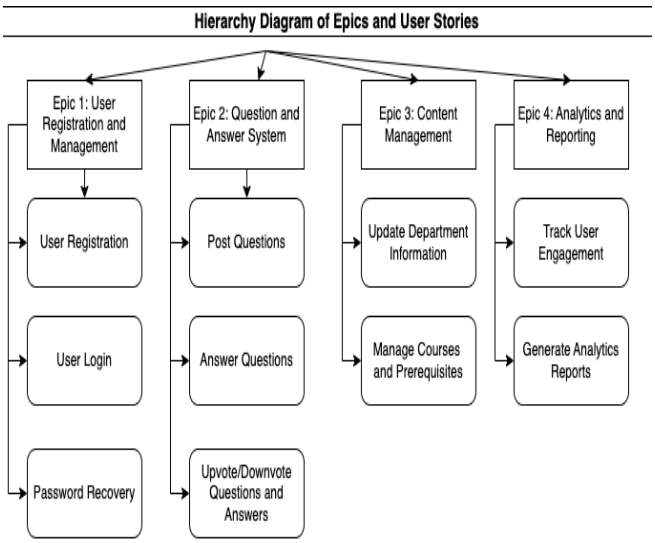


Figure 1: Hierarchy Diagram

The Hierarchy Diagram breaks down the Software System to its lowest level with the rectangles labeling the specific components or parts of a system and lines showing how they are linked to each other.

B. *System Context Diagram*

1) *System Contex of DepartmentDirect*

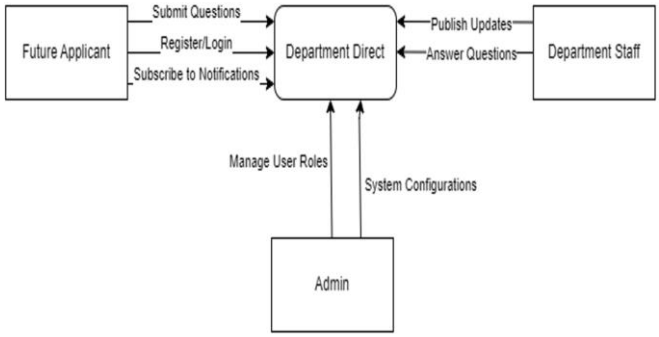


Figure 2: System Context of DepartmentDirect

The System Context diagram shows the system's environment and interactions with external entities. A System Context diagram provides a starting point, showing how the software system in scope fits into the world around it.

2) *System Context of Scenario 2 (S2)*

Figure 3: System Context of S2

3) *System Context of Scenario 4 (S4)*

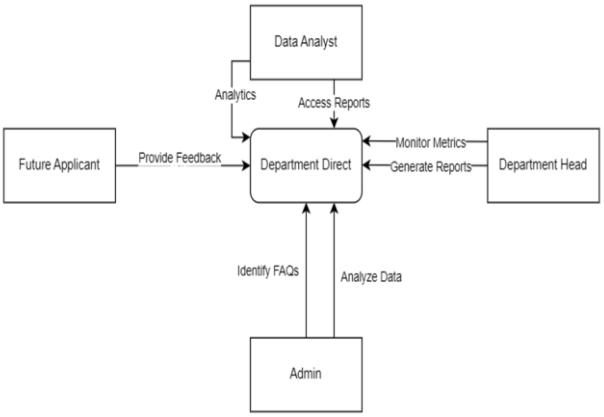


Figure 4: System Context of S4

C. Container Diagram

1) Container Diagram of DepartmentDirect

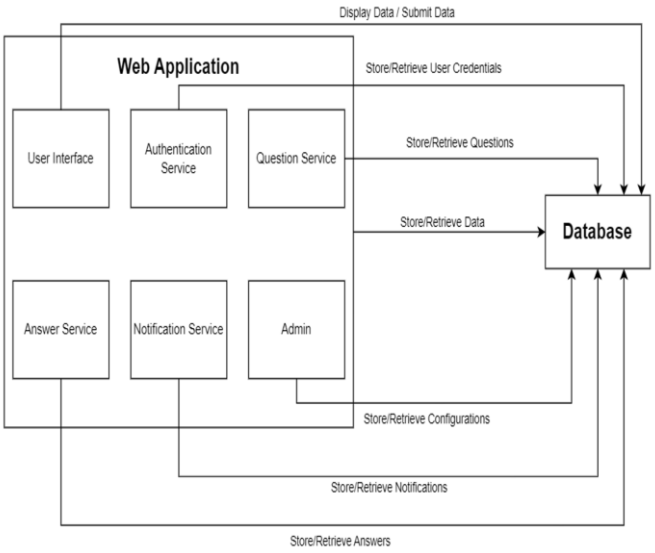


Figure 5: Container Diagram of DD

In the C4 model, a container represents an application or a data store. A container is something that needs to be running in order for the overall software system to work. A Container diagram zooms into the software system in scope, showing the high-level technical building blocks.

2) Container Diagram of Scenario 2 (S2)

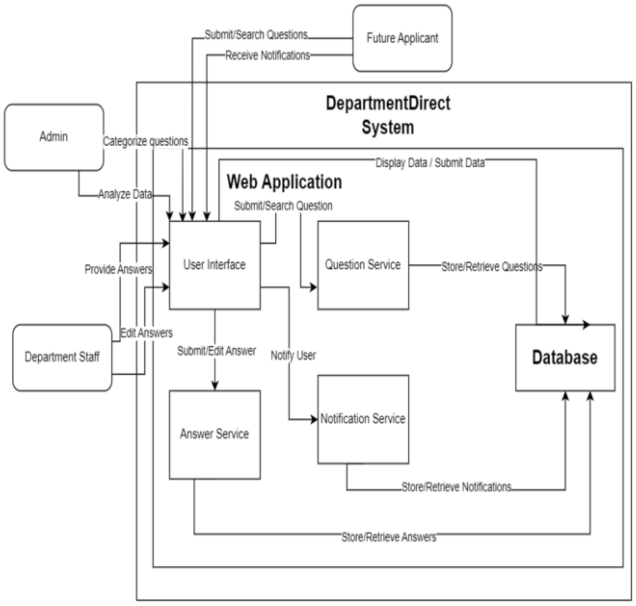


Figure 6: Container Diagram of S2

3) Container Diagram of Scenario 4 S4

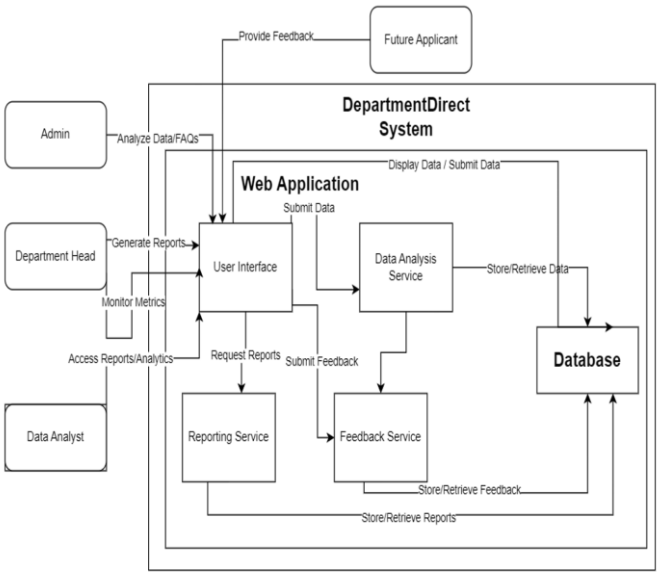


Figure 7: Container Diagram for S4

D. Component Diagram

1) Component Diagram of DepartmentDirect

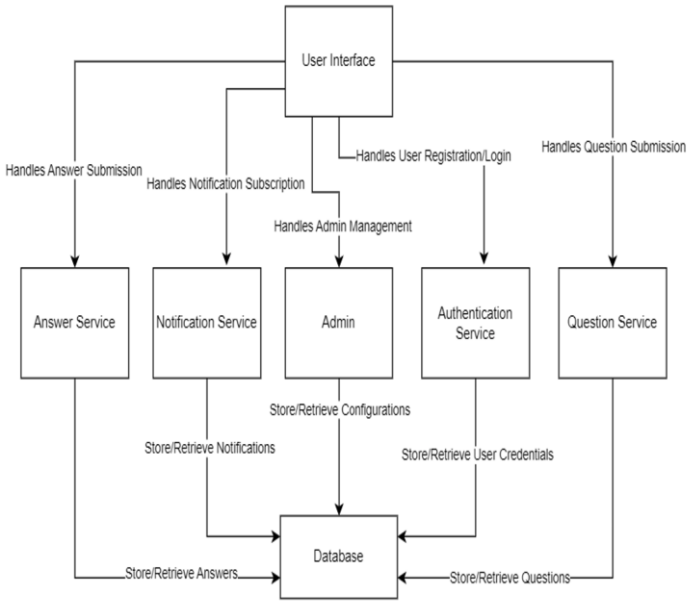


Figure 8: Component Diagram of DD

A Component diagram zooms into an individual container, showing the components inside it. The Component diagram shows how a container is made up of a number of "components", what each of those components are, their responsibilities and the technology/implementation details.

2) Component Diagram for Scenario 2 (S2)

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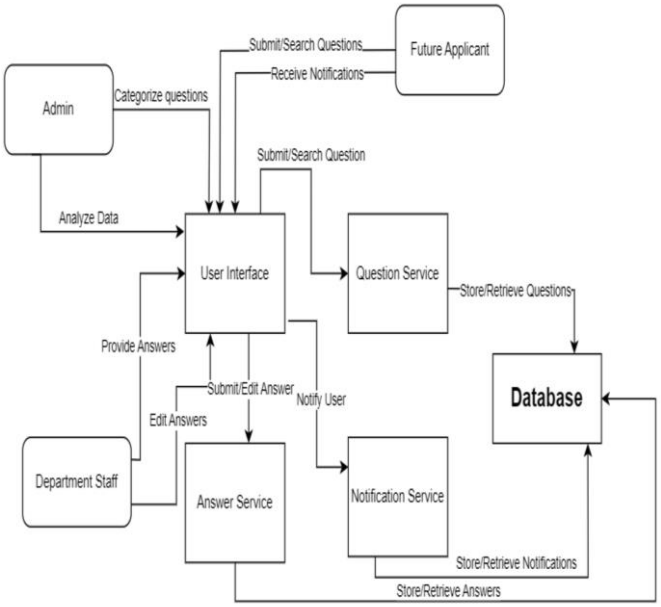

Figure 9: Component Diagram of S2

3) Component Diagram of Scenario 4 (S4)

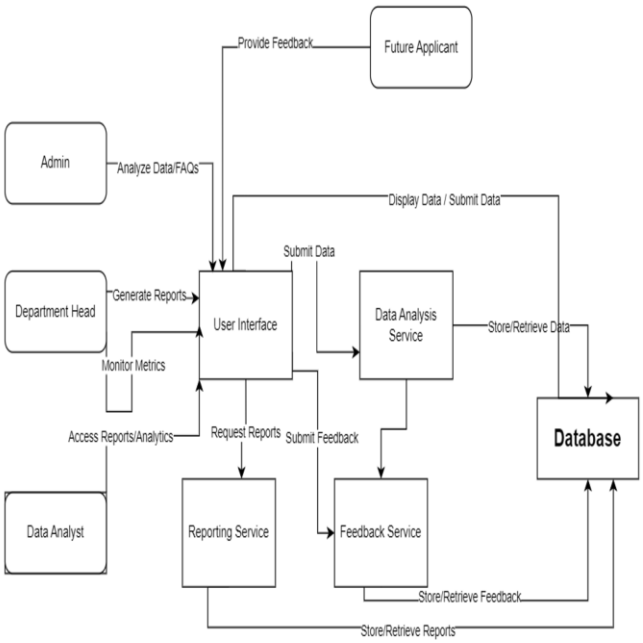

Figure 10: Component Diagram of S4

VI. Conclusion

In conclusion, the Department Direct project aims to revolutionize the interaction between prospective students and Concordia University departments by providing a comprehensive digital platform for question answering and information dissemination. By leveraging agile methodologies like SCRUM and tools such as JIRA and GitHub, the project ensures efficient development and continuous improvement. The system not only facilitates seamless communication between future applicants and department staff but also enables data-driven decision-making through robust analytics and reporting functionalities. With its scalable architecture and customizable features, Department Direct sets a new standard in enhancing open house experiences and promoting engagement within the Concordia community.

Acknowledgment

The group would like to acknowledge Dr. Yan Liu for her invaluable guidance on this project.

VII. References

[1] [Online]. Available: https://github.com/.

[2] [Online]. Available: https://en.wikipedia.org/wiki/GitHub.

[3] [Online]. Available: https://www.atlassian.com/software/jira.

[4] [Online]. Available: https://en.wikipedia.org/wiki/Jira_(software).

[5] [Online]. Available: https://www.jetbrains.com/pycharm/.

[6] [Online]. Available: https://code.visualstudio.com/.

[7] [Online]. Available: https://draw.io/.

Project Link

Jira
https://nofilsiddiqui2000.atlassian.net/jira/software/projects/C6P0000/boards/2/timeline?selectedIssue=C6P0000-6

Github
https://github.com/nofilsiddiqui-2000/coen-6311SoftwareEngineering/tree/main/Project%20Diagrams