



UGANDA TECHNOLOGY AND MANAGEMENT UNIVERSITY
UTAMU

CSE 3101 – REQUIREMENTS ENGINEERING

GROUP COURSEWORK.

SOFTWARE REQUIREMENTS SPECIFICATION (SRS) FOR ALUMNI CONNECT

VERSION: 1.0

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1. INTRODUCTION

1.1. Purpose.

The purpose of this Software Requirements Specification (SRS) document is to define the requirements for the **Alumni Connect** application, a web-based platform designed to connect UTAMU (Uganda Technology and Management University) alumni for networking, collaboration, and community engagement. This document outlines the functional and non-functional requirements, system features, and constraints to guide the development of a Minimum Viable Product (MVP) as part of the CSE 3101 Requirements Engineering class project.

1.2. Scope.

The Alumni Connect application aims to address the problem of limited interaction and collaboration among UTAMU alumni by providing a platform where they can;

- Register and log in to access the system.
- View and interact with news, activities, and member profiles.
- Foster lifelong connections through networking, mentorship, and shared experiences.

The MVP will include;

- A homepage for unauthenticated users with login and register options.
- Login and registration pages for user authentication.
- Pages for authenticated users to view news, activities, and member profiles.
- A responsive design for both desktop and mobile devices.

Future iterations will include features like messaging but this is out of scope for the MVP.

1.3. Definitions, Acronyms, and Abbreviations.

- UTAMU: Uganda Technology and Management University.
- Alumni Connect: The web application being developed.
- MVP: Minimum Viable Product, the initial version of the application with core features.
- SRS: Software Requirements Specification.
- RTM: Requirements Traceability Matrix.
- CI/CD: Continuous Integration/Continuous Deployment.
- Docker: A platform for containerization. –
- GitHub Actions: A tool for automating CI/CD workflows.
- User: An alumnus of UTAMU who uses the application.
- Admin: A system administrator who manages content (e.g., news, activities).
- FR: Functional Requirement
- NFR: Non- Functional Requirement
- HTTP: Hyper Text Transfer Protocol
- HTTPS: Hyper Text Transfer Protocol secure
- ER: Entity-Relationship
- UML: Unified Modelling Language

1.4. Overview.

This SRS document is organized as follows:

- Section 2 provides an overall description of the product, including its perspective, functions, user classes, and operating environment.
- Section 3 details the specific requirements, including functional, non-functional, and interface requirements.
- Section 4 includes supporting diagrams to model the system.
- Section 5 provides a Requirements Traceability Matrix (RTM) to link requirements to project objectives.
- Section 6 includes appendices with elicitation instruments.

2. OVERALL DESCRIPTION.

Alumni Connect is a standalone web application designed to facilitate networking among UTAMU alumni. It operates as a client-server system, with the frontend built using HTML, CSS, and JavaScript, and the backend powered by Django (Python) with a PostgreSQL database. The application will be containerized using Docker and deployed via a CI/CD pipeline using GitHub Actions.

2.1. Product Functions.

The Alumni Connect application provides the following core functions.

- User Authentication: Users can register and log in to access the system.
- Homepage: Displays an introduction to the platform with options to log in or register.
- News Page: Displays news posts with titles, descriptions, and images.
- Activities Page: Shows upcoming or past activities with details like titles, descriptions, dates, and images.
- Members Page: Lists alumni profiles with names and profile pictures.
- Responsive Design: Ensures the application is usable on both desktop and mobile devices.

2.2. User Classes and Characteristics

2.2.1. Unauthenticated Users:

Alumni who have not yet logged in.

- Can view the homepage and access the login/register pages.
- Expected to have basic web navigation skills.

2.2.2. Authenticated Users (Alumni):

Registered UTAMU alumni who have logged in.

- Can view news, activities, and member profiles.
- Expected to have basic web navigation skills and familiarity with social platforms.

2.2.3. Admins:

System administrators who manage content (e.g., posting news, activities).

- Expected to have technical skills for managing web content (out of scope for MVP but considered for future iterations).

2.3. Operating Environment

2.3.1. Client-Side:

- ✓ Web browsers such as Chrome and Firefox.
- ✓ Devices: Desktop, tablet, and mobile (responsive design).

2.3.2. Server-Side:

- Django framework (Python 3.9+).
- PostgreSQL database for the MVP.
- Hosted on a cloud platform (e.g. render, AWS) via Docker containers

2.3.3. Development Environment:

- Visual Studio Code for coding.
- Git and GitHub for version control and CI/CD (GitHub Actions)

2.4. Design and Implementation Constraints.

2.4.1. Technical Constraints:

- ✓ The MVP must be built using Django and deployed using Docker and GitHub Actions.
- ✓ PostgreSQL is used for the database.

2.4.2. Budgetary Constraints:

- ✓ No additional costs for hosting (using free tiers of GitHub Pages, render or AWS for the MVP).

2.4.3. Legal Constraints:

- ✓ User data (e.g., usernames, passwords) must be stored securely (hashed passwords).
- ✓ Compliance with data protection regulations.

2.5. Assumptions and Dependencies

2.5.1. Assumptions:

- Users have access to a modern web browser and an internet connection.
- UTAMU alumni are interested in networking and engaging with the platform.
- UTAMU will provide the necessary alumni data for verification.

2.5.2. Dependencies:

- ✓ Django framework and Python for backend development.
- ✓ Docker and GitHub Actions for deployment.

3. SPECIFIC REQUIREMENTS

3.1. External Interface Requirements.

3.1.1. 3.1.1 User Interfaces

- The application must have a clean, modern design with a blue, white, and gray color scheme.
- The homepage includes a navigation bar, hero section, and vision/mission sections.
- The login and register pages feature centered forms with error messages.
- The news, activities, and members pages display content in a grid or flex layout, adjusting for mobile screens.

3.1.2. 3.1.2 Hardware Interfaces.

No specific hardware interfaces are required beyond standard web access (e.g., mouse, keyboard, touchscreen for mobile).

3.1.3. 3.1.3 Software Interfaces

- Django: Backend framework for handling user authentication, routing, and database operations.
- PostgreSQL: Database for storing user data, news, activities, and member profiles.
- GitHub Actions: For CI/CD

3.1.4. 3.1.4 Communication Interfaces.

- The application uses HTTP/HTTPS for client-server communication.
- Email notifications for registration confirmation (future feature, out of scope for MVP).

3.2. Functional Requirements

3.2.1. User Authentication.

- FR1: The system shall allow users to register with a username, password, and confirm password.
- FR2: The system shall allow users to log in with a username and password.
- FR3: The system shall display error messages for invalid login or registration attempts (e.g., incorrect password, username already exists).

3.2.2. Homepage.

- FR4: The system shall display a homepage with a navigation bar containing "Login" and "Register" links for unauthenticated users.
- FR5: The system shall display a hero section with the "Alumni Connect" title, logo, and tagline.
- FR6: The system shall display vision and mission sections with descriptions.

3.2.3. News Page.

- FR7: The system shall display a list of news posts for authenticated users, including titles, descriptions, and images.
- FR8: The system shall display a "No news available" message if there are no news posts.

3.2.4. Activities Page.

- FR9: The system shall display a list of activities for authenticated users, including titles, descriptions, dates, and images.
- FR10: The system shall display a "No activities available" message if there are no activities.

3.2.5. Members Page

- FR11: The system shall display a list of member profiles for authenticated users, including names and profile pictures.
- FR12: The system shall display a "No members available" message if there are no members.

3.2.6. Responsive Design.

- FR13: The system shall provide a hamburger menu on mobile devices ($\leq 768\text{px}$) that slides in from the right, taking 50% of the screen width.
- FR14: The system shall close the mobile menu when a link is clicked.
- FR15: The system shall adjust font sizes, padding, and layouts for mobile devices ($\leq 768\text{px}$ and $\leq 480\text{px}$).

3.3. Non-Functional Requirements

3.3.1. Performance.

- NFR1: The system shall load pages within 3 seconds on a standard internet connection (4G or Wi-Fi).
- NFR2: The system shall support up to 100 concurrent users without performance degradation.

3.3.2. Security.

- NFR3: The system shall store user passwords securely using hashing (e.g., Django's built-in password hashing).
- NFR4: The system shall prevent unauthorized access to authenticated user pages.

3.3.3. Usability.

- NFR5: The system shall have a responsive design that works on both desktop and mobile devices.

- NFR6: The system shall include accessibility features, such as `aria-label` for navigation elements.

3.3.4. Reliability.

- NFR7: The system shall have an uptime of at least 99% during deployment.

3.3.5. Scalability.

- NFR8: The system shall be designed to use a larger database.

3.4. System Features

3.4.1. Feature 1: User Authentication.

- Description: Allows users to register and log in to access the system.
- Priority: High.
- Functional Requirements: FR1, FR2, FR3.
- Non-Functional Requirements: NFR3, NFR4

3.4.2. Feature 2: Homepage.

- Description: Provides an introduction to the platform for unauthenticated users.
- Priority: High
- Functional Requirements: FR4, FR5, FR6
- Non-Functional Requirements: NFR5, NFR6

3.4.3. Feature 3: News Page

- Description: Displays news posts for authenticated users.
- Priority : Medium
- Functional Requirements : FR7, FR8
- Non-Functional Requirements : NFR1, NFR5

3.4.4. Feature 4: Activities Page.

- Description: Displays activities for authenticated users.
- Priority: Medium.
- Functional Requirements: FR9, FR10
- Non-Functional Requirements: NFR1, NFR5

3.4.5. Feature 5: Members Page.

- Description: Displays member profiles for authenticated users.
- Priority: Medium
- Functional Requirements: FR11, FR12
- Non-Functional Requirements: NFR1, NFR5

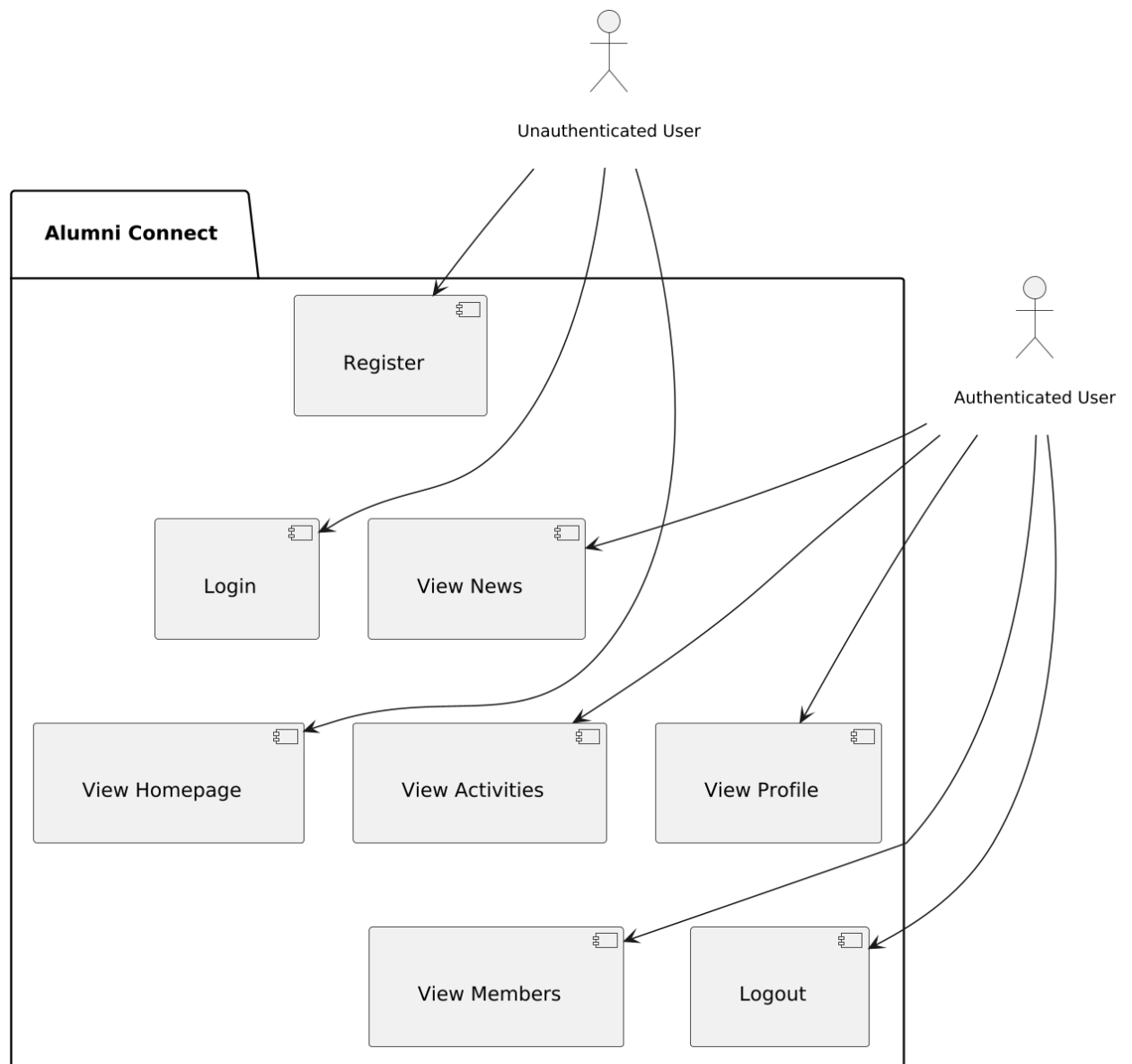
3.4.6. Feature 6: Responsive Design

- Description: Ensures the application is usable on both desktop and mobile devices.

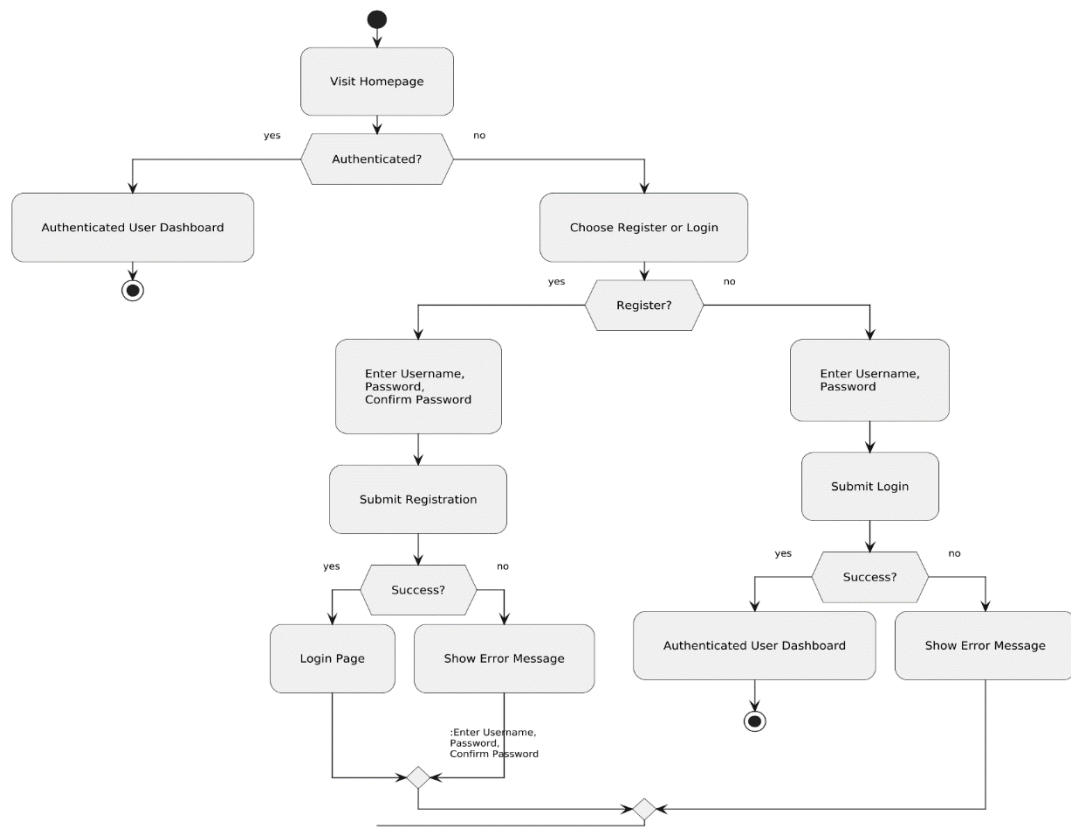
- Priority: High
- Functional Requirements: FR13, FR14, FR15
- Non-Functional Requirements : NFR5, NFR6

4. SUPPORTING UML DIAGRAMS.

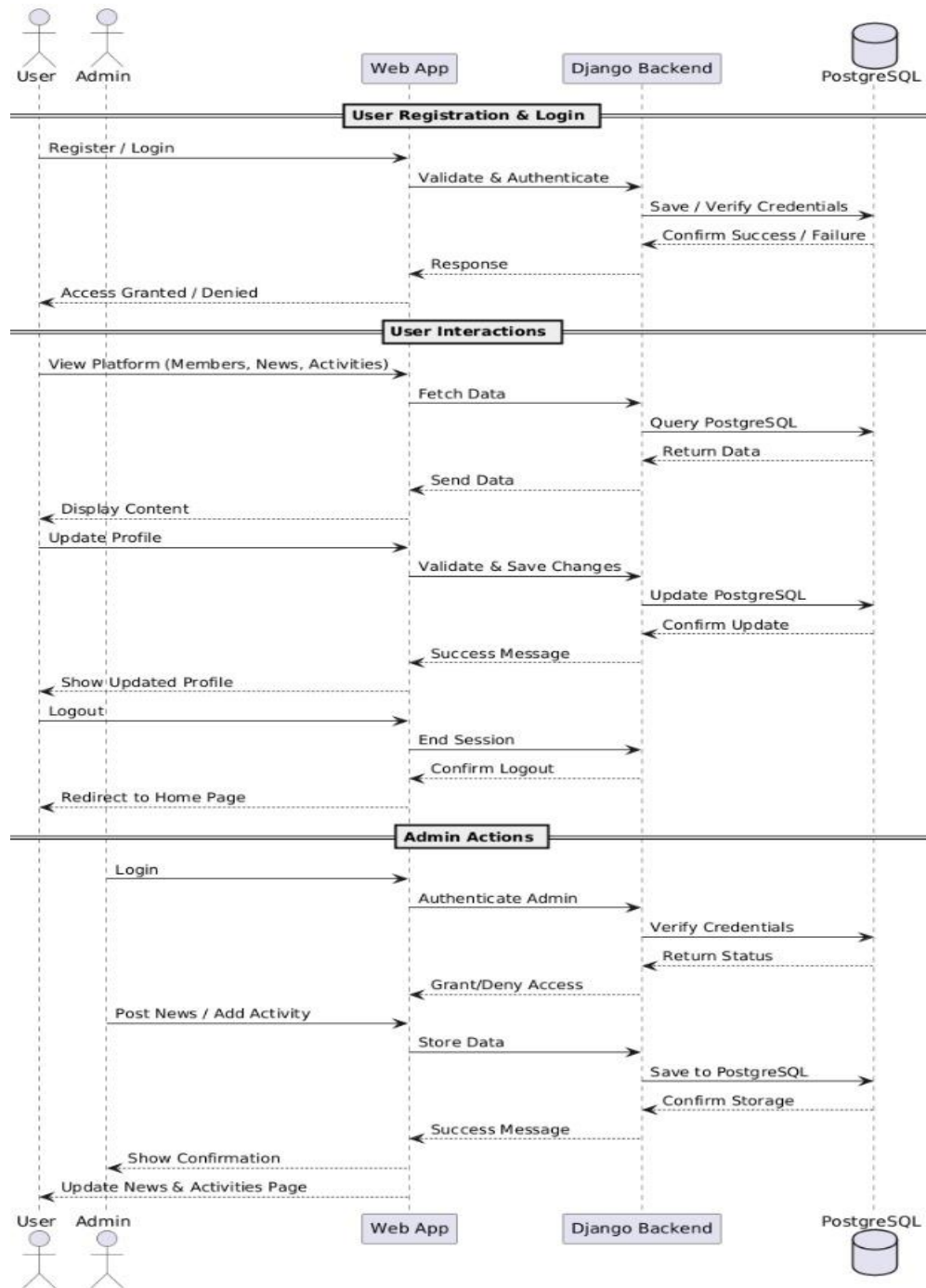
4.1. Use Case Diagram.



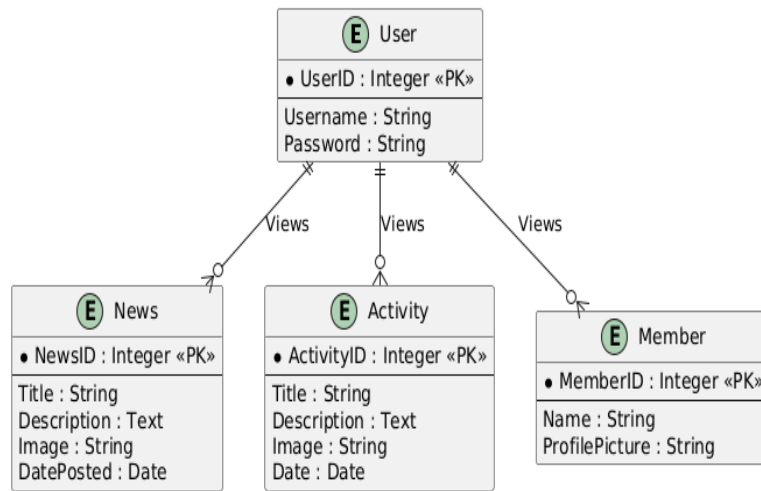
4.2. Activity Diagram



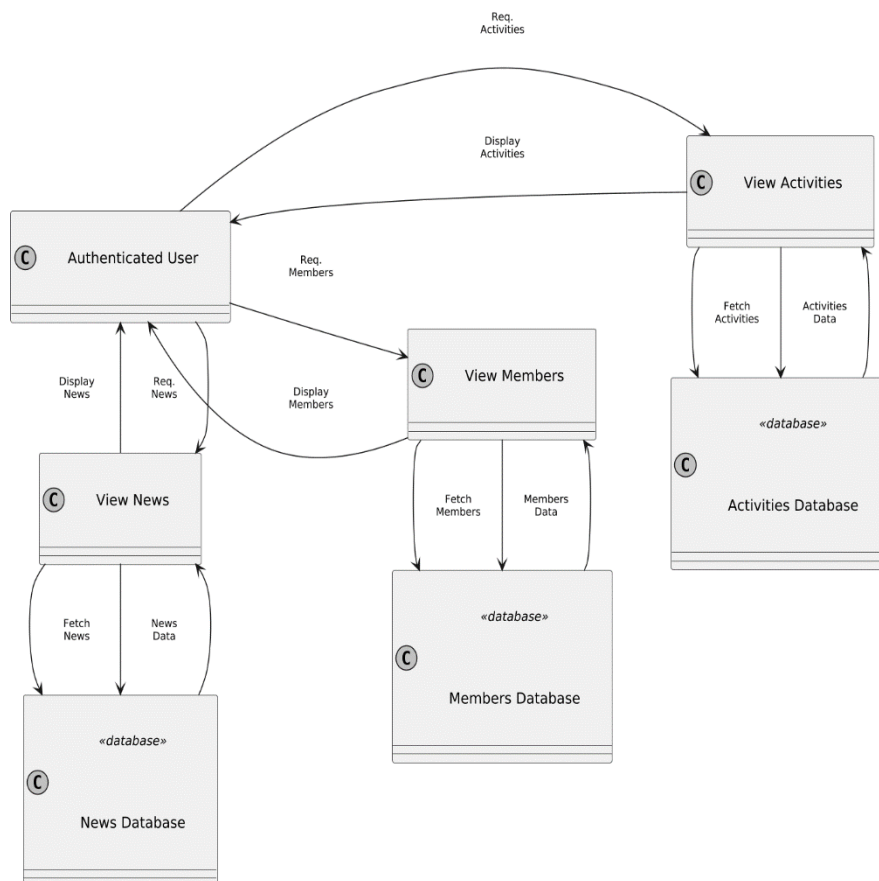
4.3. Sequence Diagram



4.4. ER Diagram



4.5. Dataflow Diagram.



5. REQUIREMENTS TRACEABILITY MATRIX (RTM)

Requirement ID	Requirement Description	Requirement Type	Priority level	Project Objective	Feature
FR1	Register with username, password, confirm password	Functional	High	Enable user access	User Authentication
FR2	Login with username and password	Functional	High	Enable user access	User Authentication
FR3	Display error messages for invalid inputs	Functional	High	Improve user experience	User Authentication
FR4	Display homepage with login/register links	Functional	High	Introduce platform to users	Homepage
FR5	Display hero section with title, logo, tagline	Functional	High	Introduce platform to users	Homepage
FR6	Display vision and mission sections	Functional	Medium	Introduce platform to users	Homepage
FR7	Display news posts with titles, descriptions, images	Functional	Medium	Facilitate information sharing	News page
FR8	Display "No news available" message	Functional	Medium	Improve user experience	News page
FR9	Display activities with titles, descriptions, dates	Functional	Medium	Facilitate event awareness	Activities Page
FR10	Display "No activities available" message	Functional	Medium	Improve user experience	Activities Page
FR11	Display member profiles with names, pictures	Functional	Medium	Enable networking	Members Page
FR12	Display "No members available" message	Functional	Medium	Improve user experience	Members Page

FR13	Provide hamburger menu on mobile devices	Functional	High	Ensure mobile usability	Responsive Design
FR14	Close mobile menu on link click	Functional	High	Improve user experience	Responsive Design
FR15	Adjust font sizes, padding, layouts for mobile	Functional	High	Ensure mobile usability	Responsive Design
NFR1	Load pages within 3 seconds	Non-Functional	Medium	Ensure performance	All Features
NFR2	Support 100 concurrent users	Non-Functional	Medium	Ensure scalability	All Features
NFR3	Store passwords securely using hashing	Non-Functional	High	Ensure security	User Authentication
NFR4	Prevent unauthorized access	Non-Functional	High	Ensure security	User Authentication
NFR5	Responsive design for desktop and mobile	Non-Functional	High	Ensure usability	Responsive Design
NFR6	Include accessibility features (e.g., aria-label)	Non-Functional	Medium	Ensure accessibility	Responsive Design
NFR7	Uptime of at least 99%	Non-Functional	Medium	Ensure reliability	All features
NFR8	Design to scale to a larger database	Non-Functional	Low	Ensure scalability	All features

6. REFERENCES.

1. Django documentation (<https://docs.djangoproject.com>).
2. IEEE Std 830-1998: IEEE Recommended Practice for Software Requirements Specifications.
3. The Unified Modeling Language (<https://www.uml-diagrams.org>).

7. APPENDIX

7.1. Elicitation Instruments

7.1.1. Interview Guide

- ✓ Objective: Gather requirements from UTAMU alumni.
- ✓ Questions.
 1. What challenges do you face in staying connected with fellow alumni?
 2. What features would you like in a platform to connect with alumni (e.g., news, events, and profiles)?
 3. How important is mobile accessibility to you?
 4. What security concerns do you have about using such a platform?

7.1.2. Questionnaire

- ✓ Objective: Collect feedback from a larger group of alumni.
- ✓ Sample Questions.
 1. How often do you engage with alumni networks? (Daily, Weekly, Monthly, Never)
 2. Rate the importance of the following features (1-5): - News updates - Event listings - Member profiles
 3. Do you prefer accessing such platforms on mobile or desktop?

7.2. Version History

- Version: 1.0
- Date: 03/23/2025
- Changes: Initial draft of SRS document
- Author(s): Ainamani Dickson, Ofwono Godwin and Atuhair Abuidi