Software requirements specification (SRS)

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Project Title : ALUMNI HUB

1. Introduction

1.1 Purpose

The purpose of the Alumni Hub is to provide an integrated online platform for alumni to connect, interact, and engage with their former educational institution and peers. It offers communication tools, event coordination, job posting features, and networking opportunities.

1.2 Scope

This software will support:

- User registration and secure authentication.
- Profile management for personal and professional data.
- Searchable alumni directory.
- Event creation, RSVP, and management.
- Job posting and application system.
- Direct messaging and group communication.
- Admin dashboard for monitoring and content control.

1.3 Overview

This document defines the software's functionalities, user interfaces, performance and security requirements, and provides a detailed **project estimation using the COCOMO model**.

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2. General Description

2.1 Functions

- Account creation and login/logout.
- Alumni profile creation and editing.
- Communication via messaging and notifications.
- Event and job management features.
- Admin tools for content moderation.

2.2 User Community

- **Alumni**: Primary users who register, interact, post, and participate in activities.
- **Administrators**: Have full access to content management, moderation, and system monitoring.
- **Guests**: Can view public-facing content (optional feature).

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3. Functional Requirements

3.1 Possible Outcomes

- Account successfully created / login success or failure.
- Event RSVPed successfully / declined.
- Message sent / unread / read.
- Job posted / application submitted.

3.2 Ranked Order of Features

1. User Authentication System
2. Profile Management
3. Messaging System
4. Event Creation & Participation
5. Job Portal
6. Notifications & Alerts
7. Admin Content Management

3.3 Input-Output Relationships

- Input: Email & Password → Output: Logged-in user dashboard.
- Input: "Search by batch year" → Output: List of alumni from that batch.
- Input: RSVP to Event → Output: Confirmation message and calendar entry.

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4. User Interface Requirements

4.1 Software Interfaces

- Web browser-based front-end (responsive across devices).
- Admin dashboard panel.
- Backend APIs for data operations (optional mobile app integration).
- Integration with email servers for notifications.

4.2 Examples

- Login screen with “Forgot Password”.
- Alumni profile page showing work, education, and contact info.
- Event calendar with RSVP buttons.
- Admin dashboard with table views for users, events, and job listings.

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5. Performance Requirements

5.1 Response Time

- Average page load: ≤ 2 seconds.
- Login: ≤ 1 second.
- Event RSVP: ≤ 2 seconds.

5.2 Throughput

- Must support **up to 500 concurrent users** without performance degradation.

5.3 Scalability

- Scalable architecture using cloud infrastructure (e.g., AWS) to accommodate up to **10,000+ users** in future.

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6. Non-Functional Attributes

6.1 Usability

- Clean and intuitive UI/UX.
- Support for screen readers and mobile access.
- Tooltips, help texts, and error messages to guide users.

6.2 Reliability

- 99.5% uptime.

- Automatic daily backups.
- Redundant systems in place for failover.

6.3 Security

- HTTPS secured web platform.
- Passwords stored with encryption (bcrypt or Argon2).
- Optional Two-Factor Authentication (2FA).
- Admin activity logs and audit trails.

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7. Schedule and Budget

7.1 Timeline

Phase	Duration	Activities
Requirements Gathering	2 weeks	Stakeholder interviews, feature planning
Design	2 weeks	UI/UX mockups, system architecture
Development	3 months	Frontend, backend, database, integration
Testing	1 month	Unit tests, bug fixing, user acceptance testing
Deployment	1 week	Server setup, production release
Maintenance	Ongoing	Monitoring, updates, support

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8. Appendices

8.1 Supplementary Information

- **Frontend**: React.js / Angular
- **Backend**: Node.js with Express
- **Database**: MongoDB or PostgreSQL
- **Hosting**: AWS or Azure with CI/CD pipelines
- **Authentication**: JWT or OAuth 2.0

8.2 Glossary

- **RSVP**: Respond to event invitations
- **KLOC**: Thousands of Lines of Code
- **PM**: Person-Month (one developer working full time for one month)
- **2FA**: Two-Factor Authentication
- **COCOMO**: Constructive Cost Model

Project Estimation Using COCOMO Model

COCOMO (Constructive Cost Model) Overview

The **COCOMO** model helps estimate:

- **Effort (person-months)**
- **Time (months)**
- **Cost ($)**

Model Used: Basic COCOMO

Project Type: Semi-Detached (moderate size and complexity)

Estimation Inputs

- Estimated size: **25 KLOC (25,000 lines of code)**

COCOMO Formulas

- **Effort (PM)** = 3.0 × (KLOC)^1.12
- **Development Time (TDEV)** = 2.5 × (Effort)^0.35

Effort Estimation

PM=3.0×(25)1.12=3.0×40.89≈122.67 person-monthsPM = 3.0 \times (25)^{1.12} = 3.0 \times 40.89 \approx \textbf{122.67 person-months}PM=3.0×(25)1.12=3.0×40.89≈122.67 person-months

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Time Estimation

TDEV=2.5×(122.67)0.35≈2.5×5.95=14.88 months≈15monthsTDEV = 2.5 \times (122.67)^{0.35} \approx 2.5 \times 5.95 = \textbf{14.88 months} \approx 15 monthsTDEV=2.5×(122.67)0.35≈2.5×5.95=14.88 months≈15months

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Team Size

Team Size=EffortTime=122.6715≈8 to 9 peopleTeam\ Size = \frac{Effort}{Time} = \frac{122.67}{15} \approx \textbf{8 to 9 people}Team Size=TimeEffort=15122.67 ≈8 to 9 people

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Cost Estimation

Assume average developer salary/month = $3,000\text{Assume average developer salary/month = } \$3,000Assume average developer salary/month = $3,000
Total Cost=122.67×3,000=$368,010\text{Total Cost} = 122.67 \times 3,000 = \textbf{\$368,010}Total Cost=122.67×3,000=$368,010

Rounded: **≈ $370,000 USD**

✅ Advantages of COCOMO

Advantage	Description
Early Planning	Useful in early project stages with minimal inputs
Empirical Model	Based on real-world project data
Scalability	Works for different project sizes and complexities
Simplicity	Easy to apply with few parameters
Customizable	Can be upgraded to Intermediate or Detailed model later

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✅ Final Summary Table

Parameter	Value
Project Type	Semi-Detached
Estimated Size	25 KLOC
Effort	122.67 Person-Months
Duration	15 Months
Team Size	8–9 Developers
Estimated Budget	~$370,000 USD