COMP5047 - Applied Software Engineering Coursework

Analysis and Specify Software Quality Requirements

Functional Requirements:

Union officers should be able to view, add, update, and remove members of their society via the web platform.

Security Requirements

Requirement Number	Security / Privacy Requirement	Rationale	Verification Method
1	The system shall require secure login using university single sign-on (SSO) and multifactor authentication for all officers	Prevent unauthorized access to society management data.	Security testing, login audit
2	The system shall encrypt all sensitive data (e.g. student IDs, emails) in transit using HTTPS and at rest using encryption	Ensure data confidentiality	Code inspection, pen testing,
4	The system shall restrict data access based on user roles (e.g. only society officers can modify member data)	Enforce least privilege access	Role-based access control testing.
5	The system shall comply with GDPR standards for data collection, retention and deletion	Protect user privacy and legal compliance	Documentation review, privacy audit

Performance Requirements

Ensure that membership management operations are processed efficiently for a smooth user experience.

Requirement Number	Performance Requirement	Rationale	Verification Method
1	The system shall load “Manage Members” page within 3 seconds under normal network conditions	Fast response improves usability	Performance testing

2	The system shall support up to 500 concurrent users performing membership management without performance degradation.	Handle peak usage (e.g. during freshers fair).	Load / stress testing
3	Updates to membership data (add/edit/remove) shall be reflected in the database within 2 seconds of submission.	Real-time data consistency.	End-to-end transaction timing.

Reliability Requirements
Ensure the system performs correctly and continuously even under the fault conditions.

Requirement Number	**Reliability Requirement**	**Rationale**	**Verification Method**
1	The system shall have an uptime of 99.5% during term time.	Ensure continuous availability for users.	Monitoring reports.
2	The system shall automatically back up member data every 24 hours.	Protect against data loss.	Backup verification tests.
3	The system shall recover from server failures within 5 minutes using a failover server.	Minimize downtime.	Disaster recovery testing.
4	The system shall perform input validation to prevent corrupt data entries.	Maintain data integrity	Validation and integration testing.

Scalability Requirements

Ensure the system can grow to handle increasing data and user load over time.

Requirement Number	Scalability Requirements	Rationale	Verification Method
1	The system architecture shall support horizontal scaling (adding more servers) without service interruption	Handle future growth in user base.	System design review.
2	The database shall efficiently handle up to 50,000 member records without performance degradation.	Support long-term data growth	Load and capacity testing
3	The system shall allow integration with new modules (e.g. event management) through RESTful apis.	Future extensibility	API integration testing.
4	The system shall use cloud-base infrastructure (e.g. AWS, azure) to dynamically allocate resources based on load.	Cost-effective scalability	Cloud environment test logs.

Summary

Quality Attribute	KeyObjectives
Security and Privacy	Protect student data using encryption, authentication, and GDPR compliance.
Performance	Fast page loads and real-time updates for membership operations
Reliability	Ensure uptime, data backups, and quick recovery from failures
Scalability	Supports increasing users, societies, and future feature integration.