

2.3 Requirements Traceability Matrix

The Requirements Traceability Matrix (RTM) ensures that all system requirements are clearly defined, traceable, and properly implemented throughout the development lifecycle. It helps verify that every functional requirement is covered during design, development, and testing, ensuring consistency between user needs and system functionality.

2.3.2 Non-Functional Requirements

Non-functional requirements define the quality attributes and operational constraints of the Home Rental Management System. These requirements ensure that the system performs efficiently, remains secure and reliable, and provides a satisfactory user experience for all roles.

Performance Requirements

- The system shall load all user-facing pages within **2–3 seconds** under normal operating conditions.
- The system shall handle multiple concurrent users without noticeable performance degradation.
- Database queries related to property listings, rent payments, and maintenance requests shall execute efficiently.
- The system shall provide quick response times for critical operations such as login, rent payment, and application submission.

Security Requirements

- User passwords shall be stored using secure encryption or hashing techniques.
- The system shall enforce **role-based access control** to restrict unauthorized access to sensitive modules.
- Sensitive data such as user personal information and payment records shall be protected from unauthorized access.
- All user sessions shall be managed securely to prevent unauthorized use.
- The system shall log critical activities for audit and monitoring purposes.

Usability Requirements

- The user interface shall be simple, intuitive, and easy to navigate for all user roles.
- Forms, buttons, and menus shall be clearly labeled and logically organized.
- Error messages and system notifications shall be clear, meaningful, and easy to understand.
- The system shall be responsive and usable across different screen sizes and devices.

Reliability Requirements

- The system shall operate continuously without unexpected crashes during normal usage.
- The system shall ensure data consistency and accuracy during all operations.
- In case of system failure, previously stored data shall not be lost.
- The system shall support regular data backup and recovery mechanisms.

Maintainability Requirements

- The system shall be designed using a modular architecture to simplify future maintenance and updates.
- Code structure and documentation shall support easy debugging and enhancement.
- The system shall allow updates and bug fixes without affecting existing functionalities.
- Maintenance tasks shall not significantly interrupt system availability.

Scalability Requirements

- The system shall support future feature additions without major architectural changes.
- The database shall be capable of handling increased numbers of users, properties, and transactions.
- The system architecture shall support growth in data volume and user traffic over time.