Property Rental Management System Requirements Specification

Version 1.0

March 10th, 2025

This is our Property Rental Management System Requirements Specification document, where we will specify the requirements: functional and non- functional requirements. We will also include a project overview, product context and other necessary information for a proper introduction into our project.

This document will be updated for every necessary part of the project, we need to add or update. Each Version shows the progress.

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1. Executive Summary

1.1 Project Overview

Our group has chosen the Rental Management System topic for our project. We will ensure the creation of a proper model encompassing all the steps necessary to fulfill its role as a design worthy of simplifying the work of the software engineers to turn the theoretical aspect into a practical one. Our duty in this project is for all the lessons of the SWE 202 course to be incorporated into our project, for example: Requirements Engineering, different Modelings, Design Patterns, etc. Everything will be posted on our Github Repository: https://github.com/martinvila22/SoftwareModelingAndDesign_Project.git

2. Product/Service Description

The Rental Management System is a multipurpose software, designed to ensure the needs of all types of users. Our System will create a safe, interactive environment for the verified landlords to post their legally and physically verified product which might be: an apartment, a mansion, a land any other type of real estate. This safe environment will also benefit a verified customer, the interested party on renting a property. It is also in the scope of the purpose of our system to ensure an easily understandable multifunctional search mechanism for all customers to search a property in a certain area, city, street and with certain filtering options decided by him such as:type of property, surface area, rooms, budget, etc. There would be ofcourse a need for contact between these two parts of a deal, so we will also integrate an inner chat between the customer and the landlord. Since the developers of a Rental Management System should have thorough knowledge on the properties and the property rental market, the system will give feedback to the customer about the best aspects of the property and if the price is below or above average(in trying not to undermine the benefits of the property). In the scope of our System is also a smooth payment transaction between the two sides of the deal either by cash or direct payment through our system. In either case the System will give both parts a pdf verifying being a third party.

2.1 Product Context

Our System will be an independent one, with no relation to other products similar to this one. Even so, we plan to implement an inner chat between the customer and the landlord. This will be an inside the System chat, designed to function within our System. To create the front-end we will use Angular for a dynamic user interface, for the back-end we will use Java and MySql for the database part. Microsoft Azure as a Cloud Service for Hosting. PayPal will be our to-go method for payments, even though we might consider other options to be added later.

2.2 User Characteristics

• 1. Tenant (Client)

Purpose: A person renting a property who interacts with the system to find, lease, and maintain their rental.

• Functionalities:

- Apply for rental properties View available listings and submit rental applications.
 - Sign lease agreements Review and digitally sign lease contracts.
- Pay rent online and view payment history Make payments through an integrated system and track past transactions.
- Submit maintenance requests Report issues (e.g., plumbing, electrical, heating) and monitor progress.
- Receive notifications Get reminders for rent due dates, lease renewals, and maintenance updates.

2. Landlord (Property Owner)

• **Purpose**: Owns and rents out properties while managing tenants and overseeing property performance.

• Functionalities:

- List properties for rent Upload property details, set rental prices, and manage availability.
- Approve or reject tenant applications Review applications, conduct background checks, and finalize leases.
- Monitor rental income and payments Track payment status and outstanding balances.
- Approve or deny lease renewals Decide whether to extend or terminate tenant leases.
- Review and manage maintenance requests Oversee maintenance operations and approve repair costs.

• 3. Property Manager

- Purpose: Manages daily operations for rental properties on behalf of landlords.
- Functionalities:
 - Oversee property listings and tenant applications Manage rental postings and screen applicants.

- Handle maintenance requests and coordinate with vendors Assign work orders to maintenance teams and track progress.
- Track rental income and expenses Maintain financial records for property-related income and costs.
- Communicate with tenants and landlords Address tenant concerns and report to landlords.
- Manage lease renewals and terminations Facilitate lease extensions or legal processes for tenant removal.

• 4. Support Staff (Customer Service)

 Purpose: Assists tenants, landlords, and property managers with inquiries, complaints, and troubleshooting issues.

Functionalities:

- Assist tenants with account, payment, and maintenance issues Help tenants reset passwords, process payments, and report problems.
- Handle tenant and landlord inquiries Answer questions about property listings, lease terms, and rent payments.
- Resolve disputes and complaints Mediate issues between tenants and landlords or escalate to higher authorities.
- Manage customer service tickets Track and resolve technical or service-related problems.

5. Administrator (System Admin)

 Purpose: Manages the platform's infrastructure, security, and user roles to ensure smooth system operations.

Functionalities:

- Create and manage user accounts Set up and modify accounts for tenants, landlords, and property managers.
- Oversee system security, settings, and backups Ensure data protection, perform system updates, and prevent security breaches.
- Generate system reports for performance and security Monitor system usage and generate analytics.

• Assign roles and permissions to users – Control access to different system functionalities based on user roles.

6. Legal Advisor

 Purpose: Ensures compliance with property laws, handles disputes, and advises on legal matters.

Functionalities:

- Review and approve lease agreements Ensure rental contracts comply with legal regulations.
- Advise landlords and property managers on legal matters Provide guidance on evictions, tenant disputes, and property laws.
- Draft and modify contracts Update lease terms to align with local regulations and prevent legal conflicts.
- Oversee legal processes related to property disputes Represent landlords in legal actions if necessary.

• 7. Finance Officer

Purpose: Manages all financial aspects of the rental business, including transactions, reports, and budgeting.

Functionalities:

- Generate financial reports Track rental income, operational expenses, and profit margins.
- Handle rent payment processing Ensure smooth payment transactions, including deposits and overdue payments.
- Track tenant deposits, refunds, and financial records Manage security deposits and process refunds.
- Assist with financial forecasting and budgeting Plan for maintenance costs and future financial needs.

2.3 Assumptions

*User should access our System on Android with an Android 12 or higher or an IOS 16 or higher. Failing to comply with this assumption will make the System unresponsive to the User and not available.

*We presume that the use of our System will be available only on Portrait Mode and not on Landscape mode.

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3. Requirements

3.1 Functional Requirements

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
BR_01	The system shall allow tenants, landlords, property managers, support staff, administrators, legal advisors, and finance officers to securely log in because the authentication process is required for access control and security.	This feature is critical for ensuring data privacy, security, and compliance with role-based access.	1	10/03/25	Evina Tershalla
BR_02	The system shall enforce role-based access control (RBAC) so that users can only access features and data relevant to their roles for the purpose of ensuring data integrity and security.	Ensures that each user has access only to their designated areas based on their role.	1	10/03/25	Evina Tershalla
BR_03	The system shall display an error message when users fail authentication because they need feedback to correct invalid credentials.	Helps prevent unauthorized access while guiding legitimate users to log in successfully.	2	10/03/25	Evina Tershalla
BR_04	The system shall restrict unauthorized users from accessing protected features or data because security and compliance with access permissions are required.	Prevents data breaches and unauthorized modifications.	1	10/03/25	Evina Tershalla
BR_05	The system shall display property search results in a user-friendly format including photos, descriptions, rent prices, and amenities because clear presentation improves decision-making.	Helps tenants compare listings effectively.	2	10/03/25	Evina Tershalla

^{*}The System will be supported with periodical updates, for the maintenance and bug fixes.

^{*}Users have two forms of payments: cash or paypal. Other forms will not be accepted by our System.

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
BR_06	Tenants shall be able to apply for properties directly through the platform by submitting personal details, employment status, and rental history because this streamlines the rental process.	Simplifies the application process and enhances user convenience.	1	10/03/25	Evina Tershalla
BR_07	Tenants shall be able to pay rent online using credit/debit cards, online wallets (PayPal, Google Pay), and bank transfers because it provides a convenient and secure payment process.	Ensures flexibility and accessibility for rent payments.	1	10/03/25	Evina Tershalla
BR_08	Tenants shall be able to search for rental properties using filters such as price range, location, number of rooms because this enables them to find suitable properties efficiently.	Improves user experience by allowing tenants to filter their search results, making it easier to find properties that meet their specific needs.	1	10/03/25	Ema Kuka
BR_09	Tenants shall be able to submit a rental application for a property by providing necessary documents and personal information because this streamlines the rental process and ensures their eligibility can be assessed.	Allows prospective tenants to apply for properties in a standardized format.	1	10/03/25	Ema Kuka
BR_10	Landlords shall be able to review, approve, or reject rental applications submitted by tenants because this enables them to select qualified tenants based on relevant information.	Landlords have control over tenant selection, ensuring suitability and compliance.	1	10/03/25	Ema Kuka
BR_11	Landlords shall be able to delegate the right to review, approve, or reject rental applications to a property manager because this allows landlords to outsource tenant screening while maintaining final authority.	Provides flexibility for landlords who prefer external management of their properties.	2	10/03/25	Ema Kuka

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
BR_12	Property managers shall be able to review and evaluate tenant applications if given permission by the landlord because this helps streamline the rental process on behalf of the landlord.	Property managers can assist with tenant selection, but only if authorized by the landlord.	2	10/03/25	Ema Kuka
BR_13	The system shall allow tenants to securely enter payment details and process transactions because security and accuracy are critical in handling financial data.	Prevents fraud and ensures safe processing of rent payments.	1	10/03/25	Evina Tershalla
BR_14	The system shall allow users (tenants, landlords, etc.) to report any security incidents (e.g., hacking attempts, data breaches) directly to the administrator, ensuring prompt action and investigation.	Helps keep the parties safe.	1	10/03/25	Evina Tershalla
BR_15	Tenants shall be able to rate and review properties they have rented because this helps future tenants make informed decisions based on real experiences.	Enhances transparency and trust by providing valuable feedback for future tenants and encouraging landlords to maintain property quality.	2	10/03/25	Ema Kuka
BR_16	The system shall generate an electronic receipt upon successful payment because tenants need proof of payment for their records.	Ensures transparency and accountability.	1	10/03/25	Evina Tershalla
BR_17	The system shall allow landlords to review, approve, or reject lease applications because they need control over tenant agreements.	Ensures landlords can manage lease applications efficiently.	1	10/03/25	Evina Tershalla
BR_18	The system shall provide tenants with a secure messaging feature to communicate directly with landlords or property managers, improving communication regarding maintenance, lease terms, and other property-related issues.	Ensures the communication between parties,	2	10/03/25	Evina Tershalla

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
BR_19	The system shall notify tenants when their lease application is approved or rejected because timely updates help tenants take necessary actions.	Improves communication and transparency.	2	10/03/25	Evina Tershalla
BR_20	Landlords shall be able to list their available properties for rent because this allows them to attract potential tenants efficiently.	Enables landlords to showcase properties with key details and images.	1	10/03/25	Evina Tershalla
BR_21	Landlords shall be able to edit or remove property listings because accurate and up-to-date information is crucial for tenant decisions.	Ensures tenants see only valid and available properties.	1	10/03/25	Evina Tershalla
BR_22	Landlords and property managers shall be able to generate detailed financial reports because tracking income and expenses is essential for managing property finances.	Ensures financial transparency and easy tracking of income and costs.	1	10/03/25	Evina Tershalla
BR_23	Landlords shall be able to request maintenance or repairs for their properties to property managers through the system because this helps maintain property quality and tenant satisfaction.	Ensures that landlords can efficiently address property maintenance issues, improving tenant experience and preserving property value	2	10/03/25	Ema Kuka
BR_24	Administrators shall be able to suspend or deactivate user accounts that violate platform policies because this helps maintain security and compliance.	Ensures platform integrity by preventing misuse, enhancing security, and enforcing compliance with policies.	1	10/03/25	Ema Kuka
BR_25	Administrators shall be able to verify new landlord accounts by reviewing submitted ownership and identity documents before approval because this prevents fraudulent property listings and ensures authenticity.	This feature enhances platform security by ensuring that only legitimate landlords can list properties, reducing fraud and maintaining trust.	1	10/03/25	Ema Kuka

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
BR_26	Administrators shall be able to generate detailed reports on platform activity, including user logins, security logs, and system performance metrics because this helps monitor platform stability and detect anomalies.	Provides insights into platform usage, helps identify trends, and ensures early detection of irregular activities for better decision-making.	2	10/03/25	Ema Kuka
BR_27	Support staff shall be able to track and resolve technical support requests submitted to them by tenants and landlords and approved by property manager because this ensures a smooth user experience.	Enhances user satisfaction by ensuring that technical issues are promptly identified and resolved, minimizing disruptions.	2	10/03/25	Ema Kuka
BR_28	Landlords shall be able to schedule property viewings and manage appointment slots through the system because this allows potential tenants to visit properties at convenient times, improving the rental process.	Streamlines property visits, ensuring efficient coordination between landlords and tenants.	2	10/03/25	Ema Kuka
BR_29	Property managers shall be able to schedule and manage property viewings on behalf of the landlord, if permitted because this allows landlords to delegate property management tasks while maintaining an organized scheduling process.	Ensures that property managers can handle operational aspects efficiently, supporting landlords when needed.	2	10/03/25	Ema Kuka
BR_30	Administrators shall be able to remove policy-violating content, including property listings and tenant reviews, after receiving reports or detecting violations because this helps maintain platform integrity and security.	Helps maintain content accuracy and trustworthiness within the platform.	1	10/03/25	Ema Kuka

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
BR_31	Administrators shall be able to set up and manage platform-wide announcements, such as system updates, scheduled maintenance, and new feature releases because this keeps users informed and reduces unexpected disruptions.	Keeping users updated about changes improves communication and reduces confusion.	3	10/03/25	Ema Kuka
BR_32	Landlords shall be able to assign a property manager to oversee property-related operations and tenant interactions because this allows landlords to delegate responsibilities while maintaining oversight.	Handling day-to-day tasks improves operational efficiency.	2	10/03/25	Ema Kuka
BR_33	The system shall provide tenants with the ability to submit maintenance requests through a user-friendly interface. Tenants can describe the issue, upload images, and prioritize the request (e.g., urgent, normal). Maintenance staff shall be notified of new requests and will have the ability to update the status (e.g., in progress, completed). Tenants will receive updates on their request's status and expected resolution time.	This feature is crucial for maintaining property condition and tenant comfort.	1	10/03/25	Mikael Xhangolli

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
BR_34	The system shall allow tenants to provide feedback and rate their experience with landlords and property managers.	This fosters accountability and helps in identifying areas for improvement.	2	10/03/25	Mikael Xhangolli
	Feedback can include comments on maintenance responsiveness, property condition, and overall satisfaction.				
	Admins can view and manage feedback for quality assurance purposes.				
BR_35	The system shall provide multilingual support, allowing users to select their preferred language for the interface and notifications.	This feature promotes inclusivity and improves user experience across different demographics.	2	10/03/25	Mikael Xhangolli
	Language options will include major regional languages corresponding to the user base.				
BR_36	The system shall issue automated payment reminders to tenants regarding upcoming rent due dates.	Payment reminders promote financial responsibility and aid in tracking tenant behavior.	1	10/03/25	Mikael Xhangolli
	Users will be able to access their payment history, including transaction details, dates, and methods used.				

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
BR_37	The system shall provide an onboarding process for new users that includes guided tutorials and tips on using various features. Users—tenants, landlords, and property managers—will be prompted to complete a walkthrough when they first log in. Tutorials will be accessible at any time from the help section.	This feature helps users become familiar with the platform, reducing confusion and enhancing user experience.	2	10/03/25	Mikael Xhangolli
BR_38	The system shall maintain an audit trail and activity log to track user actions. Logs will include changes made to properties, user logins, application status updates, and other significant actions within the system. Admins will have access to these logs for compliance and security monitoring.	An audit trail enhances transparency and protects against unauthorized actions.	1	10/03/25	Mikael Xhangolli
BR_39	The system shall allow users to update their profile information, including contact details, preferences, and profile pictures. Changes made in the profile will be saved and reflected in the user's account	Allowing users to customize their profiles enhances the user experience and helps maintain accurate user information on the platform.	1	10/03/25	Mikael Xhangolli

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
BR_40	The system shall allow the finance office to approve or confirm payments made by tenants to ensure proper financial oversight and validation of transactions.	Ensures that all payment transactions are verified before being processed, maintaining accuracy in financial records.	1	10/03/25	Mikael Xhangolli
BR_41	The finance office shall have access to a detailed payment approval interface showing payment details, tenant information, and payment status, with the option to approve or reject payments based on their review	Provides the finance office with necessary information to validate and confirm tenant payments efficiently.	1	10/03/25	Mikael Xhangolli
BR_42	Once the finance office confirms a payment, the system shall automatically update the payment status in the tenant's account and generate a receipt for the tenant.	Streamlines the payment process by automatically reflecting changes in the tenant's account after approval.	1	10/03/25	Mikael Xhangolli
BR_43	If the finance office rejects a payment, the system shall notify the tenant with a detailed reason for rejection and request further action if necessary.	Ensures clear communication with tenants, improving transparency and reducing confusion.	2	10/03/25	Mikael Xhangolli

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
BR_44	The system shall allow tenants to make in-person cash payments, which can be manually recorded by the finance office or property manager. Upon recording, the payment details (amount, date, tenant information) shall be updated in the system, and a receipt will be generated.	This feature ensures flexibility for tenants who prefer cash payments while maintaining accurate records and receipts for the transaction.	1	10/03/25	Mikael Xhangolli
BR_45	The system shall allow legal advisors to mediate conflicts between landlords and tenants, offering suggested legal actions, mediation procedures, and possible settlements.	Ensures that legal advisors can facilitate conflict resolution between landlords and tenants by providing legal guidance, mediation steps, and settlement options	1	10/03/25	Mikael Xhangolli

3.2 Non-Functional Requirements

3.2.1 Product Requirements

Requirements which specify that the delivered product must behave in a particular way e.g. execution speed, reliability, etc.

3.2.1.1 Usability Requirements

- The system shall have an intuitive and user-friendly interface to accommodate users with varying technical expertise.
- The interface shall follow Material Design principles to ensure consistency, clarity, and ease of use.
- The system shall support responsive design, ensuring compatibility with mobile and tablet devices.
- The onboarding process for new users shall not exceed 5 minutes to facilitate quick adoption.
- Online documentation and a user manual shall be provided for assistance, ensuring learnability.
- System navigation shall require no more than three clicks to reach any key functionality.
- The map interface shall support zooming, panning and property selection within minimal lag across all devices.

 Users should be able to see a summary of the key points from review the system has made before clicking to read or see the full post.

3.2.1.2 Performance Requirements

- The system shall support a minimum of 1,000 concurrent users without performance degradation.
- 95% of transactions shall be processed within 2 seconds, ensuring smooth user experience.
- System response time for database queries shall not exceed 300ms under normal load conditions.
- The system shall handle at least 10,000 property listings and 50,000 registered users efficiently.
- Peak load performance shall be tested to ensure the system can scale dynamically.
- The map should display up to 1000 listings without noticeable lag, ensuring property markers load within 5 seconds.
- Users should be able to see a review within 5 seconds ensuring no lag or delay.

3.2.1.3 Availability

- The system must maintain 99.9% uptime, ensuring 24/7 availability for property searches, bookings, and payments.
- It must handle peak traffic periods (e.g., weekends, holidays) without performance degradation.
- The booking and payment systems must support at least 500 concurrent users without delays.
- The system must automatically update property availability when a property is booked or its price changes.
- Users should receive real-time notifications via email, SMS, or mobile push notifications for property updates.
- The system must automatically switch to a backup payment gateway or booking server in case of failures.
- Users should be able to resume their booking if interrupted due to network failures or system crashes.
- Users should be able to set alerts for specific property types, receiving notifications for new listings.

3.2.1.4 **Security**

The system must use two time authentication for landlords when logging in. This means
users need to enter both a password and a one-time passcode sent via email or SMS(by
phone number).

- Passwords should be securely stored using strong encryption methods and must follow best practices, including being at least 12 characters long and not containing anything personal (like name surname) and allowing special characters.
- To prevent unauthorized access, the system should limit login attempts to 10 failed tries within 30 minutes before temporarily locking the account.(the system should send an email all the failed times, to get back to the account).
- The system should track user activity during a session and extend the session only if there is continuous interaction. If the user is inactive for 30 minutes, they should be automatically logged out and required to reauthenticate. A warning message should appear 5 minutes before logout, allowing users to stay logged in if needed.
- The system should have different user roles, ensuring that only authorized users (admins, landlords) can access specific features based on their role, and any of them should have a specific thing in the email or username so it can be easy for the system.
- The system must use automated spam filters to detect irrelevant or inappropriate content people can write in the reviews.
- Any review flagged by the system or users must be reviewed by a moderator within 24 hours.

3.2.2 Organizational Requirements

- Code Review and QA Process: The system must undergo both automated and manual
 testing to verify its functionality and quality. Automated tests should cover critical
 workflows and edge cases, while manual testing should focus on scenarios that require
 human judgment. Peer reviews of the code should be conducted to ensure adherence to
 coding standards, identify potential bugs, and ensure the system operates as expected
 before deployment.
- Regular Maintenance Schedule: A regular maintenance schedule should be established
 to perform necessary updates, such as security patches, bug fixes, and feature updates.
 Prior communication with users is essential to minimize the impact of downtime and
 ensure they are aware of when to expect disruptions or changes.
- Data Backup and Disaster Recovery: Critical data, including user information, listings, and payment records, should be backed up daily. A robust disaster recovery plan should be in place to ensure business continuity in case of data loss or system failure. The plan should outline recovery procedures and timelines for restoring services.
- Compliance with Internal Security Policies: The system should comply with internal security policies, including secure user authentication methods, access control mechanisms, and the protection of sensitive data. This ensures the system is safeguarded against potential security threats and adheres to privacy and regulatory requirements.
- System Documentation: Detailed documentation of the system's architecture, database design, and APIs should be created and regularly updated. This documentation will serve as a reference for senior developers and help ensure the system is scalable and maintainable over time. It should be clear, organized, and comprehensive to facilitate future modifications and troubleshooting.

- User roles and permissions: The application should have predefined roles for tenants, landlords, property managers and administrators each with specific permissions.
- Customer support and response time: Support staff must respond to user inquiries within 24 hours.

3.2.3 External Requirements

- Social Media Integration -The platform should allow users to share listings or bookings on popular social media platforms such as Facebook, Instagram, or Twitter, using seamless integration through their APIs.
- External Service Integration- The system should integrate with external communication platforms (e.g., email services, SMS providers) to send notifications, confirmations, and updates to users. APIs like SendGrid or Twilio can be used for this integration.
- Consumer Protection Laws -The platform must ensure that booking policies, cancellation fees, and refund processes comply with consumer protection laws in different regions. The system should allow for regional configuration to adhere to specific local regulations.
- Two-Factor Authentication (2FA)-The platform should support Two-Factor Authentication (2FA) for users accessing sensitive features, such as property management, payment processing, or personal account information. This provides an added layer of security.
- Multi-Language Support-The platform should offer multi-language support, enabling
 users from various regions to interact with the system in their preferred language. This
 should be configurable based on the user's region or preference.