Software Requirements Specification

For

House Rental Management System

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Table of Contents

1 Introduction

This Software Requirement Specification (SRS) document provides a full overview of **House Rental Management System** by defining the problem statement, scope of the system and purpose.

1.1 Problem Statement

Over the year's landlords/property managers have had a problem in maintaining and managing their customers and their own records. Management has become difficult because of data growth, lack of computerized system and storing records manually. Also, when a tenant wants to rent house it's been very difficult for him to find within time. This system decreases the problems for both tenants and the landlords.

1.2 Purpose

This House Rental Management System is developed to provide the following services:

- **Online House/Room Booking:** A tools through which customers can book available House online prior to their date of using the house instead of walking around and asking for a vacant house.
- **Customer's registration:** A registration portal to hold customer's details, monitor their transaction and used same to offer better and improve services to them and user account where he/she can view her/his details instead of the poor existing systems where only the administrators control their customer details.
- **Rentals Notice and Blog:** A tool where customers can see and view the details of nearby available House for rent/sale, and also view the current economic design of houses.

1.3 Scope

This project traverses a lot of areas ranging from business concept to computing field and required to perform several researches to be able to achieve the project objectives. The following are the scopes of work:

- Developing a smartphone app as around 97% user uses smartphone now a days.
- Studying the existing systems and learning their weakness hence developing a new system to cater for the challenges the local and world domains faces when dealing with house rental issues.

1.4 Glossary

This subsection contains definitions of all the terms and abbreviations used in the document.

i. MB Megabytes

1.5 Overview

Roam around to rent a house has always been a hassle for people. Especially, on recent times, people have so many priorities based on which they have to rent their house. Some people want their house to be in the commercial space, or some want in a chaos free space. Some people prefer to choose the area of their house relating the religion they belong. Again, there are a lot of people who love pets; therefore, they want a house which has pet allowance. Basically, in this era of modernism people want to rent their house like online shopping. To rent a house in physical world has become less popular now a days. No one wants to roam around here and there to search for a house. People would prefer a virtual system to rent a house. In general youths face much bigger problems while renting a house. They don't give house on rent to bachelors and lot of rules and restrictions by the landlord.

To decode this situation and to represent a hassle-free environment to the people a dynamic system can be implemented. We represent a home rental system which provides every needed facility the primary focus of our work is to implement constraint satisfaction problem in the search option of our home rental system. Our home rental system will have dynamic values for searching and for which constraint satisfaction problem implementation is a better preference. Not only this but also a combination of public transport tracker and a dynamic chat server between admin and agent is also a feature of this rental system. Additionally, there is a dynamic mail alert system in which if any user put any request in the wish list, they will be notified by this system.

2 User Classes and Characteristics

There are 3 types of stakeholders in our House Rental Management System. Such as-

i. **Police Officers:** Police Officers will get a same version of the application but the authorization will be different. They are the higher authority of the system. They can see and collect the tenant information like NID card number, number of people and their name. They can also get landlords information like there house information, how many people lives in a house. This module minimizes the problem of taking tenants information for a house. So, if they need any people's information like where they lived, they can get the information easily by the house rental management system.

ii. **Tenants:** Tenants also use the same application but they can only see the house information and the contact number of the landlords. From all the stakeholders, tenants have a limited access like they can only see house ads and can bookmark them. But this limited access gives them a big facility to look many houses within a short time. They can search houses by their own criteria like flat size, rent per month, specific location. An ad contains the landlords contact information which let them connect to the landlords and get more information about the house. They can also give reviews for the house where they live. Also, they can see review when renting a new house or flat. This gives them little idea about that house environment.

iii. **Landlords:** Landlords are the main stakeholder for the system. Here they can create ads for their house and add the information of a tenant who lives in their house. For giving ads, they have to pay specific amount of money and by removing ads they will get back their money if ads time not expired. They have to add tenant's information whenever some people rent their houses or flats. This will help the police officers to get access the information of tenants.

3 Design and Implementation Constraints

Design and implementation constraints are those that we have used to implement this project make successful. It also describes tool that enables developers and testers to view and interact with the user interface (UI) elements of this application.

3.1 Programming Language

We know that android is the most popular mobile app platform with largest number of devices running on this. It's already a common knowledge that android is based upon Java. Naturally Java being the core of android is likely to be the most preferred language for aspiring android developers. Java is also platform independent; it means that Java code can run on any platform. It doesn't require the source code on that machine at which platform, where it will be executed. Java is an object-oriented language which is another big reason for using this language for application development and it is secure because of using the classes and object.

For all of this major advantage of Java, we will use Java as a programming language.

3.2 XML

XML stands for Extensible Markup Language, which gives us a clue to what it does. A markup language is slightly different from a programming language. Programming languages create dynamic interactions, here as markup languages generally handle things like static user interfaces. XML uses XML elements or tags to define document structure. Basically, XML is used for our layout designing. All the UI and layout of our app will be designed using xml. Unlike Java (which is Back Bone of your app), xml helps us to design our app, how it will look, how components like buttons, textview etc. will be placed and their styling.

3.3 Database Server

MySQL is a free-to-use, open-source database that facilitates effective management of databases by connecting them to the software. That’s why we will use MySQL database server to store all of the information of this system. It is a stable, reliable and powerful solution with advanced features like the following:

- Data Security
- On-Demand Scalability
- High Performance
- Round-the-clock Uptime
- Comprehensive Transactional Support
- Complete Workflow Control
- The Flexibility of Open Source
- Fault tolerance

3.3.1 Web Server

A Web server is a program that uses HTTP (Hypertext Transfer Protocol) to serve the files that form Web pages to users, in response to their requests, which are forwarded by their computers' HTTP clients. Dedicated computers and appliances may be referred to as Web servers as well. We will use the Apache HTTP server to implement this project. We will use RESTful API to retrieve data from our server to mobile application. RESTful stands for Representational State Transfer. And API stands for Application Programming Interface.

4 Requirement Specification

All the requirements based on elicitation process is described in this section.

4.1 Functional Requirements

Functional requirements are those requirements that are used to illustrate the internal working nature of the system, the description of the system, and explanation of each subsystem. It consists of what task the system should perform, the processes involved, which data should the system holds and the interfaces with the user.

4.1.1 Search ads by specific criteria

FR-1	Search house ads based on specific criteria
Description	Stakeholders can search ads like search by flat size, rent per month and specific location. Also, they can search by ads name. If there are no ads found based on their criteria, system will show related ads on that criteria.
Stakeholders	Tenants, Landlords
Priority	High

4.1.2 Search ads by location

FR-2	Search house ads based on location
Description	Tenants only needs to click on an option “House nearby” and system at first detect the stakeholder’s position then based on that location it will list all the available houses near that area if any exists.
Stakeholders	Tenants, Landlords

Priority	Medium

4.1.3 Stakeholders can remember ads

FR-3	Stakeholders will bookmark ads to remember them
Description	If tenants found any desired ads he wants to see later, he can bookmark that ads and see the ads in favorite section.
Stakeholders	Tenants, Landlords
Priority	Medium

4.1.4 Stakeholders wants to get notified

FR-4	Stakeholders wants notification when a house is available for rent nearby his location
Description	While stakeholders want to notified when there a house nearby him or on a specific area. For getting notified stakeholders need to enable their notification. And whenever there is a house available for rent stakeholders will be notified.
Stakeholders	Tenants, Landlords
Priority	Low

4.1.5 Rent a house from the available ads

FR-5	Stakeholders wants to rent a house
Description	Stakeholders have to be a valid user of the system. Then he can see all the available ads added in the system. From the given ads list he can choose his favorable one and if everything looks good about the house to him, then he can contact with the house landlord.
Stakeholders	Tenants, Landlords
Priority	High

4.1.6 Communicate with landlords for renting a house

FR-6	Stakeholders can communicate with landlords
Description	After observing house ads, if stakeholders found a vacant house for him, he can contact through SMS, E-Mail, and Phone call with landlords. Phone number, E-Mail account will be placed in ads information.
Stakeholders	Tenants
Priority	High

4.1.7 Ranking for houses

FR-7	Tenants wants to rate a house
Description	For giving rating to a house tenant needs to be live at that house before or now. And select the house and give a rating to the house. The rating is between five stars maximum to no star minimum.
Stakeholders	Tenants
Priority	Low

4.1.8 Add new ads to the system

FR-8	Landlords wants to give ads for his house
Description	Landlords will upload his house info like rent per month, gas and water bill, picture of that house, deposit paid, terms and conditions to follow acceptance, how many days he wants to show the ads. And new ads are created based on the given information.
Stakeholders	Landlords
Priority	High

4.1.9 Boost existing ads

FR-9	Landlords wants to boost his ads

Description	Landlords can boost the ads when they are creating ads. For boosting the ads, they have to choose the specific payment credential and need to pay the exact amount of money. They also can boost existing ads doing the above process.
Stakeholders	Landlords
Priority	High

4.1.10 Remove ads from the system

FR-10	Landlords wants to Remove the ads from the system
Description	As landlords house get rented so they don't want to show the ads. For so they have to go to the ads and select it and then remove. When removing if they selected for 30 day to show the ads and removing it at 5th day of showing then they will get money for other 25 day.
Stakeholders	Landlords
Priority	High

4.1.11 Store tenant's information for a house

FR-11	Landlords can add and store tenant's information
Description	Landlords have to add tenant's information like tenant's National ID card information, phone number, permanent address, tenant's picture.
Stakeholders	Landlords
Priority	High

4.1.12 Access tenants and landlord's information

FR-12	Police Officers can access information from system
Description	Police officers has ability to access tenants and landlord's information like National ID card information, contact number.
Stakeholders	Police Officers
Priority	High

4.2 Data Requirements

For our application we have to store many information-like pictures from landlord's house, tenants picture this information needs to be stored in the system. For storing pictures system database needs to be limited.

4.2.1 Storing image data

DR-1	Stakeholders have to provide specific sized picture for the house
Description	Landlords will upload their ads information, house information and tenant's information. Also, images from the houses needs to be within 3 MB.
Stakeholders	Landlords
Priority	High

4.3 Performance Requirements

It is important to maintain performance of the software system. To ensure performance we maintain these steps:

4.3.1 Speed and Latency Requirements

PR-1	Faster searching houses and load ads quickly
Description	Loading the ads information will be faster and can load it within seconds. And any search result will show up within 1 seconds and images of the house will load within 5 seconds if the network speed is good.
Stakeholders	Landlords, Tenants
Priority	Medium

4.3.2 Precision and Accuracy Requirements

There are no precision and accuracy requirements for our project.

4.3.3 Capacity Requirements

This system can load up to thousands of tenant's information and thousands of ads information.

4.4 Dependability Requirements

If House Rental Management system can provide availability, reliability, safety, security then this system will be dependable.

4.4.1 Availability and Reliability Requirements

This system will be available for 24 hours. Stakeholders can use the system anytime they wanted and can see ads or rate a house and upload information which is very reliable for stakeholders.

4.4.2 Safety Requirements

This system will not contain any malware and this will not harm any stakeholder's device.

4.5 Maintainability and Supportability Requirements

It's very important to provide service to the end users.

4.5.1 Maintainability Requirements

MR-1	Update information
Description	It is very important to update tenant information as tenants will live various houses.
Stakeholders	Landlords
Priority	Low

4.5.2 Supportability Requirements

This system meets Testability, Maintainability, Compatibility, Configurability, Serviceability, install ability which are related to supportability requirements.

4.6 Security Requirements

Securing information is much more important for a system to get users dependability. Here is some of them:

4.6.1 Access Requirements

For accessing information, the system will use some authorization techniques to ensure that correct data is used by correct user.

4.6.2 Integrity Requirements

Integrity requirements refers to a security system which ensures an expectation of data quality. It also ensures that all data of the system would never be exposed to the malicious modification or accidental destruction. For preventing anonymous access to user password, the system will use encryption technique called Hash Function for encrypting user password.

4.6.3 Privacy Requirements

Privacy requirements enhances to protect stakeholder's privacy. In this way, all data or a partial part of data are going to be disclosed according to system's privacy policy. To ensure privacy, the central database should be protected by the anonymous. Users are permitted to get access to those data which are being associated by them which can be ensured by the user log in system.

4.7 Usability and Human-Interaction Requirements

This system will provide more user-friendly environment.

4.7.1 Ease of Use Requirements

Our system will be easier to use by any type of people and they don't need any training to use the system.

4.7.2 Personalization and Internationalization Requirements

There are no personalization and internationalization requirements in our system.

4.8 Look and Feel Requirements

Look and feel requirements mainly refers how the system will look like.

4.8.1 Appearance Requirements

AR-1	Text color and font
Description	All texts and description will be at a good font size so that users can understand what is important and mandatory input fields will be kept red colored until user put correct information.
Stakeholders	Tenants, Landlords, Police Officers
Priority	High

4.8.2 Style Requirements

There are no style requirements in our system.

4.9 Operational and Environmental Requirements

Operational and environmental requirement refers to the capabilities, performance measurements, process, measurements of effectiveness, measurements of performance, measures of sustainability, measurements of technical performances etc.

4.9.1 Expected Physical Requirements

There are no expected physical requirements in our system.

4.9.2 Requirements for Interfacing with Adjacent Systems

There are no requirements for interfacing with adjacent system for our project.

4.9.3 Release Requirements

There are no specific release requirements in our system.

4.10 Legal Requirements

Legal requirements normally refer to the terms and conditions or privacy policy of any organizations. The terms and condition of our application is that, no third-party software or person are allowed to engage to use our data for their business purpose.

5 Requirement Engineering Process

Requirements engineering refers to the process of defining, documenting and maintaining requirements in the engineering design process. It is a common role in systems engineering and software engineering.

5.1 Requirement Elicitation Techniques

Requirement Elicitation and Analysis is the process of interacting with customers and end-users to find out about the domain requirements, what services the system should provide, and the other constraints. We mainly use these techniques for gathering Requirement:

- Interview
- Questionnaire
- Existing System

5.1.1 Interview

Interview is a good technique to investigate issues in-depth, to discover how people think and feel about certain topics. We hold interviews that can be performed with a small group of stakeholders. We mainly perform our interview based on some specific criteria.

- Short description about project (Goals and objectives)
- Registration process
- Ways of search a house
- Security
- Availability
- Advertisement of a house
- Boosting

5.1.2 Questionnaire

Questionnaire is a useful technique to investigate trends, shifts in user attitudes and opinion, user satisfaction with priorities and preferences. We created two types of questions set for proper survey. One for tenants, and one for landlords. We try to Keep the questionnaire as short as possible – don’t bore or frustrate the respondent. Have an underlying reason for every question and Group topic areas together to keep the respondent focused. The main advantage behind this survey is responses are gathered in a standardized way. Information can be collected in short period of time from a large number of people, often geographically dispersed.

5.1.3 Perform Existing system Analysis

Existing system Analysis can help reveal how systems currently work or what they are supposed to do. Analysis includes any written information about current systems, business processes, requirements specifications, competitor research. Reviewing and analyzing can help identify functionality that needs to remain, functionality that isn't used. Currently the most property managers manage property and tenants' details on papers. After existing system analysis, we found many several problems on existing system.

Problems of existing system:

• With the current system recording the details of various activities of user is completely manual and entails a lot of paper work.

• The existing system only provides text-based interface which is not as user friendly as Graphical user interface

• The transactions are not secure as papers may get lost or damaged.

6 Appendix

6.1 Prioritization of requirements

We've prioritized the functional requirements by following **Three-level Scale technique.**

6.1.1 Three-level Scale

When a Business Analyst categorizes the requirements in any of the ordering or ranking scale, it is subject to the analyst's understanding of the business. Many analysts suggest that this method has some drawbacks and advocate methods that have more than one scale.

FR1 – High priority: Its essential requirement for our system. Stakeholder always can't find his vacant house in default dashboard ads. So, it's very important for a stakeholder that he can find a house with some specific criteria.

FR2 – Medium priority: Sometimes stakeholder wants houses nearby where he lives in. So stakeholder just need to click "House nearby" button , then he can see all those ads which is placed at his location. So it is very important requirement for our system.

FR3 – Medium priority: It is also urgent requirement for our system. Because sometimes stakeholder wants to bookmark some desire ads so that he can check it later.

FR4 – Low priority: This feature is basically less important for the system as well as for the Stakeholders. Because stakeholders will be rarely notified when there is any available house around his location. So, we implement this requirement later.

FR5 – High priority: It is the main theme of our project. This the most important and urgent requirement in the system. This requirement defines how a stakeholder can rent a house.

FR6 – High priority: This requirement is also highly important because tenants will have to communicate with the house owners

FR7 – Low priority: Rating is not that important for getting a house rented. And searching house ads is not depend on rating of a house.

FR8 – High priority: Adding ads is important. If new ads not added to the system stakeholders won't see ads or get house ads.

FR9 – High priority: This is one of the best requirements in our system. Cause this requirement is basically making the difference between our system and other available systems.

FR10 – High priority: As posting ads on the system is a bit costly so no one would want to continue posting their ads even after getting his house rented. So, the landlord will must remove the ads from the system for saving money.

FR11 – High priority: In our country, normally police collect tenant's information manually. But we want to digitalize this system by storing all the information of the tenants and provide them to the police.

FR12 – High priority: Police officers can access all information that are saved in our system. For security issue police need to access the information about tenants as well as landlords.

DR1 – High priority: Landlords will upload their house's recent pictures. But the pictures must not exceed 3MB limit so that database do not be too much large in size.

PR1 – Medium priority: Searched result will be loaded within a second and pictures will be loaded within 5 seconds. Sometimes it may take some more times, but this is not that much important cause it may take some time that shouldn't matter that much.

MR1 – Medium priority: Its important to update the database of the newly renting peoples because police may need to get any information of the current tenants of any house.

AR1 – High Priority: To attract the online users to use our system more and more, color and font are so much important part. Just to ensure that users do not get distracted for the color combination or font size and font colors.