SYSTEM REQUIREMENT SPECIFICATION

Contents

INTRODUCTION

A. PURPOSE

This SRS document defines the software requirements for homelink Enterprise Performance Tracking, which is intended to increase the organization's efficiency by tracking agent performance, property listings, and market trends.

This SRS includes the system's core capabilities such as performance measurements, customer and agent administration, property listings, and real estate market prediction tools.

B. INTENDED AUDIENCE AND READING SUGGESTIONS

This System Requirements Specification (SRS) document is intended for a diverse group of stakeholders engaged in the system's development and deployment. Each reader type will find sections that are relevant to their role and engagement in the project.

Readers

1. **Developer**:

   This paper will serve as a roadmap for developer as they code the system. They will focus on the functional requirements, system architecture, and detailed specifications for each module.

2. **Users**:

   End users are not required to grasp technical details, but the user interface requirements and system features sections can assist them comprehend how the system will meet their needs. This document helps users understand the system's capabilities and usability.

3. **Tester (Quality Assurance)**:

The SRS will assist the tester in designing test scenarios and ensuring system functionality. They will focus on functional and non-functional requirements to create test scenarios that cover system performance, security, usability, and compatibility. They will also need to confirm that all of the conditions have been met.

Document Structure and Organization

This SRS document is divided into sections that take the reader through many facets of the system. It gives an overview of the system and specifies the functional, performance, and interface requirements.

- Introduction: - Provides an overview of the project's objective, scope, and target audience. This part is crucial for all reader types to comprehend the system's overarching purpose.
- Overall description: - This section describes the system's environment, important stakeholders, restrictions, and assumptions. This part will be extremely useful for project managers and developers when planning and developing.
- System Features: - Provide detailed explanations of system functionality, user interactions, and features. This part is primarily intended for developers and testers, although it is also useful for project managers and end users.
- External Interface Requirements: Describes the system's interfaces with external systems, such as databases and user interfaces. Developers and testers should concentrate here to better understand how the system interacts with other components.
- Non-Functional Requirements: - Outlines performance, security, usability, and compatibility requirements. The tester and developer should prioritize this part to guarantee that the system satisfies the required criteria.
- Other Requirements: This section may cover legal, regulatory, or compliance needs. This section can help the documentation writer check that the system complies with applicable laws and standards.

Suggested Reading Sequence:

- The developer can proceed to the System Features and External Interface Requirements sections. These are critical to understanding the system's functionality and technical structure.
- The tester should start with the System Features and Non-Functional Requirements sections to identify key areas for testing. Refer to the External Interface Requirements for integration testing.

C. PROJECT SCOPE

The system is a web-based software solution for monitoring, analyzing, and improving the operational efficiency of real estate businesses. The system includes features for monitoring agent performance, managing property listings, and providing market analysis. Its major goal is to help real estate managers and agents streamline their everyday operations, improve decision-making, and drive business growth via actionable information.

Key Benefits and Objectives:

- The system tracks real estate agent actions to evaluate performance in real-time, identifying top performers and areas for improvement.
- The technology simplifies property administration by centralizing information, automating availability updates, and analyzing pricing patterns.
- The solution blends data analytics and predictive models, enabling real estate firms to monitor market trends, forecast demand, and optimize investment strategies.

Relation to Corporate Goals and Business Strategies:

The new system's development corresponds with the company's aims of boosting operational efficiency, increasing customer satisfaction, and driving revenue growth. The solution will allow real estate companies to use data-driven insights to make more educated decisions, increase agent productivity, and remain competitive in the ever-changing real estate market.

The technology is also intended to facilitate a scalable expansion strategy for businesses. Adopting the system allows the real estate company to present itself as a technology-driven enterprise, increasing its brand and assuring better market placement through improved service delivery.

OVERALL DESCRIPTION

A. USER CLASSES AND CHARACTERISTICS

The system will service a wide range of users, each with unique jobs, levels of expertise, and access privileges. These user classes are classified based on frequency of use, specific functions performed, technical proficiency, and security levels. The system will provide functionality that is suited to the demands of each user class.

1. Real Estate Managers (Admin Users): Real estate managers will use the system to make decisions, assess agent performance, and track overall business productivity. They will make heavy use of reporting and analytics to inform their strategic decisions. Real estate managers are a high-priority user class because their involvement is critical to attaining the system's business objectives. Meeting customer expectations, such as thorough reporting and user management tools, is critical to system success.
2. Real Estate Agents (Regular Users): Agents will use the system largely to manage their day-to-day operations. To avoid disturbances in their productivity, the user interface should be straightforward and speedy, with a focus on ease of use. Agents are also an important user class because their performance contributes to the system's overall performance metrics. The system must meet their needs through a simple, efficient interface.
3. Clients (External Users): Clients are users who will interact with the system to conduct property searches and inquiries. To encourage people to engage with real estate brokers, their experience must be seamless and user friendly. While vital for overall company goals, clients will have limited engagement with the system, therefore their interface needs are simpler.
4. Data Analysts (Specialized Users): Analysts will be responsible for interpreting patterns and generating predictions. They require advanced reporting and data export features to undertake in-depth studies. Their function is crucial to strategic decision-making, but they may not be the system's primary users. Ensuring robust analytics tools will assist managers in making data-driven decisions.
5. System Administrators (IT Support) require precise system diagnostics, logs, and support tools to efficiently manage the system and respond to technical issues as they emerge.

System administrators engage with fundamental functionality less than managers or agents, despite their importance to system stability.

B. OPERATING ENVIRONMENT

The system will run on a standard web-based client-server architecture, with access via internet-connected devices. The system is designed to be interoperable with a wide range of hardware platforms, operating systems, and software environments, ensuring flexibility and usefulness for all user types. The following are the important elements of the environment in which the software will operate:

1. Hardware Platform.

   Client-side (end-user devices):

   - Desktops and laptops:
   - Tablets and Smartphones:

   Server-Side (System Hosting Platform):

   - Physical server:

2. Operating System

   Client-Side:

   - The system is compatible with recent operating systems and web browsers.

   Server-side

   - The server's operating system should support the web framework (Django) and associated technologies (databases).

3. Web Browsers

• The system will support modern web browsers with regular upgrades and support for web standards like HTML5, CSS3, and JavaScript.

4. Database Management System (DBMS)

• The database will be run on the server and must be designed for speed and scalability. SQLite will be utilized during development.

5. Web Application Framework

• The system is developed and run using Django. It will include the tools required for developing the system's backend, managing user authentication, database transactions, and serving the web interface.

C. DESIGN AND IMPLIMENTATION CONSTRAINTS

Several constraints will influence the creation of the Real Estate Enterprise Performance Tracking System thereby limiting the developer's options. Addressing these limits will guarantee that the system fulfills operational, regulatory, and performance standards while maintaining a stable and secure environment for users.

1. Corporate or Regulatory Policies: The system must adhere to local and international data protection rules. These restrictions will influence how user data (such as personal information and property records) is stored, processed, and communicated. The system must also have ways for users to control consent, access, and deletion of their data.

2. Hardware Limitations: Some real estate agents and clients may utilize older or less capable equipment, which may limit the system's performance and responsiveness, especially for elements that need a lot of processing power (for example, real-time analytics, data visualizations). The user interface must be tuned to function well on a variety of devices, including low-end smartphones and tablets.

3. Integration with existing data: The developer will need to create procedures for moving data (such as agent information and property listings) to the new platform. This may include data conversion problems, maintaining compatibility with the system's database schema, and preventing data loss.

4. Parallel Operations: Concurrency control and transaction management must be included in the system to ensure data consistency even when several users access or update the same records at the same time.

D. USER DOCUMENTATION

The system will be complemented by extensive user documentation to assist various user groups, such as real estate agents, managers, administrative staff, and clients. The documentation will be developed to assist users in understanding how to efficiently run the system, troubleshoot common issues, and obtain support when necessary. The following are the main components of the user documentation:

1. User Manuals.
   - Provide step-by-step instructions for using system features and functionalities.
   - Delivery formats include downloadable PDFs and an integrated HTML-based online handbook.
2. Tutorials.
   - Purpose: Provide hands-on exercises and guided tutorials to help new users become comfortable with system functions.
   - Delivery Format: Online video and text-based tutorials available through the system or tutorial area in the main menu.
3. Quick Reference Guides.
   - The purpose of this guide is to provide a summary of key facts and functions without comprehensive explanations.
   - Delivery format includes a downloadable PDF and a one-page brief guide incorporated in the user interface.
4. Knowledge Base:
   - Provides articles, guidelines, and tools to assist users address difficulties and master advanced functionality.
   - Delivery Format: An online knowledge base accessible through the system's support department.

Documentation Standard

- The ISO/IEC 26514 standard defines requirements for software and system documentation, ensuring clarity, usability, and accessibility for all user types.

E. ASSUMPTIONS AND DEPENDENCIES

Assumptions

Client and end-user accessibility.

- Assumption: End-users (real estate agents, managers, and clients) will have access to devices with current browsers that support required technologies (JavaScript, CSS3, HTML5, and React).
- Risk: Using obsolete devices or browsers that do not support the system's technologies may result in performance difficulties or inaccessibility.
- To ensure compatibility, I will provide minimum system requirements and test the application across browsers and devices.

Good Internet connectivity

- Assumption: Users will have steady internet connections and enough bandwidth to interact with real-time services including property searches, performance tracking, and data visualizations.
- Poor internet access, especially in distant places, may negatively impact system usage.
- Optimize the system for slower connections or enable offline capabilities for specific tasks as mitigation measures.

Data accuracy and integrity.

- Assumption: The system's data sources (property records, performance measures, and agent data) will be accurate, up-to-date, and consistent.
- Inaccuracies, inconsistencies, or missing information in data can cause inaccurate analytics, unreliable performance reports, and user unhappiness.
- Implement data validation and rectification tools for mitigation purposes.

User Training and Adoption

- Assumption: Agents and supervisors will receive enough training and support to use the system and its capabilities.

- Insufficient training may lead to inappropriate use, frustration, and reluctance to use the system.
- Mitigation: Offer comprehensive user manuals, tutorials, and continuing training sessions.

2. Dependencies

Reusable software components

- Certain software components, including as authentication, reporting, and payment processing modules, will be reused from past projects or open-source libraries.
- Outdated, incompatible, or poorly maintained components may provide security or performance hazards.
- Mitigation: Conduct regular audits of reused components to verify they meet security standards and are up to date.

Development and testing tools

- The project depends on development tools, frameworks (Django, React), and testing platforms for deployment.
- Risk: Outdated or unsupported tools may impair development processes.
- Mitigation: Use widely supported tools with active communities and backup important tool configurations.

Legal and Regulatory Compliance.

- Non-compliance may result in legal concerns, fines, or restrictions on system implementation.
- Mitigation: Regularly engage with legal professionals and conduct data protection assessments to ensure compliance.

FUNCTIONAL REQUIREMENTS

A. REQUIREMENTS

REQ-1: User Authentication

The system must provide a secure login feature that requires proper credentials (username and password). If the login fails due to invalid entries, the system must provide an error message and allow retries.

REQ-2: Property Management

The system should enable users to add, amend, view, and delete property records in the database. In the event of invalid inputs, the system should notify the user to fix them before submitting.

REQ-3: Employee Performance Tracking

The system should enable managers to record and monitor employee performance statistics. When users attempt to submit performance data, the system should warn them if any fields are missing or incomplete.

REQ-4: Report Generation

The system should enable users to generate and export reports on property and employee performance in many formats (PDF, Excel). In the event of missing or corrupt data, the system should display an error message and prevent report generation until the problem is fixed.

REQ-5: Notifications and Alerts

The system should automatically provide notifications and alerts (overdue payments, performance updates) via email and SMS. If notifications fail, the system should log the problem and attempt to resend.

B. SYSTEM FEATURES

Login Page

Description and Priority: The login page requires authentication credentials (username and password) to ensure secure access to the system. This is a high priority feature because it plays an important role in managing access to system operations.

Property Database Management.

Description and Priority: The property database management module will store and manage real estate data, such as property details, owner information, and performance indicators. This feature will be highly prioritized because it will act as the central store for all tracked data.

Employee Performance Tracking.

Description and Priority: the module will track staff performance in real estate tasks like sales, inspections, and interactions with clients. It is a medium-priority feature that improves operational efficiency.

Real Estate Analytics Dashboard.

Description and priority: The analytics dashboard will track real-time information and KPIs for real estate properties and staff performance. This is a high priority characteristic because of its strategic significance in decision-making.

EXTERNAL USER REQUIREMENTS

A. USER INTERFACES

The system's user interface (UI) will be designed to be easy to use, intuitive to navigate, and consistent across all modules.

Logical Characteristics of Key Screens

- ✓ Login Screen

Components: username, password, "Forgot Password?" link, and "Login" button.

- Standard: The "Login" button will be hidden until both fields are completed.
- Error Handling: Incorrect credentials will display an error notice at the top of screen.

  Security measures include password and masking

✓ Dashboard (Home Page)

Components include a customized dashboard displaying crucial indicators such as recent property sales and agent performance.

- Graphs and charts displaying trends.
- Include quick connections to frequently used features (“Create New Property," "View Reports").

✓ Property Management Screen

Components:

- Table with sortable columns (location, price, status).
- The "Create New Property" button.
- Use of filters to narrow search results by location, status, or price.
- The details page for each property includes photographs, descriptions, and a status update form.

✓ Agent Performance Dashboard.

Components

- Graphical display of key performance indicators (KPIs) like sales, commissions, and client satisfaction ratings.
- A table containing individual agent performance statistics.
- Filter by date range, agent name, and property type.
- Performance reports can be exported in many formats, including PDF and Excel.

✓ The Transaction Management Screen includes

- A transaction log with sortable columns for property, agent, client, and transaction status.
- A milestone tracker for each transaction (offer made, accepted, and closed).
- A document upload mechanism for storing transaction-related files, such as contracts. Logical features include the ability to upload numerous documents via drag-and-drop.
- Agents and clients will receive automated email reminders upon reaching critical transaction milestones.

B. HARDWARE INTERFACES

The system will work with a variety of physical components to ensure proper operation, data gathering, and communication. This section discusses the logical and physical properties of various interfaces, such as supporting devices, data interactions, and communication protocols.

Supported Device Types

The system will communicate with a variety of hardware devices to facilitate its operations across several platforms. The primary devices are:

- Desktop and laptop computers are used by agents, managers, and administrators for daily tasks such as property management, report generation, and performance tracking.
- Field agents and on-the-go users can access and control system functionalities such as updating property listings, managing transactions, and seeing dashboards via mobile devices (smartphones and tablets).
  Logical characteristics of the software-hardware interface

Data-Control Interactions

The system will enable continuous data interchange between client devices (desktops, laptops, mobile devices) and backend servers. The interaction will consist of property data, agent performance data, transaction information, and client records.

Input data will come from users, such as agents and managers, who enter new property details, update performance indicators, and submit transaction paperwork.
Output data includes reports, dashboards, and notifications created by user behavior, system analytics, and predictive performance models.

Communication Protocols.

- HTTP/HTTPS will used for all client-server communication. Secure connection between the user's device and the server will be secured with HTTPS to protect data privacy and integrity.
- The software and hardware components will communicate using the TCP/IP protocol suite to provide reliable packet delivery over the network.
- Wi-Fi and Mobile Data: Both mobile and desktop users will access the system via Wi-Fi or mobile data. To prevent disruptions, the network must ensure reliable and secure connectivity.

C. SOFTWARE INTERFACES

The system works with a number of software components, each fulfilling a distinct purpose. These elements include databases and operating systems. The following is a full description of how the system interacts with these components, including the messages and data exchanged and how services are integrated.

1. Databases

The primary database is PostgreSQL, which stores and manages data such as:

- User Data: Details about agents, managers, and administrators.
- Real estate listings include property descriptions, locations, pricing, and transaction history.
- Performance data includes metrics for staff performance, sales, and customer happiness. Financial data refers to payments, commissions, and contracts.

Data Interaction:

- Incoming Data: When users enter data (adding a new property, updating performance records, or processing transactions), it is stored to the PostgreSQL database using SQL queries.
- SQL queries will retrieve and present data in user-friendly formats (JSON, HTML) for reports, dashboards, and property listings.

Service Provided:

- Enforces data integrity and consistency by tracking all property listings, transactions, and user data consistently.
- Backup and Restore: Automates backups and restores data after system failure or loss.

2. Operating Systems

Supported Operating Systems:

- Ubuntu Linux (Version 20.04), Windows
- The desktop client program or web portal supports Windows 10/11 and macOS for agents, managers, and administrators.

Data Interaction:

- The system will communicate with these operating systems using TCP/IP networking for HTTP/HTTPS requests and responses.
- System calls are used to conduct I/O operations, access hardware, and manage user sessions.

Services provided:

- Hosting environment for Django-based web application.

- Security: Offers operating system-level firewalls and security services to prevent unauthorized data access.

D. COMMUNICATION INTERFACES

To enable interactions between users, servers, and third-party services, the system requires a number of communication functions.

Web Browser Communication

Purpose: The system will be web-based and accessible via common web browsers. It offers capabilities such as property search and classifieds. The system is compatible with modern web browsers, such as Google Chrome
Mozilla Firefox
Microsoft Edge.
Safari.

Network Server Communication Protocols: The system will use server-side logic to manage database interactions, authentication, and performance tracking

OTHER NON FUNCTIONAL REQUIREMENTS

A. PERFORMANCE REQUIREMENTS

The performance requirements specify how the system should act under various operational scenarios to guarantee it satisfies user expectations for responsiveness, resource consumption, and scalability. These requirements are intended to help the developer make appropriate design decisions in order to provide the best possible user experience, particularly in the context of real-time performance tracking. Each criterion is intended to handle critical characteristics such as speed, resource efficiency, and system capacity.

1. Response Time

Requirement:

- The system should respond quickly to user activities
- Critical tasks, such as property listing changes or payment processing, should complete within 4 seconds of user submission.

To ensure a good user experience, real-time performance tracking require prompt input from the system.

2. Data Retrieval and Processing

Requirement:

- The system should obtain performance statistics from the database within 1 second for queries with up to 10,000 records.
- For data sets with more than 10,000 records, retrieval and processing time should not exceed 3 seconds.
- Requires sophisticated data processes, such as aggregating performance statistics, to be completed within 2 seconds for data sets with fewer than 10,000 items.

Fast data retrieval reduces delays for customers obtaining performance statistics, property details, and transaction records, leading to more efficient business choices.

3. Scalability and Load Handling

Requirement:

- The system should support up to 100 concurrent users without performance deterioration, and scale to 500 concurrent users during peak situations.
- The system's performance should not decline by more than 10% for every 100 extra users, including response times and resource consumption.
- The system should be capable of processing up to 10 property listings and 100 concurrent property searches with little performance degradation.

The system must be scalable to accommodate various real estate agents, managers, and clients. The system should run well during high traffic and peak usage periods, without crashing or slowing down.

B. SAFETY REQUIREMENTS

When building the system, it is necessary to identify and clarify the requirements that address potential loss, damage, or injury caused by the product's use. Furthermore, safeguards and measures must be designed to reduce risks related with the system's operation.

- The system must comply with data protection requirements, such as the General Data Protection Regulation (GDPR) to protect personal information about users and properties.
- Encrypt sensitive user data, such as payment information and personal identification, using industry-standard protocols (AES-256) during transit and at rest.

Action

- To prevent unwanted access, implement user authentication and authorization protocols (multi-factor authentication).
- Perform frequent security audits and vulnerability assessments to discover and address potential data security flaws.

C. SECURITY REQUIREMENTS

To protect user data and ensure compliance with applicable legislation, thorough security and privacy standards must be established while developing the system. The following requirements cover data protection, user authentication, and compliance with applicable security standards and certifications.

1. Data Protection Requirements

- The system should use industry-standard encryption protocols

- In non-production environments, sensitive user data must be anonym zed to avoid unwanted access or exposure.

2. User Authentication Requirements

- All users must use multi-factor authentication using at least two verification methods (password and mobile verification code) to access critical portions of the application.
- Lock user accounts after five unsuccessful login attempts to prevent brute-force attacks. Automatic unlock occurs after a set period or requires administrative involvement.

3. Compliance with Regulations and Policies

Requirement:

- The system must comply with the General Data Protection Regulation (GDPR) for data protection and privacy in the European Union. Users have the right to view, amend, and erase their personal information.

D. SOFTWARE QUALITY ATTRIBUTES

In addition to functional requirements, quality attributes for the system must be defined so that both customers and developers can understand them. These features ensure that the system meets user expectations while also being efficiently maintained and developed over time.

1. Usability

- The system should provide a user-friendly interface that enables users to execute common operations (signing in, creating reports) with 3 clicks or less.
- Measure user satisfaction using surveys, with a target of 85% ease of use after the first month of deployment.

2. Availability

- The system must maintain maximum monthly uptime including periodic maintenance during off-peak hours.

3. Reliability

- The system's failure rate must be less than 1% during normal operational conditions, measured 6 months after deployment.
- Critical failures should have a mean time to recovery of no more than 30 minutes.

4. Maintainability

- The system should enable developers to discover and resolve faults within 24 hours.
- Requires regular code documentation updates to provide 90% coverage of functions and modules.

OTHER REQUIREMENTS

In addition to the previously established objectives, the sections that follow detail additional needs that are critical to the successful development and implementation of the system. These requirements include database specifications, internationalization needs, legal issues, and reuse goals.

1. Database Requirements

- The system requires a relational database management system that can handle many per table without performance deterioration.

- The database will provide data backup and recovery, with automated daily backups stored securely off-site and retrievable within 1 hour of request.

2. Legal Requirements

- The system must follow all data protection rules and regulations, including the General Data Protection Regulation (GDPR)
- Users must accept user agreements and terms of service during registration to gain access to the system.
- The system will guarantee that all real estate listings and transactions follow local rules and regulations, including licensing requirements.

3. Reuse Objectives

- The use of existing open-source libraries and frameworks will reduce development time by at least 20% through reuse.
- Document and package any reusable project components for future usage and easy integration into other projects.

4. Scalability Requirements

- The system should support many concurrent users without performance deterioration.

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