

Project: Service Request System (SRS)

CSE 5325 – Spring 2024

Project Management

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1. Introduction and Executive Summary

The Service Request System (SRS) project aims to develop a comprehensive platform to facilitate service requests for home and small business owners. The project entails the design and implementation of a website and corresponding mobile applications (for Android and iOS) to connect service requesters with providers. The system will enable users to initiate service requests across various categories, ranging from appliances and electrical to tutoring and pest control. The primary objective is to streamline the service procurement process while ensuring user satisfaction and operational efficiency. This document outlines the scope, feasibility, and key objectives of the project, laying the groundwork for its successful execution within the specified timeline.

2. Objectives

2.1 BUSINESS OBJECTIVES

Objective 1: User Registration

- Facilitate user registration by collecting essential information like name, email, phone number, and address. While browsing services is optional without registration, placing service requests and becoming service providers necessitates registration. Ensure a smooth registration process with user incentives like points or discounts to boost engagement. Safeguard user data securely and adhere to data protection regulations.

Objective 2: Secure Login & Authentication

- Implement robust login and authentication mechanisms for both service providers and users. Utilize strong authentication methods such as two-factor or biometric authentication to enhance security. Regularly update security measures to counter potential threats. Prioritize seamless user experience while upholding stringent security standards.

Objective 3: Service Categories

- Offer a diverse range of service categories like appliances, plumbing, tutoring, and more to cater to user needs. Enable easy addition of new service categories without complex programming. Provide comprehensive descriptions for each category to aid user decision-making. Continuously assess user feedback and market trends to expand service offerings as per evolving demands.

Objective 4: Service Provider Registration

- Streamline service provider registration by collecting contact details and sample rates. Ensure service providers agree to pay commissions for fulfilled service requests. Simplify the registration process, verify provider credentials, and maintain service quality standards. Provide tools and resources for providers to manage their profiles effectively.

Objective 5: Place Service Requests

- Allow users to easily place service requests by selecting relevant categories and providing necessary details. Enable users to review bids from service providers before finalizing their selection. Ensure transparency and efficiency throughout the request placement process. Incorporate user-friendly interfaces and intuitive workflows to enhance user experience.

Objective 6: Cancellation and Change

- Provide users with the flexibility to cancel or modify service dates, with penalties outlined in the setup. Ensure clear communication of cancellation policies and penalties to users. Implement a user-friendly interface for managing cancellations and changes, minimizing inconvenience for both users and service providers.

Objective 7: Accept Service Requests

- Empower service providers to view and accept service requests from users. Enable providers to submit bids for requested services and communicate with users as needed. Facilitate seamless interaction between users and providers to streamline service request fulfillment. Prioritize user satisfaction by ensuring timely responses to service requests.

Objective 8: Payment Handling

- Securely handle payments made by users and received by service providers through the platform. Deduct commissions from service fees and ensure transparent transaction processing. Implement robust payment gateways to safeguard financial transactions and user data. Maintain accurate records of transactions and commissions for accountability and reconciliation.

Objective 9: Review and Rating

- Enable users to rate service providers based on their experience using a star rating system and optionally provide comments. Restrict reviews to users who have received services to maintain credibility. Empower users to make informed decisions by showcasing provider ratings and reviews prominently. Implement mechanisms to address and resolve negative feedback constructively.

Objective 10: Order History

- Grant users access to their order history, allowing them to track past service requests and payments. Provide detailed summaries of past transactions, including service details, dates, and payment information. Facilitate easy retrieval and review of order history to enhance user convenience and satisfaction.

Objective 11: Search Functionality

- Implement robust search functionality allowing users to find services based on various criteria such as service type, availability date, rating, and price. Enhance discoverability by offering advanced filtering options and sorting capabilities. Ensure fast and accurate search results to streamline user navigation and decision-making.

Objective 12: Map Integration

- Integrate maps into the platform to display the locations of service providers and provide directions to users' locations. Enhance user experience by offering visual representations of service provider locations and nearby amenities. Enable users to easily locate and navigate to service providers, improving accessibility and convenience.

Objective 13: Setup Control Fields

- Provide customizable setup control fields that allow users to personalize their experience on the platform. Offer options to enable or disable features such as sounds, communications, and point usage. Empower users to tailor their settings according to their preferences, enhancing overall satisfaction and engagement.

Objective 14: Advertisement Opportunities

- Explore opportunities for internal and external advertising to generate additional revenue for the platform. Utilize targeted advertising to promote relevant services and products to users. Implement non-intrusive ad placements that complement the user experience without compromising usability. Maximize advertising revenue while maintaining a positive user experience.

2.2 SYSTEM OBJECTIVES

Objective 1: Cross-Platform Support

- Ensure compatibility with both web-based and mobile (Android and iOS) platforms to maximize accessibility and reach. Develop responsive designs and adaptive layouts to ensure consistent user experience across devices. Utilize industry-standard frameworks and technologies to streamline cross-platform development and maintenance processes.

Objective 2: Integration with Google Search

- Integrate Google Search functionality into the system to enhance user discoverability and searchability. Enable users to easily find services, service providers, and relevant information within the platform through seamless integration with Google Search APIs. Optimize search algorithms and indexing processes to deliver accurate and relevant search results in real-time.

Objective 3: Secure User Authentication

- Implement a secure user authentication system that verifies user identities and protects against unauthorized access. Utilize industry best practices such as encryption, hashing, and salting to safeguard user credentials and sensitive information. Employ multi-factor authentication mechanisms to enhance security and mitigate risks of identity theft and unauthorized access.

Objective 4: Robust Database Management

- Develop a robust database management system to efficiently store and manage large volumes of user data, service requests, bids, payments, and other critical information. Utilize scalable and reliable database technologies to ensure data integrity, reliability, and performance. Implement data encryption and backup mechanisms to safeguard against data loss and corruption.

Objective 5: Flexible Service Category Management

- Design a flexible system that allows administrators to easily manage service categories without extensive programming efforts. Provide intuitive interfaces and tools for adding, editing, and deleting service categories. Enable dynamic category creation and modification to accommodate evolving user needs and market trends.

Objective 6: Geolocation Services Integration

- Integrate geolocation services to enable users to view the locations of service providers on maps, calculate distances, and receive directions to service provider locations. Leverage geolocation APIs to provide accurate and real-time location-based services. Ensure compliance with privacy regulations and user consent requirements when accessing location data.

Objective 7: Reliable Payment Handling

- Implement a reliable payment handling system that securely processes financial transactions between users and service providers. Integrate with trusted payment gateways and financial institutions to facilitate secure and seamless payment processing.

Implement fraud detection and prevention measures to mitigate risks associated with online transactions.

Objective 8: Efficient Communication Channels

- Develop efficient communication channels, including messaging and notifications, to facilitate real-time communication between users and service providers. Utilize push notifications, email notifications, and in-app messaging to keep users informed about service requests, bids, and other important updates. Ensure timely delivery and responsiveness of communication channels to enhance user engagement and satisfaction.

Objective 9: Effective Feedback and Rating System

- Create an effective feedback and rating system that enables users to provide reviews and ratings for service providers. Implement a user-friendly interface for submitting feedback and ratings, with options to provide comments and suggestions for improvement. Analyze feedback data to identify trends and patterns, allowing for continuous service quality improvement.

Objective 10: Seamless Order History Management

- Provide users with access to their order history, allowing them to track past service requests, payments, and interactions with service providers. Develop intuitive interfaces for navigating and filtering order history records based on various criteria such as date, service type, and provider. Ensure data accuracy and consistency across all order history records.

Objective 11: Advanced Search Functionality

- Implement advanced search functionality that enables users to search for services based on various criteria such as service type, availability date, rating, and price. Utilize advanced search algorithms and indexing techniques to deliver fast and accurate search results. Provide filtering and sorting options to refine search results based on user preferences and requirements.

Objective 12: Map Integration for Location Services

- Integrate maps into the platform to provide users with visual representations of service provider locations and directions to their desired destinations. Leverage mapping APIs to display interactive maps with markers for service provider locations and user destinations. Enhance map integration with features such as geocoding, route optimization, and real-time traffic updates.

Objective 13: Customizable Setup Control Fields

- Develop customizable setup control fields that allow users to personalize their experience on the platform. Provide options for adjusting settings such as sound preferences, communication preferences, and point usage options. Ensure flexibility and ease of use in configuring setup control fields to accommodate diverse user preferences and requirements.

Objective 14: Advertisement Opportunities for Revenue Generation

- Explore opportunities for internal and external advertising to generate additional revenue for the platform. Implement targeted advertising strategies to promote relevant services, products, and content to users. Utilize advertising placements that enhance user experience without compromising usability or intrusiveness. Maximize advertising revenue while maintaining user engagement and satisfaction.

3 Project Feasibility, Risks, and Metrics

Project feasibility and metrics are summarized below:

3.1 PROJECT FEASIBILITY CONCERNS

Market Readiness: Evaluating if the market is ready for the service request system considering competition, user demand, and market trends.

Technical Challenges: Dealing with potential technical issues like system scalability, security vulnerabilities, and integration complexities.

Resource Availability: Making sure there are enough skilled personnel, technology, and funds to support system development and maintenance.

Cost Management: Managing project costs efficiently to stay within budget limits while delivering a high-quality system.

Time to Market: Minimizing the time needed to launch the system by streamlining development processes and managing project timelines effectively.

3.2 PROJECT RISKS

Market Competition: High competition in the market may affect user adoption and penetration. **Mitigation:** Conducting thorough market analysis and developing effective marketing strategies.

Technical Challenges: Possible issues such as system downtime or data breaches. **Mitigation:** Implementing robust cybersecurity measures and conducting thorough testing.

Resource Constraints: Insufficient resources like skilled personnel or funding. **Mitigation:** Prioritizing resource allocation and securing additional funding if needed.

Legal and Compliance Risks: Risks related to failure to comply with laws and regulations. **Mitigation:** Engaging legal experts and implementing privacy safeguards.

User Acceptance: Difficulty in convincing users to use the platform. **Mitigation:** Implementing user-friendly designs and incentives for engagement.

3.3 PROJECT METRICS

1. User Registration Rate (URR):

- **Formula:** $(\text{Number of Users Registered} / \text{Total Target User Population}) \times 100\%$
- This metric measures the percentage of users who register on the platform within a specific time frame.

2. Service Provider Acquisition Rate (SPAR):

- **Formula:** $(\text{Number of Service Providers Joined} / \text{Target Service Provider Pool}) \times 100\%$
- SPAR calculates the percentage of service providers who join the platform compared to the total target number of service providers.

3. Service Request Volume (SRV):

- **Formula:** Forecasted number of service requests processed within a given period.
- SRV represents the anticipated number of service requests expected to be processed within a specified time frame.

4. User Engagement Metrics:

4.1 Active User Count (AUC):

- **Formula:** Number of Active Users / Total Registered Users
- AUC measures the proportion of registered users who actively engage with the platform within a specific time frame.

4.2 Session Booking Frequency (SBF):

- **Formula:** Total Number of Tutoring Sessions Booked / Total Active Users
- SBF indicates how often users book tutoring sessions, reflecting their engagement level.

4.3 User Retention Rate (URR):

- **Formula:** [(Number of Users at the End of a Period - Number of New Users During the Period) / Number of Users at the Start of the Period] x 100%
- URR assesses the percentage of users who continue to use the platform over time, reflecting its ability to retain users.

5. Financial Performance Metrics:

5.1 Gross Profit Margine:

- **Formula:** Gross Profit Margin = (Revenue - Cost of Sales) / Revenue * 100

5.2 Transaction Volume (TV):

- **Formula:** Total Number of Transactions Processed
- TV measures the total number of transactions (service requests) processed through the platform within a specific time frame.

5.3 Cost-to-Income Ratio (CIR):

- **Formula:** (Total Project Cost / Total Revenue Generated) x 100%
- CIR evaluates the efficiency of the platform by comparing the total project cost to the total revenue generated, expressed as a percentage.

4 Project Scope and Process Model

Project scope includes the following:

1. Major Functions (First Release):
 - User Registration and Profile Creation: Allow users to register and create profiles, providing necessary information such as name, email, phone number, and address.
 - Secure Login and Authentication: Implement a robust authentication system to ensure the security of user accounts and data.
 - Service Categories: Support a variety of service categories including appliances, electrical, plumbing, tutoring, home cleaning, and more.
 - Service Provider Registration: Enable service providers to register on the platform, providing contact information and service details.
 - Placing Service Requests: Allow users to place service requests by selecting a category and providing relevant details.
 - Accepting Service Requests: Enable service providers to view and accept service requests from users.
 - Payment Handling: Facilitate secure payment transactions between users and service providers, including commission deduction for the platform owner.
 - Review and Rating System: Implement a system for users to rate and review service providers based on their experiences.
 - Order History Tracking: Provide users with access to their order history, allowing them to track past service requests and payments.
 - Search Functionality: Implement search functionality for users to find services based on various criteria such as category, rating, and price.
 - Map Integration: Integrate maps to show the location of service providers and provide directions to users.
 - User Settings and Preferences: Allow users to customize their experience by managing settings and preferences.
 - Advertisement Opportunities: Explore opportunities for internal and external advertising to generate additional income for the platform.
2. Payment Types:
 - Credit Card Payments: Users can make payments securely using registered credit cards.
3. Advertisement Opportunities:
 - Internal Advertising: Promote service providers and their services within the platform to increase visibility.
 - External Advertising: Allow external businesses to advertise products or services relevant to users for additional revenue.
4. User Feedback Mechanism:
 - Implement a feedback mechanism allowing users to provide suggestions, report issues, and offer feedback on the platform's usability and features.
5. Service Provider Verification:
 - Develop a process for verifying service providers' credentials and qualifications to ensure trust and reliability for users.
6. Service Request Tracking:
 - Enable users to track the status of their service requests in real-time, providing updates on when the request is accepted, in progress, or completed.
7. Notification System:
 - Implement a notification system to alert users about important events such as new service requests, accepted bids, payment confirmations, and service completion.
8. Admin Dashboard:

- Develop an administrative dashboard to allow platform administrators to manage users, service categories, payments, and resolve disputes efficiently.
9. Analytics and Reporting:
 - Incorporate analytics tools to track platform usage, user engagement metrics, service trends, and financial performance. Generate reports to provide insights for decision-making and optimization.
 10. Language Support:
 - Provide support for multiple languages to cater to a diverse user base, allowing users to access the platform in their preferred language.

The following is a list of items out of scope:

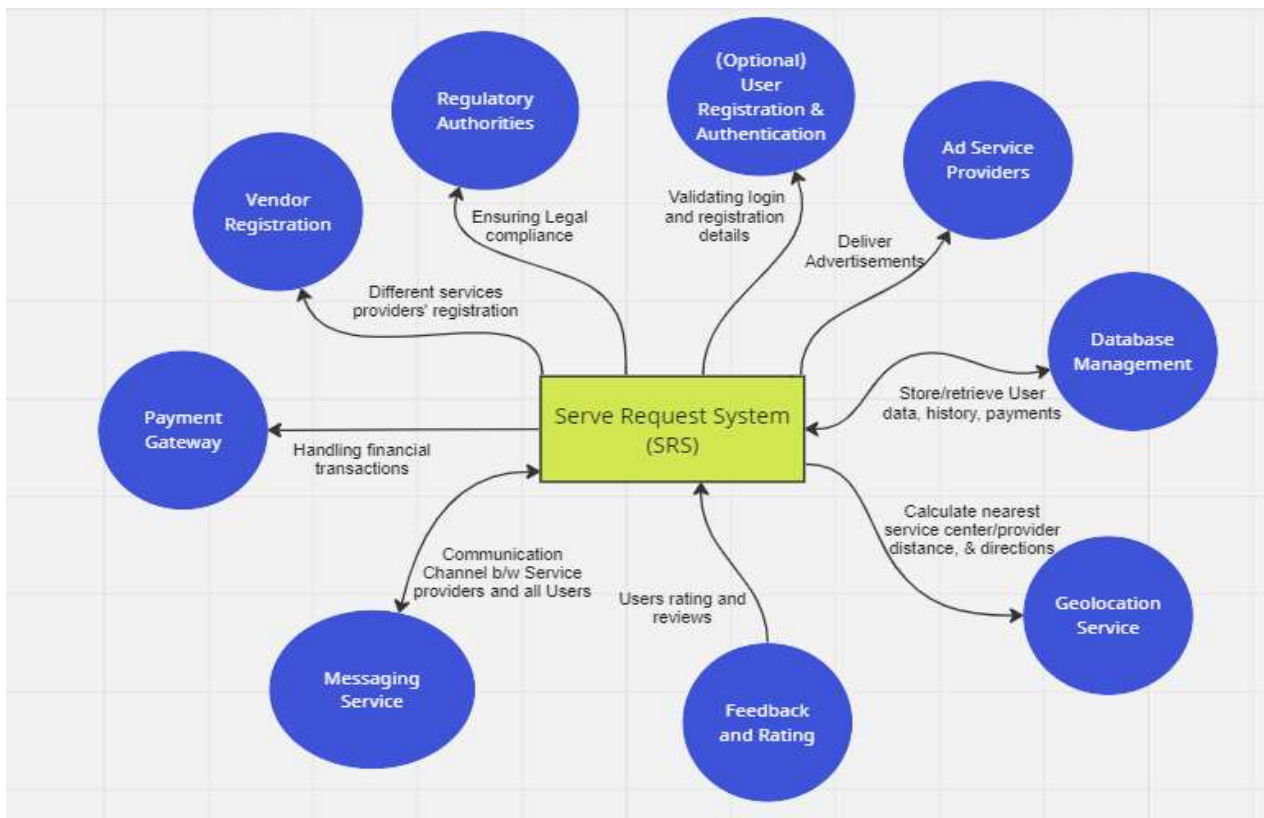
1. Marketing and Advertising Campaigns:
 - While promoting the platform is essential, the detailed planning and execution of marketing and advertising campaigns are beyond the scope of this project. This includes activities such as market research, advertising strategy development, campaign design, and media buying.
2. Legal Consultations:
 - Any legal consultations or legal document drafting, such as terms of service or privacy policies, are not included in the project scope. This involves seeking legal advice or services from legal professionals to ensure compliance with relevant laws and regulations.
3. Internationalization and Localization:
 - Adapting the platform for international markets, including language translation, cultural localization, and compliance with international regulations, is not initially included in the project scope. This involves making the platform accessible and relevant to users in different regions or countries.
4. External Integrations:
 - Integrations with external systems, services, or APIs beyond the specified project requirements are considered out of scope. This includes any additional integrations with third-party platforms or services that are not essential for the core functionality of the SRS platform.
5. Offline Access:
 - Providing offline access to content or services is not included in this release. This involves allowing users to access certain features or content on the platform without an internet connection, which is not part of the current project scope.
6. Hardware or Operating System Support:
 - Support for specific hardware devices or operating systems beyond standard compatibility is out of scope. This includes optimizations or customizations for specific hardware configurations or operating systems that are not widely used or essential for the platform's functionality.
7. Customization for Individual Users:
 - Extensive customization of the platform for individual users' unique preferences or requirements is not within the scope of this project. This includes personalized features or settings tailored to the preferences of individual users, which would require significant additional development effort and resources.
8. Post-Project Maintenance:
 - Activities related to the ongoing maintenance, updates, and support for the platform after the initial development and launch phase are out of scope. This includes tasks such as bug fixes, software updates, server maintenance, and user support beyond the project's completion.

4.1 PROJECT PROCESS MODEL

For the Service Request System (SRS) project, we will adopt the **Agile project process** model. Agile methodology is chosen for its flexibility, adaptability, and iterative approach, which align well with the dynamic nature of software development projects. Here's why Agile is the preferred choice:

1. **Flexibility:** Agile allows for changes and adaptations to be made throughout the development process. It enables us to respond quickly to evolving requirements, customer feedback, and market dynamics, ensuring that the final product meets stakeholders' needs effectively.
2. **Iterative Development:** Agile divides the project into small, manageable iterations or sprints, typically lasting 1-4 weeks. Each iteration results in a potentially shippable product increment, allowing for continuous improvement and feedback gathering from stakeholders.
3. **Transparency and Collaboration:** Agile encourages close collaboration between cross-functional teams, including developers, testers, designers, and product owners. Regular meetings, such as daily stand-ups and sprint reviews, promote transparency and communication, ensuring everyone is aligned with project goals and progress.
4. **Customer Satisfaction:** Agile places a strong emphasis on delivering value to customers early and frequently. By delivering working software in short iterations, Agile ensures that customer feedback is incorporated into the product development process, leading to higher customer satisfaction and better outcomes.
5. **Risk Management:** Agile's incremental and iterative approach helps in mitigating project risks by allowing early identification and resolution of issues. Regular retrospectives enable teams to reflect on their processes and make necessary adjustments to improve performance and address challenges.

4.2 PROJECT CONTEXT



5. Assumptions and Constraints

5.1 ASSUMPTIONS

The following is a list of assumptions:

- Assume all users are over the age of 18.
- Ignore any tax issues.
- Users have access to stable internet connections for using the service.
- Service providers have the necessary qualifications and licenses to offer their services legally.
- Users will provide accurate and up-to-date information during registration.
- Users possess the required devices (computers, smartphones, etc.) to access the platform.
- The platform will be accessible across different web browsers and devices.

5.2 CONSTRAINTS

The following is a list of constraints:

- Our developers are not trained in Android programming
- Project schedule too short
- Our development team lacks expertise in Android programming, limiting our ability to develop a fully featured Android application.
- The project schedule is too short to accommodate thorough testing and refinement of the system before launch.
- Limited financial resources may restrict the implementation of certain features or marketing efforts.
- Regulatory restrictions may impose limitations on certain service categories or payment methods.
- Technical limitations of the chosen development platform may constrain the scalability or performance of the system.

6. Project Tasks, Schedule and Cost

Project Start Date: February 1, 2024

Project Deadline: April 30, 2024

Tasks Breakdown:

Task Description	Estimated Duration (Weeks)	Resource Allocation
Requirements Gathering and Analysis	1	Project Manager, Business Analyst
System Design and Architecture	2	Project Manager, System Architect
Frontend Development	3	2 Developers
Backend Development	3	2 Developers
Database Design and Implementation	1	Database Specialist, 1 Developer
User Authentication and Security Implementation	1	1 Developer, Security Specialist
Payment Processing Integration	2	1 Developer, Payment Integration Expert
User Interface Design and Testing	1	UI/UX Designer, 1 Developer
System Testing and Quality Assurance	1	Quality Assurance Specialist, 1 Developer
Deployment and Launch	1	Project Manager, System Administrator
Total Estimated Duration:	12 weeks	

Cost Estimation:

Development Resources:

- Project Manager: \$8,000/month
- 6 Developers: \$24,000/month (6 * \$4,000)
- Total Monthly Resources Cost: \$32,000

Overhead Costs (50% of Resource Costs):

- Health Insurance, Building, and Utility Cost: \$15,000/month
- ➔ Assuming that overhead costs are approximately 50% of the resource costs, \$15,000/month seems reasonable for covering health insurance, building, and utility expenses.

Hardware/Software Costs:

- Servers: \$3,000
- Databases: \$1,000
- Total Software/Hardware Cost: \$4,000

Total Monthly Cost (including Overhead and Hardware/Software):

- \$51,000

Total Project Cost (12 weeks):

- Total Monthly Cost: \$51,000
- Total Cost for 12 months: \$612,000

Profit Margin:

- Desired Profit Margin: 30% (to make it more reasonable)
- Total Project Cost: \$612,000
- Profit: \$183,600
- Total Project Price (including Profit): \$795,600

7. Conclusion and Recommendations

The Service Request System (SRS) project holds immense potential for revolutionizing service procurement processes and enhancing user experiences. However, to ensure its success, it's crucial to address various risks, capitalize on benefits, and implement strategic recommendations.

Risks:

1. **Market Competition:** Intense competition may hinder user adoption and market penetration.
2. **Technical Challenges:** Potential issues like system scalability and security vulnerabilities need to be mitigated.
3. **Resource Constraints:** Insufficient resources may impede project progress, necessitating careful resource allocation.
4. **Legal and Compliance Risks:** Failure to comply with laws and regulations could lead to legal consequences.
5. **User Acceptance:** Convincing users to adopt the platform may pose a challenge, requiring user-friendly designs and incentives.

Benefits:

1. **Streamlined Service Procurement:** SRS aims to streamline service procurement, enhancing user convenience.
2. **Enhanced User Experience:** Features like secure authentication and real-time communication will improve user satisfaction.
3. **Revenue Generation Opportunities:** Advertisement and commission-based payment handling offer revenue prospects.
4. **Improved Efficiency:** Service request tracking and order history management will enhance operational efficiency.

Recommendations:

1. **Conduct Thorough Market Analysis:** Continuously monitor market trends and user preferences to stay competitive.
2. **Prioritize Security and Compliance:** Implement robust cybersecurity measures and ensure compliance with relevant laws.
3. **Focus on User Engagement:** Implement features and strategies to enhance user engagement and satisfaction.
4. **Continuously Gather User Feedback:** Actively solicit user feedback to identify areas for improvement.
5. **Invest in Marketing and Promotion:** Allocate resources to marketing efforts to increase platform visibility.
6. **Mitigate Resource Constraints:** Prioritize resource allocation and secure additional funding if needed.
7. **Embrace Agile Methodology:** Continuously adapt and iterate based on user feedback and evolving requirements.

By addressing these aspects effectively, the Service Request System (SRS) project can achieve its objectives and emerge as a successful platform in the service procurement domain.

Appendices

1. Writing specifications: <https://www.perforce.com/blog/alm/how-write-software-requirements-specification-srs-document>
2. Context Diagram: <https://miro.com/templates/context-diagram/>
3. <https://www.linkedin.com/pulse/how-use-service-provider-platform-grow-your-business-swiftrole/>
4. <https://www.softkraft.co/software-development-planning/>
5. Metrics:
 - 5.1 <https://uxcam.com/blog/chief-product-officer-kpis/>
 - 5.2 <https://www.zendesk.com/blog/4-customer-engagement-metrics-measure/>
 - 5.3 <https://www.workfellow.ai/learn/how-to-improve-cost-to-income-ratio-in-banks-with-process-intelligence#:~:text=To%20get%20the%20cost%2Dto,to%20cover%20its%20operating%20expenses.>
6. Agile model selection: <https://kineticdata.com/service-request-management-system/>
7. Tasks timeline estimation: <https://www.teamgantt.com/project-management-guide/how-to-estimate-projects>