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Title: Fixit Nepal – Service Booking Platform

I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a mark of zero will be awarded

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1 Introduction

Finding reliable and skilled technicians for home repairs and maintenance has become an increasingly pressing challenge in Nepal's rapidly urbanizing landscape. The traditional methods of hiring service providers through word-of-mouth or local advertisements are inefficient, time-consuming, and often result in unsatisfactory outcomes. To address these challenges, **FixIt Nepal** is proposed as a comprehensive web-based service booking platform designed to modernize the home services sector in Nepal.

FixIt Nepal aims to bridge the gap between households and businesses seeking reliable home repair services and verified local technicians offering their expertise. The platform will provide a secure, transparent, and efficient ecosystem where customers can easily discover, evaluate, and book qualified service providers for various needs including plumbing, electrical work, carpentry, home appliance repair, cleaning, and painting services.

The system distinguishes itself by implementing a dual-service model: immediate booking for urgent repair needs and a transparent bidding mechanism for planned maintenance work. This approach ensures flexibility for customers while maximizing job opportunities for service providers. Additionally, the platform emphasizes trust and accountability through mandatory verification processes, rating systems, and administrative oversight.

1.1 Problem Domain

The on-demand home services market is the market of platforms that allow to book skilled labour in order to fix the house in real-time. Urbanization and the increasing disposable incomes will see this market grow tremendously in Nepal between 2025 and 2031 (6Wresearch, 2025). Nevertheless, consumers are always struggling to get validated, punctual and responsible technicians. As an example, plumbing services do not always have post-job guarantees, which results in repetitive problems and loss of money (namaste-plumbing, 2025). Likewise, electrical and carpentry services are characterized by poor quality, and self-employed providers work without any formal control (SkillSewa, 2023).

One of the structural weaknesses is the lack of centralized verification and booking system. The customers use the word-of-mouth or local advertisements, which leads to delays, lack of price transparency, and lack of trust. The Nepal home care market is projected to grow at a CAGR of 7.1% until 2030, but the existing inefficiencies prevent the industry to grow on a large scale (tanalyze, 2025). In such cities as Kathmandu, the high demand conflicts with the disjointed supply, which worsens such problems as uncertified qualifications and irregular prices (SkillSewa, 2023). These difficulties cause time loss to users and limit the potential of incomes to skilled workers who cannot access larger audiences.

Therefore, there exists a distinct opportunity of an integrated, digital and secure service-booking ecosystem that is specific to the Nepali context.

1.2 Project as a Solution

FixIt Nepal directly solves the home-service issues in Nepal by focusing on specific features: unverified technicians are prevented by an administrative verification system where document upload, background checks, and skill tests are required using ASP.NET Identity roles, and only approved providers are allowed to get a booking. The absence of accountability is addressed by the mandatory post-job rating and review system where low-rated technicians are automatically flagged and suspended through the admin dashboard. Unstable quality is avoided by constant monitoring of performances and automatic suspension activation. Displaying fixed or range-based rates in advance, and optional quote request on custom jobs eliminates price transparency and overcharging. Word-of-mouth searches are substituted with instant discovery based on geolocation with Google Maps API. The wastage of time and the low reach is reduced through real-time availability calendars, skill and location matching and push notification to local providers. The problem of fragmented supply is solved with a centralized platform that smartly directs jobs, and security is provided with ASP.NET Core Identity and JWT authentication with all transactions being logged and encrypted. It has a microservices-ready, modular architecture and documented APIs, which can be enhanced in the future with mobile and AI features.

1.3 Project Aim and Objectives

Project Aim:

To design and develop a secure, scalable web platform that connects Nepali households and businesses with verified local service providers, thereby modernizing the home repair and maintenance sector through digital enablement.

Project Objectives:

- Implement secure user authentication and authorization using ASP.NET Core Identity and JWT.
- Build a responsive, accessible frontend with ASP.NET Razor Pages, HTML5, CSS3, and Bootstrap the latest Bootstrap.
- Develop a robust backend using .NET 9 and Microsoft SQL Server for efficient data handling.
- Integrate Google Maps JavaScript API for real-time, location-based service search.
- Engineer core modules for booking, feedback, and admin oversight.
- Enforce security best practices including encryption, CSRF protection, and HTTPS.
- Produce complete technical and user documentation alongside a detailed testing report.

2 Background

2.1 Trends in the Field

The on-demand home services industry is experiencing transformative growth globally, driven by technological advancement and changing consumer behaviors. Several key trends are shaping this market:

- **Growing Demand for On-Demand Services:** Modern lifestyles, characterized by busy work schedules and increasing urbanization, have created unprecedented demand for quick, reliable professional services. Consumers expect instant solutions to household problems, favoring platforms that can deliver immediate assistance.
- **Digital Platform Adoption:** Mobile and web applications have become the primary interface for discovering and booking services. The convenience of browsing provider profiles, reading reviews, and making bookings from anywhere has made digital platforms indispensable for both service seekers and providers.
- **Location-Based Service Discovery:** GPS and mapping technologies enable customers to find nearby service providers instantly, reducing wait times and improving service delivery efficiency. This geographic matching creates better outcomes for both parties.
- **Trust Through Verification:** Platforms implementing rigorous provider verification, including background checks and skill assessments, are gaining market preference. Customers prioritize safety and reliability, making verification a competitive differentiator.
- **Market Growth in Nepal:** Nepal's online on-demand home services market is projected to grow substantially from 2025 to 2031, driven by increased smartphone penetration, improving internet infrastructure, and rising middle-class incomes. The home care market specifically is expected to grow at a CAGR of 7.1% until 2030.
- **Sustainability and Gig Economy:** The platform model supports sustainable employment for skilled workers while giving them flexibility and autonomy. This

aligns with global trends toward gig economy participation and freelance work arrangements.

2.2 Benefits of FixIt Nepal

FixIt Nepal offers substantial advantages to all stakeholders in the home services ecosystem:

For Customers:

1. **Convenience:** Easy discovery and booking of verified service providers based on specific needs, location, and availability through an intuitive web interface.
2. **Time Savings:** Instant access to available technicians eliminates lengthy search processes and reduces emergency response times.
3. **Cost Transparency:** Clear and upfront pricing information helps users understand service costs in advance, enabling informed decision-making and better budget management for both urgent and non-urgent service requests.
4. **Quality Assurance:** Verified provider profiles, ratings, and reviews help customers make confident choices based on previous customer experiences.
5. **Safety and Trust:** Mandatory background checks and skill verification reduce risks associated with inviting strangers into homes.
6. **Flexibility:** Both immediate booking and advance planning options accommodate diverse customer needs.

For Service Providers:

1. **Increased Visibility:** Digital presence expands market reach beyond existing client networks, creating new income opportunities.
2. **Steady Work Flow:** Platform matching algorithms and notification systems ensure providers receive consistent job opportunities aligned with their skills and location.
3. **Professional Growth:** Profile building, reviews, and ratings help providers establish reputation and attract premium customers.
4. **Fair Competition:** Transparent marketplace allows skilled providers to compete based on quality and pricing rather than traditional referral networks.
5. **Business Tools:** Availability management, earning tracking, and customer communication features support professional operation.

For the Industry:

1. **Market Efficiency:** Centralized platform reduces transaction costs and information asymmetry.
2. **Standardization:** Quality benchmarks and verification processes raise overall industry standards.
3. **Economic Impact:** Digital enablement supports skilled worker employment and contributes to Nepal's growing service economy.

2.3 Challenges

While FixIt Nepal addresses significant market needs, several challenges must be acknowledged and managed:

Logistics and Service Delivery:

1. **Response Time Management:** Ensuring technicians respond promptly during emergencies requires sophisticated notification systems and provider commitment.
2. **Geographic Coverage:** Initial platform launch may focus on urban areas, potentially limiting rural access until provider networks expand.

Quality Control:

1. **Skill Verification:** Implementing effective assessment mechanisms to validate provider capabilities requires careful process design.
2. **Consistent Service Quality:** Maintaining high standards across diverse providers demands robust monitoring and feedback systems.

User Adoption:

1. **Digital Literacy:** Some target users, particularly older demographics and certain service providers, may require guidance and support for platform adoption.
2. **Behavior Change:** Shifting from traditional word-of-mouth methods to digital booking requires building user trust and demonstrating value.

Trust Building:

1. **Platform Credibility:** As a new entrant, establishing credibility and overcoming skepticism about online service booking takes time and consistent positive experiences.
2. **Dispute Resolution:** Developing fair, efficient processes for handling disagreements between customers and providers is essential.

Technical Challenges:

1. **Internet Connectivity:** Variable internet quality in Nepal may affect user experience, requiring platform optimization for low-bandwidth scenarios.
2. **Security Concerns:** Protecting sensitive user data and preventing fraudulent activities requires continuous security vigilance.

Competitive Landscape:

1. **Market Competition:** Existing platforms like Sajilo Sewa and SkillSewa have established market positions that FixIt Nepal must differentiate against.

2.4 Future Possibilities

FixIt Nepal's architecture supports numerous enhancement opportunities for long-term growth and value creation:

Service Expansion:

2. **Additional Service Categories:** Incorporating childcare, pet care, event management, and specialized technical services to capture broader market segments.
3. **Business Services:** Expanding beyond residential to serve commercial clients with facilities management needs.

Advanced Technologies:

1. **AI-Powered Recommendations:** Machine learning algorithms can match customers with optimal providers based on historical performance, preferences, and job requirements.
2. **Predictive Maintenance:** Analyzing usage patterns to suggest preventive maintenance services before failures occur.
3. **Chatbot Support:** AI-driven customer service for handling common queries and booking assistance.

Platform Features:

1. **Mobile Applications:** Native iOS and Android apps for improved mobile user experience and push notification capabilities.
2. **In-App Communication:** Direct calling functionality within the platform, potentially offering cost-free or reduced-rate communication.
3. **Video Consultations:** Remote problem diagnosis and quotation through video calls before physical visits.

Payment Integration:

1. **Digital Payment Gateway:** Secure online payment processing for cashless transactions.
2. **Escrow Services:** Holding payments until job completion to protect both parties.
3. **Subscription Models:** Monthly plans for regular maintenance services at discounted rates.

Partnership Opportunities:

1. **Real Estate Integration:** Collaborating with property management companies and real estate agencies for tenant services.
2. **Insurance Partnerships:** Working with home insurance providers for approved repair services.
3. **Equipment Suppliers:** Connecting with hardware stores and suppliers for comprehensive service solutions.

Market Expansion:

1. **Geographic Growth:** Scaling beyond initial launch cities to cover entire Nepal and potentially neighboring countries.
2. **Franchise Model:** Licensing platform to regional operators for localized market penetration.

2.5 Similar Projects

Understanding the competitive landscape provides valuable insights for FixIt Nepal's differentiation strategy:

2.5.1 Bhetayo

Bhetayo is an established online platform in Nepal connecting customers with qualified service providers. The platform emphasizes certified experts with years of experience and conducts background checks to ensure customer safety. Key features include service provider selection based on ratings and customer reviews, flexible scheduling according to customer preferences, and affordable pay-per-service pricing.

Strengths: Strong verification process, established user base, focus on certified professionals.

Limitations: Primarily focuses on immediate booking without bidding options for cost comparison, limited transparency in pricing before provider selection.

2.5.2 TaskRabbit

TaskRabbit operates internationally as a task-based service marketplace. Users can choose taskers based on price, skills, and reviews, schedule appointments conveniently, and manage all interactions including chat, payment, tipping, and reviews within one platform. Services span assembly, mounting, moving, cleaning, outdoor help, home repairs, and painting.

Strengths: Comprehensive feature set, integrated payment and communication, extensive service categories.

Limitations: Limited presence in Nepal, no specific localization for Nepali market needs, pricing structure may not align with local economic conditions.

2.5.3 Sewa App

Launched in early 2022, Sewa App is a sister company of SkillSewa operating as an online marketplace helping homeowners and businesses find home services in real-time. The platform serves Kathmandu, Lalitpur, and Bhaktapur, offering plumbing, electrical work, painting, parqueting, toughened glass installation, and UPVC roofing services.

Strengths: Local market understanding, real-time service requests, focus on Nepal's urban centers.

Limitations: Geographic limitations, service category constraints, no apparent bidding mechanism for price comparison.

2.6 Comparison of Similar Systems

FixIt Nepal differentiates itself through several unique value propositions compared to existing platforms:

Table 1 Compression Of Similar System

Feature	Bhetayo	TaskRabbit	Sewa App	FixIt Nepal
Verification Process	Background checks	Reviews-based	Basic verification	Comprehensive (documents, skills, background)
Pricing Transparency	Limited	Upfront	Limited	Fixed rates + bidding option
Service Types	Immediate booking	Immediate booking	Immediate booking	Dual (emergency + bidding)
Geographic Focus	Nepal-wide	International	Kathmandu Valley	Nepal (starting urban)
Technology Stack	Not disclosed	Mobile-first	Not disclosed	.NET 9, modern web
Admin	Basic	Automated	Basic	Comprehensive

Oversight				dashboard
Bidding System				
Rating Analytics	Basic	Advanced	Basic	Advanced with auto-flagging
Payment Integration	Online	Integrated	Not disclosed	Planned (v2.0)

Key Differentiators:

1. **Comprehensive Verification:** Multi-layered verification including document validation, skill testing, and background checks exceeds industry standards.
2. **Price Comparison:** The platform provides transparent pricing for its services, allowing customers to view standard rates and choose based on their budget and service requirements, ensuring fair and informed decisions.
3. **Modern Technology:** Built on .NET 9 with scalable architecture, FixIt Nepal is positioned for future enhancements including AI and mobile apps.
4. **Administrative Controls:** Robust admin dashboard with analytics, automatic performance flagging, and dispute management provides superior platform governance.

3 Development Till Date

3.1 Selected Methodology

3.1.1 Agile Methodology Overview

The Agile methodology represents a flexible, iterative approach to software development that emphasizes collaboration, customer feedback, and rapid adaptation to change. Unlike traditional waterfall methods, Agile breaks projects into manageable iterations called sprints, typically lasting 2-3 weeks, where functional increments of the software are developed, tested, and reviewed.

Core Principles:

1. **Iterative Development:** Software is built incrementally, with each iteration producing working features.
2. **Customer Collaboration:** Continuous stakeholder feedback ensures the product meets actual user needs.
3. **Adaptive Planning:** Requirements and solutions evolve through collaborative effort.
4. **Continuous Improvement:** Regular retrospectives identify process improvements.

Benefits for FixIt Nepal:

1. **Flexibility:** Ability to incorporate user feedback and market insights discovered through pre-survey analysis.
2. **Risk Mitigation:** Early detection of technical or design issues through frequent testing and review.
3. **Stakeholder Visibility:** Regular demonstrations maintain supervisor and stakeholder engagement.
4. **Quality Focus:** Continuous integration and testing ensure high code quality.

3.1.2 Scrum Framework

Within the Agile umbrella, the Scrum framework provides specific practices and roles that structure development activities. Scrum emphasizes transparency, inspection, and adaptation through defined ceremonies and artifacts.

Scrum Components:

1. **Sprint Planning:** Defining work to be accomplished in the upcoming sprint based on prioritized backlog.
2. **Daily Standups:** Brief team synchronization meetings (adapted for individual work as personal progress checks).
3. **Sprint Review:** Demonstration of completed work to stakeholders for feedback.
4. **Sprint Retrospective:** Reflection on process effectiveness and identification of improvements.

Implementation for FixIt Nepal:

Given the individual nature of this final year project, Scrum practices have been adapted:

1. **Sprints:** 2-3 week development cycles with defined goals.
2. **Product Backlog:** Prioritized list of features maintained in project management tools (Trello).
3. **Task Tracking:** Visual boards showing To Do, In Progress, and Done states.
4. **Review Meetings:** Regular supervisor consultations serve as sprint reviews.

Why Scrum Over Alternatives:

1. **Waterfall Rejected:** Inflexible sequential phases would have prevented mid-project adjustments based on pre-survey findings and technical discoveries.
2. **Spiral Model Rejected:** Excessive overhead of formal risk analysis cycles inappropriate for project scale and timeline.
3. **Scrum Selected:** Balance of structure and flexibility, proven effectiveness in web application development, alignment with modern software engineering practices.

3.2 Software Requirements Specification (SRS)

A comprehensive Software Requirements Specification document has been developed to guide implementation and serve as a reference for all development decisions. The SRS provides detailed specifications across multiple dimensions:

Purpose and Scope:

The SRS defines FixIt Nepal Version 1.0 (MVP) requirements, covering core functionalities that enable users to browse services, book providers, manage appointments, and provide feedback, alongside administrative capabilities for verification and oversight.

3.3 Pre-Survey Analysis

A comprehensive pre-survey was conducted to validate market assumptions and inform platform design. The survey collected responses from 50 participants across diverse demographics, providing valuable insights into user needs and expectations.

3.4 System Design Diagrams

Comprehensive system design has been documented through multiple diagram types, each serving specific purposes in understanding system structure and behavior.

3.4.1 Entity Relationship Diagram (ERD)

The ERD illustrates database schema design, showing eight main entities and their relationships:

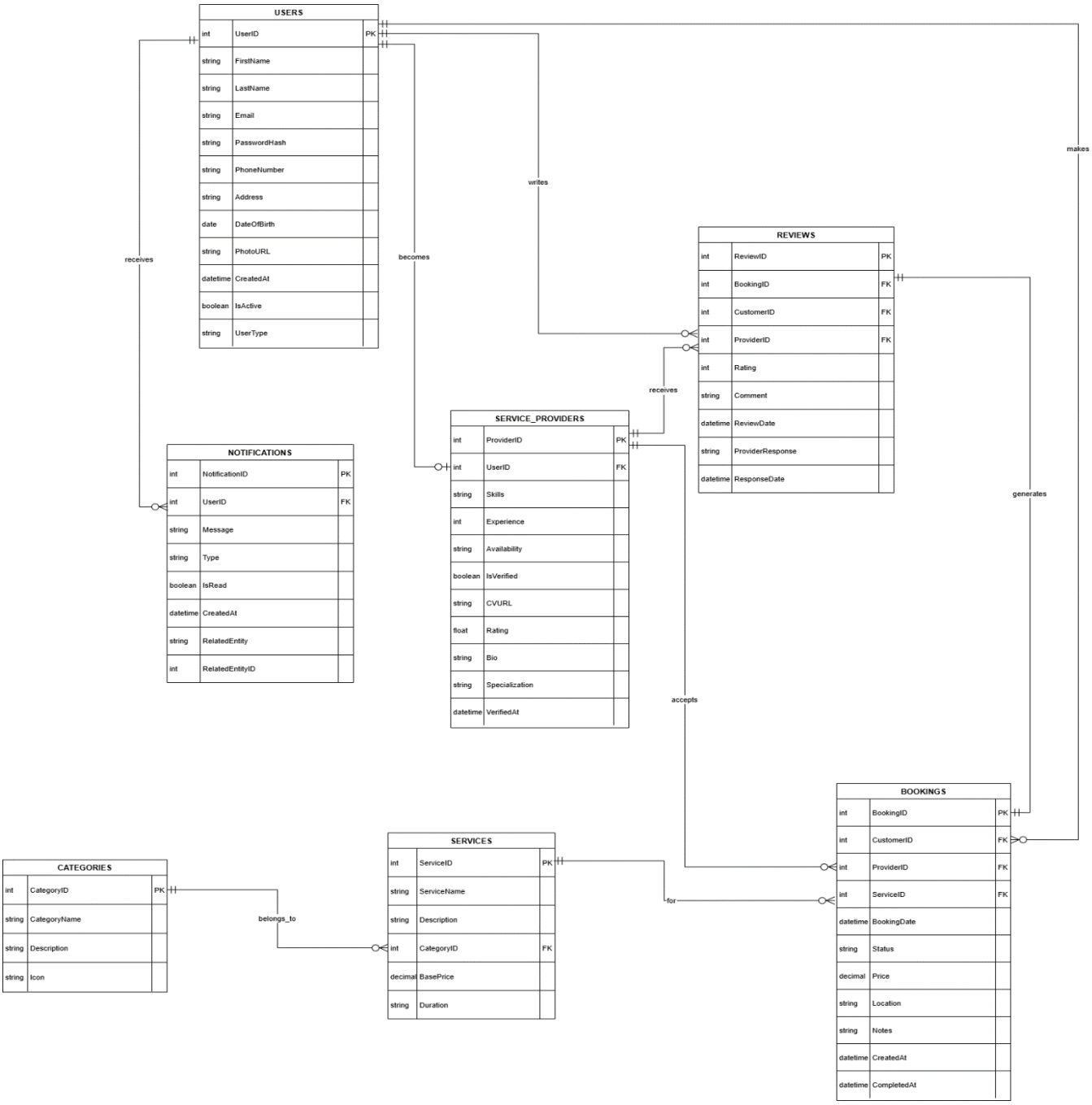

Figure 1 ER Diagram

3.4.2 Use Case Diagram

The use case diagram maps system functionality across three actor types:

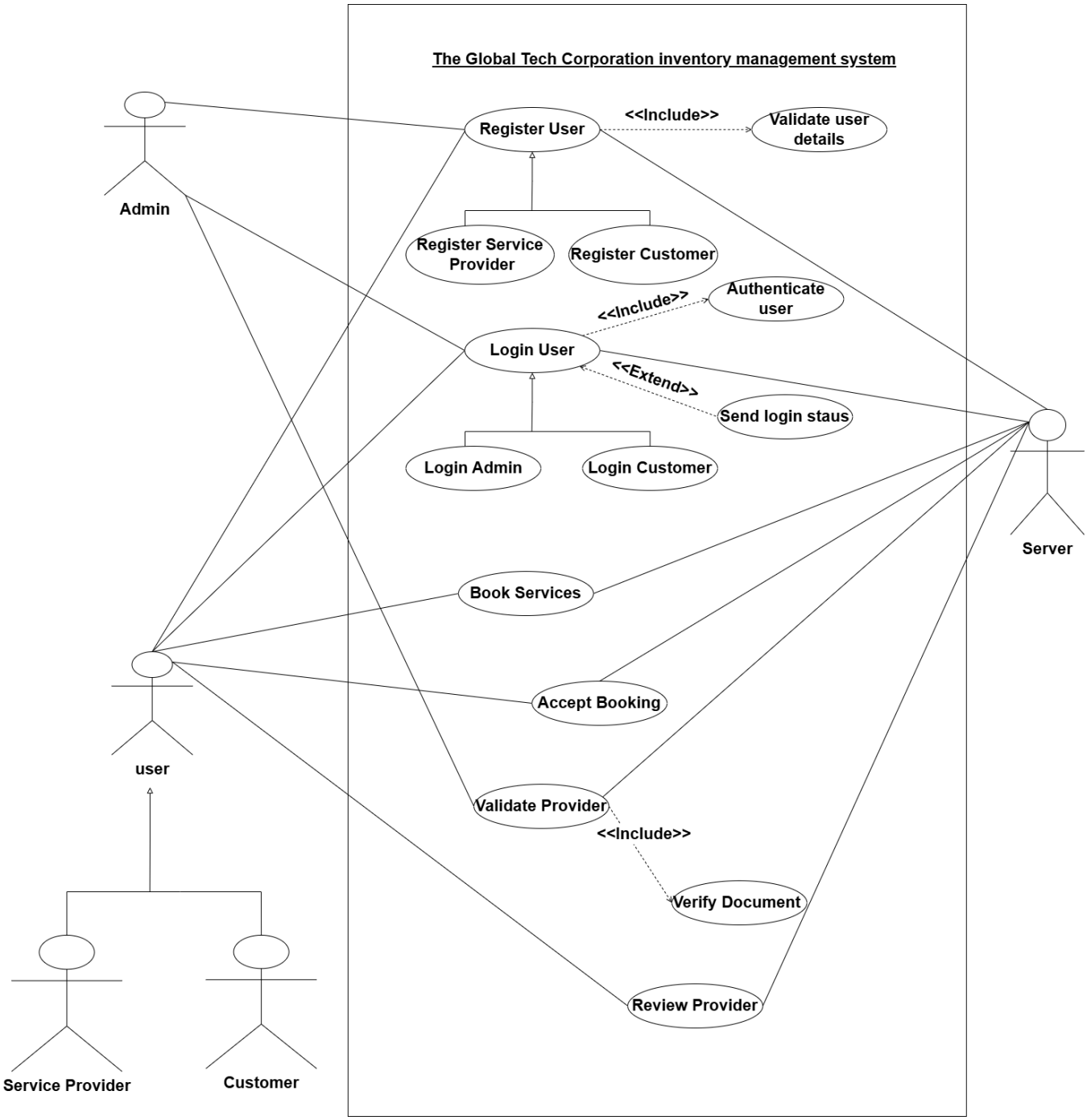

Figure 2 Use Case Diagram

3.4.3 Data Flow Diagram (DFD)

The Level 0 DFD provides a high-level view of information flow through the system:

Figure 3 Data Flow Diagram

3.4.4 Sequence Diagrams

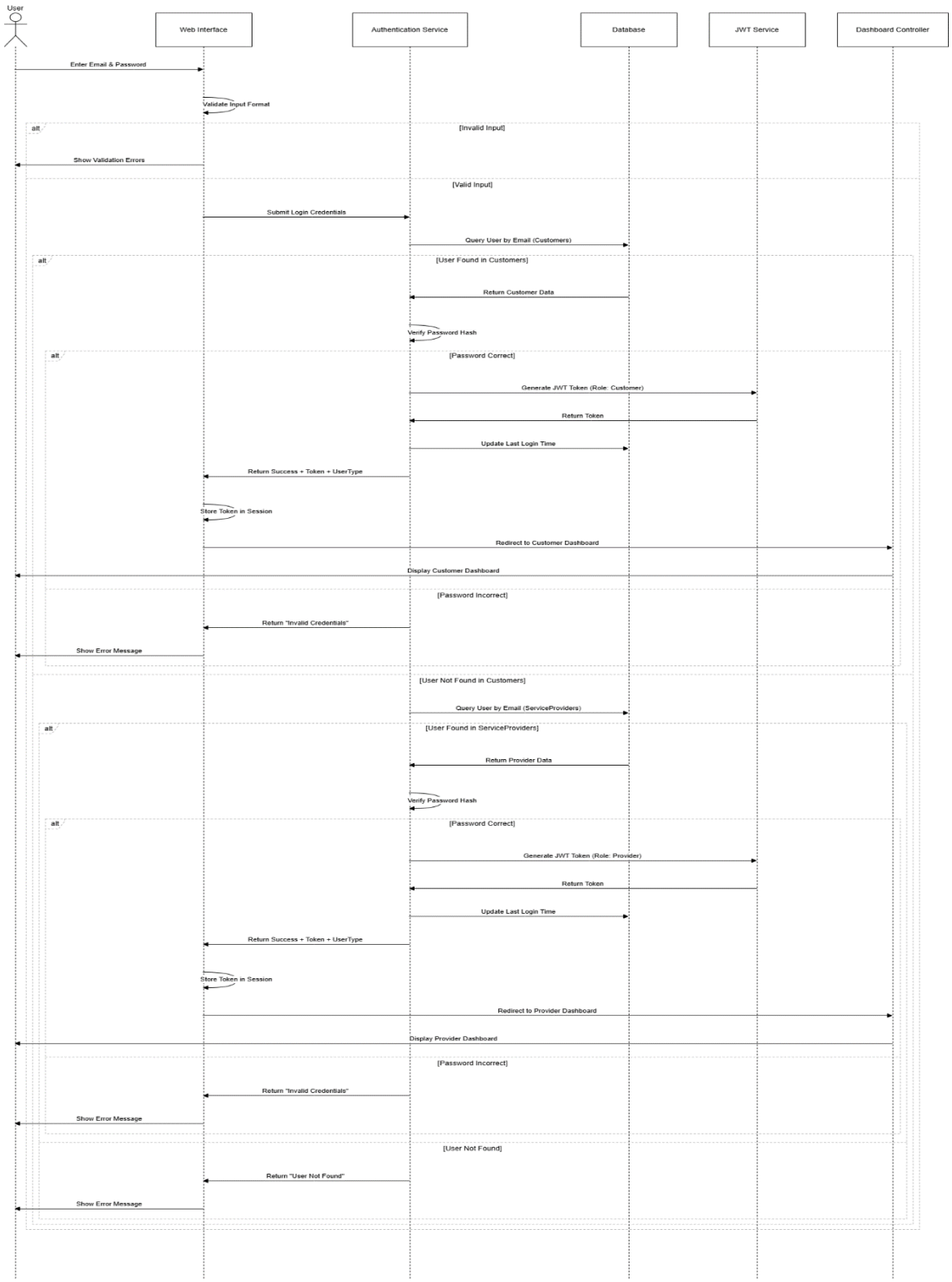

Figure 4 Sequence Diagram

3.5 Technology Stack

FixIt Nepal leverages modern, enterprise-grade technologies chosen for scalability, security, and developer productivity:

Frontend Technologies:

1. **ASP.NET Razor Pages:** Server-side rendering framework for dynamic web pages with clean separation of concerns
2. **HTML5:** Modern markup for semantic structure and accessibility
3. **CSS3:** Advanced styling with support for responsive design, animations, and modern layouts
4. **Bootstrap 5:** Responsive CSS framework ensuring mobile-first, consistent UI across devices
5. **JavaScript:** Client-side interactivity and AJAX for dynamic content updates

Backend Technologies:

1. **.NET 9:** Latest version of Microsoft's cross-platform framework offering improved performance and new language features
2. **ASP.NET Core:** High-performance web framework with built-in dependency injection and middleware pipeline
3. **C#:** Type-safe, object-oriented programming language with modern features

Database:

1. **Microsoft SQL Server 2022:** Robust relational database with advanced security, high availability, and performance optimization features
2. **Entity Framework Core:** Object-relational mapper (ORM) for database operations using LINQ and code-first migrations

Authentication & Security:

1. **ASP.NET Core Identity:** Comprehensive membership system for user management, password hashing, and role-based authorization
2. **JWT (JSON Web Tokens):** Stateless authentication tokens for API security
3. **HTTPS/TLS:** Encrypted communication for data protection in transit
4. **CSRF Protection:** Built-in cross-site request forgery prevention

External Integrations:

1. **Google Maps JavaScript API:** Real-time location services, geocoding, and interactive mapping for provider discovery

Development Tools:

2. **Visual Studio 2022:** Integrated development environment (IDE) with advanced debugging and IntelliSense
3. **Git:** Version control system for code management
4. **GitHub:** Repository hosting for backup and collaboration

Project Management:

1. **Trello:** Kanban-style board for sprint planning and task tracking

3.6 First Sprint

The initial development sprint focused on establishing foundational infrastructure and implementing core user management functionality.

Sprint Goal:

Create secure authentication system enabling users to register as customers or service providers and access role-appropriate dashboards.

Sprint Duration: 3 weeks

Sprint Activities:

Phase 1: Preparation (Week 1)

Before coding commenced, essential preparation work was completed:

1. **System Design Documentation**
    a. Created Entity Relationship Diagram showing database schema with relationships
    b. Developed Use Case Diagram mapping all user interactions
    c. Designed Sequence Diagrams for authentication flows
    d. Built Data Flow Diagram illustrating information movement
2. **UI/UX Design**
    a. Created wireframes for registration pages (customer and provider specific)
    b. Designed login interface with clear role selection
    c. Planned dashboard layouts for both user types
    d. Developed visual style guide establishing color schemes, typography, and component standards
3. **Project Setup**
    a. Initialized .NET 9 web application project
    b. Configured SQL Server database connection
    c. Set up Entity Framework Core with code-first migrations
    d. Established project folder structure following clean architecture principles
    e. Created Trello board with columns: To Do, In Progress, Done

4 Analysis of Progress

4.1 Progress Table

Table 2 Progress Table

Phase	Task	Planned Duration	Actual Duration	Status	Notes
Planning	Topic Selection	1 week	1 week	Complete	
	Topic Approval	-	1 week	Complete	Received supervisor approval
	Proposal Development	2 weeks	2 weeks	Complete	Includes WBS and Gantt Chart
	Pre-Survey Design	1 week	1 week	Complete	15 questions finalized
	Pre-Survey Distribution	1 week	1 week	Complete	50 responses collected
Requirements	SRS Documentation	2 weeks	2.5 weeks	Complete	More detailed than initially planned
	System Design	2 weeks	2 weeks	Complete	ERD, Use Case, DFD, Sequence diagrams
Design	UI Wireframes	1 week	1 week	Complete	Registration, login, dashboards
	Style Guide	3 days	3 days	Complete	Colors, typography, components
Sprint 1	Database Setup	2 days	2 days	Complete	SQL Server configured
	User Tables	2 days	2 days	Complete	Customers and

	Creation				ServiceProviders
	Registration Forms	5 days	6 days	Complete	Both user types implemented
	Login System	3 days	3 days	Complete	JWT authentication working
	Basic Dashboards	4 days	5 days	Partial	Core functionality only
Current Status	Provider Verification UI	1 week	In Progress	Ongoing	Expected completion Jan 23
	Customer Dashboard Enhancement	1 week	Not Started	Planned	Sprint 2
	Provider Dashboard Enhancement	1 week	Not Started	Planned	Sprint 2

Legend:

1. Complete: Task finished and tested
2. Partial: Core functionality implemented, enhancements pending
3. Ongoing: Currently in development
4. Planned: Scheduled for future sprint

4.2 Achievements

The project has successfully achieved several significant milestones:

Documentation Excellence:

A comprehensive Software Requirements Specification document was produced, covering functional and non-functional requirements, use cases, system constraints, and quality attributes. This documentation serves as the authoritative reference for all development decisions and provides clear guidance for implementation priorities.

Market Validation:

The pre-survey with 50 respondents provided robust evidence of market demand and user pain points. Key findings 94% consider verification extremely important, 82% face difficulties finding reliable technicians, 88% would use an online platform strongly validate the project's core value proposition.

System Architecture:

Well-designed database schema with normalized tables, clear entity relationships, and appropriate constraints establishes a solid foundation for feature development. The separation of customer and provider entities while maintaining referential integrity demonstrates understanding of relational database principles.

Secure Authentication:

Implementation of production-ready authentication using ASP.NET Core Identity with password hashing, JWT tokens, and role-based access control ensures user data protection and proper authorization from day one.

User Experience:

Separate, tailored registration flows for customers and providers acknowledge different user needs and streamline onboarding. The clean, Bootstrap-based responsive design works seamlessly across device types.

Development Process:

Adoption of Agile/Scrum methodology with sprint planning, Trello board management, and regular supervisor consultations demonstrates professional software engineering practices and ensures steady, measurable progress.

5 Future Works

5.1 Project Backlogs

The product backlog contains prioritized features for subsequent sprints:

High Priority (Sprint 2 - Next 3 Weeks):

1. **Provider Verification Workflow**
    a. Admin dashboard for reviewing provider applications
    b. Document viewing interface (CV, certifications)
    c. Approval/rejection actions with notification triggers
    d. Verification status updates in provider profiles
    e. Estimated: 5 days
2. **Enhanced Customer Dashboard**
    a. Browse services by category interface
    b. Location-based search with Google Maps integration
    c. Provider listing with filtering options
    d. Provider detail view with ratings/reviews display
    e. Estimated: 6 days
3. **Enhanced Provider Dashboard**
    a. View available job posts interface
    b. Submit bid functionality
    c. Manage availability calendar
    d. View earnings summary
    e. Estimated: 5 days
4. **Profile Management**
    a. Edit profile information for both user types
    b. Change password functionality
    c. Upload/update profile photo
    d. Update CV for providers
    e. Estimated: 3 days

Medium Priority (Sprint 3 - 3 Weeks):

1. **Service Catalog Management**
    a. Admin interface for managing service categories
    b. Service type CRUD operations
    c. Category-service hierarchies
    d. Estimated: 3 days
2. **Customer Posting System**
    a. Create new service request posts
    b. Post detail view
    c. Edit/delete own posts
    d. View bids on posts
    e. Estimated: 5 days
3. **Provider Bidding System**
    a. Browse available customer posts
    b. Submit bids with pricing and description
    c. Bid management (edit/withdraw)
    d. Estimated: 4 days
4. **Direct Booking Flow**
    a. Select provider and service
    b. Choose date and time
    c. Booking confirmation
    d. View booking details
    e. Estimated: 6 days

Medium Priority (Sprint 4 - 3 Weeks):

1. **Notification System**
    - In-app notifications
    - Email notifications for key events
    - Notification preferences
    - Mark as read functionality
    - Estimated: 5 days

2. **Rating and Review System**
    - Submit rating (1-5 stars) after service completion
    - Write review text
    - View ratings on provider profiles
    - Provider response to reviews
    - Estimated: 4 days
3. **Booking Management**
    - View all bookings (past and upcoming)
    - Booking status tracking
    - Reschedule functionality
    - Cancellation with policies
    - Estimated: 5 days

Low Priority (Sprint 5 - 2 Weeks):

1. **Admin Analytics Dashboard**
    a. Total users, bookings, revenue metrics
    b. Charts and graphs
    c. Geographic heatmaps
    d. Export reports
    e. Estimated: 5 days
2. **Search Enhancement**
    a. Advanced filtering options
    b. Sort by rating, price, distance
    c. Save favorite providers
    d. Search history
    e. Estimated: 3 days
3. **Payment Integration** (v2.0 - Future)
    a. Payment gateway integration
    b. Transaction processing
    c. Payment history
    d. Refund handling

    e. Estimated: 7 days

4. **Chat System** (v2.0 - Future)
    a. Real-time messaging between users
    b. Message history
    c. File sharing
    d. Estimated: 8 days

5.2 Contingency Plan

To ensure project completion despite potential setbacks:

Risk: Sprint 2 Dashboard Enhancement Delays

Mitigation:

Reduce dashboard feature scope to essential functionality only

Defer advanced filtering and sorting to Sprint 5

Focus on core browse-and-view capabilities

Risk: Google Maps API Integration Issues

Mitigation:

1. Allocate extra 2 days buffer for API learning curve
2. Prepare fallback to simple text-based location search
3. Have supervisor consultation scheduled for technical guidance

Risk: Database Performance Problems

Mitigation:

1. Implement database indexing on frequently queried fields
2. Add query performance monitoring
3. Optimize N+1 query problems with eager loading
4. Consider caching frequently accessed data

Risk: Feature Creep from Pre-Survey Insights

Response:

1. Strictly adhere to MVP scope defined in SRS
2. Document nice-to-have features in backlog for v2.0
3. Regularly review priorities with supervisor
4. Use MoSCoW method (Must, Should, Could, Won't) for feature decisions

Risk: Time Overruns on Complex Features

Strategy:

1. Implement time-boxing: if task exceeds estimate by 50%, reassess approach
2. Daily progress tracking on Trello
3. Weekly self-assessment against sprint goals
4. Reduce feature completeness before cutting entire features

Risk: Testing Discovers Major Issues Late

Prevention:

1. Continuous integration testing throughout sprints
2. Early user testing with classmates/friends
3. Automated testing for critical paths
4. Weekly code reviews with supervisor

Buffer Management:

1. 2-day buffer at end of each sprint for unexpected issues
2. Sprint 5 (2 weeks) serves as final buffer before submission
3. If ahead of schedule, pull features from backlog
4. If behind schedule, move lower-priority items to "Future Enhancements"

5.3 Updated Gantt Chart

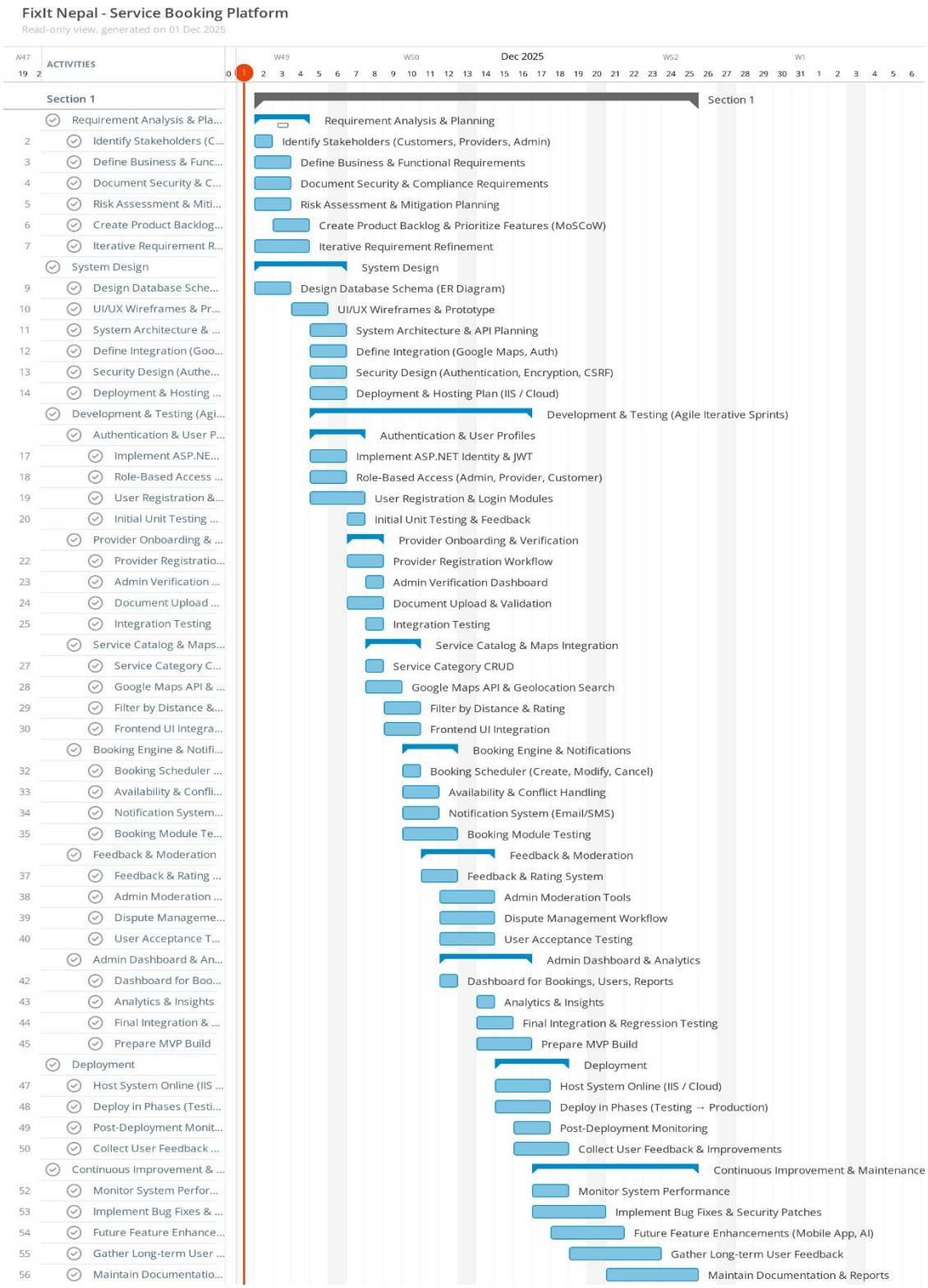

Figure 5 Gantt Chart

6 Conclusion

FixIt Nepal has made substantial progress toward delivering a comprehensive digital solution to Nepal's fragmented home services market. The interim development phase has successfully established critical foundations including secure authentication, database architecture, user interfaces, and development processes that position the project for successful completion.

The pre-survey validation confirmed strong market demand, with 94% of respondents emphasizing the importance of technician verification and 88% expressing willingness to use an online booking platform. These insights directly shaped design decisions, prioritizing features like comprehensive provider verification, transparent pricing, and location-based search all of which address the primary pain points users experience with traditional service discovery methods.

Technical implementation has adhered to industry best practices, leveraging modern technologies (.NET 9, SQL Server 2022, Bootstrap 5) within an Agile/Scrum framework that enables iterative development and continuous improvement. The first sprint successfully delivered functional user registration, secure authentication with JWT tokens, and role-based dashboards, demonstrating feasibility of the proposed technical approach.

Challenges encountered particularly around time estimation for front-end work and dashboard complexity have provided valuable lessons that inform more realistic planning for subsequent sprints. The contingency strategies in place, including buffer time allocation and scope management protocols, provide confidence in on-time delivery despite inevitable setbacks.

Looking forward, the clearly defined product backlog with prioritized features across four remaining sprints provides a structured roadmap to MVP completion. High-priority items (provider verification, enhanced dashboards, posting and bidding systems) will be tackled in Sprints 2-3, followed by notification and review systems in Sprint 4, with final polish and analytics in Sprint 5.

Upon completion, FixIt Nepal will stand as a robust, scalable platform that modernizes home service delivery in Nepal, empowering customers with transparent access to verified professionals while expanding economic opportunities for skilled technicians. The system's architecture supports future enhancements including mobile applications, AI-powered recommendations, and payment integration, ensuring long-term viability and competitive advantage in Nepal's growing on-demand services market.

7 References

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8 Appendix

8.1 Complete SRS Document

8.1.1 Introduction

Purpose

The purpose of this document is to specify the detailed software requirements for Fixit Nepal, a web-based service booking platform. This document covers Version 1.0, focusing on the core functionality allowing users to browse and book home repair services (e.g., plumbing, electrical, carpentry), manage bookings, and provide feedback, as well as an administrative dashboard for verifying providers and overseeing operations. This SRS describes the full system for the Minimum Viable Product (MVP) release.

Document Conventions

- Bold text indicates high-priority items, specific database fields, or UI elements (e.g., Book Now button).
- Requirements tagged with [MVP] are mandatory for the first release.
- Requirements tagged with [v2.0] are planned for future updates (e.g., mobile app integration or AI recommendations).
- Priorities are rated as High, Medium, or Low, with additional components such as benefit (1-9 scale) where applicable.

Intended Audience and Reading Suggestions

- **Developers:** Focus on Section 3 (External Interface Requirements) for API and integration details and Section 4 (System Features) for functional logic.
- **Project Managers:** Read Section 2 (Overall Description) to understand scope, user roles, and constraints.
- **QA Testers:** Use Section 4 (System Features) to derive test cases (e.g., "Verify provider cannot accept jobs without verification").
- **Stakeholders and Supervisors:** Read Section 1 and Section 2 to align with project aims and objectives. Suggested reading sequence: Begin with Sections 1

and 2 for overview, then proceed to Section 4 for core features, and Section 5 for nonfunctional aspects.

8.1.1.1 Product Scope

Fixit Nepal is an online platform that connects Nepali households and businesses with verified local service providers for home repairs and maintenance. It addresses inefficiencies in traditional methods (e.g., word-of-mouth) by providing a centralized, digital ecosystem. Benefits include increased trust through verification, transparent pricing, and efficient matching. Objectives include modernizing the sector, empowering skilled workers, and promoting digital inclusion. The MVP focuses on web-based access, with scalability for future enhancements. It relates to business goals of reducing time loss for users and boosting provider incomes in Nepal's growing home services market (projected CAGR of 7.1% until 2030).

References

- ASP.NET Core Identity and JWT Documentation (Microsoft).
- Google Maps JavaScript API Documentation.
- Microsoft SQL Server Documentation.
- Agile Scrum Framework Guide (Ken Schwaber, 2020).
- **Market Reports:** Nepal On-Demand Home Services Market (6Wresearch, 2025); Home Care Market in Nepal (tanalyze, 2025).

8.1.2 Overall Description

8.1.2.1 Product Perspective

Fixit Nepal is a new, standalone web-based product aimed at digitizing Nepal's fragmented home services sector. It replaces inefficient traditional methods with a centralized platform, interfacing with external APIs for mapping and notifications. It is self-contained but designed for future integrations (e.g., mobile apps). The system focuses on Nepal-specific needs, such as geolocation in urban areas like Kathmandu, and addresses issues like unverified providers and lack of transparency.

8.1.2.2 Product Functions

The major functions are categorized by user type:

- **Customer:**
  - Browse services by category, location, or provider ratings.
  - Search using geolocation and view provider profiles.
  - Book, reschedule, or cancel services; provide post-service feedback.
- **Service Provider:**
  - Onboard with document upload and verification.
  - Manage availability, services, pricing; accept/decline jobs; view earnings.
- **Admin:**
  - Verify providers, manage users, monitor bookings and disputes.
  - Generate analytics (e.g., bookings, revenue heatmaps).

8.1.2.3 User Classes and Characteristics

- **Customer:** Households or businesses needing repairs; may vary in tech-savviness; frequent users value quick bookings and history tracking.
- **Service Provider:** Skilled technicians (e.g., plumbers); need simple onboarding; important for income generation.
- **Administrator:** Platform staff; trained users requiring data-heavy interfaces for oversight. Distinguish core users (customers and providers) as most important for satisfaction.

8.1.2.4 Operating Environment

- **Client Side:** Modern web browsers (Chrome 80+, Firefox 75+, Safari 13+, Edge) on desktop, tablet, and mobile devices.
- **Server Side:** .NET 9 environment hosted on IIS, Azure, or Docker.
- **Database:** Microsoft SQL Server 2022 (for relational data) with Entity Framework Core.

8.1.2.5 Design and Implementation Constraints

- **Internet Access:** Requires active connection; no offline mode.
- **Scalability:** Must handle growing user base in Nepal without performance degradation.
- **Technologies:** Use ASP.NET Core Razor Pages, HTML5, CSS3, Bootstrap 5 for frontend; .NET 9 for backend; Google Maps API for location services.
- **Security:** Enforce HTTPS, encryption, and role-based access.
- **Development:** Follow Agile Scrum methodology with 2-3 week sprints.

8.1.2.6 User Documentation

- **In-App Help:** Tooltips and guides on first use (e.g., booking flow).
- **User Manuals:** Separate PDFs for Customer, Provider, and Admin portals.
- **Installation/Deployment Guide:** For server setup (IIS/Azure/Docker).

8.1.2.7 Assumptions and Dependencies

- Assume Google Maps API is reliable for geolocation.
- Assume users have valid email/phone for notifications and verification.
- Dependencies: Third-party services (e.g., Google Maps) may impact availability; project assumes stable internet in target urban areas.

8.1.3 External Interface Requirements

8.1.3.1 User Interfaces

The UI should be responsive, intuitive, and Nepal-focused (e.g., Nepali language support [v2.0]).

- **Landing Page:** Search bar, service categories carousel, featured providers.
- **Provider Profile:** Details (ratings, reviews, services), embedded map.
- **Booking Page:** Calendar view, real-time availability; color-coded statuses (e.g., Green: Available, Red: Booked).
- **Dashboards:** List views for bookings/history; table-based for admin analytics.

8.1.3.2 Hardware Interfaces

- **Server:** Standard cloud compute instances (e.g., Azure VMs).
- **Client:** Support touch (mobile) and mouse/keyboard (desktop) inputs.
- No specialized hardware; assume standard devices for users.

8.1.3.3 Software Interfaces

- **Authentication:** ASP.NET Core Identity for user management; JWT for secure tokens.
- **Database:** Entity Framework Core for SQL Server interactions; data items include user profiles, bookings, reviews.
- **Mapping:** Google Maps JavaScript API; sends location queries, receives coordinates and maps.
- **Notifications:** Integrate with email/SMS services for real-time alerts (e.g., booking confirmations).

8.1.3.4 Communications Interfaces

- **HTTPS:** All data encrypted with SSL/TLS 1.2+.
- **WebSockets:** For real-time updates (e.g., availability changes).
- **JSON:** Format for API responses.
- **Synchronization:** Ensure low-bandwidth optimization for rural Nepal connectivity.

8.1.4 System Features

8.1.4.1 System Feature 1: User Authentication & Profile Management

Description and Priority

- Allows secure registration, login, and profile handling for all users.
- **Priority:** High (benefit: 9, penalty: 9 if absent, cost: 5, risk: 4).

Stimulus/Response Sequences

- User enters credentials; system validates and issues JWT token.
- On profile update, system saves changes and confirms via notification.

Functional Requirements

- **REQ-1.1:** The system shall allow registration/login via email/phone or social login (Google) [MVP].
- **REQ-1.2:** The system shall enforce password rules (min. 8 characters, one number/special char). REQ-1.3: The system shall support password reset via secure email/SMS link.
- **REQ-1.4:** Logged-in users shall update profiles (name, address, phone).
- **REQ-1.5:** On invalid input, display error (e.g., "Invalid credentials").

8.1.4.2 System Feature 2: Service Provider Onboarding & Verification

Description and Priority

- Enables providers to join and get verified by admins.
- **Priority:** High (benefit: 8, penalty: 8, cost: 6, risk: 5).

Stimulus/Response Sequences

- Provider uploads documents; admin reviews and approves/rejects.
- On approval, provider gains access to dashboard.

Functional Requirements

- **REQ-2.1:** Providers shall upload documents (ID, skills proof) during onboarding [MVP].
- **REQ-2.2:** Admin shall verify and flag/suspend low-rated or fraudulent providers.
- **REQ-2.3:** System shall prevent unverified providers from accepting jobs.
- **REQ-2.4:** Providers shall set services, pricing (fixed/range), areas, and availability calendar.
- **REQ-2.5:** On rejection, notify provider with reason.

8.1.4.3 System Feature 3: Service Browsing & Search

Description and Priority

- Allows customers to find and view services/providers.
- **Priority:** High (benefit: 9, penalty: 7, cost: 4, risk: 3).

Stimulus/Response Sequences

- User searches by category/location; system returns matched providers with maps.
- User views profile; system displays details.

Functional Requirements

- **REQ-3.1:** System shall display services by category (e.g., plumbing, electrical) and location [MVP].
- **REQ-3.2:** Integrate Google Maps for proximity search and service-area mapping.
- **REQ-3.3:** Provide auto-suggest search (min. 3 characters) with filters (ratings, specialty).
- **REQ-3.4:** Show provider profiles with ratings, reviews, pricing.
- **REQ-3.5:** Handle no-results with suggestions (e.g., "Try broader location").

8.1.4.4 System Feature 4: Booking & Scheduling

Description and Priority

- Core mechanism for requesting and managing services.
- **Priority:** Critical (benefit: 9, penalty: 9, cost: 7, risk: 6).

Stimulus/Response Sequences

- Customer selects provider/time; system locks slot and notifies.
- Provider accepts/declines; system updates status.

Functional Requirements

- **REQ-4.1:** System shall display real-time availability and allow booking/rescheduling/cancellation [MVP].
- **REQ-4.2:** Enforce booking lifecycle (request, accept, complete) with notifications.
- **REQ-4.3:** Support optional quote requests for custom jobs.
- **REQ-4.4:** On completion, unlock slot and prompt feedback.
- **REQ-4.5:** If decline, suggest alternatives; handle errors (e.g., "Slot unavailable").

8.1.4.5 System Feature 5: Feedback & Rating System

Description and Priority

- Post-service reviews for accountability.
- **Priority:** Medium (benefit: 7, penalty: 5, cost: 3, risk: 2).

Stimulus/Response Sequences

- Customer submits rating/review; system moderates and updates profile.
- Provider responds; admin flags inappropriate content.

Functional Requirements

- REQ-5.1: Mandatory post-job rating (1-5 stars) and review [MVP].
- REQ-5.2: System shall aggregate ratings and flag low performers for suspension.
- REQ-5.3: Allow provider responses to reviews.
- REQ-5.4: Admin shall moderate feedback for appropriateness.
- REQ-5.5: On submission, notify parties; handle invalid input (e.g., "Review too short").

8.1.4.6 System Feature 6: Admin Oversight & Analytics

Description and Priority

- Backend tools for management.
- **Priority:** Medium (benefit: 6, penalty: 4, cost: 5, risk: 4).

Stimulus/Response Sequences

- Admin views dashboard; system generates reports.
- On dispute, admin intervenes and resolves.

Functional Requirements

- **REQ-6.1:** Admin shall manage users, providers, bookings, and disputes [MVP].
- **REQ-6.2:** Generate analytics (bookings, revenue, heatmaps).
- **REQ-6.3:** Monitor and suspend accounts.
- **REQ-6.4:** Log all actions for audits.
- **REQ-6.5:** Handle errors (e.g., "No data available").

8.1.5 Other Nonfunctional Requirements

8.1.5.1 Performance Requirements

- **Page Load:** Under 2 seconds on 4G connections.
- **Capacity:** Support 1,000 concurrent users; 100 transactions/minute.
- **Scalability:** Auto-scale if load exceeds 70% CPU.

8.1.5.2 Safety Requirements

- **Data Backups:** Automated every 12 hours.
- **Failover:** Switch to replica within 2 minutes on failure.
- **Prevent Harm:** Ensure verified providers to avoid poor service risks.

8.1.5.3 Security Requirements

- **Encryption:** Hash passwords with bcrypt; encrypt sensitive data.
- **Protection:** Sanitize inputs against SQL Injection/XSS; CSRF tokens.
- **Authentication:** Role-based access; audit logs for all actions.
- **Certifications:** Comply with Nepal data protection regulations.

8.1.5.4 Software Quality Attributes

- **Availability:** 99% uptime.
- **Usability:** Booking flow in ≤5 steps; mobile-friendly (Google test score 90+).
- **Maintainability:** Modular code; documented APIs.
- **Reliability:** Handle errors gracefully.

8.1.5.5 Business Rules

- **Provider Limits:** Max 5 active jobs to prevent overload.
- **Cancellation:** Up to 2 hours before service for full refund.
- **Verification:** Manual admin checks required.

8.1.6 Other Requirements

8.1.6.1 Database Requirements

- Ensure referential integrity (e.g., booking linked to valid user/provider).
- Normalize schema with EF Core; archive old data (>1 year) to cold storage.

8.1.6.2 Legal and Internationalization Requirements

- Comply with Nepal privacy laws; support English/Nepali [v2.0].
- Reuse Objectives: Modular for future AI/mobile extensions.

8.2 Pre-Survey Analysis

A comprehensive pre-survey was conducted to validate market assumptions and inform platform design. The survey collected responses from 50 participants across diverse demographics, providing valuable insights into user needs and expectations.

Demographic Distribution:

1. **Age Groups:** Majority of respondents (78%) fell in the 21-25 age range, indicating strong interest from young adults who are comfortable with digital platforms. Additional representation from 15-20 (12%) and 26-30 (8%) age groups.
2. **Occupation:** Predominantly students (82%), with representation from service professionals (10%) and self-employed individuals (8%).
3. **Location:** Responses from various cities including Kathmandu, Inaruwa, Dharan, Biratnagar, and international locations, demonstrating broad geographic interest.

Key Findings:

- **Service Frequency:**
- 42% need home repair services "Sometimes (Every 3-6 months)"
- 26% need services "Rarely"
- 20% need services "Frequently (Every 1-2 months)"
- Indicates substantial regular demand for platform services
- **Current Discovery Methods:**
- 68% rely on "Word of mouth / Friends & family"
- 18% use "Social media"
- 8% use "Service apps"
- 6% use "Local shops / flyers"
- Confirms hypothesis that traditional methods dominate, creating opportunity for digital disruption
- **Satisfaction with Current Methods:**
- Only 24% "Very satisfied" or "Satisfied"
- 44% "Neutral"

- 32% "Unsatisfied" or "Very unsatisfied"
- Significant dissatisfaction validates market need for improved solution
- **Common Difficulties Experienced:**
- "Hard to find reliable technicians" (82% selected)
- "Overcharging / unclear pricing" (74%)
- "Technicians arrive late" (64%)
- "Unverified or unskilled workers" (58%)
- "No guarantee after the job" (46%)
- Directly informs platform's core value propositions
- **Importance of Verification:**
- 94% rated verification as "Extremely important" or "Important"
- Only 6% considered it "Somewhat important"
- 0% rated it "Not important"
- Validates prioritization of comprehensive verification system
- **Platform Adoption Intent:**
- 88% would use online platform ("Yes" or "Maybe")
- Only 12% said "No"
- Strong market receptiveness to digital solution
- **Most Valued Features:**
- "Verified technicians" (96% selected)
- "Fixed or transparent pricing" (88%)
- "Ratings & reviews" (84%)
- "Real-time location & nearest technician search" (78%)
- "Service guarantee" (72%)
- "Instant booking" (64%)
- Guides feature prioritization in development roadmap
- **Price Transparency Importance:**
- 92% rated it "Very important" or "Important"
- Confirms critical need for transparent pricing and bidding system
- **Most Needed Service Types:**

- Electrical (78%)
- Plumbing (74%)
- Home appliance repair (56%)
- Cleaning (48%)
- Carpentry (42%)
- Painting (38%)
- Informs initial service category focus
- **Recommendation Likelihood:**
- 82% "Very likely" or "Likely" to recommend
- Indicates strong potential for viral growth and word-of-mouth marketing

Strategic Implications:

The survey results strongly support the proposed platform approach and provide specific guidance for implementation:

1. **Verification Priority:** Administrative verification system must be robust and visible to users.
2. **Pricing Transparency:** Upfront pricing display and bidding system are essential features.
3. **Rating System:** User reviews and ratings must be prominent in provider profiles.
4. **Location-Based Search:** Google Maps integration is a must-have, not nice-to-have feature.
5. **Initial Service Focus:** Launch should prioritize electrical, plumbing, and appliance repair categories.
6. **Target Demographics:** Marketing should focus on digitally-native young adults who can drive adoption.

8.3 System Design Diagrams

8.4 Code Samples

8.5 Sprint Planning Materials