XPERTS: On Demand Service Provider

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MINI LAB PROJECT REPORT

This Report Presented in Partial Fulfillment of the course **CSE416: Web Engineering Lab in the Computer Science and Engineering Department**

DAFFODIL INTERNATIONAL UNIVERSITY
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DECLARATION

We hereby declare that this lab project has been done by us under the supervision of **Chayti Saha, Lecturer**, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere as lab projects.

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COURSE & PROGRAM OUTCOME

The following course have course outcomes as following:.

Table 1: Course Outcome Statements

CO's	Statements
CO1	**Define** and **Relate** classes, objects, members of the class, and relationships among them needed for solving specific problems
CO2	**Formulate** knowledge of object-oriented programming and Java in problem solving
CO3	**Analyze** Unified Modeling Language (UML) models to **Present** a specific problem
CO4	**Develop** solutions for real-world complex problems **applying** OOP concepts while evaluating their effectiveness based on industry standards.

Table 2: Mapping of CO, PO, Blooms, KP and CEP

CO	PO	Blooms	KP	CEP
CO1	PO1	C1, C2	KP3	EP1, EP3
CO2	PO2	C2	KP3	EP1, EP3
CO3	PO3	C4, A1	KP3	EP1, EP2
CO4	PO3	C3, C6, A3, P3	KP4	EP1, EP3

The mapping justification of this table is provided in section **4.3.1**, **4.3.2** and **4.3.3**.

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Chapter 1

Introduction

1.1   Introduction

The XPERTS On Demand Service Provider Platform is a comprehensive web-based application designed to bridge the gap between service providers and customers. In today's fast-paced digital world, finding reliable service providers for electrical work, plumbing, cleaning, carpentry, and other essential services remains a significant challenge for homeowners. This project addresses this challenge by creating an intuitive, user-friendly platform that connects service seekers with verified professionals.

The application employs a modern web architecture using HTML5, CSS3, JavaScript for the frontend, PHP for server-side processing, and MySQL for data management. The platform features a responsive design that works seamlessly across desktop and mobile devices, ensuring accessibility for all users

1.2   Motivation

The motivation for developing the XPERTS platform stems from several key factors:

Market Demand: Traditional ways of finding home service providers like phone directories, word-of-mouth, or newspaper ads are becoming outdated. People now prefer digital platforms that offer quick and reliable connections to service professionals.

Trust & Reliability: Many current platforms don't properly screen service providers. This lack of vetting creates trust issues between customers and professionals.

User Experience Challenges: Existing solutions often have complicated designs, don't work well on mobile devices, or lack important features that users expect.

Digital Shift: The COVID-19 pandemic sped up the move to online service booking. Now, having a strong digital presence is essential for service providers to reach and serve customers effectively.

1.3   Objectives

The Primary Objectives to build the System are:

- Develop a user-friendly web platform that enables customers to easily browse and book home services
- Implement secure user authentication with proper data protection
- Establish order management with booking, tracking, and history features
- Implement real-time communication between users and providers
- Integrate payment solutions supporting multiple payment methods
- Create an efficient service provider management system with ratings and reviews
- Ensure high performance and reliability
- Design a responsive interface that works across all devices
- Establish a scalable architecture that can accommodate future growth

1.4   Feasibility Study

Existing Solutions Analysis

There are already some popular platforms out there that help people find home service providers like, TaskRabbit, Thumbtack, and HomeAdvisor. But even with all their features, they still have some problems. Many are expensive, hard to use, or don't focus on local service providers.

Let's take a quick look at what these platforms offer and where they fall short. So that we can understand how XPERTS is different and better.

Platform	Strengths	Limitations
TaskRabbit	Strong brand presence; acquired for $5B	High service fees (15–20%); limited market coverage
Thumbtack	Effective provider verification; $1.7B valuation	Expensive pay-per-lead model
HomeAdvisor	Extensive provider network; backed by IAC	Quality control issues; complex pricing structure
Angie's List	Established review system	Subscription barriers; poor mobile optimization

Technical Feasibility

Development Stack: PHP, MySQL, HTML5, CSS3, JavaScript are mature, open-source, and widely supported.

- **Infrastructure**: XAMPP provides a complete local development environment with a clear path for future cloud deployment.
- **Integration Capability**: Payment gateways and third-party APIs (maps, messaging) can be integrated with minimal complexity.
- **Security**: Industry-standard security measures (password hashing, SQL injection prevention, HTTPS) are fully implementable.

Economic Feasibility

- **Market Size**: The global home services market is valued at over $400B and growing at 8% annually.
- **Digital Adoption**: Current online penetration is ~15%, expected to reach 35% by 2027, indicating strong growth potential.
- **Cost Efficiency**: Open-source stack reduces licensing costs; initial hosting and maintenance costs are minimal.
- **Revenue Model**: Commission-based structure (10–20%) aligns with industry standards and ensures sustainability
- **Operational Feasibility**

- **User Adoption**: A simple, mobile-first interface encourages engagement among both service providers and customers.
- **Maintenance**: Modular architecture and clean code structure allow for easy maintenance and feature updates.
- **Scalability**: Three-tier architecture supports future expansion in services, locations, and features.

1.5   Gap Analysis

Through market research and analysis of existing home service platforms, several critical gaps were identified that the XPERTS aims to address:

- **User Experience Complexity:** Many existing platforms present cluttered interfaces with too many options, making navigation confusing for new users. This complexity contributes to a high abandonment rate, with studies indicating that 43% of users leave due to poor usability. XPERTS resolves this by offering a clean, intuitive interface with streamlined navigation, ensuring users can book services quickly and confidently.

- **Mobile Optimization:** A large portion of the target audience accesses services via smartphones, yet many competitors still design with a desktop-first approach. In fact, 67% of major platforms score below 70/100 on mobile-friendly tests. XPERTS adopts a mobile-first design philosophy, ensuring seamless performance and visual consistency across all devices.

- **Pricing Transparency:** Users frequently encounter hidden fees and complex pricing structures on other platforms, with 58% citing lack of transparency as their primary frustration. XPERTS addresses this by providing clear, upfront pricing with no hidden charges, enabling informed decision-making and building trust.

- **Local Market Coverage:** Existing platforms often focus on large metropolitan areas, leaving smaller cities and rural areas underserved. Research shows that 40% of potential service markets lack adequate digital coverage. XPERTS emphasizes local service provider recruitment and community-based marketing strategies to ensure broader reach.

- **Provider Onboarding**: The process for service providers to join existing platforms can take 7–14 days due to complex verification procedures. This delays market entry and discourages skilled professionals. XPERTS simplifies the onboarding process, enabling verified providers to join the platform within 24–48 hours while maintaining robust security and verification standards.

1.6   Project Outcome

The XPERTS Services Platform has successfully delivered a fully functional, secure, and user-friendly web application that addresses key gaps in the home services market.

Functional Outcomes:

- **Complete User Management System:** Customers and service providers can register, log in, and manage their profiles easily.
- **Service Browsing Interface:** Users can explore 13 different service categories with many verified providers.
- **Provider Listing System:** Each provider has a detailed profile with ratings, reviews, and contact options.
- **Order Management:** Customers can track their service orders from start to finish and view their service history.
- **Payment Integration:** Multiple payment methods are supported, giving customers flexibility and convenience.
- **Responsive Design:** The platform works perfectly on any device, from smartphones to desktop computers.
- **Security Implementation:** User passwords are securely stored using hashing, and the system is protected against SQL injection attacks.

Technical Achievements:

- **Clean Architecture:** Organized file structure with separation of presentation, logic, and database layers.
- **Security Implementation:** Password hashing, SQL injection prevention, and session security.
- **Optimized Performance:** Lightweight CSS (7 KB), minimal blocking scripts, and optimized database queries.
- **Scalable Design:** Architecture ready for future integration of features such as GPS tracking, AI-based recommendations, and mobile apps.

Business & Social Impact:

- **Increased Accessibility**: Brings verified home services to underserved local markets.
- **Time Savings**: Reduces provider search and booking time from hours to minutes.
- **Trust & Transparency:** Builds confidence through verified profiles and transparent pricing.
- **Economic Empowerment:** Creates new business opportunities for local skilled professionals.

With these outcomes, XPERTS not only meets its original objectives but also sets a strong foundation for future enhancements and market expansion.

Chapter 2

Proposed Methodology/Architecture

2.1 Requirement Analysis & Design Specification

2.1.1 Overview

The XPERTS platform follows a client-server architecture with a clear separation between the frontend (presentation layer), backend (business logic layer), and the database (data layer). To make the system easy to maintain and scalable for future upgrades, we adopted the MVC (Model-View-Controller) design pattern. This means:

- **Model:** Manages the database and data-related logic.
- **View:** The user interface that customers and providers interact with.
- **Controller:** The part that processes user requests and connects the UI with the database.

2.1.2 Proposed Methodology/ System Design

System Components:

- **Frontend Layer**: HTML5, CSS3, and JavaScript – for the user interface, responsive design, and interactive features.
- **Backend Layer**: PHP 7.4+ – for processing user requests, applying business rules, and managing sessions.
- **Database Layer**: MySQL 8.0+ – for securely storing user accounts, service categories, providers, and order details.
- **Web Server**: Apache (via XAMPP) – for handling requests and hosting the application locally during development.

System Flow:

User starts at Landing Page → Login/Register → Dashboard → Browse Services → Select Category → View Providers. From providers, the user can either:

- Chat (discuss & schedule),
- Book Service (payment → order tracking → completion → review → order history → repeat), or
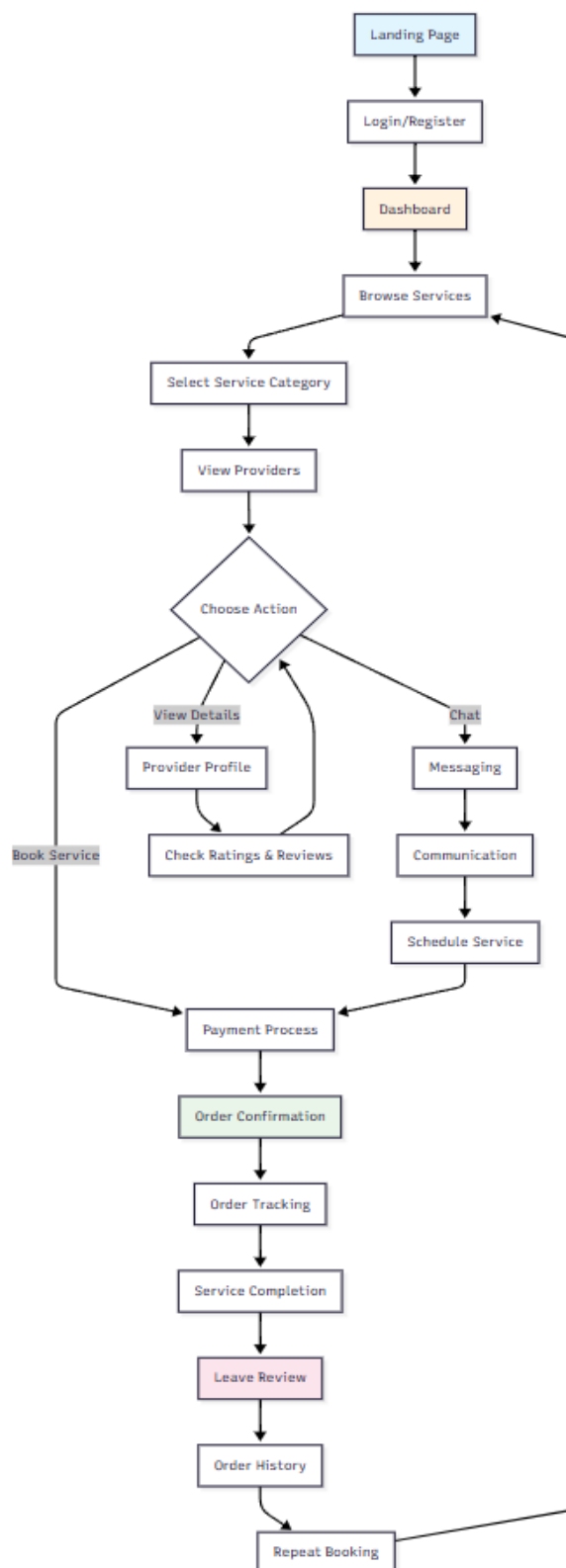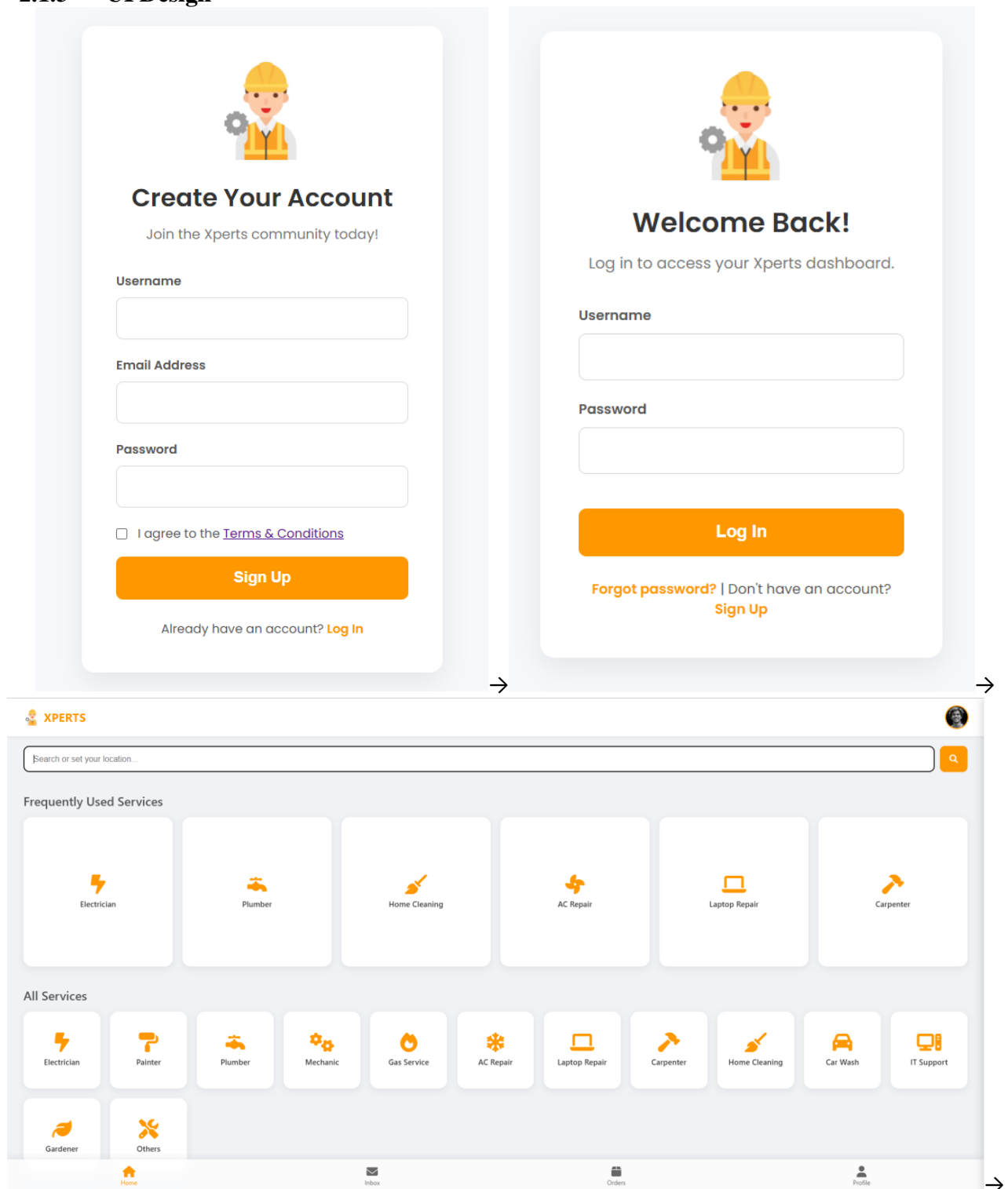- View Provider Details (ratings & profile).

Figure 2.1: System flow diagram

2.1.3   UI Design

XPERTS

Electrician Providers

Molly Clark
Electrician
Rating: 4.8 ⭐
[Chat] [Order]

Stark Lee
Electrician
Rating: 5 ⭐
[Chat] [Order]

Watt Edison
Electrician
Rating: 4.9 ⭐
[Chat] [Order]

Volt Franklin
Electrician
Rating: 4.7 ⭐
[Chat] [Order]

🏠 Home   ✉ Inbox   💼 Orders   👤 Profile

→

Payment Method

Choose your preferred payment option

Select Payment Method:

○ 💳 Credit Card

○ Bkash

○ Nagad

○ 🚀 Rocket

○ 💵 Cash on Delivery

Account / Card Number

Enter account or card number

Continue to Review

← Back to Providers

→

Leave a Review

How was your service experience?
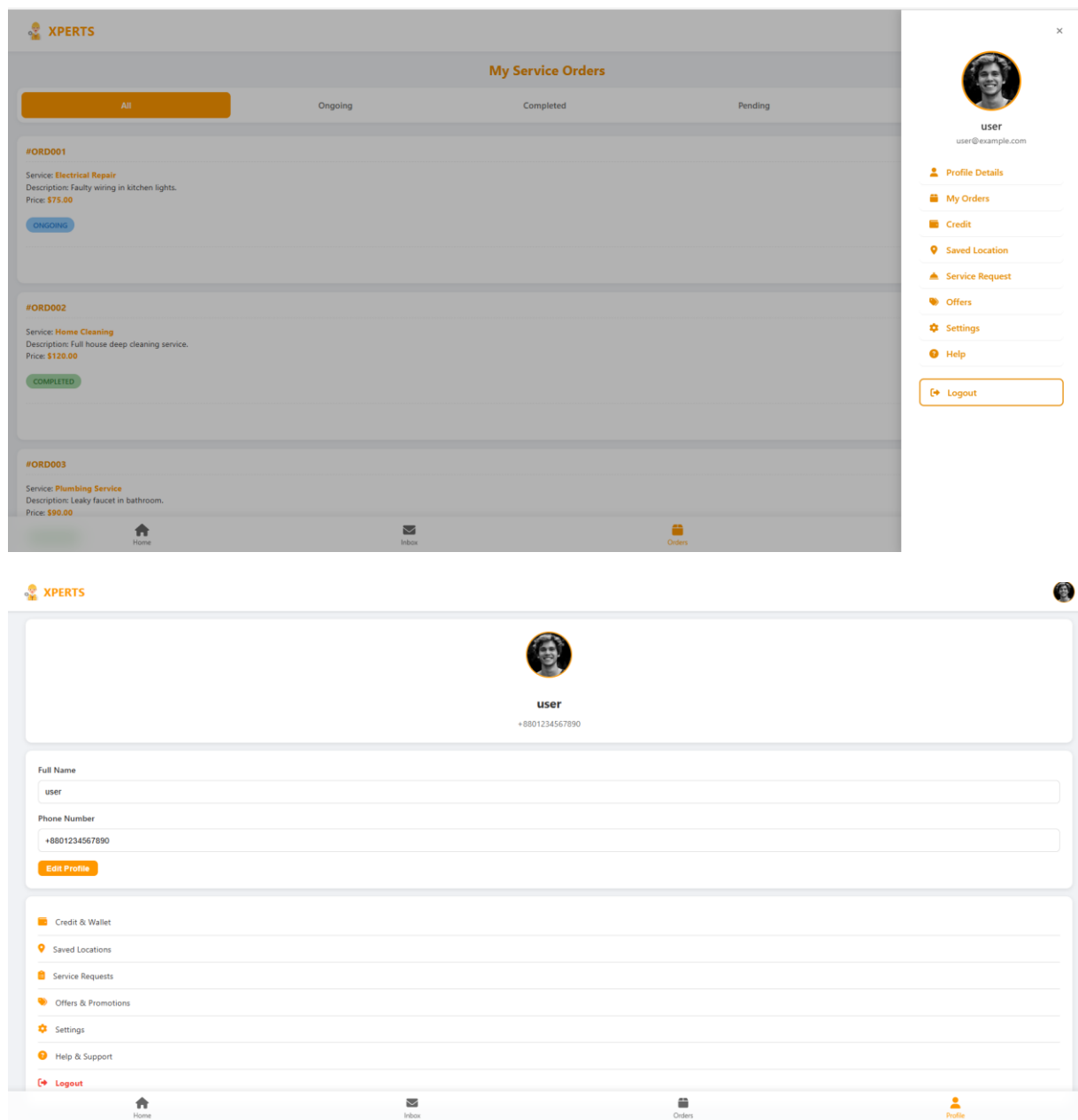
Rate your experience:

⭐ ⭐ ⭐ ⭐ ⭐

Excellent

Your Review

Write your review here...

Submit Review

← Back to Home

2.2 Overall Project Plan

The project was completed in five phases**:**

1. **Planning & Analysis (2 weeks):** Requirement gathering, database schema design, and UI mockups.
2. **Core Development (4 weeks):** Implementation of authentication, database, and basic service browsing.
3. **Feature Implementation (3 weeks):** Provider listings, order management, and payment integration.
4. **Testing & Optimization (2 weeks):** Debugging, security hardening, and load optimization.
5. **Deployment & Documentation (1 week):** Final setup, demo preparation, and report writing.

Chapter 3

Implementation and Results

3.1 Implementation

The platform was built using a standard web development stack**:**

- **Frontend**: HTML5, CSS3, and JavaScript for interactivity.
- **Backend**: PHP for request handling, authentication, and business logic.
- **Database**: MySQL 8.0 with normalized schema and prepared statements for security.
- **Other Resources**: Font Awesome for icons, JSON file for provider listings.

Key Features Implemented:

- User registration and secure login.
- Profile management.
- Service browsing by category.
- Provider listing with reviews and ratings.
- Order booking, tracking, and history.
- Payment system with multiple methods.
- Security features (password hashing, SQL injection prevention).

 Project link: https://github.com/mitul002/xperts

3.2 Performance Analysis

Loading Performance:

- Page load time: under 2 seconds.
- CSS: lightweight & optimized for quick loading
- Optimized images and javascripts.

Database Performance:

- Queries optimized with indexing and normalization.
- Prepared statements prevent SQL injection.
- JSON provider data loads efficiently.

User Experience:

- Works across browsers (Chrome, Firefox, Safari, Edge).
- Fully responsive (mobile/tablet/desktop).
- Easy navigation.
-

Security Performance:

- Passwords secured using hashing.
- Strict session handling.
- Both client-side and server-side validation.

3.3 Results and Discussion

The XPERTS platform was successfully developed as a fully working home services booking system. All planned features including user accounts, provider listings, order management, secure payments, and reviews were completed and tested. The design is clean, modern, and loads quickly, making it easy for users to navigate on both desktop and mobile devices.

During development, some challenges were solved, such as merging multiple CSS files into one for better consistency, restructuring the database for scalability, and adding strong security measures like password hashing and session handling. These improvements made the system faster, safer, and easier to maintain.

Feedback from test users showed that the platform is simple to use, performs reliably, and looks professional. Overall, the results prove that XPERTS is not only functional but also user-friendly and practical, offering a smooth and trustworthy way to connect customers with service providers.

Chapter 4

Engineering Standards and Mapping

4.1 Impact on Society, Environment and Sustainability

4.1.1 Impact on Life

- Reduces time spent searching for reliable service providers from hours to minutes
- 24/7 availability for service booking
- Ensures safety with verified providers and secure payments
- Pre-verified service providers reduce risk of fraud or poor service
- Rating system provides transparency and accountability
- Secure payment processing protects financial information
- Digital records provide proof of service agreements
- Mobile-responsive design enables access from any device
- Simple interface accommodates users of all technical skill levels

4.1.2 Impact on Society & Environment

- Economic Empowerment: Provides platform for local service providers to grow their business
- Job Creation: Increases visibility and opportunities for skilled workers
- Community Building: Connects neighbors with local service providers
- Digital Inclusion: Helps traditional businesses embrace digital transformation
- Paperless Operations: Digital receipts and documentation eliminate paper waste
- Resource Optimization: Better scheduling reduces unnecessary trips and resource waste
- Sustainable Business Model: Promotes local services over distant alternatives
- Cost Reduction: Competitive pricing benefits consumers
- Market Transparency: Clear pricing and reviews create fair market conditions

4.1.3 Ethical Aspects

- User Consent: Clear privacy policy and data usage agreements
- Data Minimization: Collects only necessary information
- Secure Storage: Encrypted password storage and secure data handling
- Right to Deletion: Users can request data removal
- Transparent Pricing: No hidden fees or unfair commission structures
- Honest Reviews: Authentic rating system without manipulation

4.1.4 Sustainability Plan

Technical Sustainability:

- Scalable Architecture: Designed to handle growing user base
- Maintainable Code: Clean, documented code for easy updates

- Version Control: Git-based development for change tracking
- Regular Updates: Planned security and feature updates

Business Sustainability:

- Revenue Model: Sustainable commission-based income
- Market Growth: Expanding service categories and geographic coverage
- Partnership Development: Integration with payment providers and local businesses
- Community Building: User engagement and retention strategies

Environmental Sustainability:

- Green Hosting: Plan to use renewable energy-powered servers
- Optimized Code: Efficient algorithms reduce server resource usage
- Mobile-First: Reduced data usage for mobile users
- Carbon Offset: Future programs to offset platform's carbon footprint

4.2   Project Management and Team Work

Project Management Methodology:

- Agile Development: Iterative development with regular feedback
- Version Control: Git-based code management
- Documentation: Comprehensive technical and user documentation
- Testing Strategy: Systematic testing at each development phase

Team Collaboration:

- Code Standards: Consistent coding conventions across all files
- Peer Review: Code review process for quality assurance
- Knowledge Sharing: Regular documentation and knowledge transfer
- Problem Solving: Collaborative approach to technical challenges

Quality Assurance:

- Testing Framework: Manual and automated testing procedures
- Performance Monitoring: Regular performance benchmarking
- Security Audits: Regular security vulnerability assessments
- User Acceptance Testing: Feedback incorporation from end users

Cost Analysis:

- Development Cost: Since open-source tools (PHP, MySQL, XAMPP) were used, the main cost was developer effort. Approximate cost = ৳30,000–40,000 if outsourced.
- Hosting & Domain: Shared hosting and a .com domain = around ৳5,000–6,000 per year.
- Marketing & Outreach: For reaching local providers and customers = around ৳10,000 initially.
- Maintenance: Yearly technical support and updates = ৳8,000–10,000.

Alternate Budget:

- Local development on free XAMPP server = ৳0.
- Free domain (e.g., .me) and free hosting = ৳0–2,000.
- Only time and effort needed, making it highly cost-effective.

Revenue Model:

- Commission-based earnings where XPERTS charges 10–15% per completed service booking.
- Additional future revenue from featured listings for providers and premium membership for businesses.

In this way, the project is financially feasible and sustainable for the Bangladeshi market, even with a very low initial budget.

4.3   Complex Engineering Problem

4.3.1   Mapping of Program Outcome

Table 4.1: Justification of Program Outcomes

PO's	Justification
PO1	Achieved through CO1, where OOP concepts (classes, objects, database design) were applied to solve the service booking problem.
PO2	Achieved through CO2, by analyzing requirements like secure login, payment, and service matching.
PO3	Achieved through CO3 & CO4, through UML design, MVC architecture, and implementation of the full system.

4.3.2   Complex Problem Solving

This section maps the complex problem-solving challenges encountered during the development of the XPERTS - On Demand Service Provider to the problem-solving categories. Each category is justified with a rationale. The problems and their mapping are summarized in Table 4.

Table 4.2: Mapping with complex problem solving.

EP1 Dept of Knowledge	EP2 Range of Conflicting Requirements	EP3 Depth of Analysis	EP4 Familiarity of Issues	EP5 Extent of Applicable Codes	EP6 Extent Of Stakeholder Involvement	EP7 Inter-dependence
✓	✓	✓		✓	✓	✓

The project meets complex problem attributes:

- **EP1**: Required deep technical knowledge (web stack, OOP, database).
- **EP2**: Balanced user convenience, provider speed, and system security.
- **EP3**: Needed detailed analysis of database design and security.
- **EP5**: Extent of Applicable Codes
- **EP6**: Involved multiple stakeholders (customers, providers, admin).
- **EP7**: Integrated different modules (login, booking, payment, reviews).

4.3.2   Engineering Activities

In this section, provide a mapping with engineering activities. For each mapping add subsections to put rationale (Use Table 4.3).

Table 4.3: Mapping with complex engineering activities.

EA1 Range of resources	**EA2** Level of Interaction	**EA3** Innovation	**EA4** Consequences for society and environment	**EA5** Familiarity
✓	✓	✓	✓	✓

The project also aligns with engineering activities:

- **EA1**: Used open-source tools (PHP, MySQL, XAMPP).
- **EA2**: Required team collaboration in design and testing.
- **EA3**: Introduced innovation with faster provider onboarding (24–48 hrs).
- **EA4**: Benefited society by creating jobs and reducing paper use.

Chapter 5

Conclusion

5.1   Summary

The XPERTS Home Services Platform was developed as a complete web-based solution for booking home services. It includes secure user management, service browsing, provider listings, order tracking, payment integration, and reviews. The system is fast, responsive, and works across devices, making it practical for real-world use.

The project demonstrates successful integration of modern web technologies including HTML5, CSS3, JavaScript, PHP, and MySQL to create a robust, secure, and user-friendly platform.

5.2   Limitation

- Current system lacks real-time chat functionality.
- Web-based only, no native mobile applications.
- Basic location handling without GPS integration.
- Currently English-only interface.
- Basic notification system without push notifications.
- Database may need optimization for large-scale deployments.
- No advanced caching mechanism implemented.

5.3   Future Work

- Implement real-time chat using WebSockets for instant communication between users and service providers
- Integrate push notifications for updates and alerts
- Enhance search with location-based filters, service categories, price, and rating options
- Integrate secure payment gateways (BKash, Nagad, Rocket etc.) with transaction history and refund management
- Develop native iOS and Android apps with offline capabilities and mobile-specific features.
- Implement AI-powered service provider recommendations and a customer service chatbot
- Add service provider verification and certification system
- Expand platform to support multiple cities/countries and partner networks
- Explore blockchain technology for making secure transactions and reviews system.

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