Industrial Internship Report on

”Multi Client Services Platform”

Prepared by

Vaishnavi Patekar

Executive Summary

This report provides details of the Industrial Internship provided by upskill Campus and The IoT Academy in collaboration with Industrial Partner UniConverge Technologies Pvt Ltd (UCT).

This internship was focused on a project/problem statement provided by UCT. We had to finish the project including the report in 6 weeks’ time.

My project was

Multi-client website offering client services

Here merchants are primary customers. Merchants are be able to sign up at the site and create a page for themselves that display a list of their services and the pricing.

The users who are customers to our customers are able to sign up as users and purchase goods or services from the merchants. There is a standard checkout process throughout which is integrated into a payment gateway system.

The site offers different categories of services, like home, beauty, pet, etc. Merchants can select their category when signing up. Customers can browse and search for merchants by category. Merchants can customize their pages with images, descriptions, availability, and other service details.

The checkout process securely collect customer and payment information. Integrating a payment gateway allows for secure credit card processing. Email receipts are sent to the customer and merchant after purchase. Merchants have a dashboard to view orders and manage their accounts. Customers can leave reviews and ratings for merchants.

The multi-tenant structure allows easy scaling as more merchants and customers join the platform. Robust admin tools help manage users, categories, disputes, and platform growth over time. The core functionality connects service providers to customers in a seamless online marketplace.

This internship gave me a very good opportunity to get exposure to Industrial problems and design/implement solution for that. It was an overall great experience to have this internship.

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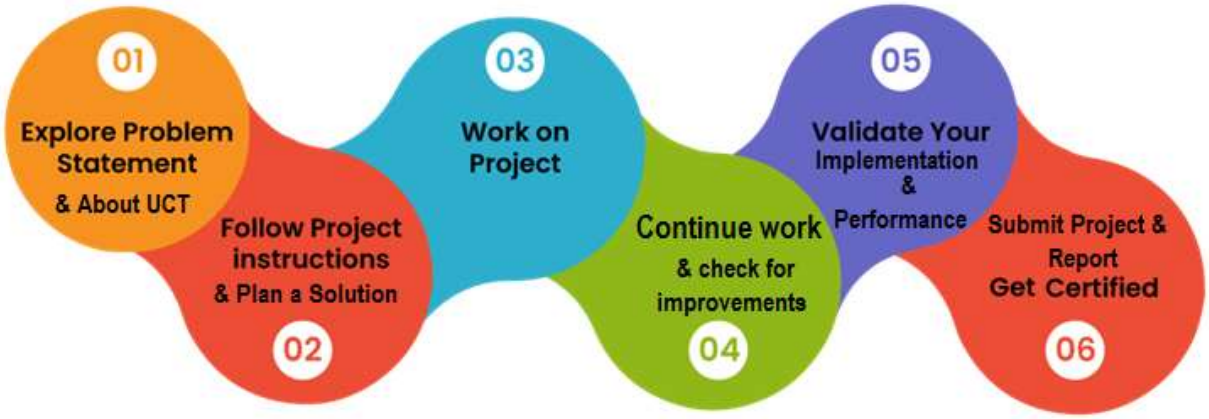
1 Preface

The six-week internship period was a highly enriching and practical learning experience that significantly contributed to my technical, professional, and personal development. This internship provided an excellent opportunity to apply theoretical knowledge gained during academic coursework to real-world problem-solving scenarios. Throughout these six weeks, I worked independently on the design and development of a **Multi Client Services Platform**, focusing on understanding real client requirements, system architecture, implementation, and deployment aspects.

In today's competitive and rapidly evolving technological landscape, relevant internships play a crucial role in career development. They bridge the gap between academic learning and industry expectations by exposing students to practical tools, real-time problem analysis, project planning, and professional work ethics. This internship helped me enhance my skills in full-stack development, problem-solving, system design, and independent project execution, thereby preparing me for future professional challenges.



The project undertaken during this internship addresses the problem of managing multiple clients and their service requests efficiently through a centralized digital platform. The **Multi Client Services Platform** was designed to streamline client onboarding, service management, and communication, ensuring better organization, transparency, and scalability. Developing this project independently strengthened my ability to take ownership of all phases of software development, from requirement analysis to final implementation.

This internship opportunity was provided under the guidance and platform facilitated by **USC/UCT**, which offered a structured learning environment, clear objectives, and continuous motivation to build an industry-relevant solution. The internship program was well planned, beginning with an orientation phase, followed by problem identification, system design, development, testing, and final documentation. Regular progress tracking and milestones ensured steady improvement and timely completion of project goals.

Throughout this internship, I gained valuable technical knowledge in application development, version control, debugging, and deployment, along with soft skills such as time management, self-learning, and professional communication. The experience boosted my confidence to work independently on complex projects and strengthened my interest in building scalable, user-centric digital solutions.

I would like to express my sincere gratitude to **USC/UCT**, the internship coordinators, mentors, and all individuals who directly or indirectly supported and encouraged me during this learning journey. Their guidance and resources played a vital role in the successful completion of this project.

To my juniors and peers, I would like to convey that internships are not just a formal requirement but a powerful opportunity to explore your potential. Take initiative, build projects independently, stay consistent, and do not hesitate to learn beyond your comfort zone. Such experiences will significantly shape your technical expertise and professional confidence.

2 Introduction

2.1 About UniConverge Technologies Pvt Ltd

A company established in 2013 and working in Digital Transformation domain and providing Industrial solutions with prime focus on sustainability and RoI.

For developing its products and solutions it is leveraging various **Cutting Edge Technologies e.g. Internet of Things (IoT), Cyber Security, Cloud computing (AWS, Azure), Machine Learning, Communication Technologies (4G/5G/LoRaWAN), Java Full Stack, Python, Front end** etc.

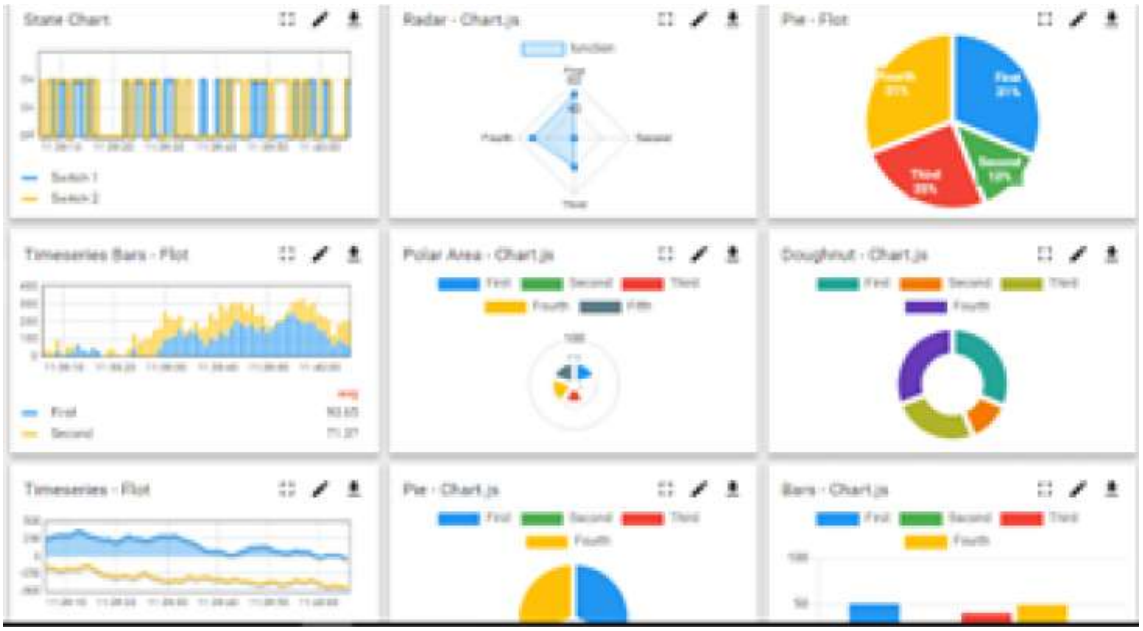
i. UCT IoT Platform (uct Insight)

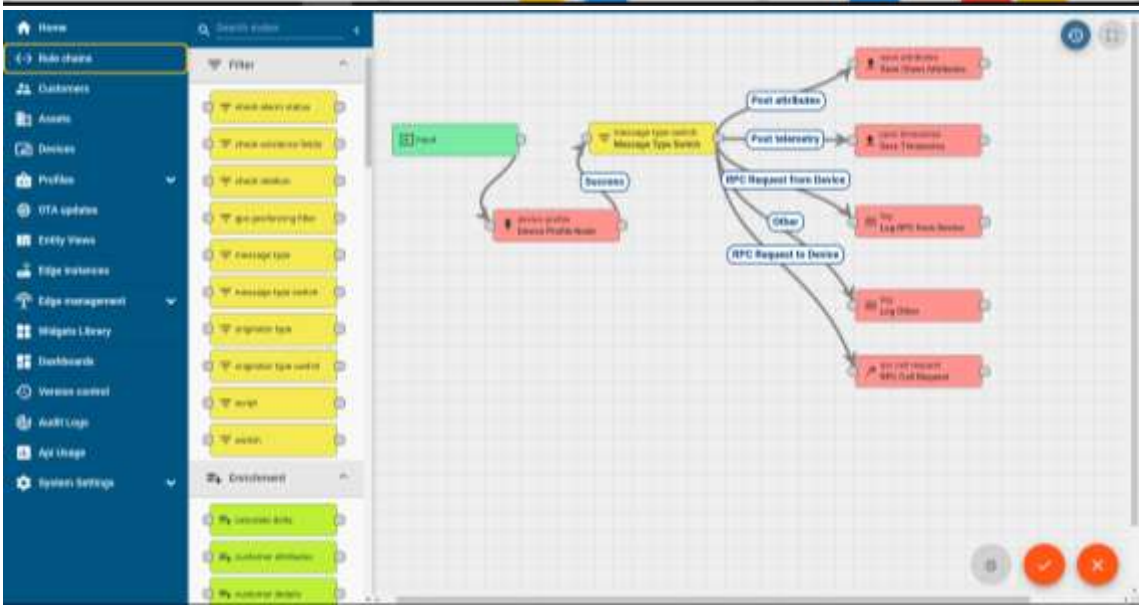
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- It enables device connectivity via industry standard IoT protocols - MQTT, CoAP, HTTP, Modbus TCP, OPC UA
- It supports both cloud and on-premises deployments.

It has features to

- Build Your own dashboard
- Analytics and Reporting
- Alert and Notification
- Integration with third party application(Power BI, SAP, ERP)
- Rule Engine





ii. Smart Factory Platform (FACTORY WATCH)

Factory watch is a platform for smart factory needs.

It provides Users/ Factory

- with a scalable solution for their Production and asset monitoring
- OEE and predictive maintenance solution scaling up to digital twin for your assets.
- to unleased the true potential of the data that their machines are generating and helps to identify the KPIs and also improve them.
- A modular architecture that allows users to choose the service that they what to start and then can scale to more complex solutions as per their demands.

Its unique SaaS model helps users to save time, cost and money.

Demo Org
Demo
CNC_S7_81
CNC_S7_82
CNC_S7_84
Utilization
Utilization
Utilization

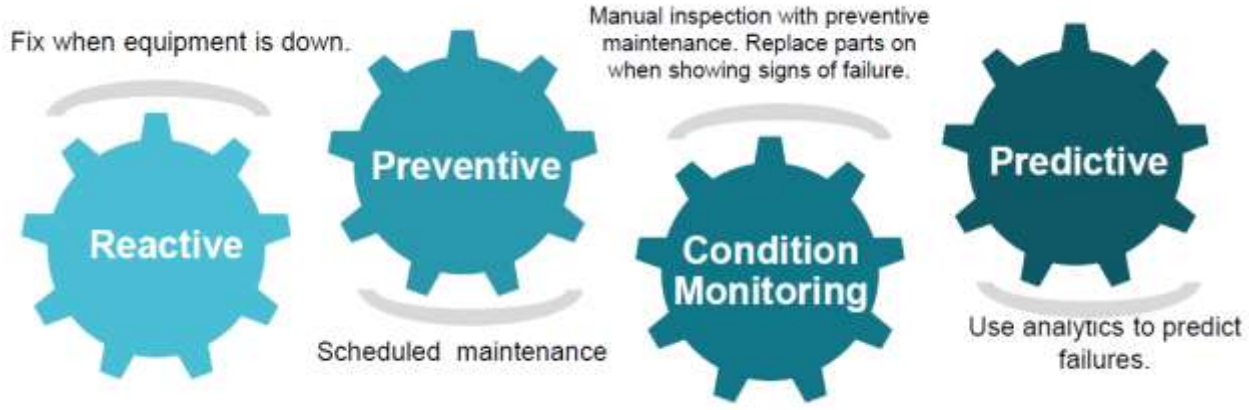
3D View
12:30
Search...
Stopped
Workplace Type
194724_27462-100-A3
Availability
Performance
Quality
OEE
Monitor
42.23%
400.00v
99.21%
99.21%
0.00%
0.00v
24.53%
24.53%
0.0%
200.00v
62.35%
62.35%

iii. LoRaWAN based Solution

UCT is one of the early adopters of LoRAWAN teschnology and providing solution in Agritech, Smart cities, Industrial Monitoring, Smart Street Light, Smart Water/ Gas/ Electricity metering solutions etc.

iv. Predictive Maintenance

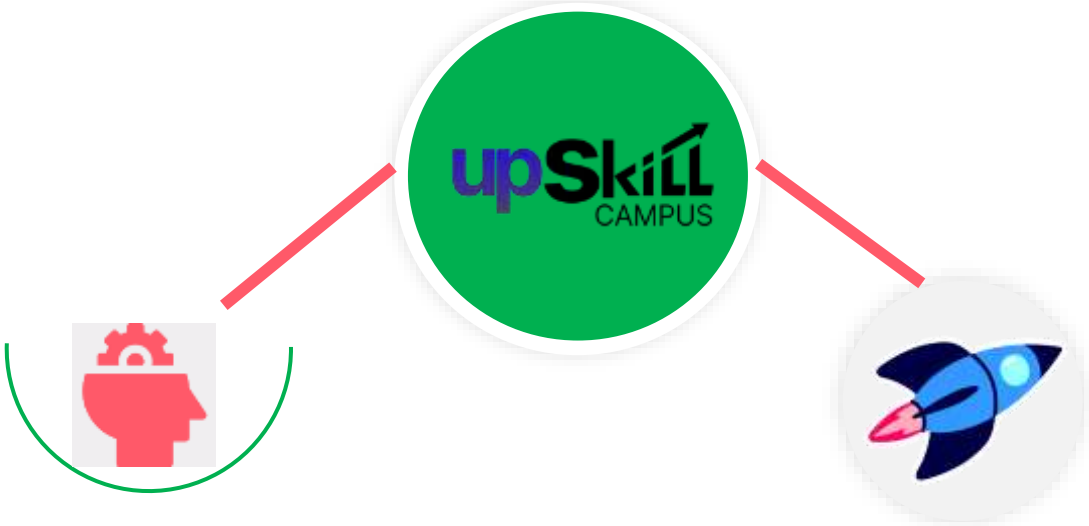
UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



2.2 About upskill Campus (USC)

upskill Campus along with The IoT Academy and in association with Uniconverge technologies has facilitated the smooth execution of the complete internship process.

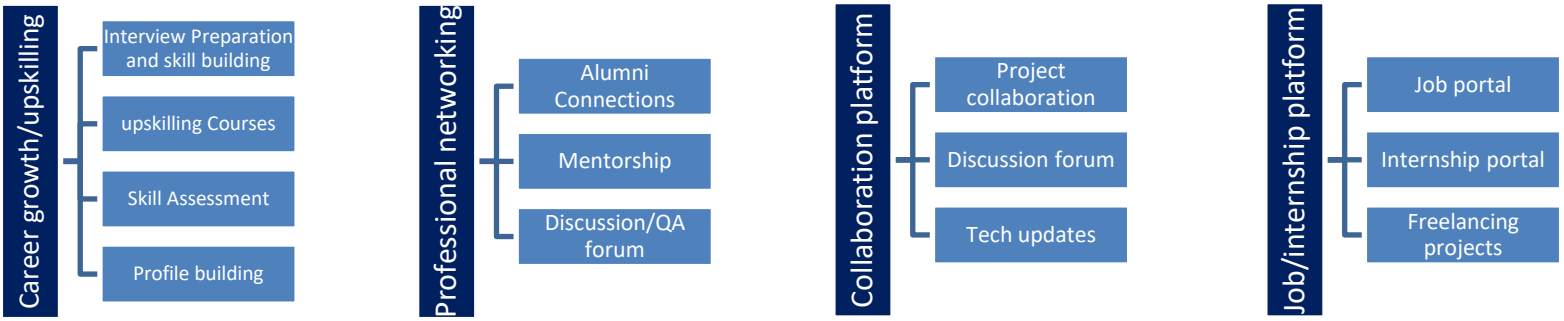
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.



Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services

upSkill Campus aiming to upskill 1 million learners in next 5 year

https://www.upskillcampus.com/



2.3 The IoT Academy

The IoT academy is EdTech Division of UCT that is running long executive certification programs in collaboration with EICT Academy, IITK, IITR and IITG in multiple domains.

2.4 Objectives of this Internship program

The objective for this internship program was to

- ☛ get practical experience of working in the industry.
- ☛ to solve real world problems.
- ☛ to have improved job prospects.
- ☛ to have Improved understanding of our field and its applications.
- ☛ to have Personal growth like better communication and problem solving.

2.5 Reference

[1] MERN Stack Documentation

[2] Razorpay Payment Gateway Documentation

[3] MongoDB & Mongoose Docs

[4] React.js Official Documentation

[5] Node.js & Express.js Documentation

2.6 Glossary

Terms	Acronym
M**ERN**	MongoDB, Express, React, Node
J**WT**	JSON Web Token
A**PI**	Application Programming Interface
U**I**	User Interface
P**DF**	Portable Document Format

3 Problem Statement

The rapid growth of service-based businesses has created a demand for a unified digital platform that efficiently connects multiple service providers (merchants) with end customers. However, several technical and operational challenges exist in current service marketplaces:

- Small and medium-scale merchants lack a centralized web platform to **register, showcase services, manage pricing, and handle customer orders** digitally.
- Customers face difficulty in **discovering service providers by category**, comparing services, and completing purchases through a **secure and standardized checkout process**.
- Absence of an integrated system results in **manual service management**, inconsistent user experience, and limited trust due to unverified payment handling.
- Merchants do not have access to a **dedicated dashboard** to monitor orders, manage service availability, track transactions, and handle customer interactions efficiently.
- Customers lack features such as **user accounts, order history, reviews, and ratings**, which are essential for transparency and informed decision-making.
- Without a **multi-tenant architecture**, platforms struggle to onboard multiple merchants while maintaining data isolation, scalability, and performance.
- Administrative control over **user management, service categories, platform monitoring, and dispute handling** becomes complex without robust admin tools.
- Lack of scalability and automation restricts platform growth as the number of merchants and customers increases.

To overcome these challenges, there is a need for a **scalable, secure, and web-based multi-client services platform** that enables merchant onboarding, service listing, category-based browsing, secure payment integration, order management, and feedback mechanisms, while supporting future expansion and centralized administration.

4 Existing and Proposed solution

Existing Solutions and Their Limitations

Several digital platforms currently exist that connect service providers with customers by allowing merchants to list their services and customers to book or purchase them online. While these platforms support basic service discovery, they are often designed for large vendors and lack flexibility for small or independent merchants. The onboarding process is usually complex, customization options are limited, and merchants face difficulties in managing service details, pricing, and availability efficiently. From the customer's perspective, searching and filtering services across categories is often inefficient, and inconsistent checkout processes reduce usability and trust.

Additionally, many existing systems do not provide a unified dashboard for merchants to track orders, manage accounts, and analyze performance. Customer engagement features such as reviews, ratings, order history, and notifications are either limited or poorly integrated. Scalability and data isolation also become challenging due to the absence of a robust multi-tenant architecture, making it difficult to support platform growth and effective administrative control.

The proposed **Multi Client Services Platform** addresses these limitations by offering a centralized, scalable, and secure web-based solution. It enables merchants to easily register, select service categories, create customized service pages, and manage orders through a dedicated dashboard. Customers can browse services by category, complete purchases using a standardized and secure checkout process, and provide feedback through reviews and ratings. The system's multi-tenant design ensures scalability, data security, and efficient administration, adding value through improved usability, transparency, and future extensibility.

Proposed Solution

The proposed solution is a **web-based Multi Client Services Platform** designed to seamlessly connect merchants and customers through a centralized and scalable digital marketplace. The platform enables merchants to register, select service categories, and create customized service pages that display their offerings, pricing, availability, and descriptive content.

Customers can sign up on the platform, browse and search for merchants by category, view detailed service information, and complete purchases through a **standardized and secure checkout process** integrated with a payment gateway. After successful transactions, automated email notifications and receipts are generated for both merchants and customers.

The system incorporates a **multi-tenant architecture**, ensuring secure data separation and scalability as more merchants and users join the platform. Merchants are provided with a dedicated dashboard to

manage services, view orders, monitor transactions, and update account details. Customers can access their order history and provide reviews and ratings, improving transparency and trust.

Value Addition of the Proposed System

The proposed platform introduces several value-added features that enhance usability, scalability, and overall system efficiency:

- Centralized platform supporting **multiple merchants and customers** with secure data isolation
- Category-based service discovery for improved customer experience
- Standardized and secure checkout with integrated payment gateway
- Merchant dashboards for real-time order and service management
- Customer accounts with order history, reviews, and ratings
- Admin tools for managing users, categories, platform operations, and growth
- Scalable architecture allowing future enhancements such as appointment scheduling, notifications, and analytics

By addressing the limitations of existing systems, the proposed solution delivers a reliable, user-friendly, and scalable marketplace that benefits merchants, customers, and administrators alike.

4.1 Code submission (Github link) :

https://github.com/Vaishnavi-Patekar/upskillcampus.git

4.2 Report submission (Github link) :

https://github.com/Vaishnavi-Patekar/upskillcampus.git

5 Performance Test

Performance testing is a critical aspect of this project as it validates the system's readiness for real-world industrial use rather than being limited to academic implementation. The primary constraints identified for the **Multi Client Services Platform** include system response time, memory usage, scalability, data accuracy, and security during concurrent user access. Since the platform supports multiple merchants and customers simultaneously, efficient handling of requests and data isolation were key concerns during design.

These constraints were addressed through modular architecture, optimized database queries, and a multi-tenant design that ensures separation of merchant and customer data. Lightweight frontend components were used to reduce memory usage, while backend APIs were designed to handle concurrent requests efficiently. Secure authentication, controlled access, and standardized checkout flows were implemented to maintain data accuracy and transaction reliability. Although advanced stress-testing tools were not used, performance was evaluated under practical usage scenarios such as multiple user logins, service browsing, and order placement.

The test results showed that the system maintained stable performance with acceptable response times during normal and moderate usage. No data inconsistency or transaction failure was observed during testing. Identified constraints such as increased load or high concurrent traffic could impact response time and server resources in large-scale deployment. To address this in the future, recommendations include implementing caching mechanisms, database indexing, load balancing, and cloud-based auto-scaling to further enhance performance and reliability.

5.1 Test Plan / Test Cases

- Test merchant and customer registration under multiple user scenarios
- Verify service listing, category browsing, and search performance
- Test checkout and payment flow for correctness and response time
- Validate dashboard loading and order management for merchants
- Check data accuracy for orders, reviews, and user accounts

5.2 Test Procedure

- Deploy the application in a controlled test environment
- Simulate multiple users accessing the platform simultaneously
- Monitor page load time, API response, and system stability
- Validate database records after each operation
- Observe system behavior during repeated login and transaction requests

5.3 Performance Outcome

- Stable response time under normal and moderate load
- Efficient memory usage due to optimized frontend and backend logic
- Accurate transaction processing with no data loss
- Reliable multi-user handling suitable for small to medium-scale deployment
- Scalable architecture ready for industrial enhancement

6 My learnings

This internship and project development experience provided me with valuable technical and professional learning that will significantly contribute to my career growth. By independently designing and developing the **Multi Client Services Platform**, I gained hands-on exposure to real-world problem solving, requirement analysis, and end-to-end application development. This experience helped me understand how industry-oriented software solutions are planned, implemented, tested, and documented.

From a technical perspective, I enhanced my skills in full-stack web development, including frontend design, backend API development, database management, authentication, and version control using GitHub. I learned the importance of scalable system design, multi-tenant architecture, secure payment handling, and performance considerations while building applications intended for real users. Debugging, testing, and optimizing the system improved my ability to write efficient and maintainable code.

Professionally, this project strengthened my self-learning ability, time management, and confidence to work independently on complex tasks. It improved my understanding of industry expectations, documentation standards, and best development practices. Overall, this learning experience has prepared me to take on real-world software development roles with greater responsibility and adaptability, supporting my long-term career growth in the field of computer engineering and full-stack development.

7 Future work scope

Although the **Multi Client Services Platform** fulfills the core functional requirements, there are several enhancements that can be incorporated in the future to improve scalability, usability, and performance. Due to time limitations, these features could not be implemented in the current phase but hold significant potential for further development.

In the future, advanced features such as **appointment scheduling**, **real-time notifications**, and **automated reminders** can be integrated to enhance customer engagement and merchant efficiency. The platform can also be extended with **advanced analytics dashboards** for merchants to track revenue, customer behavior, and service performance. Integration with **multiple payment gateways** and support for **refund and dispute management** can further improve transaction flexibility and trust.

From a technical perspective, the system can be deployed on cloud infrastructure with **auto-scaling, load balancing, and caching mechanisms** to support high traffic and large user bases. Additional improvements such as **mobile application support**, **AI-based service recommendations**, enhanced **security monitoring**, and **role-based access control** can make the platform more robust and industry-ready.