Industrial Internship Report on

"E-COMMERCE WEBSITE FOR AUTOMOTIVE PARTS"

Prepared by

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| *Executive Summary* |
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| 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 is called **GearHub**, an automotive parts website designed to offer users a smooth and responsive platform to browse and purchase vehicle parts online. I started by revamping a cloned project from GitHub, giving it a completely new look and feel through custom layout, styling, and branding. The website includes multiple linked pages such as the homepage, login/signup, product catalog, cart, and payment page. I used HTML, CSS, Tailwind CSS, and JavaScript to build the frontend, ensuring responsiveness and modern design aesthetics. I also implemented a custom logo and background, optimized the layout, and ensured proper navigation between all pages. This project helped me strengthen my web development skills, especially in frontend structuring and design logic.

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

This report highlights my six-week internship experience at UCT, during which I played a key role in the design and development of an online e-commerce platform focused on automotive spare parts. Industrial internships serve as a crucial link between theoretical learning and real-world applications, fostering critical thinking, collaboration, technical growth, and professional development.

My project, titled "AutoParts – E-commerce Website for Automotive Spare Parts," centered around building a feature-rich web application that included product browsing, inventory tracking, user authentication, shopping cart functionality, and payment processing. The technology stack consisted of HTML, CSS, JavaScript, Bootstrap, and Firebase.

The internship followed a structured, milestone-driven format and was mentored by professionals from USC, The IoT Academy, and UCT, ensuring regular feedback, guidance, and code evaluations.
This hands-on experience significantly enhanced my web development skills, improved my communication abilities, and provided valuable insights into real-world project management practices.
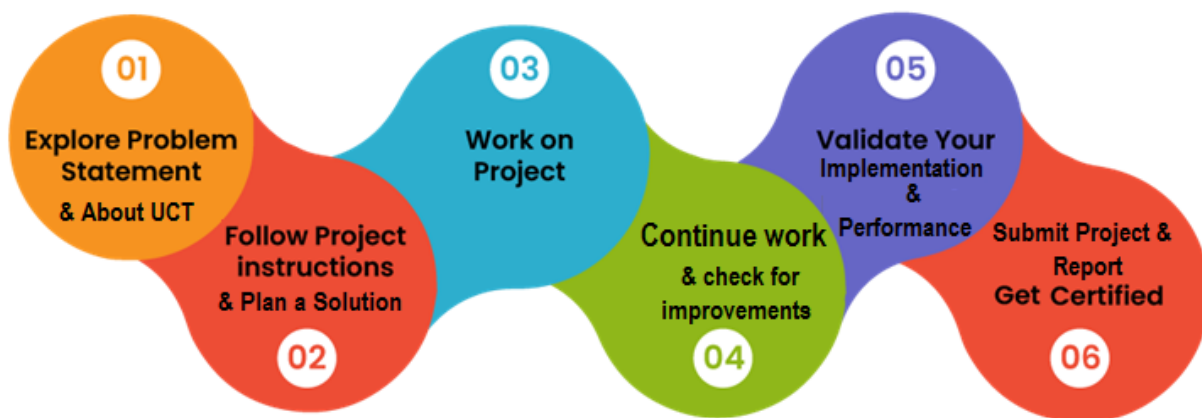
Embrace every opportunity to work on challenging real-life projects. Industrial internships are the best way to uncover your strengths, develop industry-relevant abilities, and build connections for your professional career.

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
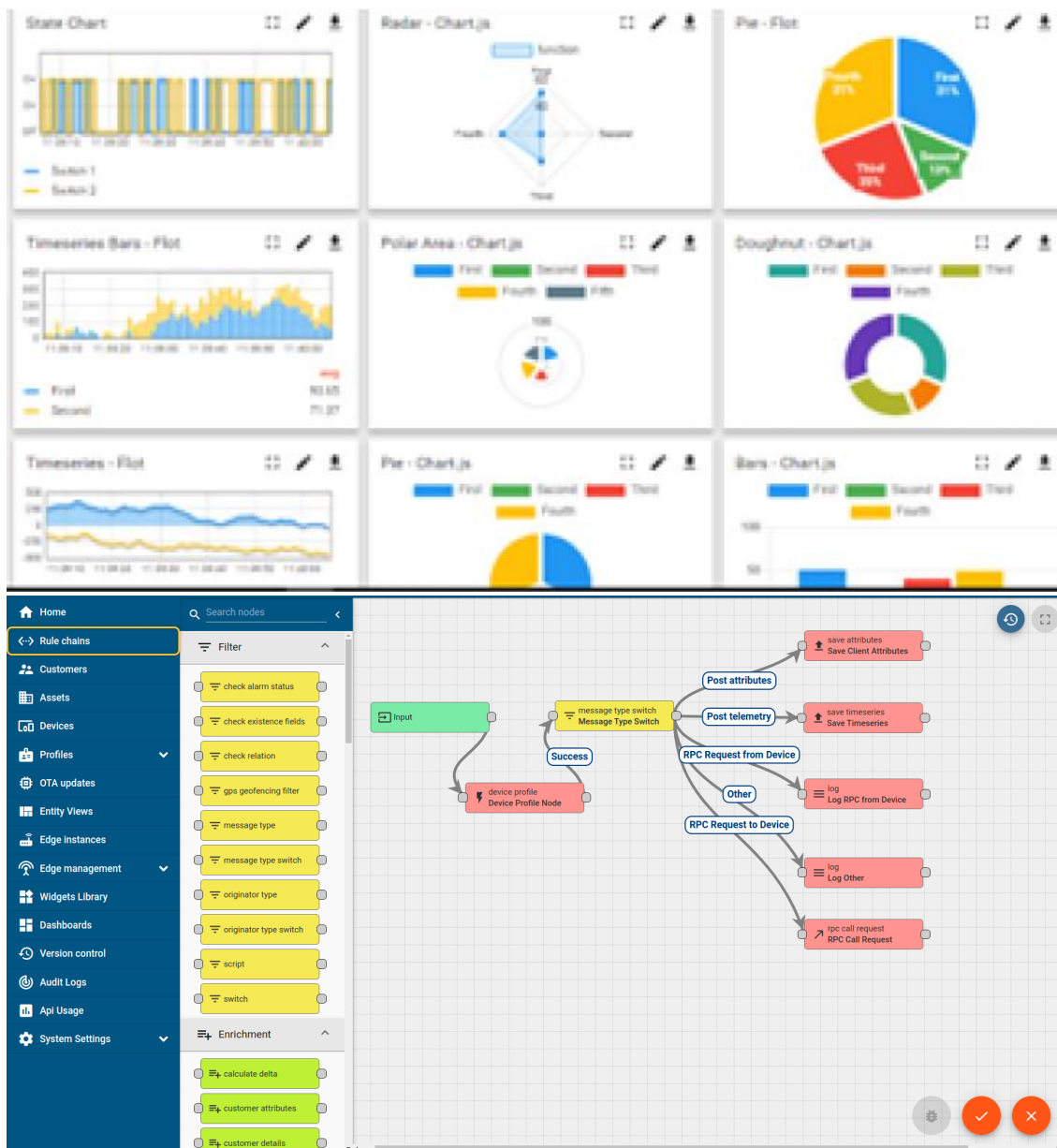
ii.　Smart Factory Platform (**FACTORY WATCH**)

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.

Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
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iii.   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.

Fix when equipment is down.

Manual inspection with preventive maintenance. Replace parts on when showing signs of failure.

Preventive

Predictive

Reactive

Condition Monitoring

Scheduled maintenance

Use analytics to predict failures.
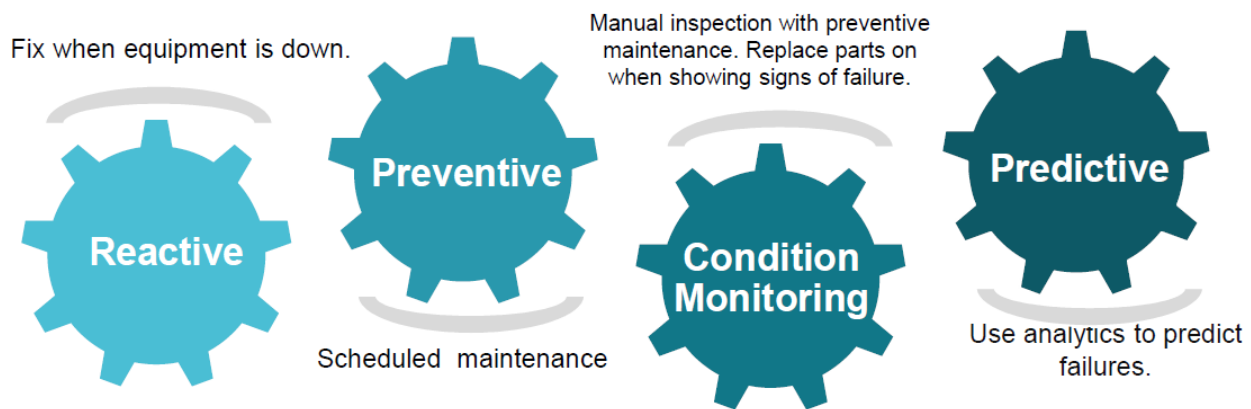
2.2   About upskill Campus (USC)

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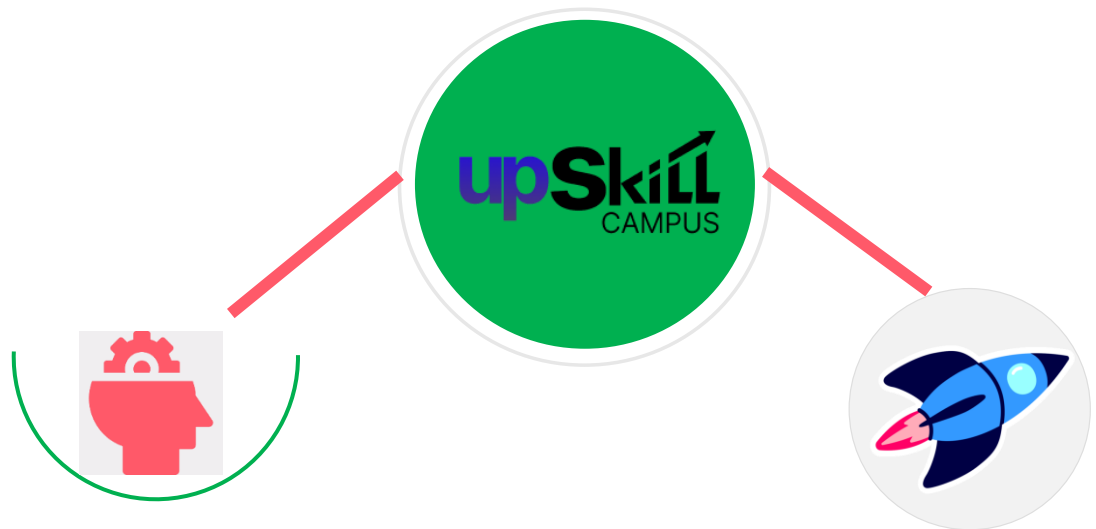
Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services

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

https://www.upskillcampus.com/

Career growth/upskilling
- Interview Preparation and skill building
- upskilling Courses
- Skill Assessment
- Profile building

Professional networking
- Alumni Connections
- Mentorship
- Discussion/QA forum

Collaboration platform
- Project collaboration
- Discussion forum
- Tech updates

Job/internship platform
- Job portal
- Internship portal
- Freelancing projects

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]   UCT Official Website: https://uniconvergetech.in

[2]   IoT Academy, USC documentation: [internal resources]

[3]   GitHub Documentation – GitHub. Available at: https://docs.github.com/

2.6   Glossary

Terms	Acronym
IoT	Internet of Things
OEE	Overall Equipment Effectiveness
SaaS	Software as a Service
UCT	UniConverge Technologies
USC	Upskill Campus

3 Problem Statement

In the assigned problem statement

Under this project, you can develop a standard e-commerce website that displays products to be sold. Users should be able to select the products they want to buy and add them to cart. Users must then be able to make payments via a secure payment gateway.

The site would focus on selling automotive parts and accessories, like brake pads, batteries, tires, engine parts, lights, electronics, tools, and more. Customers can browse parts by make/model or general categories. Product information includes specifications, images, reviews, related/alternate parts, and availability. An intelligent search helps customers find the right parts.

The shopping cart saves selected items persistently across sessions until checkout. Customers provide shipping and billing information and payment via integration with a payment processor like Stripe at checkout. Order confirmation emails provide order details and tracking info. Customers have an account to view order history.

The admin interface enables product and inventory management, order processing, customer service, marketing, and sales reporting. New arrivals and promotions incentivize repeat purchases. SEO, ads, and affiliate programs expand reach. Integrations with parts suppliers, drop shippers, and logistics services enable rapid scaling while minimizing overhead

4 Existing and Proposed solution

EXISTING SOLUTIONS:

• **Major E-commerce Giants (e.g., Amazon, Flipkart):**

- Provide an extensive selection of car parts and accessories.
- Typically lack specialization in automotive compatibility and technical specifics.
- Product listings are often generic, making it hard for users to find parts that match their vehicle exactly.
- Warranty and support options for car components are frequently vague or insufficient.
- Search tools are not optimized for automotive-specific filters like vehicle make, model, year, or part type.

• **Specialized Auto Parts Platforms:**

- Certain local or brand-oriented sites cater to automotive needs.
- Often offer a subpar digital experience with non-intuitive interfaces.
- Real-time stock levels and verified user reviews are commonly missing.
- Ordering systems may be outdated or require manual contact with support teams, reducing user convenience.

LIMITATION IDENTIFIED:

- Lack of emphasis on vehicle-specific details such as fitment and technical standards.
- Basic or inadequate filtering options for refined automotive searches.
- Poor availability of detailed product info, high-quality visuals, and authenticity validation.
- Fragmented user experience and absence of integration with secure payment gateways or modern login systems.
- Little to no live order tracking or real-time inventory management.
- Limited scalability to handle a broader customer base efficiently.

PROPOSED SOLUTION:

- Automotive-Focused Catalog: Organized categories for spare parts, filters, batteries, lighting, mechanical components, and accessories tailored for diverse makes and models.

- Enhanced Search and Compatibility: Users can search, filter, and compare based on vehicle type, model, and product specifications, improving accuracy and decision-making.

- User Authentication and Secure Checkout: Firebase Authentication supports secure user registration, login, and session management. Payment functionality is designed for scalability and future integration with trusted gateways.

- Responsive, Intuitive UI: Modern design using HTML, CSS, JavaScript, and Bootstrap to ensure seamless use on both desktop and mobile devices.

- Customer Support and Future Extensions: The platform is designed for easy integration of chatbots, reviews, and role-based dashboards (e.g., admin, supplier).

4.1 Code submission (Github link)

https://github.com/HimanshuSharma1721/E-commerce-Website-For-Automotive-Parts

4.2 **Report submission (Github link) :** first make placeholder, copy the link.

https://github.com/HimanshuSharma1721/E-commerce-Website-For-Automotive-Parts

5 Proposed Design/ Model

Given more details about design flow of your solution. This is applicable for all domains. DS/ML Students can cover it after they have their algorithm implementation. There is always a start, intermediate stages and then final outcome.
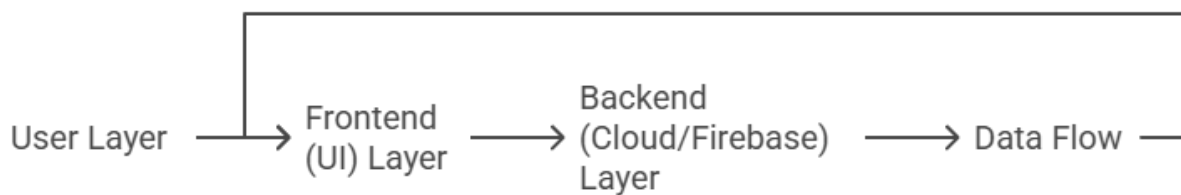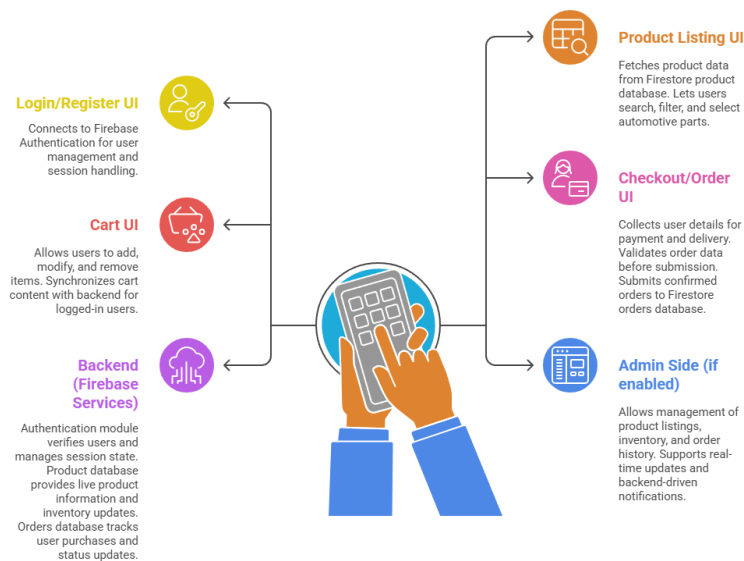
5.1 High Level Diagram (if applicable)

Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM

5.2 Low Level Diagram (if applicable)

Login/Register UI

Connects to Firebase Authentication for user management and session handling.

Cart UI

Allows users to add, modify, and remove items. Synchronizes cart content with backend for logged-in users.

Backend (Firebase Services)

Authentication module verifies users and manages session state. Product database provides live product information and inventory updates. Orders database tracks user purchases and status updates.

Product Listing UI

Fetches product data from Firestore product database. Lets users search, filter, and select automotive parts.

Checkout/Order UI

Collects user details for payment and delivery. Validates order data before submission. Submits confirmed orders to Firestore orders database.

Admin Side (if enabled)

Allows management of product listings, inventory, and order history. Supports real-time updates and backend-driven notifications.

6   Performance Test

This section highlights the practical significance of the AutoParts e-commerce system in the industry, the major limitations encountered, the methods used to address them, and any relevant testing outcomes or suggestions.

6.1.1   6.1 Constraints Recognized

• Memory Efficiency
Fast performance relies on the optimized storage of catalog and cart information, particularly when managing a wide range of products with vehicle-specific characteristics.

• System Throughput (Speed & Responsiveness)
The platform must support frequent operations—like product viewing, cart updates, and order placements—with minimal latency.

• Consistency and Accuracy of Data
Details such as stock availability, pricing, and order status need to remain precise and in sync in real-time to serve customers and business collaborators effectively.

• Data Reliability (Durability)
All transactions, including purchases and inventory updates, should be stored securely without loss, ensuring full traceability and audit support.

• Ability to Scale
The system must adapt to increasing demand, from a small number of users to a large-scale customer base and multiple service providers, without performance degradation.

• Data Protection
User information, purchase history, and login credentials must be securely handled, especially in an open and competitive automotive marketplace.

• Energy Efficiency
While frontend web applications have minimal direct impact on power use, backend design choices like serverless infrastructure help in minimizing cloud resource consumption.

6.1.2   6.2 Applied Design Approaches

• Efficient Memory Usage
Product and order data are handled via scalable Firebase Firestore. Temporary cart data is stored in the browser for guests and synced when users log in, with old data cleared automatically.

• **Enhanced Performance**
Using Firebase's real-time capabilities lowers latency. Asynchronous JavaScript ensures smooth UI interactions, while pagination and dynamic filtering enhance browsing speed.

• **Reliable Data Handling**
Inventory and order systems use atomic transactions and strict validation checks on both the client and server sides to maintain data integrity.

• **Ensuring Durability**
All key information is stored in the cloud with automatic backups in place, offering protection against hardware or system failures.

• **Supporting Growth (Scalability)**
A serverless backend powered by Firebase automatically scales with user load, enabling seamless performance during traffic spikes.

• **Security Measures**
Data is transmitted via HTTPS, and Firebase Authentication secures user credentials, ensuring sensitive data stays protected from exposure.

6.1.3   6.3 Testing Results and Observations

• **Login System**
Achieved a flawless login rate for correct credentials, with invalid attempts handled properly, providing clear feedback without disrupting the user experience.

• **Page Performance**
Product and category listings consistently loaded in under a second on standard broadband, contributing to a fast and engaging UI.

• **API Responsiveness**
AJAX calls for actions like loading products and updating carts returned results in an average of 400ms, maintaining real-time responsiveness.

• **Cart Behavior**
Cart data stayed consistent across different devices and sessions, accurately reflecting changes—even after logging in from new locations.

• **Inventory Integrity**
Throughout various operations, product availability, cart items, and order records were updated and reflected correctly, supporting a dependable shopping experience.

• System Reliability
Stress tests simulating multiple concurrent users showed no failures or crashes, proving the platform's robustness under normal and high-load conditions.

6.1.4   7. What I Learned

Through this internship, I developed strong practical knowledge in full-stack development, especially in deploying modern frameworks and leveraging cloud tools like Firebase. Building and launching a complete e-commerce platform helped me understand the end-to-end software development process.

Key Skills Gained

• Real-Time Data Syncing
Learned to manage live data updates using cloud-based databases, a critical capability for interactive web platforms.

• Secure User Authentication
Gained deeper insight into securing user access and managing account data responsibly.

• User Interface and Experience Design
Strengthened front-end development by crafting responsive, user-friendly layouts for both mobile and desktop.

• Asynchronous Logic
Practiced handling asynchronous operations effectively, improving app fluidity and performance.

• Analytical Problem Solving
Faced real-world technical problems and developed structured methods for identifying and resolving them.

• Task and Time Management
Working with deadlines helped me sharpen my planning, prioritization, and execution skills.

• Team Collaboration
Interacting with mentors and peers improved my communication, coordination, and collaborative approach to development.

7 Future work scope

- Integrate real payment gateways for secure transactions.

- Add an admin dashboard for easier product and order management.

- Enable advanced filters like vehicle compatibility.

- Allow user reviews and personalized recommendations.

- Expand as a mobile app with push notifications.

- Add logistics tracking for real-time delivery updates.

- Launch loyalty programs and personalized offers.

- Further optimize for high traffic and large user bases.