

***AutoNexus***

# Chapter 01 – Introduction

## 1.1 Background and Motivation

The Sri Lankan automotive industry is undergoing a rapid transformation due to technological advancements and increased demand for genuine and high-performance vehicle components. However, vehicle owners and workshops often face challenges in sourcing authentic parts quickly and reliably.

AutoNexus is Sri Lanka's premier **online automotive parts marketplace**, specializing in **genuine OEM (Original Equipment Manufacturer)** and **high-performance aftermarket** components from globally recognized brands such as **Bosch, Brembo, KYB**, and others.

With nationwide delivery and warranty coverage, AutoNexus bridges the gap between **suppliers and consumers** by providing a **centralized, trustworthy, and efficient platform**.

## 1.2 Problem in Brief

Currently, purchasing automotive parts in Sri Lanka involves several inefficiencies:

- **Limited Availability:** Genuine parts are often unavailable in local stores.
- **High Counterfeit Risk:** Unverified sellers often sell counterfeit or low-quality products.
- **Lack of Centralized Marketplace:** No single platform aggregates genuine and high-performance parts from multiple suppliers.
- **Time-Consuming Process:** Customers must physically visit multiple stores to find the required part.
- **Poor Warranty & Return Policies:** Many sellers do not offer reliable after-sales service.

## 1.3 Aim & Objectives

### Aim:

To develop a centralized, secure, and user-friendly e-commerce platform for genuine and high-performance automotive parts in Sri Lanka.

### Objectives:

1. Provide an online marketplace featuring **genuine OEM and performance parts**.
2. Enable **secure user registration and authentication** (via Firebase).
3. Allow administrators to **add, edit, delete, and manage inventory** efficiently.
4. Provide customers with a **catalog view**, detailed product descriptions, and easy order placement.
5. Integrate **billing functionality** for admins.
6. Ensure nationwide delivery support with warranty coverage.
7. Maintain a **scalable and mobile-responsive platform**.

## Chapter 02 – Related Works

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## Chapter 03 – Solution

### 3.1 System Requirements

- **Software:**
  - Frontend: React.js
  - Backend: Node.js with Express
  - Database: MongoDB Atlas
  - Authentication: Firebase
  - Hosting: Netlify (Frontend)

### 3.2 Functional Requirements

- **Admin:**
  - Add, edit, delete products
  - View inventory
  - Generate bills
- **Customer:**
  - Browse products
  - Search and filter by brand, price, and category
  - Place orders

### 3.3 Non-Functional Requirements

- **Security** – Firebase authentication, HTTPS
- **Performance** – Response time < 3 seconds
- **Scalability** – Support for 10,000+ products
- **Availability** – 99% uptime
- **Usability** – Mobile-responsive UI

## Chapter 04 – System Design

IF user.role == 'admin':

    DISPLAY admin dashboard

    ALLOW add/edit/delete products

    ENABLE bill generation

ELSE:

    DISPLAY product catalog

    ALLOW search, filter, and view details

    ENABLE order placement.

## Chapter 05 – System Implementation

### 5.1 User Interfaces

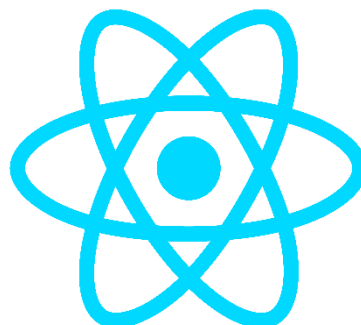
- Login Interface (React + Firebase Auth).
- Dashboard (Admin-only with analytics widgets).
- Product Management Section (CRUD features).
- Order Tracking Page.

### 5.2 Code Implementation

- Backend in Node.js + Express.
- Database: MongoDB Atlas.
- Frontend: React + TailwindCSS.

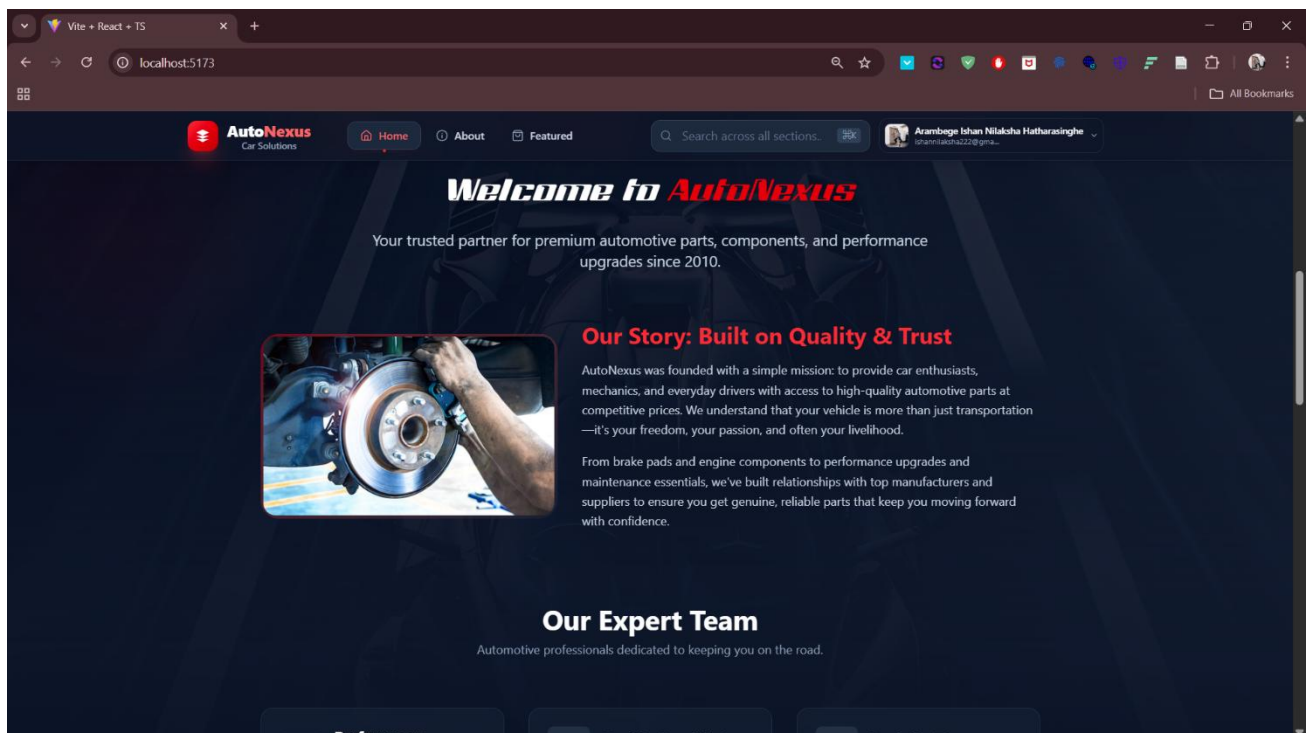
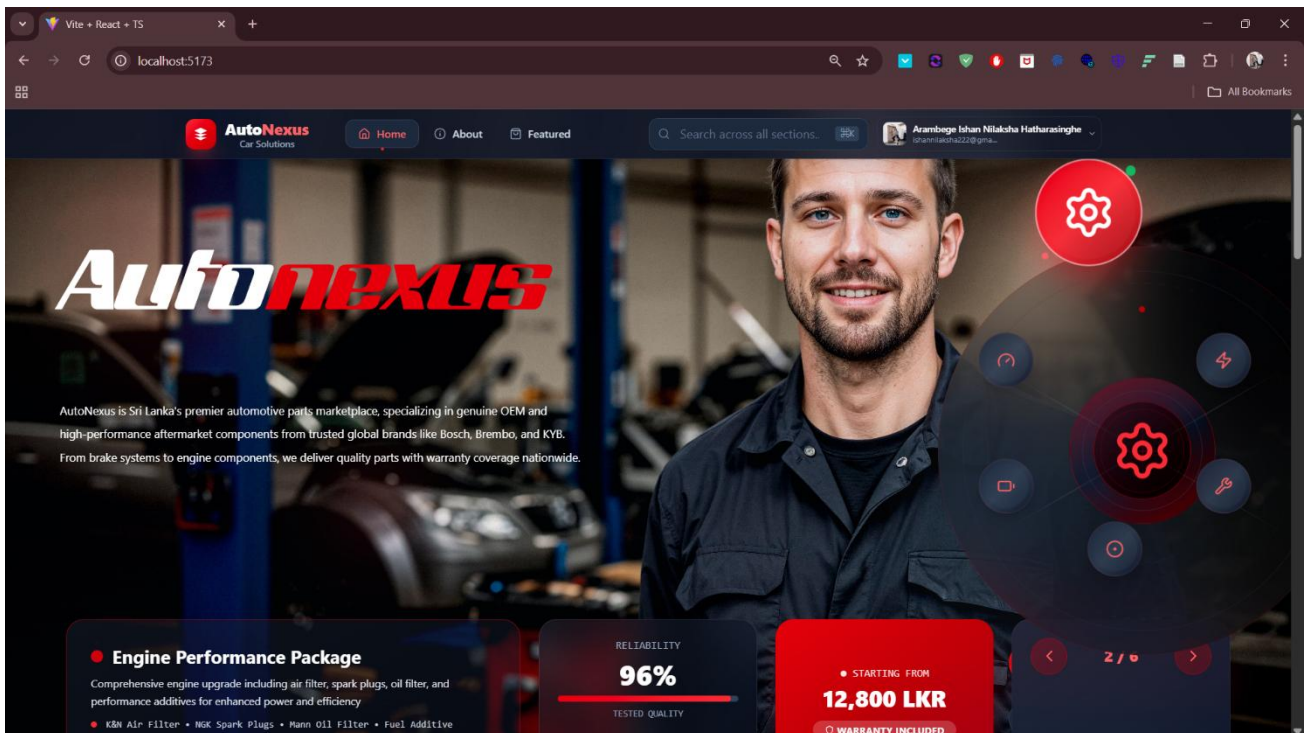
### 5.3 Inputs & Outputs

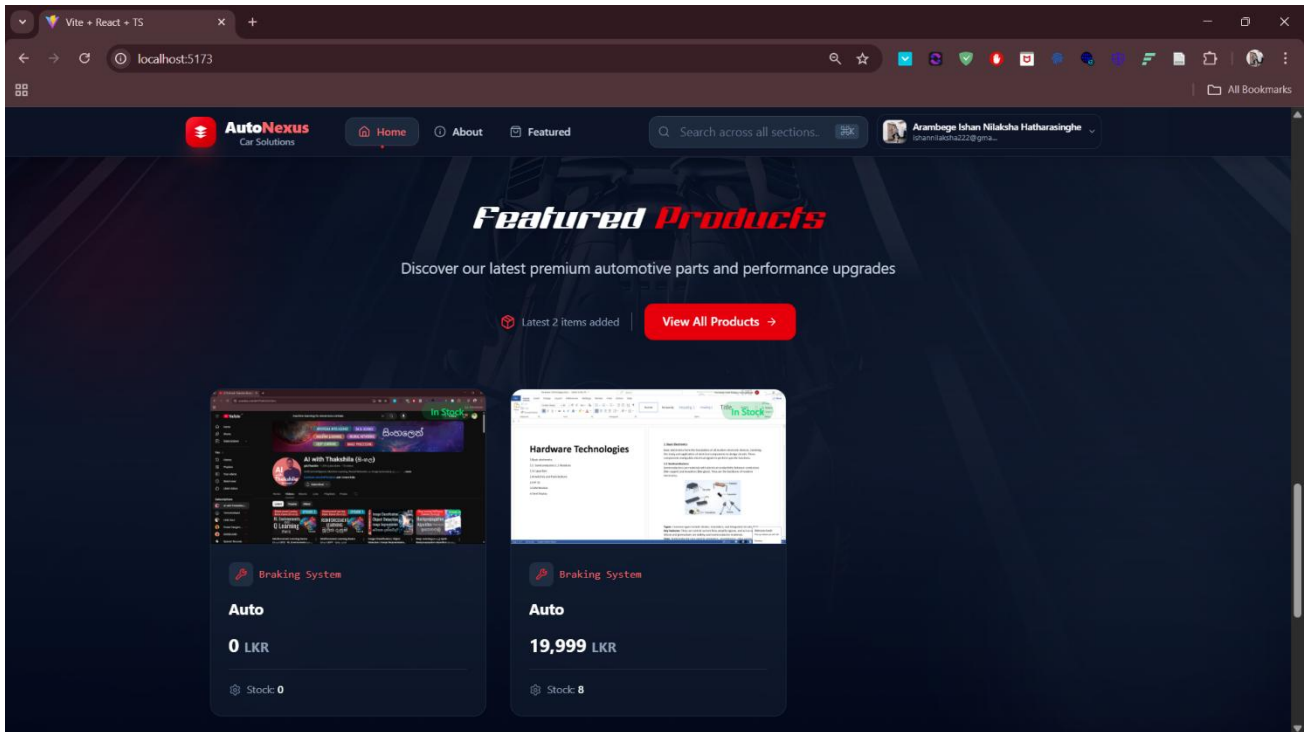
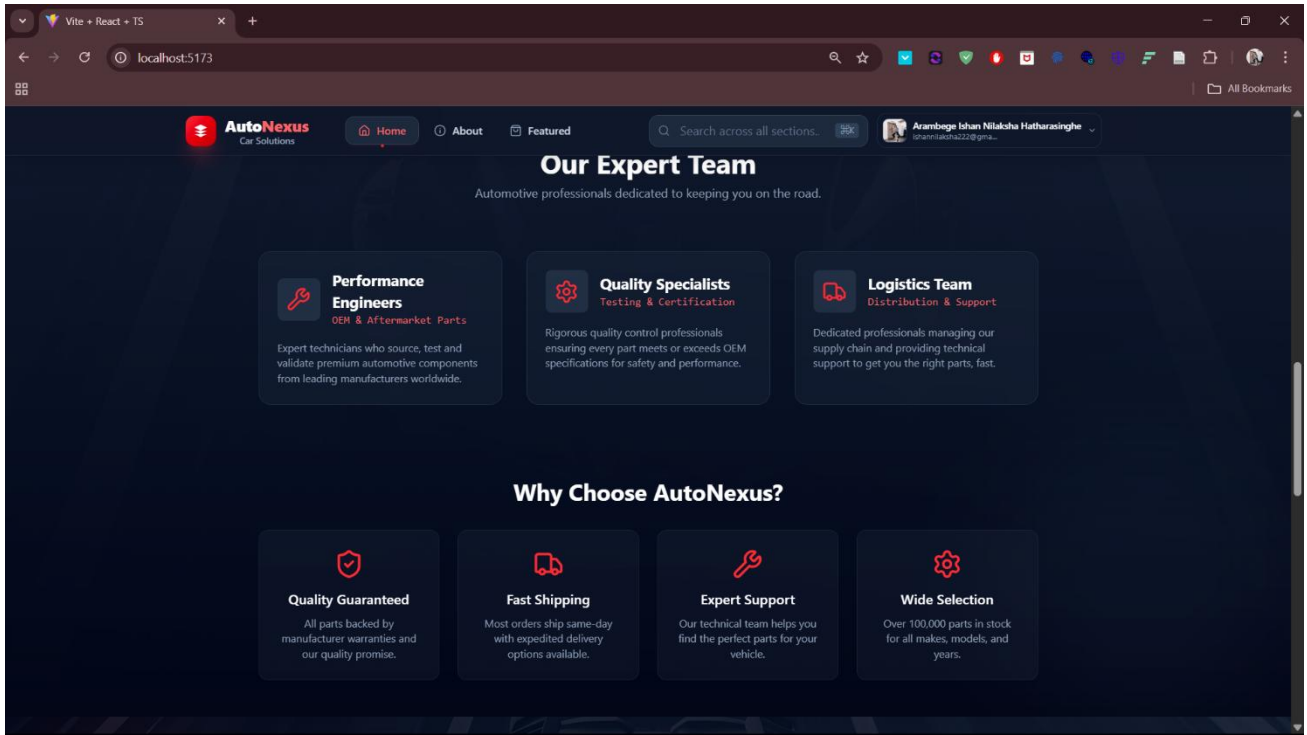
- Inputs: User details, product details, orders.
- Outputs: Product listings, order confirmations, invoices.



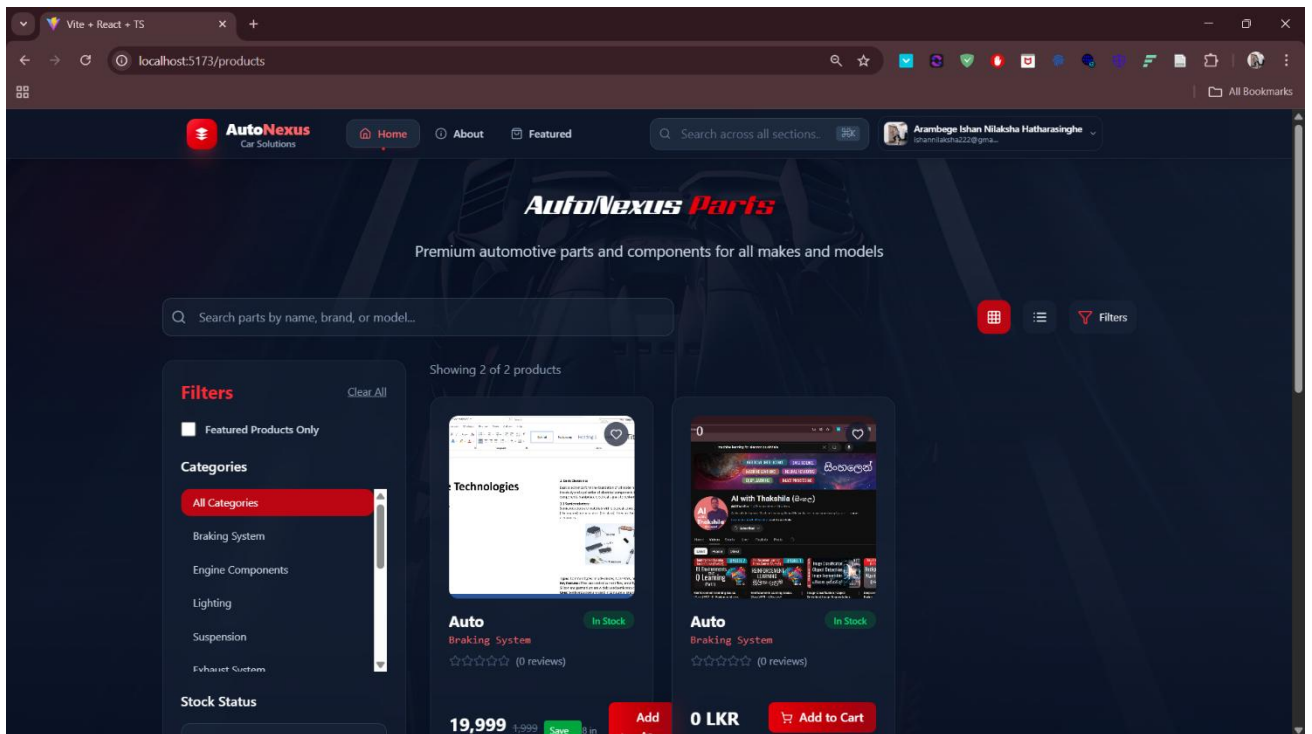
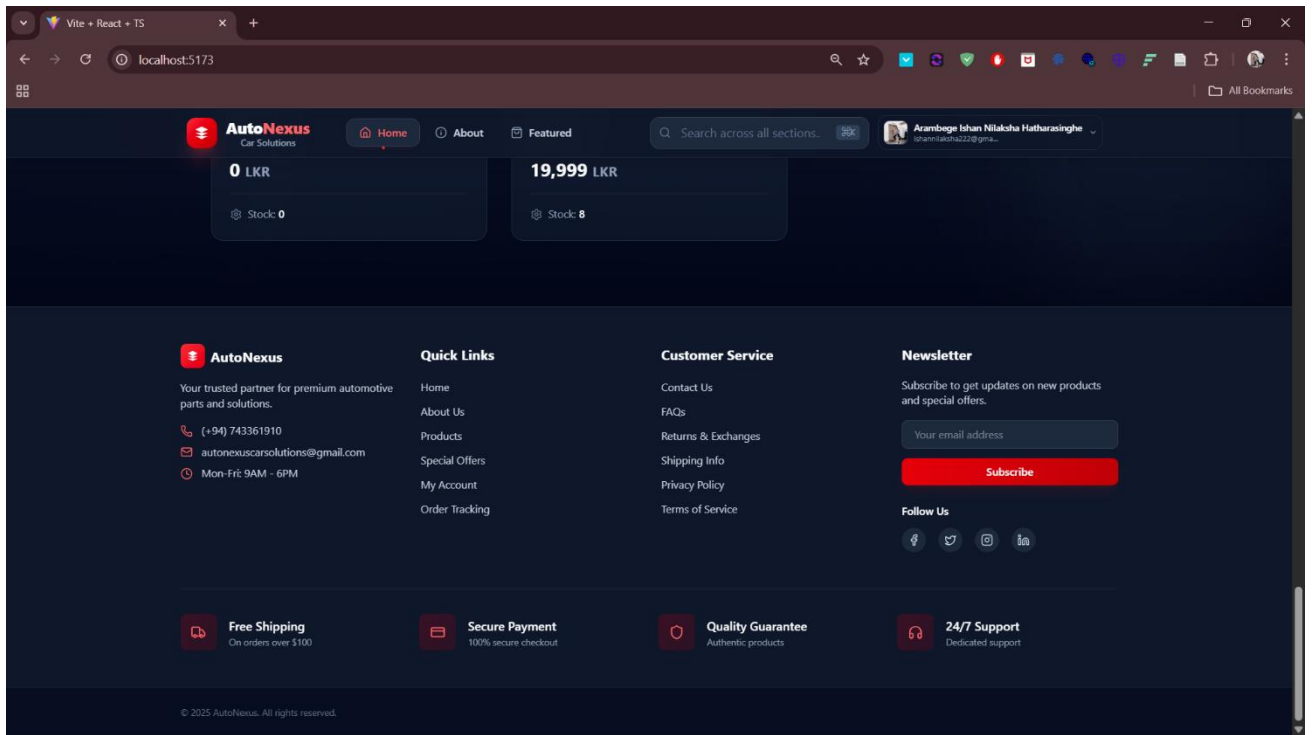
## Chapter 06 – Appendix

Detailed UI designs, color schemes, and full code listings for each interface, with explanations.









Vite + React + TS

AutoNexus inquiry

localhost:5173

AutoNexus Car Solutions

Home

About

Featured

Manage

Search across all sections.

AutoNexus CarSolutions

# AutoNexus Admin

Manage your premium automotive parts catalog with precision and style.

Total Products: 2

## Add New Product

Basic Info

Specifications

Media & Tags

Product Name \*

Enter product name

Category \*

Braking System

Subcategory

Select Subcategory

Brand

Select Brand

Model

Product model

Year

e.g. 2023

Price (LKR) \*

0

Original Price (LKR)

0

Discount (%)

0

Stock Quantity

0

Vite + React + TS

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localhost:5173

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AutoNexus CarSolutions

# AutoNexus Billing

Professional order management and billing system for automotive parts

Items in Cart: 0

Total: 0 LKR

Refresh

Sync Bills

Products & Billing

Bills History

## Available Products (2)

Search products...

All Categories

Auto

- Braking System

0 LKR

Stock: 0

Auto

- Braking System

19,999 LKR

1,999 LKR

Stock: 8

## Current Bill

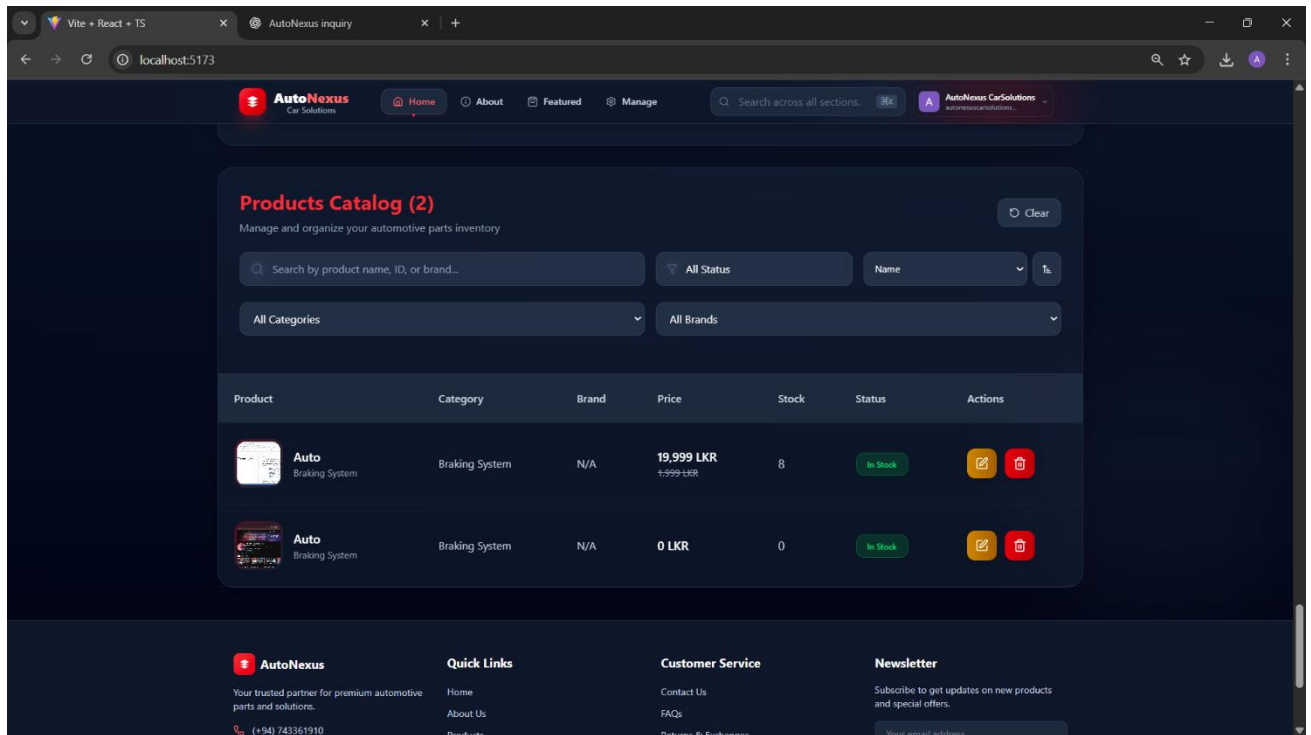
Customer Information

Customer Name \*

Phone Number \*

Email Address

Address



## **Chapter 07 – References (Page 164)**

1. MongoDB Atlas Documentation
2. Firebase Authentication Guide
3. React.js Official Docs