# A+ Auto Care - Knowledge Transfer Document

## ■ Project Overview

A+ Auto Care is a comprehensive automotive service platform that provides:

- Self-Drive Car Rental - Premium fleet management and booking system

- Car Services - Professional automotive maintenance and detailing

- Buy/Sell Marketplace - Vehicle trading platform

- Admin Dashboard - Complete business management system

## ■■ Architecture Overview

### Frontend (React + TypeScript)

- Framework : React 18.3.1 with TypeScript

- Build Tool : Vite

- Styling : Tailwind CSS with dark mode support

- Animations : Framer Motion

- Icons : Lucide React + FontAwesome

- Routing : React Router DOM v7

- Internationalization : i18next (English/Kannada)

### Backend (Node.js + Express)

- Runtime : Node.js with Express 4.21.0

- Language : TypeScript

- Database : Neon PostgreSQL (Serverless)

- Authentication : JWT + bcrypt

- Email : Resend service

- SMS : Twilio integration

- Calendar : Google Calendar API

- File Upload : Base64 encoding

### Deployment

- Frontend : Vercel (https://www.kzplusautocare.in)

- Backend : Vercel Serverless Functions

- Database : Neon PostgreSQL Cloud

- Domain : Custom domain with SSL

# Key Components

## Core Frontend Components

### 1. App.tsx (Main Application)

- Central routing and state management

- Authentication handling

- Theme management (light/dark mode)

- Navigation and layout structure

### 2. SelfDriveBooking.tsx

- Date/time selection with calendar

- Location and delivery options

- Car showcase with filtering

- Booking data collection

### 3. CarCard.tsx

- Vehicle display with images

- Pricing and specifications

- Availability status

- Selection handling

### 4. BookingForm.tsx

- Customer information collection

- Coupon system integration

- Price calculation

- Payment processing

### 5. AdminPage.tsx

- Dashboard with analytics

- User and booking management

- Car approval system

- Revenue tracking

## Authentication System

## User Authentication

- OTP-based login via email/phone

- JWT tokens for session management

- Local storage for persistence

- Auto-refresh on login/logout

## Admin Authentication

- Username/password login

- Role-based access control

- 24-hour token expiry

- Secure password hashing with bcrypt

# ■ Business Features

## 1. Car Rental System

- Fleet Management : 6 vehicles (SUVs, Hatchbacks)

- Dynamic Pricing : Per day/hour rates

- Availability Tracking : Real-time booking status

- Delivery Options : Home delivery with distance-based pricing

## 2. Service Booking

- 20+ Services : Washing, detailing, maintenance

- Flexible Scheduling : Date/time selection

- Coupon System : Discount codes (ONAMDISC20 - 20% off)

- Email Notifications : Confirmation and reminders

## 3. Buy/Sell Marketplace

- Car Listings : Detailed vehicle information

- Image Upload : Multiple photos per listing

- Inquiry System : Buyer-seller communication

- Document Management : Registration, insurance, etc.

## 4. Admin Dashboard

- Analytics : Revenue, bookings, user metrics

- User Management : Customer database

- Booking Management : Status updates, modifications

- Car Approval : Review submitted vehicles

# ■ UI/UX Features

## Design System

- Responsive Design : Mobile-first approach

- Dark Mode : Complete theme switching

- Animations : Smooth transitions with Framer Motion

- Accessibility : ARIA labels and keyboard navigation

## Key UI Components

- Calendar Widget : Custom date picker

- Image Carousel : Vehicle photo galleries

- Loading States : Spinners and skeletons

- Error Handling : User-friendly error messages

## Deployment

## Frontend Deployment (Vercel)

1. Connect GitHub repository

2. Set build command: npm run build

3. Set output directory: dist

4. Configure environment variables

5. Deploy with custom domain

## Backend Deployment (Vercel)

1. Configure vercel.json for serverless functions

2. Set up CORS for production domains

3. Configure database connection

4. Deploy API endpoints

## ■ Key Metrics & Analytics

## Business Metrics

- Total Bookings : Car + Service bookings

- Revenue Tracking : Daily/monthly earnings

- User Growth : Registration trends

- Popular Services : Most booked services

## Technical Metrics

- API Response Times : Backend performance

- Error Rates : Application stability

- User Sessions : Frontend analytics

- Database Performance : Query optimization

## ■ Testing Strategy

### Frontend Testing

- Component Testing : React Testing Library

- E2E Testing : Cypress (recommended)

- Type Safety : TypeScript strict mode

- Linting : ESLint configuration

### Backend Testing

- Unit Tests : Jest framework

- API Testing : Supertest

- Database Testing : Test database setup

- Integration Tests : Full workflow testing

## ■■ Maintenance & Monitoring

### Regular Tasks

- Database Backups : Automated Neon backups

- Security Updates : Dependency updates

- Performance Monitoring : Vercel analytics

- Error Tracking : Console logging

### Troubleshooting

- CORS Issues : Check allowed origins

- Database Connections : Verify Neon status

- Authentication : JWT token validation

- Email Delivery : Resend service status

## ■ Support & Contact

### Technical Support

- Email : support@kzplusautocare.in

- Phone : Available in ContactUs component

- WhatsApp : Integrated messaging

- 24/7 Support : For emergencies