

Project Synapse

Optimizing Last-Mile Delivery with AI-Powered Address Verification

The Problem & Our Solution

- Problem: Incorrect addresses cause delays, wasted fuel, and missed deadlines (SLAs). Current systems are rigid and can't adapt to real-time issues.

Solution: An LLM-powered autonomous agent that:

- Prevents incorrect addresses with `crosscheck_address()` at the time of order placement.
- Requests an alternate delivery location upfront (neighbor, office, or locker).
- Resolves real-time issues by contacting the customer or switching to a backup location.
- Integrates with delivery APIs for smart tool selection and reasoning.

Key Benefits: Fewer failed deliveries, less idle driver time, improved SLA compliance, and higher customer satisfaction.

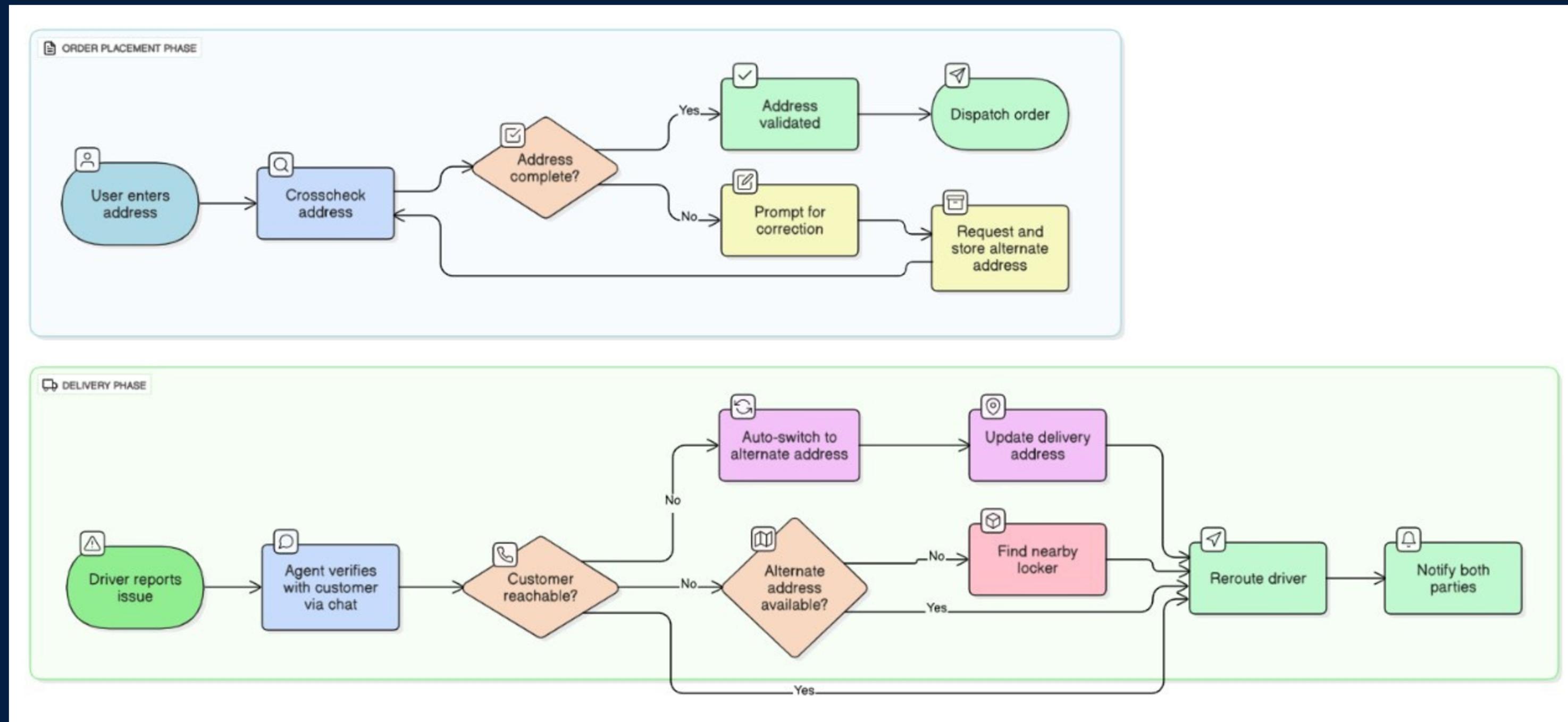
Workflow + System Architecture

1. Preventive Phase (Order Placement):

- Customer enters address → Agent runs `crosscheck_address()`.
- If incomplete, it prompts for correction and requests an alternate address.
- Order is dispatched only after validation.

2. Corrective Phase (During Delivery):

- Driver reports issue → Agent verifies with `contact_customer_via_chat()`.
- If the customer is unreachable, it auto-switches to the alternate address using `update_delivery_address()`.
- If no alternate is available, it uses `find_nearby_locker()` to locate the nearest locker.
- The system then reroutes the driver and notifies both parties.



Smart Parcel Delivery Platform (Frontend Prototype)

◆ Pages & UI Flow

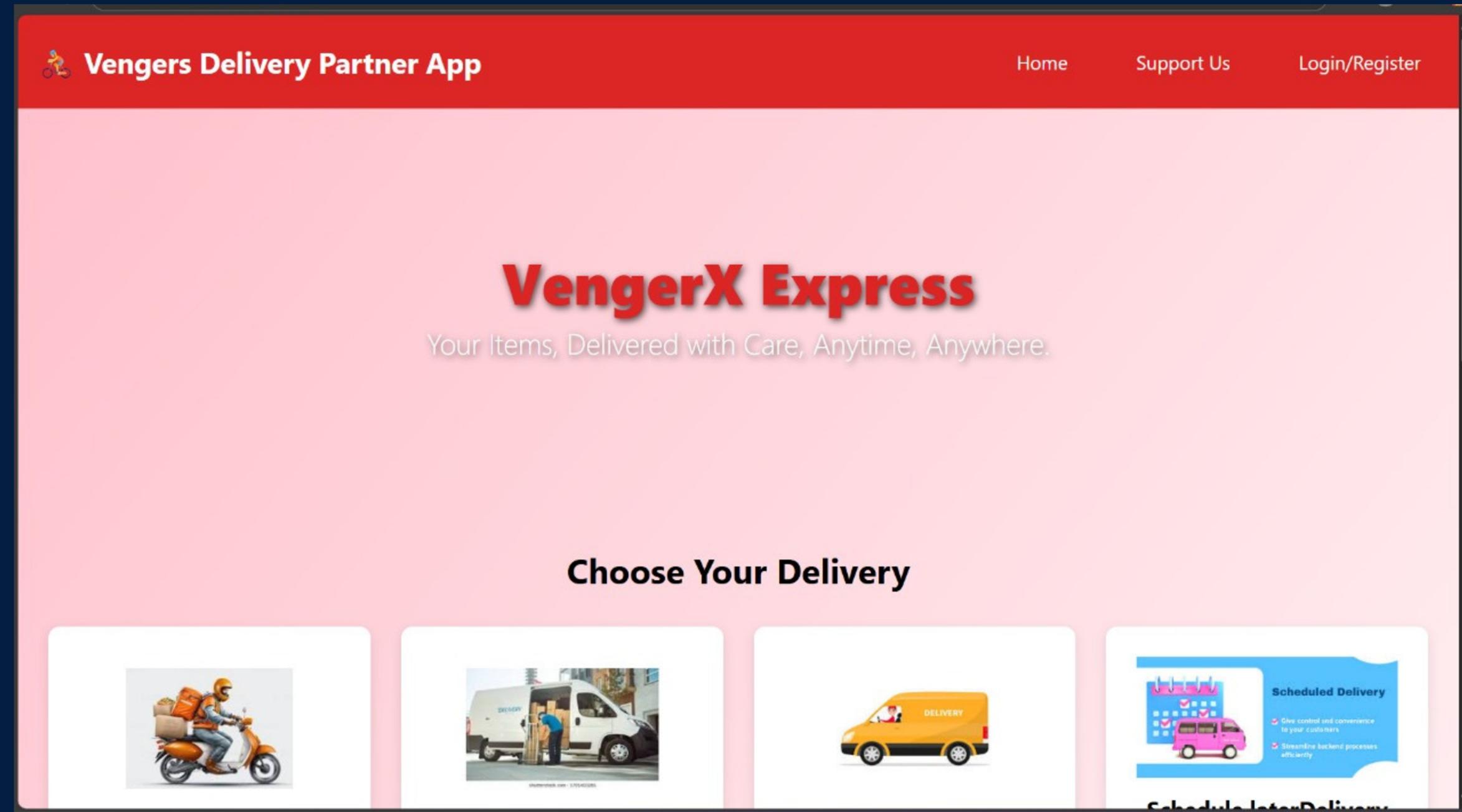
- Home / Dashboard – Hero section, delivery options (Bike, Car, Van, Scheduled).
- Contact Us & About Us – Team intro, mission, and contact info.
- Support Us – Services, FAQs, and partner details.
- Customer Profile – View/update personal details & bookings.
- Booking (Progress Bar) – Stepwise delivery booking with visual progress tracker.
- Track Delivery – Enter AWB, view live parcel status & timeline (localStorage simulation).
- My Deliveries – Manage past/current orders.
- Login / Register – Rider & Customer roles with Google Sign-In.
- Rider Dashboard – Profile, live ride tracking (Leaflet.js map), ride history, proof-of-delivery upload, reviews.
- Chatbot (VengerBot AI) – FAQ & quick actions (Book, Track, Delivery Options) with interactive bot UI.

◆ Tech Stack

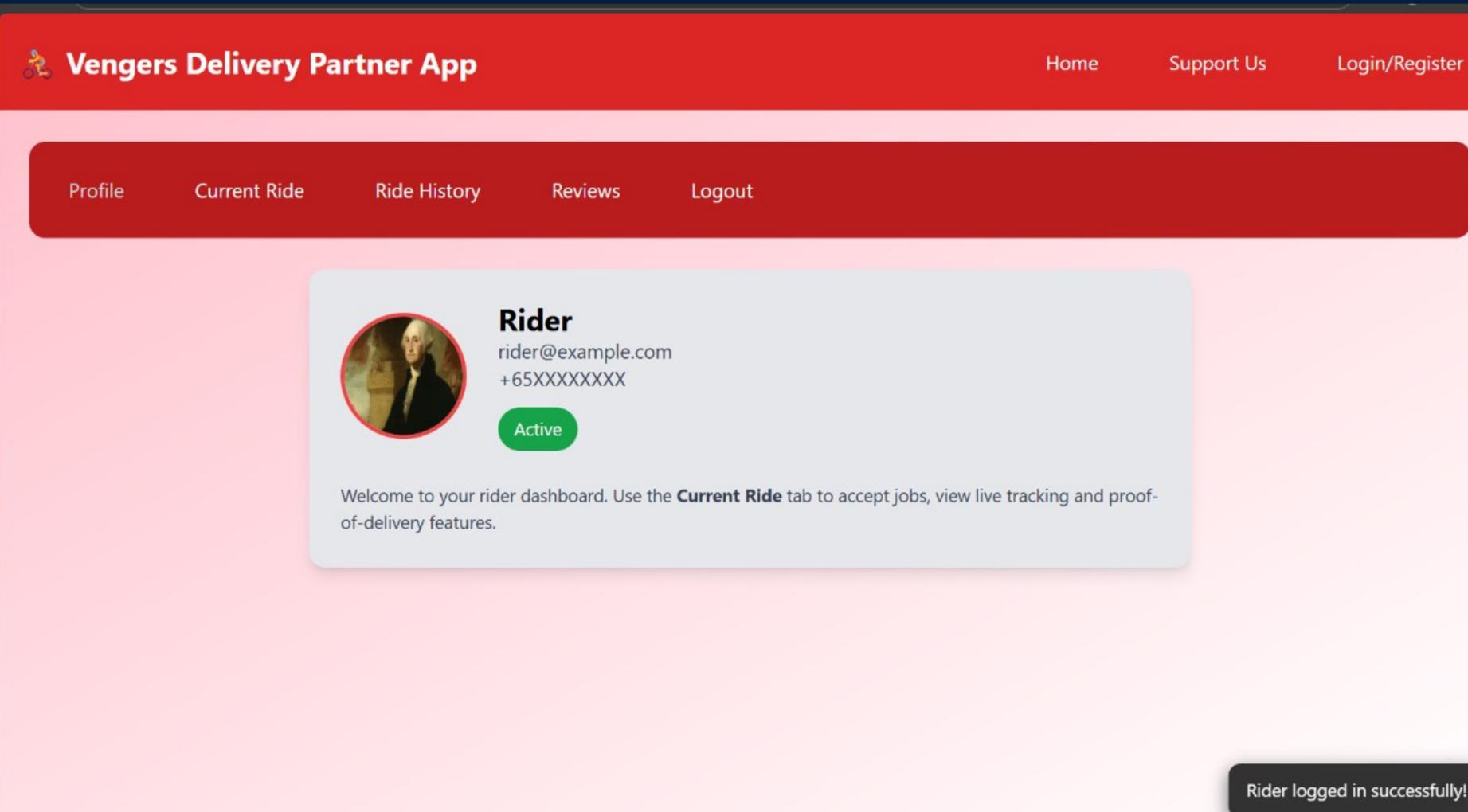
- HTML, CSS, TailwindCSS, JavaScript (frontend only).
- Leaflet.js for maps & route tracking.
- LocalStorage for booking & parcel tracking simulation.
- Google OAuth for login.

◆ Highlights

- ✓ End-to-end delivery workflow (Book → Track → Proof of Delivery).
- ✓ Dual roles: Customer & Rider dashboards.
- ✓ AI Chatbot for FAQs & quick navigation.
- ✓ Clean, responsive design with progress bars, notifications & modals.
- ✓ Future-ready for backend integration (real DB, APIs, ML routing).

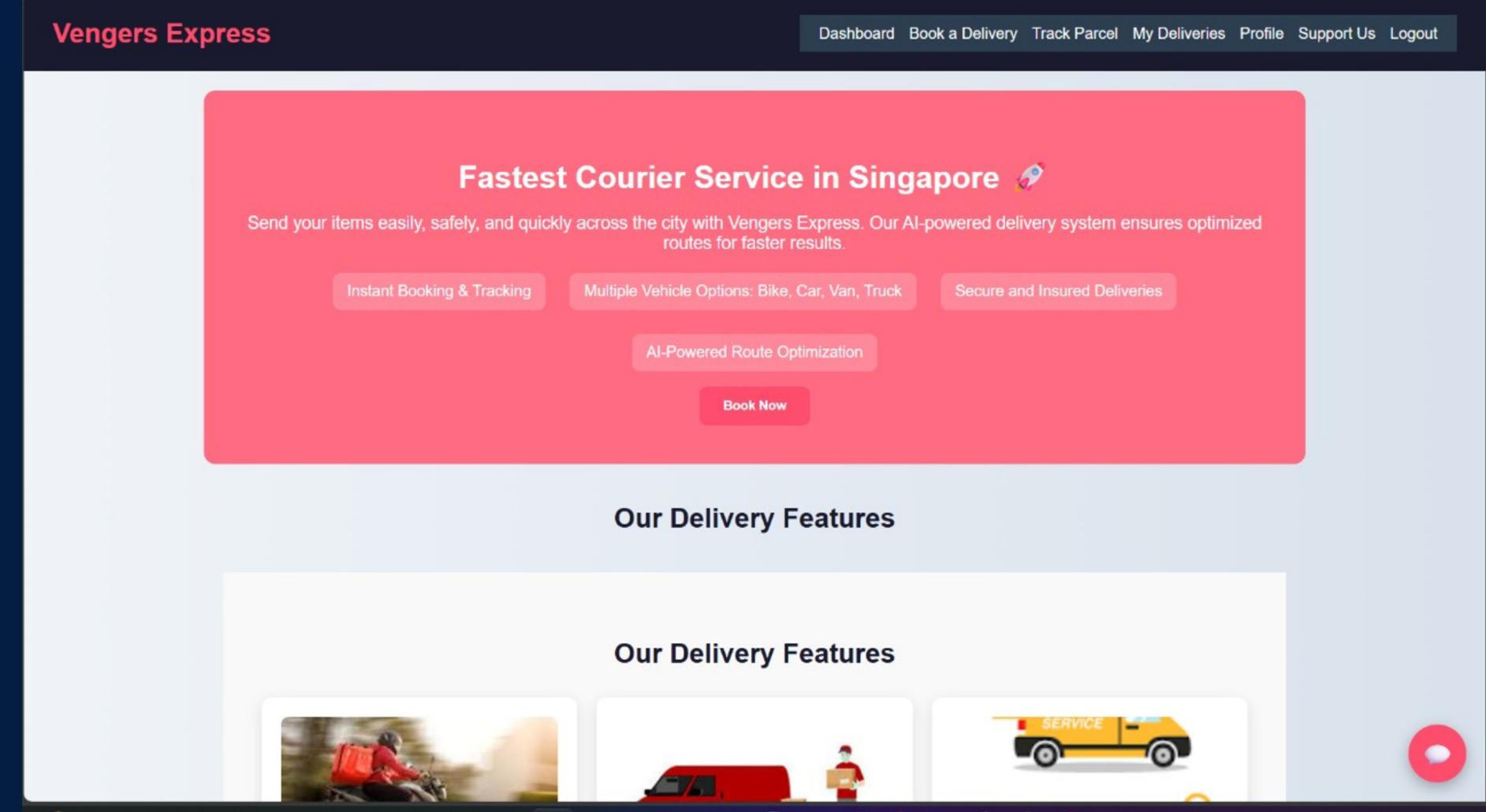


MAIN/LANDING DASHBOARD



The screenshot shows the 'Vengers Delivery Partner App' interface. At the top, there's a red header bar with the app name and navigation links: Home, Support Us, and Login/Register. Below this is a red navigation bar with links: Profile, Current Ride, Ride History, Reviews, and Logout. A large central area features a profile card for a rider named 'Rider' with an email (rider@example.com) and phone number (+65XXXXXXX). The rider is marked as 'Active'. A message below the card reads: 'Welcome to your rider dashboard. Use the **Current Ride** tab to accept jobs, view live tracking and proof-of-delivery features.' At the bottom right of this area, a success message says 'Rider logged in successfully!'. The background of the main content area is light pink.

RIDER DASHBOARD



The screenshot shows the 'Vengers Express' customer dashboard. At the top, there's a dark header bar with the app name and navigation links: Dashboard, Book a Delivery, Track Parcel, My Deliveries, Profile, Support Us, and Logout. Below this is a red promotional box with the heading 'Fastest Courier Service in Singapore' and a small globe icon. It includes a subtext: 'Send your items easily, safely, and quickly across the city with Vengers Express. Our AI-powered delivery system ensures optimized routes for faster results.' Below this are four service highlights: 'Instant Booking & Tracking', 'Multiple Vehicle Options: Bike, Car, Van, Truck', 'Secure and Insured Deliveries', and 'AI-Powered Route Optimization'. A prominent 'Book Now' button is at the bottom. Below this is a section titled 'Our Delivery Features' with three sub-sections: one showing a delivery person on a motorcycle, another showing a van with a delivery person, and a third showing a yellow truck labeled 'SERVICE'. A small circular icon with a play button is on the far right.

CUSTOMER DASHBOARD

GITHUB LINK: <https://github.com/simrannair03/GrabHack>

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