AI-Integrated Backend Workflow Automation Framework

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INTRODUCTION

With thousands of vendors and rental requests processed daily, inefficiencies in manual KYC checks, fragmented data entry, and slow backend workflows can cause delays. Isikko.com, a SaaS platform by WIMD Technologies Private Limited, unifies vendor onboarding, document verification, and live status tracking into a single platform, offering real-time updates, automated billing, and AI-powered data validation.

As an SDE Intern (May to July 2025), I built modular Node.js/Express APIs, designed MongoDB/Mongoose schemas, and automated Python OCR pipelines using Tesseract and OpenCV for vendor KYC parsing. I implemented JWT-based authentication, bulk CSV import workflows, and GitLab CI/CD pipelines for automated testing and deployment, reducing API latency by 35% and accelerating document parsing by 28.5%.

ABOUT WIMD TECHNOLOGIES

WIMD Technologies Pvt. Ltd. is a leading technology company specializing in automation-first software solutions that improve operational efficiency and enable digital transformation. Utilizing artificial intelligence, cloud infrastructure, and data analytics, WIMD delivers secure, scalable, and intelligent systems for various industries.

Isikko.com, the flagship platform, is a self-drive rental and vendor management system that offers:

- Real-time fleet and vendor tracking for operational transparency
- Automated digital onboarding to streamline vendor management
- AI-powered document processing enhancing accuracy and fraud detection
- Seamless integration with enterprise systems to improve business workflows
- Trusted by enterprise clients aiming for efficiency and growth

CORE RESPONSIBILITIES

Outlined below are the main tasks and areas of responsibility I managed throughout the internship.

- **AI-Powered Document Processing:** Built OCR pipelines using Tesseract and OpenCV for real-time extraction of KYC data.
- **Automation Workflows:** Created bulk vendor CSV import scripts with field-level checks to simplify onboarding.
- **Authentication & Security:** Set up JWT-based authentication with token refresh and role-based access control.
- **CI/CD Integration:** Configured GitLab CI/CD pipelines to enable seamless automated testing, thorough code quality checks, and reliable staging deployment, ensuring faster development cycles and higher code stability.
- **Progressive Web App (PWA) Implementation:** Developed a PWA frontend that supports offline use, real-time updates, and works well across all device types and network conditions, including 2G networks.
- **Development of Sublinking System:** Built an API-based sublinking system for the marketing team that automatically creates vendor pages with unique sublinks, improving campaign tracking, ad spending, and reducing manual work and marketing costs.

SKILL DEVELOPMENT

Describes new technical skills acquired and existing skills enhanced during the internship period (May – July 2025).

Technical Skills

- Strengthened knowledge in JWT-based authentication, implementing middleware and cryptographic protocols for secure session management and token validation.
- Gained practical experience in developing a Progressive Web Application (PWA), incorporating service workers, Cache API, and background sync to enable offline-first operation and reliable data synchronization.
- Improved scripting and automation capabilities by creating Python pipelines for bulk KYC document parsing, CSV ingestion, and data validation with robust error handling.
- Enhanced image processing skills using OpenCV by applying morphological transformations, adaptive thresholding, and noise filtering techniques to increase OCR accuracy.
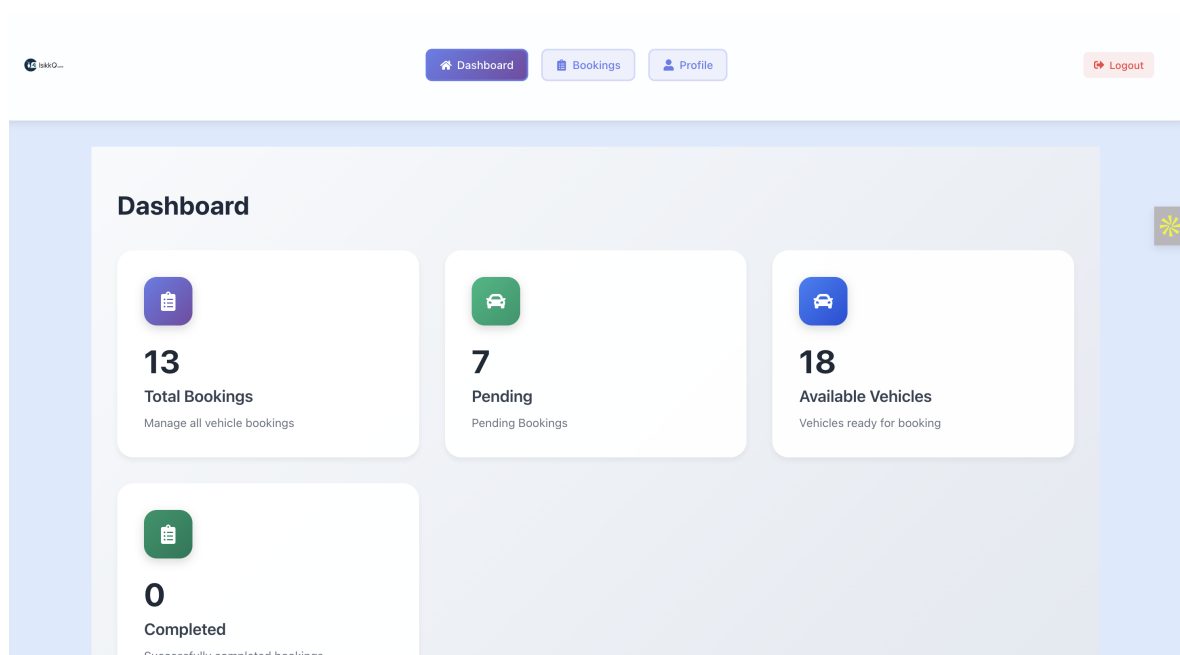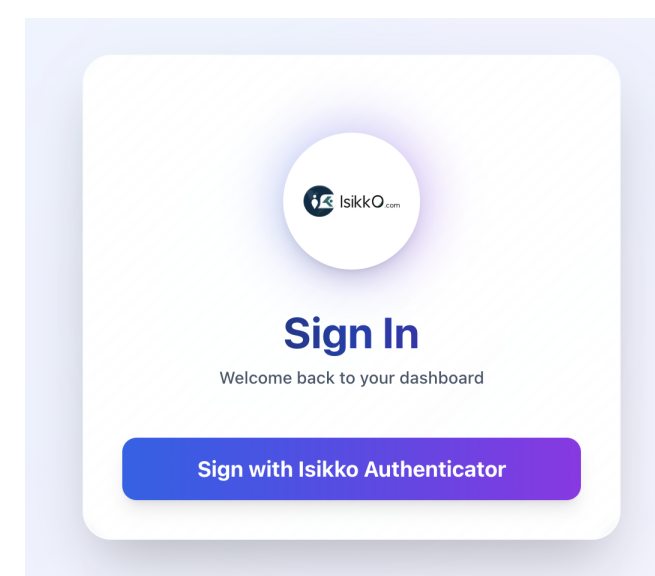

(a) Web-Based User Interface
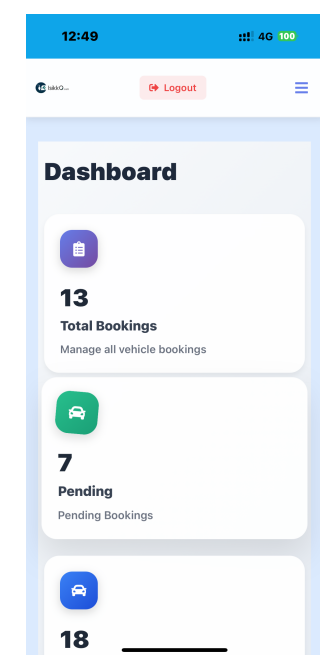
(b) Mobile Application Interface

(c) AI-Driven OCR Analysis

(d) Isikko Authentication System

Figure 1. Key interfaces and functionalities developed during the Training Phase.

TECH STACK

Lists the primary technologies and tools used to architect and deliver the solutions.

Automation & AI

JWT, PyTorch, OpenCV, Python, Tesseract

DevOps & Cloud Infrastructure

amazon EC2, amazon S3 web services, GitLab

Backend & Database

node, mongoDB, PostgreSQL, Express JS

Frontend & Testing

ANGULAR, React, HTML5, POSTMAN

HIGHLIGHTS

PWA for Offline Sync: Upgraded from a network-only platform to a PWA using service workers and caching, enabling offline access with auto-sync on reconnection. Works seamlessly on browsers and as an app-like interface without Play Store/App Store or APK downloads.
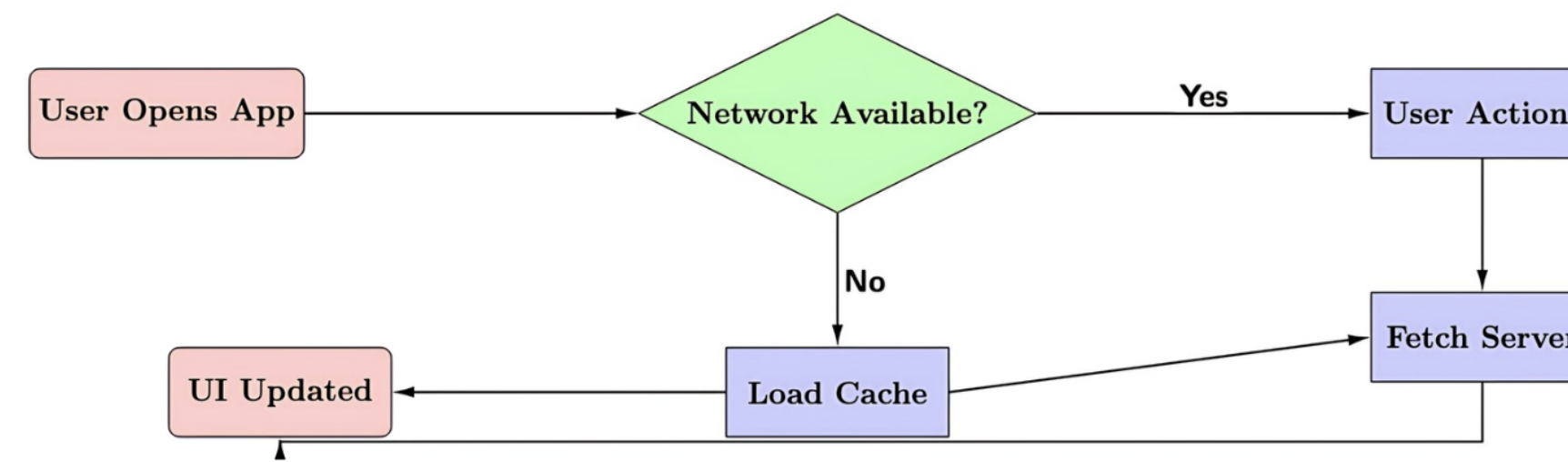

Figure 2. PWA architecture enabling offline sync and multi-platform access.

Sublinking System: Developed an API-powered tool to generate vendor-specific sublinks, enabling click-based marketing, precise ad tracking, reduced manual effort, and lower marketing costs.
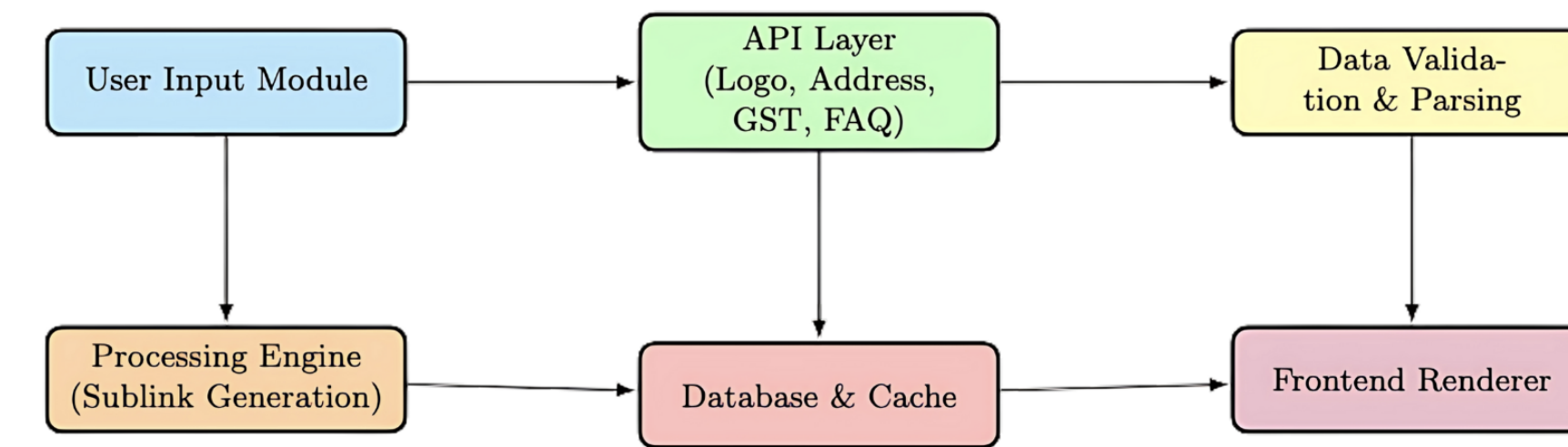

Figure 3. Automated sublinking system for targeted campaign tracking.

MAJOR ACHIEVEMENTS & METRICS

Summarizes the most impactful outcomes and breakthroughs delivered during the internship at WIMD Technologies Pvt. Ltd.:

- **OCR Pipeline Acceleration:** Enhanced KYC document parsing speed by 28.5% through efficient image preprocessing and optimized Tesseract OCR integration.
- **High Scalability:** Enabled onboarding and management of over 5000 vendors via robust bulk CSV import workflows with comprehensive field-level validations.
- **Enhanced Security:** Implemented JWT authentication with secure refresh token mechanisms and developed a proprietary Isikko Authenticator, ensuring secure, third-party-free user sessions.
- **Progressive Web App (PWA) Development:** Led the development of a PWA frontend supporting offline use and real-time updates across all device types and network conditions, including low-bandwidth 2G environments.
- **Career Growth and Leadership:** Received an increment and was promoted to SDE Intern - Leading Core Initiatives for Isikko.com for the flagship product *Isikko.com*, collaborating closely with the senior leadership to ensure project success.

CONCLUSION

At WIMD Technologies Pvt. Ltd., I enhanced backend systems and AI-driven workflows, boosting efficiency, scalability, and reliability, while strengthening my technical expertise and collaboration skills.