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 THE ORGANIZATION

WIMD Technologies Private Limited is a **technology-driven** organization focused on delivering **automation first software solutions** that enhance operational efficiency and enable digital transformation. The company leverages **artificial intelligence**, **cloud infrastructure** and **data analytics** to create secure, scalable and intelligent systems for diverse industry needs.

Flagship Product: Isikko.com, a **self drive rental** and **vendor management platform** built for **enterprise clients** seeking efficiency, transparency and intelligent automation.

Core Features:

- **Real time vendor and fleet tracking** with live location monitoring
- **Digital onboarding** with **automated KYC verification**
- **AI powered document processing** and **fraud detection**
- **Automated billing** and **customized vendor performance reports**
- **Integration capabilities** with enterprise resource planning and customer management systems

WIMD Technologies is committed to enabling businesses to achieve higher productivity, reduce manual effort and make data informed decisions through technology innovation.

KEY PROJECT CONTRIBUTIONS

- **Backend API Development** – Created modular APIs for vendor onboarding, status updates, and reporting.
- **AI-Powered Document Processing** – Developed OCR pipelines with Tesseract and OpenCV for real-time KYC data extraction.
- **Automation Workflows** – Built bulk vendor CSV import scripts with field-level validations.
- **Authentication & Security** – Implemented JWT-based authentication with token refresh logic and role-based access control.
- **CI/CD Integration** – Configured GitLab CI/CD pipelines for automated testing, linting, and staging deployments.
- **Performance Optimization** – Reduced API latency by 35
- **Progressive Web App (PWA) Implementation** – Developed a PWA frontend enabling offline support, real-time updates, and seamless user experience across all device types and network conditions, including 2G environments.

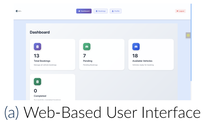
TRAINING PHASE

Platform and Authentication Deep-Dive: During the initial weeks of my internship (May – July 2025), I developed a comprehensive understanding of secure authentication workflows by studying JWT protocols, middleware integration, and encryption standards. This foundational knowledge enabled me to implement robust authentication mechanisms that ensured end-to-end data security and seamless user access control.

Progressive Web Application Design and Integration: I designed and integrated a Progressive Web Application (PWA) with advanced offline synchronization capabilities. This involved studying service workers and caching strategies to enable reliable performance in intermittent network conditions, thereby improving user experience and application responsiveness.

Automation Pipelines for KYC and Data Processing: I engineered Python-based automation pipelines to efficiently parse KYC documents and handle bulk CSV imports. This pipeline leveraged modular scripts and error-handling mechanisms to reduce manual effort and accelerate data ingestion workflows critical to operational efficiency.

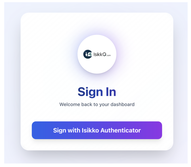
Image Preprocessing for OCR Enhancement: To enhance OCR accuracy, I implemented image preprocessing techniques using OpenCV, including noise reduction, adaptive thresholding, and morphological transformations. These preprocessing steps significantly improved the quality of text extraction, supporting downstream AI-driven analysis.



(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.

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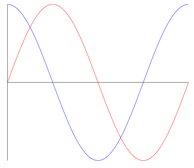

Figure 2. Another figure caption.

MAJOR ACHIEVEMENTS & METRICS

This section highlights the key contributions and significant milestones achieved during the internship at **WIMD Technologies Pvt. Ltd.**:

- **API Latency Optimization:** Refactored and modularized backend Node.js/Express APIs, achieving a **35% reduction** in response times, significantly improving platform responsiveness.
- **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.

TECH STACK

The following technologies were utilized to develop and optimize the backend workflows, AI automation, and frontend integration for the Isikko.com platform:

- Node.js, Express.js
- MongoDB, Mongoose
- Python
- Tesseract OCR
- OpenCV
- JWT
- GitLab CI/CD
- Angular v19
- Postman

Conclusion

During my internship at WIMD Technologies Pvt. Ltd., I contributed to the development and optimization of backend systems and AI-driven automation workflows. These improvements enhanced platform efficiency, reliability, and scalability, supporting seamless vendor management.

The solutions implemented provide a strong foundation for future enhancements such as fraud detection and advanced analytics. This experience has strengthened my technical skills and collaboration abilities within a professional development environment.