<Atyantik>
TECHNOLOGIES

Transforming Inventory Management in the Optical Industry: A Custom SaaS-Based RFID Integration Solution

Draft: v1.3
Last Updated: 6th May 2025

Office No. 501, Privilege Avenue, Atlantis Lane
Dr. Sarabhai Road, Opp. Ishal Hospital, Vadiwadi Vadodara,
Gujarat, 390023
CIN: U72300GJ2015PTC08368

<Atyantik>
TECHNOLOGIES

Office No. 501, Privilege Avenue, Atlantis Lane
Dr. Sarabhai Road, Opp. Ishal Hospital, Vadiwadi Vadodara,
Gujarat, 390023
CIN: U72300GJ2015PTC08368

Executive Summary

This case study explores the development and implementation of a tailored SaaS-based RFID integration solution designed to address inventory management challenges in the optical industry. The client, a forward-thinking company, aimed to streamline their inventory audits and enhance stock management with this innovative solution. By leveraging RFID technology, they significantly reduced the time and labor required for inventory audits, making the process more efficient and accurate.

Problem Statement

The client, a leader in the optical industry, struggled with managing and auditing their inventory. The manual process of tracking stock, especially frames, was both time-consuming and labor-intensive. Typically, 2-3 staff members would spend an entire weekend auditing inventory. Additionally, misplaced items and potential theft further complicated the management process, highlighting the need for a more efficient and reliable solution.

Solution Provided

To address these challenges, we developed a custom SaaS-based RFID integration solution. This solution enabled seamless interaction with RFID readers and printers, facilitating real-time inventory tracking and management. Key features of the solution included:

- **RFID Tagging**: Every inventory item was tagged with an RFID tag for easy identification and tracking, minimizing human intervention.
- **RFID Readers**: Integration with industry-standard readers like Zebra, Yanzeo, and TSL ensured precise reading. We developed an Android application in Kotlin to manage re-reading errors and range control, utilizing multiple SDKs.
- **Cloud-Based Master Database**: A centralized cloud database was created, aggregating data from all SaaS users and eliminating the need for individual catalog management at each store.
- **Manufacturer SKU Checks**: The system included checks for Manufacturer SKUs to minimize human errors and ensure accurate data.

Office No. 501, Privilege Avenue, Atlantis Lane
Dr. Sarabhai Road, Opp. Ishal Hospital, Vadiwadi Vadodara,
Gujarat, 390023
CIN: U72300GJ2015PTC08368

- **Smart Replenishment System**: With a single click, orders to vendors for predefined quantities could be placed, making inventory replenishment efficient.
- **Weekly Audits**: Quick and effective scanning during weekly audits helped detect theft or misplaced items within five working days, reducing theft and damage by 80%.
- **Real-Time Tracking**: Hosted on fast, memory and CPU-optimized dedicated servers, the solution provided real-time progress and results during inventory scans and audits.
- **Master Catalog and 3rd Party Integration**: Initially created by the admin team, the master catalog was strengthened by data from SaaS users. Integration with the Frames Data API ensured up-to-date frame information in line with market standards.

Technical Architecture

The technical architecture of the solution included several critical components:

- **Dedicated Servers**: Ensured high performance and reliability for hosting the SaaS application.
- **Laravel Application**: Implemented with a microservice-able architecture for modular and scalable development.
- **JWT Token-Based Authentication**: Provided secure access and data protection.
- **Secure API**: Used by different frontend applications to interact with the backend securely.
- **Redis**: Utilized for queue management, ensuring efficient task processing.
- **NodeJS with RabbitMQ**: Micro applications for data syncing, such as integrating with Frames Data.
- **MongoDB and MySQL**: Combined for data storage, manipulation, and logging, optimizing performance.

Challenges Faced

Several technical and operational challenges were addressed during implementation:

Office No. 501, Privilege Avenue, Atlantis Lane
Dr. Sarabhai Road, Opp. Ishal Hospital, Vadiwadi Vadodara,
Gujarat, 390023
CIN: U72300GJ2015PTC08368

- **Hardware Integration**: Ensuring seamless communication between RFID readers, printers, and custom software required extensive testing and troubleshooting.
- **Data Accuracy**: Smart checks for Manufacturer SKUs and minimal human intervention in RFID generation helped maintain accurate inventory data.
- **User Training**: Staff training was essential for effectively using the new RFID system and software.
- **Catalog Management**: Creating a robust master catalog and integrating with the Frames Data API for regular updates was crucial.

Results

The implementation of the RFID integration solution led to significant improvements:

- **Audit Time Reduction**: Inventory audits were reduced from hours to just 10 minutes.
- **Labor Efficiency**: The need for manual labor during audits was virtually eliminated, freeing up staff for other tasks.
- **Inventory Accuracy**: Real-time tracking significantly improved inventory accuracy, reducing misplaced items and potential theft.
- **Scalability**: The solution was designed to support business growth, accommodating multiple locations within an organization.

Conclusion

The custom SaaS-based RFID integration solution transformed inventory management for the client, providing a faster, more accurate, and efficient way to audit and manage stock. This case study demonstrates the potential for RFID technology to enhance operations in the optical industry, setting a new standard for inventory management.