



COFE

Smart IoT Device, Camera Management & Rewards Platform | Development Documentation

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IoT & Camera Management • Rewards Platform • Live Streaming • Device Control • Web & Mobile

Platform Overview

Cofe is a smart IoT-based device and camera management system combined with a fully integrated rewards platform Cofe Rewards. The platform enables users to manage connected IoT devices, stream live camera feeds, claim products to earn reward points, and redeem those points for gifts all within a single, unified application ecosystem.

Our team was engaged by Cofe Solutions a Delhi-based technology company to design and develop the complete Cofe platform, encompassing a cross-platform mobile application, a web-based admin panel, and the backend infrastructure powering real-time IoT communication, live video streaming, and the rewards system. The platform was built on a modern, advanced technology stack integrating multiple real-time communication protocols to deliver a reliable, scalable, and feature-rich product.

Platform Modules

The Cofe platform was delivered across the following integrated modules:

MODULE	DESCRIPTION
Authentication & Profiles	Secure user authentication with profile management supporting personalised dashboards, device ownership, and reward account tracking.
Product Dashboard & Claiming	Users can browse and claim products via product number or barcode scanning, with mandatory photo proof submission for verification and reward point allocation.
Cofe Rewards	A fully integrated rewards platform where users earn points through product claims and redeem them for gifts with a complete point history and gift catalogue.
Device Management	Location-based IoT device organisation allowing users to register, manage, and control their connected devices with real-time status monitoring.
Live Camera Streaming	Real-time live camera feed integration using advanced streaming protocols enabling users to view live camera streams directly within the application.

Device Control via MQTT	Remote device control and command delivery using MQTT protocol enabling real-time two-way communication between the app and connected IoT hardware.
Admin Web Panel	A dedicated web-based administration panel for managing products, categories, rewards, device assignments, and user activity across the entire platform.

Technical Challenges

Delivering the Cofe platform required our team to solve the following complex engineering challenges:

TECHNICAL CHALLENGE	HOW IT WAS ADDRESSED
RTMP/RTSP Stream Handling	Managing ingestion, routing, and playback of live video streams from diverse IoT camera hardware required a robust media server architecture capable of handling concurrent streams reliably at low latency.
Stream Format Conversion	Converting incoming live stream data into formats compatible with the media server for web and mobile delivery including segmented streaming and socket-based transport required a custom transcoding pipeline using advanced media processing tools.
Real-Time IoT Device Control	Establishing low-latency, bidirectional communication between the application layer and distributed IoT hardware ensuring reliable command delivery and real-time device state updates across variable network conditions.
Barcode Scanning & Photo Proof Validation	Building a reliable product claiming workflow combining on-device barcode scanning with mandatory photo capture and server-side proof validation ensuring claim integrity without introducing user friction.
Multi-Protocol System Integration	Integrating multiple real-time streaming, messaging, and communication protocols within a single, unified platform required careful architectural layering to ensure compatibility, stability, and performance across all channels simultaneously.

Business Solution

To deliver the full Cofe platform, our team designed and built a structured, multi-protocol system across mobile, web, and backend:

- **Mobile Application:** Built a complete cross-platform mobile application covering authentication, device management, live camera streaming, product claiming, and rewards all in one seamless experience.
- **Live Streaming Infrastructure:** Implemented live camera stream ingestion and delivery using advanced media server infrastructure with real-time format conversion for web and mobile compatibility.
- **IoT Device Control:** Integrated MQTT-based real-time device control enabling users to send commands to and receive state updates from connected IoT hardware instantly.

- **Product Claiming & Rewards:** Developed a complete product claiming workflow with barcode scanning, photo proof submission, and automated reward point allocation.
- **Admin Web Panel:** Delivered a web-based admin panel providing Cofe's team with full control over products, categories, devices, reward assignments, and user management.
- **Backend Architecture:** Architected the entire backend on a modern, scalable server-side framework handling real-time data, streaming, device communication, and rewards processing under one infrastructure.

Implementation / Work Done

Mobile Application — iOS & Android

- Designed and developed a complete cross-platform mobile application from scratch covering authentication, profile management, device dashboards, live camera feeds, product claiming, and rewards.
- Implemented barcode scanning and mandatory photo proof capture within the product claiming flow, ensuring a seamless and verified user experience.

Live Camera Streaming System

- Implemented a complete live video streaming pipeline ingesting streams from IoT cameras, processing and converting them using advanced media tooling, and delivering live feeds to the mobile app and web panel.
- Deployed a media server layer with format conversion and segmented streaming delivery ensuring broad compatibility across web and mobile clients.

IoT Device Management & Control

- Built location-based device organisation and real-time device status monitoring, enabling users to manage and track all connected hardware from a single dashboard.
- Integrated a real-time messaging protocol for bidirectional, low-latency device control enabling reliable command delivery and real-time state feedback from IoT hardware.

Admin Web Panel

- Developed a fully featured web-based administration panel for Cofe's internal team covering product and category management, reward configuration, device assignments, and user oversight.

Outcome

Our development engagement with Cofe Solutions delivered a complete, production-ready IoT and rewards platform with the following measurable results:

◆ Unified IoT & Rewards Ecosystem	Delivered a single, cohesive platform combining IoT device management, live camera streaming, and a fully functional rewards system replacing what would otherwise require multiple separate products.
◆ Live Streaming at Scale	Successfully implemented real-time camera streaming across web and mobile using advanced media server infrastructure providing users with reliable, low-latency live feeds from connected cameras.
◆ Seamless Device Control	Real-time MQTT-based device control gives users and administrators instant, reliable command delivery to connected IoT hardware from anywhere.
◆ Verified Product Claiming	Photo-proof based product claiming with barcode scanning ensured a fraud-resistant, streamlined reward collection experience for end users.
◆ Scalable Admin Control	The web-based admin panel provides Cofe's team with complete, centralised control over products, devices, rewards, and users supporting ongoing business operations efficiently.
◆ Modern Multi-Protocol Architecture	The platform was built on a modern, advanced technology stack integrating multiple real-time protocols delivering a secure, scalable, and future-ready IoT and rewards infrastructure.