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Dark Store Management Platform for a Grocery Retailer

How a unified quick-commerce platform helped one of Kazakhstan's leading grocery retailers turn a fragmented ecommerce and delivery operation into a scalable dark store business line, cutting cost per order by **15%**, reducing picking errors by **68%**, and achieving **95%** on-time bike and **90%** on-time car deliveries.

Business challenge

Today, fast grocery delivery is no longer a novelty for urban life. Customers are used to ordering everyday essentials online and expecting them at their doorstep within hours or even minutes. But just a few years ago when our client, one of Kazakhstan's leading grocery retailers, decided to launch its own quick-commerce business, the country's on-demand delivery market was still at its early stage.

The client's initial technology environment combined their existing enterprise systems with several temporary solutions. The ecommerce storefront captured customer orders, the ERP handled purchasing and financial records, separate applications supported couriers, and employees relied on spreadsheets and messaging tools to coordinate the processes between them.

During the first six months, while the network remained relatively small, the model was feasible. Experienced dark store managers could compensate for missing integrations, reconcile data manually, and resolve operational issues as they occurred.

However, as order volumes increased and the company began opening additional dark stores, the limitations of the fragmented setup became increasingly difficult to contain.

And in the grocery delivery space, especially the fresh-food segment, every operation has to run like clockwork. Inventory turnover, shelf-life control, delivery windows, and order picking accuracy all directly impact customer trust, retention, and ultimately, the economics of the business.

Without a robust technology foundation, the retailer faced several interconnected challenges:

- The lack of unified view of inventory and customer orders resulted in failed picks, substitutions, incomplete orders, and cancellations after checkout.
- Inconsistent shelf-life practices led to write-offs and freshness complaints.
- Desynchronization within fulfillment teams increased waiting time, complicated workload planning, and put promised delivery windows at risk.
- Dispatchers struggled to balance delivery speed with courier utilization.
- Routine issues that suppliers could have handled independently depended on manual processes and took considerable time.
- Administrative headcount grew with every location and so did operational costs.

The client reached a critical point, where adding more standalone applications would only create additional integration points and data silos.

While successful dark store management systems already existed in other parts of the world, there was no proven, off-the-shelf solution capable of supporting the entire quick-commerce operating cycle adapted to the realities of Central Asia.

After evaluating several technology vendors and reviewing our experience in building complex retail platforms, the company partnered with Instinctools to develop **a custom scalable dark store management platform** from the ground up.

Solution

Based on a detailed assessment of the retailer's workflows and international quick-commerce best practices, Instinctools' dedicated development team created a unified operational layer that connected the company's existing systems and standardized inventory, fulfillment, delivery, supplier, workforce, and customer-management processes across its dark store network. It combines web-based management tools with mobile workflows for dark store employees and couriers.

Thanks to its modular architecture and seamless integration capabilities, the platform is ready to adapt by retailers looking to launch or scale fresh-food delivery operations.

01 Bridging the gap between global best practices and local realities operation practice

To ensure that every architectural decision directly supports the client's unit economics and long-term scaling strategy, our experts executed a rigorous discovery phase. Our goal was to analyze established global dark store technology patterns, then use those insights to design a new architecture tailored to Kazakhstan's payment, logistics, and supply chain ecosystems.

Benchmarking global quick-commerce platforms and defining localization requirements for the Kazakhstan market

We examined the workflows and operating principles behind leading quick-commerce and grocery delivery companies, including Ocado, Getir, Gorillas, Glovo Express, Instacart, and Wolt Market.

But rather than replicating foreign solutions, our team assessed how international quick-commerce practices would need to be adapted to Kazakhstan's payment, enterprise software, logistics, and supply chain environment. This included:

- Identifying local payment providers, including Kaspi and Halyk Bank, and defining requirements for card and QR-based payments
- Mapping the data flows required to connect the platform with regional ERP and inventory systems, including 1C:Enterprise
- Assessing the integration capabilities of third-party courier and last-mile delivery providers, such as Wolt Drive, inDrive, and regional fleets
- Defining the data that would need to be exchanged with external delivery partners, including order details, delivery requests, courier statuses, and tracking information
- Documenting locally relevant delivery-zone, pricing, procurement, and fulfillment rules

Tailoring the platform to the client's operating model

Working alongside the client's business teams, we mapped every operational process, from procurement and warehouse receiving to order fulfillment, and delivery. This allowed us to design workflows around the retailer's actual operating model:

- replenishment rules for fresh products
- warehouse layouts and picking logic
- inventory rotation (FIFO/FEFO)
- workforce planning and shift management
- delivery SLAs and customer service processes

02 Designing a module-based architecture for end-to-end dark store management

We designed the platform around **six interconnected functional domains** comprising **35+ modules**. Each domain addressed a distinct area of dark store

01

Inventory management: creating one inventory truth from receiving to write-off

operations while relying on a shared data model and common business logic. This enabled information to move consistently across the platform and allowed workflows to be coordinated from procurement and receiving through fulfillment, delivery, and customer service.

To eliminate inventory discrepancies across the client's dark stores, we established a single source of truth for stock movements, covering receiving, storage, replenishment, FIFO/FEFO rotation, cycle counting, and write-offs.

02

Delivery management: orchestrating the complete delivery lifecycle

Last-mile operations were brought under one roof by combining intelligent route optimization, courier scheduling, mobile applications, and third-party delivery integrations into a single dispatch workflow.

03

Supplier collaboration and procurement: replacing manual coordination with self-service

Instead of relying on email- or messenger-based communication, suppliers gained direct access to purchase orders, inventory insights, promotional planning, and automated barcode generation through a self-service collaboration portal. The portal also supports purchase order (PO) management, promotional campaign alignment, smart barcode and label generation.

04

Order fulfillment: increasing speed without sacrificing accuracy

Picking and packing workflows were redesigned around guided mobile workflows that directed employees through each stage of order assembly, with built-in expiration date control and QR-based product verification to minimize errors and reduce product waste.

05

Workforce management: improving labor visibility and utilization

Warehouse teams and couriers are managed through a unified workforce module covering onboarding, shift planning, attendance, payroll, and performance tracking, giving managers the visibility needed to optimize labor utilization.

06

Sales and customer management: connecting every customer touchpoint

Customer interactions across mobile applications, POS, marketplaces, CRM, and loyalty programs were brought together into a single operational ecosystem, ensuring consistent service regardless of where an order originates.

By consolidating every operational domain within a single platform, the retailer gained end-to-end visibility across its dark store network, standardized workflows, and the flexibility to scale without introducing operational complexity.

03 Making frontline operations mobile-first from dark store to doorstep

To simplify frontline execution across the dark store network, we developed a custom mobile application for warehouse employees and couriers. Depending on the user's role, the app provides the tools required to receive and count inventory, assemble orders, record working time, or complete deliveries.

Equipping dark store employees with mobile workflows

We enabled employees to carry out and manage core operational tasks, including order picking, receiving, stock movements, cycle counts, write-offs, and working-time, directly from their smartphones. Bringing these workflows into one familiar interface reduced manual data entry, simplified employee training, and eliminated the need for costly specialized devices, making day-to-day operations easier and less expensive to run.

Giving couriers one workspace for every delivery and dispatchers – one view

The retailer relied on its own fleet for day-to-day deliveries but needed access to external courier capacity during demand spikes. Managing in-house and outsourced deliveries through separate systems would have fragmented dispatching, limited real-time visibility, and made it harder to maintain consistent service standards.

The mobile-first solution brought both delivery models into the same operational environment, while allowing dispatchers to assign orders, monitor delivery progress, and respond to capacity constraints through a single interface.

Beyond navigation and order management, the app supports shift scheduling, payroll visibility, delivery status tracking, and a gamified performance system where couriers earn points, unlock new achievement levels, and compete on leaderboards based on completed deliveries and customer ratings.

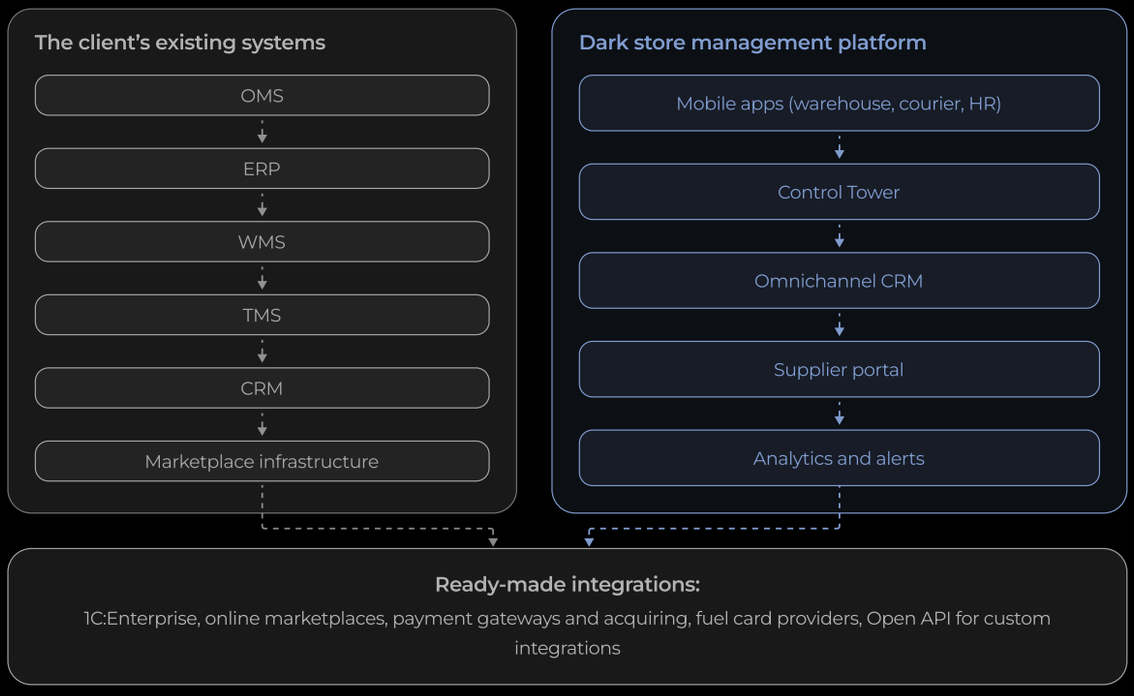
Integrating with Kazakhstan's leading ride-hailing services

To complement the in-house fleet during peak demand, the platform was integrated with Wolt Drive, inDrive and other local fleets, allowing dispatchers to seamlessly assign deliveries to external couriers.

Instead of treating partner delivery as a separate process, we embedded it into the same dispatch workflow. Warehouse staff continue working through a familiar interface while the platform automatically synchronizes order statuses, courier assignment, pickup confirmation, and delivery tracking across external services. This gives the retailer the flexibility to scale delivery capacity on demand without sacrificing operational consistency or customer experience.

04 Building on the existing technology stack

The solution was introduced as a non-disruptive operational layer, allowing the retailer to preserve existing enterprise systems while extending them with quick-commerce capabilities. Standardized APIs, asynchronous event processing, and loosely coupled modules ensured interoperability and simplified future integrations.



05 Embedding AI into operational decision-making

Once the core platform was in place, we focused on augmenting key workflows with AI-powered capabilities.

Predictive replenishment

Demand forecasting models were introduced to predict inventory requirements and automatically generate supplier purchase orders, helping maintain optimal stock levels while reducing the risk of shortages.

Waste prevention

Inventory approaching expiration is continuously identified by AI algorithms, allowing the platform to trigger markdowns and prioritize fulfillment before products become unsellable.

AI-enabled logistics optimization

Vehicle Routing Problem (VRP) algorithms optimize delivery routes and dynamically assign couriers based on traffic conditions, delivery windows, vehicle type, and operational workload.

Dynamic pricing

Pricing decisions are automated using inventory availability, demand patterns, and configurable business rules, enabling the retailer to balance sales performance and inventory turnover.

AI-powered customer support

Routine customer inquiries are handled automatically through AI assistants capable of providing instant responses, while more complex requests are seamlessly transferred to human support agents.

Before

- Dark stores managed through disconnected systems and local workarounds
- Inventory visible online but unavailable during picking
- Manual expiration-date checks and inconsistent stock rotation
- Picker-dependent fulfillment with limited traceability
- Reactive courier allocation and low return-route utilization
- Frontline employees relying on manual records and separate tools for inventory, picking, delivery, and time tracking
- Manual supplier, attendance, payroll, and claim processes
- Expansion requiring additional administrative headcount

After

- One operational layer connecting the full dark store cycle
- Real-time inventory control and predictive replenishment
- Enforced FIFO/FEFO processes and proactive near-expiry actions
- Guided, QR-verified picking, packing, and delivery
- Multi-modal routing, surge management, and automated backhaul tasks
- A single role-based mobile app supporting inventory operations, order fulfillment, courier delivery, and working-time tracking
- Supplier and employee self-service
- Comparable operational KPIs across every dark store

Business value

- **One unified platform** powering the entire quick-commerce lifecycle
- **Lower operating costs and simpler frontline execution** through one role-based mobile app
- **95%+ on-time delivery** achieved across the network
- **92% post-delivery CSAT**, following a picker rating system focused on freshness and quality
- **25+ dark stores** launched and managed from one platform
- **15,000+ daily orders** fulfilled through automated workflows

- **20,000+ SKUs** tracked with complete inventory visibility
- **5 cities** connected through a unified operational model

Multiplier effect

The engineering expertise and operational research invested in this platform have created a reusable accelerator for future implementations. For retailers planning to launch or expand a quick-commerce business, this experience translates into a shorter path to market. Your initiative can benefit from proven architecture, mature business workflows, and ready-to-adapt components.

Do you have a similar project idea?

Contact us — and we will estimate your projects costs for free!

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