Vending Machine Software for a Multinational Company

How developing a web app MVP for seamless remote management of 1000+ vending machines enabled a global retail company to prove the viability of the new product in the German market and expand their customer base by 14%.

Industry:
Retail and E-commerce

Duration:
Eight months

Budget:
$300,000

Context

In the face of ever-changing market needs, especially during the pandemic, our client was looking for opportunities to expand their niche in cash processing to other industry areas.

One of the ideas was creating a vending machine which sells locally sourced organic food. This solution allows local farmers to access additional space to sell their fresh produce, while city residents can buy their favorite items at any time of the day, particularly on weekends and holidays when grocery stores are usually closed.

Challenge

The vending solution developed for our client consists of several parts, including IoT-enabled hardware, vending machine software based on cloud technology, and an online store.

Our main task as a technology partner was to develop software that would enable the fast and smooth operation of vending machines in terms of orders, delivery, stock control, payments, and other essential processes.

In the first stage of our cooperation, we conducted a discovery workshop to identify the product's technical requirements and the expected outcomes the client wanted to achieve. After thorough research and gathering the requirements, we provided an elaborate project plan that included the software architecture, development approach, team composition, and a clear timeline.

> " After we created the architecture and a detailed development plan, the market situation adversely impacted the client's business, and hence the project budget. The real challenge was to adapt the already designed architecture to new requirements with a reduced budget, while preserving the product's primary functionality and purpose. It was challenging, but at the end of the day, still feasible.
>
> **Natallia Chmel**
> Account Executive

We aimed to build a scalable solution architecture that could handle up to thousands of machines, ensuring minimal software disruption as the client's business grows.

Solution

An automated vending machine provides customers with fresh produce from local suppliers 24/7, without days off or closed hours. But what's under the hood of this solution and the entire process, from product supply to customer purchase?

Each component ensures consistent and smooth operations and interactions between all participants. Each user has a tailored experience with the software solution built by *instinctools' dedicated team.

- Vending machine administrators
- Farmers or grocery store owners
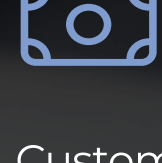- Delivery managers (or refillers)
- End customers

The machine administrators operate as though they are managing a small plant, with a full-fledged management system that allows them to import suppliers, grant or revoke access, book slots for future products, and organize the delivery process. They have access to all data and can remotely manage vending machines, warehouses, product turnover, and suppliers.

With IoT-enabled hardware, vending machine administrators can monitor the refrigerator's temperature remotely and check the products' sell-by dates to ensure freshness.
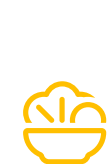
Farmers and grocery stores can book available slots in the vending machine for future deliveries of organic food, based on a flexible schedule.

Customers can visit the nearest vending machine or an online store to find, book, and purchase fresh organic products 24/7. Users can access product and producer information and pay for their orders online or via the vending machine.

Key features

- Refill process management of perishable goods with sell-by dates
- IoT solution for remote temperature monitoring
- Warehouse logistics and product turnover management
- Flexible schedule for booking slots in the vending machine
- Convenient payment system via the web app or vending machine
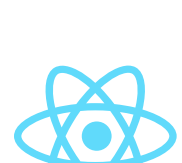- Modern and intuitive client interface for all stakeholders

Business value

With a limited budget and timeline, the MVP we developed enabled our customer to successfully launch the project and test it on the local German market.

The solution provided value to local producers by offering an additional channel for selling organic products, while city residents benefited from the availability of fresh food at any time.
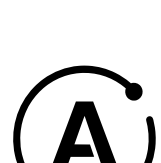
Our customer is now able to scale this vending solution for various regional markets, partnering with local producers for safe and efficient product sales.
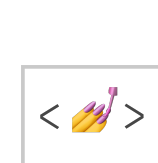
Technologies
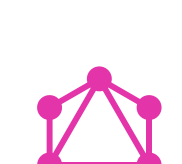
Front-End:

- React
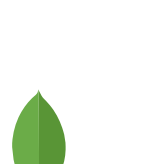- Apollo GraphQL Client
- Styled Components
- Material UI
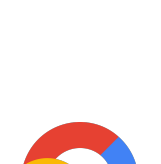
Back-End:

- GraphQL
- Node.js
- MongoDB
- VPC
- Compute Engine
- Pub/Sub
- Google Cloud
- Cloud Storage
- IMC

Multiplier effect

Our expertise in developing this solution can be beneficial for businesses dealing with the storage, management, and delivery of perishable goods, as well as vending or parcel machine providers. Contact us if you have a similar project idea and are interested in implementing it in your region. We are committed to delivering high-quality solutions for improved business outcomes.

Do you have a similar project idea?

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

CONTACT US