



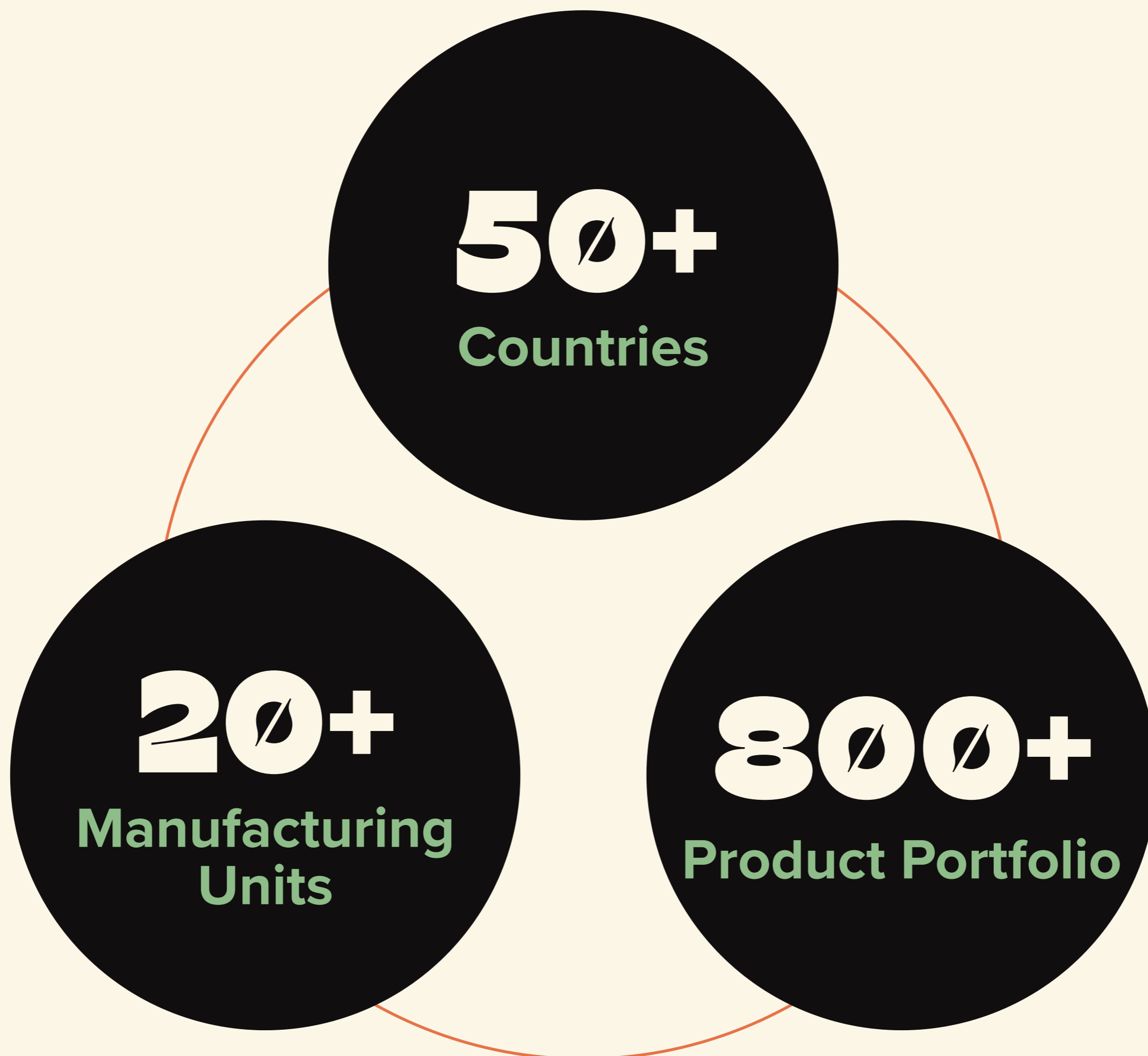
Building a Scalable

CLINIC MANAGEMENT PLATFORM

using Serverless for a \$5B Pharmaceutical company

Alkem Labs

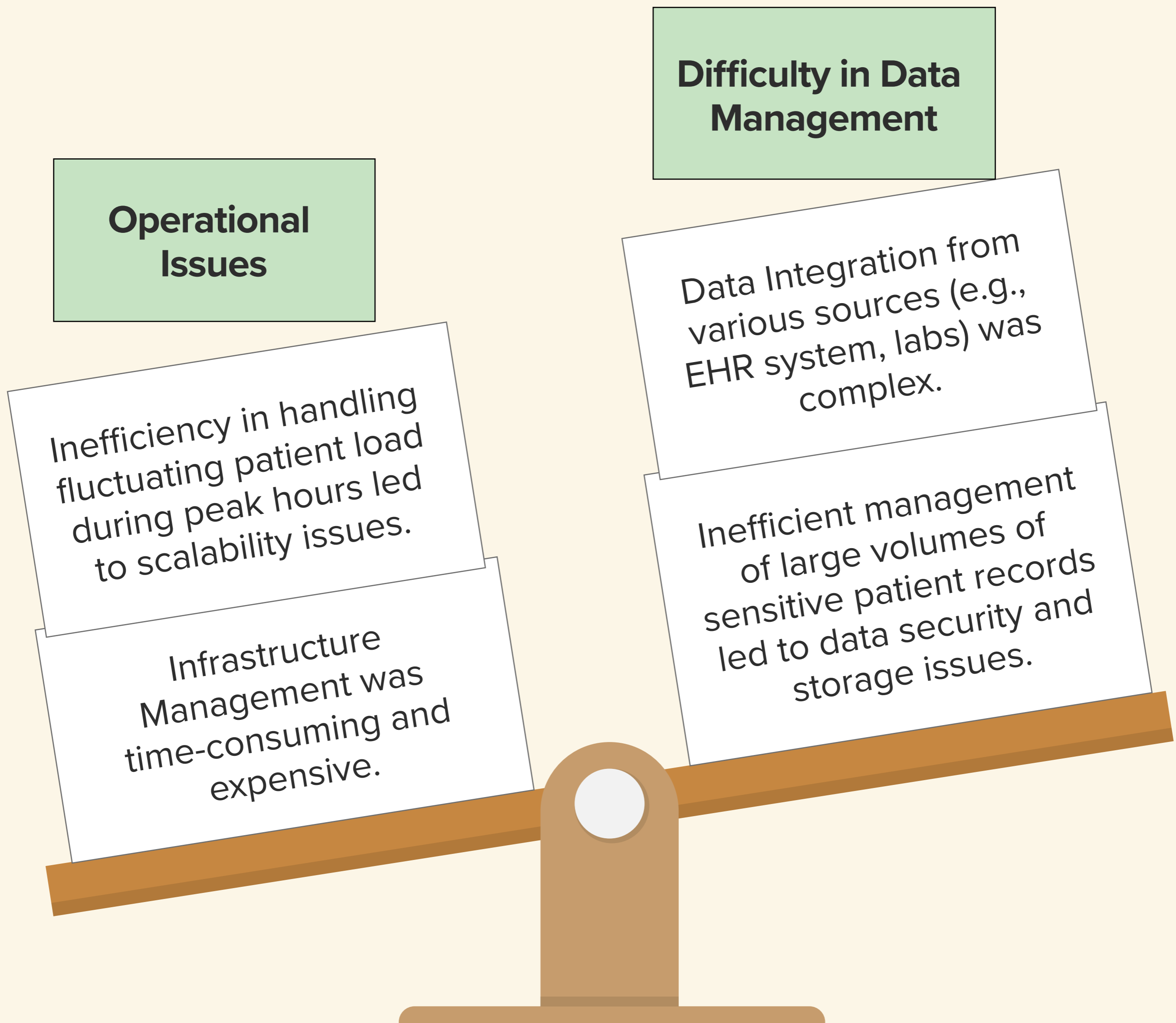
is a \$5 Billion global drug manufacturer,



Committed to empowering healthcare providers, Alkem envisioned to develop a **physician-focused clinic management platform**.

Opting for an off-the-shelf solution, the company soon encountered a series of challenges.

KEY CHALLENGES





To address these challenges, Alkem engaged McKinsey to identify potential solutions. Based on McKinsey's recommendations, Alkem chose Mantra Labs as its technology partner.


OBJECTIVES

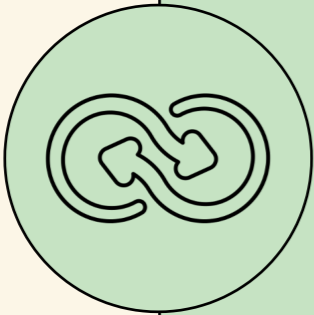
To overcome the existing challenges, we built the solution from the ground up.

This approach was designed to:

- **1 Accelerate Time-to-Market**

Reduce development cycles and get the system up and running faster.
- **2 Optimize Costs**

Eliminate unnecessary spending on idle resources.
- **3 Enable infinite Scalability**

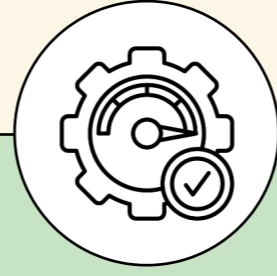
Handle fluctuating workloads with ease, ensuring optimal performance.
- **4 Boost Platform's Extensibility**

New business modules can be built as independent functions, easily integrated into the platform.

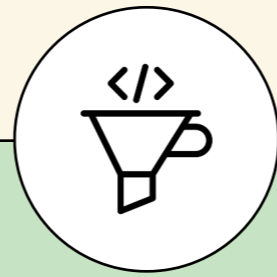
Through an in-depth analysis of their business and technical needs, we recommended adopting a serverless architecture to enhance the scalability of the platform.

KEY PREREQUISITE

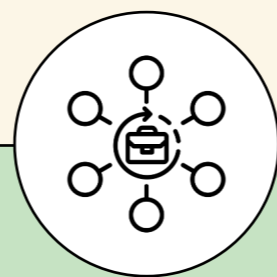
Building a Strong Foundation



To establish a robust development environment, we built a high-efficiency CI/CD pipeline supported by reliable version control and project management systems.



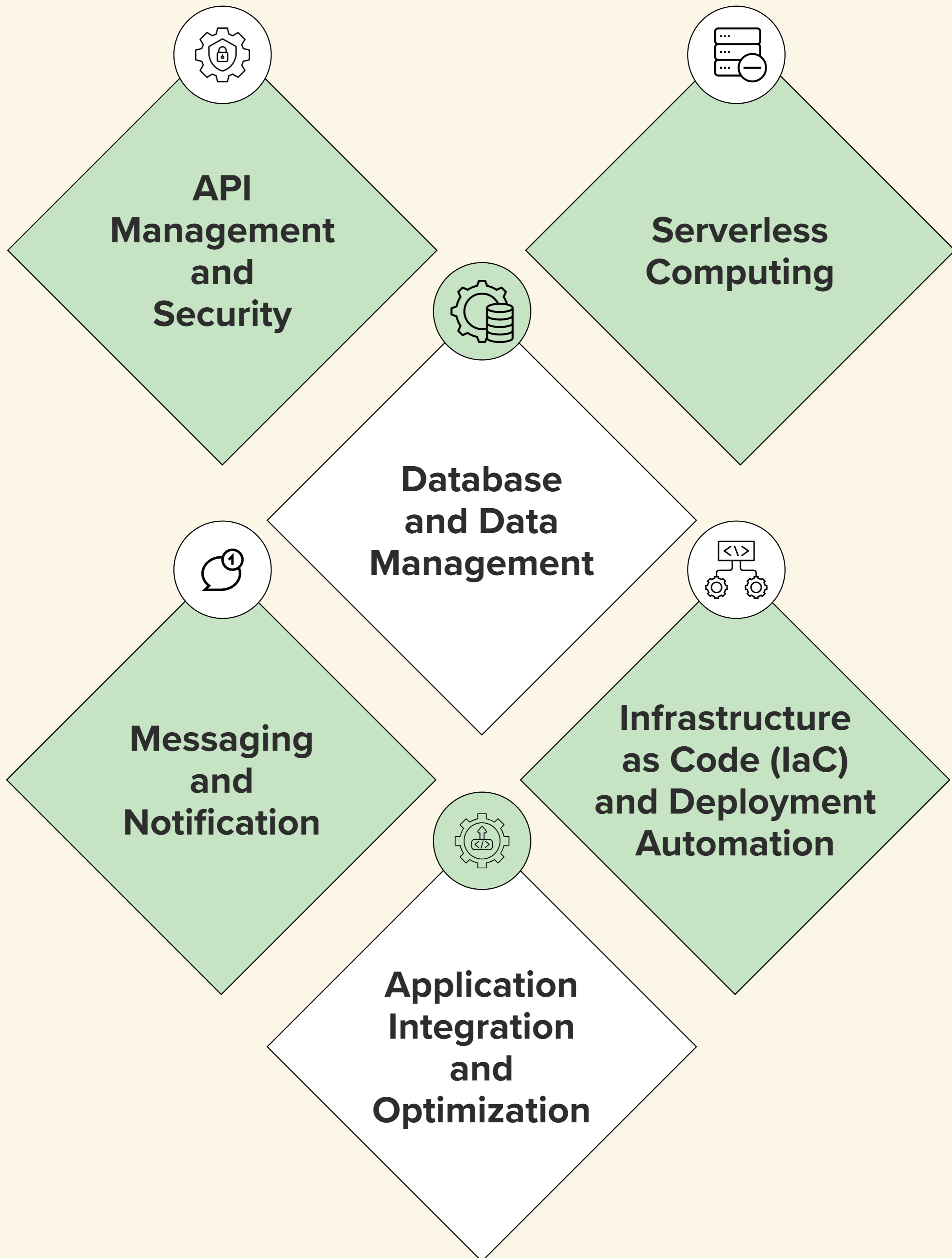
Bitbucket streamlined code management and seamlessly integrated with Jira for efficient project tracking.



Jira served as a project management hub, facilitating agile workflows, issue tracking, and overall project visibility.

CORE PLATFORM

Components and Functionality



Serverless Computing

Serverless Lambda + Layers (Cold Start)

Handle dynamic workloads without managing servers.

Optimize resource allocation, reduce operational overhead, and scale seamlessly based on demand.

Serverless Lambda + Layers (Hot Start)

Immediate execution of functions without startup delays.

Eliminate cold start delays, ensure consistent performance, and enhance responsiveness for time-sensitive applications.

API Management and Security

API Gateway Rest (Authorization)

Secure exposure and management of REST APIs.

Enable controlled access, integrate effective authorization mechanisms, and ensure API security and compliance.

Database and Data Management

Postgres RDS Cluster (Master Configuration)

High availability and scalability of relational databases.

Ensure robust data management, support scalable operations, and facilitate seamless failover for reliability.

DynamoDB (NoSQL)

Flexible and scalable storage of unstructured data like abha logs, reports, WhatsApp chats etc.

Support high-performance queries, scale seamlessly, and ensure efficient storage and retrieval of diverse data types.

Liquibase

Automate SQL schema changes and migrations.

Infrastructure as Code (IaC) and Deployment Automation

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Cloudformation + SAM template

Implement Infrastructure as Code (IaC) for managing AWS resources.

Ensure consistency in resource deployment, simplify management, and enhance scalability and reliability.

Codepipeline + Codebuild + Code Deploy

Automate build, test, and deployment processes.

Enable continuous integration and delivery (CI/CD), ensuring efficient and reliable deployment with minimal downtime.

Messaging and Notification

Amazon SNS

Subscribe to SQS queues and sending Email notifications.

Facilitate real-time communication and event-driven notifications, enhancing responsiveness and user engagement.

Amazon SQS

Reliable message queuing system. Used for scheduling SMS (with Kaleria), Appointments schedules, etc

Application Integration and Optimization

Amazon Lex

Integrate chatbot capabilities with WhatsApp.

Cloudfront for media caching.

Integrate chatbot capabilities with WhatsApp.

Security and Access Management

Secrets Manager

Manage and rotate sensitive credentials like DB credentials, configurations etc.

Testing and Quality Assurance

Device Farm

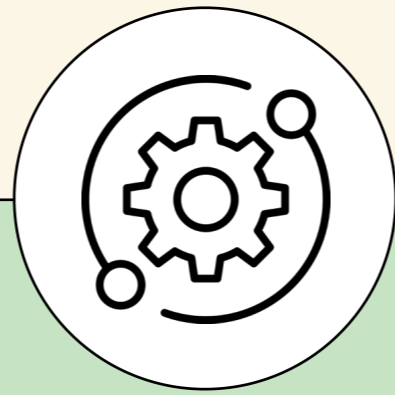
Test mobile applications across real devices.
Ensure compatibility and performance across various platforms, enhancing application quality and user experience.

Communication and Notification Services

Kaleria sms

Send transactional notifications via SMS.

OUTCOMES



TECHNICAL

Overall development time was reduced by 29%, 

leading to faster time-to-market for new features.



BUSINESS

Platform handles over 100K+ appointments a month

Trusted by Apollo Group that runs over 300+ clinics and India's leading hospital- Breach Candy Hospitals amongst others.

An astronaut in a white and red spacesuit stands on the reddish, rocky surface of Mars, looking back at the Earth as seen from space. The Earth's horizon is a large, curved arc on the right side of the frame, with clouds and the sun's glow visible. The sky is a deep blue with scattered stars.

**ACHIEVE
OUTCOMES**

**THAT
MATTER**

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