

# Ceiba Case Study





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# Web Application Catapults an Energy Market Leader into the Future

XM oversees Colombia's energy market and the operation of Colombia's electric power transmission system. XM controls and monitors the energy supply and demand, drives the energy market, maintains the national electricity grid, and plans the distribution of energy to meet Colombian demand.

XM was using a legacy system to plan and distribute energy. The utilization of a legacy system for energy planning and distribution, presented multiple risks, including risks to the energy market and distribution planning, as well as increased vulnerability to competition and security breaches. This not only threatened the success and sustainability of the company, but also undermined XM's mission to remain an innovative and technologically advanced organization. XM needed to take action to address this issue and implement a more efficient and effective system to ensure their continued success in the industry.

# Ceiba as an ally to boost efficiency

In order to keep the company at the forefront in the industry, **Ceiba designed an advanced, user-friendly Simplex platform for XM**, improving energy distribution and energy predictions.



As part of the contracting process, we competed with a variety of software vendors in the region. After an exhausting vetting process, Ceiba Software won the bid. This is due to our experience with enterprise clients in the energy sector, our low developer/employee turnover ratio, our technical capability and our technology partner approach where we become the technical decision makers and guide the project to success.” said a Ceiba team member.

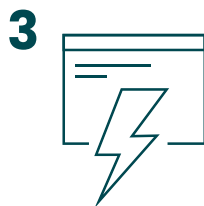
SIMPLEX is a software platform that helps XM in the following three areas:



**Planning energy distribution and making better decisions** about who will receive energy and the proper amount.



**Pricing calculation** taking into account different conditions in order to offer the most competitive price.



**Measuring the quality of the energy** purchased and the way it will be distributed.

With Simplex, XM can perform medium- and short-term national energy distribution planning, besides analyzing large quantities of case studies and scenarios, it also gives results to report in the Energy and Gas Regulatory **Commission (CREG)**



and use them to make energy distribution plans, alternatives, and predictions. Simplex's user-friendly interface and robust backend technology makes it easy for an energy operator to determine the optimal energy distribution plan with full confidence and without much hassle.



# The Technology Behind the Platform

The analysis of a considerable amount of historical information allowed the team to build the platform using a microservice's architecture to ensure **scalability and improved maintenance and minimize the impact of incidents.** On the other hand, Microservices give the platform an improved leg up in terms of reliability, growth, and security.



# Key Components



## **Web application firewall (WAF):**

Helps protect each component against bots and exploits that consume resources and cause downtime.

## **Azure Front Door:**

As a cloud content delivery network, Azure Front Door, provides fast, reliable, and secure access to content and it is fully integrated with WAF to prevent security risks.





# Key Components

## **BlobStorage:**

Stores static files from each frontend (one per frontend built).



## **AKS Cluster:**

The cluster where microservices are hosted.



## **Services Bus:**

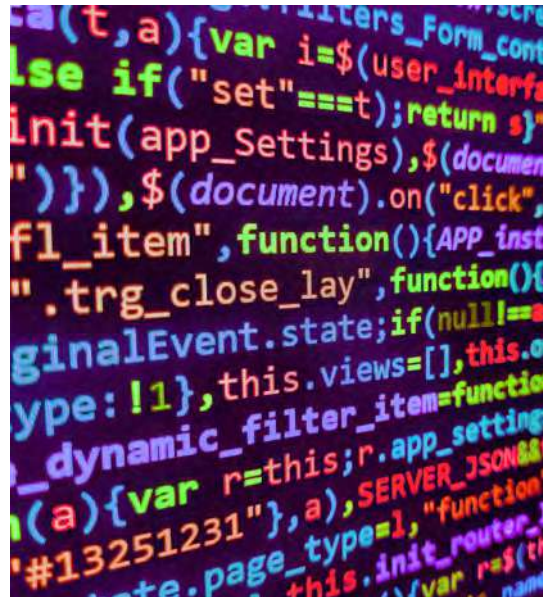
XM is a highly interconnected company. Integrations with other applications are very important and critical. The service bus allows improving and ensuring communication between them, it facilitates the asynchronous communication between the different microservices.



# Key Components

## SignalR:

Timing is very important for XM. So, SignalR allows users to be informed about every information modified inside/outside Simplex operativo, even if it takes minutes to be loaded. Therefore, it sends push notifications to frontends in asynchronous processes.



## SQLServer:

The database engine selected to perform the relational database management.

## Azure Data Lake Storage:

Since XM requires and store a big amount of information, but this is keep it because of historical needs, so Blob Storage receives this historical information and keep database free of unnecessary information.





# Key Components

## Large-scale Azure Storage:

System where historical data storage is performed.



## API Management:

Since everything in XM is interconnected to other company applications, API management is used as a centralized place to exchange information. Hybrid and multi-cloud management platform for the APIs of all environments.

## Storage:

The Azure system where results, reports, and other systems are published.





## Simplex Helps XM Meet the Demands of a Rapidly Expanding Energy Sector

With Simplex, XM can confidently meet the demands of the transforming energy sector in Colombia. Thanks in large part to Ceiba's diligence in applying modern, scalable technologies, XM has been able to increase operational efficiencies, reducing the processing time from 40/50 minutes to 5 minutes, besides improving resource optimization, and mitigating IT and operational risks.



