



Case Study



Cargo Management





Paweł Szczeki

Technologies

Azure Data Factory
Azure Data Lake Store
Azure Analytics
Azure Event Hubs
Azure Resource Manager
Azure APP Services
Azure AD
U-SQL
Power BI
Windows Universal
Applications

Area

Denmark

Industry

Logistics & Supply Chain

Company Size

11 000+

Duration

May 2016 - January 2017



Executive summary

We transformed Supply Chain Management to help our client's customers seek value strategically through solutions that affect the whole supply chain. We aimed to provide end-to-end customer happiness by aligning all players as customers and appealing to individual motivations, as well as serving shared needs.



Description

Project goals

The integrated solution to track shipments and transports that:

- gathers information about known or possible delays caused by weather conditions or other unexpected events.
- simplifies delay management and makes looking for an alternative or faster route much easier.
- removes the human factor from cargo management process and makes it fully automatic, with data-based decision making.
- uses an interactive map with estimated time of arrival and alerts about potential obstacles.

Solution

The core of the solution was built using two Microsoft Azure Cloud technologies – Data Lake Store and Data Lake Analytics.

- We filled the storage with data from multiple sources, including customer reports, GPS position of trucks and ships, weather forecasts and news from the internet. It was necessary to structure the unstructured data to make it searchable. To analyze the RSS news reports we used LUIS cognitive technologies provided by Microsoft.
- All the monitoring is done with Azure dashboards and application insights that can send alerts about any shortages and scale up to meet the demand. There are no physical servers in the client's IT department, only the cloud.

Our client can get a real-time generated world map with the location of every container, package or even a single order. At the same time, the application provides information about expected delays and makes planning alternative routes convenient.

Digital transformation of the bloodstream of the world



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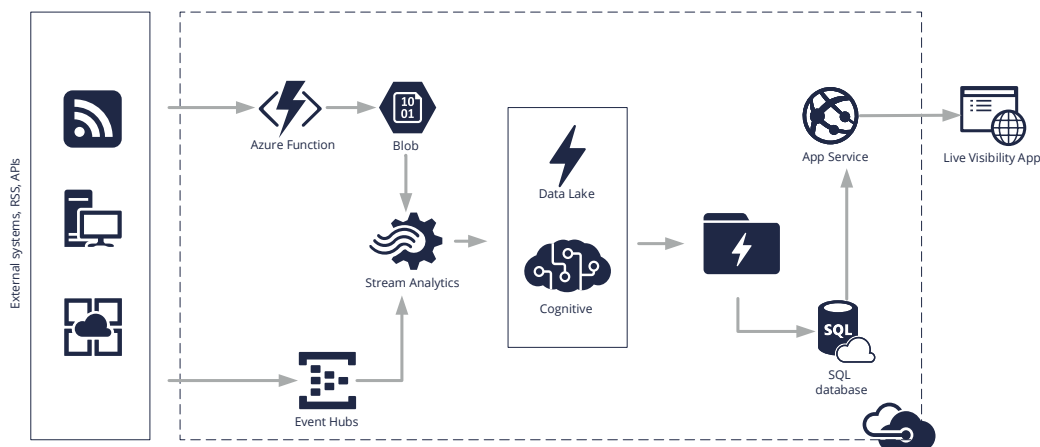
Duration

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High level architecture

The following diagram shows the “Live Visibility App” architecture:

- The application collects a vast range of data from different sources like on-premises systems, location services, weather newsfeeds and RSS channels.
- Analytics and Event Hubs services.
- In order to determine potential disruption in transport delivery date, the processed data about vessel location and weather events is analyzed and processed by Cognitive.
- Cognitive models can understand written text to extract a number which indicates potential delay time in delivery.
- All the processed data is stored in central Azure Data Lake Store where it is combined and can be used for further processing by other applications.
- Azure Data Lake Store which is used in this solution serves as central storage available not only to the Live Visibility App, but also for many other systems which share the data for analytics with each other.
- Disruption details, including current vessel location (map), are available to end-users through an internet browser.



Bringing logistics into the 21st century through end-to-end automation



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Azure Logic Apps
Azure Functions
Azure Service Bus
Application Insights
Azure Key Vault
Azure SQL Database
Azure Storage

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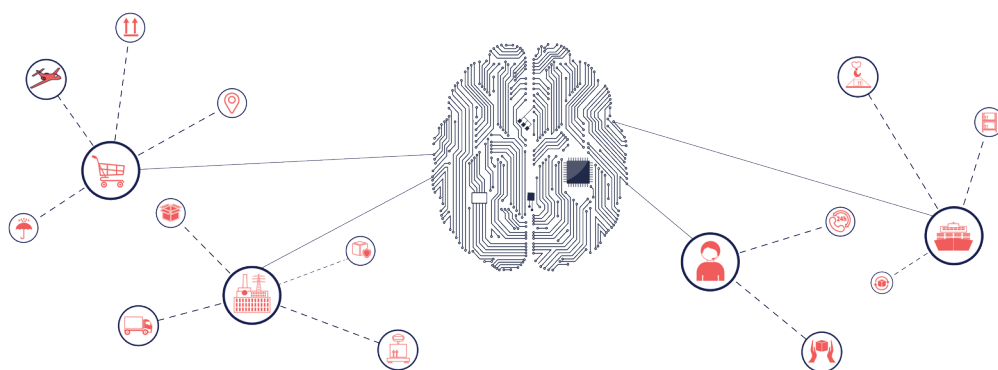
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Executive summary

Our client cooperates with many suppliers and vendors from many industries. The information exchange between multiple different systems is a crucial element of the whole supply chain ecosystem. The “Brain” solution completely changed and improved the whole supply process by integrating and establishing communication between all independent systems.



Description

The Brain is the central component of the new Digital Platform that will orchestrate processes across various business capability products.

The most important goals are to:

- fully automate supply chain process from the moment the shipment leaves the factory until it reaches a client.
- allow to orchestrate processes by creating and tracking workflow such as message flows between integrated systems.
- gather all data flowing through for further data analysis.
- provide visibility to the whole process. This allows to check where the shipment is at any point in time.

Solution

The core of the solution was built using serverless technologies available in Microsoft Azure Cloud: Azure Logic Apps and Azure Functions.

- We integrated multiple internal/external systems, including customs, warehouse or customer invoicing systems. In order to be able to easily handle different protocols and systems we fully utilize the Azure Logic Apps capabilities.
- The system is designed to be able to handle high throughput. Some of the external systems send a lot of messages and all of them combined make for high traffic.

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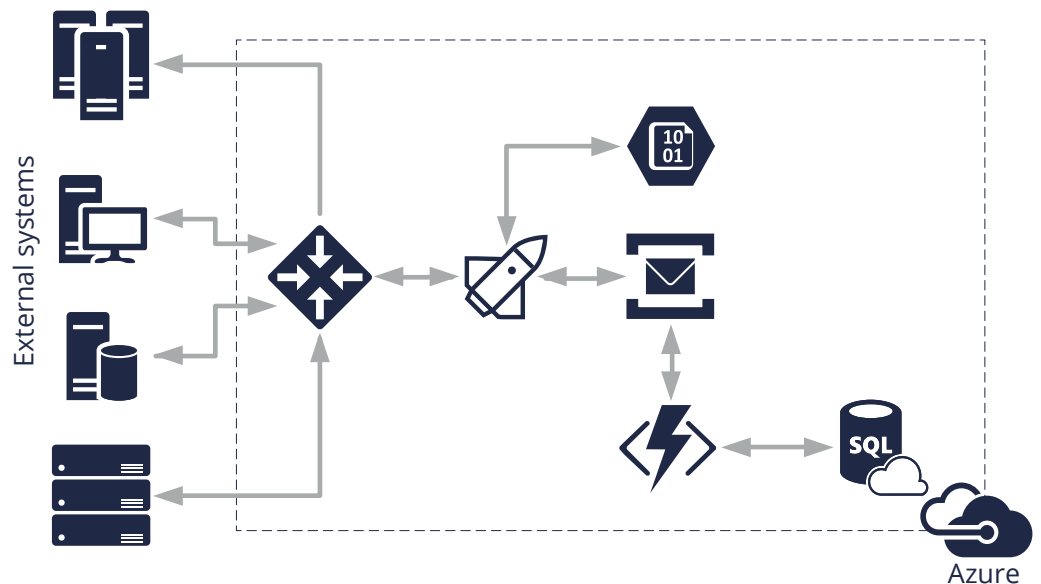
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High level architecture

The following diagram shows the “Brain” architecture:

- Dedicated API allows for information exchange between external systems and “Brain”.
- Each message sent to “Brain” is permanently stored in Azure Blob.
- Service Bus is utilized to communicate between Azure SQL Database (through Azure Functions) and external systems.
- Azure SQL Database stores configuration. Each input message has a dedicated output. This information is stored in Azure SQL Database. Based on it, an appropriate feedback message is sent to the corresponding systems.





Interested? Contact us



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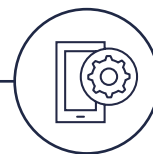
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