plain concepts

Rediscover
the meaning of technology

Manufacturing Webinar

Founded in 2006 by 4 Microsoft MVPs, Plain Concepts was created to **help companies adopt new technologies** aimed at improving their productivity and processes.

Awarded in 2016 as Microsoft Partner of the Year, we currently have **over 350 employees**, reaching a milestone in the technology sector by having 12 professionals recognized as Microsoft MVP and over a dozen certifications at business level.

Present in **Spain, USA, UAE, United Kingdom, Germany and the Netherlands**, we have developed over 2,000 projects for companies across all industrial vertical.

Rediscover
the meaning of technology

Manufacturing & IoT

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Manufacturing

Training

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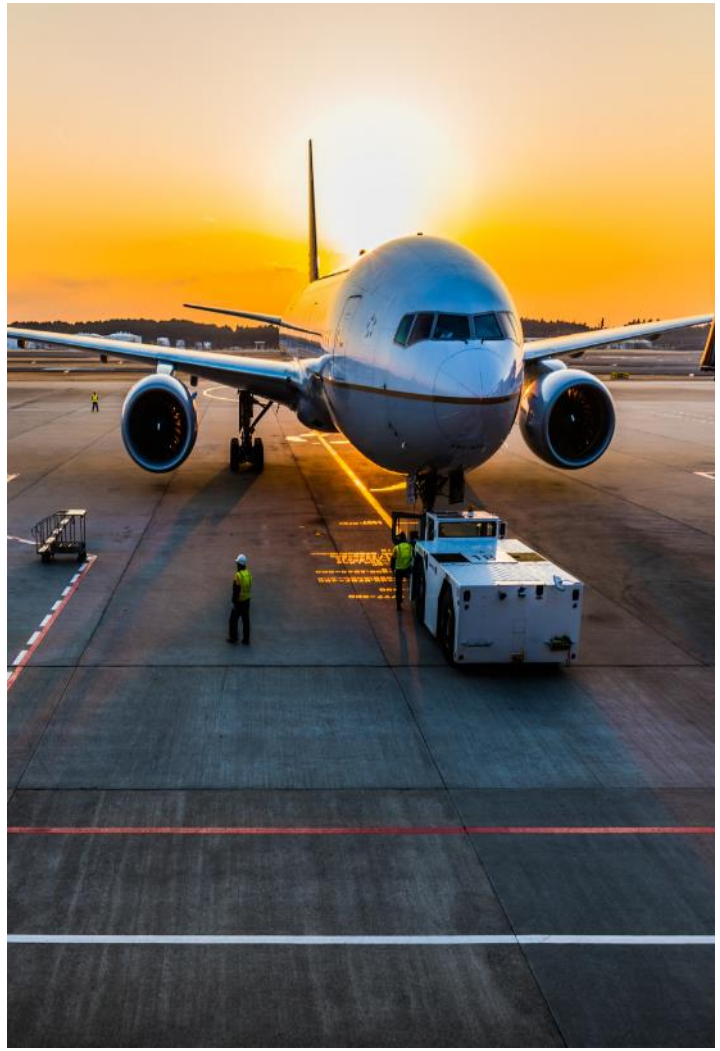
Airbus

AIRBUS

Airbus is the world’s leading aircraft manufacturer.



Challenge

Trainning new employees

Solution

An application based on Virtual Reality for the Oculus Rift device.

Impact

The application allows a very natural manipulation. The operator has virtual hands that allow him both to dissemble a part and to adapt the size of the workspace to be able to see in detail.

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VR vs AR vs MR

Virtual Reality (VR)

The user´s perception of reality is completely based on virtual information.

Example: Oculus Rift

Augmented Reality (AR)

The user is provided with additional computer-generated information that enhances their perception of reality.

Example: Google Glasses.

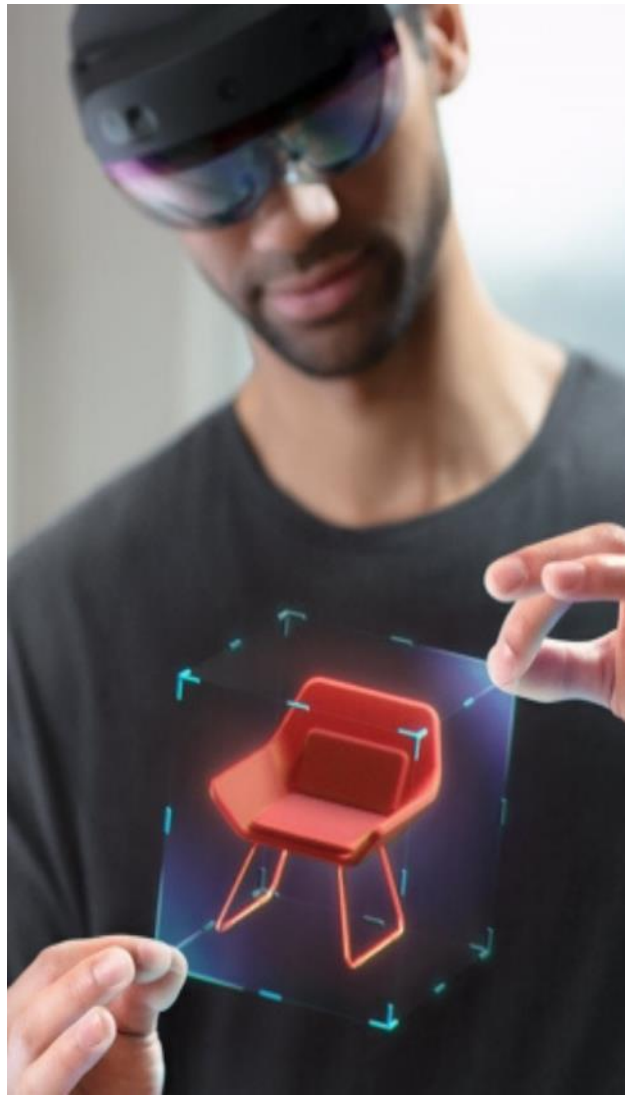
Mixed Reality (MR)

A merge of the virtual world into the real world.

Virtual objects are anchored into reality and interacts with it.

The difference with AR is fuzzy and sometimes the terms are used interchangeably.

Example: Microsoft HoloLens 2



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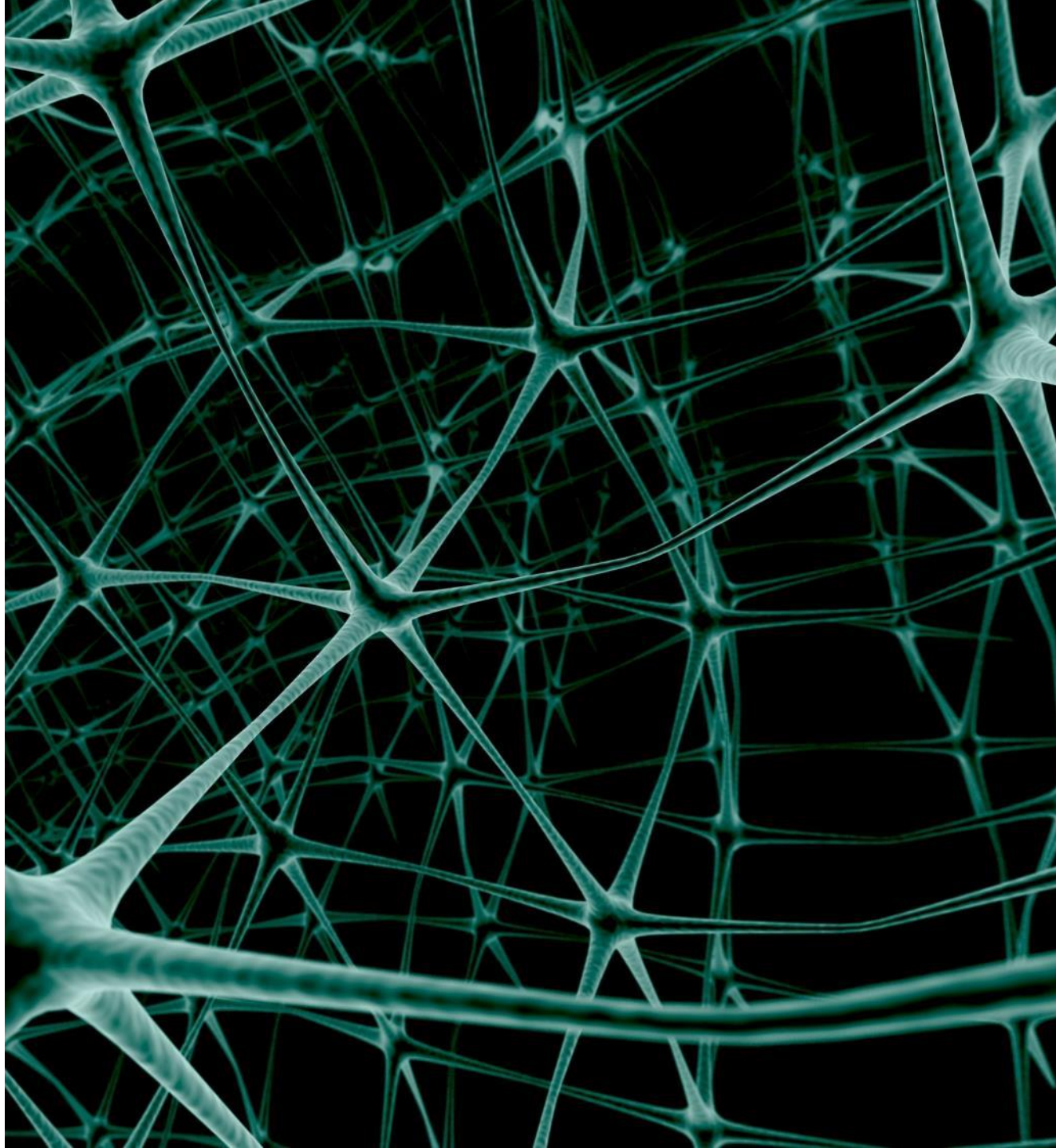
MACHINE LEARNING



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The democratization of machine learning

Forecasting is the process of making predictions of the future based on past and present data and most commonly by analysis of trends.

The problem

Finding non-obvious interrelationship of metrics is hard.

Processing big amounts of data requires a lot of computational power.

Until recently this was reserved to a few.

The solution

Thanks to new cloud-based machine learning and data platforms as a service, machine learning and big data is available for all.

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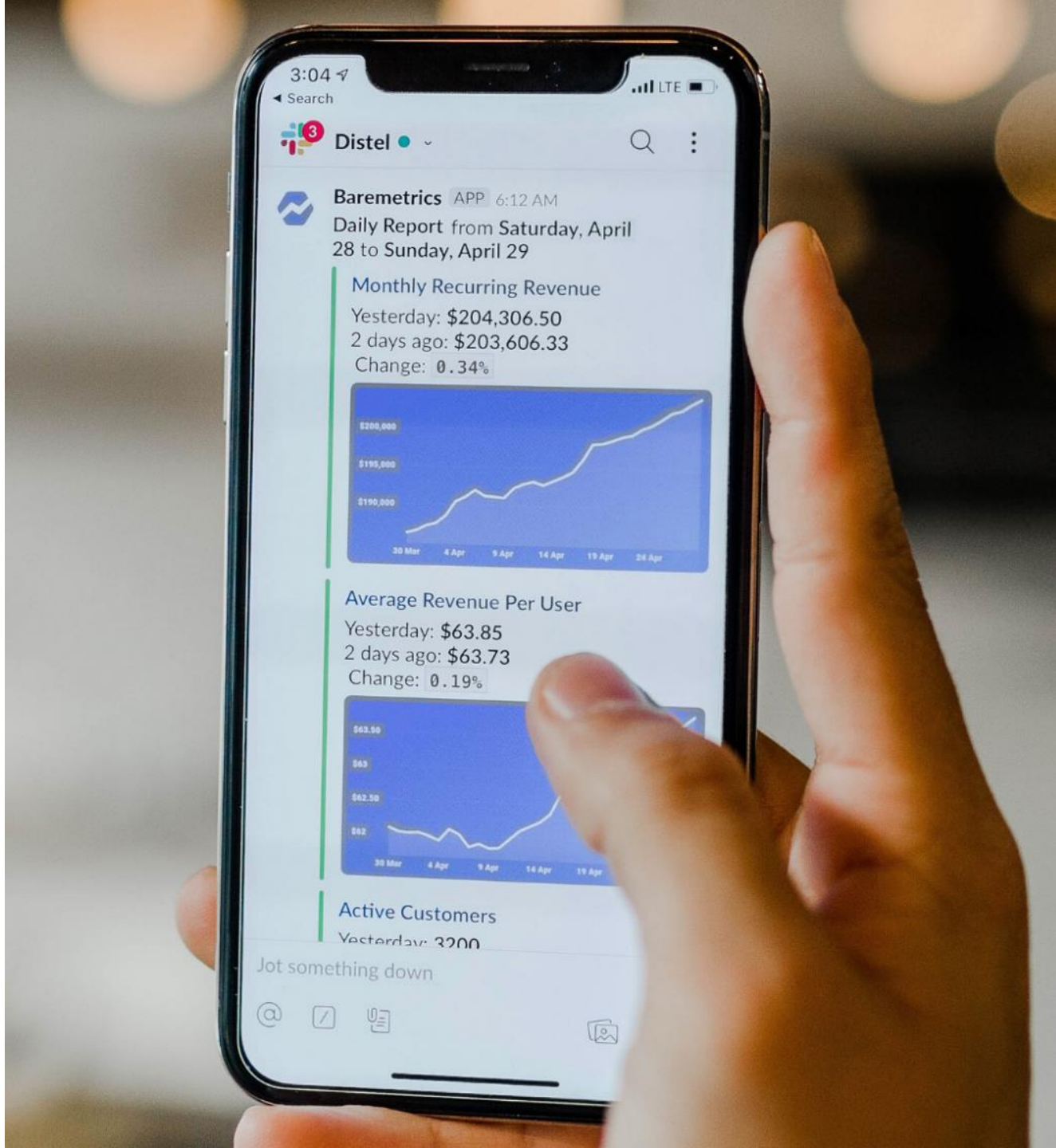
Forecasting



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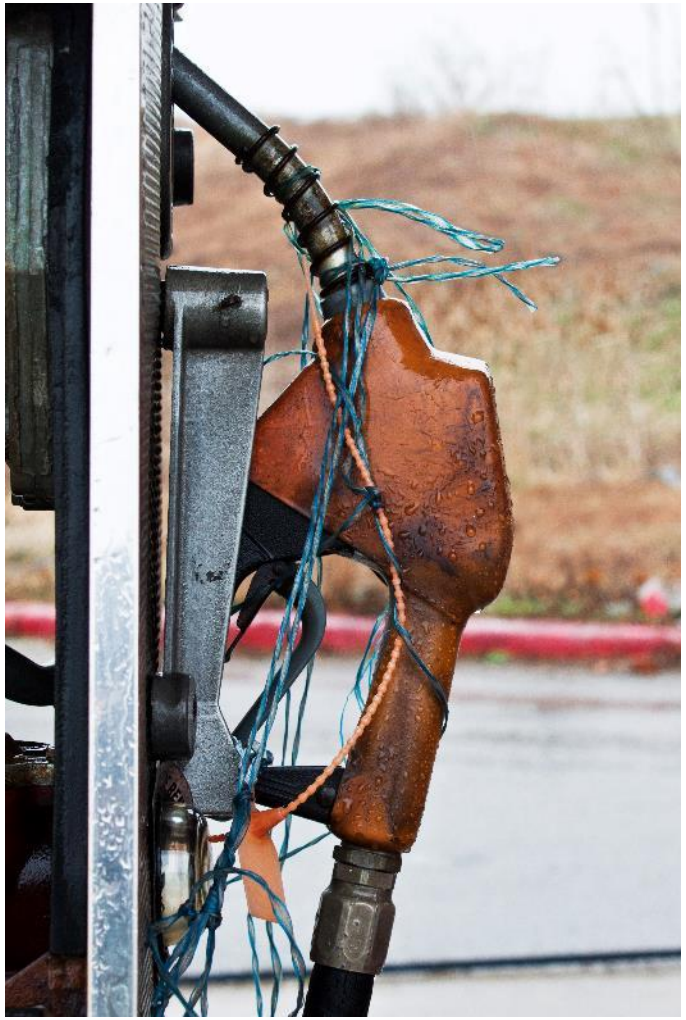
CLH Fuel demand forecast

Manufacturing & IoT

The CLH Group is a leading international company in the transport and storage of petroleum products in Europe, as well as one of the leading companies in the sector in the world. They manage Europe's largest network of refined products.



Challenge

Build a Machine Learning model to calculate future fuel demand for each station.

Solution

Machine Learning model based on Azure ML. This model considers different variables such as weather, season or days of the week to calculate the prediction.

Impact

Help management to make the right decisions based on demand, facilitating correct managerial decisions about material, personnel an other requirements.

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CLH Predictive maintenance

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Challenge

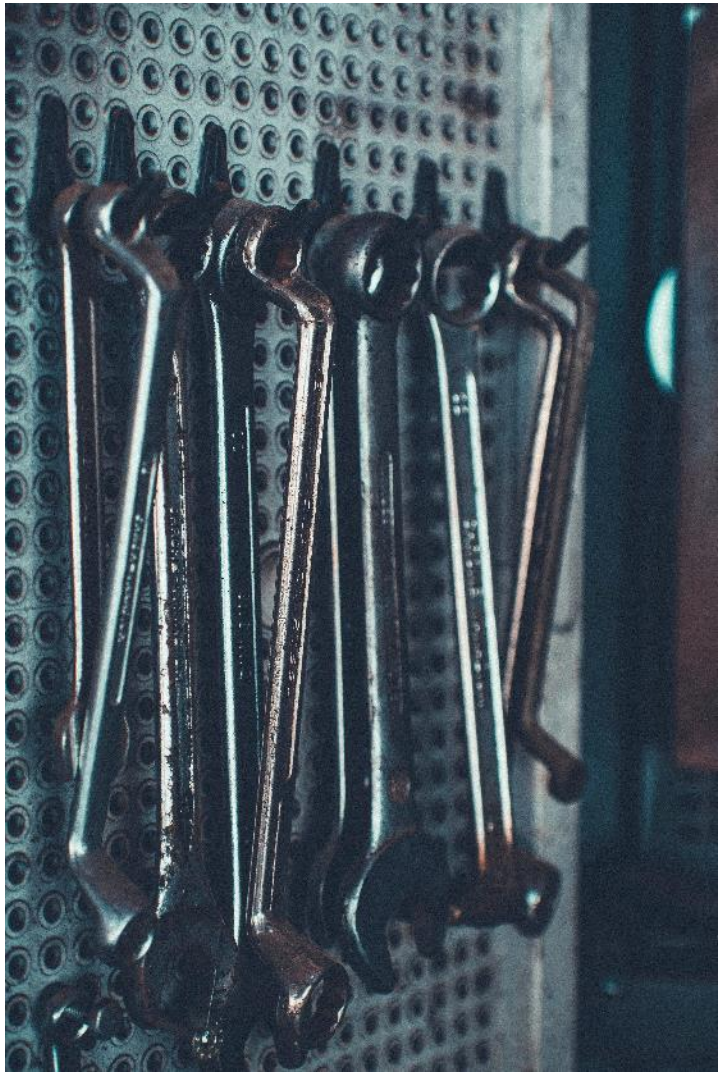
Be able to anticipate the maintenance needs of fuel pumps to improve response, organization and avoid the problems of possible concentrations of maintenance problems on key dates.

Solution

Develop a Machine Learning model to detect when maintenance should be performed for each pipeline. This model considers different vibration sensors to know when a fuel pump is going to fail.

Impact

Costs savings over routine or time-based preventive maintenance, because tasks are performed only when warranted.



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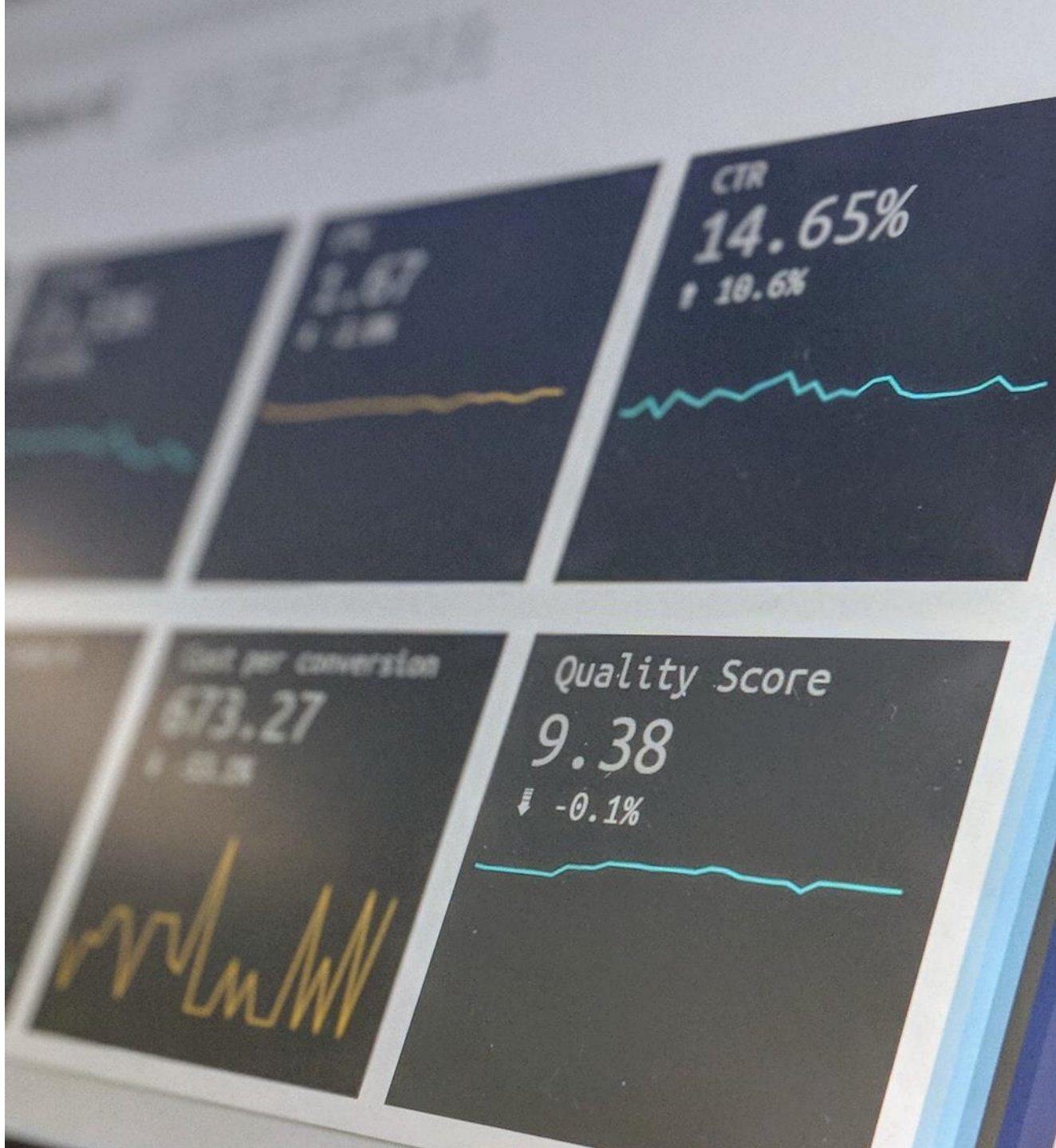
Data Governance



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Pharma Centralization of data and operation

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Challenge

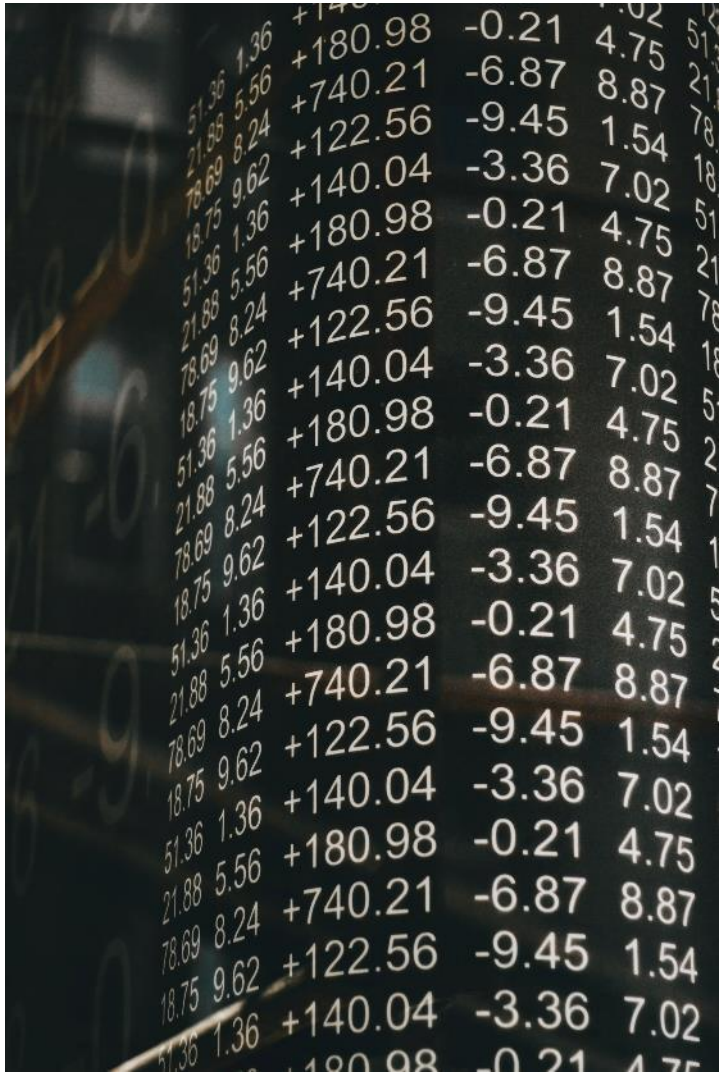
The challenge was to create a central, unified repository for all company data, easily accessible and backed up, that would allow the use of that data for testing and analysis without compromising security and the data itself.

Solution

Data Lake Sandbox

Impact

Improve all department use of Data and Machine Learning for business decisions



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Pharma Centralization of data and operation

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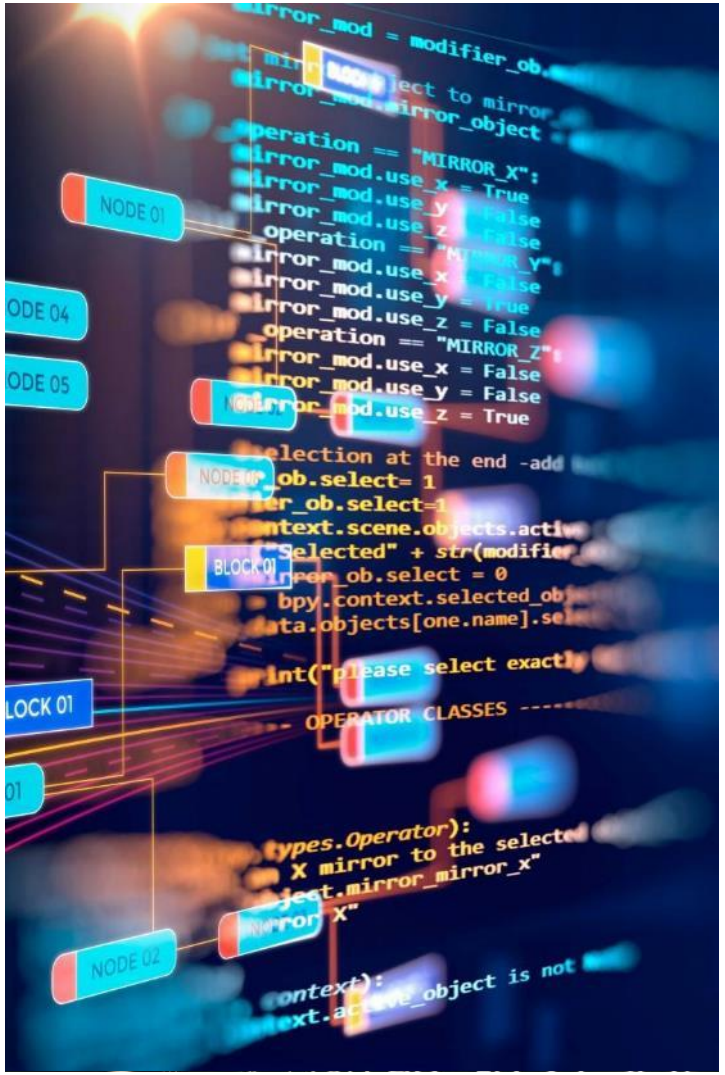
Solution in depth

1. Data Lake
2. Sandbox Engine



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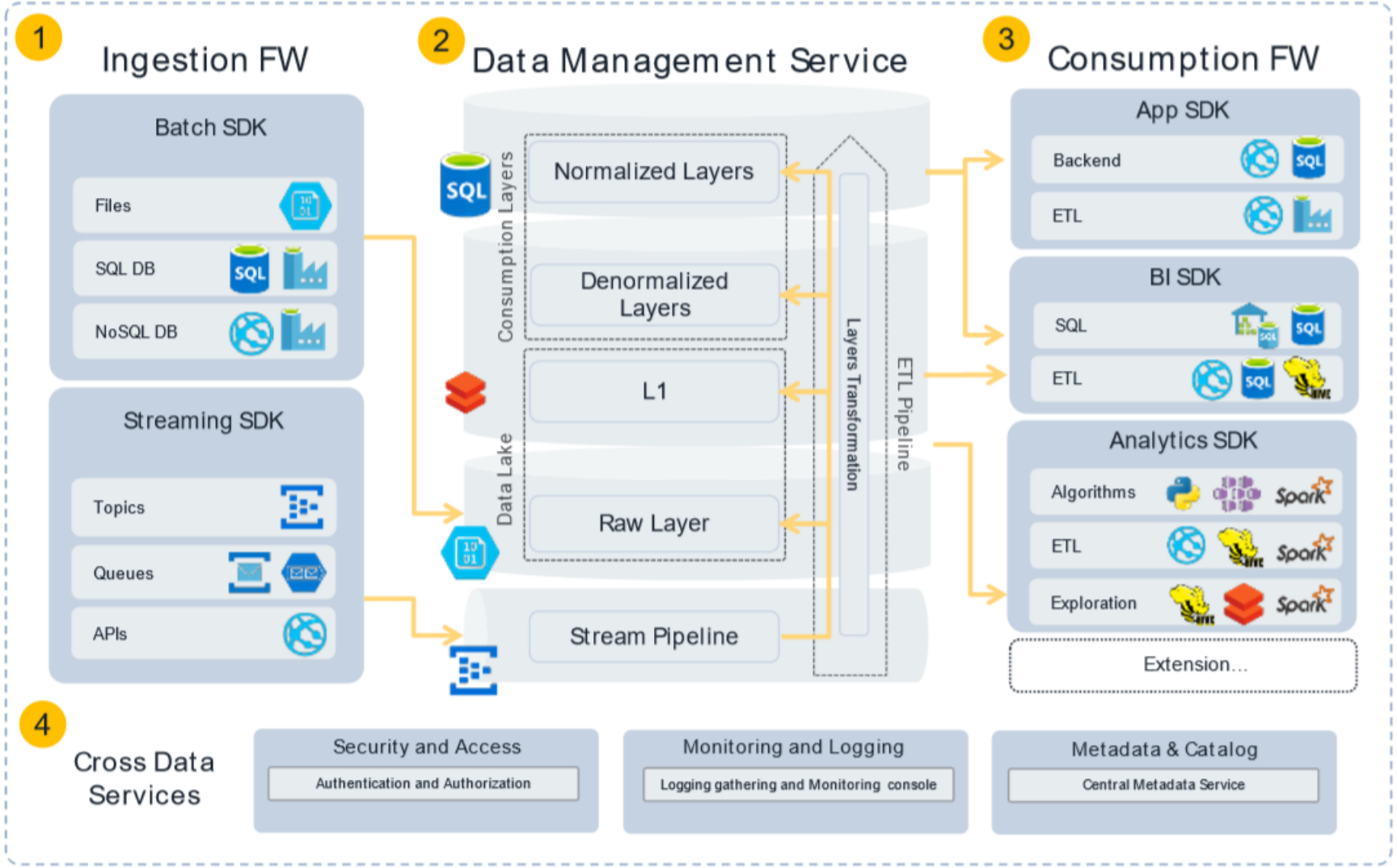
Data Lake Architecture



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Frameworks and Services

1. Data Ingestion

Batch Mode:

- From Files: Blob storage ingestion utils
- From SQL: SSIS SQL or Data Factory
- From NoSQL: App services or Data Factory

Stream Mode:

- Exposing Topics : Azure Service Bus
- Exposing Queues: Azure Storage Queues
- Pull or Push from APIs: App Services

2. Data Governance

Stream pipeline

- Stream flow and analytics: Event Hub

Data Lake

- Raw Layer: Blob Storage
- Layer 1: HD Insights (HIVE) or Azure Datalake

Consumption Lake

- NoSQL: HD Insights (HIVE) or Databricks
- SQL: SQLServer

3. Data Consumption

App SDK

- Backend: App Services
- SQL Access: SQL Server

BI SDK

- SQL Access: Azure Data Warehouse or SQL Sever
- ETLs: App Service or HIVE

Analytics SDK

- Algorithms: Python on Spark
- ETLs: App Services or HIVE or Spark
- Exploration: Hive or Spark

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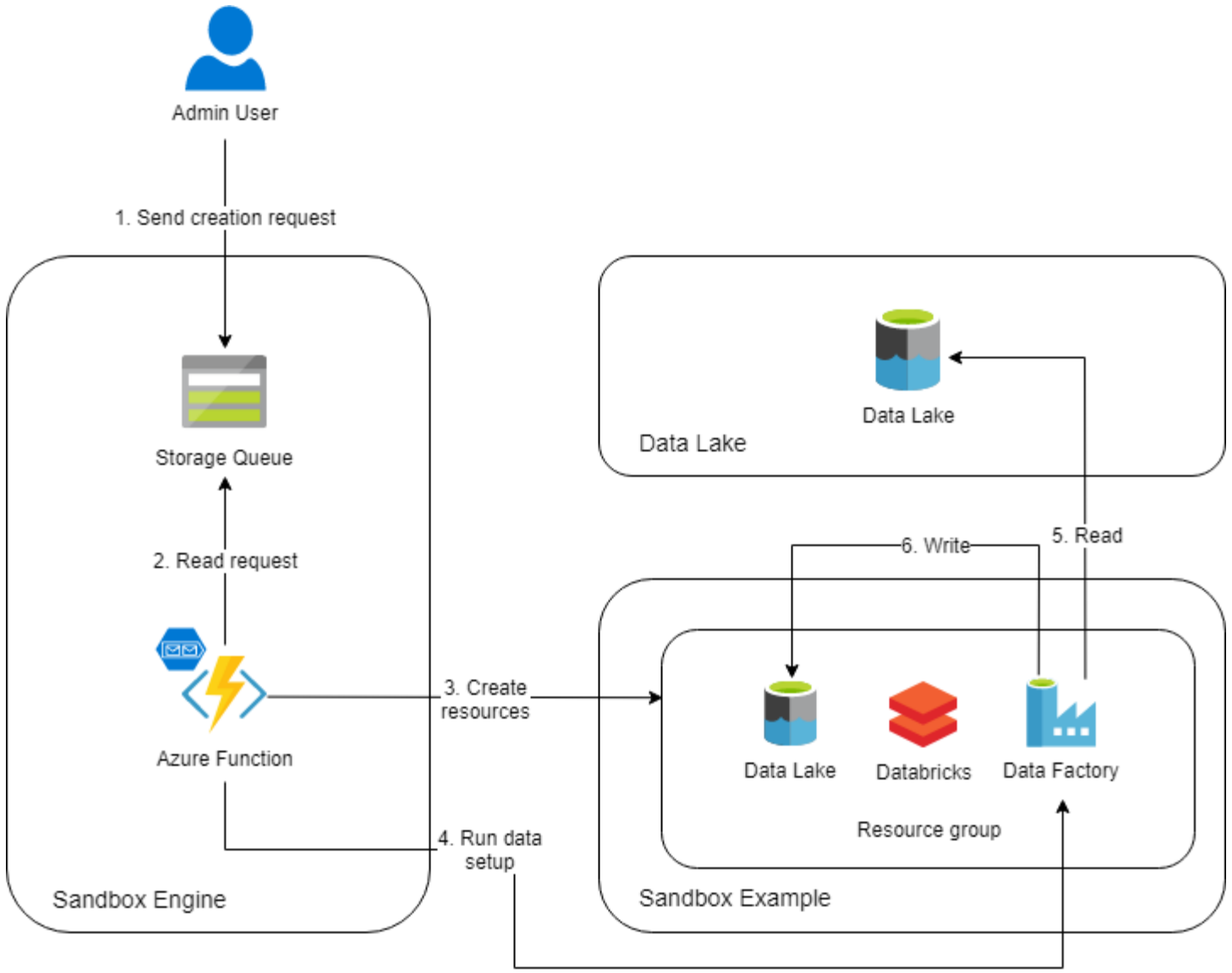
Sandbox Engine



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Pharma drugs production optimization

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Challenge

The challenge was to optimize the manufacturing process of a group of drugs that use centrifuge technology to generate pills.

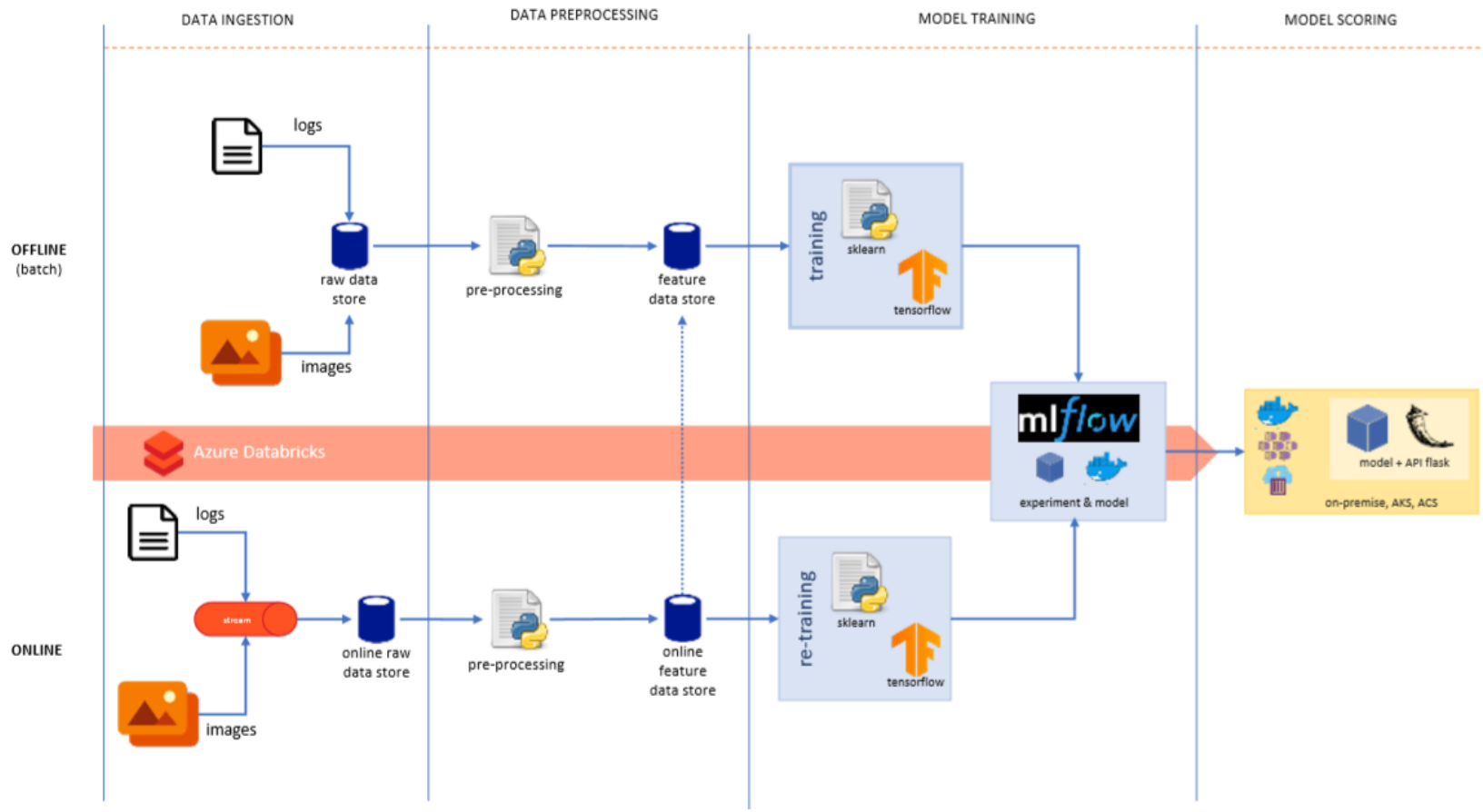
Solution

Create a model using ML to find the optimal machine preheating time, spin time and cooling time based on data extracted from machine sensors.

Impact

More than 7% of improvement on every pills lot.

The following diagram shows the usual flow of Machine Learning processes using Databricks and MLFlow:



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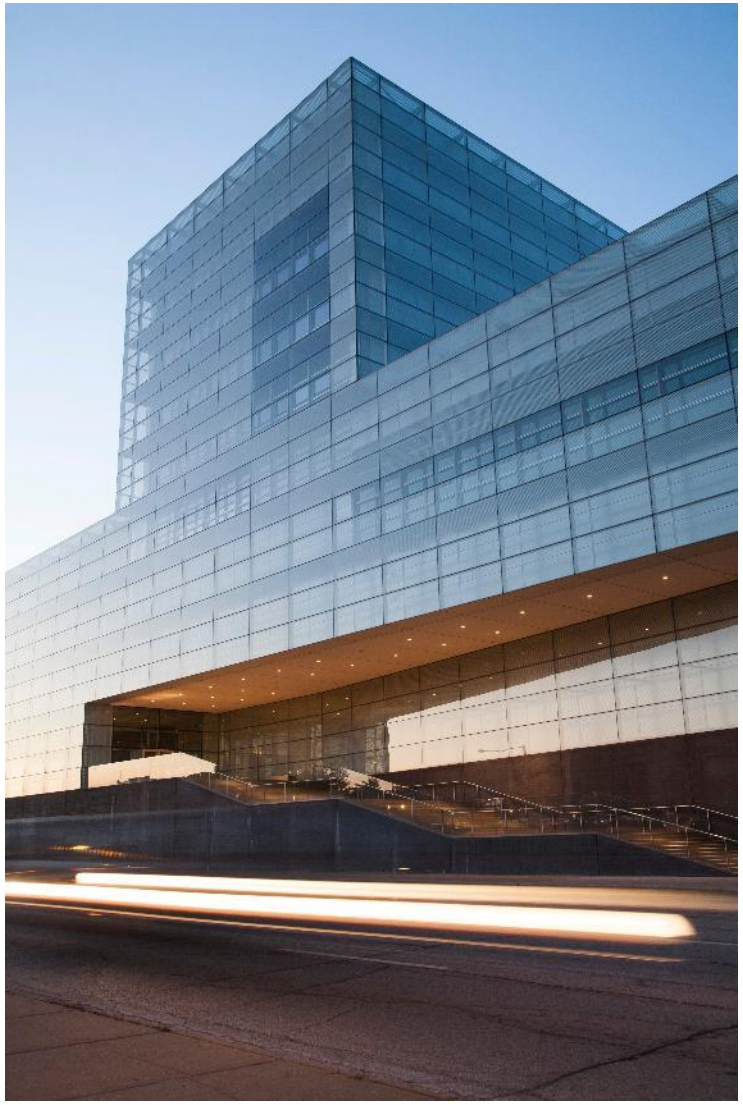
How to increase the company's profit in the use of the rooms by using IoT

Our client is a multinational provider of services offices, coworking spaces, business lounges, virtual offices, meeting rooms and video teleconference services. They currently have more than 3,340 locations in more than 120 countries, providing services to over 2.5 million clients.



Challenge

Create a cross-company system that concentrates all the data from the different sensors installed at the different company locations.

Solution

Create an IoT and Analytic Platform on Azure, using Azure data Lake.

Impact

More than 20K buildings are connected. There’s an improvement on sales by enhancing the value proposition and giving more visibility to customers.

Delay between events and insights reduced from 2h to 3-5 minutes.

Detected potential millionary revenue leakage per year.

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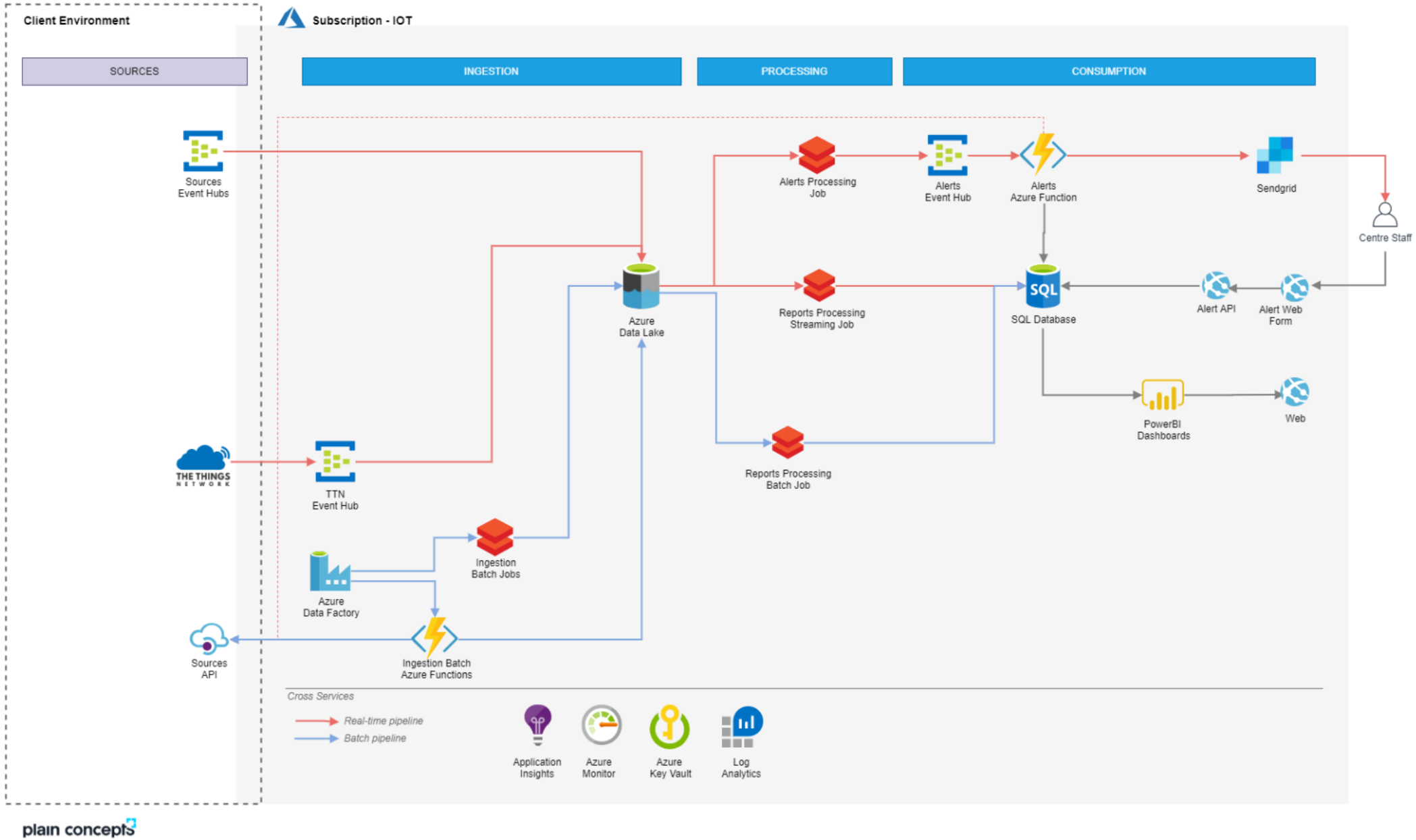
IOT ARCHITECTURE OVERVIEW



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Filters

Date

1/1/2020 — 3/26/2020

Alert Category

All

User Type

All

LOCATION

Country

All

City

All

Centre Name

All

Centre Number

All

INVENTORY

Inventory Name

All

Inventory Id

All

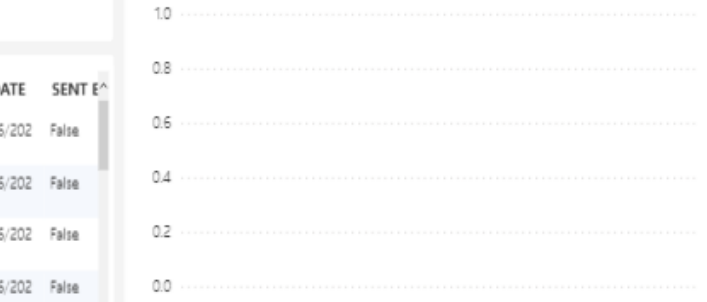
Inventory Type

All

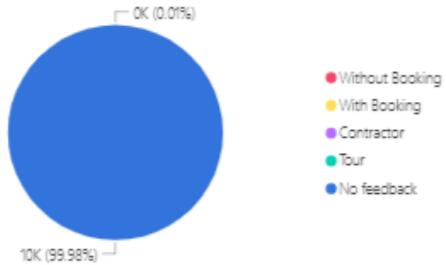
476K	10K	0%
Detected Alerts	Sent Email	Response Rate

CENTRE ID	CENTRE NAME	CITY	COUNTRY	USERNAME	USER TYPE	INVENTORY ID	INVENTORY NAME	CATEGORY	DATE	SENT E^
5064	[redacted]	Fukuoka	Japan	[redacted]	Customer	2504098	204	Door left open	3/26/2020	False
5396	[redacted]	Tokyo	Japan			2590047	827	Door left open	3/26/2020	False
5064	[redacted]	Fukuoka	Japan			2504105	309	Door left open	3/26/2020	False
4303	[redacted]	Tokyo	Japan	[redacted]	Customer	2275385	229	Open Door	3/26/2020	False
4303	[redacted]	Tokyo	Japan	[redacted]	Customer	2275385	229	Open Door	3/26/2020	False
5064	[redacted]	Fukuoka	Japan	[redacted]	Customer	2504098	204	Open Door	3/26/2020	False
4581	[redacted]	Seoul	Korea, Republic of	[redacted]	Customer	2394067	7028	Open Door	3/26/2020	False
4581	[redacted]	Seoul	Korea, Republic of	[redacted]	Customer	2394067	7028	Open Door	3/26/2020	False
4303	[redacted]	Tokyo	Japan			2579645	Collaboration	Door left open	3/26/2020	False
5116	[redacted]	Dandenong	Australia	[redacted]	Customer	2494476	1039	Open Door	3/26/2020	False
4212	[redacted]	Shenzhen	China			2294117	8565	Door left open	3/26/2020	False
4869	[redacted]	Shanghai	China			2459008	Boardroom	Door left open	3/26/2020	False
5318	[redacted]	Singapore	Singapore	[redacted]	Customer	2534391	42047B	Open Door	3/26/2020	True
5318	[redacted]	Singapore	Singapore	[redacted]	Customer	2534391	42047B	Open Door	3/26/2020	True
4212	[redacted]	Shenzhen	China			2294095	8540	Door left open	3/26/2020	False
5006	[redacted]	Shanghai	China	[redacted]	Customer	2487662	zz3093	Open Door	3/26/2020	False
4787	[redacted]	Taipei City	Taiwan, Province of China	[redacted]	Customer	2450041	1576	Open Door	3/26/2020	False

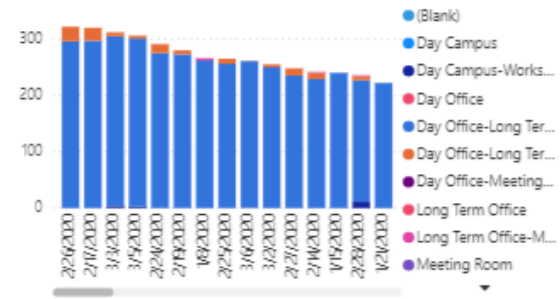
Response Rate



Alert Feedback



Emails sent



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How to improve check-in process by using IoT

Manufacturing & IoT

Challenge

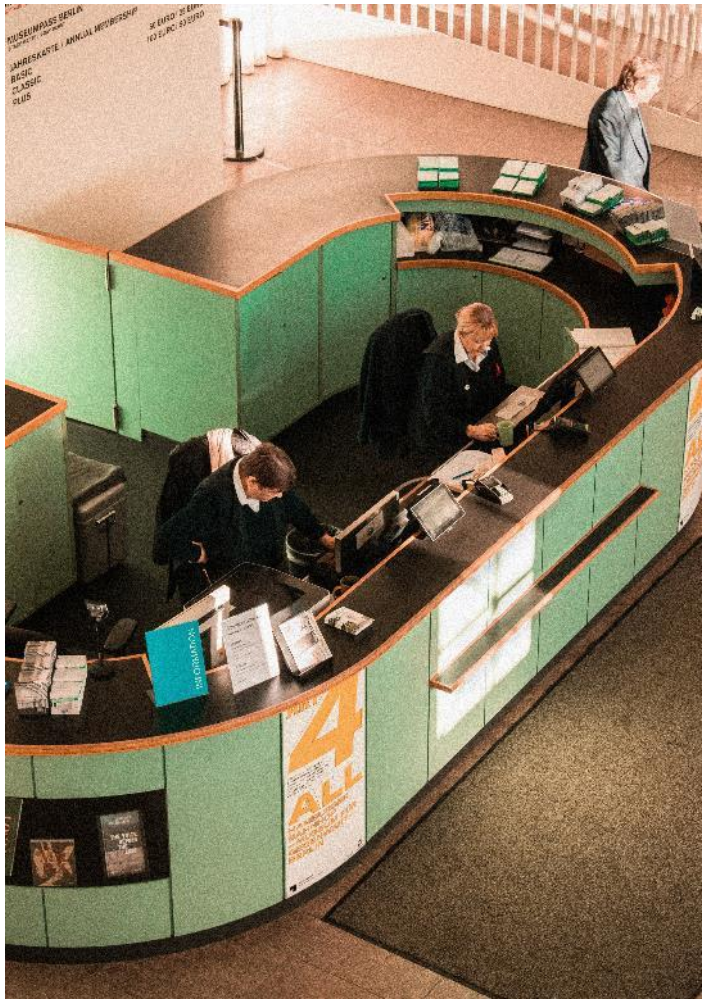
The goal from this project is to optimize efficiency and security in their centers while providing a seamless user experience for their customers and visitors.

Solution

The solution consists on an application running on tablet devices in the receptions of centers. This application allows customers and visitors to check themselves in without the need to get support from community associates. Furthermore, it will automate the notifications to customers and community associates.

Impact

Improve and optimize check-in process around more than 10 million.



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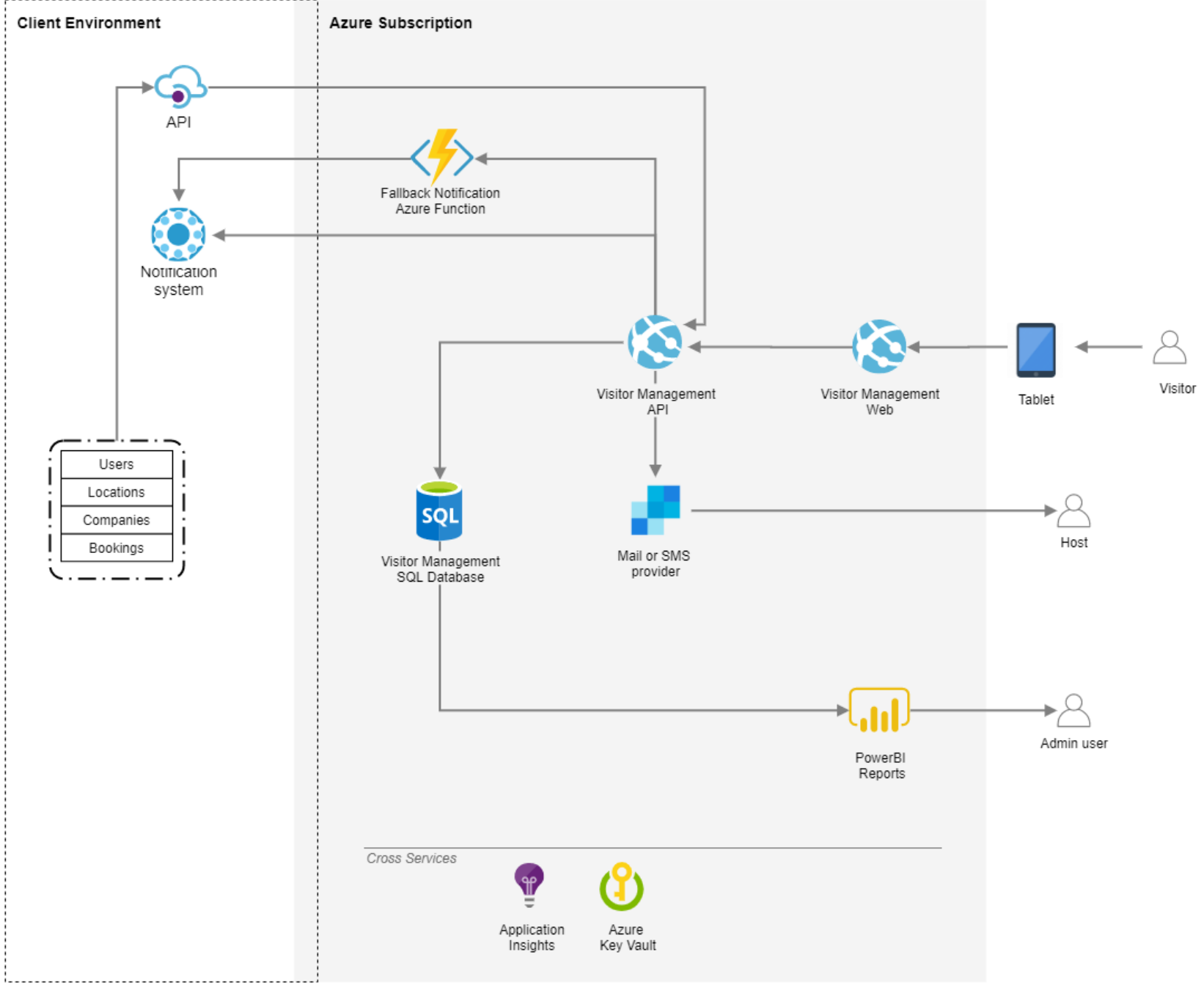

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EN

Welcome!

Place your QR code in front of the tablet camera

Place QR in front of the camera

Or

Tap here the enter number

No QR Code?

Select your type of visit

Go to Type of visit

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IoT Active Seating

Manufacturing & IoT

Challenge

Introduce IoT to their chairs, in order to offer solutions for improving posture, suggesting rest times, locating people in the office and for example analyze the use of spaces depending on the volume of chairs in a room or space.

Solution

Integration IoT into their chairs, doing some benchmarking of devices, and creating and IoT and Data platform to manage all the data from chair sensors.

Impact

- More quality, more data, more usability, improve the user experience and brand perception.
- The data extracted from the monitoring allows a much better analysis of the use of our client furniture in order to be able to improve their products in line with the needs of the customers.

IOT ARCHITECTURE OVERVIEW

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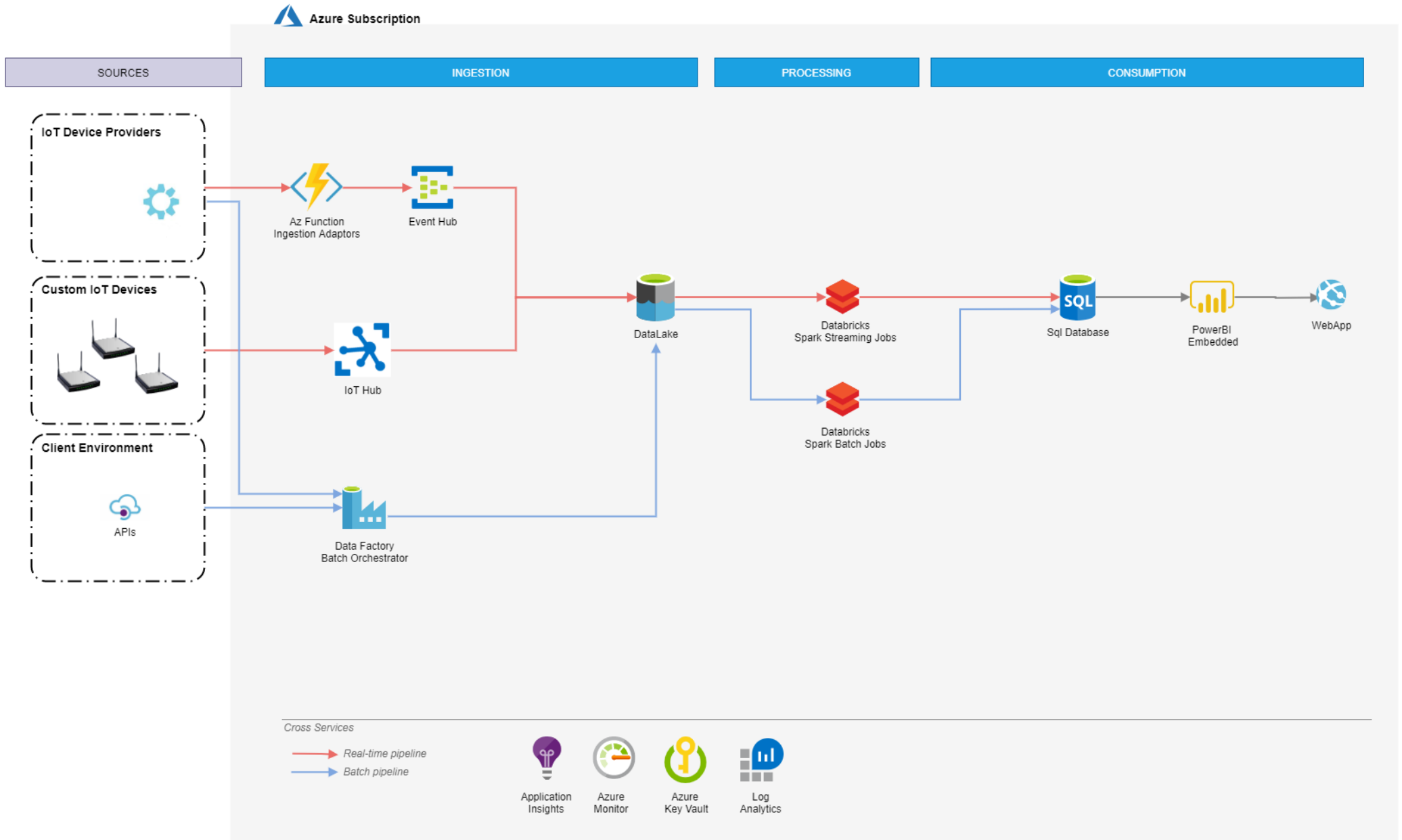

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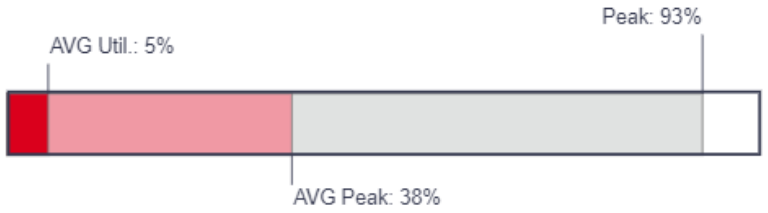
General

Sensors

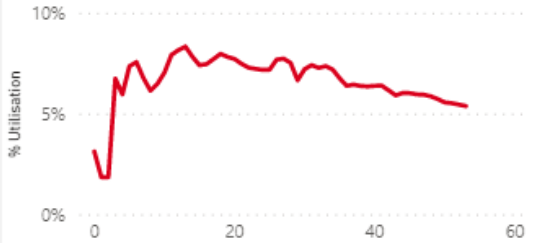
164

Utilisation

Peak Ocurrence:
13.45K/246042 observations



YTD. Utilisation



Occupancy

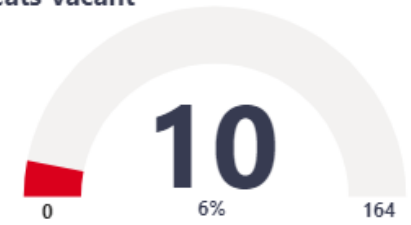
Out Of

154
of 164

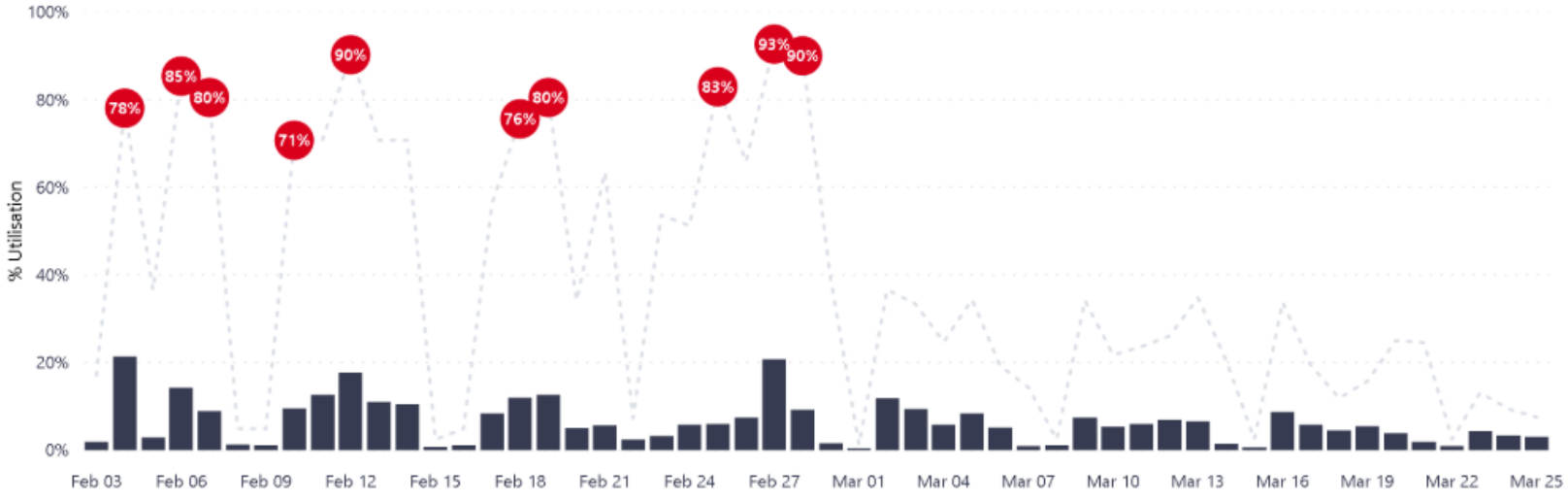
Stay Duration

42
Minutes

Seats Vacant



Utilisation By Period



Filter

Date

2/3/2020 — 3/25/2020

Intervals

5 | 15 | **30** | 60

Tags

TOP RANKED	LINKS
space type (4) ›	122
1. workstations	60
2. meeting	28
3. collaboration	25
4. work point	9
furniture type (3) ›	60
1. normal	49
2. sit to stand	6
3. fixed high	5
room name (6) ›	28
1. beta	9
2. level 6 meeting r...	9
3. alpha	4
4. focus pod 1	3
5. focus pod 2	2
capacity (3) ›	22
1. 10p	9
2. 9p	9
3. 4p	4
workstation (2) ›	6
1. basement	5

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Thank you for your time

www.plainconcepts.com

For further information

info@plainconcepts.com