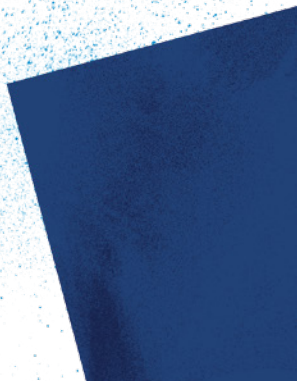
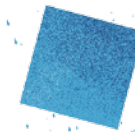
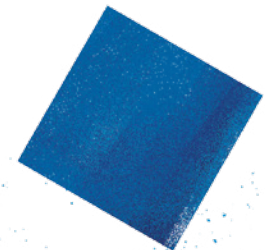
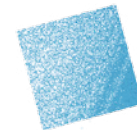


Pharmaceutical Industry Polpharma S.A.

Case study



Problem

Generic drug production is expensive and time consuming, and requires a lot of specialised equipment. Manufacturers must create, maintain and monitor a suitable production environment, and measure and report experiment results, periodically comparing them to a reference object. The challenge is not only one of managing biological complexity, but also of data handling and management. A manufacturer must gain and retain appropriate accreditations, and ensure the quality of the products they sell into an increasingly global marketplace.

Polpharma wanted to explore whether a software based solution could help ensure the integrity and consistency of the data generated in their Research and Technical Development Department during the production of generic drugs.

The solution must allow Polpharma to maintain high quality in production, while achieving an appropriate level of data management and data traceability for auditing and accreditation purposes. To satisfy Polpharma's high-level requirements, the solution must:

- Scale to meet the needs of the entire Research & Technical Development Department;
- Be intuitive and easy to use;
- Prevent data becoming corrupted, ensuring its integrity and coherence;
- Provide context to data entry, allowing the project and experiment IDs to be associated with experiment data as it is uploaded;
- Enable automation of data acquisition and further improvement of processes via the use of Machine Learning algorithms;
- Enable power users to gain insights over historical data by means of "data sets", which can be readily queried.



Polpharma

Polpharma is the largest Polish manufacturer of pharmaceuticals and a leader in the Polish pharmaceutical market, employing more than 7,000 people.

Polpharma actively operates in the markets of Central and Eastern Europe, the Caucasus and Central Asia. With 7 manufacturing plants and 7 R&D centres in Poland, Russia and Kazakhstan, Polpharma is among the top 20 generic drug manufacturers in the world.

Polpharma Group's portfolio includes approximately 600 products, with a further 200 in development.

Polpharma is rated by the Institute of Economic Sciences of the Polish Academy of Sciences (PAN) as one of the most innovative companies in Poland.

Solution

Our team was engaged by Polpharma to work on an Internet of Things (IoT) scenario, which involved using the Microsoft Azure IoT stack to monitor the temperature of laboratory refrigerators. We then collaborated closely with Polpharma and Microsoft, to enhance the existing solution. These enhancements show not only assets and their monitored values, but also the location of each asset on a floor plan. This allows users to identify assets more rapidly, and to observe correlations of asset location with temperature changes over time.

After a short analysis at Polpharma laboratories, we built a proof of concept (PoC) solution, which enabled us to confirm that the proposed architecture was fit for purpose. Additionally, the PoC phase was designed to yield an order of magnitude estimate for the associated time and cost of implementing the full solution.

The team

Objectivity formed a team consisting of 2 .NET/Azure Developers, a UI Developer, a UX Specialist, a Business Analyst, and a Project Manager. The team delivered the scope of the PoC in 11 weeks, consuming 74 person-days, including analysis and preparation of technical solution.

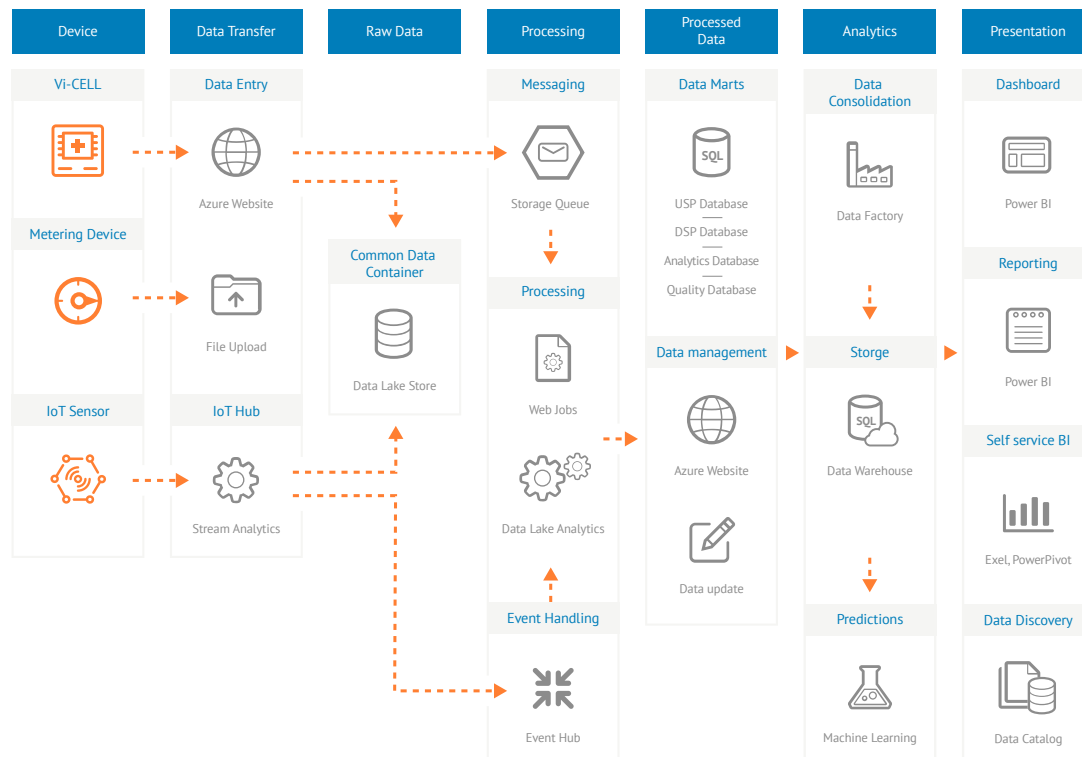
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Microsoft offers an Azure environment capable of addressing the customer's current issues and allowing for further growth, including Machine Learning capability. We turned to our partner – Objectivity, a leader in solutions incorporating Big Data and IoT – to discuss architectural concepts and potential solutions.

Agnieszka Zimnoch

Cloud Data Solutions Architect
at Microsoft

Finally, Technical Architects from Objectivity proposed an architecture that accommodates future extensions and meets all of Polpharma’s requirements. To save costs, the concept contains only those components that are needed at each specific stage of the project.



“
The architecture is flexible and is prepared for extension to large amounts of data (Big Data) as well as for the concept of the Internet of Things (IoT). It allows for successive addition of new data sources (both in the manual upload model and automatically if the device has such technical capabilities).”

Krystian Biń
IT Business Partner at Polpharma

The solution's architecture breaks the data flow into the following layers

- Device (device specific formats and protocols)
- Data transfer (manual or automatic data input, contextualisation, data integrity)
- Raw Data (original data files from devices)
- Processing (reading, cleansing and enriching data)
- Processed Data (data stored in data marts, correlations and insights)
- Analytics (data de-normalisation and modelling for reporting, and advanced analytics with machine learning)
- Presentation (reports, dashboards and self-service analytics end-points)

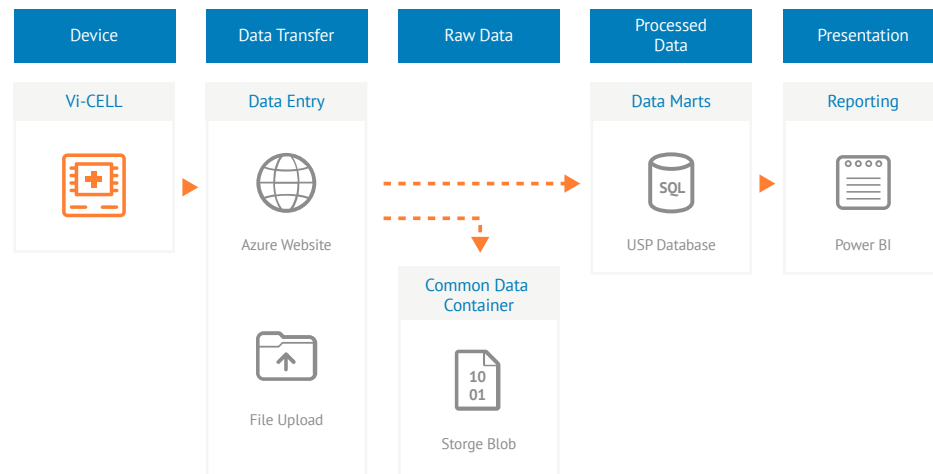
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After processing, the data is stored in a secure managed cloud database that enables performance to be scaled on the fly without application downtime. To leverage self-service analytics and provide stunning interactive reports we have implemented a dashboard in Power BI. This offers the potential to gain insights from an experiment's results quickly and in a controlled manner.

Krzysztof Stanaszek

Senior Software Developer at Objectivity

To ensure cost effectiveness at the proof of concept stage, we agreed to implement only a subset of the final architecture. This was achieved by implementing the processing layer within web application logic, instead of using asynchronous Azure components as had originally been planned.



We created and configured an environment in Microsoft Azure that allowed us to construct our proof of concept architecture. The next step was to build the web application, which is used to upload measurement results to a cloud based data store (Azure Blob storage). The application also ensures that uploaded data is always tagged with appropriate meta data, including user name, equipment used, date and time, project, work order, and experiment details.

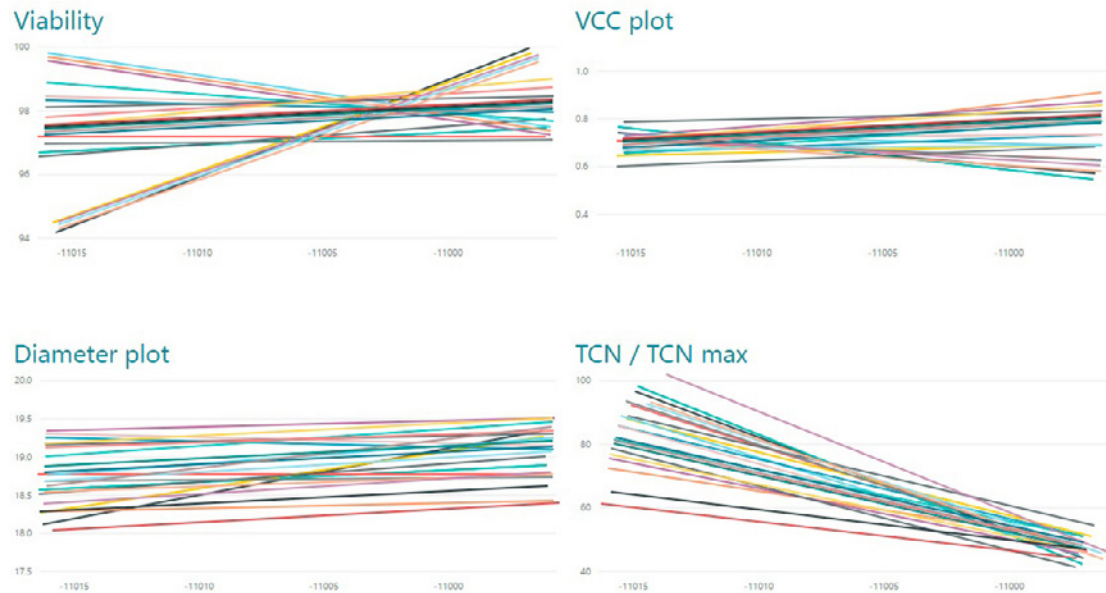
The technical solution delivered by Objectivity fully meets Polpharma's needs and enables:

- Data coherence, integrity of readings and association with contextual data;
- Increased quality through reduction of possible human errors;
- Process automation (data acquisition, processing and presentation);
- Business process optimisation (daily monitoring);
- Auditing and traceability of projects, experiments and samples;
- Further correlation of various data sets, wider analysis and drawing conclusions.

We understand that our clients need the solutions we provide to be easy and cost effective to support and maintain, so our developers created a Continuous Integration pipeline. This enables us to provision an environment in Microsoft Azure, and fully deploy a ready to use application within 15 minutes – all via a single mouse click.

Vi-Cell reports for following vessels

● CS1.1 ● CS1.10 ● CS1.11 ● CS1.12 ● CS1.2 ● CS1.3 ● CS1.4 ● CS1.5 ● CS1.6 ● CS1.7 ● CS1.8 ● CS1.9 ● CS2.1 ● CS2.10 ● CS2.11 ● CS2.2 ● CS2.3 ● CS2.4 ● CS2.5 ● CS2.6 ● CS2.7 ● CS2.8 ● CS2.9



“ I was impressed how fast Objectivity was able to understand the business processes and terminology and propose a technical solution to meet all the requirements. The PoC phase was really helpful, not only to understand how the solution will support our further growth, but also to verify our readiness for digital transformation.

Piotr Zień
 Research and Technical Development
 Director at Polpharma Biologics

Certificates



Microsoft
Partner

Gold Data Platform
Gold Datacenter
Gold Data Analytics
Gold Application Development



Awards



Objectivity

We are a value driven organisation enabling our clients to maximise their impact and results. We assist them in embracing new technologies and digital approaches. We hire experts to deliver only excellent solutions and have convenient location in the centre of Europe – a short flight from every part of Europe. Our aim is to establish long-term relationships based on trust and become the supplier of choice.

Contact us

If you would like to speak to us about your bespoke software needs and how we can help, then please contact.

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