infopulse

In Partnership with EarthDaily agro

Infopulse & EarthDaily Agro Help an Agri Giant Embrace Precision Farming_

Azure Data Platform Helps a Global Agribusiness Process Satellite Imagery & Make Data-driven Decisions

Industry: **Agriculture** **Location:** **Ukraine** **Employees:** **30,000+**

Client Background

Our client is a large international agro-industrial group with more than 30 enterprises across Europe. The company takes a leading position in the market, supplying its products to more than 80 countries worldwide.

Executive Summary_

Goals

The client aimed to align and effectively manage large volumes of agricultural data and bring its crop field planning and operations to a new level by embracing precision farming.

Solution

Infopulse designed and engineered a modern data platform based on Microsoft Azure, which serves as a focal point for data storage and management, as well as delivers insightful analytics based on the Earth observation data supplied by our partner EarthDaily Agro.

Benefits

The solution paved the way for data-driven decisions and high-precision farming practices, which helped the agricultural giant optimize time, costs, and resources while improving harvest quality and risk management.

Services delivered

Custom Software Development, Advanced Analytics, BI and Data Analytics, Microsoft Azure, Microsoft Power BI, Integrated Satellite Imagery

Business Challenge_

Our client is a progressive agro-industrial company that continuously seeks new opportunities to transform its business with cutting-edge technologies. Aiming to enable data-driven decisions, ensure efficient use of resources, as well as foster more sustainable farming practices, the company decided to **adopt the precision agriculture approach.**

To achieve its strategic objective, the client had to find a way to tackle a range of challenges, such as:

- **Consolidate both raw and processed data** from numerous internal and third-party systems
- **Facilitate the management of agricultural data** regarding thousands of crop fields across Ukraine and Europe
- **Improve crop maintenance** by accessing and analyzing the normalized difference vegetation index (NDVI) data
- **Establish continuous monitoring of weather data** to effectively plan field operations

During the initial stage of the project, the client requested **maps of vegetation heterogeneity** across its crop fields, which could be done by processing high-resolution satellite images of the farmland.

To meet the client's needs, Infopulse formed **a strategic alliance with EarthDaily Agro** – a leading Earth observation data processing company that delivers geo-analytics services across agriculture, BFSI, commodity trading, and other sectors. The company also operates a proprietary data analytics platform **"Geosys"**, which provides access to continuously updated satellite imagery and weather information on agricultural areas across the globe, along with advanced data aggregation, processing, and visualization capabilities.

Solution & Business Value_

In collaboration with our partner EarthDaily Agro, Infopulse developed **a modern Azure-based data platform** that serves as a cornerstone for the storage, management, and analytics of agricultural data. The solution helped our client **enable smart data-driven decisions** and embrace the **precision agriculture approach**. As a result, the agricultural giant received the following benefits:

- **A single source of truth**, which stores, aggregates, imports, and extracts large volumes of agricultural data across diverse systems in near-real time
- **Significantly reduced production costs** due to well-timed fertilization and crop protection activities, as well as proper sowing dates and crop density planning in different farmland zones
- **Streamlined crop field management and planning** enabled by the analysis of NDVI values across the farmlands, as well as custom features that monitor changes in vegetation (field productivity zones, indication of vegetation hot spots, data benchmarking, etc.)
- **Enhanced business productivity** due to advanced BI capabilities and precision agriculture reports that bring in-depth insight into the planned/done crop operations
- **Optimized time and costs** through continuous, **fully automated weather data analytics** across thousands of crop fields. Previously, the weather data analysis required 3+ days of manual work. Now the client receives updated weather insights **4 times per day** (which can be **scaled to near real-time** weather data analytics), as well as **predictive analytics for the next 6 hours**
- **Improved risk management** due to weather records for the past 30 years supplied by EarthDaily Agro, which allows analyzing weather dynamics and mitigating potential climate change impacts

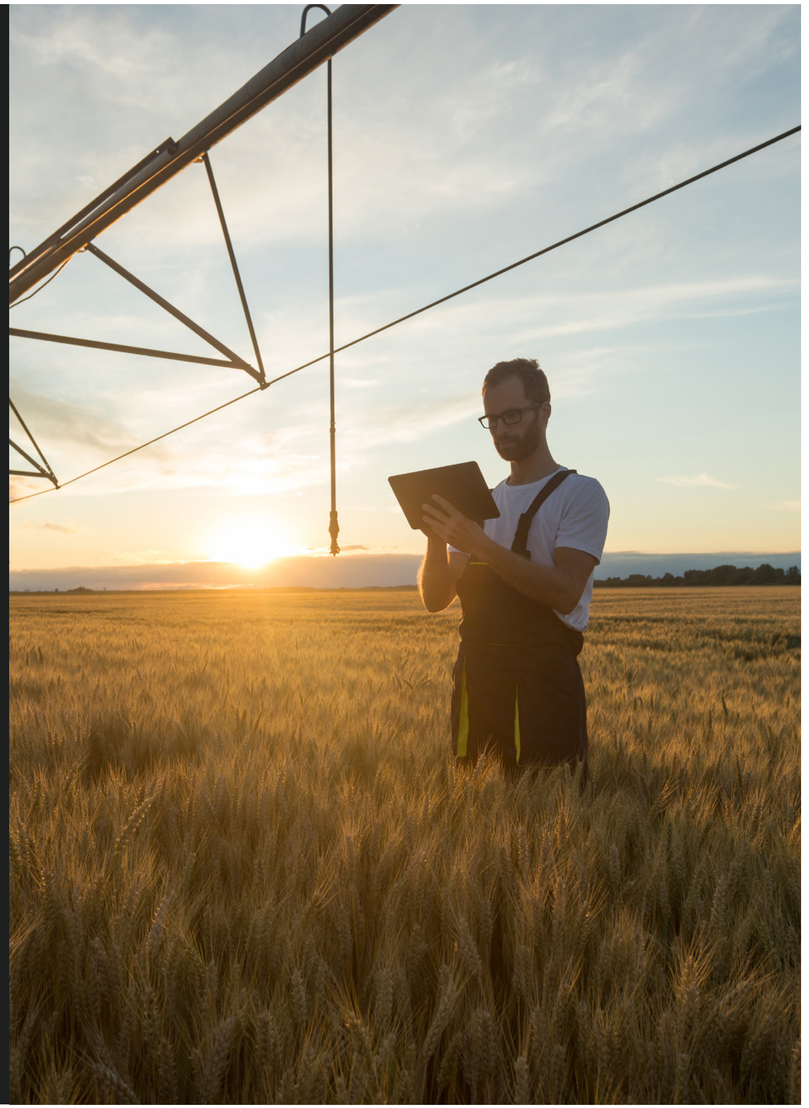
Technical Details

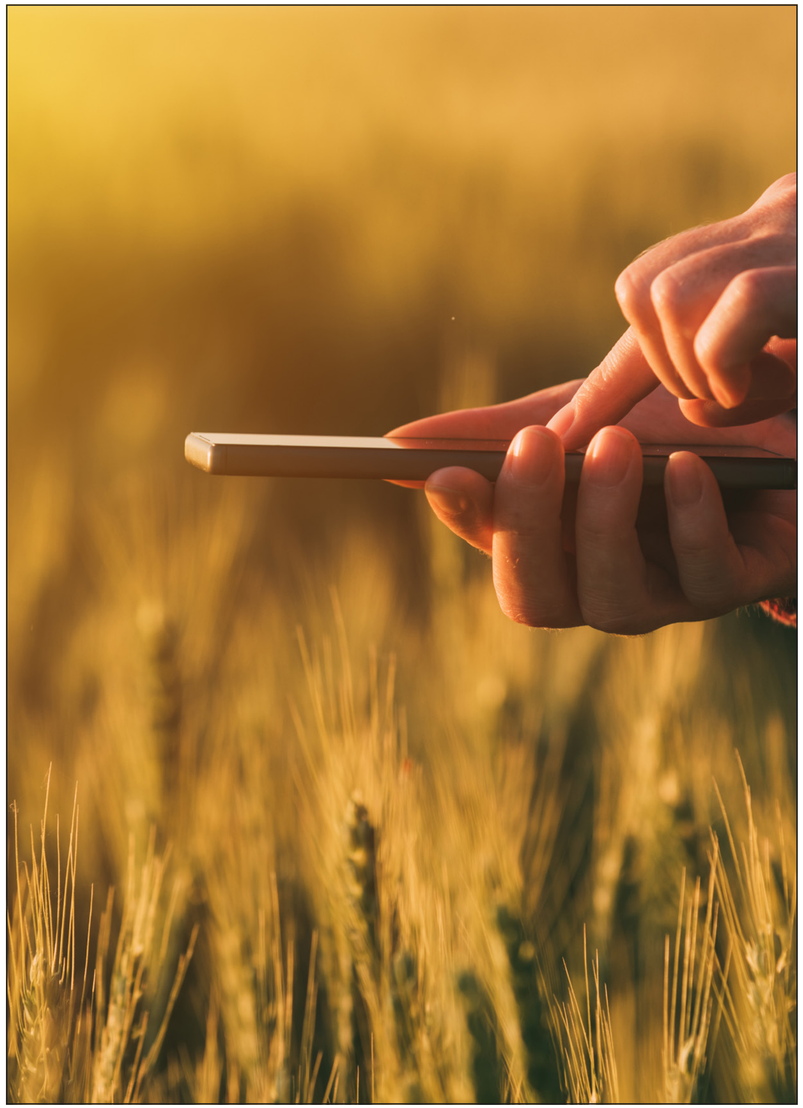
After eliciting the key technical and business requirements, and assessing the client's IT environment, source systems, and data models, Infopulse proceeded with the end-to-end engineering of a **modern data platform based on Microsoft Azure.**

Our experts used **APIs to connect the data platform with** the **Geosys** data analytics platform, which **gathered and transferred agricultural data** related to the crop fields, yield mapping, and the weather conditions, as well as precision agriculture metrics to the solution. In addition to the data supplied by Geosys, the solution **aggregates data from the client's agrochemical laboratories**, as well as ERP and third-party systems (including field boundaries, topographic data, VRA prescription maps, and other types of data), and transfers it to the client's agro-specific system.

In turn, the system processes the delivered data and forms **a 360-degree view of each field**, which indicates the soil quality and NDVI values across the farmlands. Subsequently, the processed and visualized data is extracted and stored back at the platform for further analytics. Both data import and extraction flows are fully automated via custom triggers and occur in near-real time.

The solution has **a multifaceted structure based on the Azure Data Lake framework**, which allows storing both raw and processed data and using it to access precision agriculture insights. One of the platform's major BI capabilities involves conducting a yield mapping analysis and generating a report that reflects the planned/done agricultural activities, along with a range of additional precision agriculture metrics. The client's agronomists regularly use this report to detect deviations and provide plan VS fact productivity analysis.





Another fundamental requirement from the client was to enable an **in-depth analysis of the weather data**. During the project, EarthDaily Agro provided a full spectrum of weather-related insights based on the Geosys platform, such as precipitation, temperature, soil moisture, snow depth, and solar activity across the client's farmlands for the **last 30 years**. The historical data helped the agricultural giant analyze the weather patterns and climate change impact on a regional/local level. Furthermore, our partner EarthDaily Agro had the capacity to support the client's growing needs and provide hourly updated weather data for each crop field upon request.

Infopulse ensured that the developed Azure-based platform enables **continuous gathering, storage, and analysis of the supplied weather data**, including past and present records, as well as predictive weather insights. The solution also generates detailed weather reports, which indicate precise weather dynamics and deviations, thus helping the client's agronomists timely plan operations for each field.

Lastly, during the project development, Infopulse and EarthDaily Agro came up with a range **of ideas on how to enhance the data platform** with new capabilities, which would help our client drive precision agriculture. As a result, Infopulse implemented the following features:

- **Continuous provisioning of full-scale NDVI maps** for each field to analyze the variability of crops during the entire growing season
- **Comprehensive relief maps** that provide additional insights into the vegetation development across the farmlands
- **Vegetation data benchmarking** – custom-built algorithms that perform daily crop monitoring and detect vegetation deviations
- **Hot spots across the crop fields** that indicate areas with the highest changes in vegetation
- **Productivity zones** outlined at each field to reveal the optimal locations for collecting and analyzing soil samples

Technologies & Tools_

Azure Data Lake

Azure Synapse Analytics

Microsoft Power BI

Apache Spark

Geosys data analytics platform

Thanks to the utmost professionalism, in-depth IT expertise, and effective communication of the Infopulse team we managed to carry out this ambitious project for one of Ukraine's leading agricultural enterprises. EarthDaily Agro sees Infopulse as a reliable and inventive IT partner, and we are looking forward to future collaboration on new daring digital transformation projects that may reinvent the agriculture industry.

Yuriy Pekun

Project Manager Lead,
EarthDaily Agro

About Infopulse

With 30+ years of IT experience, Infopulse provides a full range of Business Intelligence & Data Analytics services to empower the agricultural sector with data-driven strategy and decisions. We deliver end-to-end engineering of industry-specific Data Platforms, Data Warehouses (DWHs), Advanced Data Analytics, and Big Data solutions, as well as custom development of agri-specific software, such as grain balance, land management, and silage control applications, ML-powered sales forecasting, and more. Our expertise is supported by long-term partnerships with Microsoft and AWS and is recognized through Azure Expert MSP Status.

Infopulse is trusted by many established brands, such as Corteva Agriscience, Delta Wilmar, RAGT Semences, MHP, Kernel Holding, Credit Agricole, and others.

For more information, please visit **www.infopulse.com**

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