infopulse

METINVEST

Data Center Migration to Microsoft Azure for Metinvest Group_

Digital transformation of an international steel and mining group

Industry: **Mining & Metals** **Location:** **Ukraine** **Employees:** **80 000**

Client Background

An international, vertically integrated mining and metals company, Metinvest Group is among the world's Top-50 steel and Top-10 mining companies. The Group comprises mining and metallurgical assets in Ukraine, Bulgaria, Italy, the UK, and the US, complemented by a global sales network and employs more than 80.000 employees globally. Metinvest manages the full production chain, from extracting iron ore and coal to manufacturing semi-finished and finished steel products. With assets close to key railway lines and ports, Metinvest supplies raw materials and steel products to more than 100 countries.

Website: metinvestholding.com

Business Challenge

Metinvest Group operated two on-premises Data Centers, located in Kyiv, Ukraine, which provided centralized IT services for the Metinvest Group except for SAP and Office 365 services and solutions. Additionally, the company utilizes Azure cloud platform as a basis for the IT infrastructure and services of the Metinvest's assets in Europe and Northern America, namely for data backup, AI & Machine Learning projects, cybersecurity solutions, etc.

Implementation of the widest range of cutting-edge Industry 4.0 technologies for 30+ enterprises of the Group required extra capacities, namely for strategic innovations such as industrial IoT, Big Data processing, Manufacturing execution systems (MES), AI & Machine Learning, drones & UAVs, computer vision, etc.

By the end of 2018, Metinvest faced the need to scale up and expand the capacities of existing Data Centers, as, in 2020, 3 out of 4 storage systems of the Data Centers would reach End-of-Life & End-of-Support.

Metinvest Digital, as a core IT business partner of Metinvest Group, had to determine the strategy for IT infrastructure development of the Group.

To be able to implement and support innovations for Metinvest Group's business in line with their IT strategy for the next ten years, Metinvest Digital had to select between two different ways of IT infrastructure development and scaling:

- Continue maintaining on-premises Data Centers and acquire additional server and data storage equipment.
- Migrate to a cloud platform such as Microsoft Azure, already partially used across the Group.

To select the best option, Metinvest Digital conducted Business Value Assessment (BVA) and Total Cost of Ownership (TCO) analysis, modeling a 10-year comparative perspective for both possible directions of IT infrastructure development.

A detailed study of the technical and economic indicators showed that migration to Microsoft Azure would be the most effective option. In addition to more than $3mln TCO savings, switching to the cloud would enable new Big Data computing and management capabilities, which would be impossible to achieve with the on-premises infrastructure.

Project aims

According to the 2030 Development Strategy of Metinvest Group, new IT infrastructure had to comply with the principles of scalability, rapid changes, transparency and manageability, adequate cost of ownership, business continuity, and cybersecurity.

- Migrate the existing on-premises infrastructure of the Group (servers, virtual machines, services) to Microsoft Azure cloud utilizing the 'Lift & Shift' approach.
- Increase the utilization of Microsoft Azure cloud services across the Group.
- Reduce the TCO of IT infrastructure by lowering CAPEX and OPEX expenditures on IT infrastructure support in a long-term perspective.
- Ensure smooth migration of all servers and services of the company without halting production or business processes.

Solution

The migration of data centers to Microsoft Azure and the transition to IaaS were big steps for Metinvest Group. This transformation would affect all aspects of the Group's business, bringing it numerous benefits — from TCO gains to improved productivity. At the same time, the cloud transformation of such a scale required a detailed plan and accurate implementation of the transformation strategy.

Taking into account project complexity and timeframes, Metinvest Digital approached Infopulse, an international IT service provider, and a long-term Microsoft partner. Infopulse was recommended by Microsoft to become a cloud migration partner for this project and was selected by Metinvest Digital via a tender process as one of the most experienced providers of Microsoft services in Ukraine.

Experienced engineers of the Microsoft FastTrack Team were also involved, providing extensive support and consulting during cloud infrastructure deployment.

Microsoft Cloud Adoption Framework for Azure was utilized as a primary knowledge source for this cloud migration project. It allowed to quickly find relevant answers to the most common questions, which could have arisen in the course of the migration. This approach helped to split the global project into several stages and substages, simplify the requirements analysis, and get a detailed view of the solution architecture.

The cloud migration project comprised several stages carried out according to a detailed plan:

1. BVA / TCO (Total Cost of Ownership) analysis

Metinvest Digital designed a 10-year comparative perspective of the two core options of future IT infrastructure development and estimated TCO for keeping IT infrastructure on-premises VS conducting cloud migration, which confirmed the necessity to make a move to the cloud.

2. Project initialization and planning

Upon analyzing cybersecurity requirements, including network security, Metinvest Digital selected Infopulse as a partner for the Migration Project. Together, both companies formed a project team, developed a project timeline, and identified roles and responsibilities.

3. IaaS & PaaS architecture design & development

Metinvest Digital, Infopulse, and Microsoft Fast Track team conducted a series of architectural sessions, resulting in a detailed strategy of data center migration. The teams designed and agreed on Cloud Architecture (IaaS and PaaS), technical solution stack and specifications, scheduled migration plan, and designed a testing approach.

4. Stabilization of the solutions within the IaaS infrastructure

One of the crucial stages of the project was the stabilization of the IaaS solution based on the Proof of Concept (PoC) approach. During this stage, the project team configured Microsoft Azure infrastructure, including Identity Management, Availability, and Disaster Recovery, Backup and Monitoring Systems, Migration mechanisms, and created custom scripts to automate the Migration. After configuring all required settings, the project team conducted a test migration of 20 servers and tested them according to the previously designed quality assurance approach. Test migration allowed to further improve the mechanisms of the full-scale migration, discover and fix all shortcomings, and update the project documentation with new findings.

5. Migration process (split into several stages)

Due to a large number of servers to be migrated to Azure, the Project Team decided to split the entire migration process into five stages. Each stage included the Migration of 160 servers, post-migration testing, ASR setup, backup, and monitoring. At the same time, one stage of Migration lasted 20-22 working days.

6. Post Migration Testing of migrated services

Project Team conducted post-migration testing of services (functional and performance testing) to confirm that the solutions deployed in Microsoft Azure operated correctly and met the functional requirements according to designed Architecture. Thus, testing helped to check the quality of VMs migration to the cloud infrastructure and fix all remaining shortcomings.

Key Stages of Metinvest Group Cloud Transformation Project

STAGE 1 – PROJECT INITIATION
- Project initiation
- Project committee
- Project charter
- Start of architectural sessions
- Infrastructure audit

STAGE 02 – DEVELOPMENT OF IAAS SOLUTION
- Architectural sessions
- Migration planning
- Development of the testing methodology

PROJECT FINALIZATION

JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR

2019 2020

STAGE 00 – PREPARATIONS
- Initiation of the project
- Business case costs estimation
- Agreement of the project with the investment committee

STAGE 03 – DEVELOPMENT OF PAAS SOLUTION
- Architectural sessions
- Architecture development
- Updates to documentation

STAGE 04 – DEVELOPMENT OF PAAS SOLUTION
- Azure interface configuration
- Backup configuration
- Set up Monitoring
- Test migration (20 servers)
- Updates to the migration plan

STAGE 05-09 – MIGRATION
- Migration in batches
- Testing
- ASR configuration
- Backup
- Monitoring

Technologies

- Azure Windows Virtual Desktop
- Azure Cost Management & Advisor
- Azure Resource Manager
- Azure Key Vault
- Azure Availability Zone
- Azure Monitor
- MS System Center Operation Manager
- Azure NSG
- Azure ASG
- Azure Backup
- Azure SQL Database
- Azure Active Directory
- SQL Server Availability Cluster
- Azure Security Center
- Azure Site Recovery
- Azure Firewall
- Azure Application Gateway
- Azure VPN Gateway
- Azure Express Route

Technologies

Windows Virtual Desktop

Switching from Terminal Services to Windows Virtual Desktop.

Azure Cost Management

A cost management tool to track and control the overall cost of Azure services and optimize their use.

Azure Resource Manager

A tool to configure infrastructure, deploy Azure solutions, manage applications, resources, and more.

Azure Key Vault

Protects cryptographic keys and sensitive data in the cloud. Provides fast and secure key management.

Azure Availability Zone

This technology ensures a high level of infrastructure resiliency in cloud architecture. Thus, for SQL clusters we utilize the SQL Always On technology, while nodes are placed in separate Availability Zones. For NLB clusters, each cluster node is housed in its own Availability Zones. For OpenText and MII systems (DEV and QAS environments), an Availability Set with a minimum of two fault domains and two virtual machines is used.

Azure Monitor | Microsoft System Center Operation Manager

These tools are used to monitor infrastructure in Azure. Currently, the monitoring systems, which are installed on servers, send monitoring data to both systems simultaneously. In the future, when the functional capabilities of Azure Monitor can fully meet the technical requirements, it will become the primary monitoring system.

Azure NSG & ASG

Azure NSG helps create rules f or filtering network traffic between Azure resources on Azure virtual network. At the same time, Azure ASG enables detailed control over systems and applications, providing dedicated protection for each application depending on the settings of the relevant security policies.

Azure Backup

A core solution to back up data and protect data of local servers, virtual machines, all databases, SQL servers, SharePoint servers, files in Azure File Share services, etc. In case of an unexpected failure, Azure Backup provides full online access to all information stored on the damaged hardware.

Technologies

Azure SQL Database

This platform ensures 99.99% availability of databases. Azure automatically handles critical maintenance tasks such as fixes, backups, Windows and SQL updates, as well as unscheduled events such as hardware, software, or network failures.

Azure Active Directory

Azure AD is used to identify and control access in Azure.
Both a cloud directory and a credential management service, it combines basic directory services, application access control, and credentials protection.

SQL Server Always On Cluster

Ensures High Availability of SQL Server and Disaster Recovery, which helps to increase the availability of databases and protect them from any system failures.

Azure Security Center

Utilized to process trillions of signals from a variety of services and systems. Detects threats and helps to provide comprehensive protection, as well as improves the security management and protection against threats in the cloud.

Azure Site Recovery

A disaster recovery tool (DRaaS) utilized to ensure business continuity even during major IT infrastructure failures.

Azure Firewall

An intelligent and scalable traffic filtering technology, it helps to ensure the full security of Azure virtual environment resources.

Azure Application Gateway

A tool to balance and load web traffic, which allows managing traffic to web applications depending on the needs and settings of each application separately.

Azure VPN Gateway/ Express Route

Thanks to Azure VPN Gateway, encrypted traffic between Azure virtual network and the on-premises infrastructure can be sent over the public internet.

Business Value

Migration to Microsoft Azure significantly improved reliability, security, and productivity of Metinvest systems, as well as reduced TCO of IT infrastructure

- Azure will serve as a digital cloud platform for the development and implementation of innovative IT services per digital transformation strategy of the Group.
- Reduced operational support costs. Metinvest is now more flexible in terms of building virtual servers, being able to scale, and add capacity to the running instances. Azure also helped to cut down the costs of upgrading obsolete equipment.
- Azure ensures Metinvest Data Security and Privacy in terms of risks related to data losses or corruption thanks to integrated replication/ backup/ clustering solutions and 99.95% availability of IT services with minimized unplanned downtimes.

2 / 680 / 240

2 Datacenters, 680 servers, 240 Tbs of data migrated

30+

enterprises of Metinvest Group affected

2,000

daily Windows Virtual Desktop active users

12 months

total duration of the project

6 / 12

6 Infopulse, 12 Metinvest Digital technical experts were involved

$3+ Mln

estimated TCO savings over the next 10 years

One

of the largest cloud migration projects in Europe

24/7

Maximum mobility with anytime-anywhere 24/7 available services

Metinvest Digital Team:

Konstantin Koval — Project Supervisor

Dmytro Kyreyev — Project Manager | Chief Architect

Leonid Sapelnikov — Resource Owner

Eugene Zhurba — Project Administrator

Konstantin Fadin — Infrastructure Engineer (PaaS/SaaS/Office 356)

Dmytro Savchenko — Infrastructure Architect (Secondary)

Yevgeniya Malchenko — Infrastructure Engineer (DBA)

Pavlo Pastushenko — Infrastructure Architect (Primary)

Infopulse Team:

Ivan Musiienko — Head of Cloud Managed Services and Solutions

Pavlo Diachenko — Sales Manager

Oleksii Masharov — Delivery Manager

Vadym Popov — Expert IT Engineer/IT Architect

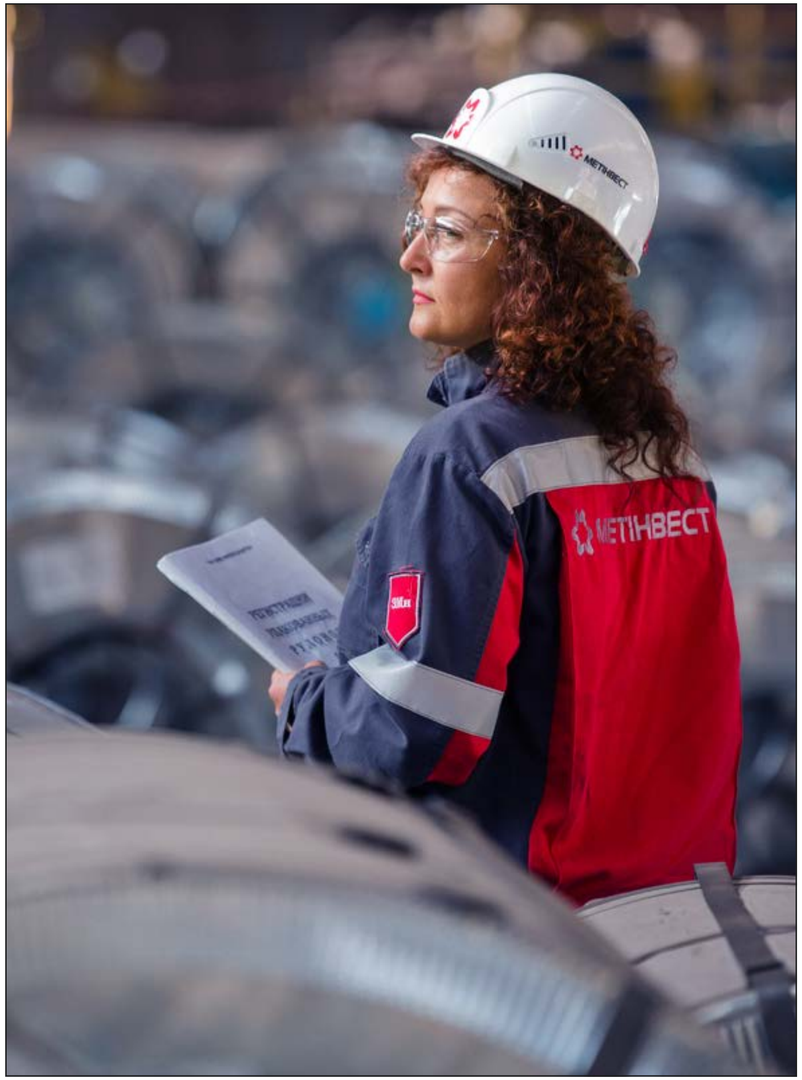
Oleksii Ivanov — Expert IT Engineer/IT Architect

Ievgen Muzyka — Expert IT Engineer/IT Architect

Serhiy Kozlov — Senior IT Engineer

Pavlo Tymoshenko — Senior IT Engineer

Volodymyr Vaskov — DevOps Engineer



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Infopulse stays at the forefront of solving the greater challenges of digital transformation. We are deeply inspired by projects and people who undertake such challenges for a turn for the better. When we were invited to take part in one of the largest cloud migration projects in Europe, we could not stand aside. Our experience, confidence in the expertise and strengths of the Infopulse team, as well as the ambitions of Metinvest Digital team goals and their high level of professionalism have been a real incentive for us to give our best to implement this, without exaggeration, grand project.
The synergy of the two teams allowed us to hold extremely productive architectural sessions within relatively short timeframes and develop the most optimal solution to meet the high business standards of Metinvest Group.

Oleksii Masharov

Delivery Manager, Managed Services and Solutions, Infopulse

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We are proud to see that Metinvest Group has made a remarkable digital transformation in Ukraine. By migrating to Azure, our customers get an ever-expanding set of cloud services, with the highest possible security from the ground up, backed by a team of experts and proactive compliance trusted by enterprises, governments and start-ups. Microsoft is committed to help Ukrainian companies to upgrade their business with the newest technologies. Thanks to partnership with Metinvest Digital and Infopulse, we are witnessing an amazing case of powerful digital transformation that will help Metinvest to develop further by implementing new innovative solutions in the mining industry.

Jan Peter De Jong

CEO of Microsoft Ukraine

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The times, when the primary aim of building a modern IT infrastructure was to ensure the reliability of IT services and systems, have long passed. The world and technologies evolve so quickly that capital investments in on-premises infrastructure become a burden for the business and do not provide any capabilities for rapid changes for them to comply with the requirements of the competitive market.

As for the coming years, we have extensive plans to further strengthen the digital maturity of Metinvest Group and implement Industry 4.0 solutions, which require much better flexibility and manageability. Add these factors to the economic effect that we will get from cloud migration within a 10-year perspective and the choice becomes obvious. Staying with the on-premises infrastructure would have significantly increased the cost of such IT projects implementation due to the abovementioned limitations.

Konstantin Koval

Director of IT Infrastructure Centre of Excellence at Metinvest Digital

About Infopulse

Infopulse, part of the leading Nordic digital services company Tietoevry, is an international vendor of services in the areas of Software R&D, Application Management, Cloud & IT Operations, and Cybersecurity to SMEs and Fortune 100 companies across the globe. Founded in 1991, the company has a team of over 2,300 professionals and is represented in 7 countries across Europe and the Americas.

Infopulse is trusted by many established brands, such as BICS, Bosch, British American Tobacco, Credit Agricole, Delta Wilmar, ING Bank, Microsoft, Offshore Norge, OLX Group, OTP Bank, SAP, UkrSibbank BNP Paribas Group, Vodafone, Zeppelin Group, and others.

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

Contact us

PL +48 (221) 032-442

DE +49 (69) 505-060-4719

US +1 (888) 339-75-56

UK +44 (8455) 280-080

UA +38 (044) 585-25-00

BG +359 (876) 92-30-90

BR +55 (21) 99298-3389

info@infopulse.com