

# Case Study BOOK.

asreco

VIRTUAL REALITY, OMNICHANNEL, BIG DATA, E-SIGNATURE,  
CLOUD, ERP, UNMANNED AERIAL VEHICLE, CYBERSECURITY,  
CRM, UNMANNED AERIAL VEHICLE, WMS, ERP, UNMANNED  
AERIAL VEHICLE, CYBERSECURITY, E-SIGNATURE, VIRTUAL  
REALITY, OMNICHANNEL, CRM, VIRTUAL REALITY, CLOUD,  
UNMANNED AERIAL VEHICLE, BIG DATA, ERP, E-SIGNATURE,  
CRM, ERP, WMS, VIRTUAL REALITY, ERP, BIG DATA, CLOUD,  
E-SIGNATURE, CLOUD, CYBERSECURITY, UNMANNED AERIAL  
VEHICLE, WMS DATA, E-SIGNATURE, VIRTUAL REALITY, CRM,  
CYBERSECURITY, VIRTUAL REALITY, OMNICHANNEL, BID DATA

# Dear Ladies and Gentlemen,

„Technology for business, solutions for people” – this motto fully reflects the approach to projects carried out by the Asseco Group. We develop innovative and advanced solutions which meet the needs of even the most demanding customers all over the world because we believe that in this way we can improve comfort of many people.

Asseco is everywhere where technology and business connect with everyday life. We are a federation of companies operating in over 50 countries and employing more than 24,000 people. Thanks to our presence on foreign markets, we gather comprehensive experience which constitutes the know-how of all of the Asseco Group's companies. We combine sector, business and technological knowledge in order to build solutions of the future. The synergy of these competencies is an added value for our customers who receive products of the highest quality.

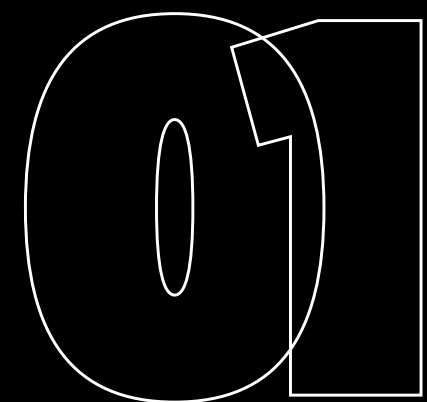
We are very proud of our history reaching over 27 years, but we are aware that in order to ensure good prospects for the whole Group, we need to be innovative in every area in which we operate. We are constantly investing in R&D, developing our products and looking for custom solutions because only in this way can we create innovations on an international scale.

It is the global activity of Asseco and cooperation with our clients which inspired us to create our own publication – Asseco Case Study Book. Here you will find interesting and innovative projects which we have carried out together with our customers in various parts of the world and solutions which have been changing the face of individual sectors of the economy.

We hope that this publication will show how diverse and fascinating the world of new technologies is, and will be an inspiration for the implementation of innovative projects.

**Asseco Team**

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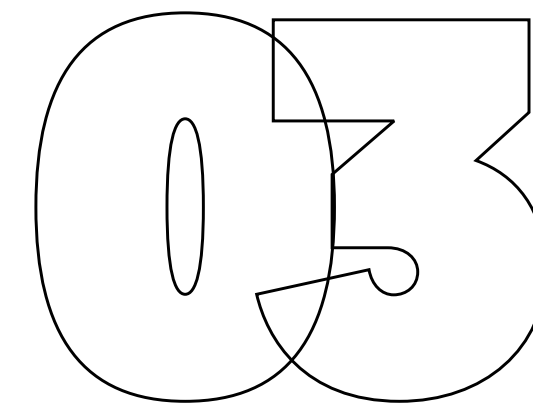
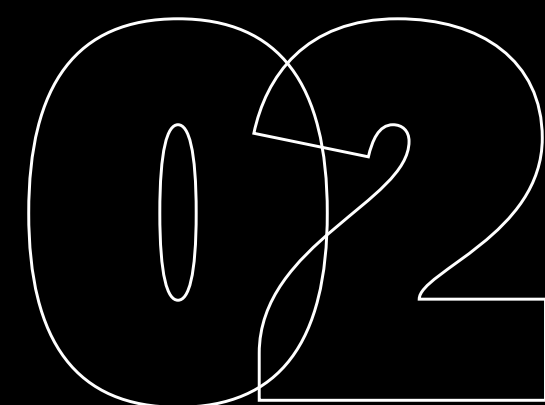


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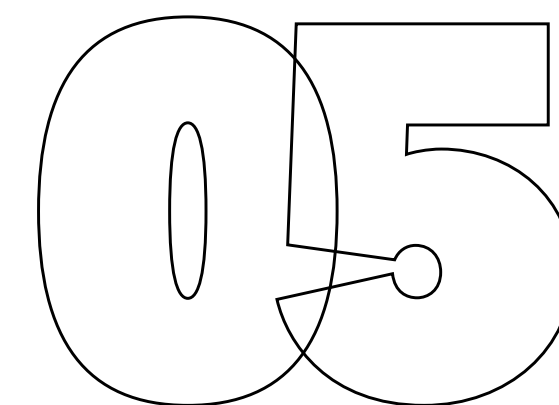
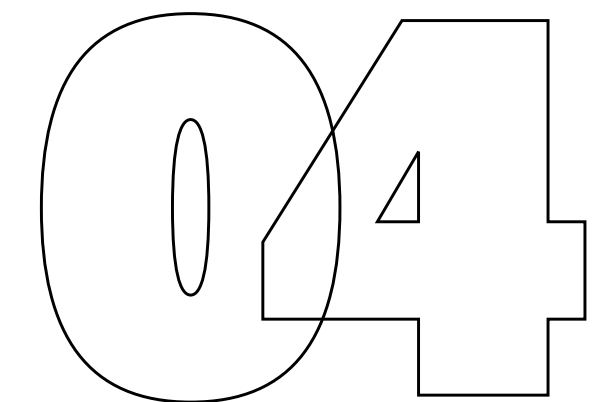


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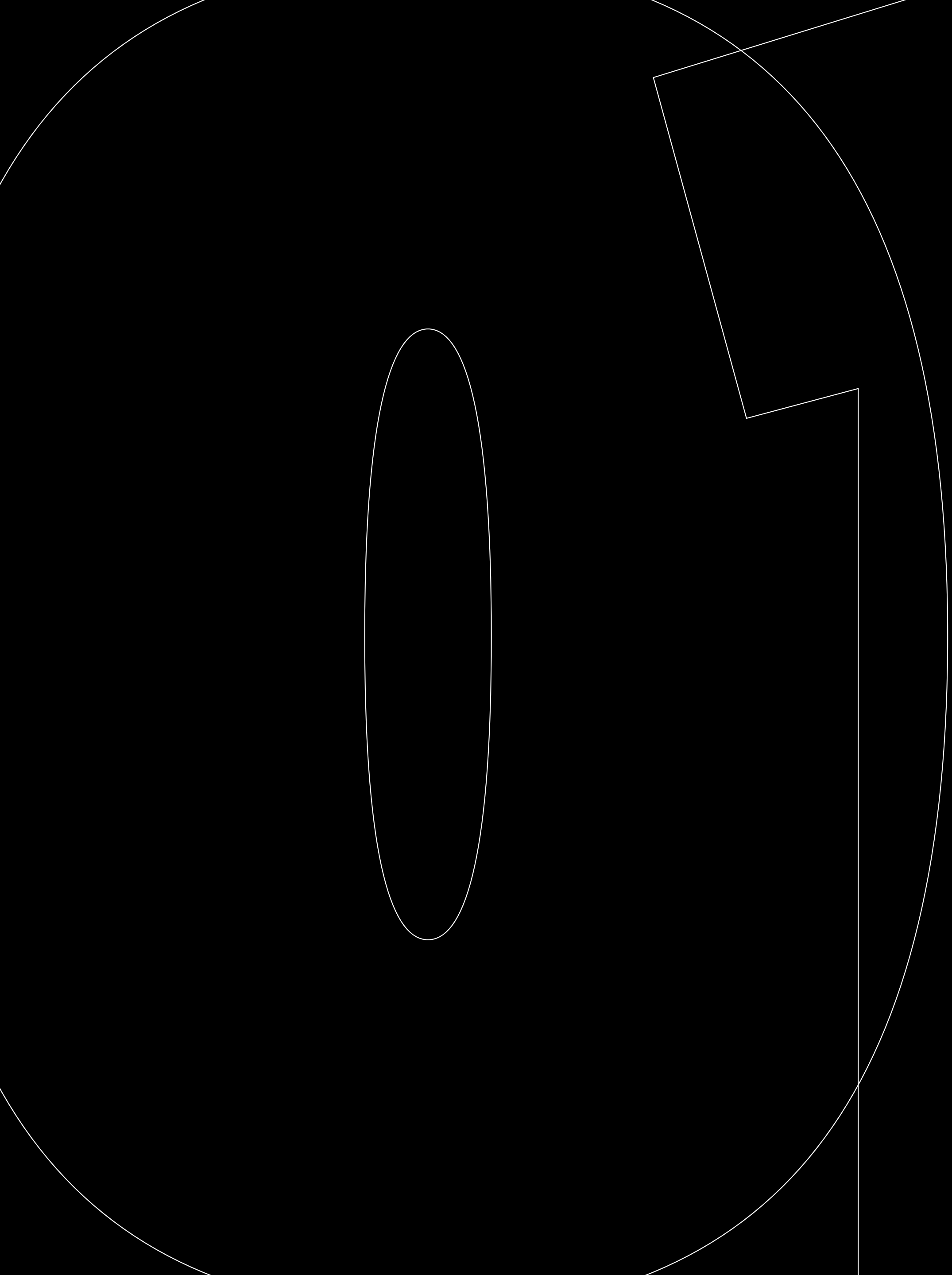
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Chapter one |

# INDUSTRY 4.0

# VOLKSWAGEN SLOVAKIA: SMART FACTORY OF THE FUTURE.

## Customer.

Volkswagen Slovakia is the largest car manufacturer in Slovakia. Its car factory in Bratislava is the only automotive facility in the world producing five different car brands within a single factory in sizes coming from the compact cars to luxury SUV's (Volkswagen Touareg, Audi Q7, Audi Q8, Porsche Cayenne, Volkswagen up!, Volkswagen e-up!, ŠKODA Citigo, SEAT Mii). Total production reached 361,776 cars in 2017.

The factory in Bratislava is one of the most innovative and advanced automotive factories of the Volkswagen Group in the field of auto-

mation of internal logistics. CEIT, a company from the Asseco Group, is a proud partner of the plant as the supplier of autonomous robotic systems (currently more than 300 CEIT autonomous tractors operating in the plant in Bratislava).

The unique CEIT logistics system consists of Automated Guided Vehicles (AGV) of various types, interchanges, dynamic and static conveyors and monitoring workplaces. It also includes a control system using elements of artificial intelligence which is capable of autonomous flexible decision-making and control of transport, based on

peripherals status, requirements from external devices and systems as well as the current situation in the plant.

The successful cooperation between Volkswagen Slovakia and CEIT meant that they did not want to stop with the logistics automation alone. Their shared intention was to move further, to improve the process by implementing smart solutions within Industry 4.0. Therefore, in 2017 the implementation of CEIT Digital Twin together with the Sewio Indoor Positioning System began.

## Implementation.

The main objective of the CEIT project was to digitize the entire fleet within one of the plant's halls and introduce precise location of intralogistics, including CEIT AGVs and forklift tracking. An important part of it was also to ensure full visibility and verifiability of the

whole process, as well as obtaining very detailed information on individual objects.

The challenges which accompanied the implementation of the project resulted to a large extent from the specificity of the produc-

tion hall. As much as 30% of the whole tracked area represented a completely variable warehouse that could turn from a completely empty area to being fully blocked within a timeframe of just a few hours. Given the number of moving objects, both manually and

automatically driven, the system had to be able to cope with high traffic density, its peaks and occurrences of multiple objects within close proximity of each other.

The implementation of the solution, which was completed within 6 months, provided Volkswagen Slovakia with a real-time overview of all movements within the hall. Owing to the implementation, the plant in Bratislava has gained an efficient tool enabling a precise analysis of each machine in the fleet in terms of operational time, down and idle time, distance travelled and efficiency. In turn, the

heat maps and spaghetti diagrams help visualize the flow and reveal the traffic density, actual path for each machine at a given time and where and at what time the biggest bottlenecks occur.

The delivered indoor positioning system covers the hall and its warehouse with a total area of 10,000 m<sup>2</sup> with hundreds of shelves, tracking 70 objects – both automatically navigated AGVs and manually driven forklifts. The system works with 50 cm accuracy and a refresh rate of 333 milliseconds.

### Thanks to the implementation of the project Volkswagen Slovakia has gained the following benefits:

- real-time visibility to verify current processes,
- the overall operation time of the fleet and its objects,
- the possibility to compare the ratios of run/stop time, distance travelled and loaded/unloaded trips to optimize fleet utilization,
- an immediate visual summary of the movement within a time period,
- information on traffic density and its bottlenecks to optimize fleet movement,
- the ability to select and reply path of any of the moving object at a selected time in the past to uncover driving into any restricted zones or get the context of the situation that preceded the incident to prevent it in the future,
- the simulation of proposed process updates in a real model and time frame,
- navigation of drivers so they know where to go and what is the closest path without obstacles.

CEIT is a technological company that develops and brings to its industrial partners innovations to help them change their plants to intelligent factories within Industry 4.0. CEIT's mission is to increase productivity, efficiency and growth in the competitiveness of industrial enterprises. In particular, it focuses on automation of internal logistics, optimisation of production and logistics processes, design and material engineering, the Digital Factory concept, and complex solutions for Smart Factories.

### Project in numbers:

**6**

months implementation of the system

**10%**

less distance travelled attributed to forklift navigation

**20%**

increase in the use of warehouse space

**20%**

increase in OEE of the fleet after implementation of the solution

**70**

machines operating in the system

**10,000 m<sup>2</sup>**

of warehouse space handled by the system

| Magic Software Enterprises Ltd.

## **ASSA ABLOY (SWITZERLAND) AG: KEY TO INDUSTRY 4.0.**

### Customer.

ASSA ABLOY (Switzerland) AG wanted to digitize the production for its KESO brand keys to move toward Industry 4.0 efficiency. ASSA ABLOY previously employed up to 20 separate drilling machines to make its keys. As the first step in digitizing production, the company replaced its existing equipment with two new digital drilling machines. To provide the new drilling machines with the necessary job data, data from the company's Infor ERP and its proprietary Lock Management System had to be merged, saved in a machine-readable form and communicated to the new drilling machines. Previously, data from both systems was merged on paper forms and entered manually by employees on the respective drilling machines using job boards. In order to complete the automation, the company developed a Production Information System based on MS Dynamics CRM. The Production Information System merges relevant data from the company's ERP – order data, BOMs, workpiece information – and permutation data from their Lock Management System into an XML job file that the drilling machine can read and run. The Magic xpi Integration Platform was chosen to be the central component of the overall solution connecting all three systems.

### Business processes.

Prior to the introduction of ASSA ABLOY's (Switzerland) new Production Information System and its new digital drilling machines, the manufacturing process for keys for its locking systems required twenty different machines. Necessary production information was transported on paper to the respective machines where it was read and inputted manually from job boards. Today, the company's new digital machines receive production information for jobs in the form of XML files from the company's new Production Information System. ASSA ABLOY developed their Production Information System in-house based on MS Dynamics CRM.

Relevant data from their ERP system and from their home-grown Lock Management System are fed into to the Production Information System. Information from the ERP system includes data regarding the specific order, BOMs and work piece information while the Lock Management System is queried for data from its database which stores all the designs that have been developed in the last 40 years. Bar codes on the containers enable the machines to recognize which order belongs to which blank container. Then the blanks for the end products are inserted in the drilling machines and processed automatically according to the data files. Magic xpi Integration Platform serves as the central data hub between the three systems: the ERP, the Lock Management System and the Production Information System. Magic xpi takes the data from the two upstream systems, integrates it in a job file and transfers it to the Production Information System in XML format. The Production Information System transfers the job file to the drilling machines that run it.

## Key benefits.

With Magic xpi as a central data hub, ASSA ABLOY [Switzerland] AG has a fully integrated Industry 4.0 landscape that connects three central IT systems for the automation of production orders. Today, ASSA ABLOY can process about 400 orders per day, an output of approximately 10,000 keys, using its two new digital drilling machines and automated processes. With Magic xpi at the heart of the company's new fully automated and continuous information logistics system, turna-

round time from the job placement to the delivery of the locking system has shortened dramatically. By being able to deliver customized products faster and more reliably, ASSA ABLOY enjoys a significant competitive advantage. Process optimization and the integration of new machines is much easier and faster in the company's new Magic xpi-based Industry 4.0 landscape. The company is now looking to duplicate its success with other product lines and processes.

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„Magic xpi has proved to be an ideal integration solution because its standard connector for MS Dynamics dramatically reduced development time, enabling us to complete the project quickly. It's code-free visual, drag and drop approach lets us see the all the objects and functions, and easily create the business processes we want” – said Erwin Fuchs, Business Development Manager at ASSA ABLOY [Switzerland] AG.

„For us, the Magic xpi integration solution stands in the center of our Industry 4.0 landscape, providing us with a sustainable competitive advantage that can be expanded in the future” – added Erwin Fuchs.



We build

**THE FUTURE**

# NGR: BUSINESS MODEL RECYCLING.

## Customer.

Next Generation Recyclingmaschinen GmbH (NGR) is an Austrian company headquartered in Feldkirchen, which has been producing highly specialized recycling machines since 1996. They are used for reprocessing plastic scrap materials, which are turned into pellets and can then be fed back into the production cycle.

The company's dynamic growth and willingness to provide high quality services led it to look for a solution enabling it to collect and

analyze the operating data of its machines to support its smart manufacturing initiatives. It was also essential for NGR to improve the efficiency of its service processes, especially as the company has over 1,000 machines in operation at customer sites in 80 countries.

The achievement of these goals was the reason why NGR decided to supplement its existing APplus system with a solution which will allow it to streamline its business processes to the Industry 4.0 level.

## Implementation.

In the autumn of 2015, the company's development department initiated an internal research project to identify ways to adapt NGR's machines to the needs of smart production. Smart Connected Solutions (SCS) – a proprietary system of Asseco Solutions - was considered to be the best to achieve this goal and its implementation began in April 2016.

The SCS system enables NGR's machines to transfer a wide variety of process and quality parameters to the cloud, such as pressure, temperature and the viscosity of the molten plastic. This is carried out with the help of a special software client which NGR installs in the control systems of its machines. It encrypts the data and transfers it securely to the cloud.

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The implementation of the system developed by Asseco Solutions allows NGR to conduct analyses based on data provided by 1,000 machines operating in 80 countries.

SCS continuously monitors and analyses the machine data once it has been sent to the cloud. If it detects certain values or correlations indicating an imminent machine malfunction or breakdown, the Asseco solution triggers a preventive maintenance process.

Once the service ticket has been sent, the solution automatically identifies a suitable technician based on various criteria such as their

qualifications. The solution then sends all information to the SCS app on the technician's mobile device. The SCS app supports the technician and saves times by handling manual tasks, such as documenting travel time, logging the duration of the visit and creating the service call report. Then, it sends this information to the ERP system, which immediately triggers any follow-up processes, like invoicing.

## Key Benefits.

The machines' internet connectivity enables an even higher degree of automation as well as the proactive planning and execution of maintenance processes. By triggering a preventive maintenance process, a worn component can be replaced before it causes a machine breakdown and a loss of productivity.

Using the machine data also enables the company to expand its portfolio with added-value information services. For example, NGR will be offering its customers a personalized app with which they

The solution is currently in the implementation phase. NGR is planning a simultaneous go-live for its headquarters in Feldkirchen and all its international facilities in the USA, Malaysia and China.

can view and monitor the parameters of their machines and re-use the information in their internal processes.

The implementation of the Asseco system also allows NGR to conduct analyses based on data transmitted by all of its machines in operation. That gives it the possibility to provide its customers with recommendations, such as how they can optimize their output data by making one or two configuration changes.

The combination of APplus and SCS turns NGR products into smart

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For NGR, the project has become not only the first step towards Industry 4.0, but also an investment in the future profitability of the company.

machines which communicate via the cloud. For NGR, this increases and protects the value of its systems over the long term. As a result, this project is not only a first step for NGR towards Industry 4.0 but also an investment in the future profitability of the company.



Chapter two |

# **PAYMENT**

| Payten

## **PINK TAXI: 4-WHEELED PAYMENTS.**

### Customer.

The taxi industry has been disrupted by the rise of ride-sharing companies, modern technologies and flexible experiences expected by taxi customers. In order to be competitive, taxi companies have faced a challenge of introducing new technologies for accepting payment for their services with optimum safety and convenience, such as mobile point of sale (mPOS) payments. In the revolutionized financial world, taxi vehicles have evolved from cash-only to both cash and cashless transaction points.

Pink Taxi, the largest taxi company in Serbia with over 1500 vehicles, identified the importance of providing a full-scale service in the transformed payment ecosystem and enabling seamless customer experience. With the intention of offering the comfort and security of card payments through a mobile point-of-sale to their customers, the company chose to implement mPOS solution from a diversified product portfolio of Payten, member of Asseco.

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The mPOS Payten solution provided Pink Taxi and its employees with the ease, convenience and security of cashless payments.

### Smart mobile payments with mPOS.

mPOS is a new generation of intelligent and interactive mobile POS solutions for accepting payment cards. This integrated mobile payment solution enables merchants to transform their smartphones or tablets into mPOS systems that fully support PIN based transactions, including the use of EMV chip cards. In this way, start-up costs are reduced and equipment requirements are minimized. The system also provides merchants with additional payment-acceptance-related services, such as a certain extent of application and slip customization, branding, inventory management and an online preview of transaction history.

## Key Benefits.

Implementation of mPOS in taxi payment systems yields numerous benefits to taxi companies and their customers, as well as merchants in general, which the taxi fleet of Pink Taxi has already started to experience after the deployment.

### **Convenience in use**

mPOS solution is designed to bring ease and simplicity in payment for both participants in a transaction. What a taxi driver needs is a tablet, and a small device, mPOS, made by Spire Payments. A simple interface on the tablet requires only an entry of the taxi fare amount, after which the customer swipes/taps the card on the mPOS device and the payment is completed. An additional possibility allows customers to fill in their email address in order to receive an electronic receipt.

### **Secure and quick transactions**

When using an mPOS device, payments are processed in real time and the transactions are encrypted. With the increased speed and not compromising security, taxi drivers can save time on counting change or waiting for card readers to do the processing, along with the minimized theft risk.

### **Easy implementation**

The simplicity of mPOS use translates into the ease of its installation. The communication between an mPOS card reader and a tablet device is established through Bluetooth. Transaction background processes are the same as with a traditional one, the only difference being new participants: Merchant Server and Payment Gateway. Merchant Server is specialized for receipt management and transaction reporting. On the other hand, Payment Gateway, as its name says, routes the transactions and carries out the necessary encryption and decryption.

### **Additional options**

Payment initiation is just a beginning. Android payment application implemented on a tablet device also enables detailed transaction review with a full set of different payment options, end-of-day functionality, and a remote update option.

### **Achieving the ultimate goal: customer satisfaction.**

Successful implementation of Payten's mPOS solution has enabled Pink Taxi to be the first and unique taxi company in Serbia offering this globally booming service on the local market. The solution has

provided the company and its taxi drivers with the convenience of secure, easy, cashless payments on the go. Since all payments are directly transferred to a taxi driver's account, they are relieved from keeping track of receipts and wasting time on paperwork at the end of each day. In addition, daily taxi routes are much safer, as taxi drivers don't need to carry cash and worry about theft.

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„With this project, we have gained numerous benefits both for our employees and our customers. The solution we implemented together with Payten makes it simple for Pink Taxi customers to pay for longer, more expensive drives without worrying about how much cash they need to have on hand or where the nearest ATM is. Our decision to go in this direction has already proved fruitful. After two months of full production, the number of transactions grew by 39% comparing the first and the second month, and we all expect it will continue to rise” – said Novica Radosavljević, Pink Taxi Dispatch Manager.



We drive

**INNOVATIONS**

| Payten

## **DELHAIZE SERBIA: ALL-IN-ONE SHOPPING.**

### Customer.

The retail industry is undergoing transformation and has been expanding beyond the traditional method of operation. In addition, the competition in the retail environment is growing rapidly following the trend in other industries. With the customers' demands and expectations on the rise, the offering of high-quality products along with the best price and proper services in such an environment is a must. However, a move forward in the tight race of retaining existing and attracting new customers requires a true differentiating factor that will distinguish one retailer from another.

With this goal in mind, a powerful partnership was extended between Delhaize Serbia, the biggest retailer in Serbia, and Payten, member of

Asseco Group, two years ago following a successful long-term cooperation in the field of delivery and maintenance of POS terminals. Delhaize Serbia, which operates within Ahold Delhaize Group, has more than 400 stores and a POS network that counts over 2,000 terminals in Serbia.

Contributing to Delhaize's steady and competitive market position in Serbia, the project with Payten and ChipCard, a processing company which is a member of Payten, delivered a new, unified and modern POS network. The previous POS network consisted of more than 7 different models of POS terminals, some of which were significantly outdated. Replacing it with the new and unified one meant a single

application for all POS terminals and an identical set of services offered to Delhaize customers at all points. From a technical point of view, any application changes can now be carried out remotely applying to all terminals.

In addition to deploying new devices with flexible POS holders, the emphasis was also placed on delivery of state-of-the-art processing services. They have enabled faster transactions with greater customer convenience and increased employee efficiency.

### In a TECH nutshell: Processing services for Delhaize.

Processing is the key channel for transaction realization in terms of data security, accuracy, timeliness and, of course, successful payment completion. From the moment when a customer taps their card on a POS terminal to the payment successful message that appears on the screen, only a few processing seconds pass. In this short period of time, all necessary cardholder data is transmitted through secure

channels to VISA, MasterCard, bank issuer and all other participants in the payment system. All payment transactions are processed encrypted in real time. Integration of a POS terminal and a cash register via ECR protocol results in shorter time for completing a transaction, with the slip printing only at the cash register. The new generation of POS terminals goes beyond ordinary transaction processing of-

fering a plethora of additional options matching the rising needs of customers due to technological advancements.

Payten's processing solution yields numerous benefits to retailers and their customers, and the advantages were recognized by Delhaize Serbia soon after the implementation.

Payten's processing solution yields numerous benefits to retailers and their customers, and the advantages were recognized by Delhaize Serbia soon after the implementation.

### **Enhancing customer experience with “transactions that fly”**

From a customer's perspective, new POS terminals facing the customer thanks to the flexible POS holder contribute to time saving, allowing transactions to be processed in a few seconds upon customer's card tapping or swiping and entering a PIN code if necessary.

In addition to making payment for purchased goods, customers at Delhaize retail chain are encouraged to carry out a number of additional transactions that are now available. Previously available scope of processing for ordinary transactions and benefit cards at POS terminals was broadened thanks to the project in order to incorporate 3 additional options at a single POS terminal. What once used to be a supermarket is now transformed into a branch where customers can

do the top up for all local mobile providers, pay their bills for electricity, utilities, Internet or mobile packages, and top up their public transportation cards. This, of course, does not have to be the end, as the scope of services can be extended.

The all-in-one device contributes to Delhaize's efforts on making everyday life of their consumers easier and approaching the tech-savvy customers that expect the same seamless experience also in offline activities.

### **Facilitating work for associates through new technology**

Payment processing shouldn't be an additional burden on the associates. Instead, Payten's processing solution reduces the logistics of choosing between multiple POS terminals depending on the brand, requesting the information on the card brand from customers, taking the card from their hand, tapping it on the device, printing slips both at the POS terminal and cash register, and so on. Now, Delhaize's

cashiers could take a step forward and handle more important tasks than tedious, repetitive activities. They can now work on boosting sales by focusing on customer service and cross-selling.

An additional benefit for Delhaize associates includes benefit cards which are also processed using the same POS terminal and which provide them with discounts in Delhaize Serbia stores (Maxi, Tempo and Shop&Go).

### **Leveraging IT innovation to drive competitiveness**

To run business more efficiently and smoothly, retailers that understand changing consumer habits and technology trends are investing in business growth and expanding the portfolio of services they offer. As the biggest retailer in the country, Delhaize Serbia has added additional value to its brand with Payten's support by enriching customer experience with fast transaction checkout and all-in-one device for multiple services that allows future add-ons.

## **Delhaize Serbia: “Always Moving Forward”.**

Successful replacement of the POS network, new holders for POS terminals, faster completion and growing number of transactions, along with new valuable functionalities contribute to the positioning of Delhaize Serbia and their stores as an innovative retailer in Serbia offering such a wide spectrum of services on the Serbian market.

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„We have successfully improved our business operations and gained benefits both for our associates in stores and for our customers. The solution we implemented together with Payten makes it simpler for our “cashless” customers to pay in just a few seconds, and our associates benefit from this technology as well. In the following period, we plan to continue introducing new options for our customers as well as improvements to their daily shopping experience” – said Snežana Stjepanović, Manager for Treasury, Risk and Insurance at Delhaize Serbia.

We provide

# SECURITY



## **BANKART: THIRD DIMENSION OF SECURITY.**

### Customer.

Bankart is a leading provider of card and ATM transaction processing services as well as POS terminals on the Slovenian market. Its offer is used by approx. 21 banks from 6 countries and 2 state institutions, which require maximum trust, security and support in providing their customers with a wide range of payment services and channels.

Bankart's main business areas focus on processing of:

- “multi issuing” and “multi acquiring” card operations for MasterCard and VISA – currently over 3.6 million cards,
- the POS network in the region - the company manages over 36,000 POS terminals,
- the ATM network in the region - the company manages over 2,000 ATMs,
- the SEPA payment instruments.

The company pays special attention to the continuity and quality of services offered. It also focuses on the development and improvement of internal processes in order to meet all the challenges posed by changing market forces and its competitive environment.

In order to ensure a maximum level of security for its customers and end users, Bankart decided to replace the existing 3D Secure solution with the Asseco SEE Software as a Service (VerifiedByVisa and MasterCard Secure Program) which provides Bankart's clients (bank) to minimize time to market, reduce investment and operational costs for 3D secure compliance. The company also wanted to standardize the program in a way which would enable its efficient implementation and provide banks with access to a solution meeting specific GUI requirements. Bankart was also willing to ensure maximum cost

effectiveness on a global level, while at the same time meeting the expectations of banks regarding the time the solution will be introduced to the market.

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The implementation of the project allowed both Bankart and member banks to increase efficiency and reduce costs.

### Implementation.

In order to achieve these goals, in April 2018 Bankart decided to implement the Asseco SEE ACS hosting Service. Together with Bankart's business and technical experts, the Asseco SEE team has created an optimized 3D Secure scheme profile which can be applied to all member banks, leaving opportunity for later specific customizations required by individual needs. In this process, Bankart's experience and strong relationships with member banks have contributed extraordinarily in terms of creating the most optimized and widely usable scheme to satisfy the requirements of all member banks and their end users.

## Key benefits.

### **Flexible authentication mechanism**

One-time passwords have been replaced by SMS, which has been selected as the primary method of authentication. This has enabled all participants of the process to increase efficiency and reduce costs for both Bankart and member banks. Owing to the ACS service, they have also gained the possibility of using two-factor authentication.

### **Card activation**

In order to ensure a smooth user experience, all cards are activated BIN – first 6 digits in card number, which reduces the pre-activation or Activation-During-Shopping processes. These processes are the prerequisites of online payment, and were earlier identified as one of the main reasons for low utilization and abandonment of 3D Secure programs when introduced by merchant e-commerce gateways.

### **Card management system integration**

Instead of exchanging cardholder data from bank through file exchange which was common in the 3D Secure 1.0.2 implementation. In this implementation a Web Service is used for fetching cardholder data from the bank core system, in case when those data are necessary for proceeding with the 3D secure scheme.

### **GDPR alignment**

A special attention was given to the upcoming GDPR requirements, which were reviewed during the stage of scheme profile definition. By minimizing the quantity of personal data in the 3D secure process, deploying data encryption in databases and data masking in reporting, the overall process has become fully compliant with the GDPR requirements.

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### **Why Asseco SEE ACS hosting service?**

ACS hosting service is a 3D secure fast track for issuing institutions. It is a highly configurable solution, allowing maximum alignment with issuers' business requirements. It enables quick implementation and efficient configuration, which does not cause disruptions for system users. The hosting platform includes a card and user database, balanced HSM modules and technical connections with Directory Servers infrastructure. The whole hosting infrastructure as well as the serving processes and procedures are certified according to the PCI DSS.

**The 3D Secure** technology also reduces the risk of online fraud by providing a cardholder authentication at the time of submitting the card for online payment. It also reduces unauthorized card usage, which also increases the level of security of customers' transactions.

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The system enabled quick adaptation of solutions to the individual needs of Bankart's customers, as well as to the changing requirements of the sector.

## How did Asseco SEE help Bankart to achieve these results:

### **Flexible Implementation**

The implementation has provided fast adaptability of tailor-made solutions for Bankart's customers and allowed for meeting the changing requirements within the industry.

### **Graphic interface (GUI)**

The system provides an intuitive interface, which enables the full parametrization of the 3D Secure scheme profile. This significantly reduces the time necessary for onboarding additional issuing institutions. Additionally, user credentials ensure the assignment of appropriate roles and rights to administrators and bank help desk personnel.

### **Strong expertise and know-how**

TriDES ACS deployed in the ACS SaaS platform has been fully designed and built by Asseco's Development team. Their professionalism, strong expertise and rich experience guarantee a successful completion of the project.

### **Multi-tenant platform**

TriDES ACS has built in an additional multitenancy level which enables aggregated onboarding of issuing institutions either through a processor or mother group of banks.

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„We are very satisfied with the Asseco SEE ACS hosting Service implementation. It provides us with the unified 3D Secure scheme applicable to the majority of the member banks. The solution enables us, as the service provider, to handle comprehensive administration of the member banks. Together with Asseco's support team, we can administer each member bank individually, while making use of the benefits of a unified service. It has also been easily integrated with the Bankart Card Management System” – said Tomaz Borstner, Head of Technology Divison from Bankart.



Chapter three |

**BANKING &  
CAPITAL MARKET**

| Asseco Poland

## **WARSAW STOCK EXCHANGE: MODERN BROKER INTERFACE.**

### Customer.

The Warsaw Stock Exchange [the WSE] is the largest exchange in the region of Central and Eastern Europe. With over 25 years of experience, high security of trading, operational reliability and a wide range of products, the WSE is one of the most recognizable Polish financial institutions in the world. Its markets include shares and bonds of over one thousand domestic and foreign issuers, as well as derivative instruments. In 2016, it generated sales revenues of PLN 310.9 million and had 187 employees.

In 2017, the WSE was faced with the challenge of adapting its IT system to the requirements of the EU Markets in Financial Instruments Directive [MiFID II], which significantly changed trading in securities and derivative instruments in the European Union [EU]. The introduction of the new regulations required modification of existing solutions

in many key areas responsible for information processing, including orders placed by market participants. It was also necessary to adapt the WSE's system to a more detailed scope of data on current financial instruments' stock prices.

An important part of the changes was also to increase the comfort of stockbrokers, who needed flexible and effective IT tools. Market conditions also required the construction of a new and highly useful user interface, whose modernity, intuitiveness and high reliability were to ensure comfortable access to the system, anywhere and anytime.

The achievement of the above objectives and the scale of the planned changes were the reasons why the Management Board of the WSE decided to change its existing trading system. Therefore, on

May 11 2017, the company signed an agreement with Asseco Poland for the implementation and launch of Promak TS – a modern system providing access to UTP [Universal Trading Platform], which was to be available to the WSE's clients in the form of a dedicated application under the Trade-App name, as well as in the Internet version as WebTradeApp.

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Asseco was responsible for development of IT tools available both in the form of web applications and applications installed at the Client's station.

## Implementation.

The aim of the project, which began in September 2017, was to provide selected trading participants cooperating with the WSE access to a modern, safe and reliable trading solution compliant with the MIFID II regulation. Its implementation was also to enable the internal consistency of the activities of these organizations with the new regulations. Asseco's task was to develop IT tools, both in the form of web applications and applications installed at the Client's station, containing functionalities enabling:

- monitoring of the state of the market and stock exchange prices, including a presentation in the form of charts,
- analysis of the offer and transaction book on the indicated instrument,
- management of the baskets of instruments' prices being reviewed,
- order flow management (registration, modification, cancellation),
- controlled access to the order book,
- management of system users and rights of system users.

For the Client, the unquestionable challenge was the short time required to implement the project, consistent with the date of entry into force of MiFID II, and the need to implement the requirements formulated on the basis of the dynamically changing content of technical standards. Another challenge was the need to implement the system in the WSE's environment, which, due to the specificity of its operations, imposes high requirements on safety, reliability and availability.

In the initial phase of the implementation, Asseco was granted access to a test environment in which a significant part of the activities was conducted remotely. The implementation also included automation of the installation process of the entire IT environment of the WSE. Owing to this, the initial phase of the implementation, as well as the update of the version of the system, was performed with the use of a „single button“. This allowed to maintain high efficiency of activities, increase the speed of reaction and improve the tests taken, as well as mutual software reviews.

## Project milestones.

**11.05.2017**

Signing the agreement

**22.09.2017**

Commencement of the implementation

**27.09.2017**

Supply of the software

**26.10.2017**

Completion of functional tests  
(2nd phase of the implementation)

**10.11.2017**

Certification of software for compliance  
with the WSE technical standards

**28.12.2017**

Completion of UAT (3rd Implementation Phase)

**02.01.2018**

Production launch of the system

Despite the time constraints and the complexity of the project, it was completed very quickly. As early as in November, i.e. only 3 months after the commencement of the implementation, the software was certified for the compliance with the WSE technical standards. On December 28, 2017, User Acceptance Tests (UAT) were completed, which showed that 100% of the designed functionality was delivered and executed in accordance with the specification. The system was launched on the first trading day of 2018.

Asseco was also responsible for conducting training sessions for the WSE, which was then to present the solution to the market. In this area, too, good cooperation and efficient project implementation

## Key benefits.

Since January 2018, the WSE has had one of the most modern solutions for trading in financial instruments, which meets the requirements of the current EU MIFID II directive. It provides investors with access to the WSE's markets and full control over transactions.

The implementation of the system had a positive impact on the international perception of the WSE. Thanks to the implementation, the WSE has become one of the most modern trading exchanges in the world. Solutions of this class are used in Europe only by the London Stock of Exchange (LSE).

resulted in the WSE's representatives appreciating the professionalism of the supplier and inviting Asseco to jointly conduct training sessions for Polish brokers.

The implementation of TradeApp and WebTradeApp on the WSE was carried out by 24 qualified specialists of Asseco, who were supported in the process by a team of the WSE's experts assigned to the project. The project was based on close cooperation of the combined teams – business-IT-contractor – which ensured optimal effectiveness of the implemented activities and enabled constant monitoring of the progress of works and avoidance of discrepancies with the original assumptions. Currently the system is used by 19 Exchange Members

from Poland and the EU, 13 of whom use WebTrade App, and 9 use Trade-App. Over the next 3 years Asseco Poland will also be responsible for providing maintenance services.

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Thanks to TradeApp and WebTradeApp, market participants have received secure access to the trading system on the WSE – without any geographical limitations.

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„Asseco has been developing software for capital market participants for many years, but for the first time we were able to cooperate with the Warsaw Stock Exchange (the WSE). It is a great distinction for us, but also a valuable experience. The institution creating a trading floor has its own specificity, which should be taken into account when implementing the project – these are first of all extremely high requirements in terms of IT security of the applied solutions. In addition, there was considerable time pressure due to the entry into force of MIFID II. The successful implementation of the project proves that even during the period of significant regulatory changes, modern IT solutions can be effectively implemented and additional value for market participants can be built” – said Artur Trunowicz, Director of the Capital Market Division, Asseco Poland.

The implementation of the project allowed the WSE's clients to have secure access to current market information and efficient order management. As a result, it brought efficient and fast communication, as well as improved the conclusion of transactions and the control of the stream of transferred orders.

Thanks to the implementation, the WSE has obtained a solution that allows stockbrokers to resign from costly IT tools of third parties - the so-called OMS class solutions. They have also gained the freedom to choose the method of accessing the UTP trading system, thanks to which information on the current state of the market and prices of instruments can be obtained by means of two independent solutions.

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„We consider the new system to be modern and effective – it meets the requirements of the current EU MIFID II directive and equals the offer made available to customers by modern global exchanges, such as the London Stock Exchange [LSE]. Since the beginning of 2018, the WSE's clients have gained access to current market information as well as order and brokerage house risk level management. TradeApp is a testament to the commitment of the WSE – the leader in Central and Eastern Europe – to reach technological excellence” – said Dariusz Kułakowski, the Member of the Management Board of the WSE.

### Project in numbers:

**4**

months from implementation to launch of the system

**19**

Members of the Exchange use the system

**3 use WebTrade App** (including 4 from outside Poland)

**9 use TradeApp** (including 7 from outside Poland)

**24**

qualified Asseco specialists

The background of the image is a dark blue server room. On the right side, there is a large, curved wall of server racks with a grid of small lights. The rest of the image is filled with out-of-focus, colorful bokeh lights in shades of blue, green, yellow, orange, and red, creating a sense of depth and activity.

We deliver

# **SMART INVESTMENTS**

# SANTANDER BANK POLSKA: IN THE CIRCLE OF TRUST SERVICES.

## Customer.

Santander Bank Polska (Bank Zachodni WBK until September 7, 2018) is the third-largest bank in Poland by assets, with over 6 million customers. It offers financial solutions for individual customers, micro, small and mid-sized enterprises and international companies. The Bank provides services through one of the largest branch and partner outlet networks in Poland, as well as through electronic access channels, including mobile banking. It is also one of the market leaders in the use of modern technologies, which are an important element of the bank's market strategy.

Currently Santander Bank Polska employs over 11,000 people who

work in the bank's headquarters and 576 branches throughout the country. Their engagement and competence determine the strength of the organization, therefore the Bank makes every effort to provide them with a friendly and supportive work environment.

The willingness to improve internal processes and eliminate paper document circulation became the reason why the institution decided to introduce qualified electronic signatures and other cloud trust services into its internal banking systems. Thanks to the EU eIDAS regulation, since 2016, an e-signature issued in one of the EU member states is recognized in all member states and is treated as an equiv-

alent to a handwritten signature. In addition, it increases not only the security, but also the convenience of network users.

The Bank considered the solution of Asseco Data Systems, the leader in the market of trust services in Poland, to be the best system to achieve this objective. In June 2017, the Bank signed an agreement with the company for the implementation of the Online Trust Services Platform. In this way Santander Bank Polska became the first bank in Poland and one of the first in Europe to provide its employees with the possibility of electronic signing and circulation of intra-bank documents.

## Implementation.

The aim of the project was the implementation of the Online Trust Services Platform – an internal portal, which enables the Bank's employees to use the electronic identification tools provided for in the European eIDAS regulation. Its implementation allowed for the introduction of an electronic seal, a qualified electronic signature and a mobile signature "SimplySign", which is submitted through a mobile application on a smartphone or tablet.

The platform fulfils rigorous banking procedures. It has been adapted to internal banking systems and connected to an external Authorisation Centre, acting as the so-called trusted third party. The mobile qualified electronic signature and remote electronic seal operate in the cloud technology. The functional scope of the solution includes leasing and factoring services, as well as relations with the Bank's external environment – contracts with suppliers,

communication with customers, brokerage houses and eKRS financial statements, among others.

The project, which ended on October 1, 2017, involved 10 people representing the Bank as well as 15 specialists from Asseco Data Systems, who responded to the Client's suggestions and needs on an ongoing basis.

## Key benefits.

The implementation allowed for efficient management of the internal circulation of documents and eliminated the need to sign them manually. This significantly improved internal banking processes and enabled the immediate transmission of signed documents to their dedicated recipients.

The replacement of a handwritten signature with its electronic equivalent made it possible for the organization to carry out „paperless” processes. It also helped to reduce costs and save time associated with the implementation of business processes. Owing to this, over 300 bank employees, regardless of place and time, can now quickly handle the necessary formalities.

Thanks to the implementation of the project, Santander Bank Polska has received a safe and convenient solution which does not require

any additional tools. Through it one can easily sign e-documents with any device connected to the Internet, without the need to use a special reader, token or card.

The Online Trust Services Platform enabled the Bank to fulfill its obligation to implement the so-called durable medium. Owing to this, obligatory correspondence to customers concerning e.g. changes in tariffs or regulations can be transmitted electronically.

The benefits resulting from the implementation of the solution of Asseco Data Systems led the Bank to make the qualified signature available also to its clients, which is the next stage of the project, planned for the coming years.

## Project in numbers:

**8**

months passed from the signing of the contract to the system's start of operation

**15**

specialists of Asseco Data Systems involved in the implementation

**300**

employees of the Bank using the solution

**26,000**

signatures made in 2018

„For several years now, we have been observing a growing interest in digital services in Poland and awareness of the advantages and benefits of this type of solutions. This applies in particular to institutional clients. In our bank we observe and respond to the constantly changing needs and expectations of our clients. „Paperless” processes have become part of the current world for good, so we want to take full advantage of their potential. This results in benefits for both customers and the bank itself. Especially if, thanks to new tools, the cooperation with us becomes easier, more efficient and, what is extremely important, safer. And this is the case with digital signatures in the cloud” – said Feliks Szyszkowski, Vice President of the Management Board of Santander Bank Polska.

„We are proud that this bank trusted us and we hope that this will open the door to cooperation in other areas in which Asseco Data Systems specializes. The Trust Services Platform is the first cloud solution of this type in Poland. This project has shown that SimplySign, a mobile qualified signature created by Asseco, is not only a product for businessmen or accountants who sign documents electronically, but also a new technology tool of unlimited use, improving communication between enterprises, administration and citizens” – said Andrzej Dopierała, President of the Management Board of Asseco Data Systems.

# ANGOLAN BANK: DATA E-MIGRATION.

## Customer.

The customer is a leading Angolan banking institution, which has been operating in the financial sector for over 20 years. It manages 147 branches, 11 out of which are Business Service Centers, specialized in meeting the needs of companies, and 2 Premium Service Centers. The bank employs 2,000 people, provides services to about 1 million customers and processes 3.8 million transactions per day.

## Implementation.

Due to the multiplicity of solutions in force at the bank, a gap analysis and an integration study was required before the migration. Then, with the client participation, a migration roadmap was set, which defined the methodology and goals to be accomplished.

The migration project included the implementation of the latest versions of the core banking system BANKA, of the Financial Markets FINANCA and the needed amendments at 22 Custom Routines and

It also operates in Angola through a local subsidiary offering microfinance solutions and through an insurance company. The value of the bank's net assets exceeds EUR 7.300 million and its net profit in 2017 reached approximately EUR 295 million.

New products and integration needs were becoming harder to support and posed daily challenges to the organization. Therefore, due

Developments. After the migration, Asseco PST High Availability solution was implemented, which enables institutions to provide round-the-clock services for Internet banking, mobile banking, as well as debit and credit card processing centers. In the final phase of the project, Asseco PST conducted user training and updated business processes.

to technological and functional constraints, the client identified the need to migrate from the installed Promosoft Financial Suite (PFS) to a new version. In 2017, the bank decided to cooperate with Asseco PST, a company of the Asseco Group, which became responsible for the implementation of this demanding project.

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The project was implemented with no or little impact on the Bank's day-to-day operations.

With the new version, Architecture, Audit and Control and Business Alignment resulted in a functional evolution adapted to the bank's business. Processes execution in an anywhere / anytime context, regulatory and legal compliance and business requirements became easier to be implemented. The migration objectives crossed almost all business areas and touched most of the processes of the bank, from credit to transfers, from cheques to foreign transactions, from card management to financial market transactions. The project carried out by Asseco PST also redefined the way in which 1,200 internal

## Key benefits.

Thanks to the analysis of 20 years of data, their dimensioning, restructuring and categorization, it was possible to come up with a faster and more flexible system, which allowed to improve the quality and efficiency of processes. In addition, the project was carried out with little or no impact on the bank's day-to-day operations.

As a result of the successful migration process, the bank has a renewed technological architecture and a modern High Availability

users of the bank run the Promosoft Financial Suite (PFS) application. The major challenge faced when implementing the project was the scale of the bank, which required the update of data and processes. The orchestration of all the components and solutions which interact with the PFS core was also a demanding challenge to fulfill and this was taken into consideration by Asseco PST at the early stages of the project.

The implementation schedule was set for almost a year and was carried out by a team of 20 qualified specialists from different areas.

solution which eliminates the downtime period to run EOD batch. The system does not only streamline the bank's processes, but most importantly, it has an extended functional reach, which makes it possible to offer customers a wide range of modern financial products. It also enables the institution to meet the new challenges posed by the market.

## Project milestones.

### Kick-Off, Coordination and Project Management

### Implementation

- Current and New Specs – Gap and Processes Analysis.
- Specs and Processes to Implement with the new version.
- Client Project Team Training.
- DEV Environment Setting and Custom Solutions Amendment.
- TEST Environment Setting (Trial, Go Live Simulation, Integrated Tests).
- QUALITY / ACCEPTANCE Environment Setting (Go Live Decision, Training, Acceptance Tests).
- PRODUCTION Environment Setting (Go Live).

### Pos Production Support

# RAIFFEISEN POLBANK: OMNI-BANK OF THE FUTURE.

## Customer.

Raiffeisen Bank Polska S.A. – operating under the name Raiffeisen Polbank – was established in 1991 and was one of the longest-running foreign capital banks on the Polish market. In 2013, as a result of the merger with Polbank EFG S.A., it joined the group of the largest banks in Poland, holding leading positions in many segments of the financial market, including factoring, leasing, foreign exchange, trade financing instruments and payments. In 2016, the value of its assets amounted to PLN 53.3 billion, it provided services to nearly 750,000 retail customers as well as 14,700 small, mid-sized and large enterprises. In 2018 it was

purchased by BGŻ BNP Paribas, which is part of the largest banking group in the euro zone and one of the largest banks in the world. Technological developments have had a major impact on the banking sector since they have brought many new challenges. Banks have had to modify their business models and adapt to the new reality in order to be able to consistently expand their market share in the increasingly competitive market. The need for a change became a catalyst for the emergence of new ideas also at Raiffeisen Polbank, which decided to launch „R Online” – a new, intuitive internet and

mobile banking system. In order to implement it, the bank decided to choose Asseco Customer Banking Platform (Asseco CBP), Asseco Poland's proprietary solution, which provides unlimited opportunities for making new products and services available through online channels and mobile devices. The project implementation agreement was signed in June 2015 and the launch of the new customer system took place in July 2016.

## Implementation.

The goal of the project was to implement and make the „R Online” electronic banking system available to individual clients and micro-companies. The solution was to enable users to freely shape their banking and use a wide range of products and services availa-

ble on the remote access platform. As a result, the need to design IT systems with a specific customer segment in mind became a thing of the past. The implementation of Asseco CBP has also provided the possibility of flexible selection of mini-applications through which

Raiffeisen Polbank can direct its Internet and mobile banking to various customer groups.

The project was completed in an exceptionally short time in relation to the scope of the work. This was possible thanks to, among other

things, mini-applications which allow for quick and safe launching of individual system functionalities. What is important, the previous internet banking solution was not turned off and customers could decide for themselves when to switch to the new system at the most convenient time. Asseco CBP works on mobile browsers, which elim-

## Personalized banking.

The bank put emphasis on customer convenience and simplicity of use, therefore the system provides high intuitiveness and quick access to particular functions with a minimum number of clicks. All the information was presented in a clear and aesthetic way, so that the clients could immediately receive the data they needed, without wasting time searching for them and going into the next levels of the menu.

Based on the currently implemented solution, the bank may expand the system, both in terms of other types of devices, as well as functionality. It is also important that the bank's team can expand the offer independently.

inates the need to create a native application, which the client would have to download and install on the phone. The RWD technology used by the system allowed the bank to quickly implement the mobile banking service working on every computer, smartphone and tablet model. In turn, the customers deal with the same functions,

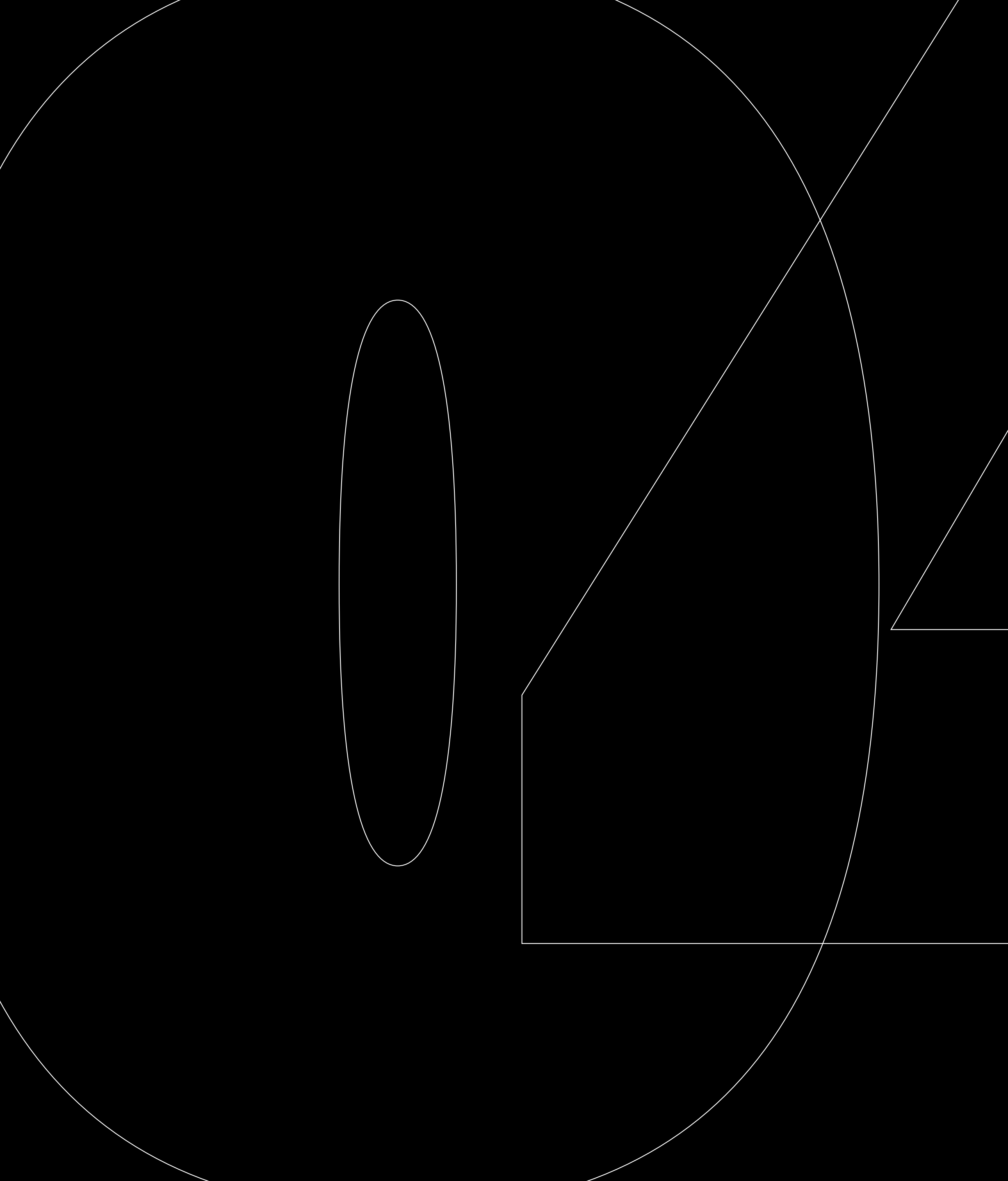
graphics and logic of performing particular operations on their devices. They do not have to „learn” how to use each of them individually – as it has been the case so far. Regardless of the device they use, they have access to the same functionalities.

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„The new service is based on the architecture of separate applications, also known from smartphones – so we have a separate mini-application for accounts, deposits or payments. This simplifies and shortens the time needed to perform individual operations. Add to this the possibility of any personalization of these applications, their selection, layout, creating shortcuts for the most common transactions so that they can be performed with a single click, and we get a service that each customer can configure in a preferable way to use it quickly and conveniently”

– said Tomasz Dymowski, Director of the Product Offer Development and Customer Relations Department at Raiffeisen Polbank.

„Asseco CBP enables quick and effective implementation of internet and mobile banking. The unique architecture of this solution based on a platform, mini-applications and adapters gives unprecedented possibilities. It allows for a different approach to a project and shaping its scope and stages, providing measurable business benefits in a very short time. The freedom of personalization for both individual customer segments and their individual needs is a key benefit of the system implementation” – said Sławomir Filar, Project Director at Asseco Poland.



Chapter four |

**PUBLIC  
ADMINISTRATION**

| Asseco Nigeria & Asseco Poland

# LAGOS STATE MINISTRY OF SCIENCE AND TECHNOLOGY IN NIGERIA: TOP-DOWN DEVELOPMENT PLANNING.

## Customer.

The Lagos State Ministry of Science and Technology is responsible for planning, development and implementation of Lagos State (Nigeria) policy in the field of new technologies. It aims to exploit innovation in a way which will contribute to solving problems and have a positive impact on society.

Lagos is the smallest and at the same time the most densely populated state in Nigeria. The Lagos agglomeration has an estimated number of inhabitants reaching about 21 million, which makes Lagos one of the 10 mostly populated cities in the world. The state's dynamic development and constant influx of new residents have led the Ministry to seek a solution which would improve the efficiency of the state's development planning, enable efficient management of spatial resources and ensure better management of the 3,577 km<sup>2</sup>

area. This meant that modern tools were needed to capture images feeding the Geospatial Information System with reliable, up-to-date and high-quality data.

This is why the Lagos State Ministry of Science and Technology decided to use Unmanned Aerial Vehicles (UAVs). It chose Asseco Nigeria to implement the project. The company won the international competition thanks to innovative solutions developed by Asseco Poland, which was responsible for the delivery of two unmanned platforms together with operator panels, Asseco Ground Control Station (Asseco GCS) and Asseco Simulation Environment (Asseco SE), enabling training for unmanned aerial systems' operators. The implementation was carried out by Asseco Nigeria in close cooperation with Asseco Poland.

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The use of Asseco's software in the project allowed to create an accurate orthophoto basemap of the entire state of Lagos.

## Implementation.

The project began in February 2017 and was implemented in two stages. During the first one, Asseco supplied the Asseco SE simulation environment, which provides training for unmanned aerial systems' operators. Thanks to the solution, the operators can acquire necessary skills related to the complex use of the UAV system – from planning, take-off, execution of the entire mission to landing – and acquire knowledge needed for a quick and appropriate response to emergencies. The software allows flight training to be conducted in a way that very accurately reflects the actual conditions of the use of Unmanned Aerial Vehicles, without fear of losing the platform or waiting for the appropriate weather conditions.

As part of the project in Nigeria, Asseco also established a certified training centre for UAV operators and a service centre. It was the first investment of this type in the region and one of the first in Africa, thanks to which several dozen people per year will be able to gain

theoretical and practical knowledge. The scope of training includes the maintenance and use of multicopter and airframe platforms, as well as software for building a digital terrain model. The training courses are conducted by experts from Asseco Poland and Asseco Nigeria. In the second stage of the project, the company was responsible for delivering UAVs, which, thanks to Asseco's software, enable the creation of an accurate orthophoto basemap of the entire Lagos State. The use of Asseco GCS makes it possible to plan the flight routes with the highest precision. Flights can be performed simultaneously by two unmanned platforms, each moving over one of 39 separate sectors. For 6 hours spent in the air, a drone takes about 22,000 pictures in very high resolution. A flight over one area of 12 km<sup>2</sup> is carried out within two days.

Asseco Ground Control Station enables the operators to continuously supervise the progress of their missions. The photos taken during each

flight by the flying platforms are then analyzed and processed with the use of dedicated software, which creates orthomosaics. In this way, a very precise orthophoto basemap of the area is created, which is made available in the geoportal in the next stage.

As part of the project, Asseco was also responsible for integrating individual components of the solution and testing the system, which was fully adapted to the requirements and needs of the Lagos State Ministry of Science and Technology. Owing to Asseco GCS's flexibility, it will be able to be extended and ultimately integrated with the Unmanned Traffic Management (UTM) system.

The implementation of the software was the responsibility of Asseco Nigeria, which was also the first line of customer support. The project was carried out in full cooperation with the Nigerian Civil Aviation Authority and the Office of the National Security Adviser to ensure compliance with all applicable regulations and security procedures.

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„The African market's dynamic development has made unmanned systems more widely used in the implementation of activities related to security or business. The Lagos State Government has decided for the first time to use unmanned systems in its eGIS project. It is very important for us that it decided to cooperate with our company, as the development of these systems is an important element of Asseco's strategy. We beat the competition from all over the world thanks to the advanced functionalities of Asseco GCS, which ensure maximum safety during flights over densely populated areas. The support of Asseco Nigeria, which was responsible for the maintenance work, was also very important. This project once again showed us the enormous potential we have when acting together as the Asseco Group” – said Zdzisław Wiater, Director of the International Organizations and Solutions for the Security Sector Division of Asseco Poland.

## Key benefits.

As a result of the project, Lagos State has a solution which provides highly accurate measurements and efficient image acquisition feeding the State's GIS system. It has also gained the ability to register real estate and receive up-to-date administrative information about over 21 million inhabitants and their places of residence, work and leisure.

Asseco's cooperation with the Lagos State Ministry of Science and Technology allowed, among others, for more effective planning of the development of this region of Africa and management of its spatial resources. It also enabled continuous monitoring of environmental pollution as well as land erosion and flooding risks.

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„It was a pioneering project, and, at the same time, the largest GIS project ever carried out in West Africa. The UAVs delivered by Asseco are the most reliable, safest and cheapest way to collect and continuously keep updating accurate cadastral data, which is vital for an economy like that of Lagos State” – said Simon Melchior, CEO, Asseco Nigeria.

„Apart from the strategic cooperation between the Lagos State Ministry of Science and Technology and Asseco Nigeria, this project is a practical example of the transfer of technology and knowledge from Europe to Nigeria and we trust that this project will turn Lagos into a UAV center of excellence” – said Hakeem Fahm, Lagos State Commissioner of Science and Technology.

„The integration of this complex system was a real challenge for the whole team. Such difficult and advanced solutions are rare on a global scale. A successful implementation, the main part of which is AGCS software, which manages the whole photogrammetric mission together with the installed sensors – LIDAR, thermal imaging camera and high-resolution cameras – proves the high maturity of our system and the high competence of our team. It also allows for optimistic approach to next international challenges” – said Tomasz Mosiej, Project Manager in the Division of International Organizations and Solutions for the Security Sector at Asseco Poland.

Asseco's solution has become an integral part of the Lagos eGIS project, enabling the efficient acquisition of high-resolution images of a vast agglomeration area. It has also ensured their processing and publication through the geoportal to both residents and investors.

Thanks to the educational center established by Asseco, Lagos State can effectively educate other UAV operators who, thanks to training in environment accurately reflecting drone behavior in the air, can prepare well for future flights.

## Project in numbers:

# 2

Unmanned Aerial Vehicles with advanced payload (LIDAR, thermal imaging camera and high-resolution cameras)

# 12

hour flight over each of the 39 sectors

# 39

sectors covered by flights, each covering the area of 12 km<sup>2</sup>

# 3,577 km<sup>2</sup>

area covered by a single orthophoto basemap

# 22,000

photos in a single flight

# 21 million

inhabitants will get access to up-to-date data

An aerial, high-angle photograph of a city at night. The city is densely packed with buildings, and the streets are illuminated with warm, golden-yellow lights. The overall scene is a vibrant, glowing urban landscape. The text is overlaid on the left side of the image.

We explore

**NEW POSSIBILITIES**

# UNIVERSITY OF WROCŁAW: STUDIES IN VR TECHNOLOGY.

## Customer.

The University of Wrocław has been operating for over 300 years and is one of the best universities in Poland. Over 30,000 students attend 10 faculties, where humanities dominate. One of them is the Faculty of Law, Administration and Economics, which is one of the largest in the country.

The University of Wrocław was looking for solutions which would increase the effectiveness of the teaching process. It wanted to develop practical skills of the students of the criminalistics faculty, involving conducting the inspection of a crime scene and securing the traces of a crime. Therefore, in 2018, it decided to make the „Virtual

Crime Scene” simulator, based on the Virtual Reality [VR] technology, available to students. The solution, the only of this type on the Polish market, was developed by Asseco Data Systems, a company of the Asseco Group.

## Implementation.

The implementation of the simulator was carried out by the Training Division of Asseco Data Systems in cooperation with the professional staff of the University of Wrocław. The solution has helped the students of criminalistics to develop their skills and shape behavior at a crime scene. After moving into the virtual world, the scene of the murder of a well-known lawyer appears to their eyes. The students’ task is to properly secure the evidence at the crime scene and to determine the cause of death.

The VR software provided by Asseco Data Systems includes two

separate scenarios leading to different conclusions about the event – a murder or a suicide. Pieces of evidence and other interactive but unnecessary objects are placed in the office and private bathroom of the lawyer.

Each student navigating in virtual reality has at their disposal a professional set of tools for analyzing the place of the event, including: gloves, equipment for securing and collecting samples left on the spot, such as: swabs, vials, paper package, plastic bags, tweezers, pliers, a microscopic table and a flashlight.

The „Virtual Crime Scene” makes it easier for students to gather the necessary knowledge and acquire appropriate habits in terms of the correct way of inspecting a crime scene and securing the evidence left there. The application was developed in the Unreal Engine 4 environment. The simulator is compatible with virtual reality glasses of different manufacturers. Special VR controllers will enable advanced interaction with the created environment. The application uses a high quality 3D image, allowing the most accurate representation of a real crime scene.

The implementation of the project took 6 months and required the involvement of 12 people from Asseco Data Systems and the University of Wrocław. Thanks to its implementation, the „Virtual Crime Scene” can be used by over 500 students per year. In this way, they have gained a valuable tool, which allows them not only to improve their competences and master the procedure of conducting an inspection, but also to feel like in a real crime scene. The university has also launched the Virtual Technology Centre and is planning to implement educational programs based on the VR technology also in other faculties.

## Key benefits.

The use of the virtual reality technology in the educational process has helped students to acquire practical skills needed for their future professional work. The „Virtual Crime Scene” has also become a very important complement to the theoretical knowledge conveyed in the form of traditional lectures.

The implementation of the project has also helped to improve the educational value of the classes by involving a whole group of students. While some of the participants take an active part in the „game”, the others analyze and evaluate their decisions, observing the course of all activities on the screen. The simulator also enables individual educational cycles depending on a scenario planned by a lecturer.

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„Higher education in Poland has been entering the digital world increasingly more dynamically. I am proud that we have been trusted by another prestigious Polish university and together with the University of Wrocław we will implement and popularize the technology which has already started to revolutionize various fields of science and business, and is now increasingly more often entering our daily lives”

– said Andrzej Dopierała, President of the Management Board of Asseco Data Systems.

„Our students will be able to „participate” in examining a crime scene, make a detailed analysis of it. They will only have to put on special goggles. Thanks to two controllers, equivalents of hands in virtual reality, they will collect evidence, secure traces of blood and shells. If they manage to find a code, they will open a safe where they will find more pieces of evidence” – said Damian Mroczyński, Head of the Digitization Section at the Faculty of Law, Administration and Economics of the University of Wrocław.

„Virtual reality, which has been used in many areas of our lives for several years now, is also an innovative method of teaching. This is particularly important in the process of acquiring practical skills, which complement the knowledge passed on in the form of lectures. The simulator developed by us will help law students learn their official duties, which they will come across in their later work – while conducting an inspection, securing evidence. VR is a solution which offers great application possibilities with relatively small outlays, especially given the fact that thanks to the ongoing NCBR competitions „Integrated School Programs” it is possible to obtain co-financing for such implementations from the EU funds” – said Mariusz Lala, Managing Director of the Training Division in Asseco Data Systems.

| Asseco Lithuania

# MINISTRY OF THE INTERIOR OF THE REPUBLIC OF LITHUANIA: FAIR ACCESS TO INFORMATION.

## Customer.

The Ministry of the Interior of the Republic of Lithuania performs the functions of public administration in the field of public safety, state border protection, emergency assistance and civil protection. The ministry is also responsible for the implementation of public administration reforms and the development of state management systems, civil service, IT and other areas related to its competences.

The ministry's mission is to serve the public and to guarantee a safe, efficient and professional public administration based on information technologies, which will create conditions for sustainable regional development.

## Implementation.

The biggest challenges during the implementation of the project were related to its complexity and a very wide functional scope of the new solution. In terms of scale, it was the largest project of this type in Lithuania and one of few projects of this size carried out in the European Union. The project covered all penal proceedings: from registering a crime

The ministry was willing to increase the efficiency of the penal process and extend the cooperation in this area between authorities in Lithuania, as well as with other institutions in Latvia and Estonia. Nine institutions participated in the process, each of which used different tools and technologies to organize pre-trial proceedings. This had a negative impact on communication and the effectiveness of information exchange. It also caused duplication of data, as well as low productivity and overloading associated with paper workflows. In addition, it limited the possibility of access to the most recent data, which resulted in a prolonged pre-trial investigation process.

event (by the police or other investigation institutions, like jails, finance crimes investigation services, customs, law enforcement authorities, etc.) to all process actions carried out by the police and the electronic exchange of information between the police, the prosecutor's office and courts. The IISPP system's task was also to improve all activities

The improvement of the cooperation between the institutions required the development of a single solution which could be used by all of them. Therefore, the Ministry of the Interior of the Republic of Lithuania decided to cooperate with Asseco Lithuania, a company of the Asseco Group, in order to develop and implement the Integrated Information System of Penal Process (IISPP).

related to penal investigation carried out by the prosecutor's office, including the cooperation and exchange of information with courts and their employees.

In addition, Asseco Lithuania with partners was responsible for the supply and installation of the software, licenses and hardware, the de-

velopment of the system modules, the modernization of the system used by the police, prosecutor's office and court, and the integration of IISPP with registers and other systems. The project began in 2013 and was completed in 2015 (warranty support until 2017). In 2017 the IISPP system was modernized in order to meet the new customer needs and functional requirements. Additional integrations, substitution functionality, adaptation to always changing Code of Criminal Procedure were implemented. In 2018 additional module dedicated to handling a high volume content (i.e. video content) and integrated tools for viewing video content were developed.

Its implementation ensured the efficient exchange of data between

### Project's results.

- One database and one centralized system for the organization of pre-trial investigations.
- Common forms, common view of data.
- Easy and flexible search.
- Bi-directional data exchange between IISPP and registries and other systems.

### Key benefits.

- One data source for all pre-trial institutions.
- Handling all pre-trial investigation activities.
- Archiving of whole data set (documents, photos, videos) from the investigation.
- Control of compliance with the penal procedure code.

all the institutions involved in the penal process. It also enabled them to effectively create, manage and exchange documents and tasks, search for data and carry out reporting activities. In addition, it improved investigation and pre-trial control, judges' activities, IISPP user management and event audit. Asseco Lithuania also upgraded the relevant pre-trial systems of the investigative bodies and ensured the integration of the new solution with approximately 15 registers and systems. This created new opportunities for procedural interactions via IT system between police officers, prosecutors and judges. As a result, all penal case files can be signed electronically and transferred between the institutions until action is taken by the court.

- Basis for data interchange with other countries.
- Electronic documentation and e-signature.
- QR code (QuickResponse Code) in documents.
- Reporting tools.
- Reminders of the conditions for pre-trial investigations.
- Access to data according to permissions.

- Improving data security.
- Possibility of verification and transparency of pre-trial investigations.
- Efficient use of resources.

### Project in numbers:

**15**

registers and systems integrated with the solution

**5,000**

transactions executed per hour

**10,000**

active system users

**85,000**

cases handled annually

**10 million**

operations per month



Chapter five |

# **UTILITY & TELECOMMUNICATIONS**

| Asseco Central Europe

# **PRAŽSKÁ PLYNÁRENSKÁ DISTRIBUCE:** **GAS PIPELINES SUPPORTED BY TECHNOLOGY.**

## Customer.

Pražská Plynárenská Distribuce, a.s. [PPD] is the subsidiary of Pražská Plynárenská, which is responsible for natural gas distribution in the area of Prague. PPD's task is the safe handling, maintenance and modernization of the gas distribution network in the Czech capital. The company has high-quality technical facilities and professional employees who have many years of experience in the operation and construction of gas installations.

The geographical location of gas pipelines plays an important role in the activities of engineering and construction companies, architects

and planners. In order to prevent breakdowns or possible accidents, they must be provided with accurate and reliable network information. According to the regulations, it is PPD which is obliged to provide the access to the data concerning the Prague area. Therefore, in April 2017 the company signed an agreement with Asseco Central Europe [ACE] for the implementation of V3S Data Delivery Portal (based on the Technical Information System) and related IT services. The new solution was built on the basis of SAMO Portal Technology.

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The development of the comprehensive Data Delivery Portal allowed the company to improve the efficiency of its services.

## Implementation.

The goal of the project was to build the comprehensive Data Delivery Portal, which will allow the company to increase the effectiveness of the services provided. An important element of the implementation was also the company's need to meet the obligations imposed by the regulator. They concerned providing external entities with the electronic access to the data on: gas installation networks, project documentation, the execution and location of network, the notification on the handover of the site and the delivery of territorial analytical documents.

The system uses the data from the Register of Territorial Identification, Address and Real Estate [RÚIAN] to enter the address data and is connected to the services of the Administrative Business Registry [ARES] for retrieving addresses of legal entities based on the given IR. The solution is also integrated with the ArcGIS server's geospatial services and with SMTP / SMS gateways for sending emails and sms notifications. The new Data Delivery Portal provides efficient verification of specific areas in terms of the existence of gas installations and pipelines. All necessary network information can be printed by the user or made available as DGN [CAD] files.

## Key benefits.

The implementation of the comprehensive portal solution was completed in March 2018. It has enabled PPD to meet its information obligations under the Construction Law. The system has covered the entire life cycle of applications, from the first contact, through processing, to the closure and delivery of statements and relevant documents.

The implementation of the project has resulted in a significant reduction of the operating costs of the company, which, thanks to the integration with the GIS system, has gained at the same time a tool enabling the automatic evaluation of the gas network system.

The Data Delivery Portal has ensured efficient interaction with customers. Its implementation has improved the efficiency of handling more than 12,000 requests per year, which are now processed automatically. This, in turn, has resulted in significant time saving for employees who can devote themselves to other tasks. In addition, it has improved and accelerated the communication with the customer, who, thanks to a fully automated service, no longer has to appear in person at PPD.

## Project milestones.

Analysis and audit of current business processes while defining homogenization of these processes.

Optimizing processes.

Customization and development of the system to integrate it into the customer's environment.

Development and modification of the interfaces.

Data migration.

Coordination with projects in progress.

Providing post-implementation support.

## Project in numbers:

**244**

gas pressure regulation and measurement stations

**4,437 km**

of the gas network (374 km of high-pressure, 2,780 km mid-pressure and 1,283 low pressure networks)

**10,050**

home regulators

**14,380.7 kWh million**

natural gas sales per year

**397,073**

off-take-points

# ZÁPADOSLOVENSKÁ DISTRIBUČNÁ: **ELECTRICITY SETTLED BY AN IMAGE.**

## Customer.

Západoslovenská distribučná a.s. (ZSD) is the subsidiary of Západoslovenská energetika a.s., part of the German energy group E.ON. As the largest electricity distributor in Slovakia, with more than 95 years of history, it is subject to regulatory rules under the relevant laws. The mission of ZSD is to ensure safe and reliable energy supplies as well as to improve the quality of life of the citizens in the western region of

Slovakia. In order to achieve this goal, the company has made significant investments in the renovation and development of distribution facilities and the development of electronic services for its customers. ZSD is a modern company, which attaches great importance to improving the quality of offered services. That is why it wanted to implement an IT solution which would improve the process of reading data

from electricity meters and enable efficient flow of Big Data, among other things. The company was also looking for a way to reduce costs and optimize the logistics of meters – from the moment of their delivery to implementation. Therefore, it decided to create the ZSD Mobile Application and invited eDocu, a company from the Asseco Group, to cooperate in this project.

## Implementation.

The project began in March 2017 and assumed the development of a solution which would support both ZSD's customers and the company's processes. Its implementation was preceded by a very thorough analysis of the company's needs, which allowed to precisely define the functionalities of the new solution.

The ZSD Mobile Application designed by eDocu consists of two parts. The first is intended for end users and allows them to use electricity efficiently. Thanks to the OCR (Optical Character Recognition) technology, the application makes it possible for customers to perform meter readings on their own. They only need to scan the digits and

the application passes on the collected data to the distributor, where they are verified and sent to the energy supplier. An invoice is issued on this basis. This eliminates the need for a personal visit by the customer, who can also monitor energy consumption through the application on clear graphs in weekly, monthly or annual cycles.

The second part of the application is responsible for the improvement of internal processes of ZSD. The implementation of the solution has provided the possibility of monitoring the entire logistics process of electricity meters. The company has also obtained full data on their location.

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The implementation of the application helped to reduce the costs associated with meter-reading which previously had to be done manually.

The entire back-end and service infrastructure runs on the general eDocu system. The application has also been integrated with the internal SAP system, which helps to collect all the relevant data. Both parts have been adapted to the customers' needs, in accordance with their requirements and internal processes.

It was the first implementation of this solution carried out by eDocu and at the same time the first client of the company in this sector. The mobile application was made available free of charge in September 2018, thanks to which it is already be used by about 1 million ZSD's customers from the Western Slovakia region. Approximately 6 eDocu's experts took part in the project - they responded to the client's needs and suggestions on an ongoing basis. Currently eDocu is working on the extensions of the application for entrepreneurs and large customers.

## Key benefits.

The implementation of the application has helped to reduce the costs associated with meter reading, which previously had to be performed manually by ZSD's staff at each point of electricity consumption. It has also streamlined internal processes and provided quick access to data, which has improved the efficiency of settlements and enabled the accurate analysis of potential irregularities or fraud.

The ZSD Mobile Application has made it possible for electricity consumers to read meter readings on their own and monitor their current electricity consumption. As a result, they can compare when the con-

sumption level is the highest and assess whether they use electricity optimally at home. They can get estimates of future consumption or activate notifications on daily and monthly overruns specified in the contract. The use of this information can contribute to additional savings and lower bills.

The implementation of the application has significantly improved the communication with ZSD's customers, who can easily contact the company or report a shortage in the electricity distribution network, among others. They have also gained the access to up-to-date infor-

mation on possible downtime or failures in the electricity distribution network. In addition, they can find a qualified electrician or contact ZSD via the app.

Thanks to the application, customers have also obtained all the necessary information concerning contracts and invoices, among others. They have also saved time because they have become the administrator of their own data and can quickly update details, for example on their address, through the app.

## Project milestones.

Deep analysis of customer needs.

Back-end software development.

App programming.

Integration with other systems.

App's release at AppStore and Google Play.



We create

**DATA CONNECTION**

# ORANGE: TWO WORLDS OF TELECOMMUNICATIONS.

## Customer.

Orange Polska is listed on the Warsaw Stock Exchange (WSE) and is part of the Orange Group, a leading provider of telecommunications services in Poland, Europe and worldwide. Orange Polska provides mobile and fixed-line telecommunications services, including voice connections, message and content transmission services, Internet access and television. In addition, it provides ICT (Information and Communications Technology) services, leased lines and data transmission services, as well as sales of telecommunications equipment, electricity trading and the development of telecommunication infrastructure. In Poland, Orange is leader in the fixed telephony, Internet and data transmission markets. It is the only unique operator offering comprehensive telecommunications solutions available nationwide. Orange aims to provide the highest customer satisfaction and remain the most chosen provider of telecommunications, multimedia and entertainment services which use modern technologies.

Orange provides fixed telephony services to approximately 3.5 mil-

lion subscribers based on two different technologies: TDM – i.e. via traditional digital switching systems and by modern VoIP – telephony based on the SIP protocol. Orange wanted to improve cooperation of these two systems to provide smooth communication between them. To achieve this goal, the existing solution had to be replaced with a newer, more reliable, efficient and cost effective system. The implementation of this project, which also allowed for the reduction of operating costs (OPEX), was associated with a very significant challenge – the implementation of a completely new, critical system into the backbone network operator. The key factor regarding Orange's choice was finding a proven and reliable vendor who had the competence, necessary capabilities, experience and engagement to successfully complete this demanding project. This was the reason Orange Polska decided to implement Asseco Media Gateway Control Function (Asseco MGCF), Asseco proprietary solution.

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Asseco MGCF completely replaced the existing platform, becoming one of the most critical systems for maintaining the continuity of core fixed-line Orange services in Poland.

## Implementation.

The main project goal, which began in November 2016, was to ensure the continuity of long-term services of Orange's fixed network core in all of Poland. This was achieved by ensuring cooperation between VoIP and TDM – two areas of the network which are significantly different in terms of basic technology. Asseco MGCF replaced the existing platform completely and became one of the most critical systems for maintaining the continuity of Orange's fixed-line services in Poland.

Asseco MGCF was built in JAVA language according to the JSLEE standard and operates within the JBoss application server. The system is responsible for the conversion of signaling between VoIP and TDM networks for SIP and ISUP protocols. It has mechanisms for configuring protocol cooperation and filters, which are important for handling the vast amount of traffic coming from other telecommunications networks.

The MGCF system implemented by Asseco provides Orange Polska with the following functionalities:

- connections handling in SIP-ISUP, ISUP-SIP relations, as a local exchange,

- connections handling in ISUP-ISUP relation, as a transit exchange,
- support for ISUP, SIP, MEGACO (h.248), MGCP, ENUM,
- support for number portability through communication in the ENUM protocol,
- cooperation protocol configurations and filters,
- handling several hundred new connections per second while maintaining many thousands of active connections.

The MGCF system in Orange Polska communicates:

- in the TDM network with international, transit and local telephone exchanges, via SS7 protocols in the SIGTRAN network (120 telephone exchanges of 4 types),
- in the VoIP/IMS network directly with the main Session Router/Controller elements operating within the New Border Infrastructure platform,
- with 16 Media Gateway (MGW) instances of three different types across Poland.

## The main stages of the project included:

Approx. 8 months – design, development of basic system version.

Approx. 14 months – tests and system modifications.

Approx. 6 months – migration which took into account:

- physical resources of TDM throughout Poland,
- traffic at the point of contact with VoIP network,
- international, transit and domestic traffic in both relations,
- reliability tests in real traffic.

The introduction of Asseco's product into the Orange backbone network was an enormous challenge for the project team. This was primarily due to the need to carry out a very large range of tests, as for one system. The aim was to confirm the compatibility of telecommunication protocols, starting with tests of cooperation with a wide range of the operator's network equipment on through support scenarios involving handling various end services. This part of the project, which lasted for approximately one year, was carried out in the Orange laboratory and on the production network, and included:

- Approximately 2,000 protocol compliance scenarios performed by

several teams of Orange experts. Their scope was highly diverse: from automatic telecommunications protocol testers to service handling scenarios for many different types of end equipment.

- approx. 2,000 scenarios implemented in the production environment included:
  - tests of cooperation with all telephone exchanges carried out by teams all over Poland,
  - interoperability and reliability tests with the SIGTRAN network,
  - traffic tests handling at the border of availability of resources in a specific relation (handling of collisions, transfers, etc.).

As part of the project, Asseco and Orange's team of experts integrated the new solution with other Orange systems, migrated domestic resources as well as ensured local and geo-redundancy.

This was one of the most technologically complex implementations carried out by Asseco for Orange Polska. Completed in January 2019, the project required tests and reconfiguration of 120 telephone exchanges of 4 types, which required the cooperation of personnel throughout Poland. At its peak, the project included about 90 specialists from Orange and more than 20 engineers from Asseco.

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„The main objective of the MGCF project was to ensure the continuity of the fixed-line voice network services of Orange in Poland and at the same time increase the cost effectiveness of their provision. Replacing the existing solution with a new, much more efficient and economic system, allowed us to fully achieve this goal. Building a system from scratch connecting two worlds of different voice service technologies was a difficult and ambitious challenge. The teams of Orange Polska and Asseco can be proud of the results of their joint work on this project” – said Krzysztof Kaszewski, Head of the Network Development Department at Orange Polska.

„The new MGCF system enables our customers to make fixed-line calls and is much more efficient than the previous one. Its implementation has also significantly reduced operating costs, which translates into the OPEX ratio” – said Łukasz Trzos, Director of Convergent Network Development at Orange Polska.

## Key benefits.

The new system implementation allowed to reduce platform maintenance costs significantly and provide long-term support. The solution not only met the high requirements of this large telecommunications operator such as reliability and efficiency of connection handling, but the new system also proved to be more flexible, efficient and scalable than before.

The system is fully adaptable to further development, which significantly shortens the time to market for introducing modifications to protocol cooperation and callflows algorithms, which may be necessary e.g. for

launching access to new inter-operator connections or transit services. An additional advantage is the proprietary architecture of the solution, which allows for its further expansion and makes it possible for the telecom to become independent of outside software and hardware manufacturers. Due to the deployment of Asseco MGCF, Orange Polska has a scalable and efficient system in a suitably matched license model, which does not require, among others, operating licenses or product licenses of third parties.

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„It was a ground-breaking project for Asseco as we created a solution for Orange which operates in the main part of the backbone network and is responsible for the ability to provide basic telephone services. This means that the solution provided must work with the right efficiency, performance and reliability. It is the only element of this type in the fixed part of the Orange network responsible for communication between the IMS and TDM network areas, both at the domestic and international level” – said Maciej Kogut, Head of the Networks and Mobile Services Area at the Telecommunications and Media Division, Asseco Poland.

„The implementation of Asseco MCGF in Orange Polska was an unprecedented challenge for the Telecommunications and Media Division project team. Moreover, besides telecommunication protocols implementation, we faced a distinctive and demanding way of verification and deployment for provided solution. Despite the project’s challenges, the long-standing cooperation between Asseco and Orange Polska proved to be one of the key factors of success. We hope that the created Asseco MGCF product will meet market interest, especially from operators looking for alternative solutions for expensive and outdated systems” – said Radosław Semkło, Managing Director of the Telecommunications and Media Division, Asseco Poland.

## Project in numbers:

# 6

months – telephone exchanges migration of resources on a domestic scale

# 14

months – system tests and modifications before implementation

# 16

Media Gateways – 3 types

# 110

professionals involved in the project

# 120

telephone exchanges of 4 types integrated and tested

# 450

maximum and **130 on average CAPS** [call attempt per second] during peak hours, effectively handled by a single instance in real traffic

# 4,000

tested scenarios repeated several times in 4-5 week cycles, along with application development

# 60,000

connection channels

**Technology for business,  
solutions for people.**

DZIĘKUJEMY, THANK YOU, DĚKUJI, ĎAKUJEM, DANKE,  
AČIŮ, NA GODE, OBRIGADO, MERCI, GRAZIE, HVALA,  
DZIĘKUJEMY, THANK YOU, DĚKUJI, ĎAKUJEM, DANKE, AČIŮ,  
NAGODE, OBRIGADO, MERCI, GRAZIE, HVALA, DZIĘKUJEMY,  
THANK YOU, DĚKUJI, ĎAKUJEM, DANKE, AČIŮ, NA GODE,  
OBRIGADO, MERCI, GRAZIE, HVALA, DZIĘKUJEMY, THANK  
YOU, DĚKUJI, ĎAKUJEM, DANKE, AČIŮ, NAGODE, OBRIGADO,  
MERCİ, GRAZIE, HVALA, DZIĘKUJEMY, THANK YOU, DĚKUJI,  
ĎAKUJEM, DANKE, AČIŮ, NA GODE, OBRIGADO, MERCI,  
GRAZIE, HVALA, DZIĘKUJEMY, THANK YOU, DĚKUJI, ĎAKUJEM

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