

# Reference Booklet Digital Success Stories

**T Systems** Let's power  
higher performance





# Digital Success Stories

Discover success stories of how T-Systems is transforming its clients' businesses with extensive digital expertise and in-depth process and industry knowledge. T-Systems brings customers all the latest digital solutions and a sustainable ecosystem to support them in their digital roadmap across various industries and to accelerate a sustainable future for all of us. Innovative solutions based on bleeding-edge technologies help clients elevate their business performance, focusing on the end-to-end aspects of services. Over the past few years Deutsche Telekom and T-Systems gained several leader positions from the Information Services Group (ISG) across multiple topics such as Intelligent Automation Services, Digital Business Enablement and ESG Services, SAP Services, ServiceNow Services, and so on. Pierre Audoin Consultants (PAC) ranked T-Systems in 2023 as best-in-class in 8 categories in sustainability-related IT consulting and services in Europe 2023.

With this selection of successful customer projects, we want to inspire you.

What would you like to achieve for your company?

Happy to get in touch,

Stefan Spielbauer

Senior Marketing Manager Digital Services

**Contact us  
now!**

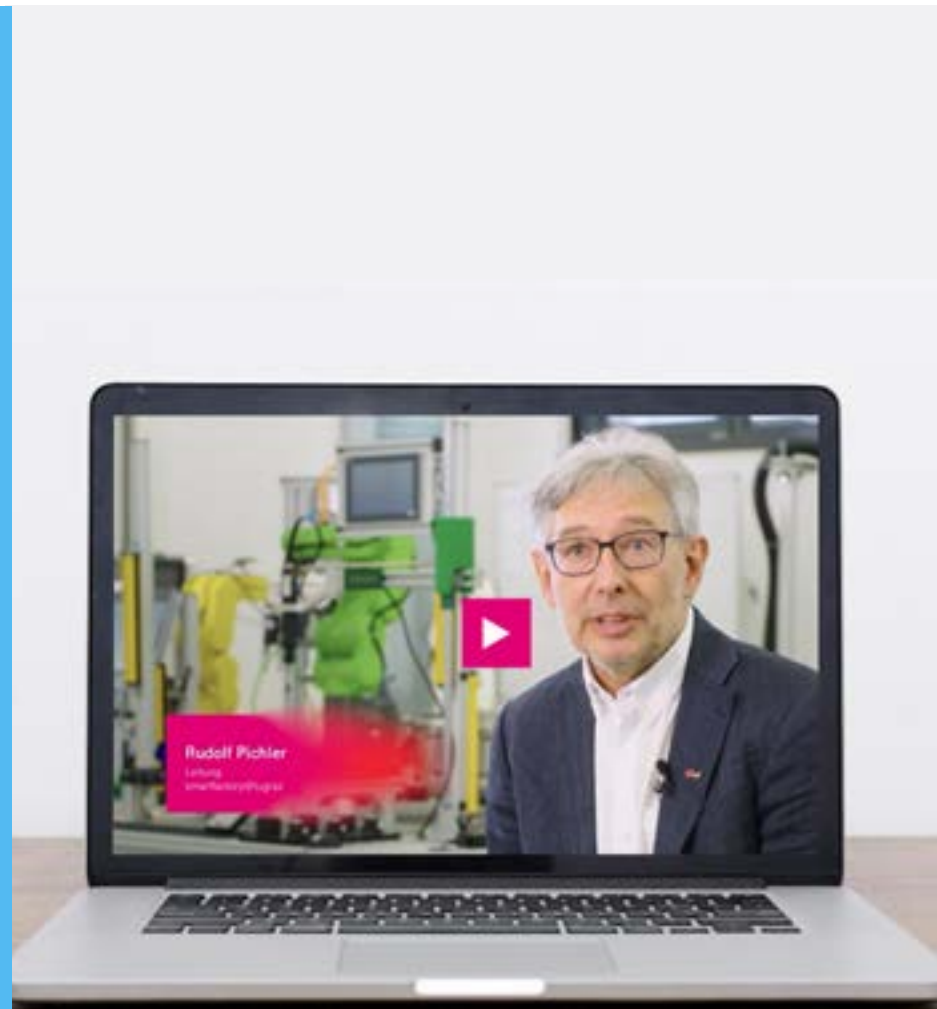
 Online contact form

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# Contents

Technical University  
Graz benefits from  
T-Systems' Security  
Services and PDM  
WebConnector



Weck-Verlag:  
Robot colleague in  
the editorial team  
converted 17.000  
articles



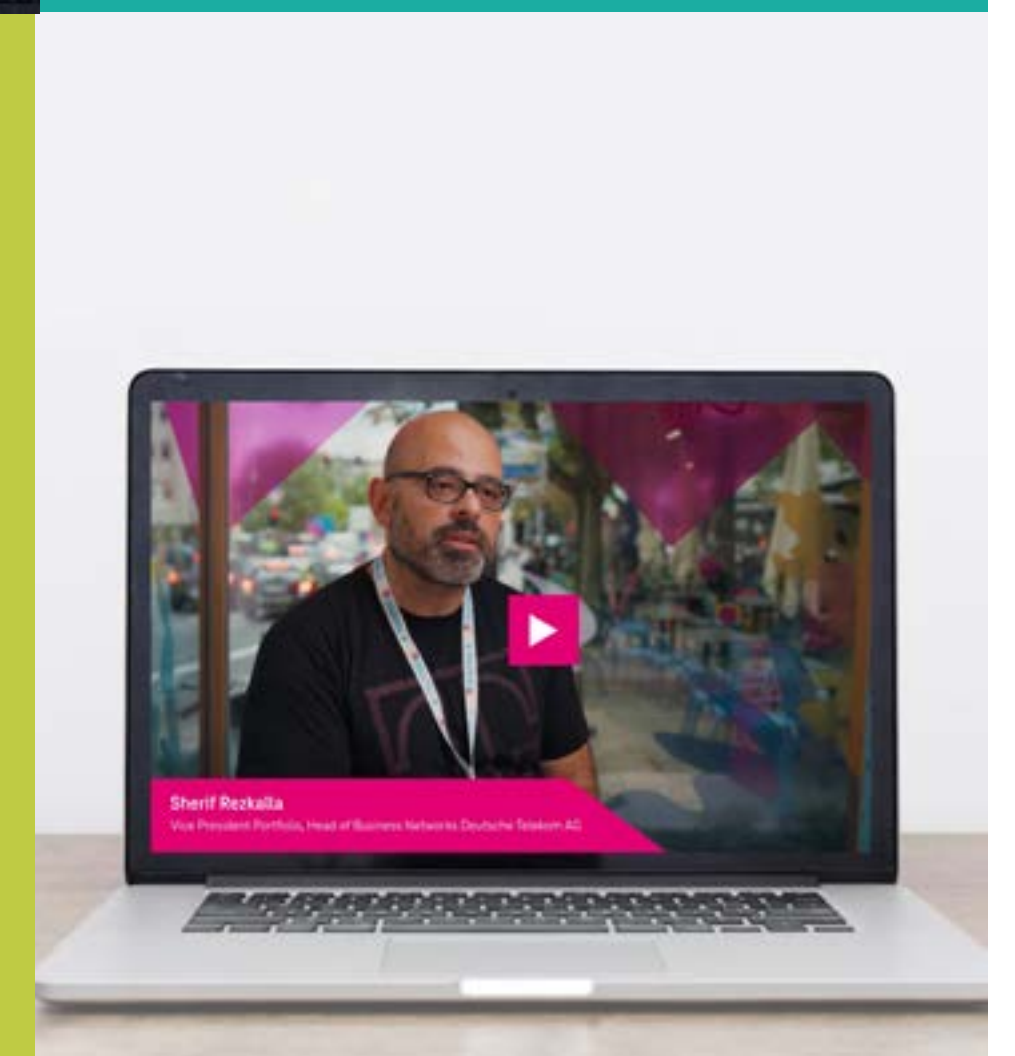
Sherif Rezkalla,  
Deutsche Telekom  
AG, talks about the  
use of ServiceNow  
as the “heart” of the  
core processes and his  
experiences with this  
platform



KUKA: Elevating  
automation  
excellence for smart  
manufacturing



Mercedes-Benz:  
With Data-as-a-  
Service, T-Systems  
is speeding up test  
drive analyses





# Contents

**Adeje: Stepping into the future as a smart tourism destination**



**Tarragona City Council: Global and transversal digitalization for public administration**



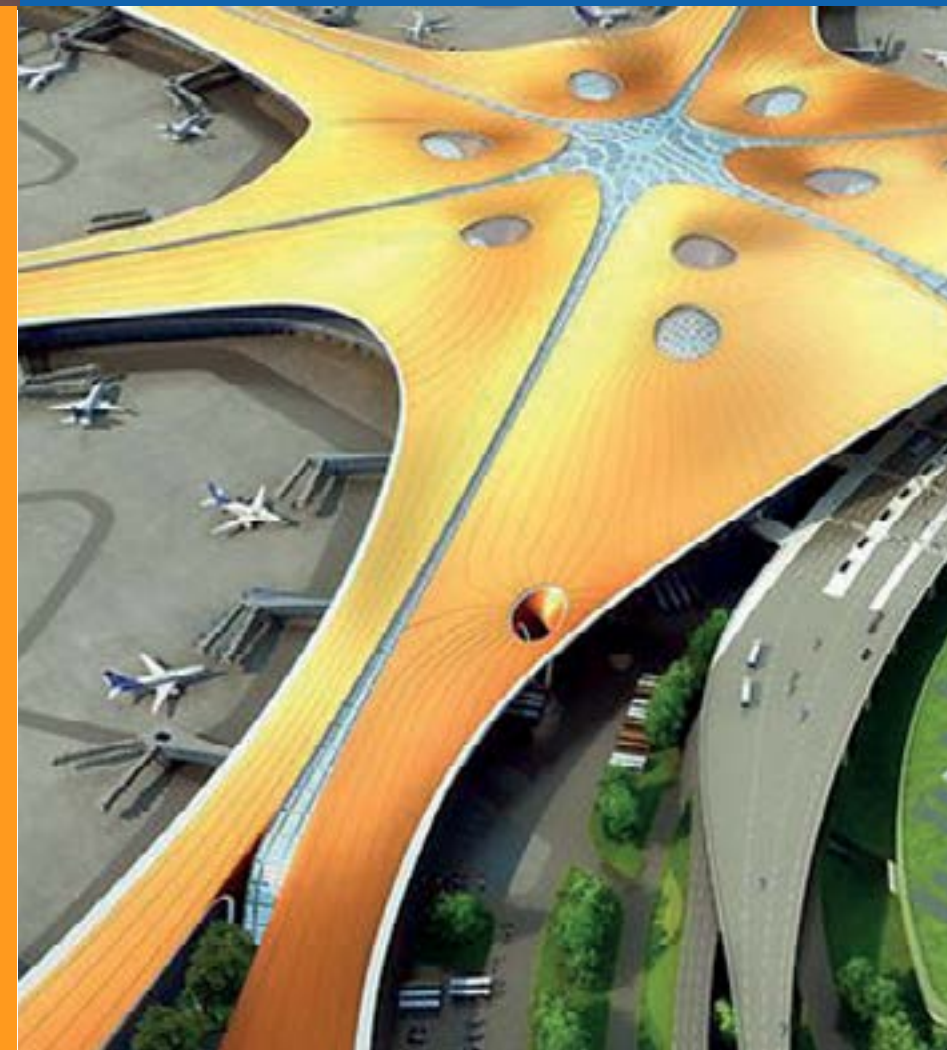
**Rhine/Main Regional Transport Association: Transportation safety for self-driving shuttles**



**Marek Rydzewski, BARMER CDO, on Digital Identities in Healthcare**



**Beijing Airport: Digital airport management for smooth aircraft movements**





# Contents

**DT Technik: AI-based network operation center space optimization**



**Generalitat de Catalunya: Partnering for innovation and quality**



**gkv informatik: A partner on the journey to digitalization**



**T-Systems and Mercedes-Benz do Brasil develop an innovative application for drivers and fleet owners**



**Comfort Charge: Groundbreaking platform for managing electrical charging infrastructure**





# Contents

**Free State of Saxony:  
Modern financial  
administration in  
Saxony with Pega  
and SAP solutions**



**Diepholz district:  
IoT solution from  
T-Systems for  
sustainable water  
management**



**Autohaus Gitter: The  
digital car dealership**



**Boasteel Tailored  
Blanks uses the  
automated solution  
Kofax Total Agility  
for its invoices**



**Automobile  
manufacturer: AI-  
driven QA process  
helped to reduce  
errors during  
production**





# Technical University Graz benefits from T-Systems' Security Services and PDM WebConnector





# Robot colleague in the editorial team

WECK-Verlag (WECK publishing house) converting 17,000 articles using Robotic Process Automation (RPA)



**“T-Systems’ RPA made it possible to continue with editorial work without interruption despite the technological switch to new hardware and software.”**

Eberhard Hackelsberger, CEO of J. Weck GmbH u. Co. KG

Which companies can say that their company name has become part of their country’s language? Well, the WECK company from Wehr-Öflingen in Baden Württemberg can. Since 1900, it has been selling its famous WECK-Gläser (glass preserving jars) and further preserving tools (jars, pots, accessories).

Over time, the company has diversified its product range and now also offers candlelight glassware as well as packaging glass for the filling industry. The Weck publishing house with such publications such as “Ratgeber Frau und Familie”, “Lust auf Natur”, and “Weck Landjournal.” is also part of the company. Five or six-figure quantities of these magazines are published each month or every second month. The publishing house also prints further special magazines on food and drink, culture, living, gardening, and travel.

The editorial team previously worked using Apple hardware and software with QuarkXPress for editorial work and issue design. However, as part of an IT consolidation process, the IT department decided to replace the Apple systems and, consequently, the established QuarkXPress with a Windows-based solution in 2021. The team switched to standard PCs with Adobe InDesign.

## At a glance

- Technological switch: From Apple to Windows
- QuarkXpress replaced with Adobe InDesign
- Extensive article archive with QuarkXPress documents
- No solution available for mass conversion
- Managed service from T-Systems
- Migration of approx. 40,000 potential documents to be converted
- Development of a robot to convert the data incl. logging and troubleshooting
- Development of a script to filter the documents that are actually to be migrated
- Conversion of 17,000 files into INDD format
- Employees relieved of repetitive conversion activities
- Retention of file and filing structures
- Inexpensive conversion
- Editorial work without interruption
- Avoidance of permanent license costs associated with the replaced system



# The reference in detail

## The challenge

Over the many years of editorial work, an archive comprising approx. 45,000 articles had been collected. The change of infrastructure and software meant that the editorial team would no longer be able to access or work with the old articles. This is because Adobe InDesign is unable to process the QXP format. And filing something in the archive isn't simply a matter of "out of sight, out of mind" for the editorial team. Nearly every day, editorial and layout staff need to access material from the central archive in order to re-use it, answer readers' questions, or for their own research.

To ensure a smooth transition between the editorial environments, the team needed a quick and functional solution in order to ensure access to the content in the archive. Conversion was unavoidable. However, the established data filing structures and names needed to be retained during this process, but QuarkXPress permitted naming conventions (special characters) that are not supported by Adobe. An initial estimate indicated that almost 9,000 files needed to be converted immediately. And the tools on the market were only able to convert individual files. How is it possible to perform mass conversion?

## The solution

The solution was the use of a software robot. However, some framework conditions first needed to be established for the conversion project. A date for the migration from QuarkXPress to Adobe InDesign was agreed. After this date, it was no longer permitted to create QXP files. Sufficient storage space needed to be made available for the new (and old) files. Using an analysis of the existing content, priority was determined: 17,000 files were converted and 28,000 were ignored. This categorization was performed by software developed by T-Systems.

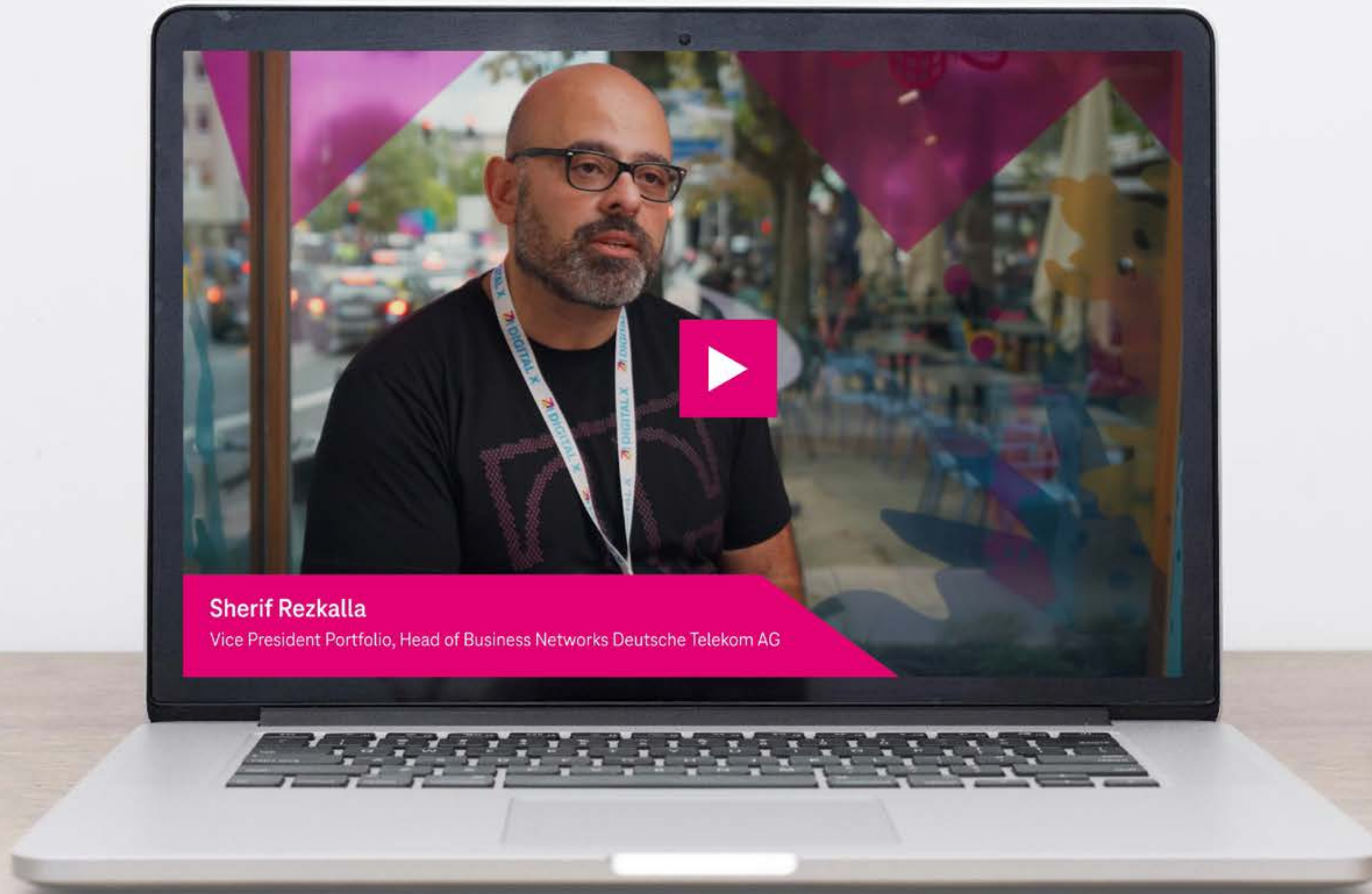
Finally, suitable conversion software was required. After a third-party provider had supplied such software. T-Systems designed the Robotic Process Automation (RPA) for the conversion process. It maps the manual process – it opens the file to be converted, launches the software, removes the special characters that cannot be mapped in the file name, and saves the new INDD file in an identical structure. The old QXP files are retained. The robot was created in almost one week. It needed around two weeks to complete the entire file migration process – incl. quality review of the converted files. Once the project was completed, the robot was "retired".

## Customer benefits

T-Systems offered the WECK publishing house the conversion as a managed service. This means that T-Systems not only developed the robot, it also converted the files and secured their functionality. Thanks to the robot, the editorial team received the files required to perform their editorial work with a quick turn-around. Using RPA on a project basis, the WECK publishing house did not need to provide any conversion software for employees or even maintain the replaced infrastructure. As part of the conversion process, the editorial team employees do not need become accustomed to new steps or processes and can simply continue to work in the established structures. This ensures good usability.



# Sherif Rezkalla, Deutsche Telekom AG, talks about the use of ServiceNow as the “heart” of the core processes and his experiences with this platform.





# Master of test data

With Data-as-a-Service, T-Systems is speeding up test drive analyses



**“Data-driven decisions that previously required a huge workload and a much longer lead time are now possible.”**

Bastian Wymar, Portfolio Management Data Intelligence, T-Systems

Many carmakers are convinced that individual mobility will remain a basic human requirement in the future. However, the CASE (Connected, Autonomous, Shared, and Electrified) era is changing the ground rules: Customer experience is becoming the priority. The focus is on sustainability, electric vehicles, and automated driving, as well as the potential offered by digitalization. All of these drivers are having a huge influence on the way in which cars are developed. In modern vehicles, driver assistance systems and online value-added services are becoming increasingly efficient, while vehicle electronics, onboard sensors, and bus systems are becoming more and more complex and are collecting more and more data. On test drives, it is important to analyze this data intelligently in order to meet very strict quality requirements further down the line during series production. Mercedes-Benz AG – with its focus on services and the development, production, and sale of cars and vans – is just one carmaker that found existing systems for collecting test drive data had reached their limits.

## At a glance

Development engineers and IT departments have joined forces with T-Systems to create a future-proof end-to-end solution that is setting new standards for the sector. It is based on an intelligent combination of a central cloud and decentralized edge resources. T-Systems has submitted a patent application for a new type of software called Big Data Signal Processing, which runs on big data clusters of edge computers and makes the local analysis of highly complex, extensive measurement data up to 40 times faster. The local resources are connected to a central cloud for uniform, central access to the local clusters (federated Spark).

- Data transcoding of machine signals
- Up to 90 percent data compression rate
- Measurement data available within a few hours
- Data analysis up to 40 times faster
- End-to-end solution: network, cloud, edge, applications



# The reference in detail

## The challenge

The test drives for endurance testing are one of the milestones in vehicle development. The engineers in the development departments specify the exact types of data to be recorded for these. Carmakers send a whole range of prototypes for new models to different test routes at the same time – to both deserts and permanent ice zones – to examine their behavior using a three-shift pattern. These handmade vehicles include extensive measurement technology to record the behavior of the different components (including the software) during the endurance test. During one shift, approx. 10 to 100 GB of data accrues in all sorts of data formats. Once the test drive has finished, the data is transferred from the car to a data warehouse and measurement data management system. The engineers at the development sites receive the raw data via file shares and copy it to local file systems. This process not only results in considerable data redundancy, it also takes a lot of time: It can take several days for the engineers to gain access to the measurement results. If errors are then detected, the cars and drivers have already gone to different places. That makes it extremely time-consuming and costly to reproduce the tests. The situation is further complicated by the current trends toward electric vehicles and automated driving, which are increasing the volumes of data recorded to TB levels. T-Systems has developed a new process to reduce the data provision time in the future.

## The solution

T-Systems is winning customers over with a high-performance end-to-end solution that optimizes the entire process and allows “data as a service” to be used. The core components of the solution are edge computing resources, a central cloud platform, the Big Data Signal Processing software, which is compatible with Hadoop/Spark, and the federated Spark system based on it. After the test drive, the measurement data (signals) is transferred to big data clusters via Wi-Fi. These are in the edge computing resources that are permanently installed at the test sites. They are managed and operated by T-Systems. Big Data Signal Processing (BDSP) is also installed locally on the systems. BDSP pre-processes the measurement data, i.e., the different data formats collected are transcoded into standard big data formats. And this is precisely the point: It enables processing to be up to 40 times faster for decoding and subsequent analyses than when using conventional tools. That’s because BDSP allows parallel interpretation of the measurement results recorded from distributed, binary, or textual trace files. In practice, the volume of data is reduced by up to 90 percent. BDSP also supports signal resampling and tagging and has an API for connecting to other systems. The edge part of the solution is complemented by a central cloud with a federated Spark system. This system enables engineers to access

the measurement data – regardless of where it is located. The federated Spark system automatically identifies data for the developers. However, the developers not only find the right data, but also trigger the corresponding analyses on the edge servers via the cloud. That means that only instructions and results have to be transferred between the test sites and developers’ workplaces, rather than the complete raw data sets as in the past. This avoids the need for a costly expansion of the MPLS network. The solution also scores points for security: The measurement data is already encrypted when it is stored in the vehicle and remains highly encrypted and secure at all times. This also applies to the transport layers, including the transport protocols between the vehicle and edge resources as well as to network access points.

## Customer benefits

With the new system, Mercedes-Benz is gaining a groundbreaking and future-proof platform that significantly speeds up work for development engineers and enables a faster time-to-market. The engineers at development sites can now gain access to measurement data within a few hours. On the one hand, they can start working with the measurement results immediately, and on the other hand, they can identify errors directly, allowing them to arrange a repeat of the test drive. This is bringing them closer to testing and reducing development cycles. The new solution has yet another benefit: Detailed measurement plans and precise specifications for the measurement data to be recorded are no longer needed. The engineers have access to the entire measurement data set at all times and can analyze it at a later date if specific questions arise. This creates tangible cost advantages and contributes toward sustainability. The number of test drives is falling and the tests are becoming more efficient – allowing data-driven decision-making, which was only possible with a huge workload and much longer lead time in the past. The engineers can continue using their tried-and-trusted systems and also utilize different tools from the big data community, as the integrated API makes it easy to connect to BDSP. The API also offers another benefit: It now allows the actual use of the recorded data to be analyzed. On top of everything, the introduction of the new architecture is making it easier for carmakers to collaborate with suppliers and to control the data. Until now, suppliers received the raw data for their analyses and had to return their completed analyses back to the original equipment manufacturers (OEMs). Now it is possible for the suppliers to process these analyses directly on the carmakers’ systems, so the raw data no longer has to leave the plant.



# KUKA: Elevating Automation Excellence for Smart Manufacturing



Reference project

**KUKA**

**“Together with KUKA, we provide the Edge services to ensure secure and exact automation services that are tailor-made for our customers’ requirements.”**

Frank Strecker, SVP Public Cloud Managed Services at T-Systems

The world of manufacturing is going through a significant transition with edge computing and Industry 4.0. Slowly but surely, global manufacturing companies have realized the importance of digitalization as fuel for meeting the current and future challenges in production and gaining a competitive edge.

In 2020, T-Systems teamed up with robot maker and automation specialist KUKA to offer a combined Industry 4.0 package for small and medium-sized enterprises (SMEs) in the manufacturing sector. Headquartered in Augsburg, Germany, KUKA is a leading supplier of intelligent automation solutions, providing customers with a range of products, from small production cells and robots to fully automated systems and their networking in markets. KUKA provides IIoT solutions for various small and medium businesses, right from automotive, to electronics, metal & plastic, consumer goods, e-commerce/retail and healthcare.

Along with the robots, KUKA also offers its customers an operating system that not just enables flexible programming and control of the robots, but also enables data acquisition and processing from the operation of the robot. This information can be further analyzed for optimizing production processes and production time. Analysis and processing of data also help in preventing or minimizing unplanned downtime.

For many small and medium-sized companies that KUKA is catering to, it can be difficult to integrate robots into the IT infrastructure and also connect the digital services alongside it. T-Systems resolves this problem by providing the complete management of IT resources as a managed service, named EdgAIR and providing an up-to-date platform that is essential for such a business model.

## At a glance

- T-Systems and KUKA, the world’s leading automation solution provider join hands to offer a combined Industry 4.0 package
- Providing a ready-to-go bundle of industrial IoT services for small and medium industries (SMEs) in the manufacturing sector
- Focus on data-driven production and tailored automation solutions
- T-Systems is an experienced partner in edge computing whose managed services and virtualization platform was used to create a turnkey solution



# The reference in detail

## The challenge

In manufacturing companies around the world, data from robots, machines and entire production systems are being increasingly used to record and monitor the performance of the production systems. This is aimed at increasing efficiency, ensuring better quality and more sustainable production in the longer run.

One of the key challenges, however, for KUKA's customers was the storage and processing of large amounts of data that is collected by the robots. The preprocessing of this data to reduce the amount to be transferred required powerful computing and storage capacities that the robots did not possess. The easiest solution would be to outsource these to the cloud. However, this poses a fundamental challenge. The large amounts of data could result in significant network load and latencies. This would make real-time analysis quite difficult. Additionally, processing right at the customer's premises is faster than doing it in the cloud and there is no risk of information falling into the hands of third party.

This is where Edge Computing comes into play. By using the computers and storage media located on their premises, data sovereignty and performance are ensured. KUKA also needed a reliable, up to date platform on which it can offer the logic needed for the services that it offered to its customers. Certain customer-facing services must be deployed directly on the edge devices for use in the production environment.

The efficient IT systems enable customers to use the full scope of the automation solutions. Edge Computing enables a real-time experience and allows customers to view their data with relative ease.

## The solution

In 2020, T-Systems and KUKA launched the Edge portfolio, providing a tailor-made all-in-one package for its clients containing robots, software, and IT hardware including maintenance, all from a single source. While T-Systems provides the IT services from hardware to platform with EdgAIR, the Kuka service employees deliver the complete solution to the customer and put them into operation. This ensures that instead of spending additional time on management or implementation of the solution, the customers can immediately start focusing on data evaluation and optimizing their production.

As a partner to KUKA, T-Systems has provided the Edge Infrastructure along with the virtualization platform for management. The Edge device collects and preprocesses the data from all the robots and puts it into a cloud backend.

For running the KUKA applications T-Systems provides platform services as containers using Kubernetes on the central edge server at the customer site. This was specifically demanded by the customer. The provision of a container allows KUKA to unlock all the advantages of modern IT. Since the solution is platform agnostic, the applications can be run anywhere without the need for extensive hardware and applications.

The integrated managed package is specially designed for small- and medium-sized enterprises (SMEs), helping them scale up with automation and digitalization.

## Customer benefits

With the T-Systems Edge solution, KUKA is able to offer all IT services from a single source including servers, integration, servicing, support, as well as safeguarding. This enables easy integration and higher efficiency for its customers, especially for the small and medium companies who are shaping up for the digital transformation in the aftermath of the pandemic.

The joint solution between T-Systems and KUKA opens up several new avenues in the manufacturing industry through data reports and analysis. The data analytics helps reducing errors and optimizes processes, resulting in data-driven solutions and the overall improvement in the production chain for KUKA's customers.

The solution also allows remote access to software updates. This enables KUKA to maintain, repair and provide updates, without the need for local servicing – resulting in lower servicing and management costs.

The joint solution has been a step in the right direction, enabling customers and empowering them by providing digitalization from a single source.



# Adeje: Stepping into the Future as a Smart Tourism Destination



Reference project



**“It is about investing so that the new digital and technological tools that we have available improve our tourist destination and the attention to visitors, but above all it is about improving people’s lives, being more efficient and effective and doing everything that it is in our power to reduce the carbon footprint and emissions, and this project goes along those lines.”**

José Miguel Rodríguez Fraga, Mayor of Adeje.

Imagine travelling to an unknown place and being completely stumped as to where you need to go, what is the best mode of transport and how to find a place where you can relax, without hordes of people stomping around. These are some of the problems that smart tourist destinations such as Adeje are now trying to address.

A popular national and international tourist destination with gorgeous beaches and stunning coastal views, Adeje is located in southwest Tenerife, one of the Canary Islands in Spain. Tourism is an important economic activity in the region. Each year, Adeje welcomes huge tourist masses from across the globe, wanting to enjoy the long sandy beaches, delicious food, nautical sports and deep-sea diving facilities.

As is for most tourist destinations, the flip side of this is that during peak season, it can be a challenge to manage the massive influx of tourists. The result is crowded beaches, water shortage, traffic snarls, disgruntled citizens, and disappointed tourists. To avoid these issues, Adeje is now being converted into a smart tourist destination. T-Systems will deploy its AERO-PULSE city platform on which 14 components of the project will be developed. With the interactive information points and intelligent management systems on the beaches, data about the influx of tourists and citizens, water consumption in showers or noise levels will be collected and utilized for

enhancing the efficiency of services and making the lives of the tourists, the staff, and the citizens easier.

The aim is to create an intelligent platform for reorganizing the municipal services structure in an integrated manner, improving public services management and transparency in the information availability to citizens and tourists. By enhancing the information and communication technologies, Adeje as a destination can fulfil its own goals by providing quick and personalized responses to the needs of tourists, citizens and the government.

## At a glance

- Convert Adeje (Tenerife) into a Smart Tourist Destination
- Single platform for the use and public management of assets, infrastructures, and urban services
- T-Systems created the Adeje DTI Smart Tourist Destination platform and Smart Adeje App
- Improve public services management and information availability to citizens, staff, and tourists
- Citizen capacity control and remote management of public services on the beaches





# The reference in detail

## The challenge

With lovely beaches and a mild climate, Adeje is a growing tourism hub in the region. As the world gets back on its feet after the pandemic and with the influx of tourists set to increase, the municipality was looking for innovative and modern ways to cater to the new “digital tourists”, the ones who are well informed and want quick access to information at the tip of their fingers. Every year, the large number of tourists in the region posed a major challenge for the administration. With a limited staff to manage, the capacity challenges during this time had to be dealt with effectively for a smooth tourist experience. This included overcrowding on the beaches as well as the sustainability demands related to water and energy. Moreover, the solution also needed to address the concerns of the citizens and provide the staff the data and transparency to manage the tourist masses.

Technology, today, plays a key role in facilitating the interaction and integration that the tourists have with the surroundings and enhancing the quality of their experiences as well as the lives of the residents. To enable this, the Smart Tourist destination project for Adeje was initially endowed with almost 6 million euros, the beneficiary of the Red.es 'Intelligent Tourist Destinations' call, with co-financing from the ERDF through the Pluriregional Operational Program of Spain (POPE).

By converting Adeje into a smart tourist destination, the goal was to improve the efficiency of resource management, maximize competitiveness and enhance sustainability using technological innovations and practices. The municipality wanted a single intelligent platform that could provide vital information to the city council staff, the tourists and citizens. The technology will also improve city services efficiency, such as capacity control on its most-crowded beaches or optimizing the use of shower water consumption during peak hours.

## The solution

To enable the Adeje DTI project, T-Systems developed the Adeje DTI Smart Tourist Destination platform and Smart Adeje App creation. This project will cover 10 major beaches in Adeje and monitor the influx of people in the beach area thanks to a camera system with different counting strategies. In addition, data will also be collected on water consumption in the showers or noise levels, among other data that the Adeje City Council will be able to access through a 'Smart Beach' management dashboard.

All the sensors and Internet of Things (IoT) devices are connected and will deliver data into the central platform and this data would be available on the platform and the app for the tourists as well as the staff. Together with these systems, local citizens and tourists will also have interactive information points available. The data collected and predictive analysis can help the city council with active management such as issuing timely

notifications and allow the tourists to make smarter decisions. For example, if the tourist realizes that the beach that they have chosen is too crowded due to an alert sent via the app, they might opt for a different touristic opportunity on the island instead.

Apart from the smart management of the coast, the project will also focus on smart irrigation solutions, smart lighting, smart waste management, smart parking systems with 360-degree view, Wi-Fi network for tourists and improving energy efficiencies for 37 public buildings. These will be integrated into the AERO-PULSE platform. The LoRaWAN™ communications network development will enable communication between the different elements of the project. The project also includes the development of the Smart Adeje mobile application. This app is fully configurable according to the user's preferences and will provide vital information on the tourist spots in Adeje, mobility and transport services or smart parking. Apart from the information about the smart elements integrated with the city management systems, the app will also help tourists with trip planning. The app also has a notification service for users based on their location, enabled by the installation of more than 200 Bluetooth beacons throughout the municipality.

## Customer benefits

In the digital age, tourists no longer just want to visit a place, they want to enjoy unique and real experiences. By enhancing the information availability and utilizing intelligent systems there will be significant improvements in the integration and interaction of the tourists. The hyperconnectivity through the new application and platform makes the tourist experience in Adeje much easier and more flexible. The platform will connect different stakeholders and allow the information relating to tourism activities to be exchanged instantly. For the municipality of Adeje, the benefits include optimization of resources and capabilities. The platform supports public services management, monitoring, control of citizen services and improving the experience of citizens and tourists in the municipality. The project will also promote citizen participation through the CONSUL open-source participation platform and the Smart Adeje App. The citizens can also voice and seek faster redressal for their concerns. As the different phases of the project are implemented, an interconnected and intelligent system will boost resource management while maximizing both destination competitiveness and consumer satisfaction. It will also help in meeting the sustainability demands of the island, such as water conservation which is vital for the region and reducing the carbon footprint. As the project moves along, it can pave new roads for further improvement in tourist experiences and additional opportunities for all.



# Global and Transversal Digitalization for Public Administration

T-Systems is forging a new path to digital transformation for the Tarragona City Council in Spain

Reference project



**“The next 8 years are dedicated to the analysis, evolution and monitoring of solutions.”**

Pep Budi, ICT General Manager Tarragona City Council

With the changes in citizen preferences and burgeoning public utility demands, governments across the world are facing numerous challenges today. Municipalities particularly need to make the essential shift from traditional to digital channels by leveraging the right combination of emerging technologies to deliver citizen-centric and cost-efficient solutions. This is in line with the European Green Deal where amongst other things, digital technologies are acknowledged as a “critical enabler for attaining the sustainability goals of the Green Deal in many different sectors”. To meet the objectives of the Green Deal, cities across Spain are adopting digital transformation. Recently, the Tarragona City Council in Spain decided to move on from the legacy IT, isolated storage silos and verticalized processes and adopt a path towards digitalization that would allow them to improve service delivery, operations design, and achieve increased transparency, interoperability, and citizen satisfaction. This will empower efficiency, collaboration, and service quality not just for the citizens but also the 1000+ employees. With approximately 130,000 citizens, Tarragona is an important port city in northeast of Spain’s Catalonia region. To make the transition, its City Council will be relying on the expertise of T-Systems.

The project is based on the TAO, the T-Systems’ suite of services for public administration, and the T-Systems’ Private Cloud. The solution will unify all the different verticals and simplify the technological infrastructure for the City Council.

## At a glance

- Using TAO 2.0, T-Systems’ integrated municipal management platform
- A 12-year comprehensive digital transformation project
- Deployment of Syrah solution to measure Sustainable Development Goals
- Smooth migration of data
- Predictive analytics to facilitate effective planning
- Cloud-based platform for service delivery



# The reference in detail

## The challenge

With the need to improve productivity, process efficiencies and increase collaboration, the public sector is increasingly looking at digitalization and new technologies as the key drivers for change. Change initiatives and transformation projects require comprehensive digital transformation to ensure better outcomes and more productivity. Moreover, with the EU Green Deal, the cities must fulfil the demands for meeting the Sustainable Development Goals while strengthening the digital infrastructure. The Tarragona City Council has long been plagued with process inefficiencies due to the verticalized approach to municipal management.

The management areas were divided into multiple heterogeneous solutions for each management area including tax and collection system, accounting, administrative files, population register, etc. In this ecosystem, solutions from different suppliers and proprietary developments coexisted in an on-premises model, which generated information silos and often contributed to the realization of time-consuming, ineffective, and even unreliable processes. The result: citizens had to knock on several doors to complete a single errand due to the lack of integrated systems, and inefficient citizen processes.

## The solution

To improve citizen interactions, increase transparency and meet sustainability targets, the Tarragona City Council has partnered with T-Systems for a 12-year comprehensive digitalization project that covers all areas of the council and promotes interconnectedness between them. The digital transformation project will include the migration of existing legacy systems to a single efficient model. The project follows a stepwise approach and is divided

The reference in detail into two phases to ensure unified cooperation, coordination and harmonization between various sectors. The first phase of full transformation, lasting four years, will allow T-Systems to deploy the solutions to each management area, adapting the timing of the work to the requirements of the council. The move to TAO will commence once the agreement for the current solutions end. The second phase, for the next eight years, has been earmarked for the monitoring and analyzing the performance of the systems to ensure that they meet the requirements of the city council. The project will feature the implementation of TAO 2.0, a Smart City platform, which will unify the services of the city with those of the municipal management. It will provide management solutions for all municipal areas: tax collection, economic management, registration of inhabitants, administrative files, Citizen Folder, etc. The TAO solution for public administration is one of the

most widely used options in Spain, currently serving more than 22 million Spanish citizens (almost half of the country's population). Along with TAO, T-Systems will deploy several solutions including Syrah Solutions. Developed by T-Systems India, Syrah Solutions will be used for big data and data analytics for monitoring and measuring compliance with the Sustainable Development Goals in the municipality. Built in collaboration between 20 municipalities in Spain, the Solution features a configurable SDG dashboard that enables public and private organizations to define, visualize, measure and monitor sustainability indicators and has been used successfully by numerous public administrations in Spain. T-Systems will provide transversal solutions such as biometric signature for the citizen service office, secure signature from mobile devices for civil servants and public managers; or promoting proactive services through data analysis and prescription of services for automated administrative actions to the citizen.

## Customer benefits

Digital transformation is a long game. From 8 to 9 different providers to an end-to-end single platform that offers a holistic view of different verticals, the change will be a significant one, especially for the 1000+ professionals in the Tarragona City Council who will now have the right resources to cater to the needs of the 130,000 people in the city. T-Systems is one of the few experienced service providers that has the capability to implement massive digital transformation projects for the public administration in Spain and is a trusted partner in the 12-year journey.

### Added advantages:

- Significant time and cost savings in administrative processing compliance with Law 39/2015
- Less time-consuming processes and easier management
- Better user experience for the citizens of Tarragona
- Efficient data management



# Transportation safety for self-driving shuttles

The Rhine/Main Regional Transport Association is piloting a novel mobility concept – with AI software from T-Systems



**“Computervision, the solution from T-Systems, is enabling us to pilot autonomous, on-demand mobility and helping us to ensure that our passengers feel safe.”**

Thorsten Möglinger, Team Lead, New Mobility, Rhine/Main Regional Transport Association

The Rhine/Main Regional Transport Association (Rhein-Main-Verkehrsverbund, RMV) provides transportation to around 2.5 million passengers every day. It moved an impressive 808 million passengers overall in 2019. With nearly 300 cities and municipalities in the association, RMV covers nearly two-thirds of the German state of Hesse with its transportation services. Regional trains, metro lines, buses, subways, and trams drive more than nine billion passenger kilometers every year – making RMV one of Germany’s largest regional transportation associations. It provides environmentally- oriented mobility to people in the greater Frankfurt region and beyond.

Environmental protection aspects, not least the German government’s climate targets and the 9-euro ticket, have put public transportation back on the map for many travelers but have also shown where improvements are needed. The decision-makers at RMV are thinking about ways to make mobility more flexible and more customer-centric and to create stronger intermodal connections. Digital components also show potential here. Specifically, RMV wants to pilot a shuttle service on the outskirts of its served area. Self-driving minibuses with a capacity of six to eight people will be deployed on routes where passenger volumes make it impossible to run conventional buses economically. This autonomous mode of transport saves the costs of drivers.

As the operator of this mobility-on-demand service, RMV is also responsible for monitoring passenger transportation – just like any other mode of transport. While driving personnel performs this duty on buses

and trains, a different solution is needed for autonomous means of transport. RMV is piloting a digital solution for this task as part of a proof of concept that was launched in November 2022. Its subsidiary, Rhein-Main-Verkehrsverbund Servicegesellschaft mbH, has teamed up with T-Systems to do so.

## At a glance

- New solutions for intermodal transportation
- Use of self-driving minibuses
- Satisfies the required monitoring of transportation safety
- A must: Compliance with data privacy laws
- Computervision from T-Systems as object recognition solution
- AI-based application on a local edge device
- On-board analysis of video data
- Anonymized data is transported to the customer’s back-end system
- Dashboard for historical analyses and current status
- Data-protection compliant
- Foundation for business decisions





# The reference in detail

## The challenge

Serving main lines in cities and metropolitan regions is only one facet of public transportation. Another facet involves predominantly rural, structurally weak areas where passenger numbers are low – and transportation services have a low frequency as a result. All the same, large regional transport associations also have to think about how areas and zones with low passenger numbers can be connected to the transportation network efficiently and economically. To do so, they are increasingly offering on-demand services such as “call-a-bus” services or shared taxis.

The emergence of the first self-driving buses is giving new impetus to this topic. But will autonomous buses provide a foundation for operating such services economically? And how can RMV, as the responsible organization, sufficiently monitor operations, perform its supervisory duties, and guarantee transportation safety? And how can all of this be done in compliance with legal regulations? After all, RMV also has to comply with applicable data privacy policies.

## The solution

In November 2022, RMV launched a pilot project to operate self-driving shuttles on its own premises. The project integrates Computervision, a solution for person recognition. Deutsche Telekom Business Services (DTBS), which has RMV as its customer, established contact with T-Systems, which is implementing the solution.

In essence, it consists of an AI-based application that is installed on a powerful edge hardware device and can be connected with an on-board camera, which can either be already integrated into the bus or installed specifically for this purpose. The solution also features GPS tracking. However, the true intelligence of the solution lies in its pre-trained, AI-based application. Among other things, it is capable of scanning the passenger compartment. It can handle four specific use cases: It recognizes how many people are on the bus, whether they are wearing masks, whether they are standing, and whether a passenger has forgotten a bag.

A potential add-on is a tablet PC or screen that is integrated into the bus. Communications with passengers are implemented depending on the customer’s requirements and can be mono- or bi-directional. For example, if a passenger is standing or not wearing a mask, they receive an appropriate message. The tablet PC also serves as an information medium in case unusual traffic situations arise – such as traffic jams or accidents. The application on board analyzes the data from the object recognition software and transmits it to the customer’s back-end system. The Open Telekom Cloud, including a dashboard from T-Systems, can also be used as the back-end system. The important factor: While the on-board application records and analyzes videos, no still or moving images are sent to the back-end system. The application only identifies “three persons”. This completely anonymized number is added to the dashboard and the stored data.

## Customer benefits

The dashboard enables RMV to guarantee safety on the shuttle and to determine capacity utilization. Based on the data from the six-month proof of concept trial, RMV will be able to make sound business decisions on the wider deployment of the shuttles. At the same time, RMV has gained a solution that will also guarantee transportation safety in self-driving vehicles. In doing so, it is meeting its legal obligations as a transportation operator – completely compliant with data privacy laws since no personal information is transmitted.



# Digital airport management for smooth aircraft movements

Beijing Airport equipped to state-of-the-art standards



Reference project



## “Beijing Daxing Airport sets new air traffic digitization standards.”

Edgar Ziller, Head of Airport Management, T-Systems

Air passenger numbers are growing worldwide – and so, too, in China. Beijing Airport, internationally known as Beijing Capital International Airport, no longer has the capacity to handle the increasing air traffic. Therefore, following an international design competition, construction work began in 2014 to create a new airport, Beijing Daxing International Airport. Located just under 50 kilometers south of Beijing’s downtown area, in the Daxing district, one of the world’s largest civil aviation airports was built in only five years. Not only does the megaproject meet the highest architectural design standards, it is also equipped with state-of-the-art technology to overcome the challenges of the years ahead. The German digital service provider T-Systems was tasked with programming the digital airport management system and tailored its self-developed Airport Software to the Chinese airport’s specific needs within 24 months.

### At a glance

The version of T-Systems’ airport management system used at Beijing Daxing Airport is tailor-made to suit the operator’s exact requirements. It is designed to manage, once all airport expansions are completed, flight operations on a scale in line with the following parameters:

#### Size:

- Terminal area of 700,000 sqm
- Six runways
- 345 parking positions along the building and on the apron, plus 186 boarding gates
- 422 check-in desks
- 117 security checkpoints
- 3,000 flight information display boards
- 50 gangways
- 63 baggage carousels

#### Capacity:

- 100 million passengers/year
- 880,000 aircraft movements/year (2,200 flights/day)
- 186 take-offs and landings/hour

#### Main components of the airport management system supplied by T-Systems:

- Airport Operational Database (AODB)
- Resource Management System (RMS)
- Airport Collaborative Decision Making (A-CDM)
- Enterprise Service Bus (ESB)



# The reference in detail

## The challenge

100 million passengers, 880,000 aircraft movements, six runways, and a high-speed rail service: the new Beijing Airport is set to become the largest in the world within a few years. It is located at a geographical hub of the People's Republic and serves a wider area of more than 200 million people, who can reach the airport from 28 major cities within three hours. The number of visitors to the airport is expected to grow over time. In view of this steady increase in the use of the transport hub, the software that manages airport operations must be sufficiently flexible to respond to the changes over the coming months until Beijing Daxing has become the largest airport in the world.

## The solution

Passengers, flight times, aircraft width, and many other factors – an airport is a highly complex ecosystem whose operational efficiency depends on reliable information and sound decisionmaking. T-Systems' self-developed airport management system is a fully integrated end-to-end solution for digital airport management that takes account of the complexity of day-to-day airport operations through modular technical components. Based on real-time data, it maps all flight-relevant activities, enabling better decision-making and efficient collaboration between all parties involved in flight operations. Accordingly, the system plays an important role in optimizing flight handling processes and providing reliable information to passengers and staff, and, as a result, ensures flight punctuality.

The following are the main components of the airport management system supplied by T-Systems:

### • **Airport Operational Database (AODB)**

The AODB is the technical IT backbone of the management system. Similar to a database, it collects all flight-relevant data required for planning and management – from the number of baggage items through to physical aircraft data. All components of the interconnected system can access this database.

### • **Resource Management System (RMS)**

Based on the data provided by the AODB, the RMS module automatically allocates the parking position, gate, check-in, and baggage reclaim for each flight. This allows aircraft, passengers, and baggage to be handled smoothly and efficiently.

### • **Flight Information Display System (FIDS)**

More than 3,000 display boards are used at Beijing Daxing. Based on the FIDS, they provide passengers and handling staff with all the information they need in real-time.

### • **Airport Collaborative Decision Making (A-CDM)**

The collaboration tool A-CDM is the communications platform for all individuals and bodies involved in airport operations: air traffic control, airlines, ground handling, traffic managers, and service staff. Based on real-time data, it offers summarized views of the status of operational activities, simplifying the decisionmaking process and contributing to the improvement of airport efficiency.

### • **Enterprise Service Bus (ESB)**

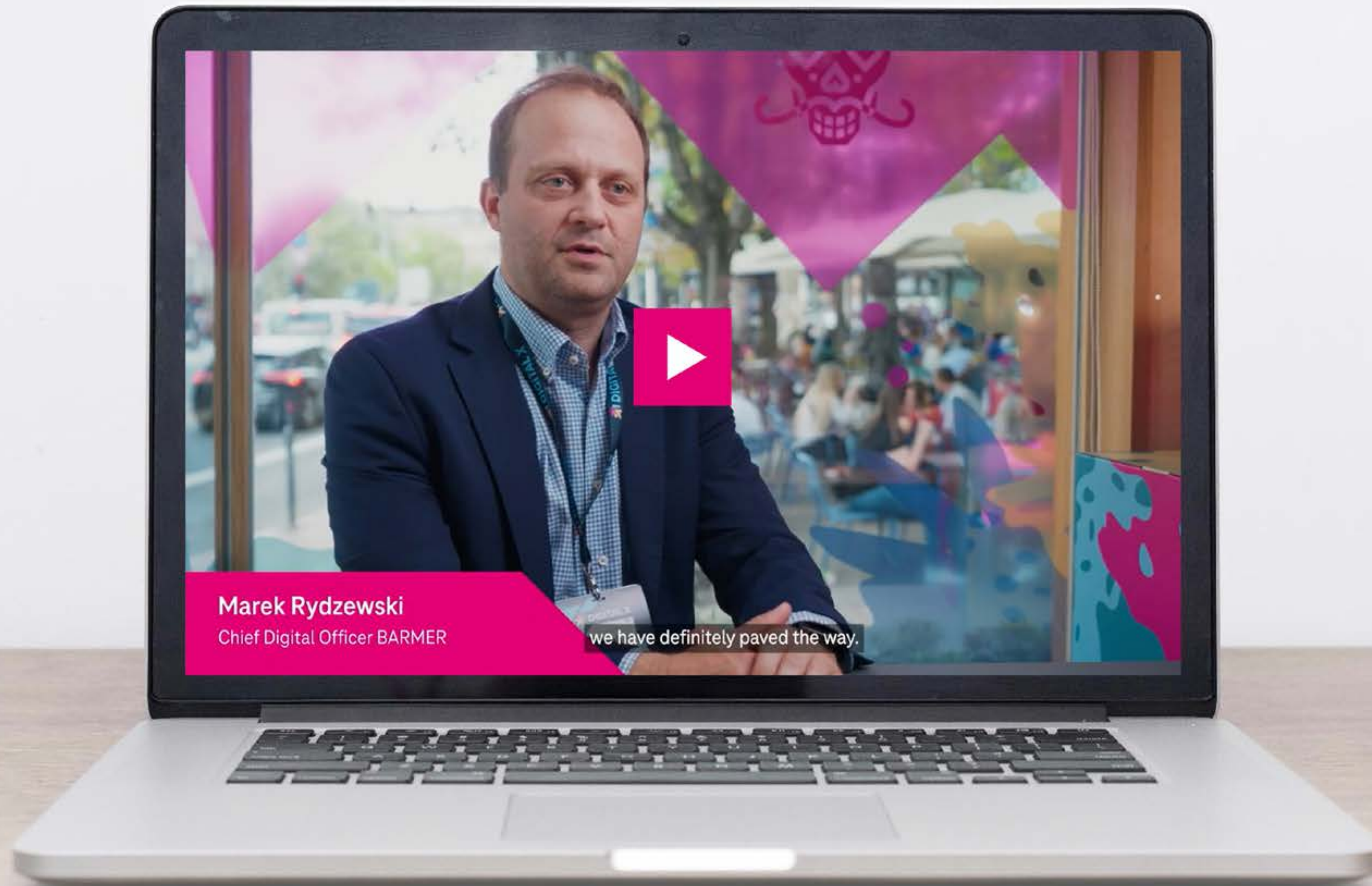
The ESB is responsible for interconnecting all the components supplied by T-Systems and ensures the seamless integration of the systems of all external stakeholders involved in flight operations. It is therefore an essential requirement for implementing the collaboration efforts of the A-CDM portal. More than 5,000 rules are stored in it, which contribute to the optimized short-, medium-, and long-term planning of resources.

## Customer benefits

T-Systems' airport management systems (AMS) is already in use at more than 40 airports worldwide. The software is optimally tailored to the operational management of air traffic and can be expanded in a flexible manner based on needs. The AMS analyzes, processes, and visualizes all flight-relevant data of an airport, and ensures the smooth running of aircraft movements and ground handling processes. The solution is implemented in a highly secure on-premise server environment.



# Marek Rydzewski, BARMER CDO, on Digital Identities in Healthcare





# AI-based network operation center space optimization

DT Technik leverages a data-driven approach for efficient utilization of its facilities



**“The cooperation with T-Systems regarding the integration and usage of different approaches including ML technology as well as rule-based algorithms advanced the project to the next level.”**

Leonhard Jugenheimer, Squad Lead at DT Technik

Deutsche Telekom Technik (DT Technik) is responsible for the planning, construction, and operation of critical technical infrastructure facilities and systems, and technology rollout within Germany for Telekom Deutschland GmbH. In 2022, DT Technik approached T-Systems to create a solution that would enable them to effectively utilize space in their network operation centers (NOCs).

A key priority was to automate the interpretation of the NOC layouts that were available as graphical data in Microsoft Visio and thereby reduce manual research time.

## At a glance

- The NOC plans data was only available in a graphical format (MS Visio) and interpreting these plans manually was a timeconsuming and error-prone task.
- T-Systems leveraged an algorithms-based approach to automate the interpretation of the NOC plans.
- Technologies used: Kubernetes, Python, VS Code, Label Studio, FiftyOne, PyTorch, Aspose, Kotlin, Java, MS Visio, C#, REST API, PostgreSQL.
- Outcomes: standardized data management, process automation, optimized space utilization, elimination of manual activities, end-to-end digitalization of the process.



# The reference in detail

## The challenge

Network operation centers are very crucial for business organizations that require high availability at all times. Employees managing NOCs need to monitor one or multiple networks for any conditions that may require special attention to ensure uninterrupted services. In this instance, the customer was struggling to optimize their NOC spaces because the plans were originally in manually prepared MS Visio drawings.

DT Technik employees would consult these drawings for manual research activities, for example, to plan for racks and optimize the available space. This was a very time-consuming task, and it also made computer-aided optimization processes impossible. The customer needed a solution that would help recognize the objects in the Visio drawings and relate the objects to the texts in the drawings.

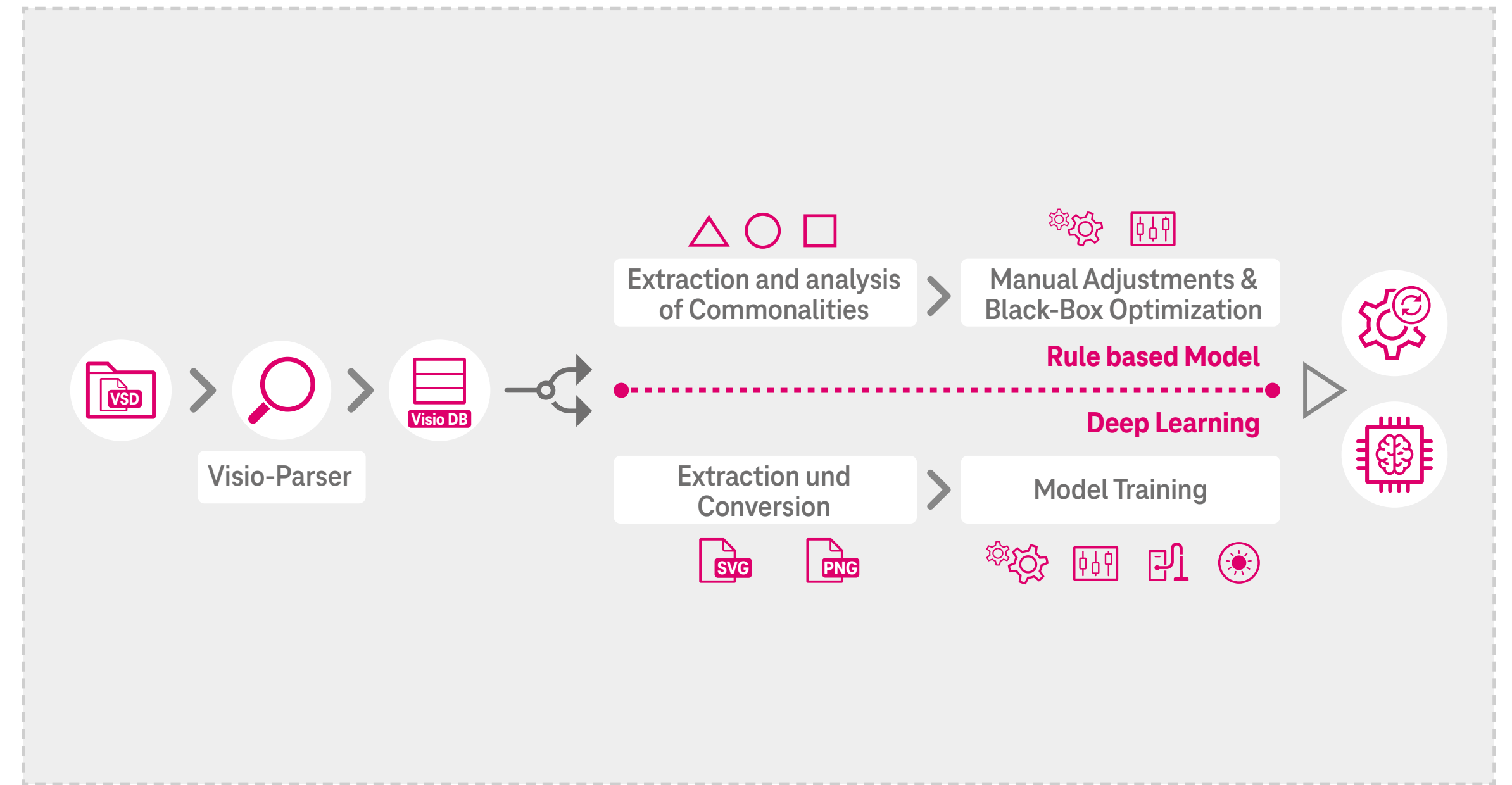
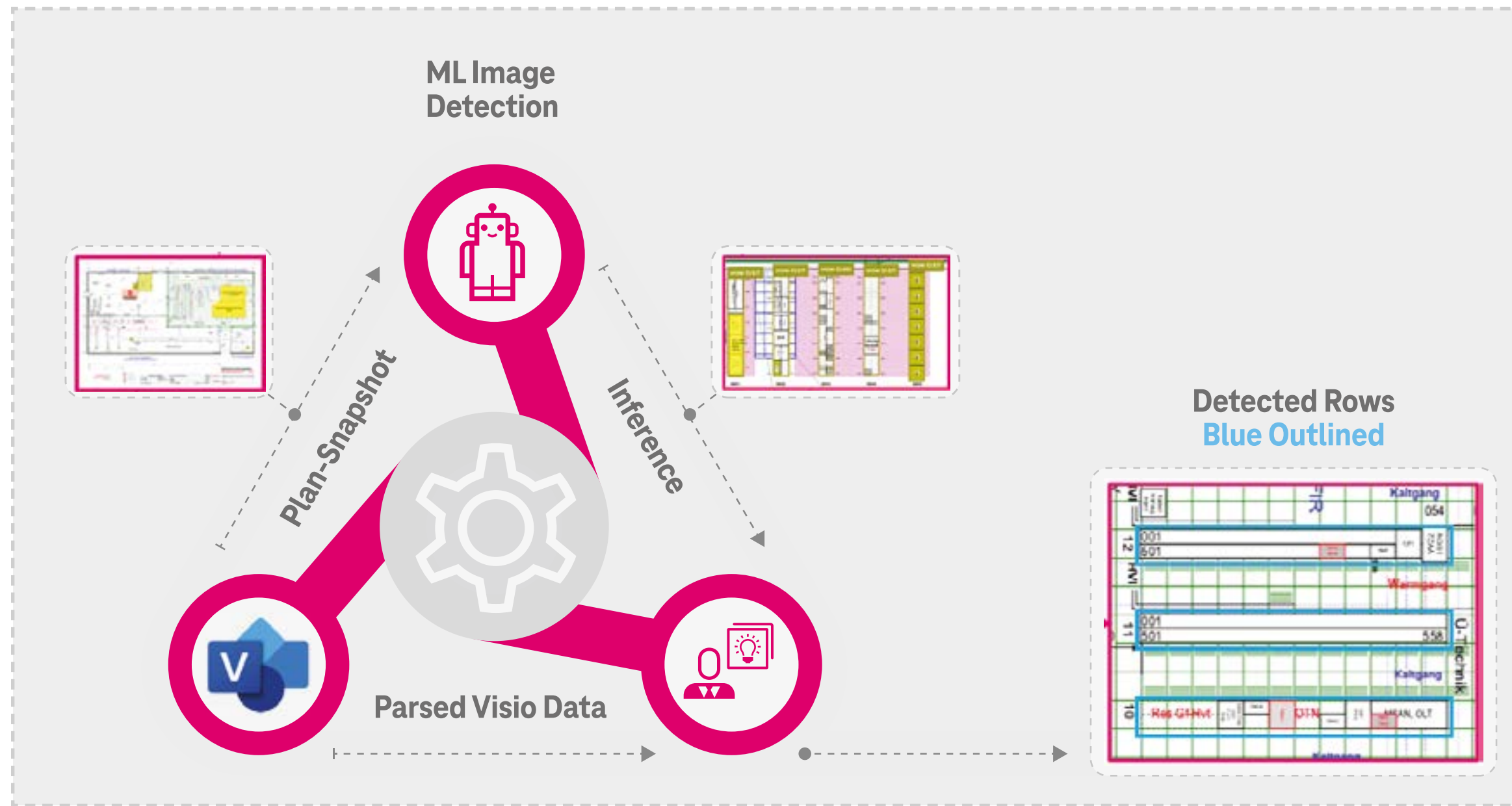
## The solution

T-Systems have been pioneers in the data space technology for over five years now. With their deep knowhow in the AI/ML space, they developed a Machine Learning-powered microservice called “Data Transformator”, which combines domain expert-driven rules with computer vision deep learning within an ensemble model. This model, called “deep object detection model”, enabled automation of Visio object recognition and interpretation of Visio drawings. The Visio files were parsed and analyzed for domain objects. The detected domain objects were served via dedicated REST API and front-end application. Then, the results were saved in a relational database (PostgreSQL).

The implementation of automation scenarios for the specialist pages was made possible through automated assignment of operating points. The detection system was thoroughly monitored and tested against the label data validated by domain experts to ensure quality.







## ★ Customer benefits

With the AI-based automation solution provided by T-Systems, the customer was able to save manual efforts and time and focus on their core tasks. The solution also helped them achieve process and system optimization, resulting in reduced operational costs. Data forms the backbone of any AI-based initiative. The solution provided by T-Systems helped the customer to achieve effective data management and cleansing, which, in turn, provided a valuable data feed for a holistic digital twin of network center. The customer's future migration needs are also addressed with this solution as T-Systems, with its forward thinking approach, has established a future-proof platform architecture comprising a modular structure.



# Generalitat de Catalunya: Partnering for Innovation and Quality

Reference project



**“For 20 years, T-Systems has been a steadfast innovation and digital partner for Generalitat de Catalunya, enabling better and timely services to its citizens.”**

Marius Albert Gomez, T-Systems

Over the years, there has been a significant emphasis on digital transformation, not just in the private sector but in public organizations as well. Digitization enables governments to enhance services that meet the evolving expectations of their citizens and businesses, even in periods of tight budgets and increasingly complex challenges.

The Government of Catalonia, within its functions and through the Center for Telecommunications and Information Technologies (CTTI), is focused on providing a wide set of public services to its citizens, from education to justice, health, emergency and citizen protection services, transportation, etc. Citizen services are well-designed and implemented with a citizen-centered approach. With citizens and businesses adopting technology and collaborative tools in every aspect of their lives, they now demand digitalized services from the governments as well. This requires a significant investment in digital services that are needed to bring a transformative change to society.

The Government of Catalonia and CTTI are very forward-thinking. The regional government wants to exploit the potentials of digitization for their citizens and employees, becoming one of the top EU digital regions.

T-Systems as a reliable partner for different IT services and projects as well as for digital innovation, has been collaborating with CTTI on such transformation and digital road. It has been ranked number one with the Generalitat de Catalunya and has undertaken significant contracts in several sectors such as justice, health, HR, transport, etc.

## At a glance

- T-Systems as a key technological and innovation partner for Generalitat de Catalunya for more than 20 years
- A broad range of services like datacenter management, private and public cloud management, workplace services, service management, applications management, digital solution development and operations
- Introducing new service models and new technological levers
- Integrated end-to-end technology solutions provider for various key public areas like health or justice
- Customer intimacy allows the design of innovative solutions for efficient and modern business processes in the public administration



# The reference in detail

## The challenge

The Government of Catalonia and CTTI wanted to create a sustainable, predictive and proactive administration for the new century with a lasersharp focus on modernization and growth. The emphasis has been on enhancing user-centered public services, fostering digital skills among citizens, and promoting modern and flexible public management.

The Catalan Government has identified the ICT sector as a key sector and an engine for long-term development. There has been a significant increase in investment in innovation aimed at promoting digital transformation in the administration. The aim is for enhanced region-wide digitization and ability to consolidate a global transformation from an industrial-based economy to a knowledge-based economy.

ICT can enhance and support economic and social development, by enabling and attracting new knowledge-based companies and talent, by reshaping public function and services empowering public servants into more value-added activities, and at the end by boosting more timely, efficient, secure, sustainable and transparent services to citizens.

To help Generalitat de Catalunya and CTTI achieve their objectives in such transformation and innovation, a powerful digitization and innovation ecosystem of partners is needed to assist in the convergence of all technological aspects in the administration and provide end-to-end consulting and services, right from setting up the infrastructure via application to processes.

## The solution

The digitization efforts of governments are usually based on four capabilities: services, processes, decisions, and data sharing.

For over 20 years, T-Systems has been a reliable process and innovation partner for the Generalitat de Catalunya in various sectors, providing services such as application management and digital solutions, digital workplace or datacenter management. Some of the major projects that have been undertaken during this time include justice, healthcare, education, public function and home affairs.

One example of the innovation projects that the team has executed is the implementation of the first no-paper court. The end-to-end court processes have now been digitized and are completely paperless. This has helped in overcoming the challenge that lies with bringing justice closer to the citizens and enhancing the service level from and effectiveness of the dealings between the justice apparatus and the rest of its stakeholders.

Other recent relevant examples are the maintenance and evolution of the Primary Care information system or the introduction of new digitized traffic services by designing and implementing IoT solutions that have made the roads safer. Also, in the past T-Systems deployed key support initiatives like the first integrated academic & administrative system deployed to support regional schools or the first virtual and integrated one-shop portal for public services. T-Systems and CTTI not only introduced new IT and digital solutions at Generalitat de Catalunya but also new trailblazing service models during their long-lasting partnership that support the client's business processes most efficiently.

## Customer benefits

With digitalization, the government has been able to improve the accessibility of public services to citizens and companies, protect data, overcome social and territorial digital gaps and boost the efficiency of public administrations through the digitization of important driving areas such as health, justice, education services or territorial administration.

Today, the new technologies and innovations have allowed the Generalitat de Catalunya to become more proactive, automated, and citizen-focused with T-Systems as a partner driving transformation and increasing agility. The Catalonia Government thus became a region-wide forefront and a role model in the introduction of ICT and digitization to work more efficiently and provide better services to the citizens.

During and after the COVID-19 pandemic, taking decisive and quick actions has become imperative. Against the backdrop of high demand for unemployment and other benefits, governments need to ensure faster and efficient processes and compressed delivery timelines—particularly to alleviate backlogs that have built up during the pandemic and embracing new transformational phase that could be boosted with the new European NG-EU funding.

This long-lasting association between the Generalitat de Catalunya and T-Systems has created a model of trust with the client and a stable relationship that has helped to achieve the objectives and has also helped in the transition towards efficient and sustainable systems within the government.

The end-to-end level discussions have built trust and enabled the company to understand and provide solutions based on their future needs and technological possibilities. One of the crucial aspects of this relationship has been the flexibility and proximity that has been gained by attending to the evolving customer needs, reliability and ensuring data security and privacy. This has helped the Government make critical business decisions, displace costs, and mitigate risks.

With an in-depth knowledge of the customer and its processes, T-Systems has been providing long-lasting, reliable support for critical processes for the benefit of the administration and the citizens of Catalonia, especially during peak times. The processes have vastly improved the agility, allowing the administration to interact with citizens, enable staff flexibility and allow the capture of data to improve decision-making across the organisation. The Government of Catalonia is now heading for a digital/cloud world that spans from infrastructure via applications to processes, re-shaping the classical ICT provision models into a new vertical driven approach that combines and integrates applications and infrastructures with the introduction of new agility models.



# A partner on the journey to digitalization

T-Systems is transforming and migrating the entire IT infrastructure of gkv informatik to the cloud, creating the foundation for new services in the healthcare sector



Reference project

**gkv informatik**  
unternehmen synergien

**“T-Systems has supported gkv informatik for many years, in a close partnership for the digitalization of the healthcare sector and supports the customer in all disciplines – private and public cloud, SAP, and security.”**

Udo Lingen, T-Systems

gkv informatik is a leading IT service provider for social health insurance providers: it provides IT applications, such as office systems, for 38,000 employees of these health insurance providers, and is responsible for managing over 17 million insurance customers. The partners (clients) of gkv informatik represent around one-fifth of the overall German healthcare market. gkv informatik is a consortium that was formed in 2006 through the merger of BARMER and several regional AOK organizations in northern Germany. Its goal was to capture synergy effects in IT operations. Its partners, the health insurance providers, were able to build on these effects to further improve service for their customers. In gkv informatik, the social health insurance providers have a specialized partner with profound industry expertise and extensive IT skills that develops and runs innovative solutions for the digital transformation of the healthcare sector. gkv informatik has two data centers in the western German city of Wuppertal, where it runs SAP and non-SAP applications. In 2018, gkv informatik decided to outsource key IT services to T-Systems to realize the transformation of its IT services into agile, cloud-native technologies and hone its focus on application management, requirements management, and service development. This was the kickoff for a German “health cloud”, with a high level of data security and strict, GDPR-compliant privacy protection from German data centers.

## At a glance

- Outsourcing in the healthcare sector
- Foundation for new, improved digital healthcare services
- A perfect combination of digitalization, data security, and – primarily – privacy in a regulated market
- Transformation of IT infrastructures into a private cloud
- Deployment of cloud-native technologies
- One of Europe’s largest server installations
- Provision of container platforms
- Introduction of DevOps methods
- Support by DevOps engineers and DevSecOps architects
- Takeover of complete IT security management
- Excellent service reliability, with high availability and system resilience



Industry digitalization



# The reference in detail

## The challenge

Thousands of servers, hundreds of systems, and many petabytes of data. gkv informatik subjected its potential new IT service providers to a selection process that lasted more than a year. Above all, the company sought a partner that was capable of guaranteeing data protection and the confidentiality of its extensive data pool. Healthcare data is subject to extremely strict protection demands in Germany, and the provider has to prove the ability to comply with these stringent demands in this regulated environment. The managers at gkv informatik also expected their new service provider to help them navigate the development paths toward IT modernization. They sought a partner who would work with them to master the challenges of digitalizing the healthcare market together. This meant they also had to be capable of reliably managing a large-scale IT transformation. The third selection criterion was a hygiene factor for outsourcing: excellent reliability of the services through high operations quality. In particular, the oscare® core system had to be robust, with high availability for the health insurance providers: customer master data, healthcare funds, billing – all critical processes run on or with this highly individualized SAP system.

## The solution

T-Systems met all of gkv informatik's requirements and won the contract. As part of a comprehensive transformation project, T-Systems migrated all workloads from the data centers in Wuppertal to its modern twin-core data center in Frankfurt. In the process, the applications were migrated directly to modern infrastructures that offer a high level of virtualization and automation – a large portion of them run in a Cisco-based private cloud. T-Systems took full advantage of the platform's feature set for this "health cloud": with nearly 1,000 servers, 7,000 virtual systems, and around 10 petabytes of data, the platform is one of the world's largest installations of its kind. The same applies to the SAP HANA® databases, which use multiple Superdomes with 24 TB of RAM each – the largest systems certified by SAP at this time. The health cloud provides an extremely high level of security, but also enables the establishment of a DevOps culture and the use of container platforms. An OpenShift platform supports the agile deployment of cloud-native applications for gkv informatik's clients. "Together with T-Systems, we're establishing a highly automated container platform for the healthcare sector," summarizes Ralf Gietz, Enterprise Architect at gkv informatik. In addition to the IT services for all SAP and non-SAP applications, T-Systems also assumed management of the hybrid workstation

infrastructure, with thin and fat clients (some classic, some virtualized). This involves 50,000 email accounts, among other elements; T-Systems is also responsible for software packet assembly and distribution and print services. T-Systems also took over the complete IT security management: among other activities, the security infrastructure was completely rebuilt and 24/7 monitoring was implemented by the T-Systems Security Operations Center.

## Customer benefits

With its transformation, gkv informatik has created a modern platform that health insurance providers can build upon to offer innovative healthcare services like the electronic health record (EHR) to their customers. The new platform supports the acceleration and simplification of processes in the healthcare system, a more intensive customer relationship, and improved customer service. With the transfer of responsibility and outsourcing of its systems, gkv informatik has achieved significant cost savings while making its IT much more flexible at the same time. It now receives secure, robust IT services from a single source and has gained the leeway it needs to concentrate on its core competencies for application management. Its clients' cloud readiness to tackle the upcoming challenges posed by the digitalization of the healthcare market has risen dramatically. New digital services can now be rolled out quickly and cost-effectively.

### Further advantages:

- Best-in-class IT security management
- Access to specific IT expertise
- Highly stable operations
- Seamless transformation of legacy applications into the cloud



# Comfort Charge takes off

Groundbreaking platform for managing electrical charging infrastructure



**“With Ambika from T-Systems, we were able to build an absolutely innovative solution for the young, highly dynamic e-mobility market in record time.”**

Mathias Laubenstein, Head of Technology, Innovation, and Operations, Comfort Charge

Against the backdrop of sustainability efforts and increasing independence from fossil fuels, e-mobility is steadily gaining importance in Europe. Germany set a new record in 2021 by registering 356,000 fully electric cars. And the trend continues, not just among consumers but also among companies that are increasingly adopting clean electromobility.

A high-performance charging infrastructure is a crucial factor for the long-term success of the concept. Many providers with different backgrounds are entering the market. However, the infrastructure means much more than just bolting on wallboxes or installing charging stations. Behind the charging infrastructures are complex processes that require intelligent systems to match demand and supply.

The lack of uniform standards and processes poses a significant problem. The young, dynamic market is reminiscent of a kind of electric Wild West, where many vendors merged proprietary backend IT, hardware, and processes to manage the complexity.

Comfort Charge, a startup from the Telekom Innovation Pool, is taking a completely novel path in this market environment. Mathias Laubenstein, Head of Technology, Innovation, and Operations, “We want to offer

a leading solution in terms of processes and technology for charging infrastructures from a single source - on the basis of open protocols and in cooperation with our partners.”

This meant that Comfort Charge also wanted to take the lead in service quality. The company already monitors its managed charging stations with a high frequency and achieves extraordinary availability figures.

The solution from Comfort Charge covers the complete lifecycle of the charging stations (in accordance with the well-known ITIL principle): from planning, installation, and long-term operations, the company consolidates all the related services on a single platform. On this basis, Comfort Charge rolls out its own charging infrastructure, manages its customers’ installations, and offers them to other charging providers as a white-label solution.

Managing a platform for charging infrastructure is similar to managing telecommunications infrastructure. The right data must be in the right place at the right time. This means IT plays an essential role in Comfort Charge’s business model. The company relies on a modular platform from T-Systems as its technical solution: Ambika.



## At a glance

- Implementation of a novel approach for the end-to-end management of charging infrastructures for electromobility
- Lack of standards and protocols
- Best-of-breed: Interconnection of various proprietary, marketleading tools
- Integration for automated data exchange
- Use of Ambika based on ServiceNow
- Pioneering solution for charging infrastructure management
- Can be scaled for further growth
- Audit compliance
- Flexibility for a dynamic business environment
- Efficient, automated processes for end-to-end management

# The reference in detail

## The challenge

“We didn’t want to develop a new solution for the lifecycle management of charging infrastructures from scratch,” explains Laubenstein, “but instead pursue a best-of-breed approach, utilizing solutions that were available on the market. And under no circumstances did we want to take a conventional, proprietary path by building custom-developed add-on functions on top of a backend system.” This “mash-up” approach was intended to enable a rapid time-to-market, provide flexibility to respond to changes in a dynamic market (technical adaptability), and most importantly, for a start-up, keeping costs under control. Scalability was another crucial requirement of the system. Since Comfort Charge is active in a regulated market, ensuring audit compliance was another important factor that had to be considered in the design of the management platform.

The central challenge here: How can the various contributions by the partners be integrated to create an end-to-end solution? How can communications and data be provided without interruption?

## The solution

“Ambika from T-Systems proved to be the ideal central hub for the different services, regardless of which language they speak,” sums up Laubenstein. Ambika is based on ServiceNow and is provided fully scalable from a ServiceNow data center in Germany. ServiceNow’s strength lies in its incredible flexibility, which enables it to connect nearly any system and digitalize and automate any process quickly – thanks in part to the combination of turnkey modules and low-code capabilities of the platform.

As such, Ambika formed the foundation for the central hub that enables the rapid exchange of data – for all lifecycle phases of the charging infrastructure. “We use Ambika to both collaborate with our partners for the planning and installation of the charging stations and manage our operations,” says Laubenstein. At the same time, Ambika makes it possible to integrate additional systems at any time. Due to the operation in the cloud, scaling is easy.

## Customer benefits

“With Ambika, we are independent of proprietary systems. We have created a flexible platform that goes in an entirely new direction and gives us the dynamism we need as a startup in a young market,” summarizes the Comfort Charge manager. “With our management platform for charging infrastructure, we have built a pioneering industry solution that we can now offer broadly on the market. We are poised for further growth.” Ambika avoids manual intervention, the use of Excel spreadsheets, other databases, and emails that are often needed to manage processes. “The high level of automation and workflows in ServiceNow provide us with the efficiency and speed that we need. Other tools can’t do that.” Automated controls and simple user navigation also improve the quality of the results. In addition to smooth-running processes, Ambika also effortlessly provides transparency for business operations, thanks to its centralized data storage, and – closely related to this – ensures audit compliance for supervisory authorities. Last but not least, the maintenance costs are at a level that is manageable for the startup.



# T-Systems and Mercedes-Benz do Brasil develop an innovative application for drivers and fleet owners

Utilizing customer feedback for the development of an advanced solution with monitoring and gamification features

**“Working on the development of an app that has a lot of added value with the agile methodology has brought to T-Systems a very valuable growth and exchanges with Mercedes-Benz.”**

Isis Fioretti, T-Systems Account Manager for Mercedes-Benz do Brasil

Over the years, Mercedes-Benz do Brasil has invested heavily in high-tech services to improve the performance of its drivers, and consequently, improve the fleet owners' businesses. A testament to this is **Fleetboard telemetry**, a management tool that produces detailed reports on fuel consumption, distance traveled, route difficulty and other conditions related to the registered vehicles.

In other words, Fleetboard is a performance monitoring and evaluation solution that helps in the reduction of operating costs and the risks of accidents. Recently, Mercedes-Benz has joined hands with T-Systems to develop another state-of-the-art solution that aims to monitor the level of driver performance and use of the driver, the “Liga na Estrada” application.

## The solution

Having emerged from the rising demands in the market, the main objective of the Liga na Estrada application is to reduce fuel consumption, extend the life of components and prevent truck accidents. However, it is

necessary to track the amount consumed, which is why the application has a monitoring feature capable of generating this data accurately while evaluating the behavior of active drivers.

In summary, Liga na Estrada unifies the information and sends it directly to the driver through the application itself. This ensures that the driver has the necessary information about his performance and an understanding of the aspects that can be improved.

In addition to working with Fleetboard, Liga na Estrada was inserted in Mercedes-Benz do Brasil's intra-entrepreneurship program, the Incubator, to encourage company employees to think about new ideas and solutions to optimize internal processes and apply them in a startup model using Agile Methodology, solving existing problems and identifying opportunities through innovation.

According to Isis Fioretti, T-Systems Account Manager for Mercedes-Benz do Brasil, the Agile Methodology advocates an approach that is not just limited to creating a certain solution to solve specific problems but also understanding the user's pain points to deliver value. This is a focus for Isis as well.

Both the Liga na Estrada app and the Incubator program reinforce Mercedes-Benz's commitment to technology and digitization to facilitate the driver's day-to-day life and ensure the quality of service provided by the fleet.



## Gamification

Along with the monitoring resources for generating accurate reports, Liga na Estrada also features a gamification functionality which allows drivers and their managers to create competitions and groups within the app itself. This is done to motivate and encourage the drivers to engage and monitor their performances continuously.

Amidst the praise for the “game”, there was also constructive criticism (and even a request) from customers who participated in the pilot. According to them, there was a need for the inclusion of drivers who until then did not have access to the app and would also like to participate and contribute to the dynamics of the tool.

With the constant use of the tool by the drivers to excel in the competition and achieve good performance, the excitement generated with gamification helped in significant improvements in the drivers’ performance. The drivers were able to use the solution to pay attention to the metrics obtained during the trips and make significant performance improvements, particularly conscious fuel consumption (one of the priority items of companies and people) and the reduction of accidents and maintenance costs. Moreover, with the improvements in performance, the trucks now needed fewer emergency repairs.

Gamification has been one of the main attractions of the application, generating high levels of interaction and engagement for drivers, who displayed a lot of enthusiasm for the league and, consequently, a genuine interest in using the tool correctly and constantly.

## The voice of the customer

The Liga na Estrada development process involved Sprint models. With each delivery, the project participants validated the results with customers to make all the necessary changes and make the application compliant with the proposal. Involving the client during project development is fundamental to understanding the end-user’s needs and ensuring a positive experience.

This initiative puts into practice the great motto of this project, which is also the commitment of Mercedes-Benz do Brasil, “The roads speak, and Mercedes-Benz listens to every voice”. According to Isis Fioretti, “The development team embraced the cause and treated the project as if it were a son.”

There were constant efforts taken by both T-Systems and Mercedes-Benz to listen to the customers and understand their needs. These were further discussed with IT teams and presented in the application’s strategic planning meetings. This dialogue helped in avoiding misunderstanding or conflicting information that could jeopardize the development of the app.

With this, Mercedes-Benz and T-Systems teams received feedback regarding the improvement points to be considered during this initial stage of using the solution. This allowed the team to ensure that all possible pain points were mapped during sprints, thus reducing rework and major postlaunch modifications.

In addition to the gamification attributes, the application was also praised for its enormous practicality during the performance analysis process. Since the platform is directly accessible by the drivers, it does not require any action by the manager, who previously had to print several reports and constantly share them with his employees.

**“We have to understand the customer and build the solution based on his pain.”**

Luciano Abrahao, Digital Solutions Development Manager at Mercedes-Benz do Brasil

## The challenge

The idea for developing the application came from a real need of those who managed the day-to-day fleet’s activities, whether on or off the road. The creation of Liga na Estrada application was not a requirement of the Board or the leadership team of Mercedes-Benz. Instead, it was developed for the people who worked in the field in operation directly with the customer.

Along with the communication established with customers, the constant interaction with the two companies ensured that the work was properly aligned. This allowed the teams to get the feedback that marked the users success of the project at the beginning.

The project needed a lot of robustness during its development phase to meet the expectations – of teams and – and to show that Mercedes-Benz do Brasil preparedness for the journey of digital transformation, with a 20-year-old partner who breathes innovation and disruption.

**“There was a very productive interaction between all areas of Mercedes-Benz and T-Systems that was essential to the success of the project.”**

Priscila Protásio, Sales Analyst at Mercedes-Benz do Brasil



**“Mercedes-Benz is a structured manufacturing and industrialization company, so the big challenge for teams was to synchronize the manufacturing process in a digital production process.”**

Ivan Martinez, Systems Analyst at Mercedes-Benz do Brasil

## ▶▶ Next steps

Currently, about 215 drivers are using the app. Considering that the project is still in its initial phase, the numbers are expected to grow. The Mercedes-Benz and T-Systems teams have started discussions for a second phase in which they will promote the application intensively to encourage other drivers and managers to use the platform, allowing continuous process improvements. With the widespread acceptance of the app, the managers have now asked for access to not just the overall evaluation of their drivers, but also to their individual performances.

In addition to presenting a system with functions important to the customer, the application also ensures data protection (Vehicle Cyber Security), which occurs through the Data Protection approach and is in line with the General Data Protection Law (LGPD).

## About Mercedes-Benz

Present in the country for 65 years, Mercedes-Benz do Brasil is the largest manufacturer and exporter of trucks and buses in Latin America. It is also a leader in the development of technologies for the transport of cargo and passengers.

The Company has production units of trucks, bus chassis and aggregates in São Bernardo do Campo (SP) and truck cabins in Juiz de Fora (MG), in addition to the Customer Parts and Services unit, Parts Logistics and Global Training in Campinas (SP).

In 2018, the Company inaugurated the first line of trucks in the country's 4.0 concept and launched its Proving Grounds, the largest in the Southern Hemisphere for commercial vehicles. In 2019, in the second phase of Industry 4.0, the Company began operations in a new line of cabs and launched the New Actros, the smartest, well connected, efficient, and safe truck in the country. In 2020, it was time to inaugurate the 4.0 bus chassis factory. Continuing investments in Brazil, the Company is implementing a contribution of R\$ 2.4 billion between 2018 and 2022.

The partnership between Mercedes-Benz and T-Systems began in 2001 and expanded four years later with the signing of a global contract. T-Systems is currently responsible for the development of Mercedes-Benz technology systems, strengthening its expertise within the automotive industry. With 20 years of relationship, Mercedes-Benz and T-Systems continue to work together on promising projects, including the implementation of the Liga na Estrada app.



# Modern financial administration in Saxony

BBA 2025 builds on a hybrid solution with Pega and SAP



**“With a hybrid solution consisting of SAP and Pega, T-Systems found a custom solution that is helping us build a modern, forward-looking BBA landscape.”**

Michael Golsch, Head of Section for Digitalization and Automation of the State Budget

With over four million inhabitants, the Free State of Saxony is the seventh largest of Germany’s 16 federal states. The state’s government has put pioneering future projects on its agenda for the years 2023 and 2024. Around 20 percent of the state’s budget is allocated to education. In addition, infrastructure expansions are planned, and a breakthrough in renewables must be advanced. The twin budget dedicates 49.3 billion euros in funding to these areas – a record amount.

At the same time, the proprietary systems currently used for budgeting, bookkeeping, and accounting (BBA) are reaching their limits. Prominent examples include the cash accounting (KABU) and financial management (SaxMBS) processes, which use outdated technology and have reached the end of their life cycle. In light of this, the cabinet resolved in 2020 to fundamentally modernize the BBA systems and build a new, forward-looking, state-wide BBA platform. One of the most pressing challenges was mapping incoming electronic invoices in a suitable workflow that is free of media discontinuities. The EU has ordered the mandatory implementation of such workflows by public administrations in EU member countries.

The Saxony State Ministry of Finance (SMF) assumed management of the BBA 2025 program with the goal of establishing reference and standard processes for the entire state administration and centralizing functional

and technical operations to capture synergies. To achieve this, existing structures in the State Office for Taxes and Finances (LSF) are being enhanced to create a BBA competence center. A central platform at Staatsbetrieb Sächsische Informatik Dienste (SID), the state’s internal IT service provider, is building a central platform for the technical operation of the BBA system.

Within the framework of the BBA 2025 project, the ministry launched a competitive dialog with several providers for the development of the BBA architecture – with the goal of developing a target architecture for the future BBA system in an agile process.

## At a glance

### Current situation

- Media discontinuities and “paper interfaces” reduce the efficiency of budgetary, bookkeeping, and accounting (BBA) processes
- Existing proprietary standalone systems require high administrative efforts
- Aging technology is not forward-looking
- No support for in-house enhancements Data transcoding of machine signals



## Project framework

- Agile project methodology: Scrum/SAFE adapted to the project subject and the needs of public administration
- Hybrid concept for modernizing the BBA landscape as an alternative to a full SAP solution
- Pega with low-code functionality for front-end flexibility, SAP as a core system
- Standard interfaces for system integration

## Goals

- Rapid implementation of binding EU regulations governing the processing of electronic invoice payments by the administration
- Successive replacement of legacy systems
- Efficient administrative processes that are free of media discontinuities
- Data-driven process control through a strategic information system
- Possibilities for in-house enhancement
- Sustainability aspect: Reduction of printed documents

# The reference in detail

## The challenge

The existing, heterogeneous BBA landscape and its various aspects – such as the KABU process, the HH portal, and the SaxMBS instances, are currently characterized by media discontinuities. The proprietary, custom-programmed systems do not have enough standardized interfaces, which means administrative processes can only be partially automated at best. In particular, the project owners hope to become largely paper-free through BBA 2025 to contribute to sustainability and simplify the processes through digitalization.

Another side-effect: Consolidation and the use of modern, established standards and central operating models should cut future operating and maintenance costs for the system significantly. The possibility for in-house enhancement of the processes – without the involvement of external partners – is also a relevant factor for the ministry. This will require a targeted knowledge build-up and transfer as early as the project phase.

By the end of 2025, an integrated, modular, forward-looking, end-to-end BBA system should become available, consisting of a BBA portal, BBA platform, and BBA core system. An initial milestone has already been reached: An operational solution for processing electronic invoices received in X format has been available since January 1, 2023.

## The solution

Using SAP as the core system and Pega as the main access point (front-end) for the BBA processes, T-Systems designed a hybrid solution for the future architecture of the BBA system. The State of Saxony considers the low-code capabilities of Pega to be an ideal complement to the standard SAP back-end system. The system is run by Staatsbetrieb Sächsische Informatik Dienste (SID), Saxony's own provider for IT infrastructure. The new system is being implemented in stages in an agile procedure model of the project partners. The first stage involved the Pega system, which was built for eInvoicing between August 2022 and December 2022.

It was launched at the start of 2023 as an MVP (minimum viable product) in selected government agencies, initially for invoices received in X format, in parallel to the existing systems. It now supports full digital processing of submitted invoices. “The low-code approach meets our demands for internal responsibility in the sense of selfservice. It also enables non-IT specialists to enhance processes and procedures autonomously, as needed,” explains Michael Golsch, Head of the Section for Digitalization and Automation of the State Budget.

In the next step, the invoice handling process will be opened up for other input formats (replacement scanning, mail attachments). At the same time, an SAP system is being built to serve as the BBA core. This system is based on the new SAP S/4HANA standard. The FI, CO, and PSM modules will be implemented for the financial management and cash accounting processes. By the end of 2025, the legacy systems will be successively replaced and their data will be migrated to SAP.

Operational analytics, workflows, and support processes will be realized through a combination of Pega and SAP. The two systems can be integrated easily via web services. In this process, the team will utilize standard protocols and interfaces that SAP provides for accessing the relevant objects. Pega delivers the matching connectors for out-of-the-box integration.

## Customer benefits

Goodbye media discontinuities; hello efficiency and self-service. The hybrid concept will enable the State of Saxony to implement its modernization strategy for public financial administration. The SAP back-end establishes a powerful standard core, while Pega on the front-end provides wide-ranging flexibility and extensive design options. This has been proven by the new tool for eInvoicing, which was implemented in detail according to the state's requirements. The State of Saxony will get a forward-looking BBA system based on an open, integrated landscape – and will be able to utilize the data to build a strategic information system. The new system landscape will meet all necessary data security and information security requirements and comply with the legal framework. External auditors, such as the state's Court of Audit, will benefit from the modern IT architecture, which is nearly free of media discontinuities. As an additional benefit, paper consumption is declining substantially – as a small contribution to the state's sustainability goals.



# Digitalization as strategy for adapting to climate change

Diepholz district relies on IoT solution from T-Systems for sustainable water management

Reference project



**“With this digital water consumption measurement, we aim to implement a convenient solution – with the help of T-Systems – that optimizes our water management for field irrigation in the long term and enables reliable, data-driven decisions.”**

C. Bockhop, District chief executive, Diepholz district

Germany’s Diepholz district is located in Lower Saxony, south of Bremen. It is nearly 2,000 km<sup>2</sup> in size. Around three-quarters of this area is agricultural land. At the same time, the district is home to 40 nature reserves. This includes extensive marshland, as well as the 16 km<sup>2</sup> Dümmer Flachsee (shallow lake), which serves as a retreat for waterfowl and waders. As such, large areas are subject to landscape and nature conservation measures. The recent summers, particularly the drought years of 2018/2019, pose a sustained burden to the water balance. With increasing average temperatures, stable, small-scale weather conditions, and changes in annual rainfall distribution, climate change is leading to changes in groundwater formation and declining local groundwater levels. Lower Saxony has already identified downward trends in groundwater levels at many measuring points throughout the state, particularly the measuring points in geest areas. Groundwater extraction has the potential to exacerbate this trend, particularly in times of drought. Changes to the general climate conditions are increasing needs for agricultural irrigation, to maintain yields and quality of agricultural production. Consequently, a significant increase in the number of field irrigation wells has been recorded over the past 10 years.

The pressure to utilize the groundwater resource and the related competing uses, such as safeguarding public drinking water supplies and maintaining moisture-dependent habitats, demand improved water management. Near-time digital recording and centralized collection of extraction volumes is an important, forward-looking element in this process. And water management isn’t only a relevant subject for Diepholz district by far. Germany’s Federal Environment Ministry is considering a national water strategy, which will describe how the country will handle the important resource of water (particularly against the backdrop of climate change) nationwide.

## At a glance

- Drought periods require extraction of groundwater for field irrigation
- Sinking groundwater level
- Digital water extraction measurement (IoT solution)
- Faster, simpler reporting
- Optimization of water management
- Solution for sustainable, resource-friendly agriculture



# The reference in detail

## The challenge

The agriculture sector is one of the largest users of groundwater. Diepholz district in Lower Saxony is no exception. To irrigate their fields, farmers usually rely on wells that draw groundwater. Recording the consumed water volumes represents an important contribution toward optimizing – and potentially reducing – water use in the long term. It could also help ensure a more environmentally benign use of groundwater in the long term. Previously, farmers had to visit the water meter-equipped well locations regularly to satisfy the extensive documentation requirements. The extraction volumes were usually recorded as handwritten lists, which were submitted to the water authorities at the end of the irrigation season. The consolidated extraction volumes, which were reviewed by the water authorities, then had to be reported to the corresponding state authorities, together with the water extraction fees. It was a complex process. Could a digital solution help?

## The solution

With Ground Water Monitoring for Smart Farming, T-Systems developed and implemented the right solution for Diepholz district on behalf of the local water authority. In this approach, the water meters become “things” in the Internet of Things (IoT) and transmit the water data digitally and automatically, so a computer system on the back end can interpret and process it. Generally, the existing analog water meters can be replaced or upgraded – in the simplest case, existing meters can be retrofitted through an electromagnetic contact. This contact makes it possible to generate impulses (for example, one impulse for every 1,000 liters of water), to record the consumption data. 30 existing water meters in Diepholz are being upgraded with such a solution. The devices are connected via a local gateway (LTE-M, with SIM card) to Deutsche Telekom’s IoT platform, where it is analyzed and visualized. Both the local water authority and the individual farmers can access their respective data via a web portal and get specific analyses with regard to water volumes and extraction times and locations.

## Customer benefits

The robust solution not only enables the local water authority to make up-to-date statements regarding extracted water volumes, but also speeds up and simplifies all process flows. Analyses of irrigation behavior also enable projections of the impact on the groundwater table. These analyses are simple and convenient, requiring minimal effort. The solution incurs very low running costs. Farmers can now check their meter values at any time, regardless of location, saving trips and travel time, and can irrigate their fields more efficiently by choosing the time of day better, for example. Automatic alerts notify farmers when they reach or exceed threshold values for extraction. The solution can also be enhanced in individual cases, for instance, enabling farmers to start and stop field irrigation via texting. Ultimately, monitoring water consumption through field irrigation will pave the way to sustainable, more resource-friendly agriculture – and ensure the continued existence of the nature conservation areas in the district.

### Further advantages:

- End-to-end solution from a single source, one point of contact
- High level of data security through IoT platform running in a T-Systems data center



# The digital car dealership

A digital pioneer: The Autohaus Gitter car dealership has been using VaudisX from the very start



**“Users are guided step by step, from appointment scheduling and planning to order qualification and repair shop planning, even up to invoicing and archiving.”**

Jürgen Ketzler, Managing Director, Autohaus Gitter

“We’re not reinventing the wheel – we’re turning it forward.” As his maxim clearly shows, car dealership Autohaus Gitter looks ahead and is not content with the status quo for either itself or its customers. Providing excellent service for Toyota and VW cars is the top priority at its locations in Erfurt and Weimar, And digital innovations are to make increasing contributions. For the car dealership, “digital” doesn’t only mean modernity and an improved customer experience. They also want the IT support to generate tangible business value. Firstly, they wanted to optimize workflows in service processes. This greater efficiency not only benefits employees, but also sets the company apart from its competition. Secondly, the IT needed to capture specific business potential – in other words, generate additional sales.

## At a glance

- Demand for more efficient service processes
- Replacement of the VAUDIS legacy system with VaudisX
- Higher service quality
- Strengthen customer relationships
- Identify additional business potential
- The data remains with the car dealership
- Connections to external systems possible (sales force, TKP repair shop planner)
- Modern user experience



# The reference in detail

## The challenge

VAUDIS – it’s hardly an unknown among VW service partners. VAUDIS is a dealer management system that has reliably supported process flows at car dealerships for over 30 years. VAUDIS still has a strong presence. Nearly half of all VW dealerships still trust in this dealer management dinosaur. However, the system cannot provide sufficient support for modern requirements, such as customer intimacy for an optimized customer experience, that benefit both customers and the repair shop. What’s more, the user experience when working with VAUDIS is stuck at the level of the late 1990s. Car dealership Autohaus Gitter in Erfurt didn’t want to settle for this situation any longer: “We wanted to make the entire service process as smooth and elegant as possible,” explains Heiko Etzhold, one of the dealership’s managing directors. It was important to the VW and Toyota partner that any potential replacements both maintain existing links to crucial, established tools and support connections to modern applications like Salesforce in the future. The dealership also wanted to make sure that all its customer data remained on their local servers.

## The solution

T-Systems teamed up with users from dealerships to develop VaudisX, the next generation of VAUDIS. This modern dealer management system comprehensively maps the service processes at the dealership, which runs the software on its own in-house servers based on a user-oriented, monthly payment model. VaudisX serves as the central hub for all service processes, from booking an appointment to returning the car to the customer.

The dealership’s employees can find all history information at a glance in the archived customer and vehicle files; all process flows between service consulting, repair shop, and customer are coordinated on a single screen. The new system makes switching between different programs a thing of the past. What’s more, VaudisX gives the dealership new options for services. When a service customer arrives at the dealership, their process is already defined and pre-qualified. Thanks to integration with other back-end systems, they can tell at once whether the customer is affected by a recall campaign. Waiting times are eliminated because the service appointment has been optimally planned in advance, including the repair shop resources and necessary spare parts. The digital solution keeps customers in the loop even if they don’t stay on site. The repair shop uses a tablet PC for electronic remote check-in. The tablet also makes it possible to document previously unidentified repair needs by taking pictures of the car directly. To extend the order, the photo can be sent to

the customer’s smartphone, together with a cost estimate. The customer can then decide – again, using their smartphone – whether they want the dealership to include the repair in the current service or wait until a later point in time. Postponed services can then be used to address the customer proactively later, because they are not lost – as was previously the case – thanks to archiving in VaudisX. In addition to making process flows more flexible, the structured, pooled storage of customer and vehicle information in a database archive also enables other analyses, to get to know the customer better and optimize the customer experience.

## Customer benefits

“Users are guided step by step, from appointment scheduling and planning to order qualification and repair shop planning, even up to invoicing and archiving,” says managing director Jürgen Ketzler, full of praise for the system. The diverse customer communication channels that the DMS offers were another convincing argument for the dealership manager. The end-to-end process support increases efficiency, benefiting employees and customers alike. Ultimately, VaudisX also helps Autohaus Gitter get a leg up on the local competition: it lets staff give better, more competent advice, which in turn strengthens customer relationships. What’s more, the new dealer management system helps the service consultants at Autohaus Gitter save a lot of time when organizing service orders. At the same time, VaudisX also opens up new business potential, by enabling customer targeting. Facts and analyses provide a much more solid foundation for sales talks, significantly increasing the chances of closing a deal. The software architecture of VaudisX opens the solution up to both the past and the future. Established tools like the TKP repair shop planner can still be integrated or used via interface. And new applications like Salesforce can be used at any time. And because VaudisX has a brand-neutral design, the dealer management system can also be used for the processes in the dealership’s Toyota division.

### Further advantages:

- Fixed price per user per month
- Simple addition and cancellation of users
- Joint further development with the customer
- Potential to run as SaaS from a T-Systems data center



# Laser-sharp focus on quality for carmaker

AI-driven QA process helped automobile manufacturer reduce errors during production



**“With its AI-based solution, T-Systems has supported the customer in optimizing its manufacturing processes in laser beam welding systems in terms of quality, robustness, and flexibility.”**

Wolfgang Holz, Sales Expert AI, T-Systems International

In 2020, the customer, a globally renowned automobile manufacturer, approached T-Systems to create a solution that would enable effective monitoring and quality control of the laser welding process in their factories.

A key priority was to reduce process complexity for the plant manufacturer, increase process robustness, and improve the flexibility of the laser beam welding systems so that modularity can be leveraged in the future. Continuous monitoring of quality throughout the welding process was also a crucial requirement.

## At a glance

- The customer was facing challenges with a complex and expensive laser welding quality assurance.
- AI-based solution with focus on data modelling, anomaly detection by leveraging computer vision.
- Technologies used include TensorFlow, Nvidia CUDA, OpenCV, Python, Tkinter, Docker, Jupyter.
- The customer benefited with a massive reduction of errors during production.



# The reference in detail

## The challenge

The customer was faced with the challenge that there are hardly any sensor suppliers for the intelligent process monitoring and quality assurance of laser welding processes in metal processing, which means that an economic large-scale implementation of an overall laser system is not possible. Manual quality controls with laser technology, CT, etc. that have been usually used so far are too complex and too cost intensive. Even random inspections lead to faulty deliveries. Due to the high complexity of quality assurance for laser welds, there is a need for customized, efficiency-increasing process automation by means of intelligent algorithms. Essentially, the customer wanted to reduce the process complexity at their factory, and improve process robustness and flexibility of the laser beam welding systems so that modularity could be exploited in the future. The customer also wanted to ensure a reliable quality control of the welding before, during, and after the welding process. The creation of the necessary prerequisites for a system-penetrating use of laser beam welding was also a requirement.

## The solution

T-Systems and the customer both agreed on the fact that intelligent algorithms can help reduce the price of the process enormously by using simple hardware sensor systems in the optics paired with previously unheard-of control intelligence that can be quickly and easily trained for new conditions. The pilot solution provided by T-Systems spanned three “packages”: (1) Consulting (2) Development of a computer vision approach for the holistic process of laser welding (3) Provision of a summary of all the results.

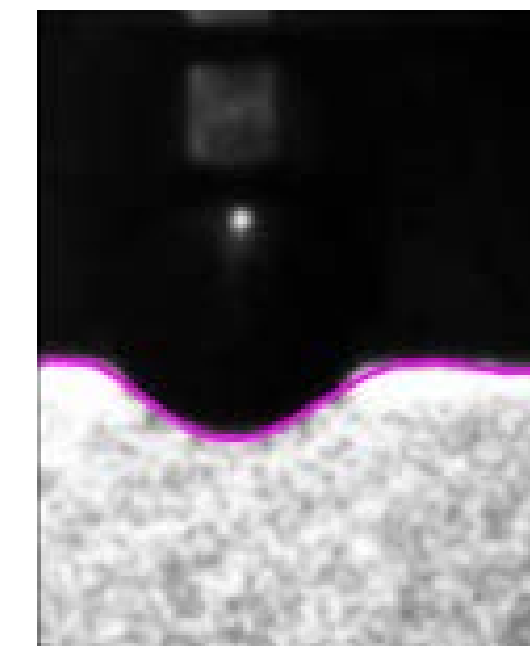
During the Consulting stage, T-Systems provided advice on different approaches driven by AI for the detection of fault patterns; procedures for mapping the requirements for the whole process; labeling and preprocessing methods for the planned image identifications; generating further data for subsequent model training, along with documentation of all considerations and proposals.

Based on the findings during the Consulting stage, T-Systems developed a computer vision approach for the automated quality assurance of laser welding. This included development of an AI software program for processing video files (around 500 different welding videos) of the process camera from the welding process, so that the evaluated video file is returned. T-Systems experts also worked on documentation of the data transfer, preparation of the data, and all analysis regarding methodology and results including evaluation of results. T-Systems provided its own GPU computers for the implementation of the training of computer vision models.

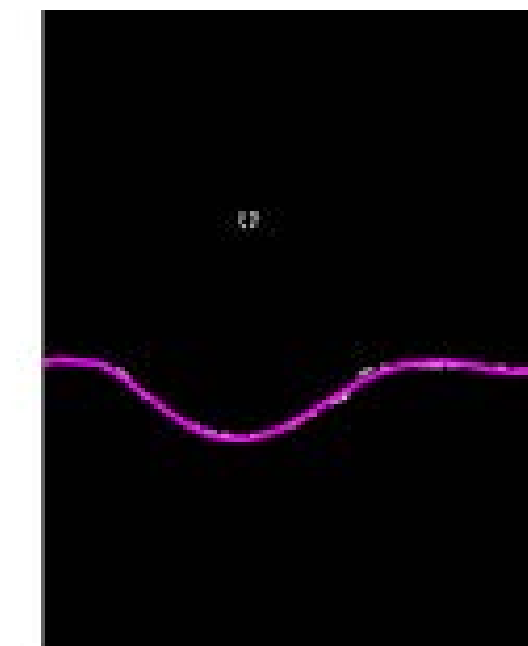
T-Systems identified four different use cases for laser welding, which are relevant: Edge & Notch Detection, Splatter Detection, Weld Through Detection, and Surface Pores Detection.

### Edge & Notch Detection

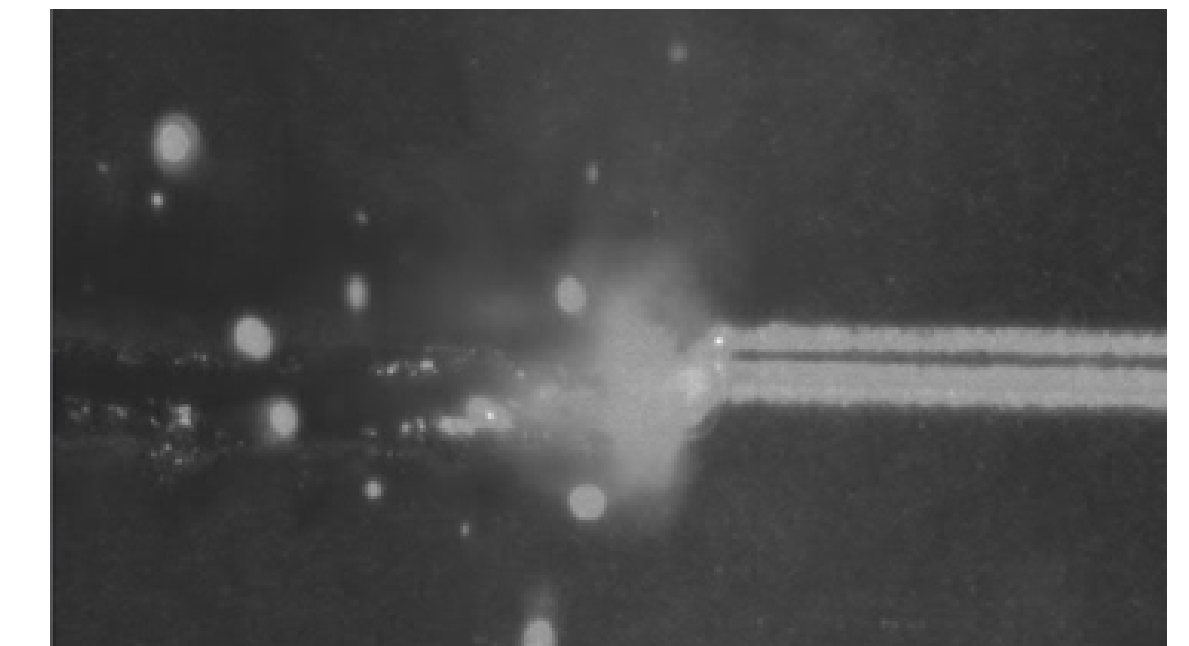
Original



Contours

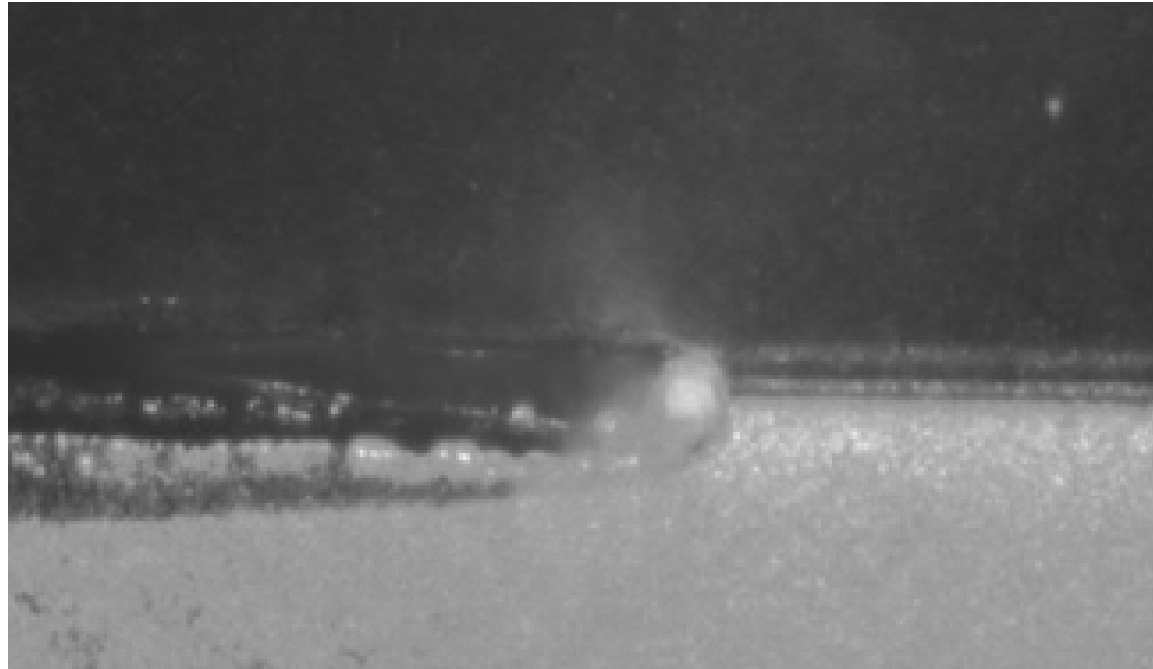


### Splatter Detection



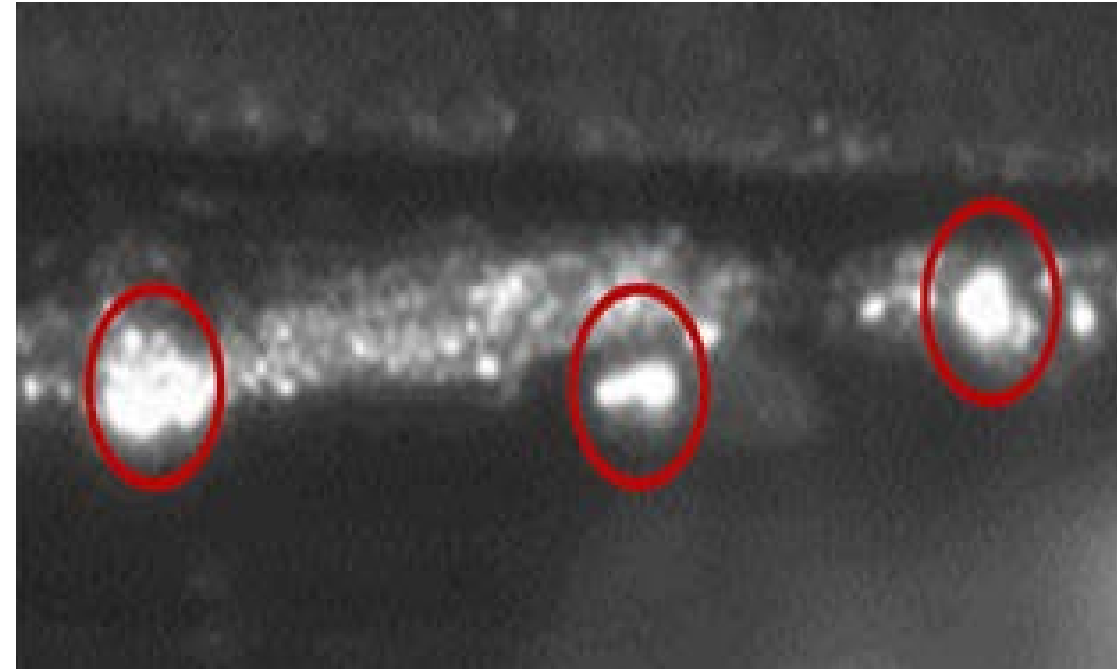


### Weld Through Detection



The deliverables of the third stage included a summary of all results of the project, code documentation, and consulting service for possible improvement of the code in the future with the aim of greater robustness and for industrialization.

### Surface Pores Detection



Noticeable value additions from the T-Systems team was experienced data scientists from various backgrounds, previous experience of executing similar projects, use of AI Vision with ready-to-use services for computer vision, and local availability of experts.

### ★ Customer benefits

Turning to a future-oriented partner like T-Systems allowed the customer to focus on their core business. Regarding the detection of through-welding, of weld spatter and of enclosed pores, the customer experienced a 100% accuracy over a dataset of 500 different welding videos and thus a reduction of errors during production.

Regarding Notch Detection, the algorithm within this project is able to detect notches with an accuracy of around 94%. A consequence of a notch, however, will be a weld through, which – as mentioned – can be detected with 100% accuracy.

Moreover, early detection of failures helped prevent multiple bad quality welds, resulting in quality and cost optimization for the customer and reduced stress for the plant engineers. The solution also enabled efficient quality management and continuous improvement by avoiding complex systems and implementing a flexible, more cost-effective approach driven by AI. In addition, process robustness and flexibility are increased.



# Process documents securely and with little effort

Boasteel Tailored Blanks uses the automated solution Kofax Total Agility for its invoices

Reference project



**“All the relevant data for our invoice process is extracted by the Kofax software, matched with SAP, and forwarded to the downstream systems. That saves time – and, of course, money – in many places in the process.”**

Süleyman Küçük, Team Leader, IT Baosteel Tailored Blanks

How can invoice receipt processes be optimized and automated? Baosteel Tailored Blanks, a specialist in lightweight construction that was founded in 1983, also faced this question. With 17 locations across three continents, more than 400 employees (239 of them in Germany), and revenues of around 148 million euros (data from 2019), Baosteel Tailored Blanks is a successful automotive supplier with expertise in lightweight construction – specifically in the area of laser-welded products. Most business enterprises still work document-based in many areas. Currently portal solutions for the pure electronic processing of information currently primarily exist in the public sector. This applies in particular to invoices and credit notes, which are predominantly still submitted in printed form or, in rare cases, sent to customers as PDF email attachments. By contrast, the processes that are used for invoice and credit note processing are largely completely digitalized. This means that the relevant information, such as the invoice amount, has to be transferred from printed or PDF documents into an electronic, digitally processable format.

In the worst case, this involves an administrator entering the information in the digital system manually and then scanning the documents and importing them into the corresponding systems. These burdensome activities take up a lot of time and staff resources. The processes are also error-prone, because any typos made during the manual transfer of information can impair the process.

## At a glance

- Highly automated solution for processing invoices and credit notes
- Automatic recognition of the type of document involved
- Integration with SAP and the ImageMaster archive system
- Reduction of manual activities and elimination of sources of errors



# The reference in detail

## The challenge

Baosteel Tailored Blanks also has to deal with large numbers of invoices and credit notes every day. The company only receives 20 % of them via e-mail as PDF files; all the rest arrive as conventional printed documents. The challenge is to process these specific documents with a minimum of manual effort, with the files having to be digitalized, their content captured, and the original documents archived. In addition, all content must be passed on to an SAP workflow.

## The solution

As part of a project for improving their invoice processing workflow, the company asked about an automated solution based on OCR and similar technologies. According to Süleyman Küçük, the previous process was error-prone, which required a lot of manual intervention by employees in the respective business unit and within Accounting. Since the company was unable to achieve the desired results, they decided to implement a solution from T-Systems, based on the Kofax Total Agility platform (KTA), a product for the digitalization and automation of document-based processes. All printed documents are now scanned and passed on to Kofax Total Agility, which automatically recognizes what type of document (invoice or credit note) is involved and then processes it in a workflow specific to the identified document type. Süleyman Küçük confirms this: “The recognition of data is outstanding. Subsequent corrections are only rarely needed.” The content (metadata) that is relevant for the invoice process is then extracted and, based on the PO number, a query is started in the SAP database to find the transaction to which the invoice or credit note belongs.

The digitalized documents and metadata are then forwarded to the ImageMaster archive system and from there to SAP. Recognition of the document type and extraction of the metadata are performed with the support of AI (artificial intelligence), which means no rigid set of rules has been defined. Instead, Kofax Total Agility has “learned” how to tell the documents apart and find the relevant data within them.

## Customer benefits

Thanks to the smart solution from T-Systems, Baosteel Tailored Blanks is saving time and money, as the company itself confirms. It now has a platform that makes it possible to process invoices and credit note error-free, with a high level of automation. Only a few manual steps are required to send the documents and other important information to the responsible administrators within Accounting, who can now approve transactions for posting with a few clicks of the mouse. The overall process is accelerated by the automation, giving employees more time to spend on other tasks. Süleyman Küçük underlines: “The solution is very stable. We haven’t had a single outage of Kofax so far.”

### Further advantages:

- A platform is available that can be used for every process and the corresponding documents and content involved.
- Enhancements are relatively simple, which means new processes can be implemented at short notice.
- Thanks to the use of the AI technology, the system improves continuously. New document types or invoices from suppliers
- that the system has not yet encountered merely have to be taught – no rule sets have to be modified.





# Thank You

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