WIRTSCHAFTS
WUNDER 4.0

DIGITIZATION MADE IN GERMANY

ZERO DISTANCE II
Wirtschaftswunder 4.0 – digitization made in Germany

Melitta coffee filters are experiencing a come-back in the USA and shoppers in Chinese stores are making a bee-line for Solinger cutlery. This drives the message home: the ‘made in Germany’ label still has real impact – worldwide. Even in countries outpacing us in terms of digitization, the products we make are held in high esteem. But which industries benefit the most? Which items have fully exploited their potential in the digital age? We Germans dozed through much of the first half of the digital era. Which is no surprise really because, led by consumers, the first wave primarily affected retail. And if we’re honest, marketing, sales and services are not our strongest points. We are much more at home in the worlds of construction, manufacturing and engineering. They’re what we are good at.

So how can Germany get onboard before the second digital wave gets underway? This time, in addition to retailers, and music and book specialists, there are other players on the field. Digitization is pervading sectors that are the heavyweights of our economy: plant and general engineering, heavy industry, consumer goods, pharmaceuticals and chemicals. These are our true fortes, accounting for our annual export surplus of 285 billion dollars – the highest in the world.

The conviction of our politicians in Berlin that a Wirtschaftswunder 4.0 – a digital economic miracle – is on the cards comes as excellent news for manufacturers. But as Chancellor Angela Merkel asks: “Will it take place in Germany?” Economist Rainer Drath observes: “Asian companies are influenced by what goes on in Europe, where our strengths lie in standardization and connectivity. Americans, on the other hand, are self-starters; they set to work even before the standards have been defined. We Europeans tend to hesitate before taking the plunge.” Yet it is time to stop dithering, and flex our muscles in standardization and integration. Because then, and only then, can Europe and, in particular, Germany be in with a chance of translating its highly respected industrial prowess into marketable digital business models. Industry 4.0, the cloud, mobility and analytics solutions will drive this digitization. But to master these in the B2B space, businesses must take a holistic approach to transformation. And they must demand quality – from their IT providers, for instance. Organizations should ask for nothing less than the best networks, first-rate platforms and the highest levels of security. As IT, telecommunications and production converge, manufacturing industries can make a real difference to the future. A study by McKinsey highlights exactly what is at stake: by incorporating the Internet into production processes, the German economy alone could grow by 207 billion euros by 2025. But if the transformation fails, the same amount will be lost.

As we know, economic miracles do not happen overnight. They are the result of hard work and they require us to look at the world in a new way.

Best regards,

Reinhard Clemens
Chief Executive Officer, T-Systems
The German economy could grow by 207 billion euros by 2025 if manufacturers incorporate Internet technologies into their production processes. But if the transformation fails, the same amount will be lost.

Source: McKinsey
DIGITAL ECONOMIC BOOM

“The potential is there for a digital economic miracle. The only question is: will it happen here in Germany?”

Angela Merkel at the German government’s IT summit, 2014

IT TRANSFORMATION IN BUSINESS

“As a leading industrial nation, Germany enjoys a reputation for innovation, but more especially for quality. This means that German businesses are relatively cautious. However, it is high time to accelerate IT transformation – across all industries. The key often lies in the cloud – and that’s why every single enterprise should seriously consider cloud-based solutions.”

Christophe Chalons, Chief Analyst, Pierre Audoin Consultants
Economic miracles do not happen overnight. They are the result of hard work. But where do we stand right now? How far have we travelled along the digital path?

Google and friends are constantly raising the bar, and ramping up the pressure. The future economic growth and competitiveness of entire nations depends on them embracing digital transformation. But how far along this path have German enterprises travelled?

The Boston Consulting Group (BCG) has ranked seven German industries according to their digital readiness, in comparison to the rest of the world. The logistics and automotive sectors are performing well, and keeping in step with the best international players. Engineering and retail are holding their own in mid-table positions. However, the TIME (telecommunications, information, media, entertainment) industries, financial services and healthcare are lagging far behind. Germany has traditionally enjoyed the greatest prowess and success in manufacturing and industry. And in these fields, the country must avoid falling off the pace within a fiercely competitive globalized marketplace.

The pivotal role of digitization in supporting new business models and economic growth is an established fact. But as soon as customer information and manufacturing processes are involved, there is simply no getting around radical IT reengineering. But how exactly can this transformation be accomplished? How do you migrate from a legacy environment to standard software and cloud computing in conjunction with maximum cost-efficiency? How do you make the necessary changes without disrupting ongoing business operations? And how do you deploy innovative technologies such as cloud computing, big data analytics and M2M while ensuring robust data protection?

The cloud is central to almost any transformation project. T-Systems can advise and assist customers every step of the way along this journey. We have a successful track record in cloud and related fields that stretches back more than ten years. And we can leverage the resources of an extensive partner ecosystem. This book presents real-life case studies that illustrate how businesses have improved their flexibility and competitiveness through cloud-based resources and applications, in conjunction with robust security and lower costs.

“Wirtschaftswunder 4.0 – digitization made in Germany” is the overarching theme for Deutsche Telekom in 2015, significantly impacting the ICT company itself, and its customers. Miracles do not happen overnight, they are the result of hard work. But it is possible to turn them into reality. And German engineering prowess, ingenuity and precision are the ideal basis for building a better, smarter, more digital future.
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01 Logistics.
31% of surveyed members of BVL, a major German and international logistics industry association, regard digitization as the sector’s most important issue by far.

The logistics industry does not produce or sell anything itself; instead, it is an enabler, ensuring that products and materials are always precisely where they are needed – 24 hours a day, 365 days a year, and frequently just-in-time or just-in-sequence. The sector employs 2.8 million people in Germany, generating revenues of 230 billion euros annually. A key role is played by innovative IT solutions. Examples include a goods-to-person picking system based on powerful mini-robots, a new delivery concept allowing couriers to deposit packages in recipients’ car trunks, cloud-connected forklift trucks, and a solution that leverages big data and real-time telematics to streamline management of seaport freight.
When global logistics companies order replacement parts or repairs from Linde Material Handling (LMH), time is of the essence. To keep costly downtime to a minimum, service tasks need to be planned, assigned and performed in double-quick time. Against this background, LMH deploys a cloud-based platform to connect its back-end ERP system with the special hardware on the customers’ forklifts and handhelds used by LMH’s engineers. This has accelerated processes and improved transparency. Moreover, LMH has combined this solution with Deutsche Telekom’s Arrival Control app, providing real-time information on the status of spare-part orders and service assignments. Its minute-by-minute updates allow customers and LMH professionals to track repair and maintenance processes from end to end – from the moment an error code is captured by the on-truck hardware, to the dispatch of an engineer. The combined solution makes repair and maintenance work much easier to plan, increases efficiency, and reduces forklift truck downtime.

7500 service engineers are employed by Linde Material Handling worldwide.

The deployment of Arrival Control saves a significant amount of time, provides greater transparency, and streamlines planning. The net result is time and cost savings for both LMH and its customers. Using the app, customers know the arrival time of engineers to within a matter of minutes, and do not waste valuable time waiting unnecessarily. In addition, the on-truck capture and subsequent transmission of error codes enables remote diagnostics. In conjunction with highly automated staff deployment planning, this eliminates unnecessary call-outs and wasted man-hours. All in all, the solution increases cost effectiveness, and is good for the environment, too.
MINIMIZING DOWNTIME – MAXIMIZING EFFICIENCY

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THE FUTURE OF PARCEL SERVICES?

E-commerce revenue in Germany is expected to double by 2017 – reaching approximately 70 billion euros. But as online sales have increased, so too has the number of failed delivery attempts for e-purchases – generally because the buyer was not at home. The schedules of DHL and other couriers simply do not align with the working lives of many online shoppers. These fruitless trips cost time and money, and have environmental repercussions. However, T-Systems may have found a way to avoid this waste. The company is working on a new concept: couriers and grocery delivery services drop off their parcels at the customer’s car. A secure, one-time access code is sent to the driver’s smartphone, allowing them to deposit the package directly in the recipient’s trunk.

38.7 bn

Euros were generated by online sales in Germany in 2013. This is a 17 percent year-on-year increase.

Retailer Edeka and a major car manufacturer have completed a successful field trial of the new delivery concept, based on the mIAS solution developed jointly by T-Systems and software partner MicroStrategy. Employees from the auto company who shop at Edeka had their groceries delivered directly to their cars, which were parked on the car manufacturer’s premises. The courier locates the correct automobile via GPS using their cell phone. The system authenticates the person’s identity before granting access. It only opens the trunk of the car, and relocks it as soon as the goods have been deposited. The T-Systems solution is easy to implement, and may completely change the face of e-commerce.
CARRY BY NAME, CARRY BY NATURE

Fast, agile, and powerful – meet Carry, the mini-robot from Grenzebach. This high-tech innovation addresses a common problem in warehouse logistics in the mail order sector: in conventional warehouses with static shelves, employees walk up to 18 kilometers per day during the picking process.

Grenzebach’s G-Com system takes a goods-to-person approach; this automated solution brings the shelves directly to the workstation. The Grenzebach fleet management software is the core of the system; it coordinates and monitors the robots’ movements, ensuring that goods arrive at the right picking station at the right time. To accomplish this, the Carry robot moves beneath the shelf, lifts it, and conveys it to the workstation. There, state-of-the-art picking technologies such as lasers, scanners, and put-to-light further accelerate the process.
70% increased picking efficiency through use of intelligent robots.

Massive power in a small package: the mini-robots can travel at up to 60 meters per minute while carrying loads of up to 600 kilograms. When not carrying a load — on the way to retrieve a shelf, for example — they reach speeds of up to 90 meters per minute. What’s more, the scalable, automated system’s low purchase price ensures a rapid return on investment. An easy-to-use GUI makes learning how to operate the G-Com system simple and quick, and reduces the error rate during picking.
The amount of container cargo traffic at Hamburg’s docks is rapidly increasing – up to 18 million twenty-foot equivalent units (TEUs) are expected to pass through each year by 2030, double today’s traffic. But the largest port in Germany, and second largest in Europe, is limited to an area of 72 square kilometers. Physical expansion would cost time and money, and is not a feasible option. Against this background, Hamburg Port Authority (HPA) has introduced smartPort Logistics to efficiently manage flows of goods, improve truck throughput, eliminate congestion, and gain a bird’s-eye-view of operations.

Benefits. The solution streamlines port logistics – from the moment goods arrive, to when they reach their final destination – and benefits all process participants. Some 40,000 trucks are loaded and unloaded at Hamburg’s docks each day. A central portal and mobile applications support seamless communications, enabling port managers, terminal staff, freight carriers and parking slot coordinators to exchange information with each other and with drivers and vehicles. Rapid insight into the current traffic situation and entire port infrastructure enables faster responses, ultimately saving time and money. In addition, less congestion around the port benefits drivers and the environment.

18m

TEUs are set to pass through the port of Hamburg annually by 2030.

*Twenty-foot equivalent unit
Telematics from the cloud

HAMBURG PLAYS A KEY ROLE in global shipping operations. Multiple routes pass through the north German port, connecting it to 179 countries around the world. The second largest commercial harbor in Europe handles almost 140 million metric tons of goods each year. An increase in global marine traffic is expected to more than double annual container throughput in Hamburg by 2030, pushing it up to 18 million TEUs. The docks’ 72-square-kilometer site offers limited scope for expansion, which means the Hamburg authorities (HPA) needed an alternative way to meet rising demands. Enter smartPort Logistics. This offering streamlines management of spiraling goods flows, improves truck throughput and prevents congestion – enhancing quality and efficiency along the entire logistics chain. The facility’s operators leverage a private cloud solution from T-Systems, based on elements from the ICT provider’s connected car portfolio, to deliver, access and integrate all relevant data in real time. As a result, all stakeholders – from port and fleet managers, to freight carriers, drivers, and gas station and rest stop operators – enjoy role-specific, up-to-the-minute visibility. Using SAP HANA, HPA enriches this information further by adding details on road and bridge closures, construction sites and orders.

IN SHORT: smartPort Logistics delivers facts and figures that support faster decision making and rapid responses to dynamic changes in traffic and port infrastructure, saving time and money. What’s more, the solution accelerates traffic and goods flows and eliminates congestion – benefiting both drivers and the environment.
T-Systems has long been an acknowledged cloud-computing pioneer, and has successfully delivered dynamic ICT services for ten years. It currently provisions more than 40 million SAPS for production systems supporting over 2.6 million users. In the last decade, it has repeatedly expanded its portfolio - and it now includes infrastructure, applications, mobile-enabled apps and industry-specific solutions. Its Dynamic Cloud Platform (DCP) has benefited from continuous improvement and the ongoing development of diverse technologies and methods. The result is a secure, high-availability core cloud system of consistently high quality around the globe. Internationally, more than 250 enterprises leverage this platform to meet the unique demands of their businesses. For one major corporation T-Systems executed the world’s biggest migration project (to a cloud-based SharePoint environment). For another, it completed the largest-ever transition to a secure collaboration platform.

In late 2014, T-Systems signed its largest customer contract for its Dynamic Workplace offering. Moreover, the ICT provider is a front-runner in cloud computing for the automotive sector, and an enabler of alternative personal transportation services and new digital business models. In addition to extending its cloud portfolio with the support of a worldwide partner ecosystem, the Deutsche Telekom subsidiary continues to expand its global cloud infrastructure. Its future hub will be Germany’s largest and most advanced data center, on a campus in Biere near Magdeburg, that opened in 2014. The quality of T-Systems cloud solutions has repeatedly earned the plaudits of IT industry analysts.

**CLOUD 1.0 2000–2004**
- Develops and analyzes various provisioning models, pilot projects.

**2005–2006**
- First provider of a viable cloud offering for business applications (SAP).
- Fifteen customers deploy T-Systems’ dynamic platform.

**CLOUD 2.0 2007**
- Pioneers networks optimized for cloud applications with redundant data lines and secure transfer via IP VPN tunneling.
- Deutsche Telekom’s billing system, the largest SAP installation in Europe, migrates to a dynamic platform.
- Over 1,000 systems run on the Dynamic Services platform.
- Pinnacle Award for innovative hosting services.

**CLOUD 3.0 2008**
- Deutsche Telekom becomes first German company to establish a dedicated management board position for data protection, legal affairs and compliance.
- 2,000 systems running on the Dynamic Services platform.
- US software vendor NetApp names T-Systems Innovator of the Year.

**CLOUD 4.0 2009**
- T-Systems is a leading provider of virtualized SAP landscapes.
- Named SAP Global Support Partner.
- Recognized as Run SAP Partner of the Year.

**CLOUD 5.0 2010**
- Pioneers mobile cloud solutions for enterprise customers.
- Enters strategic partnership with Microsoft.
- Adds a collaboration solution to its Dynamic Services portfolio.
- Awarded world’s first SAP cloud certification.
CLOUD 6.0
2011
>> Performs world’s largest transition of a collaboration solution to the dynamic cloud platform, for a DAX-listed corporation.
>> Launches Infrastructure as a Service, a standardized offering accessible over the Internet.
>> Start of the world’s largest-ever migration to a cloud-based SharePoint platform for a publicly traded global player.
★ Named Run SAP Partner of the Year (support category).
★ Receives award from the German Federal Ministry of Economic Affairs for secure cloud computing for mid-size enterprises and the public sector.

CLOUD 7.0
2012
>> The only provider with a fully dynamic portfolio of one-stop ICT services.
>> Offers comprehensive consulting and operating services for migration of complex applications and data to the cloud.
>> Delivery network for an end-to-end ICT offering for more than 120 countries.
>> Launches Infrastructure as a Service, a standardized offering accessible over the Internet.
>> Delivery network for an end-to-end ICT offering for more than 120 countries.

CLOUD 8.0
2013
>> Pioneering in cloud offerings for the automotive industry: connected car, predictive maintenance, personal mobility services, and digital business models (e.g. car sharing, park sharing)
>> Expands cloud partner program (VMware, doculife).
★ Named VMware’s Partner of the Year for Consulting and Integration (EMEA).
★ Becomes first German company certified by VMware as a vCloud Data Center Services provider.

CLOUD 9.0
2014
>> Launch of multi-provider cloud broker for enterprises.
>> Establishes and commences roll-out of a standardized global cloud platform.
>> Expands portfolio to include cloud-based Dynamic Workplace and online marketplace.
★ Expands cloud partner ecosystem: Cisco, Siemens, SAP/SuccessFactors, Informatica, Salesforce.
★ Partnership with SAP: dynamic provisioning of SAP HANA from a secure private cloud. Where required, proof-of-concept installation including licenses for short trial periods (e.g. three months).

T-SYSTEMS
DIGITIZATION – STRENGTHS IN DEPTH

Data center opened in Biez; when completed, this will be the largest cloud data center in Germany and the third-largest in Europe.

Operates the world’s largest single SAP (ERP) cloud platform with 713,000 SAPS.

Wins largest customer contract for Dynamic Workplace: 80,000 desktops and 10,000 service systems provisioned worldwide from a T-Systems cloud.

Recognized as a Cloud Leader by Experton in 2010-2014.
DEGREE OF DIGITIZATION IN THE GERMAN AUTOMOTIVE INDUSTRY (100 = GLOBAL LEADER)

Digital customer interaction: 74
New business models: 80
Automated processes: 93

Germany is the world's leading exporter of cars – over two thirds of the country's output is exported, accounting for more than half of the national balance-of-trade surplus. And the major automakers are now applying the passion and engineering expertise that made them successful in the past to ensuring progress in the present – 127 years after Gottlieb Daimler and Carl Benz's historic invention: they are marshalling their skills and resources to build digital connections between cars, manufacturers, repair shops, and smart infrastructures.

McKinsey forecasts a 6x increase in market volume for components and services for connected cars – from 30 billion euros annually at present to 170 billion euros in 2020.
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INCREASING BUSINESS VIABILITY WITH A DIGITAL PITSTOP

Germany’s innovation and quality have made the nation a world leader in automotive engineering. 391.05 billion euros was generated by Daimler, BMW and Volkswagen in 2013 – accounting for over 32 percent of the industry’s global sales revenue that year. Japan is in second place, followed by US manufacturers in third. Dealerships and repair shops play a pivotal part in Germany’s success. They are vital to sales and customer satisfaction in an increasingly connected world. But traditional dealerships are under pressure from new concepts and technologies, such as car clubs, Internet sales platforms, and virtual showrooms. And research suggests that many will buckle under the strain. In 2010, there were approximately 8,000 dealerships throughout Germany. However, the German Institute for the Automotive Industry (IFA) expects this number to almost halve – to 4,500 – by 2020. The nation’s 38,500 auto repair and maintenance shops are also locked in a fierce battle, vying for the 80 million visits that statistically occur annually – a figure that may seem low for a total pool of 43 million registered cars. But today’s automobiles, especially those engineered in Germany, have become highly reliable. Moreover, workshops and dealerships are often unmanned 16 hours a day, making scheduling appointments a hassle.

However, there are customer-friendly dealerships and workshops that buck the trend – by means of new services and value-added technologies – such as beacons, Bluetooth, and mobile phone apps. These resources are available 24/7, and form the basis for customer experience management (CEM) applications from the cloud.
“OF THE 7,950 INDEPENDENT CAR DEALERS THAT EXISTED FIVE YEARS AGO, ONLY 4,500 WILL SURVIVE UNTIL 2025.”

Prof. Willi Diez, Director of the German Institute for the Automotive Industry (IFA)

Retrofitting Internet connectivity

If all three million new vehicles registered annually in Germany were to be equipped with an Internet interface, then every car in the country would be online by 2015. This would, for example, enable data to be seamlessly exchanged with their repair shop. But there is no need to wait that long. There is a plug-in retrofit solution available: CAXLA captures a variety of key metrics and event data, and can be installed in any used car, no matter what the model or marque. This data is transferred to an app on the driver’s smartphone by means of Bluetooth, which converts it into meaningful diagnostic information. This is then forwarded to an authorized workshop via a cloud platform. The dealer can access this data pool at any time, and can integrate it into his CRM and UMS software, and the corresponding processes. As a result, it is possible to recognize when a car requires maintenance, and to schedule an appointment. The solution streamlines workshop visits, increases productivity, and enhances convenience.

Digital dealership

Automobile dealers struggle to accurately determine which customer is interested in which vehicle on the lot or in the showroom. Customer experience management modules, such as the Showroom Proximity app, are changing this. For example, when a customer approaches a vehicle equipped with an IDEASCON, the app on their mobile phone registers the object of their attention. Even outside of normal business hours, they can pull up prices and other important information directly on their smart device, or set up an appointment for a test drive. This vertical solution is part of a comprehensive cloud platform, connecting drivers, dealers, workshops, and UMS.

Streamlined vehicle handover

Anyone taking their car into an auto shop for a repair or routine inspection wants to know two important things: how much will the work cost, and how long will it take. sCHECK delivers a rapid, reliable answer to both questions. The cloud-based, mobile solution provides a quotation in a matter of minutes, rather than days. Using the touchscreen on a tablet, the mechanic describes what repairs and space parts are needed — while looking over the car with the customer. sCHECK pulls information directly from the dealership’s or manufacturer’s database, and provides answers to delivery times for parts, open slots in the work schedule, and total price, including labor. Once the mechanic and customer have added their signatures, the sCheck process is completed and the workshop’s CRM system automatically initiates the necessary purchase orders.
**BUSINESS**

**Requirements.** According to PwC, annual global car sales are expected to grow from 83 million at present to 109 million by 2020. This will mean more road traffic and more pollution, and may just take much of the enjoyment out of getting behind the wheel. Daimler is taking steps to ensure that the Mercedes-Benz driving experience remains a pleasant one. In 2011, the manufacturer introduced COMAND Online, a multimedia system. Now it wants to broaden the system's functional scope beyond Internet connectivity, telephony, and infotainment to offer new, uninterruptible, and highly secure communication services worldwide. Daimler's Mercedes me and connect me are specially designed to digitize driving and create an end-to-end customer experience.

**Benefits.** By launching innovative online services, the automaker is expanding the digital driving experience for Mercedes-Benz and Smart customers. These services can, for example, simplify travel to a desired destination, assist in emergency situations, and reduce service and maintenance times. This not only strengthens customer and brand loyalty in a digital world, but also facilitates improvements to and expansion of the company's internal manufacturing and logistics processes – including support for meeting the business requirements of fleet customers and organizations.
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**Carpe diem in the cloud**

In 2011, Daimler began equipping a number of Mercedes-Benz models with the COMAND Online multimedia system. The Daimler Vehicle Backend (DaVB), operated by T-Systems in a private cloud, is deployed to configure applications in line with each car’s user interface, to distribute automatic updates and to launch new apps. From the onset of the project, the automobile manufacturer has proven itself an industry pioneer in the use of secure VPN technology and encryption for Internet communications. And Daimler plans to build upon this reputation in its key growth markets, China and the USA. COMAND Online’s new functions will leverage a secure hosting infrastructure, where T-Systems operates the Daimler Vehicle Backend – providing Mercedes drivers with a system uptime of 99.9 percent. In addition to central platform and communication services (text messages, e-mail, push notifications), Daimler can also deploy its own internal apps, and products developed by and for dealers, fleet managers, logistics partners, and insurance companies.

**In short**: Daimler can provide a range of online services and Mercedes-Benz applications through its multimedia system, COMAND Online, centrally from a private cloud. The new functions have improved efficiency, convenience and safety for drivers, and have reduced environmental impact.
FORT KNOX IN THE CLOUD

In 2014, T-Systems officially opened a campus in Biere, Magdeburg, that will one day house Germany’s largest data center. The complex will be the main hub for the ICT service provider’s global cloud infrastructure.

NETWORK CONNECTIVITY

Designed as twin-core data centers, the two identical facilities are linked by several terabit connections spanning the 20 kilometers between them. Each site has dual connections to Deutsche Telekom’s backbone network. All data is simultaneously maintained at both data centers. Should one of them fail, the other can instantly take over.

High-performance backup generators can keep the entire facility powered up in the event of a mains outage. All of these features ensure the high availability and redundancy that underpin the provider’s outstanding IT service quality. At the same time, the very latest security systems and uncompromising physical access controls enable T-Systems to deliver on its promise of cast-iron IT security “made in Germany”. The complex offers close to 40,000 square meters of production space. When it is fully built out, it will be one of Europe’s largest data centers.

The new facility’s groundbreaking energy efficiency earned T-Systems LEED (Leadership in Energy and Environmental Design) gold certification. This is an international accolade shared by only a handful of the world’s data centers.
Air conditioning
A stream of cold air is routed to the rear of the servers, where it is heated to 32 degrees Celsius. The air is cooled by heat exchangers and then recycled. As the outside temperature rises, additional cooling systems are gradually brought online.

Space for 30,000
physical servers

27% saving in power consumption

Server space
The data center will initially provide 5,400 square meters of space for 30,000 servers. Over time, this will increase to 39,600 square meters, making the Biere facility the largest data center in Germany and the third-largest in Europe.

Backup power supply
In the event of a mains disruption, a 25-megawatt uninterruptible power supply (UPS) can keep the twin-core facility operational. Diesel generators can provide backup for up to 72 hours until mains power is restored.
03 Engineering.
Traditional engineering is a powerhouse of the German economy, with annual revenues of 212 billion euros. “Made in Germany” is a seal of quality known across the world; over 70 percent of the country’s engineering output is exported. To maintain this prime position, the industry is increasingly harnessing M2M and similar digital technologies – not just in Germany, but worldwide. Examples include state-of-the-art fault detection technology in elevators, enabling predictive maintenance, and highly agile microfactories that leverage 3D printing to make customized cars.
SCHINDLER ELEVATORS – SMARTER THAN THE REST

The Schindler Group’s elevators and escalators are used daily by a billion people in 100 countries. The Swiss company employs 20,000 field engineers worldwide to service and maintain its products.

When an elevator breaks down, it can take several hours before the fault is detected and reported. This is not only the case in buildings occupied by just a few people, but also in high-rise towers, where there are sometimes dozens of elevators and hundreds of users. But Schindler has the solution to this problem. In the event of a malfunction, their state-of-the-art elevators automatically issue an alert to a control center. This means that, in most instances, by the time the customer notices the problem, a service engineer is already on the way to fix it, with the correct replacement parts. This approach drastically reduces downtime, and minimizes inconvenience. And in the near future Schindler hopes to go a step further, and leverage predictive maintenance technology to prevent all outages.

20,000

service engineers already working with digital toolboxes.

Schindler began deploying this fault detection technology in 2013. Key roles are played by the digital toolbox for service engineers, installed on Apple iPhones and iPads, and an M2M system that sends status updates from the elevator to a central connectivity management platform. Sensors installed in elevators capture and transmit data on parameters such as vibration, speed and temperature. This information provides Schindler with complete and continuous transparency, enabling real-time fault detection. Furthermore, when maintenance work is required, Schindler’s business-rules engine automatically transmits an alert to the field engineers – who receive it via the digital toolbox. In the majority of cases, the system prompts the service engineers to carry out maintenance before a breakdown even occurs. For this solution, Michael Nilles, CIO of Schindler, was presented with the Digital Business Innovation Award 2015 by leading German business daily Das Handelsblatt.
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PRINT MY RIDE!

John B. Rogers, 41, has a clear vision for his Arizona-based enterprise, Local Motors. He wants to show that in the digital age, there's more than one way to build a car. Instead of highly complex multi-million-dollar production lines, Local Motors uses 3D printers to generate prototypes, and creates the finished article at super-fast, highly agile microfactories. The ideas for designs and technology come from the crowd. The Local Motors online community's 48,000-plus members exchange ideas on which car should be built next and how. As a Web 2.0 automotive manufacturer, Rogers places particular emphasis on personalization and localization. "We want to give people the car they need. It must suit the climate where they live, and be affordable for them."

50 parts

Just 50 parts were used in the Strati 3D roadster. Normally, cars contain up to 10,000 components.

The Strati is the world's first electric car made entirely using 3D printing technology. It was printed and assembled in September 2014 at a technology exhibition in Chicago, in front of a live audience. The roadster's body and chassis were printed in a total of just 44 hours, in a process similar to the operation of a hot-glue gun. It then took 15 hours to sand, shape and polish the vehicle, and two days to fit it with the electric powertrain from a Renault Twizy. This particularly rapid manual assembly is only possible because the two-seater vehicle consists of just 50 parts, compared to a typical car, which has up to 10,000 components. Local Motors expects the Strati to be declared fit for the road by this summer.
MORE PROACTIVE, LESS REACTIVE

The number of cyber attacks is skyrocketing. Every day, there are 3,000 attempts to penetrate the German federal government’s network alone. And more threatening than the sheer volume of attacks is their increasing quality and complexity. Firewalls and antivirus software typically recognize known malware; however, professional hackers frequently breach defenses while remaining under the radar. The intruder can then manipulate IT systems, and steal business-critical information. According to a study by Trend Micro, it takes on average nearly 230 days for an organization to discover this kind of intrusion, and to begin mustering a counter offense. With this in mind, enterprises need to invest more in early detection and prevention.

In the future, defense methods and mechanisms will increasingly shift to backbone networks.

PREVENTION
Identifying and mitigating vulnerabilities

Conventional defenses, including firewalls and antivirus software, remain an integral part of an organization’s security lineup. They block the majority of standard attacks by hackers on IT systems, and curb the spread of malware. Additionally, educating employees on cyber security and potential threats is a key aspect of any prevention strategy.

This added layer of protection is vital, as professional criminals can often exploit the human factor to pinpoint vulnerabilities and obtain network access. Furthermore, it is important to deploy products and IT solutions that are secure by design. And enterprises should determine what data is truly mission-critical - and ensure that robust defenses are in place for these key assets.
480,000 euros of damage is caused by the average targeted attack on a large German corporation.

400,000 new viruses are unleashed on the Internet every day.

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229 days, on average, elapse before an organization detects a targeted cyber attack on their IT systems.

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In 2013, cybercrime damaged the German economy to the tune of 1.6% of GDP.

800,000 attacks are registered daily by Deutsche Telekom’s 180 honeypots.

35,000 customers are notified of malware infections by the Deutsche Telekom Abuse Team every month.

1,444 security warnings and advisories were published by Deutsche Telekom’s CERT in 2014.

DETECTION
Simulating and analyzing attack patterns
Dissecting the tactics employed by hackers can help hone defenses, making them more effective. Companies should implement intelligent security management that aggregates information from a variety of sources – and analyzes it in real time to shield systems from novel attack vectors. To combat these emerging threats, T-Systems has partnered with FireEye, which specializes in protecting systems from complex digital threats. The cyber security enterprise detects previously unknown, particularly dangerous vulnerabilities - frequently encountered in popular programs. Furthermore, major corporations should analyze attacks in dedicated cyber security centers, and share their findings with others.

REACTION
Rapid response and robust recovery
There is no way to guarantee assets are 100 percent safe. Even when all available mechanisms are in place, criminals may still successfully infiltrate networks. Enterprises must be prepared for these scenarios - and have recovery plans ready, and cyber emergency response teams (CERTs) on standby. CERTs identify, verify and counter threats, detect and evaluate vulnerabilities, and manage security architectures.
04 Retail.
Reaching nearly 43 bn euros in 2014, the market volume in online retail experienced substantial growth.

No industry is as customer-centric as retail – or as successful at enhancing this centricity through digitization. The pressure on profit margins is high; German retail prices for fast-moving consumer goods are the lowest in Europe. As competition grows, department store and supermarket chains across the globe must continuously increase the efficiency and user friendliness of both their products and the corresponding marketplaces. This means using customer insights, track and trace solutions, and new services to build bridges between bricks-and-mortar retail and e-commerce. It is important to create product environments and shopping systems that are attractive to today’s consumers.
GAS STATION 2.0

In-store sales now account for more than 86 percent of gas stations’ net revenue. As a result, their IT systems face very similar challenges to those of supermarkets. Customers expect stocked shelves and access to the latest services, an up-to-date product assortment, and advertising to match. Cloud-based POS and ERP systems make this possible. This solution allows changes, such as new promotions and campaigns, to be swiftly implemented across all retail locations. Customers access coupons via their smartphones, and are informed of new offerings on digital displays and screens. They can pay with their smartphone or at a self-checkout. That is gas station 2.0.

27%

increase in mobile payment transactions in 2013.

Cloud-based POS and ERP systems are the future. They offer lower IT costs, and much more besides. In comparison to conventional, locally-installed solutions, gas station 2.0 is far more agile and dynamic: new modules, components, and even entire software programs can be rolled out quickly across all sites straight from the cloud. This pioneering approach saves significant time and resources when introducing additional value-added functionality— including, for example, social media capabilities, innovative corporate apps, and software for monitoring traffic flows.
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BUSINESS

Requirements. The Internet and e-commerce have put immense pressure on Weltbild’s business model. The situation was exacerbated by the simultaneous pursuit of multiple large-scale projects and a failure to make the right strategic decisions at the right time. This ultimately led to bankruptcy in January 2014. To survive, the company had to take rapid, radical action, including drastic consolidation and cost cutting. Migrating their online shop to a cloud was one of the steps taken.

Benefits. Weltbild is able to immediately slash costs, and is better equipped to manage its growing e-commerce activities. The new, scalable infrastructure can accommodate fluctuations in demand – for example during the Christmas season, when order volumes increase by approximately 600 percent. What’s more, the infrastructure boasts availability of up to 99.9 percent.

Increase in load of 600%.

During busy periods, such as Christmas, order volumes can skyrocket by up to 600 percent. Weltbild’s new IT infrastructure is easily able to handle these peaks.
Cloud computing – Weltbild’s future

WHILE IN THE process of adopting a primarily-online business model, Weltbild was forced to declare bankruptcy. The publishing group has 10 million customers across Europe, three million products, approximately 150 bricks-and-mortar shops, and one of the continent’s largest online book stores. However, the shareholders were unable to agree on strategy.

In order to survive, a cost-effective and scalable IT infrastructure was needed – and fast. In fact, the company was required to vacate the legacy data center in Augsburg within six weeks. The data and applications for critical online shops were migrated to a cloud in a data center in Bavaria; the remaining back-end systems were moved to Hesse. This marked the first milestone: a huge reduction in IT costs.

Previously, the IT infrastructure had been pushed past its limits; now, it had become scalable. It is dynamically delivered from a vCloud, allowing it to handle peak loads, such as a six-fold increase in business during the Christmas season. Resources are provisioned immediately, in line with changing needs; clearly defined SLAs and a high-performance twin-core data center guarantee availability of up to 99.9 percent. Weltbild no longer has a diverse server landscape – they enjoy state-of-the-art, cost-effective, uniform infrastructure, including the assets needed for their online shop.

IN SHORT: Today a scalable infrastructure from a cloud enables cost savings, helps stabilize Weltbild’s position, and provides the framework for a digital business model.

IT

Requirements. A race against the clock – after a 14-day preparation phase, only four weeks remain to migrate 200 business-critical online shop systems. These need to be transferred to the Dynamic Services Infrastructure vCloud in Bavaria, and 330 back-end systems were relocated to Hesse. Furthermore, the highly heterogeneous legacy landscape with 530 systems has to be harmonized to deliver stable high performance.

Solution. The online shop and back-end systems are migrated to the cloud on schedule. The test and production environments required over 1,000 CPUs and up to one terabyte of RAM. New resources are now provisioned in seconds. The systems are managed via a self-service portal, and all 150 bricks-and-mortar shops are connected by a stable, high-performance WAN.

200 systems were migrated to a highly dynamic DSI vCloud in Bavaria, to serve as a testing and production environment for the online shop. 330 back-end systems were relocated to a demand-side management (DSM) platform in Hesse. A high-performance Gigabit Ethernet network ensures the systems for 10 million customers and 3 million products work smoothly and reliably.

Transformation in six weeks

Phase 1: Migration of the online shop to a DSI vCloud in Bavaria

Phase 2: Migration of databases to the DSM platform in Hesse in three phases:

- Provisioning of the infrastructure, the first 50 servers, and WAN connectivity
- Implementation of 100 further servers
- Implementation of the remaining approx. 180 server systems

Phase 3: Upgrade to a Gigabit Ethernet network
TIME* DEGREE OF DIGITIZATION IN GERMAN TIME INDUSTRIES (100 = GLOBAL LEADER)

Digital customer interaction: 56
New business models: 58
Automated processes: 44

Digitization impacts the new and old economy. TIME* is a young industry; its disruptive technologies blur boundaries between enterprises. Cloud computing, mobile and analytics solutions are creating innovative business models and products. From audiobooks to smartphones, to interactive online newspapers – new offerings continue to evolve. Companies such as Google and Apple are developing connected cars. Soccer clubs are looking to leverage apps for improved CRM. And it is not just end-products that are changing. It is also enterprise IT resources and working environments. Here, too, digitization continues to sweep all before it – via virtual desktops, mobile applications, big-data analysis, and more.

90% of all data that exists today was generated in the last two years – and of this, 17 percent is generated by mobile devices, according to Intel President Renée J. James.
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BIG DATA – AN ALL-ROUND WINNER

Soccer fans – whether in the stadium or watching at home on TV – will soon enjoy an app that puts match-related graphics, videos and animations right at their fingertips. The app utilizes reams of unstructured data generated by the SAP HANA platform during the match – including passes, player movements, distance covered, and shots on goal. The German national team benefits, too – coaches leverage SAP Match Insights, a powerful tool for analyzing tactics and player performance. And clubs and associations may, in the future, be able to harness the technology to create real-time CRM – for example for ticketing, the fan shop, spectator management and social media channels.

77.7 m

Data points on player and ball positions are processed by SAP Match Insights every hour.

The German national team harnessed a prototype of SAP Match Insights to prepare for the World Cup in the summer of 2014. During training sessions, sensors in the ball and in players' socks transmitted 4,200 data points per second into a database. These facts and figures were used in the development of the prototype, and the information was synchronized with video to aid in tactical analysis. Additionally, coaches were able to view each player's metrics in real-time, and could import data from third party providers to prepare for their next opponents. During the tournament in Brazil, the German national team used this system heavily – to resounding success.
BUSINESS

Requirements. Deutsche Telekom plans to enhance service quality at its 720 Telekom shops by equipping these retail and customer service outlets with virtual desktops. In the future, key data will be stored on central servers rather than local systems. On the new, virtualized platform, employee access to customer data will be certified to DEKRA security standards. All in all, the move will improve data-privacy practices at the shops, increase employees’ awareness of the issue, and ensure they know how to handle customer data correctly. The improvements will be certified by audit.

Benefits. Employees will be able to view customer details at any terminal in the shop, handle customer inquiries faster, and offer a better quality of service. At the same time, the shops’ operating costs will decrease, system outages at peak times can be avoided, and visitor satisfaction will rise thanks to shorter waiting times. The Telekom shops fulfill all DEKRA test criteria, and have been certified for compliance with the German Federal Data Protection Act.

36m

Customer contacts are handled by the Telekom shops each month.
Company: Telekom Shop Vertriebsgesellschaft
Headcount: 6,250
Shops: 720
Virtual desktops: 4,700

Desks hosted in the cloud

36 MILLION CUSTOMER CONTACTS are handled by Telekom shops every month. Deutsche Telekom is standardizing the IT resources, products and services at its 720 shops throughout Germany, and providing 6,250 employees with virtual desktops hosted in the cloud, with the goal of continuously improving service quality while driving down costs.

A top priority for Deutsche Telekom is to enable its customer service advisors to log on at any workstation in the shop using their personal myCard. Now, advisors can easily switch workstations to view or enter contract details, run product demonstrations, or accept payments. This means they can meet the needs of any customer – wherever they are in the shop. This flexibility is the result of session roaming, a feature of the new Dynamic Workplace environment introduced by T-Systems as part of the desktop virtualization project. All existing workstations are being replaced by energy-saving lean clients, and data will no longer be stored locally at the shops, but at a central point in the cloud. The vShop virtualization solution will boost customer satisfaction and make employees more flexible – by providing access to the applications and data they need from any device in the shop. At the same time, the customer data provisioning model, which has been security-certified by DEKRA, cuts Deutsche Telekom’s energy costs and reduces the risk of system outages – with less administration work being carried out locally. This is especially important at peak times: when new smartphone models are launched, more than 100,000 iPhones, Galaxy models and similar devices leave the shops in the space of a few days.

IN SHORT: Deutsche Telekom is leveraging cloud computing to virtualize 4,700 desktops in its 720 Telekom shops and enhance security, speed and cost-effectiveness. The result: an efficient sales process and more satisfied customers.
THE LARGEST, CLOUD-BASED SAP PRODUCTION SYSTEM IN THE WORLD

T-Systems operates the world’s largest cloud-based SAP production system. This dedicated ERP solution delivers 713,000 SAPS for close to 143,000 people within a single customer organization on a daily basis. Currently, a total of some 250 enterprises around the globe leverage the services provided by the T-Systems Dynamic Cloud Platform – and with good reason. Over the course of ten years, T-Systems has made significant investment in the platform, resulting in best-in-class services and excellent investment protection. Businesses of many shapes and sizes, from mid-size companies to global players, benefit from standardized cloud services that can be scaled up or down in line with changing demand.

Working in close partnership, T-Systems and SAP have offered SAP HANA Enterprise Cloud services since 2013. Where required, customers can test-drive the offering during a proof-of-concept phase. This can be for periods as short as three months, for a variety of HANA sizes, and includes all SAP licenses.

The largest SAP HANA installation currently in a production environment comprises 48 terabytes. It harnesses in-memory technology to generate huge increases in speed. In total, T-Systems delivers more than 40 million SAPS to over 2.6 million cloud-based SAP users in production environments.
German checking accounts were managed online in 2013. The German financial services industry is one of the largest in the world, with 2,029 institutions and over 70 trillion euros transferred annually. Though the number of bricks-and-mortar branches is decreasing (38,225 in 2013), the volume of online accounts is increasing. 54.3 million checking accounts at German retail banks were managed online in 2013. But the financial services sector is still lagging behind in terms of digitization in comparison with other industries, according to a study by the Boston Consulting Group (BCG). The key to improvement, BCG says, is future-proof IT solutions.
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RE-INVENTING BANKS

“Banks are not in a crisis, they are experiencing a storm,” states “Wirtschaftswoche”, a leading German business magazine. And the Lünendonk report on banking’s future (Zukunft der Banken 2020) established that more than 80 percent of German banks believe that there are “deficiencies in IT support for business processes, customer relationship management, sales, and for advising customers.”

Just as iTunes and Amazon revolutionized the music and book industries, Internet services and start-ups are challenging traditional business models in financial services. For example, over two thirds of Ebay’s customers use the auction site’s online payment service, Paypal. And banks must also contend with recent arrivals from other high-tech players, such as Google Pay and Apple Wallet.

Experts believe banks need to invest in order to keep up with online competitors and the digital times we live in – despite shrinking profit margins, low interest rates, and the high costs of maintaining branch offices. As far as IT is concerned, analysts at PricewaterhouseCoopers believe that preference should be given to standardized software that can be easily modified to meet new challenges, over home-grown solutions.

Already there are bankers venturing into innovative IT. For example Fidor Bank, headquartered in Munich, plans to establish a bank for digital currencies, Credit Suisse is developing a social media network for high-net worth clients, Deutsche Telekom offers a low-cost encryption app for mobile phones, and high-speed traders are leveraging cutting-edge technology to make waves on Germany’s stock exchange.

Virtual bank

Fidor, a Munich-based direct bank, is exploring uncharted territory. The company is collaborating with Payward/Kraken, the Californian Bitcoin exchange, to form the first bank for digital currencies. The goal is to create a regulated platform, operated within the scope of a banking license, to trade electronic assets. Fidor Bank will contribute its experience in financial markets, banking services, and effective governance, and is part of the regulated banking environment. The bank will also provide fidorOS, a payment and online community software, via its IT subsidiary Fidor TecS. And Kraken will lend its technological expertise in digital currencies.

Mobile encryption app

It is now possible to easily and inexpensively make mobile phone calls without the fear of eavesdropping. The mobile app from T-Systems reliably encrypts phone calls, contact information, and text messages on iOS and Android operating systems. This neutralizes one of the greatest, long-standing threats to mobile communication, man-in-the-middle attacks – where a third person taps into private conversations unnoticed to acquire sensitive information. The app creates strong defenses through two powerful algorithms that run simultaneously. The software requires a bandwidth of only 4.8 kbit/s, and is therefore viable even in regions with weak network coverage, regardless of provider or platform.
BANKS’ VALUE CREATION PROCESSES AND BUSINESS MODELS WILL NOT JUST BE MILDLY AFFECTED BY DIGITIZATION; THEY MUST BE ENTIRELY RE-ENGINEERED IN LINE WITH THE ARCHITECTURE OF THE DIGITAL AGE.

Thomas F. Dapp, Economist, Deutsche Bank Research

High-speed dealers

The traditional trading floor is slowly fading into obscurity as high-frequency electronic trading gains traction. These agile brokers already account for 40 percent of stock market transactions in Germany, and approximately two thirds in the US. Their algorithms respond to fluctuations in prices in fractions of a second. Initially, glass fiber cables were used for these high-speed transactions, and now, through millimeter and microwaves, orders are transmitted at close to light speed. In North America, a number of traders transmit their data via laser technology to shave off additional nanoseconds. Some of these so-called ‘flash boys’ use high-performance computers, equipped with powerful Intel processors that are not officially on the market.

Social media for the affluent

Credit Suisse is responding to Google, Apple and Facebook encroaching into its traditional banking backyard by launching its own social media initiative. The institution, boasting 872 billion Swiss francs in total balance sheet assets, is working on a network reminiscent of Facebook for high net-worth clients. It is a platform where members can develop and exchange ideas, and make joint investments. Credit Suisse is also planning additional projects for the Asia-Pacific region. These include personalized newsfeeds, virtual investment portfolios and algorithms designed to attract positive attention on social networks.
**BUSINESS**

**Requirements.** In recent years, Vienna Insurance Group has been expanding rapidly – particularly in Central and Eastern Europe. The company has seen a threefold increase in premiums written since the year 2000. This has heightened the need for scalable IT resources. In addition, new EU legislation has imposed stricter requirements in terms of transparency and exposure.

**Benefits.** Monthly invoicing of clearly-defined, dynamic IT services has increased visibility into VIG’s and its 25 international subsidiaries’ business processes. The insurance company succeeded in cutting IT operating costs while safeguarding revenues from premiums. A powerful fraud detection solution has enabled rapid differentiation between false and legitimate insurance claims. Moreover, VIG has improved customer centricity and communication, and can now introduce innovations more quickly and at lower cost.

“DYNAMIC RESOURCE PROVISIONING HAS ENABLED US TO ACHIEVE THE DEGREE OF FLEXIBILITY WE NEED.”

Ryszard Dyszkiewicz, Head of Group IT, Vienna Insurance Group
Open-heart surgery

VIENNA INSURANCE GROUP is Austria’s largest insurance company, with 23,000 employees. The strategic decision to change the IT provider entailed migrating sensitive customer data to a cloud over a very limited number of weekends – without impacting ongoing operations. Over a terabyte of data had to be transferred from the legacy infrastructure to a cloud-based platform in a T-Systems twin-core data center in Austria, 59 SAP and 12 non-SAP applications were also relocated, and all VIG departments and subsidiaries integrated. The platform is hosted within the scope of T-Systems’ Dynamic Services for Infrastructure offering.

Following successful migration, the insurance company can provide new customers – particularly in their new locations in Central and Eastern Europe – with better, faster service. What’s more, dynamic resource provisioning has significantly reduced SAP operating costs.

Despite a number of changes, including the introduction of new applications, T-Systems was able to perform the migration on schedule, with no interruption to ongoing operations. Extensions and enhancements previously requiring 14 days’ lead time are now feasible within a few days. The solution offers 99.999 percent availability and far greater transparency.

IN SHORT: VIG enjoys a centralized, scalable cloud-based IT infrastructure. This transformation has played a key role in enabling the company to expand its business activities. Since the migration, a further 97 systems have been successfully integrated.
Building lasting partnerships is a key aspect of corporate strategy at Deutsche Telekom. The enterprise leverages alliances with specialists to develop best-in-class solutions for its customers. T-Systems, too, is collaborating with an increasing number of companies around the world – from strength-in-depth global players to fast-and-flexible start-ups. Moreover, T-Systems strives to create ties that extend beyond the world of information and communications technology (ICT). This enables the joint development of entirely new solutions and business models that transcend individual industries. As a vendor-agnostic provider, T-Systems has a long and successful track record of strong partnerships. However, the nature of these relationships has evolved over time – they are now more open, more agile, and more dynamic. In all contexts, T-Systems focuses on its core competencies – but seeks to enhance and extend them by adding the strengths of its partners, with the aim of creating a coherent offering for its customers. The partnerships are diverse in character – both national and
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Today, T-Systems works hand-in-glove with almost 90 enterprises, including SAP, Microsoft, Oracle, Salesforce, VMware, FireEye and SugarCRM. And its customers are reaping the benefits.
Healthcare.

Healthcare is a strong driver of the German economy. Between 2005 and 2010, the country’s gross economic output grew by 10 percent overall, whereas the value of goods and services from the seven leading healthcare and pharmaceutical companies rose by nearly 40 percent. The industry is experiencing bottom-up digitization, driven by consumers. In late 2014, 45 percent of Germans used their personal hardware devices for healthcare-related offerings. Network infrastructure and cloud solutions connect all market stakeholders.

6% annual growth expected in the global pharmaceuticals market between now and 2030.
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NAVIGATING THE HUMAN BODY

Stefan Vilsmeier is known in the medical field as a prodigy and visionary. Twenty days into semester, he broke off his university studies, and in 1989 – at the ripe, young age of 21 – founded Brainlab. Vilsmeier dreamed of developing a device that guides surgeons during operations – a type of GPS navigation system for the human body. Today, Brainlab has 1,200 employees at 17 sites. The enterprise is a leader in image-guided surgery technology, with an internationally installed base of 5,000 software and hardware systems. All data critical to Brainlab’s global operations resides in the Sales Cloud hosted by T-Systems partner Salesforce, granting field sales professionals access to the same facts and figures – anytime, anywhere. And according to Brainlab COO Stephan Holl, this has “dramatically improved the sales process.”

In just a few simple steps, the 250-member sales staff can access key information on contacts at the customer organization, on Brainlab products already deployed, and on open and closed opportunities. Instead of tediously logging into multiple systems, as was previously the case, the sales team now uses a single front-end – frequently via iPad. As COO Holl observes, this simplification “has led to sharply increased efficiency and markedly higher employee satisfaction.” Furthermore, the platform has improved connectivity and communication among Brainlab customers, including hospitals in approximately 95 countries.
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SMART PILL

The pharmaceutical industry faces many daunting challenges. These include the substantial investment necessary to develop and test medications – estimated to be around a billion US dollars for each new product. However, an innovation from Medimetrics, a Philips-associated company, could change this. Winner of Accenture’s 2014 European Innovation Award, IntelliCap is an electronically controlled capsule that automatically releases the correct dose of medication into the body. The product administers the drug directly in the section of the gastrointestinal tract where it is most effective. The smart pill also transmits health-related data wirelessly to a device located close to the body, which then sends this information to a PC, making it available for cloud-based analysis or other downstream processes.

The IntelliCap capsule consists of two sections: one containing the medication and the other the electronics – including sensors, a microcontroller, a wireless transmitter, and a pump. This latter component is based on the stepper motor principle, and delivers 0.001 milliliters of active ingredients at the required time intervals. While the pill travels through the digestive tract, sensors measure temperature and pH values to be forwarded to the PC. This data is used to establish the optimal position to release the medication. This technological innovation from Medimetrics can help pharmaceutical companies efficiently establish what precise dosage is required for effective treatment when researching and developing new products.

Approximately 92 million wearable health and fitness devices will be manufactured globally in 2015, according to latest estimates.
BUSINESS

Requirements. Since 2009, Singapore-based Raffles Medical Group (RMG) has grown rapidly – by some 68 percent. With each new phase of growth, the Group had added new information systems to serve various clinical, administration and technical departments – but wishes to further enhance the efficiency of this infrastructure. The staff working at Raffles Hospital and the Group’s 103 multi-disciplinary clinics requires a lean, integrated IT environment that would simplify communication and collaboration across departments. Furthermore, senior executives need a solution that would provide greater visibility into the organization’s business-critical data, allowing them to accelerate decision making and provide more effective corporate management. In line with its commitment to meeting ever-increasing demands for high-quality care, the Group aims to streamline its materials management system, putting it in a prime position to deliver consumables and medication to patients swiftly.

Benefits. RMG has fully automated calculation and payment of doctors’ fees, and the billing of medication to patients. The same applies to materials handling – from single micro-doses of drugs to everyday clinical consumables. This made-to-measure IT solution, boasting an integrated system for logistics and financial management, leads to increased transparency. At the same time, collection management has been simplified, while centralized IT operations optimize effective corporate management and control. Invoicing processes are completed 75 percent faster, while the error rate has been cut by ten percent. Similarly, fees can now be calculated more quickly. Administrative effort could be reduced by 30 percent, allowing medical staff to focus on delivering maximum standard patient care.

30% reduction in administrative effort
The SAP system accelerates and simplifies administration processes for medical staff.
Billed by the half-tablet

CLINICS WORLDWIDE are looking to streamline administrative processes and deliver truly outstanding patient care. Singapore-based Raffles Medical Group (RMG) has grown by 60 percent since 2009. Today, its 19 organizational units run a central hospital and 103 multidisciplinary clinics, serving over two million patients and more than 9,000 corporate clients. As is standard practice in Singapore, RMG bills patients (or their employers) directly. The Group collaborates with 6,500 contractual partners and remunerates its 250 doctors in accordance with individual agreements.

As the Group has expanded at such a pace, it intended to implement a high-performance IT solution that would accelerate and simplify its administrative tasks – from generating new patient files to treatment, medication handling, and the settlement of medical fees. The Group has consolidated its network of structures and processes into a single solution, now employing a scalable ERP platform based on SAP software. SAP Business Objects has been incorporated to enhance operational data analysis, and SAP IS-H is used for patient management and billing. In addition, RMG leverages i.s.h.med, a solution that integrates electronic drugs prescription, preparation and administration – down to half-tablet doses – with materials management. As a result, the Group benefits from a centralized, automated remuneration system for its doctors and accelerated billing processes. At the same time, the system integrates digital care-management processes and data exchange with Medisave, Singapore’s national health savings program.

IN SHORT: RMG boasts a lean, efficient infrastructure that supports automated processes and a centralized data repository. The scalable, centrally operated IT platform creates strong foundations for the Group’s further expansion.
MIGRATION OF 154 TERABYTES OF DATA. SHELL PROJECT SETS NEW STANDARDS

Shell has a repository of legacy data that has grown over several decades. As a result, searching for business-critical facts and figures had become a complicated and time-consuming process. To alleviate this issue, T-Systems was tasked with developing and integrating a powerful search engine. The solution trawls through data stored in Shell’s public and private clouds, and highlights the most valuable information. The relevant, high-priority data is then forwarded to a T-Systems migration factory. Over 150 terabytes of legacy data will be reformatted and migrated to the corporation’s SharePoint environment, in a gradual process expected to continue until at least 2017. This will enable Shell professionals around the globe to communicate and collaborate more quickly and effectively than ever before.
154 terabytes is the same amount of data as can be stored on 248,432 CDs. If stacked, the CDs would reach a total height of 298 meters – equaling One Island East, one of the tallest skyscrapers in Hong Kong.
08 Other Use Cases.
IT change processes across all industries increasingly share common characteristics. For example, centralized cloud-based solutions are being deployed to replace complex, fragmented system landscapes and cut costs. These new offerings are rapid and reliable, support cross-border collaboration, and can quickly be scaled up and down in line with changing market needs. They enable business transformation, and are key to innovation for many enterprises, whether a major energy player or a specialist packaging company.
The centerpiece of the connected bike is a matchbox-sized, on-board unit discretely embedded in the frame. The device is not immediately visible, and is difficult to remove. It is equipped with a SIM card, microcontroller, motion sensor, and a GPS module. As many as ten sensors transfer data to the controller to log mileage and estimate wear-and-tear. Moreover, the system recognizes signs of an accident – for example, strong vibrations, drastic loss of speed, or if the bicycle is suddenly positioned at an unexpected angle. Under these circumstances, the on-board unit issues an alert to the owner’s smartphone. If there is no response, an eCall is automatically placed to an emergency dispatch center.

KNIGHTRIDER ON TWO WHEELS

This bike is smarter than your average thief: with a built-in GPS tracking system, it keeps its owner up-to-date on its current location. This information can be accessed via a cell-phone app – and, in the event of theft, forwarded to the police. The intelligent recreational product was developed by Canyon Bicycles, based in Coblenz, in collaboration with Deutsche Telekom. The two-wheeler also offers predictive maintenance functionality. Embedded sensors record data relating to wear-and-tear, and this is reported to the owner via app, and made available to the manufacturer via a cloud-based portal. This input is employed to preemptively purchase spare parts, and to generate recommendations for the user. This system can be leveraged to proactively manage entire bicycle fleets.
BUSINESS

Requirements. Each year, Consol, based in Johannesburg, transforms a million metric tons of glass into around three billion packaging products. By integrating additional sites, the company is now looking to generate further growth. However, Consol, just like other glass packaging manufacturers, operates in a volatile market – characterized by rapidly changing product lines, diversification, and fluctuating order volumes. Each of these factors directly impacts the core of the production process: the furnaces. These machines should not be shut down, unplanned, at any point during their 15-year lifecycle. Against this background, they need more than just fuel and raw materials: they require product orders 24/7, 365 days a year.

Benefits. Consol's IT team opted for a flexible IT infrastructure to support continued business growth. By migrating systems to the cloud, it has reduced server operation costs by 25 percent in just two years, and halved storage costs. In addition, Consol’s management now benefits from reliable business data for supply chain planning, accessed via a central platform. This standardized data structure enables a closer relationship with the client, allowing Consol to respond more quickly to specific requests. What’s more, it plays a key role in supporting the high-cost furnaces – Consol’s most important manufacturing equipment.
Cloud-fuelled growth

CONSOL, HEADQUARTERED IN JOHANNESBURG, has become South Africa’s largest manufacturer of glass packaging by far. And despite a volatile market, the enterprise is aiming at further growth. Yet manufacturers of packaging – whether for food, beverages, cosmetics, or pharmaceuticals – must adapt rapidly to shifting customer requirements. Packaging design is a key differentiator, and a critical factor in the customer’s purchasing decision. Against this background, Consol’s core imperatives are: transparent business data, to ensure closer customer relationships, plus maximum production process stability, and protection against outages. Manufacturing is performed in its furnaces – with a throughput of one million metric tons of recycled glass per year. Each furnace is worth up to 15 million euros, and must remain in continuous operation throughout its lifetime.

Thanks to Dynamic Services for SAP Solutions, a PaaS offering delivered from a T-Systems cloud, Consol was able to migrate its 8 SAP applications and 35 SAP systems, in just 8 months – and link them all via a high-availability MPLS network. As Consol CIO Johan du Plessis explains, “This enabled us to reduce operating costs by 25 percent in the first two years alone. In addition, the scalable solution increased our agility. And in terms of security and outages, we’ve never been better protected than we are now with cloud computing.”

IN SHORT: By deploying a scalable, high-availability cloud solution, Consol’s IT has achieved significant savings, and freed up capital to re-invest and support the company’s growth strategy. Furthermore, the enterprise has extended redundancy for its existing production processes, in addition to standardized, transparent data. As a result, it can respond faster to changing needs – boosting customer satisfaction.

IT

Requirements. Consol’s existing infrastructure was based on distributed systems and was hosted in Consol’s headquarters data center. Computing resources were scaled to 120,000 SAPS (SAP Application Performance Standard) to deal with rare load spikes. A confluence of factors, including hardware nearing the end of its lifecycle, the increasing demand for higher levels of business continuity, the risky dependency on a single WAN link, and the desire to optimize IT spend, led the organization’s IT Director to evaluate alternate approaches. A cloud strategy was an obvious consideration.

Solution. In just eight months, Consol transformed 35 SAP systems, and transferred them to a private cloud operated from a T-Systems twin-core data center. For its part, Consol now ran only its Pro/E CAD development software, plus its GR8 manufacturing system, a homegrown solution. The enterprise also moved its SAP in-memory solution and Business Warehouse Accelerator to the same data center as the cloud, and replaced its legacy database with DB2 software running on Suse Linux, increasing data compression. Consol now runs its highly integrated SAP infrastructure in a PaaS environment. The cloud solution, designed for 70,000 SAPS, can be automatically scaled up or down, and delivers 99.5 percent availability.

Company: Consol
Headcount: over 1,200
Headquarters: South Africa

Consol replaces its legacy IT environment, by migrating 35 SAP systems to a private cloud.

TRANSFORMATION PROCESS – 8 MONTHS

- **Stage 1**: BIS and cloud readiness assessment
- **Stage 2**: A copy of the entire production system including data is transferred to a test system in the cloud
- **Stage 3**: Testing of all functions, and interfaces to the remaining systems
- **Stage 4**: Transfer to a high-performance production system in a private cloud
- **Stage 5**: Migration of data from the legacy production system to the cloud
- **Stage 6**: Go-live of the new production system, carried out on a single weekend
**BUSINESS**

**Requirements.** Shell is a global group of energy and petrochemicals companies with about 92,000 employees in more than 70 countries that generated sales in 2013 of 461.2 billion dollars. The group supplies fuel to 25 million customers daily – making it vital to provide seamless communication and collaboration across borders. But in the gas and oil sector, where prices are crucial, there is a strong focus on costs. And at the same time, tapping new sources of raw materials in the farthest flung corners of the world (using legacy geological data, for example) is an expensive business. By deploying global IT tools, Shell aims to support local implementation of worldwide group strategies such as cost focus, whilst reducing communication and collaboration costs.

**Benefits.** Today, Shell can assemble virtual project teams at short notice, bringing together employees and suppliers based in all four corners of the planet. As a result, it is possible to address international challenges within a short time frame, whilst reducing communication and collaboration costs. Plus, the group has seen a significant boost in agility: it can respond rapidly to changing requirements and accelerate the discovery of new sources of raw materials. To this end, it is essential to provide employees with quick and easy access to business information from across the globe.

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IT

**Requirements.** Shell uses SharePoint to support collaboration between its 135,000+ in-house staff and suppliers, taking advantage of both the scalability and attractive price offered by a public cloud and the security and availability of a private cloud.

**Solution.** T-Systems provides the infrastructure and support for a hybrid cloud for Shell’s unstructured data and 45 SharePoint applications. The solution consists of a combination of a T-Systems private cloud, hosted in data centers in three continents and the Microsoft Office 365 service. A search engine provided by T-Systems finds information both in the private and the public clouds. T-Systems also provides a data migration factory which helps Shell to analyze its legacy data store and move 150+TB of valuable business data from the legacy stores to SharePoint.

**IN SHORT:** With data migration from legacy sources to SharePoint well under way, Shell benefits from the SharePoint platform in the cloud as a consistent, global collaboration tool for secure access to an ever-growing volume of business data and SharePoint applications, taking advantage of the constantly improved features of the Office 365 service as well as the security and flexibility offered by SharePoint hosted in the T-Systems cloud.

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Company: Shell

Headcount: 92,000 employees

Output: 3.3 million barrels every day

Revenue 2013: 451.2 billion US dollars

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**TRANSFORMATION PROCESS – 36 MONTHS**

Phase 1: Establishment of SharePoint Center of Excellence

Phase 2: Establishment of SharePoint search farms and connection with Office 365; packaging and customization of SharePoint apps

Phase 3: Design and implementation of SMP; testing and migration of Shell-specific SharePoint apps

Phase 4: 135,000+ user uptake in 400 days

Phase 5: Legacy data analysis and data migration

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**OTHER USE CASES**

“THIS JOINT SHAREPOINT SOLUTION WILL ALLOW US TO APPRECIATE CONSIDERABLE COST REDUCTIONS AND GREATER FLEXIBILITY.”

Jay Crotts, Shell Vice President and CIO for IT Services & Operations

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**Fueled by the cloud**

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Fueled by the cloud

44,000 GAS STATIONS, 3.3 million barrels of oil and gas every day, a global fleet of tanker ships, over 40 oil rigs, and more than 30 refineries – this infrastructure helps Shell provide a reliable fuel supply to 25 million consumers and businesses in 140 countries every day. But with the price of oil being a sensitive factor in the world economy, competition in the sector is fierce. To deliver on its goal of maintaining profitable operations across the group, Shell must be in a position to respond to changing circumstances with global strategies, and it must be able to implement these strategies rapidly and effectively at the local level. Efficient communication and collaboration among Shell’s 135,000-strong team of in-house and contract staff and external suppliers is essential to make this a reality. To this end, Shell utilizes 45 SharePoint applications in a hybrid cloud. The solution consists of a combination of a private cloud comprising 500 servers in four T-Systems data centers across three continents and Microsoft Office 365 service. A search engine provided by T-Systems finds information both in the private and the public clouds. T-Systems also provides a data migration factory which helps Shell to analyze its legacy data store and move 150+TB of valuable business data from the legacy stores to SharePoint.

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In 2014, T-Systems achieved record customer satisfaction for the second year running, placing the company in the top.* 

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Number of major incidents 50% lower than in 2013, and 95% lower than in 2010.
Number of high-priority incidents 30% lower than in 2013, and 80% lower than in 2010.
93% milestone compliance, 99% SLA compliance.