GTAI GERMANY TRADE & INVEST

MARKETS

GERMANY

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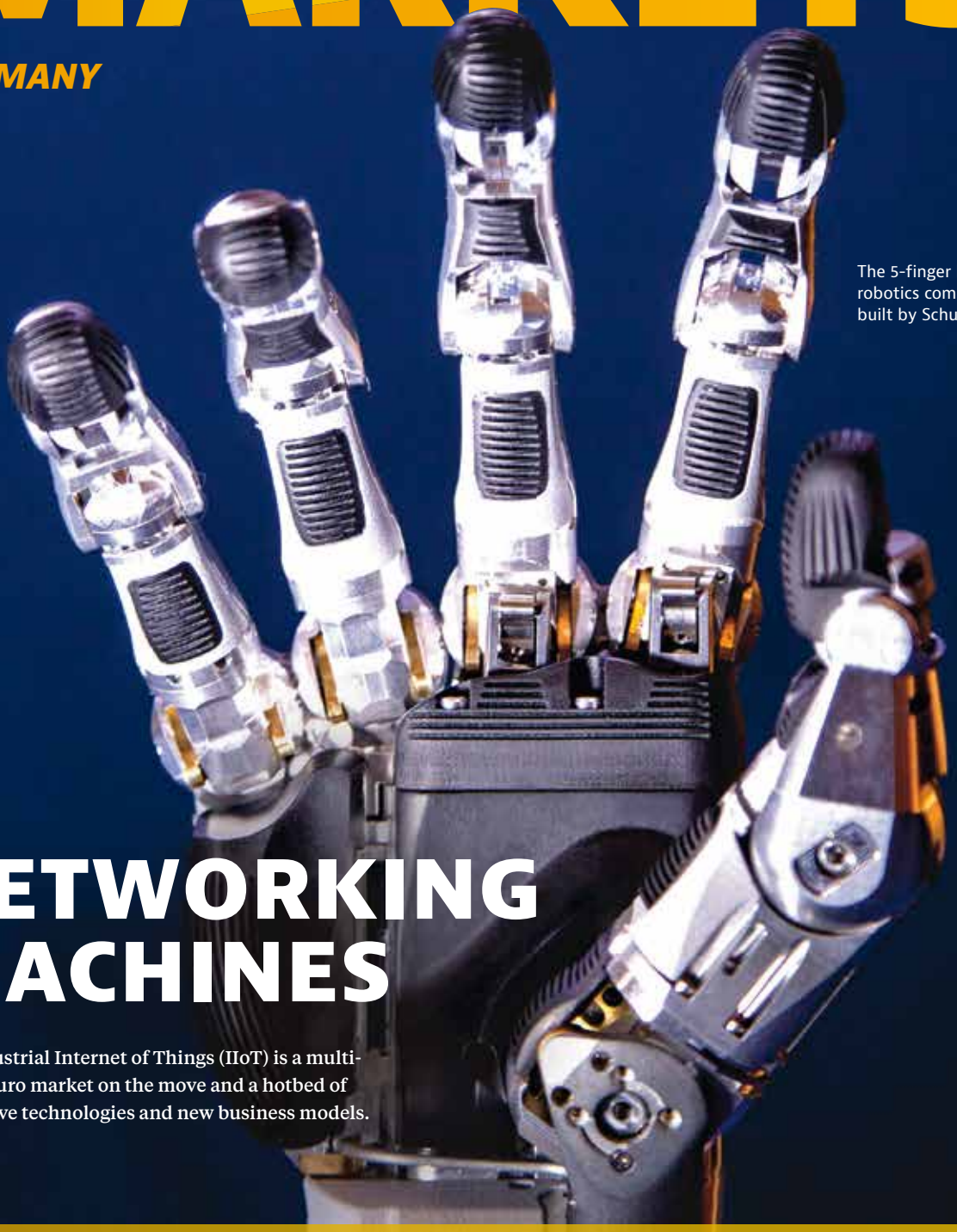
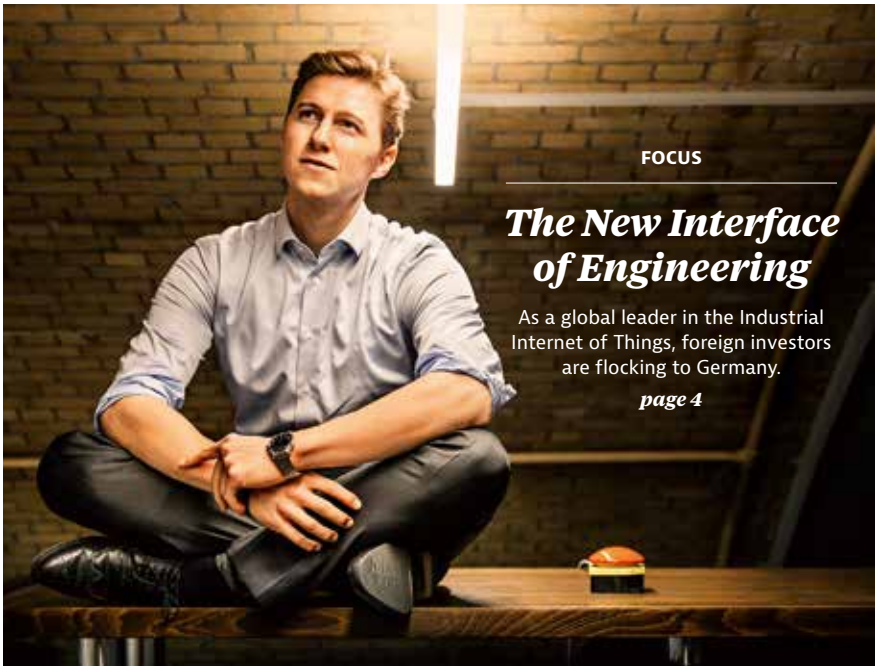


The 5-finger hand, a robotics component built by Schunk.

NETWORKING MACHINES

The Industrial Internet of Things (IIoT) is a multi-billion euro market on the move and a hotbed of innovative technologies and new business models.



FOCUS

The New Interface of Engineering

As a global leader in the Industrial Internet of Things, foreign investors are flocking to Germany.

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DIGITIZATION

Introducing de:hubs

Germany's 12 digital hubs mix innovative startups with established businesses, excellent research facilities and networking.

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FINANCIAL TECHNOLOGY

FinTech Shifts its Axis

Germany's burgeoning FinTech hotspots: Frankfurt, Munich, Hamburg and Berlin.

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AUTOMATION

Get Set, e.GO!

The compact e.GO Drive 20 will democratize electric and self-driving cars. We talk to the company's managing director.

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CONSTRUCTION

Green Bricks

The construction industry is transforming itself with energy efficient retrofits, renovations and new builds.

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Photo: Illing & Vossbeck Fotografie

»The Competition in the global markets is intensifying, so products have to be continually improved.«

Dear Reader,

The mechanical engineering industry forms one of the central planks of Germany's strong economy. It is characterized by two interdependent qualities: it is both highly export-oriented and highly innovative. As competition in the global marketplace intensifies, so products must be continually improved to keep apace of change.

German mechanical engineering businesses have been investing huge amounts of time and money in the Industrial Internet of Things to maintain Germany's leading position worldwide and its reputation as an industrial location. This has made the country particularly attractive as a location for foreign investors, whether they're hoping to profit from the billion-euro future market of "Industry 4.0" or participating in its development within Germany itself, thereby improving their own competitive position.

Competitiveness is also the watchword of another major topic in this issue. With Brexit looming larger, many FinTechs are considering leaving London in order to remain in the EU. Germany offers itself as a new home – its local FinTech market is certainly one of the most attractive in the world. Experts expect the market volume to increase from €2.2bn (2015) to €58bn in 2020. Cities like Berlin, Frankfurt, Munich or Hamburg are ready to welcome investors with open arms and excellent conditions. Read more about it in this new issue of "Markets Germany".

***Dr. Jürgen Friedrich** / Chairman/CEO*
Email: invest@gtai.com

ONE TO WATCH

Photo: Gordon Welters/laif

Leah Hinton, *founder and CEO of TechSpaghetti*

Leah Hinton, founder of TechSpaghetti, is a woman of many talents. Before launching the educational software studio behind the hit language app Hey Monster! English for Kids, she taught literacy and digital arts in schools for ten years in her native New Zealand and Europe, while touring with her rock band during the vacations. It was only when she invited fellow bandmate and IT whiz Elliot Tabachnik along to a screening event, to demonstrate the way she'd been integrating tech into classrooms, that they decided to go into business.

Hinton felt unable to achieve her vision – to use technology "to teach through story creation and music" – inside the education system, and so she and Tabachnik decided to go it alone. They bootstrapped for two years with seed funding from Axel Springer's Plug and Play accelerator, and launched Hey Monster! English for Kids in August 2016, which has consistently been the No. 1 app in its category (6-8 age range) in 14 countries.

Their next launch, Coding the Musical, a musical app that teaches girls how to code, sits perfectly with Hinton's personal mission to close the tech gender gap and to "make cutting edge education tools available to kids everywhere." She believes that technology should be embedded throughout the curriculum to prepare kids for jobs that don't exist yet. "Rather than teaching times tables, we should be teaching them how to learn and how to find new solutions to new problems," she says. And with screens increasingly prevalent in the learning environment, "it is now more important to teach kids how to filter information, rather than learning by rote."

Her plan from here on in is to launch an app every three months (using their proprietary app creation software that enables super-fast content creation and delivery) and to attain the ultimate goal of "becoming the No. 1 digital education provider for 4-10 year olds – globally." It is a bold vision. Little wonder that these days Hinton sees herself primarily as "an entrepreneur".

www.techspaghetti.com

This humanoid robot hand made by Schunk was shown at Innorobo, a robotic event in Paris in May 2017. It has been designed to allow robots to interact with a human-scale world.

Photo: Simon LAMBERT/HAYTHAM-REA/laif

The New Interface of Engineering

The Industrial Internet of Things is a multi-billion euro market on the move and a hotbed of innovative technologies. As a global leader in this new era of manufacturing and mechanical engineering, Germany is attracting more foreign investment than ever.

The Felss Group, an international mechanical engineering company from Baden-Wuerttemberg, recently made a substantial investment: it developed software that enables metalworking companies to track their products and collect data on their way through the factory. Why is this so important? "Our customers can thus optimize their process flows and increase the availability of the machines," explains Wolfgang Haggenmüller, business development manager at Felss. "Now, thanks to the intelligent analysis of the information collected along the entire value chain, bottlenecks can be reduced and material saved. The costs of production are reduced by 10 to 15 per cent."

The Felss Group's subtle but smart development to streamline production processes is just one example of why the German mechanical engineering market is so attractive to foreign investors at the moment. German companies are blazing a trail with their cutting-edge technologies, with a focus developing machines for tomorrow's world. "It's no coincidence that the term 'Industrie 4.0' came from Germany," says GTAI engineering expert Claudia Grüne. In her opinion no other market in the world better combines the expertise to build equipment with intelligent digital controls.

TRADE FAIR

GTAI at the Hannover Messe

At the industry's leading trade fair, Hannover Messe in Hanover (April 23–27, 2018), some 5,000 companies will present their products and services. With the lead theme of "Integrated Industry – Connect & Collaborate," this year the spotlight will be on the interplay between automation and energy technology, IT platforms and artificial intelligence. In the GTAI Investment Lounge, our experts will answer questions about the future of industrial production in Germany and international business opportunities. At the forum, representatives from leading international companies will discuss which technical innovations are currently significant and the new business models IoT will provoke. You can find us in Hall 27.

Market opportunities

Mechanical engineering is one of Germany's most muscular industrial sectors. Across some 6,780 companies, the sector employs more skilled engineers than in any other country and the export rate is 77 per cent, according to the industry association VDMA. Last year alone, German machine builders turned over a record €219bn. The Industrial

Internet of Things (IIoT) is at the forefront of new developments. "We are witnessing a structural change in value creation. Machine builders, electronics and IT companies will work together much more closely than before," says GTAI electronics expert Max Milbredt. "This results in interesting investment opportunities for foreign investors." Specialized clusters dotted around the country bring research institutions together with the private sector to drive the IoT industry forward.

At present, the main focus is on the networking of production machines. The linking together of automated industrial equipment will dramatically increase flexibility in production dynamics, thereby multiplying opportunities for the development of new products. "The industrial IoT is a key driver of innovation for German mechanical engineers," says the author of an EY study, Stefan Bley. The report found that 69 per cent of engineers believe IoT is of vital strategic importance, while 44 per cent of machine builders already use IoT applications, and another quarter plans to use them.

Machine builders, electronics and IT companies will work together much more closely than before.

Investment rush into IoT

German companies have been investing billions into the IoT and a new market is evolving. "The IoT market is currently establishing itself, with new specialized players and existing system integrators considerably improving their IoT qualifications," says GTAI's IoT expert Asha-Maria Sharma. Last year, one in three industrial companies invested between

SmartFactoryKL is preparing the ground for the intelligent factory of the future. As a leading center of expertise and a demonstration and research platform which is manufacturer-independent, it develops innovative factory systems which help to make the vision of Industry 4.0 become a reality today.

Photo: SmartFactory^{KL}

five to ten per cent of its annual turnover into Industry 4.0 applications (while 46 per cent invested just up to five per cent).

A large tranche of the investments goes into software systems and applications. The platforms through which machine builders and manufacturing companies share device data are the control centers of the IIoT. One of the major platform providers is the U.S. IT giant IBM, which in 2017 invested €200m in the IBM Watson Center in Munich. It was the group's largest foreign investment in the past two decades. "For us, Germany is the perfect location and one of the world's most important industrial regions in the middle of Europe," says Carsten Holtmann, the director of Watson IoT. Inside the imposing twin glass skyscrapers – a bold new addition to the Munich skyline – IBM collaborates with IT partners and key players from the industry. And IBM is not the only IT giant with its eye on the Bavarian capital: Microsoft opened its "IoT & AI Insider Lab" in the spring of 2017, offering a range of services related to digitization.

Networking machines

The market potential for digitization and networking of production machinery is huge: industrial machines are usually large-scale investments that may have been in use for decades. A typical factory might deploy a patchwork of old and new machines from different manufacturers. Old machines record little or no data, and while there are add-on devices to do that job, they can only store information in a volatile memory which is cleared after a few days. "The Industrial Internet of Things usually starts with a relatively small step," explains Holger Kett from the Fraunhofer Institute for Industrial Engineering (IAO) in the city of Esslingen. Companies start by equipping their machines with sensors for generating, visualizing and storing data. The next step is for the system to filter data because the sheer volume of information generated quickly becomes very large.

This harvested data also has inherent value: statistical tools look for patterns and contexts in the information from which interesting anomalies emerge. These anomalies can help predict when a machine is not functioning normally and prevent it from failing well in advance by highlighting which parts need

FACTS & FIGURES

How the market is responding to IoT

What do medium-sized companies in Germany think about digitization?[1]

14.6%
"The success of the digital transformation is business-critical and will change our company significantly."

66.3%
"Digitization will change our company in many areas."

16.4%
"The importance of digitization cannot be overestimated."

2.7%
"Digitization is not relevant for our company."

Does your company use digitization for developing new production processes?[2]

Security First[3]

IT security
93%/7%

M2M communication
45%/44%

Cloud computing
49%/30%

Social machines
38%/40%

Big data
36%/30%

Augmented reality
28%/26%

Additive fabrication
18%/35%

very important / rather important

Finance for machines and data-collecting systems[4]

90% Machine park and data collection
70% Use of data
50% Integration of systems and processes
35% Digitization of products and data-based services and business cases
15% Cloud services/IT security

1 Source: Lünendonk, TÜV Rheinland; 2 Source: Institut für angewandte Arbeitswissenschaft;
3 Source: EY, Bitkom; 4 Source: VDMA

to be serviced. "Predictive maintenance" is one of the most important trends in engineering 4.0: companies can now avoid failures due to avoidable defects and save on the cost of expensive routine system maintenance, which may not even be necessary.

"Consolidating the necessary data and developing explanatory models is currently one of the most demanding tasks in the Industrial Internet of Things," says IBM IIoT expert Holtmann. Ideally the system would not only identify the maintenance needed but also take on more of a project management role by suggesting actions to take based on other data sets: for example, when is the next service, when is a specific technician available and what are the latencies for each process affected by the machine being shut down. "In the most comprehensive scenarios, the alternative actions created by the computer flow directly into production control," says Holtmann.

FACTS & FIGURES

6.9%
is the share of the total annual spend German machine builders hope to save by using Internet 4.0 technologies

87%
of German machine-builders describe machine-to-machine communication as an important trend (up 12% on last year)

6,780
mechanical engineering companies based in Germany, all of whom are facing challenges from digitization

€156bn
was the total annual value of exports from the German machine trade in 2016. Germany is a leading producer of intelligent machines

Source: EY & BITKOM 2017, VDMA 2017, German Federal Statistical Office

Germany attracts U.S. cloud company

Another big technical challenge is the processing of so-called "unstructured data." This can come from very different sources, such as when video cameras inspect products for defects. The U.S. cloud provider Virtustream, for example, makes software that can store and analyze unstructured data. Virtustream collaborates with companies such as SAP to enable applications to synchronize data from the production line with information from an Enterprise Resource Planning (ERP) system (for example, with sales and marketing).

Lars Nagel,
Managing Director of the Industrial Data Space Association

»Germany sets the global standards for security in the Industrial Internet of Things«

The Industrial Data Space Association based in Dortmund has created the software architecture and legal framework for the secure exchange of data between companies. Now the internationally-networked association wants to establish its regulations as a global standard.

Mr. Nagel, why is Germany the right place to set a global standard for the Industrial IoT?
Germany is the reference market for the Industrial Internet of Things, especially with regards to security. Accordingly, local players know relatively early on what course is needed for further development. Currently, we have our data room certified to an official DIN (a standard issued by the German Institute for Standardization), and by the end of next year, companies will be able to refer to this standard. The industry is also pioneering in this field for other sectors: we have members from finance, telecoms and pharmaceuticals who face similar challenges.

Why is it useful for companies to follow this new standard?
So far, there are a variety of platforms through which companies can exchange data from machines. In order to exchange data across manufacturers, interfaces are necessary. This is complicated and expensive. In addition, there are hardly any regulations governing who can do what with which data. We have therefore defined a binding set of rules that you can easily attach to your data. This allows a company to clearly determine from the outset how long a partner can use certain data, what they can and can't do with it. To date you have had to trust that your business partner will honor your data agreement, and in case of dispute, it then goes to court. This cannot happen to companies in our data room.

Standards only work if as many parties as possible sign up to them. What is the current situation?
So far, about 80 companies and associations from 15 countries are active in our association. In Germany, this includes the central Industry 4.0 platform, through which we also coordinate with our European neighbors. In the U.S., we communicate with the influential Industrial Internet Consortium and with similar organizations in Asia. Our greatest opportunity is that no organization in the world has yet dealt with corporate data governance, so we're creating something completely new.

Photo: Industrial Data Space e.V.

Virtustream's parent company Dell Technologies (which has had a presence in Germany for a long time) provides the other IT infrastructure, such as sensors for generating data and gateways for transmitting it. Virtustream launched a subsidiary in Germany last year and already has 50 employees in sales and technical support.

"Germany, with its strong industries such as mechanical engineering, is an attractive market for us," says Maik Gasterstaedt, head of technical sales at Virtustream Germany. The decision to found a separate German subsidiary was strategic: the company operates two data centers here, which are subject to the state's strict legal regulations. "Data security is a big issue for users in the industry," he points out.

Strategic alliances

Considering the security imperative, IAO researcher Kett identifies a need for cloud-based applications, especially for medium-sized companies. "After the big companies, medium-sized industrial companies in Germany have realized the potential of the Internet of Things for their production," he says. "However, the necessary IT infrastructure is often costly and expensive. For SMEs it may therefore be more interesting to buy cloud-based services from a service provider that offers more flexibility."

Some machine-building companies that spotted the potential of cloud-based Industry 4.0 software early on have become technological innovators themselves. The toolmaker DMG Mori from Westphalian Bielefeld and Dürr, the Stuttgart-based machine and plant manufacturer, got together with software specialists to found the joint venture Adamos. This strategic alliance of mechanical and software companies is the first of its kind. Launched in October 2017, the IoT platform is vendor-neutral and open to all machine builders as a platform where companies can share data with customers and suppliers for digitally networked production. "Regarding digitalization, mechanical and plant engineers must set their own standards and drive development," says Christian Thönes, CEO of DMG Mori.

From a long-term strategic perspective, the IoT may even transform the business models of machine manufacturers. Instead of just selling machinery, they could offer leasing or rental models – such as capacity guarantees – or even completely new ancillary services. "Digital services open up new sales opportunities and business models that we do not even think about today," says Felss business developer Haggenmüller. Could mechanical engineering even learn from the example of Google, which first set about collecting data and then developed multiple associated business models around it?

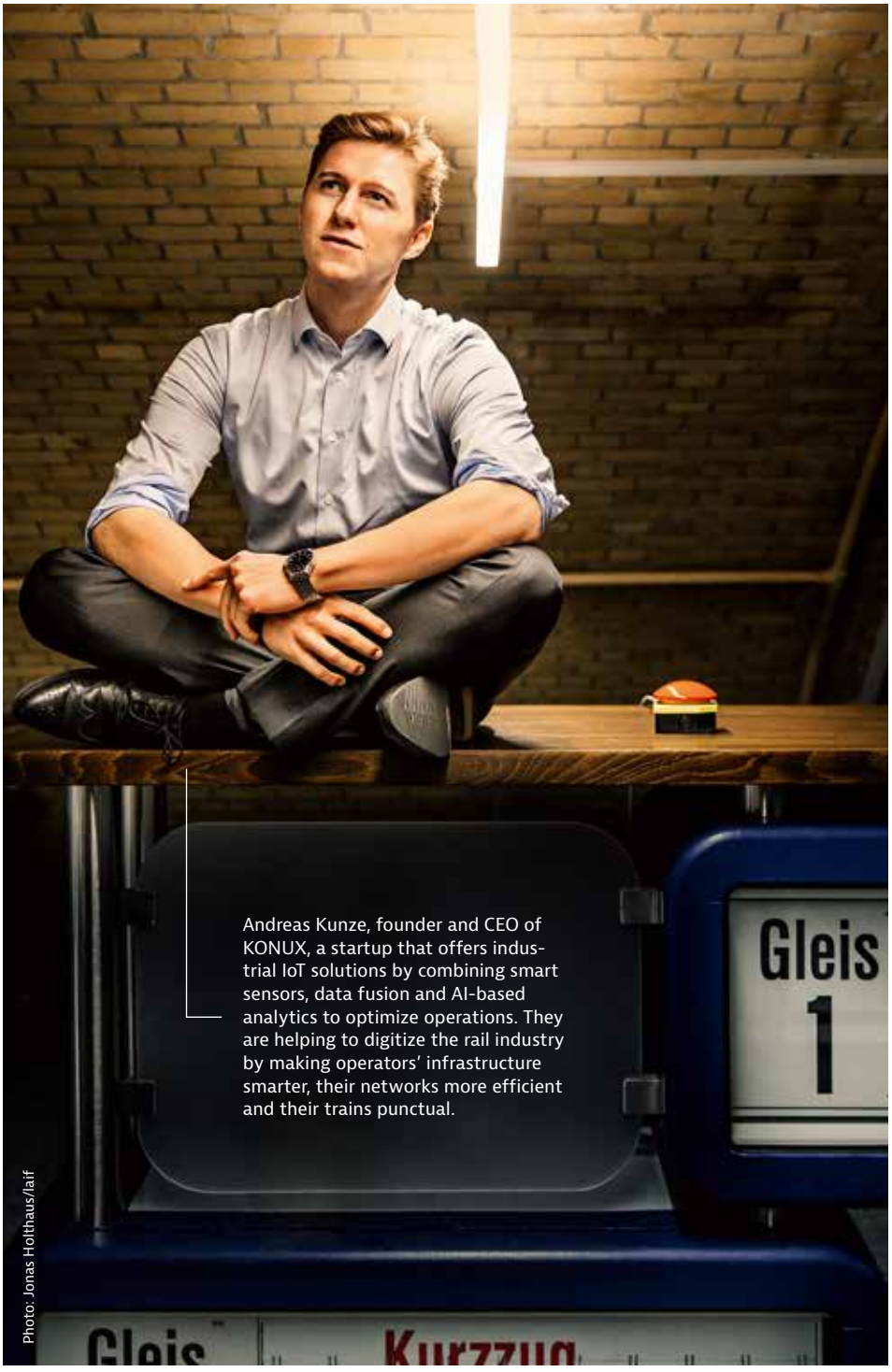


Photo: Jonas Holthaus/laif

Andreas Kunze, founder and CEO of KONUX, a startup that offers industrial IoT solutions by combining smart sensors, data fusion and AI-based analytics to optimize operations. They are helping to digitize the rail industry by making operators' infrastructure smarter, their networks more efficient and their trains punctual.

Contact:
Claudia Grüne, GTAI expert for engineering and Industry 4.0:
Claudia.gruene@gtai.com

Asha-Maria Sharma, GTAI expert for Industry 4.0 and IoT:
Asha-Maria.Sharma@gtai.com

Further information:
www.gtai.com/industrie4.0
www.gtai.com/machinery-equipment

The Secret Agents of Industry 4.0

Sensors are the eyes and ears of Industry 4.0. Without them, the promise of networked factory production enabled by the Internet of Things would be empty. Here's how these tiny, hidden components are transforming the future.

They control the brightness on our smartphones, allow cars to drive themselves and even help to navigate robots on Mars. But these little helpers are rarely ever seen or given the credit they deserve. "Sensors are the sensory organs of systems and machines," says Thomas Ruf from the manufacturer First Sensor. When a vehicle drives autonomously through a factory warehouse, for instance, 3D sensors are its "eyes" directing its path. Sensors are by their very nature ultra-sensitive and must be made in special "clean rooms". → *shown opposite*

Sensors are present in all types of new technology, from Smart Cities to Industry 4.0. By the year 2022, the worldwide market is forecast to be worth $240.3bn a year, according to BBC Research. By comparison, the market was valued at $123.5bn in 2016. Nearly 90 per cent of the members of the Association for Sensors and Measurement Technology (AMA) believe that industrial applications will play a key role in rising sales.

Sensors and IoT are intertwined

In recent years, according to the AMA's estimates, the German sensor and measuring technology industry has generated around €35bn. The export rate increased to nearly 60 per cent in 2016, and was over 70 per cent when sensors built into machines and products were included. Overall, AMA members are confident that Industry 4.0 and the Internet of Things (IoT) will keep driving healthy growth.

In the future, sensors will also be able to indicate when machines require maintenance. For example, they can register the vibrations or noises made by a system, explains Nico Zobel, who runs the Process Industry 4.0 department at the Fraunhofer Institute for Factory Operation and Automation (IFF). Then the search for patterns begins: for example, which vibrations cause breakdowns, and when? With this technology, sensors could detect when urgent action is required to avoid further complications or failures.

But sensor technology and Industry 4.0 are not necessarily just about new technological developments. From high-tech and heavy machinery to transportation vehicles to white goods, increasing demand for technological efficiencies has been driving the change. What is new is networking. Sensor data from similar facilities can be analyzed together during a networked production cycle, explains Nico Zobel. Other systems within the network will benefit from the experiences of one system. A standardized interface on the internet for all sensors would optimize interoperability, and this might be one of the defining characteristics of 4.0.

Every year, sensors become smarter, more powerful, more energy-efficient and smaller. A key trend for industry is that sensor technologies will increasingly be integrated into machines. These silent and unseen agents will continue to perform a vital role in driving the economy.

Contact:
jerome.hull@gtai.com;
asha-maria.sharma@gtai.com

A NEW INDUSTRIAL REVOLUTION

Industrie 4.0: Made in Germany

Industrie 4.0 was the term given to a national strategic initiative to establish Germany as a lead market and provider of advanced manufacturing solutions. It is generally agreed that Industry 4.0 will revolutionize manufacturing and production, and usher in a fourth great industrial age. It represents a paradigm shift from "centralized" to "decentralized" smart manufacturing and production.

Smart production must be the norm in a world where intelligent ICT-based machines, systems and networks are capable of independently exchanging and responding to information to manage industrial production processes. Germany has the ideal conditions to become a global leader in innovative, internet-based production technology and service provision. Technological leadership in the fields of manufacturing, automation and software-based embedded systems, together with a long tradition of strong industrial networks, form the cornerstone of long-term success. Furthermore, Germany has set itself the ambitious goal of being an integrated industry lead market and provider by 2020.

Relayr's award-winning "Wunder Bar" contains a WiFi master module and six chips that measure sound, temperature and brightness.

Berlin Startup with U.S. Roots

Berlin startup Relayr has an American founder and backing from the prominent U.S. venture capital fund Kleiner Perkins. The specialized cloud service provider not only wants to make the machines of industrial companies more intelligent, but also to develop their businesses.

In Relayr's version of the future, mechanical engineers will become software service providers as well. The Berlin startup currently offers a cloud service for industrial and logistics firms that brings data from multiple devices together. This enables machine builders to collect and evaluate daily operational data via sensors on their products, so that they can offer better support to their manufacturing customers. Not only will this reduce down-time, but it will also highlight the need for new investments or developments. "With our technology, machine builders can cut the running costs of their machines and increase productivity," says Relayr founder Jackson Bond. "This benefits machine builders and manufacturing companies alike."

U.S.-born Bond and his co-founders launched Relayr in spring 2013, initially as a software tools supplier for IT developers. Their first notable success was a hardware interface called '*WunderBar*' (Wonderful), which enabled users to collect sensor data from various devices and forward it to networks. "But many of the users were using the interface to try out IoT applications in their companies," says Bond. The founders refocused their business development strategy around this discovery and were able to attract new investors, like the current CEO Josef Brunner. Having successfully sold his former company to Cisco in 2015, Brunner brought money and contacts to the venture and opened the door to the VC Kleiner Perkins, known for being a key investor in Google and Amazon. The VC invested a further $11m.

Relayr is growing robustly and employs 200 people at eight locations in four countries. By learning from its customers, Relayr has been able to carve out a unique niche. "In the end, decision-makers in companies are not interested in technology, they just want to optimize their business," says Bond. The software deepens the relationship between the machine manufacturer and their customers: after-sales support becomes an ongoing operational service to keep them in daily contact. The insurance group Munich Re was so convinced by this concept that it offered a unique insurance product to Relayr's customers, which protects them for the life-span of the product which is leased and maintained by the original equipment manufacturer. Sensing a golden opportunity, Munich Re's investment subsidiary HSB Ventures invested a further $23m in Relayr in 2016.

Further information:
www.relayr.io

Privatizing Space Travel

One Giant Leap for Germany

Berlin leads the race (back) to the moon

It's been almost 50 years since mankind last set foot on the moon. But in August 2018, PTScientists from Berlin will be joining the race to go where no private company has gone before. The "new space" firm has teamed up with several partners to make this mission truly historic. Launching from Cape Canaveral, Florida, a SpaceX "Falcon 9" rocket will take the company's Autonomous Landing and Navigation Module (ALINA) some 42,000km into space before setting it on its three day, 380,000-km journey to the moon. Once it has landed in the Taurus-Littrow valley, two ultra-light, solar-powered Audi "Lunar Quattro" rovers will travel 5km to the site of the Apollo 17 mission and send data and high-resolution images back to earth. The mission will also use the module to set up the moon's first data LTE (Long Term Evolution) base station for Vodafone to keep lunar communication costs from getting truly astronomical.

www.mission-to-the-moon.com

Photo: AUDI AG

Berlin-based PTScientists is planning its first mission to the moon in August 2018, where it will establish an LTE base station for Vodafone.

Online Marketplaces

Power Through Partnership

Many players, one basket

Following Amazon's slam-dunk success, more and more traditional "bricks and mortar" retailers in Germany are upping their game to become contenders in the online one-stop-shopping arena. Online marketplaces already account for over two-thirds of e-commerce revenue in Germany. Among the heavyweights getting in on the action are Real, Otto, Karstadt, Zalando and Rewe. The latter, Germany's second-largest food retailer, is teaming up with Dallmayr, Käfer, myToys and Butlers to expand its online portal's offerings to include a broader range of day-to-day products, such as toys and household items.

Digital Commerce

No More Missed Deliveries!

The package that gets in when you're out

Having much of what we buy delivered right to our door is great. What's not great is when our purchases are there – but we aren't. The Munich-based startup Nello has designed a tool to save those of us with a door-unlocking buzzer from having to reschedule deliveries or trudge down to a pick-up spot. Installing the intercom unit is "a cinch" and using Nello's smartphone app from anywhere in the world, you can buzz deliveries in – be it food, groceries or mattresses – and have them waiting for you when you get home. Plus, you can schedule time slots for letting in service providers and guests. Hello Nello! **www.nello.io**

Industry 4.0

Center for Digital Competence

Helping SMEs digitize and thrive

Germany's 3.7m SMEs are the beating heart of the country's economy. But due to their size, many find it difficult to keep pace with dynamic changes in the world's "digitize or die" business environment. To advance these companies along the path to digital success, the Federal Ministry for Economic Affairs and Energy (BMWi) is setting up a network of "Mittelstand 4.0" centers of competence across Germany. In August, a new center was opened in the "Experimental Factory" in Magdeburg, Saxony-Anhalt. The center helps regional SMEs find innovative digital solutions for optimizing internal processes, networking with other companies and developing new fields of business. This test lab-cum-demonstration workshop also offers tailored information, free training programs and expert advice in four key fields.

www.mittelstand-digital.de

Networked Society

German Internet Institute Launched

Exploring technology's impact on society

The winner is in! In May, Germany's Federal Ministry of Education and Research (BMBF) selected a consortium from Berlin-Brandenburg to run the new German Internet Institute, which will explore the interplay of society and digitization, such as how automation is transforming the modern workplace. The consortium will address such issues in an interdisciplinary way, combining different approaches from economics, social science, political science, computer science, law and design, as well as building a network of partners from business, politics, media and civil society. Made up of five universities, the WZB Berlin Social Science Center and the Fraunhofer Institute for Open Communication Systems (FOCUS), the consortium will be funded by the states of Berlin and Brandenburg in addition to €50m from the BMBF.

Aerospace Innovation

Satellite Package Deals

Startup offers a piece of space for everyone

Getting a satellite into orbit might require rocket science, but a Berlin-based startup aims to demystify and simplify the process – and make it a lot cheaper. Founded in 2014 as a spin-off of the Technical University of Berlin, German Orbital Systems (GOS) is the country's first company to focus on mini-satellites in standardized sizes called "CubeSats." As part of its "turnkey satellite mission" packets, it offers not only the equipment but it also takes care of the launch segment by purchasing space on Russian Soyuz rockets via its sister company, ECM Launch Services. And to keep costs low for its customers, GOS also manufactures microsatellite components that are compatible with other systems and in other configurations, as well as ground station equipment to receive transmissions.

www.orbitalsystems.de

Future Travel

The Shoppers' e-Chopper

Transporting urban traffic into the 3rd dimension

Flying taxis have been the stuff of science fiction movies for decades. But if all goes well for Volocopter, this dream could be available for hire later this year. The Bruchsal-based aviation startup aims to revolutionize urban mobility with its fully-electric vertical take-off and landing (eVTOL) air taxis. The Volocopter 2X – which claims to be the world's first safe manned eVTOL – looks like a big, round, 18-rotor drone and carries the meaty part of a mini helicopter with plenty of room for two. So while its competitors are theorizing, Volocopter is making quiet, eco-friendly air taxis a reality, with a team boasting members from Airbus Helicopters and Siemens, and with backing from heavyweight investors like Daimler and Intel. In 2016, it was given provisional licensing by the German aviation authority, and it will stage the global premiere of an autonomously-flying air taxi in Dubai in late 2017.

www.volocopter.com

Photo: Volocopter GmbH/Nikolay Kazakov

The Volocopter 2X sets a new benchmark for air taxis: it is fully electric, low maintenance, surprisingly quiet and operated by a simple joystick.

Introducing de:hubs

Unlike centralized Silicon Valley, there are twelve separate digital hubs ("de:hubs") in Germany. Here, foreign founders and investors find the perfect mix of sustainable networks, excellent research facilities, established economies and innovative startups.

Silicon Valley in the San Francisco Bay area has become an internationally recognized brand, the global capital of tech boasting a concentration of IT expertise across different sectors, attracting the most innovative minds, the busiest networkers and big investment. The situation in Germany is different. Here there are several large urban regions that focus on different industries, some of which are tied to the region's specialties – such as the auto industry in southern Germany, the financial sector around Frankfurt or logistics in the harbour city of Hamburg.

Germany's economy is supported by its "Mittelstand," a large number of small and medium-sized businesses (SMEs) including many "hidden champions", a strong base of established companies and then its excellent universities. These are supplemented by innovative and predominantly international startups: nearly half of all those employed in Berlin's startup scene come from outside Germany, for example.

What has been lacking in the past is an overarching digital ecosystem to link the individual players that would bolster Germany's position as a digital heavyweight on the international scene. To remedy this, the Federal Ministry of Economic Affairs and Energy (BMWi) launched the Digital Hub Initiative with twelve "de:hubs." Each one is both a network and a physical location concentrated around regional strengths, creating synergies that will help to advance digitization.

Josefina Nungesser ***»Continuously monitoring trends and innovations«***

You're head of the new Trend & Innovation Scouting division at Germany Trade and Invest (GTAI). What is it exactly?
Our primary task is to boost the competitiveness and digital transformation of Germany and, in particular, that of SMEs by attracting international digital pioneers (startups, innovators, investors etc.) to our country and, if possible, integrating them into one of the 12 digital hubs.

What role does the GTAI play in the Digital Hub Initiative of the Federal Ministry for Economic Affairs and Energy (BMWi)?
A decisive one – as GTAI and in particular the Trend & Innovation Scouting division is in charge of the internationalization strategy of the Digital Hub Initiative. In my opinion, the success of the initiative strongly depends on whether we manage to market the hubs abroad in a way that convinces innovators to cooperate with or settle in one of the hubs for the long term.

What is the role of your division within GTAI?
My division is key to the company gaining new expertise. By continuously monitoring trends and innovations, and building new networks for international innovators, we become valuable advisors on the topics of digitization, startups and innovation.

"We want to strengthen our network and we are positive that this mixture can be very attractive for international founders and investors," says Brigitte Zypries, Germany's Minister for Economic Affairs and Energy. "And that is one of the main goals: convince them to establish their companies and make their investments in Germany. In a nutshell, you can say that we have many "valleys" and we need to connect them."

A short history of de:hubs

Above all, the hubs aim to put startups and their digital innovations in contact with market leaders and accelerate collaboration on priority topics. This type of cooperation has been successful in the past: according to a recent study by the research organization RKW, 95 per cent of all SMEs would work with a startup again in the future.

The initiative was the brainchild of BITKOM, the German IT industry association, which selected the hubs along with an independent committee of experts from across a range of digital and tech industries. Criteria such as the presence of established world-leading companies and research facilities, an embedded startup community and an overarching vision for the hubs to be international "beacons" played a large role in the selection process.

As an example, Potsdam was already known worldwide as a location for the media and film industry. But its new MediaTech Hub is now striving to attract international attention beyond these fields to "create a lo-

Photo: GTAI

cal space for innovation in digital transformation beyond entertainment," according to its chairwoman Andrea Peters. She goes on: "Through the Federal Ministry of Economic Affairs and Energy's new Digital Hub Initiative we are offering an inspiring and powerful combination of digital technologies, video and mobile capabilities, animation, visual effects, games, interactive media, VR/AR and big data. Potsdam has not forgotten its success over the last '100 Babelsberg years,' [a reference to its famous film studios] but is rather embracing the future and offering an interesting prospect for startups and investors from all over the world."

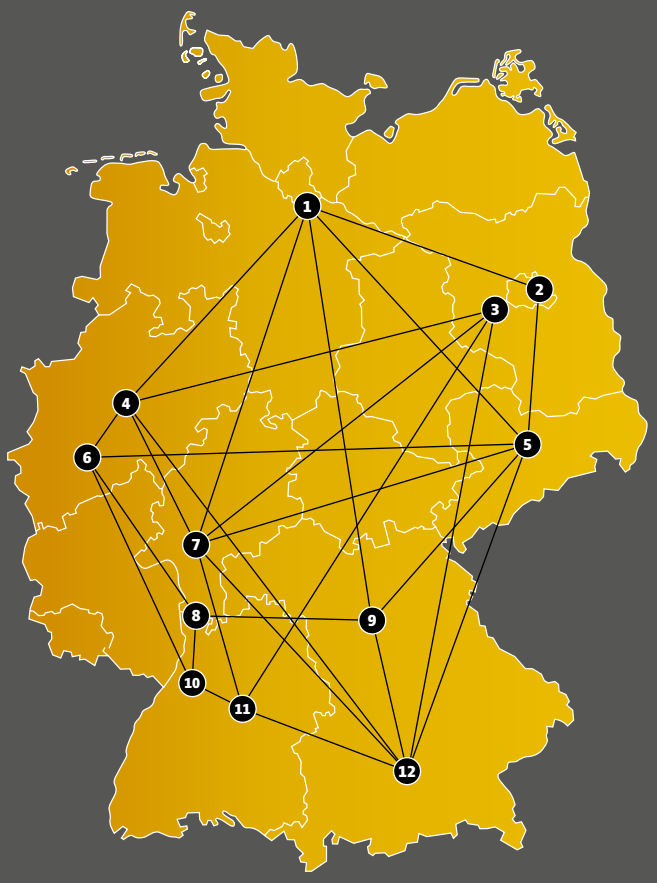
Digital Health Hub

However, Germany's regional cluster model is still relatively unknown outside the country. As the Startup Monitor 2017 discovered, more than a quarter of the startups surveyed did not know about clusters, or if they did, were unsure what industries they represented. In Nuremberg-Erlangen, the immediate challenge of the Digital Health Hub (built on a strong, existing healthcare cluster) is simply to let the rest of the world know it exists. "The Digital Hub Initiative is a great opportunity to increase our international visibility and reputation in the field of digital health in general. Germany has many innovative startups and strong SMEs, but we often tend to be too modest about our ideas," says Johanna Mathes, project manager for the hub. "The Hub Initiative helps us to make the 'Digital Health Made in Germany' brand known all over the world."

With its global network and expertise in attracting investors, GTAI is making the Digital Hub Initiative visible abroad and recruiting a complementary mix of startups and investors. The ultimate goal is to make "de:hubs" an international brand that is distinct from the Valley in that it offers access to a range of ecosystems unique and specific to Germany.

Contact:
hub-initiative@gtai.com

Further information:
www.de-hub.de



Mapping Germany's **de:hubs**

1. ***Hamburg***
   Logistics
2. ***Berlin***
   IoT & FinTech
3. ***Potsdam***
   MediaTech
4. ***Dortmund***
   Logistics
5. ***Dresden Leipzig***
   Smart Systems & Smart Infrastructure
6. ***Cologne***
   InsurTech
7. ***Frankfurt Darmstadt***
   FinTech & Cybersecurity
8. ***Mannheim Ludwigshafen***
   Digital Chemistry & Digital Health
9. ***Nuremberg Erlangen***
   Digital Health
10. ***Karlsruhe***
    Artificial Intelligence
11. ***Stuttgart***
    Future Industries
12. ***Munich***
    Mobility & InsurTech

TAKE THREE de:hubs

Digital Hub Logistics

With one of the largest and most modern harbours in Europe, an international airport and excellent transport links, **Hamburg** is a vital logistics hub in Germany. Digital Hub Logistics focuses on digitizing the transfer of goods and products by land, sea and air, as well as intralogistics and intelligent logistics and transport systems.

Digital Hub Health

Thanks to the interplay of a strong economy, health research and training and healthcare provision, the **Nuremberg** metropolitan region has fostered a world-leading ecosystem in healthcare. Systematic digitization projects aim to change traditional processes in the sector, encouraging the development of innovative business models.

Mobility & InsurTech

The greater **Munich** region is renowned for its innovation in the automotive and insurance industries. Here at Digital Hub Mobility and Digital Hub InsurTech, products and services are developed for digital transformation. The two are closely linked: new mobility concepts like networked and autonomous transport require new insurance models.

FinTech Shifts its Axis

Due to uncertainty in the market after the Brexit referendum, many FinTech companies and investors are now moving to Germany. From insurance to crypto-finance and SME lending, Germany's startup cities are welcoming the new disruptors of finance.

Brickvest, a London-based real-estate investment platform that uses technology to "close the investment gap," is just one example of a young Fintech company opening an office in Berlin to take advantage of Germany's swelling market and reduce Brexit-induced risk. "Our industry relies heavily on talent with a creative and global outlook. The uncertainties around the status of EU citizens post-Brexit and the high cost of living in London have become a real barrier to hiring international talents since Brexit. We opened an office in Berlin in 2016 to enable the firm to attract talent," says Thomas Schneider, Brickvest's CEO.

FinTech is a very lively part of the digital revolution, which has been disrupting traditional financial models and probing new kinds of transactions and processes to both monetize links in the value chain and provide better value for the average consumer.

Germany's FinTech hotspots

The substantial investment drive in FinTech over recent years has produced companies like Cringle in Berlin and Lendstar in Munich, whose apps enable people to transfer tiny amounts of money to each other via their phones. And there's Kreditech in Hamburg, which specializes in small loans by assessing customers' online data as opposed to credit rating information. Digital banks, digital currencies, mobile wallets and peer-to-peer lenders are all new variations on classic banking services that FinTech startups are bringing into the mainstream economy.

While bankers in Frankfurt are rubbing their hands in anticipation and getting ready to receive major international banks and financial institutions fleeing the uncertainties of Brexit, the FinTech scene is a Germany-wide phenomenon. Hamburg, Frankfurt, Munich and Berlin are all hotspots. Boasting the largest investments, Berlin is the clear leader and there are strong indicators that it may take over from London as Europe's FinTech capital. Since September 2016 it has welcomed nearly three times more FinTech startups and certainly as much venture capital as any other European city.

Market intelligence

A 2016 EY study put Germany's overall FinTech market size at US$2.5bn, the fourth-largest in the world, with new investments of US$539m. VC-backed funding for German FinTechs rose by 118 percent in 2016, contrary to an overall global downward trend, according to Business Insider. As for last year, the statistical observer Statista reckons that transactional value in 2017 across German FinTech companies was US$115bn; a

STARTUP MONITOR

FinTech stars

These FinTech startups have taken advantage of Germany's innovation hubs to transform the way we bank and exchange money.

Berlin

N26 – enables customers to manage current accounts through smartphones.
Raisin – lets customers open deposits at attractive interest rates across Europe free of charge.

Munich

Scalable Capital – leverages technology to offer first-class investment services, previously only available to large institutional investors, at a fraction of the cost.
Fidor Bank – unique in the virtual banking field in that it has its own banking license. Offers peer-to-peer lending, crowdsourcing and bonus payments for interactions within the community.

Hamburg

Kreditech – assesses people for loans using online data and machine-learning rather than credit checking.
Figo – offers a Banking-as-a-Service platform that aggregates financial data from over 3,100 banks and financial institutions.

Frankfurt

Traxpay – provides a B2B trading platform that allows large companies to optimize liquidity and cashflow.
Bancalis – supporting FinTech with automated analysis of legal texts. Its cognitive system quickly assesses which business processes and products are affected by new regulatory requirements.

Dorfleitner/Hornuf study FinTech Market in Germany estimates that the market volume in finance and asset management alone will grow from €2.2bn in 2015 to €58bn by 2020.

Sebastian Schäfer, CEO of TechQuartier in Frankfurt, sees Germany as the future center of the industry in Europe, filling the hole left by Brexit. "There are opportunities here in insurance, crypto-finance, RegTech, infrastructure and particularly SME lending," he says. "Crucially, FinTech companies from Germany and other countries do not see London as first choice anymore."

With FinTech seemingly looking for a new base, Germany's tech hubs, so strong on innovation, are actively courting startups. "A recent survey counts about 700 companies in this sector in Germany, half of them founded during the last three years," says Josefine Dutschmann, senior manager at Germany Trade & Invest's Investor Consulting. "A series of regional digital hubs has been established in Germany as an initiative of the Federal Ministry for Economic Affairs and Energy, where startups, science, SMEs, industry and administration join together and become centers of digital transformation. These also become centers for collaboration, which is interesting, as banks and insurance companies are starting to be a lot more open to FinTech collaborations and partnerships."

»FinTech companies do not see London as first choice anymore.«

Sebastian Schäfer
CEO of TechQuartier, Frankfurt

Contact:
josefine.deutschmann@gtai.com

A carpet with a programming code motif in the offices of the Berlin-based FinTech N26, a startup which aims to fix all the "outdated" quirks and oddities of the European banking systems.

Photo: Andreas Pein/laif

Giving Startups a Hand Up

From disruptive technologies to game-changing gadgets, more and more startups from around the world are choosing to collaborate with well-established German companies. What makes them so alluring?

Gregor Schlosser, the man behind AHK Israel's initiative BETATEC, which helps German and Israeli startups and companies collaborate and thrive together in the field of ICT.

Imagine a small gadget that turns every car into a moving WiFi hotspot. This was Jay Giraud's vision when he founded Mojio in 2012 in Silicon Valley. But when the software and hardware had been developed, the venture ran aground. In order to make the leap from the research laboratory to the streets, the Californian entrepreneur realized he needed an industrial partner with a sales network and deep pockets. Several companies expressed an interest in a collaboration, but in the end Giraud went for the German telecommunications giant Deutsche Telekom.

The fact that a volatile startup might be looking for a strong and stable partnership is not exactly news. But Giraud's decision is symptomatic of a wider movement: foreign startups are flocking to work with blue chip German corporations. For Kevin Heidenreich from the German Chamber of Industry and Commerce (DIHK), the reason is clear: "Germany is home to many well-established and internationally successful companies," he says. No other country exported so many goods abroad in the past year and the sales networks of German companies spread across the globe.

German-Israeli co-operation

So on the one hand startups can gain a foothold in the German market, but they can also expand internationally. Charme Rykower of the German-Israeli Chamber of Commerce and Industry (AHK) points out that "many Israeli startups are developing brilliant technologies, but are failing to implement them worldwide. Seen in this way, cooperation with a German company offers a great opportunity." The AHK has set up an initiative called BETATEC in Tel Aviv to enhance and further develop collaboration between the two countries in the ICT fields.

The benefits of such a cooperation are not one-sided. A startup will approach a larger, established company with a fresh perspective on an old problem. They often bring a lot of technical know-how with them and find unconventional solutions that can be put to immediate use. Through the association, the host company saves thousands of euros in R&D and can even benefit from the sale once the product has reached market maturity. For Mojio and Deutsche Telekom, the cooperation has proven to be a win-win situation; the "little guy" gained access to Deutsche Telekom's vast telecommunications and the worldwide distribution networks, while the "big guy" acquired the right to commercialize the product worldwide. And since November, customers have been able to buy Mojio adapters in Deutsche Telekom shops.

Contact:
oliver.wilken@gtai.com

Photo: Jonas Opperskalski/laif

All Aboard the 5G Superhighway

5G promises to impact on our lives more than any other wireless technology before it, ushering in superfast speeds, a huge increase in throughput, security and resilience. The 5G Lab Germany at the Technical University of Dresden is at the forefront of research.

With more than 600 researchers from 20 different disciplines, 18 committed industry partners including companies like Bosch, Deutsche Telekom, Ericsson, IDT, NEC, Nokia and Vodafone (to name a few), Dresden's 5G Lab is unique in Germany, if not in the world.

"No other research center is offering the holistic approach which is needed to push 5G into industries early on," says Rico Radeke, managing director of 5G Lab GmbH at the TUD. And the future of industry depends on 5G enabling Industry 4.0, robotics, the Internet of Things, connected e-cars, the smart grid and numerous other disruptive technologies that are transforming sectors such as construction, engineering, healthcare, agriculture and logistics. Quite simply, 5G is the medium through which networked and intelligent machines will flow.

The Tactile Internet is here

"5G is a revolution in communication," explains Radeke. "The Tactile Internet will enable real-time communication for trillions of devices worldwide. This real-time aspect offers completely new business perspectives, but will change our society, especially regarding interworking and living with machines." The 5G Lab GmbH offers administrative support for all research projects and industry partners and members of the 5G Lab Germany. And the first industries to benefit from the superhighway will be robotics, manufacturing, healthcare, autonomous driving, education and entertainment.

Many of the projects are "closed" but the first to be unveiled is "5G-ConnectedMobility": four motorways in Germany have been carrying out tests in vehicle-to-vehicle and vehicle-to-infrastructure communication to create the environment for autonomous driving and for new methods of traffic information provision in real time. Stefan Koetz, chairman of the board of Ericsson in Germany, which is a key partner, hopes that "it will be possible to accelerate 5G R&D beyond Germany with the help of the telecoms industry and the application industry."

All that Radeke can say about the other collaborations underway is that they "include sharing each other's view on 5G, the updating of a common vision and networking between partners." But what is clear is that there will be very few places – including space – where 5G can't take us.

5G LAB GERMANY IN FIGURES

5G Lab Germany and the Institute of Electrical and Electronics Engineers (IEEE) successfully organized the 2nd IEEE 5G Summit Dresden on September 19, 2017.

18

committed/50 connected industry partners

600+

researchers from over 20 different research areas

22

founding professors from the Technical University of Dresden

Source: 5G Lab

Contact:
vanessa.becker@gtai.com

Further information:
www.5glab.de

Photo: 5G Lab Germany/Frank Grätz

Get Set, e.GO!

There is very little Günther Schuh, managing director of e.GO Mobile, doesn't know about e-cars. We talked to the professor about self-driving cars, production engineering and his ambitious plans for the future.

Profile view of the e.GO Life 20. This lightweight, green and economical little e-car can accelerate from 0 to 100 km/h in 35 seconds and has a turning circle of approx. 9m.

Photos: e.GO Mobile AG (2)

»Anyone who can afford between €170 and €200 a month can afford our e-car.«

Günther Schuh, *managing director of e.GO Mobile*

Günther Schuh has been Professor of Production Systematics at RWTH Aachen University since 2002. He is also director of the FIR Research Institute for Rationalization, one of the directors of RWTH's Machine Tool Laboratory (WZL) and part of the Fraunhofer Institute for Production Technology (IPT). Before heading up e.GO, he was co-founder of the electric vehicle manufacturer Streetscooter.

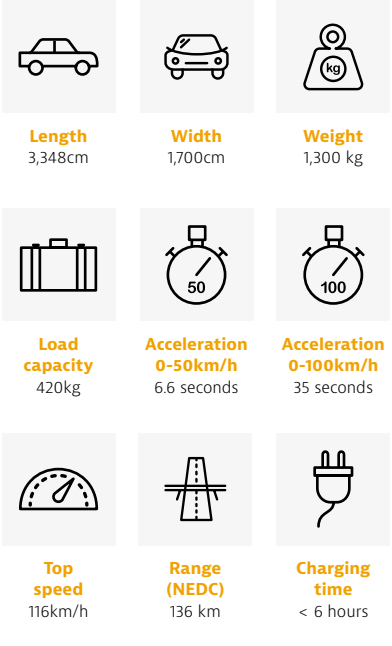
Mr. Schuh, where is e.Go currently at?
We have had to change some components, so that has held us up a bit, but we are still planning to go into service production in March 2018. For the first three months, we'll be producing only one or two cars a day, while we work up our new system and factory. Then, by November, we'll be up to 45 vehicles a day. We originally intended to produce 800 cars in 2018 but the demand has been so great and we've already sold so many, that we have been forced to expand production to 1,800 vehicles next year.

Are there any developments you can share with us?
Our second car is the People Mover. We are planning to produce 400 of these in 2019 and by 2020 will be making some 3,500, around 30 per cent of which will be self-driving. Between 2021 and 2022, we'll be producing at least 15,000 at our factory. We're also planning to launch e.GO Life's big brother in 2019: the Booster is a longer reinforced version with more performance and a bigger battery. We are building two new factories for them on our site in Aachen and are planning a fourth factory for the e.GO Life and Booster chassis.

Will cost-conscious consumers be able to afford e.GO cars?
The most urgent challenge facing our society is to free our city streets from emissions. And that will only work if the products are affordable. I'm often asked whether it's possible to make affordable electric cars at all. The answer is "Yes!" As far as I know, the Streetscooter is still the only e-car worldwide to undercut its petrol-driven counterparts in total cost of ownership. We have shown it is technically and conceptually possible and we're confident that the market will react to it.

What customers are you aiming at and what feedback have you been getting from them?
We collected user stories and identified nine that were on target, from healthcare service providers to bakers, pizza deliveries and especially "taxi moms." We used them to develop a profile and went public with it in May.

NINE FACTS ABOUT E.GO LIFE 20



Source: e.GO Mobile

Since then, the customers have been coming to us. We are selling around 15 cars a day, without any marketing.

How can you compete with the established OEMs?
People who drive in cities can't afford to pay more than 15 cents per passenger-kilometer. An E-Smart costs around 32 cents, an Opel Ampere some 45 cents per passenger-kilometer – and our car costs 14. Also, the e.GO is basically only available on a full subscription with leasing, servicing, upgrades and insurance, while a minimal deposit payment means the entry bar is extremely low. Regardless of how old their car is or how little cash they've got, anyone who can afford between €170 and €200 a month can afford our e-car – but not any other one. So, that's why I say: "It'll work!"

Is Germany a good place to build e-cars?
Production engineering is the real strength of Germany's research landscape. In relation to GDP and population density, Germany has more R&D facilities working closely with industry than any other country on earth.

How are you financed – with outside investment?
After Streetscooter was sold to DHL and the German Post Office, we made enough money to finance the second and third capital increases ourselves. We have just completed the seventh round, so in four capital increases we have brought purely strategic investors on board. We have just launched our eighth increase, which should be completed by Christmas. Then we will be worth roughly a billion euros.

Further information:
www.e-go-mobile.com/en

Green Bricks

Germany will not be able to meet its climate targets by increasing renewable energy production alone: energy efficiency must also be progressed. The drive towards greener buildings is creating numerous opportunities in the construction and HVAC sectors.

Around 35 per cent of Germany's final energy consumption is attributable to buildings. Old buildings are responsible for two-thirds of heat consumption in the residential sector. The country has set a target of reducing the primary energy demand of buildings by 80 per cent by 2050 compared to 2008. In order to meet these targets, the annual rate of energy retrofits in existing building stock will have to double from the current 1 per cent to 2 per cent – and that in a residential construction market already expecting around 5 per cent growth in the coming years. These figures alone illustrate the potential for innovation in the sector.

The government has made substantial efforts to increase energy efficiency in new and existing buildings via a combination of regulations and generous funding programs. Between 2006 and 2016, some 4.6m dwellings received funding for energy efficient refurbishment or construction through the CO_2 building renovation program. In addition, the government has passed measures to tighten minimum energy efficiency standards in new builds by 20-25 per cent as of 2016, and to increase the share of renewable energy in heat provision to 14 per cent by 2020.

CONSTRUCTION INNOVATIONS

Energy efficiency investments

The government's push for greater energy efficiency is creating diverse opportunities for innovative companies at home and abroad.

- U.S. tech giant **Google** is partnering with German utility **E.ON** to introduce its smart solar platform Sunroof (picture above) in Germany's residential market.
- Norwegian company **Mjøsplast** (part of Strukturplast) and German high-tech polymer manufacturer **Covestro** have collaborated to develop polyurethane foam insulation elements that have been shown to dramatically reduce energy use in homes.
- Dutch grid operator **TenneT** and German solar battery manufacturer **Sonnen** have launched a pilot project to test power grid stabilization using Sonnen's decentralized home energy storage systems.
- Last year **Sonnen** raised €76m ($82m) in a funding round that added Chinese wind turbine maker **Envision** to a list of shareholders that includes **General Electric** and Czech **Inven** Partners.

Germany invests hundreds of millions of euros annually in financing the development and promotion of refurbishment technologies such as Celitement, an environmentally-sustainable cement developed by the Karlsruhe Institute of Technology, whose production uses 50 per cent less energy and emits 50 per cent less CO_2 than conventional cement. Another funded project involves the development of high-efficiency vacuum insulation panels.

Key factors driving progress

Strong demand for new housing – especially in large urban centers – continues to buoy the sector, which is expecting five per cent revenue growth in 2017. Renovation spending by households in 2015 totaled €10.7bn (a 13 per cent increase since 2008). Energy-related expenditures in existing residential buildings likewise grew dramatically in that period, rising 28 per cent to €36.4bn. The German Energy Agency (dena) reports that heating consumption declined by around 9.7 per cent between 2008 and 2015.

Insulation measures have faced criticism that they can lead to higher rents and require the use of environmentally question-

Photo: E.ON Energie Deutschland

able materials, claims that are dismissed by Alexandra Langenheld, energy efficiency project manager at Berlin-based Agora Energiewende. "The true driver of cost increases is not the introduction of new efficiency standards but the demand for housing in combination with a short supply in urban areas."

There is still much to be done in order to achieve the 2050 target. "The renovation rate in residential buildings must be raised to two per cent," Langenheld says. The sector will only be successfully "decarbonized", she maintains, if there is "energetic renovation of existing buildings towards the minimal standards that exist for new ones."

»Renovation rate in residential buildings must be raised to 2%.«

Alexandra Langenheld
project manager, Agora Energiewende

The challenge ahead presents opportunities for foreign investment: "meeting climate change mitigation targets will require considerable investments in both building insulation and heating systems," she says. Although construction and heating are both highly consolidated industries in Germany, rapid growth and the vast sums being invested in efficient construction and renovation and efficient heating systems mean the sectors are attractive for new market entrants with innovative products and services.

Further information:
robert.compton@gtai.com

Renovation of the solar photovoltaic system on the roof of the *Südflügel Chancellery* (Federal Chancellery's south wing) is underway in the "solar government district" of Berlin. The system generates more than 200 kilowatts at peak power.

Photo: Paul Langrock/Zenit/laif

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Around 100 companies in Berlin-Brandenburg are active in the sector

Order number: 20965

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Germany is a powertrain technology leader

Order number: 20962

ICT Clusters in Eastern Germany

The new federal states in Eastern Germany are in an excellent position to shape the digital transformation

Order number: 20986

Publisher:
Germany Trade & Invest Gesellschaft für Außenwirtschaft und Standortmarketing mbH
Friedrichstraße 60, 10117 Berlin,
T. +49 30 200 099-0, F. +49 30 200 099-111,
office@gtai.com, www.gtai.com

Excecutive Board:
Dr. Jürgen Friedrich, Chairman/CEO;
Dr. Robert Hermann, CEO

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Andreas Bilfinger

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Consultant Editor: Daniel Stephens
Editorial Team KammanRossi/wortwert:
Imogen O'Rorke, David Batty, Christoph Hus, Jürgen Jehle, Andrea Reibold.
Design and Layout: Arne Büdts, Verena Matl
Print: Kern GmbH, 66450 Bexbach, www.kerndruck.de
Circulation: 5,000
Distribution: *Markets Germany* is distributed solely by the publisher all over the world.

Order number: 21002
Cover: DAVID WALTER BANKS/NYT/Redux/laif

Federal Ministry for Economic Affairs and Energy

on the basis of a decision by the German Bundestag

The Leisure Boom

Germany is flying the flag as the most popular destination for city breaks, reinforcing its strong position in the international tourism market. The trend is driven by bookings from European culture vultures and young people.

In 2016, city breaks were one of the prime growth drivers for Germany's tourism industry. Take Berlin, Frankfurt, Munich and Hamburg – all very different places with unique urban characters, climates, economic underpinnings and even local dialects – and yet they were all in the top 25 cities for overnight stays. And in the same year, Germany was the only European country to have more than three cities on the list.

Germany is already one of the largest tourism markets on the continent, with a gross added-value of more than €105bn. In a country with unemployment at record lows, purchasing power at record highs, a population with a thirst for travel and a high level of connectedness and travel infrastructure, the tourism and leisure sector generally is enjoying a heady spell of success, be it incoming or outgoing. According to Eurostat, Germany is the biggest domestic tourism market within Europe; correspondingly, Germans spend €73.2bn holidaying outside of the country.

The blue lagoon at Tropical Island Berlin, a vast climate-controlled dome which has been basking in its own success since 2004.

Photo: Dagmar Schwelle/laif

A good time to invest?

Investors of all shapes and sizes are enjoying the leisure boom. British hotel chain Premier Inn is planning a dozen hotel openings throughout the country over the next three years. Spanish boutique apartment company Eric Vökel is opening up a new block of boutique apartments in Hamburg. Tropical Island, a vast, climate-controlled dome south of Berlin opened in 2004 by Malaysian company Tanjong, has been basking in its success. Coral World, an Israeli aquarium operator, is also looking to expand into the German market.

"2016 was the seventh year in a row for record numbers in incoming tourism," says Petra Hedorfer, CEO of the German National Tourist Board (DZT). "Germany is the number one place for culture and city trips for Europeans and is the most popular destination for young Europeans. It is also the top trade show, congress and summit location in Europe and is the most popular destination in Europe for international luxury trips."

A digital-first sector

Martin Buck, senior vice president of travel and logistics at Messe Berlin (which will host the 2018 ITB Berlin Travel Trade Show and Congress in March), cites digitization as the key influencing factor on the national tourism market. "The whole travel industry has entirely transformed itself into a digital-first sector," he said. "The trend toward digitization will have a huge impact on the German travel market."

Hedorfer also points to social networks, e-booking and the widespread use of digital solutions as a key driver for growth and investment. "The global significance of social media as part of the decision-making and booking process in travel cannot be underestimated, and Germany is investing heavily in the digitization of its tourism industry," she asserts. Ultimately, the best way to test these assertions is to book a German city break.

Contact:
daniel.lindel@gtai.com

GTAI's Investor Support Services team supported companies from more than 70 countries last year with advice on how to enter the German market and thrive.

Photo: Gordon Welters/laif

GTAI: First Contact for Investment in Germany

Markets Germany talks to Silvia Obajdin and Fabian Möpert from the team of specialist advisors at GTAI's Investor Support Services.

What kind of questions do foreign companies come to you with?
Each business case is unique, therefore so are the questions. Our mission is to provide orientation for foreign companies seeking to enter the German business environment, as well as information relevant to their potential business venture. First we must gain a sound understanding of a company's investment plans, then we keep talking with them to help map out their project.

Where do most of your investment enquiries come from?
Last year we supported companies from more than 70 countries. The most important sources of foreign direct investment into Germany are North America, Asia and our European neighbors. But we are always happy to assist, regardless of a company's size and country of origin. The most common areas of investment for foreign investors we are seeing at this time are energy and environmental technology, production and materials, automotive, life sciences and projects concerning the digitization of society and the economy.

Does GTAI host business delegations from abroad?
Yes, we organize briefings for foreign delegations. Typically, these are groups of business managers, representatives of industry associations or governmental institutions. We also participate in events and conferences organized by our partners like the German Chambers of Commerce Abroad and embassies.

What do you like most about your work?
At GTAI we work within a truly international and thematically diverse setting and we have a meaningful task in promoting Germany's economy. This is what we enjoy most.

Contact:
fabian.moepert@gtai.com,
silvia.obajdin@gtai.com

Bridging the Skills Gap

Mario Kratsch, vice president at the German American Chamber of Commerce of the Midwest (GACC), explains how German-style dual apprenticeship training could solve the shortage of skilled workers in the U.S.

Companies in the U.S. are facing a critical challenge: Skilled manufacturing workers from the baby boomer generation are edging closer to retirement, but there are not enough younger and next-generation skilled workers in the pipeline to replace them.

Two-thirds of high school graduates head straight to college without exploring alternative career opportunities such as high-tech manufacturing. One estimate puts the number of likely vacant positions because of this impending skill shortage at a staggering 3.4 million by 2025 if no steps are taken to address the problem.

German-style apprenticeships, one of the bedrocks of German economic success, may provide the solution. Policymakers from both sides of the Atlantic have been discussing how apprenticeship programs can be expanded in the U.S. So important is this issue for the future health of the U.S. economy that Germany and America have signed a Joint Declaration of Intent on exchanging best practices and cooperation in this field. The idea is to adapt the German model for the U.S. market by creating structures within the existing U.S. education and employment systems, and it has led to a number of regional pilots.

The guru of GACC

Mario Kratsch is VP at the GACC Midwest and leader of their Skills Initiative, a program which promotes dual apprenticeship training in the U.S. Previously, he worked at the Chamber of Commerce and Industry East Thuringia, training professionals working in industrial and technical sectors.

The GACC Midwest is one of the pioneers supporting the creation of these scalable programs within the region. And the results speak for themselves: its Industry Consortium for Advanced Technical Training (ICATT) Apprenticeship Program has not only proved a success story for the trainees and companies involved but also has gained significant recognition nationwide. ICATT delivers a pipeline of skilled talent to high-tech manufacturers and companies with complex automation or logistical requirements. It is the only apprenticeship program in the Midwest which is fully benchmarked against the German dual education system.

How dual apprenticeships work

Apprentices (known as *Azubis* in Germany) are taken into companies at a comparatively early age and given on-the-job training in parallel with education at local colleges over three years. The training often involves specific and specialized practical skills that are in high demand yet difficult to acquire through the academic system. Azubi graduates are typically highly-skilled and experienced by the time they enter the labor market.

Spearheaded in the U.S. by German subsidiaries familiar with the benefits of developing their own specialized workforce, more and more American companies are following suit and investing in apprenticeships. Apprenticeships not only help to close the skills gap but they can foster a deep sense of company loyalty. They are not, however, the solution for short-term worker shortages and should be seen as a medium to long-term investment. Companies who commit at the beginning must do so in the knowledge that it will be some time before their investment bears fruit.

Further information:
www.gaccmidwest.org,
www.thinkicatt.com

Photo: German American Chamber of Commerce® of the Midwest, Inc.

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