# Germany, home to high-tech business

International competitive advantages
in the IT and communications sector

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■ Publishing information

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# Welcome to Germany

Prof. Dr. Dr. h.c. mult. August-Wilhelm Scheer

If you associate Germany with Goethe, Schiller and Beethoven, you are certainly on the right track. But Germany is more than that: it is Europe's leading technology nation, the European Union's biggest economy, an attractive market, and not least a globally unique location to carry out research and produce innovations. It is the cradle of revolutionary technologies like the telephone and fax machine, and where the computer and MP3 standard were invented.

Increasingly, BITKOM is approached by foreigners interested in coming into contact with German companies and research institutes, and keen to receive information on Germany as a technological center and its working environment. This brochure was produced to cater to this interest. It gives insights into the fascinating world of information technology, telecommunications and the new media in Germany. We hope it arouses the interest of all who are inspired by the chances and opportunities in this area: students and teachers, researchers and entrepreneurs, investors and politicians.

This brochure brings together the most important information about Germany and its ICT industry. The BITKOM office can provide further help, for example on potential and legal issues regarding ICT. In collaboration with the European Information Technology Observatory, Bitkom Research GmbH provides details on market developments. Companies keen to commit themselves to the German market are also welcome to take out membership of BITKOM as soon as they open a branch in the country.

Come to Germany! Convince yourself of the power of our industry and of the first-class ICT infrastructure. Network with the world's leading researchers, benefit from a secure legal framework and enjoy the high quality of life.

Sincerely, August-Wilhelm Scheer

President of BITKOM
Founder and Chairman of the Supervisory Boards, IDS Scheer AG
and IMC AG

# Message of greeting from the Federal Minister of Economics and Technology



Rainer Brüderle MdB,
Federal Minister for Economics and Technology

German products are sold around the globe. "Made in Germany" is a seal of quality that enjoys world renown. At the same time, Germany is becoming increasingly attractive for investors. This is connected, among other things, to Germany's strong position in the field of information and communication technology (ICT). Together with the United Kingdom, Germany is the world's third-largest market for ICT behind only the United States and Japan. More than 800,000 people work in the German ICT industry, and an additional 650,000 ICT specialists are employed in user sectors.

I am pleased that BITKOM – Germany's leading industry association for information and communication technology – has published this brochure providing information on investment opportunities in Germany's ICT sector. I believe that Germany offers an attractive environment for foreign ICT companies, and one of our key strengths is our abundance of outstanding specialists and researchers.

ICT experts predict that, in the future, information and communication technology will play an even stronger role in driving growth and innovation in key economic sectors such as the automotive industry, mechanical engineering, energy, media and health care. And this is exactly where German Government policy aims to kick in. We intend to strengthen Germany's position as a location for information and communication technologies. This will make our country even more attractive for investors.

The Federal Republic of Germany's economic promotion agency Germany Trade & Invest is a key point of contact for investors. Germany Trade & Invest advises and supports foreign companies looking to expand their business activities on the German market. The agency can provide assistance on a wide range of issues, including information on the overall economic situation in Germany, legal conditions, tax regulations, visa and residency provisions, and government support measures. Germany Trade & Invest also assists German companies that are looking to tap foreign markets. You can access more detailed information on all of these topics at www.gtai.de.

I would like to thank BITKOM for its dedicated efforts and wish all of you the best of success in reaching our shared goals.

Yours sincerely, Rainer Brüderle MdB

Federal Minister for Economics and Technology

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# Germany – a strong center for IT and telecommunications

Powerful arguments for presence on the ground

Ulrich Dietz, CEO GFT, Member of the BITKOM Presiding Committee

"The horse does not eat cucumber salad" – this was the memorable phrase that began one of the most important and perhaps exciting eras in human history: the age of telecommunications. When Philipp Reis, the inventor of the telephone, repeated this strange phrase to confirm that his speech transmission device was working before an amazed audience, no one could have guessed the enormous growth in telecommunications that was to follow. As a result, the first "Made in Germany" telephone networks were not only set up in Germany, but in czarist Russia too. Statistics show that every German has more than one mobile phone and that in 2007 they spent more than 253 billion minutes calling.

Germany has produced countless pioneering inventions in information and telecommunications technology. The first facsimile machine first saw the light of day in Berlin in 1910, also the prototype of the first computer in the 1930s. German companies made significant contributions in the development of GSM and UMTS technology, and the MP3 standard was invented here. Some of the world's leading technology providers are today headquartered in Germany: SAP and Software AG, Infineon and Epcos, Deutsche Telekom and Gigaset

Communications, Rittal, Rohde & Schwarz und Kathrein – and numerous others. All the industry's global players have branches in Germany, several of which carry on their research and development here.

Germany, traditionally a center of machine and plant engineering, auto and chemical manufacture, now owes 40 percent of its productivity gains to ICT. Across all sectors, ICT will generate growth impulses of around 100 billion euros by 2020. So, there are plenty of arguments to set up here as an ICT provider.

After the USA and Japan, Germany is the world's third-largest ICT market, with sales of 146 billion euros. Its geographical and cultural proximity to the markets of Central and Eastern Europe, and to the other traditionally strong trading partners in the European Union are part and parcel of the export success of Germany's ICT companies. With ICT exports of 56 billion euros, Germany holds the top slot in Europe.

The German economy is reacting to the pressing problems of today's world above all by promoting the use of sustainable energy-efficient technologies. Companies
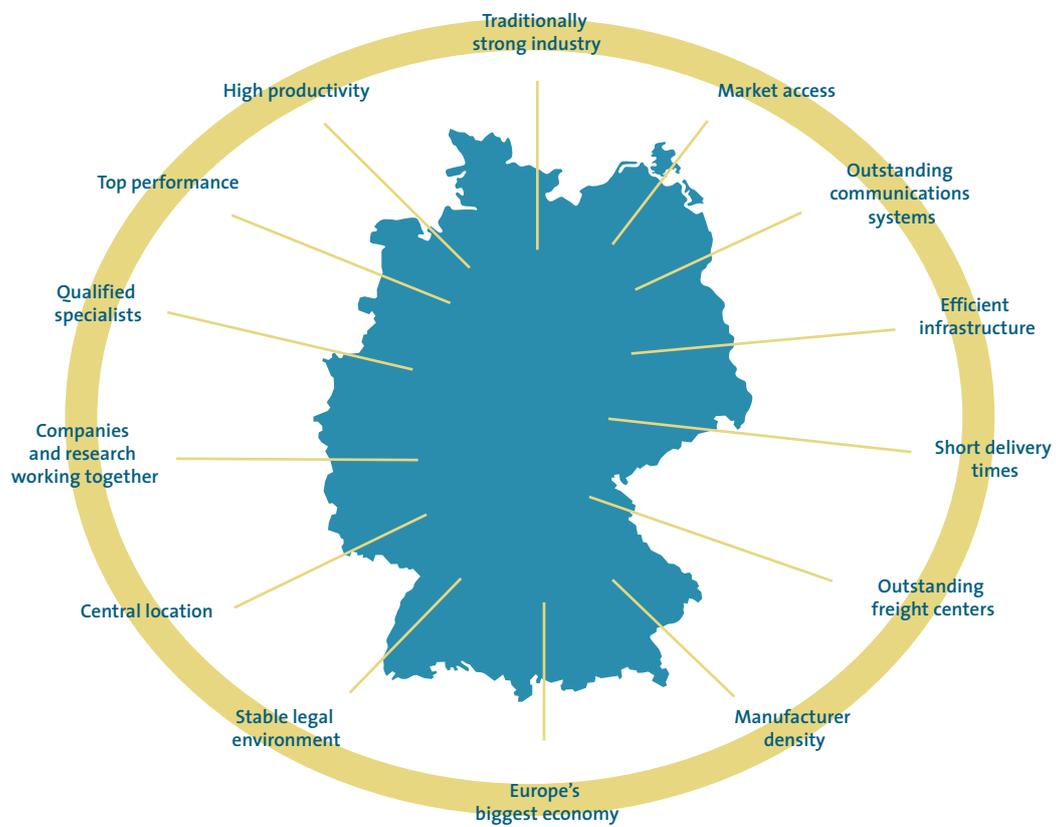
based in Germany have developed answers to these questions and work closely with politics and science in establishing Germany and its industry as global leader in the area of "clean tech".

A secure legal framework, a stable social network, a cosmopolitan population, excellently qualified and highly motivated specialists – Germany has the best conditions for high-tech providers. Rooted in Germany – networked with the world: In this way, technology providers from Germany are successful the world over.

# This is the German ICT economy

Expertise in figures

## ⬈ 830,000 jobs

The employees are the most important capital of the IT and telecommunications industry. In Germany, some 830,000 people work for the sector, many of them self-employed. In 1999, during the "New Economy" hype, that number was 700,000.

The last few years have been marked by two contrary trends: Among manufacturers of ICT hardware and telecommunications service providers, the number of employees has been in decline when taken as a whole, while among software producers and IT service providers, the number has continued to rise strongly – from 270,000 ten years ago to more than half a million today.

## ⬈ 3.8% share of total real net output

The principal indicator of an industry's economic performance is real net output, in other words the value of the goods and services produced net of input-related expenditure. Since the mid-1990s, gross value added in the IT and telecommunications industry has grown rapidly, reaching 80 billion euros in 2006. With a share of 3.8 percent of overall domestic output, ICT holds a commanding position.

In addition, the share of ICT in the output both of traditional and service industries has been growing for years. In this way, too, the ICT sector has made a decisive contribution to competitiveness and economic growth.

## ⬈ 18,000 companies

Germany is home to around 18,000 ICT companies with annual revenues above 250,000 euros. Four out of five of these companies produce software or provide IT services, 15 percent manufacture ICT equipment and systems and three percent provide telecommunications services. The number of ICT companies is growing constantly; in this way, the number of software producers alone has more or less doubled in the last decade.

Added to these are the sector's 55,000 companies and self-employed persons that generate less than 250,000 euros in revenues annually. In this group, the share of software and IT service provides stands at a staggering 90 percent.

# Domestic market valued at 145 billion euros ⬈

The volume of the German market for IT and telecommunications is around 145 billion euros. This is the amount that companies, consumers and the public sector expended in 2008 for products and services from the ICT industry. Of this, more than 66 billion euros was spent on ICT and 12 billion euros in the market for digital consumer electronics. The strongest growth impulse was posted by providers of software and IT service. Yet in telecommunications, too, high growth rates have been recorded, for example in Internet and mobile data services

# 24% of all patents ⬈

Patent applications are one proof of an industry's innovative force. ICT technologies account for 24 percent of German patent applications at the European Patent Office. With more than 5,000 ICT patent applications at the European Patent Office, Germany leads the way in Europe, only surpassed by the USA and Japan.

The great importance of innovations for the ICT sector is also shown in its very high research and development expenditure, which, at seven billion euros, makes up around 15 percent of the economy's entire R&D bill.

# Exports worth 57 billion euros ⬈

Germany is among the leading ICT exporters in the OECD. In 2007 export volume totaled 57 billion euros. Of this figure, 80 percent falls to exports of ICT goods and the rest to ICT services. In 2007 the sector exported IT and TC services worth 11.5 billion euros, up 10 percent from the previous year.

The share of the ICT sector of all German service exports is currently 7.3 percent and is on the rise. Like most European countries, Germany imports more ICT goods than it exports, while the balance of trade in services is by and large zero.

# 33% contribution to growth ⬈

ICT solutions raise productivity and innovative performance in user-operated industries and thus have a positive impact on economic growth. Since the mid-1990s, investments in ICT in Germany have made up around a third of GDP growth.

Although the share of ICT in overall investments has risen noticeably in recent years, it is around 15 percent lower in Germany than in other leading industrial nations.

# SAP: Developer verve produces world leader

Internationalization "Made in Germany"

The success story of Baden-based software forge SAP is unique in Germany and Europe. The world leader in corporate applications achieved its leap to the top not least because of being based in Germany where employees' high level of training and marked developer verve, among other factors, have ensured success.

Right from their very first customers at the start of the 1970s, the founders of SAP were shown precisely the requirements an international company had to meet. Paint maker ICI based in Östringen near Walldorf gave the SAP founders insights into the functioning of an international corporation, and they understood the great potential for efficiency and savings that standardized and integrated processes could produce for just such a company. Although ICI then had to wait several years before SAP's software had been installed in all international branches, but this early internationalization of SAP applications was a keystone to its success.

But to begin at the beginning: In 1972 Claus Wellenreuther, Dietmar Hopp, Hasso Plattner, Klaus Tschira and Hans-Werner Hector, all former IBM employees, founded SAP – originally short for "system analysis and program development". Their aim was to develop standard application software for real-time or online processing (in contrast to the batch processing common at the time). This was the dawn of an unparalleled success story. Starting out with nine employees working from rented space in Mannheim, the company now has a workforce of better than 51,000, posts revenues of more than 10 billion euros, is active in 120 countries, and is the clear leader in corporate software. From the first programs that handled orders, stock management and soon accounting, through the decades it became the world's most successful business management software portfolio. SAP today has more than 89,000 customers, 80 percent of revenue is generated abroad and two thirds of its employees are non-German. SAP has grown into a global company – in fact, it is globalization that

has made the company what it is. Quality, reliability, creativity and innovation are the pillars on which the SAP corporate culture is built.

## ◼ Strong in Germany, a force worldwide



SAP is still strongly rooted in Germany, with around 11,000 of the 15,000 employees based in Walldorf and neighboring St. Leon-Rot, where they develop, market, maintain and design. But not only Germans work at the two centers by any means: Walldorf and Rot is workplace for Americans, Asians, Africans and of course Europeans – from more than 80 nations.

And these colleagues in Germany work closely with the global development centers - the SAP Labs - in Silicon Valley, Canada, China, France, Israel and India. "The successful cooperation between our labs is an outstanding example of how SAP has developed into a truly global concern, one that does not merely operate local branches," says Henning Kagermann, who as chairman of the Executive Board and Chief Executive Officer of SAP AG until his departure in May 2009 largely pushed the company's internationalization efforts. "At the same time, each development center has its own strengths, guaranteeing a fruitful addition to productive competition." At the last count, the company invested some 13 percent of its revenue in research and development – more than one billion euros a year. Besides the labs responsible for product development, there is also the SAP Research division. "Together with our academic and industrial partners, we want to make a contribution to

coming closer to the vision of a web-based service company," says Lutz Heuser, head of SAP Research, explaining one hot topic. "To this end, we carry out research on applications for the Internet of Things or the Internet of Services, and on innovative industry solutions in areas such as trade, manufacturing and the energy sector. The results of our work flow directly in the application development of the SAP Labs."

Ask the current Chairman of the Executive Board Léo Apotheker for his secret to continuing success and he will emphasis customer focus as one of the most important guarantees of success: "For SAP the customer is always in the spotlight. From the beginning, we tried to understand the business processes of our customers in detail, and have tailored the development of our products to their needs accordingly. By doing so, we have gained practical insight into business processes from all industries throughout the entire world and from this, we have derived standardized and optimized processes. Armed with these "best practices", SAP software has become a driving force behind competitiveness and growth in the global economy. Co-innovation with our customers and partners is decisive for us in achieving the greatest added value for our customers." To do this, SAP brings partners, developers, business process experts and customers together in a dynamic



Léo Apotheker

community that now numbers more than 1.25 million members with the aim of developing innovative solutions in concert. Joint development initiatives with partners and customers are a prime success factor for SAP in offering a portfolio that supports innovation and growth.

## ■ The education factor

In research and teaching, SAP works closely with the world's leading universities and research institutes. With its University Alliances Program the company also promotes practical forward-looking training by giving teachers and students global access to the very latest SAP technologies. In Germany alone, more than 200 universities, technical colleges, academies and vocational schools teach procedure-oriented business administration taking SAP software as their example. Around the world, more than 150,000 students at 700 universities and schools participate in the SAP University Alliances program.

Besides early internationalization, a strong customer focus and a large network of partners, SAP's success benefited above all from the general conditions offered by a base in Germany: A technically-focused environment, customers from all sectors who are receptive to the use of IT and through it improve their competitiveness, and not least a high level of engineering expertise and an inventive spirit shared by customers and SAP itself. "The high level of training in this country has played straight into SAP's hands," says Prof. Helmut Krcmar, who holds the chair of Information Management at Munich's Technical University. "Above all, the company has benefited from the qualifications of its computer scientists, information management specialists, engineers and industry experts." SAP aims to maintain and extend these advantages of doing business in Germany through its University Alliances initiative and through the training programs offered by SAP Education. After all, education is the key to innovation und social advancement.

But the question is: can other young companies repeat the success of SAP? Léo Apotheker is cautiously optimistic: "Although global competitive pressure is only set to increase, Germany also continues to produce many ingenious inventors and excellent engineers. That is demonstrated by the success of many small- and medium-sized world leaders, those "hidden champions". While focusing on our strengths in industrial production, we must at the same time appreciate the significance of innovative services and business models. An idea only becomes a genuine innovation if it is launched on the market in the right way - and that is when it creates added value for the customer. Take this to heart, and you're bound to succeed."

## Ashant Chalasani, company founder and Indian expat

**Mr. Chalasani, when and how did you come to Germany?**
I was head of IT at an automaker in Kyoto when I heard about and enrolled in a Master of Sciences course at the University of Stuttgart. I came across the course on the university's website and was then supported in my efforts by one of its professors who thought that the university should open itself further to international influences.

**Why did you finally decide for Germany?**
I had already gained my Bachelor in Electronics in the USA and benefited from the training options there. Germany, on the other hand, enjoys an excellent reputation as a mecca of engineering. That is why I wanted to study here and get my M.Sc. that I believed would offer me more than similar programs in the USA or UK. And that's the way it turned out.

**Your resume to date is indeed impressive – highly qualified courses, several successful startups in ICT, networked internationally... How do you get into such an interesting sphere of work?**
Well, in conservative Indian families, the sons usually choose their father's profession, or at least something similar. As for me, I come from an engineering family, so my choice of studies was only logical. In the 1990s, IT and communication technologies were the most promising areas of study, which then led me to study electronics.

**As you said, choosing Germany was quite conscious. What were the decisive factors?**
Besides a high quality of life – including security and a functioning healthcare system – it was also naturally important for me that I could rely on its excellent education and further training mechanisms. More and more universities now offer courses in English, which makes it easier for foreign students to make their choice of studies.
Employment prospects after university are good and Germany has a great deal to offer throughout one's working life: excellent infrastructure, a fast and efficient legal system and not least a huge market with central access to further markets in Europe.

**Would you describe Germany as a cosmopolitan country?**
In contrast to the generally communicated image of Germany as being a sealed-off society, I experience greater tolerance here than in other countries – including the USA! When I first came to Germany I had problems getting in touch with people in my social surroundings. Whether in bars or in discos, social interaction with the locals proved to be difficult. But in time this changed, not least because of my better language skills and cultural understanding that I gained through interacting with German friends. And of course my professional environment helped me in fitting in.

**What are the main cultural differences?**
The differences between the German and Indian cultures are many and varied. In the end, the key to success lies in finding a common basis and adapting to the local environment instead of cutting yourself off.

**Is there anything that you feel is particularly lacking in Germany?**
Not too much – expect perhaps lower taxes ...

**What is your recommendation to Indian specialists and rising talents interested in Germany?**
The training options at the technical faculties are my absolute top recommendation. In this area, German is at the top of the global rankings and graduates of its education system have a genuine competitive edge. What is more, it is a positive experience to work for German companies, both as far technological excellence goes and the typical characteristics associated with the country such as efficiency, punctuality and precision.

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# Rittal: IT infrastructures – at the heart of the information society

German company meets global challenges

Growing demands on availability and energy efficiency, high server packing densities and the associated heat buildups, as well as increasing and external requirements such as data privacy legislation – IT is developing at a rapid pace. Rittal has been successfully offerings solutions for secure and fault-tolerant IT infrastructures for many years and continues to invest heavily in the development of energy-efficient innovations. It also focuses on global availability, customer proximity, reliability and speed.

Although Herborn in the German state of Hesse is hardly a metropolis, it is the headquarters of a world leader. With some 11,100 employees spread throughout the world and more than 10,000 immediately deliverable standard products, Rittal is one of the leading solution providers of technology packaging. The company is at the top of international competition in many segments, such as IT racks and industrial air-conditioning.

## Germany as the hub of global activities

A decisive criterion in Rittal's success is the global availability of its products. The company expanded early on, and to date has founded more than 60 subsidiaries, 150 distribution and logistics centers, and more than 70 offices. It has also built 19 high-tech production sites at key locations throughout the world – some in the important "BRIC" nations of Brazil, Russia, India and China. But although this has led to 70 percent of its business being generated beyond Germany, Rittal continues to invest in the location and 70 percent of production is performed here. It recently opened a new distribution and logistics center in Gera (Thuringia), a move that strengthened its offer of customer-facing services in eastern Germany.

Rittal is the largest company in the Friedhelm Loh Group and likewise is rooted in the region where the three states of Hesse, Rhineland-Palatinate und North Rhine-Westphalia join. All seven of the company's production sites are located here. Rittal's responsibility for the region is writ large: it supports and promotes schools and training centers, local sports clubs, social facilities, and many other projects and institutions.

## From Germany for the world

The availability of highly qualified employees is just one factor that favors Germany as a business location. The country has one of the best university systems in the world. The dual training system is also beneficial. Rittal takes advantage of the Friedhelm Loh Group's employee qualification courses at the Loh Academy and sends staff abroad as part of their training. Dual study courses and international qualifications for high-potential employees are also a fixed part of HR development. Through the use of and innovative technologies and highly qualified specialists and management, Rittal ensures top-level product and process quality that ultimately benefits its customers at home and abroad.

Another argument in favor of its base in Germany is the varied and excellent research environment. This sees Rittal working closely with research institutes such as the Fraunhofer Institute and many universities and specialist colleges. Germany also boasts outstanding telecommunications and logistics infrastructures.

Germany, the home of high-tech business: International competitive advantages in the IT and communications sector

Rittal server room

Rittal implemented holistic solutions in its IT department at a very early stage: the company offers end-to-end services, from consulting, planning and analysis, to physical security all the way to its IT infrastructure consisting of racks, IT climatization, power supply and distribution, as well as monitoring and remote management.

## Ideal solutions for customers

"Our goal is to deliver ideal solutions to our customers wherever they may be. To do this, we cover a broad and globally available range of solutions. In IT we work closely with our subsidiaries Lampertz and Litcos along the lines of 'Rittal – Complete IT Competence'. As a result, we have expanded the Litcos portfolio of analysis, planning and consulting services, and the physical security solutions offered by Lampertz. The outcome for customers is end-to-end solutions meeting a universal high standard. Individual wishes can also be implemented swiftly and the routes to our consultants are short," says

Bernd Eckel, Director of Global Marketing and Distribution, describing Rittal's IT offers.

Its customers include internationally leading solution providers such as T-Systems. Manfred Teumer, Vice President Infrastructure & Architecture Services at T-Systems, is very satisfied with the good cooperation of many years: "Rittal's global presence enables us to benefit from the system producer's expertise the world over."

Rittal solutions are not only used in the business world, but in leading research institutes too that place high requirements on their IT infrastructures – for example the Max Planck Institute for Gravitational Physics (Albert Einstein Institute) in Hannover. Germany's sixth-fastest scientific data center and the world's fastest Ethernet-based cluster went online in May 2008 to evaluate the gravity waves predicted by Einstein. Direct measurement of the waves would represent impressive confirmation of the General Theory of Relativity. At the same time, direct observation of the gravity waves heralds a new era in astronomy since previously inaccessible regions of the universe would then become "visible". "Our data centers achieve the high server densities required for the processing-intensive evaluation of measurements. Since we have to rely one hundred percent on our infrastructure – in particular the cooling systems – we use Rittal's server racks and LCP Plus cooling systems," says Prof. Bruce Allen, Director of the Albert Einstein Institute (AEI). Other customers in this segment include the Fraunhofer Institute for High-Speed Dynamics (Ernst Mach Institute) in Freiburg and the world-class RWTH Aachen University.

Rittal's has a long-standing tradition of innovative work. For example, in the area of IT climatization: its Liquid Cooling Package was greeted as the first of its kind when it came on the market in 2004. The air-to-water heat exchanger is mounted on the racks to channel off even the highest heat buildups. The technology is used in data centers around the world. Its Rimatrix5 is another top-flight innovation. The complete and scalable IT solution for setting up secure modular computer centers was launched by Rittal back in 2005. It ensures perfect business continuity and is highly economical.

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IT solutions from Rittal are not only used in business, but also in leading research institutes.

## In focus: environmentally-friendly and energy-efficient solutions

Environmental protection is at the very top of Rittal's agenda and a foundation of its corporate principles. The company operates an integrated management system for all global production sites based on quality management certified to ISO 9001:2000, environmental management based on ISO 14001:2004 and work safety and health management according to OHSAS 18001:1999. In 2007 Rittal was awarded first place for its energy efficiency-measures in the 1st Climate Protection Competition organized by Hesse's State Environment Ministry.

Its products are designed for efficient use. For example, Rittal has introduced an "efficiency label" in industrial climatization in cooperation with the Fraunhofer Institute for Production Technology and Automation (IPA), TÜV Nord and Deutsche Montan Technologie GmbH & Co. KG to support energy-efficient and environmentally-friendly cooling devices.

## The trend toward "Green IT"

As a member of The Green Grid, Rittal also plays a part in promoting efficient and environmentally friendly computer centers. The organization made up of IT firms and experts backs the development of manufacturer-independent standards, measurement processes, procedures and new technologies, whose use is designed to raise the energy efficiency of computer centers worldwide.

In product development, Rittal uses solutions that ensure that the IT infrastructure itself saves energy and costs. Modularity is decisive here. "Pay-as-you-grow" is the keyword, since a data center designed to be modular and scalable can easily be adapted to new requirements and so grow with the company. In the final analysis, it is enough if the power available is precisely what is required. RimatriX5, the modular complete solution for IT infrastructures, was awarded the Innovation Prize in the Green IT category in the "SME Initiative" contest.

It enables energy savings above all in IT climatization and power consumption. Since different conditions prevail from one data center to another, individual climate concepts are called for. With this in mind, Rittal offers solutions ranging from basic load cooling to the removal of medium heat buildups all to way to the "high-density" domain – cooling for very high heat loads. The intelligent use of cooling solutions from Rittal produces savings of up to 50 percent. Compared to less efficient solutions, the company's highly effective USV systems can save up to 95% across typical life spans – amounting to several thousand euros.

To ensure it can offer efficient solutions well into the future, Rittal also carries out research into the use of alternative materials. One idea it is promoting as part of its "Fascination Future" development platform is the "BioRack": rack technology that uses renewable, environmentally-compatible and easily degradable materials. Its environmentally-friendly RiCell fuel-cell system and the use of "Augmented Reality" are also interesting advances. The latter is a mobile device with built-in camera that shows users comprehensive information about imminent service and maintenance work. The camera transmits real-time values and status information from its position on the IT racks.

These and many other ideas are researched by the Rittal Research and Basic Development department to ensure that customers have energy-saving options now and in the future.

# RWTH Aachen University:
# Research excellence in Germany

ICT enables innovation and quality



Chartered in 1870 to provide the emerging industrial region straddling the Rhine and Ruhr rivers with research expertise and qualified management, RWTH Aachen University, an integrated interdisciplinary technical university, is meeting the global challenges of the 21st century with a forward-looking concept entitled "RWTH–2020: Meeting Global Challenges". It sees energy supply and mobility, health und demographic change being tackled by engineers and scientists in concert with humanities researchers, industrial partners and research institutes. In the strategic Jülich-Aachen Research Alliance (JARA), the RWTH works particularly closely with the Jülich Research Center. The city of Aachen, with its four Fraunhofer institutes, is in any case an important location for research.

## ◼ ICT sets the pace

Computer science, information and communications technology have become a prime focus of RWTH Aachen. Research groups of all faculties have joined with 45 computer science and IT professors in the Informatics Forum to organize interdisciplinary networking projects, special research areas, graduate colleges and excellence clusters. The forum pursues four main areas of research:

◼ Software systems quality engineering is designed to ensure the mathematical and organizational quality of complex software-intensive systems in chemical technology, the automotive industry, medical and communications technology, and aerospace and aeronautics. One research group at the university, for example, is developing advanced formal methods that enable the European Space Agency to check already in early design phases the faultlessness and performance of space vehicles to avoid grave control defects such as happened with Ariane 5 or the Mars

Pathfinder. The LISA programming language developed at RWTH Aachen University for the development and simulation of highly integrated multiprocessor systems are now used around the world by leading manufacturers.

- **Information and communication systems engineering** investigates the convergence of data management, the Internet, sensor technology, mobile communication and service-oriented software architectures. Besides basic research in the UMIC Excellence Cluster (see box), application projects concentrate on car-to-car communications, data mining and technology-aided learning. The "homecare robots" developed by computer scientists from Aachen were RoboCup world champions in 2006 and 2007. The JARA-FIT initiative researches the physical and technical foundations of new storage and communications technologies carrying on the pioneering work of Peter Grünberg, physics Nobel laureate from Jülich.

- **Multimedia data processing** places people in the center of the informationalized world. Innovative algorithms are being created for a broad spectrum of media such high-quality graphics, the spoken



Wireless Transport Platform

word, video and audio conferencing. Post-desktop interaction paradigms include conducting systems, "intelligent stuff" and special access methods for seniors and the disabled. The JARA-BRAIN initiative employs brain imaging to study dementia, analyses of schizophrenics, and also effects of computer games in cooperation with the Fraunhofer Institute for Applied Information Technology (FIT). FIT is also examining the use of mobile computer games in planning and training scenarios.

- In **computational engineering sciences**, mathematics, informatics and machine engineering join forces in the high-performance simulation used to design and evaluate innovative engineering applications for use in machine-building, chemical and plastics technology, material sciences and medicine. The JARA-SIM research initiative supports this by providing access to one of the world's fastest supercomputers, as well as promoting young talent through the German Research School on Simulation Sciences. The Virtual Reality Center Aachen complements the simulation with the latest visualization technologies, for example for medical students in designing blood pumps to aid circulation and plant builders in constructing entire assembly lines.



Cave pumps

The Ultra High-Speed Mobile Information and Communication (UMIC) research cluster, part of the German Excellence Initiative, has been funded since the end of 2006 with around 35 million euros over five years.

UMIC research focuses on mobile information and communications systems of the future. The systems' quality as experienced by users must be at least one order of magnitude above the current state of the art, not only in big cities, but also in rural areas and all parts of the world without a fixed network. Performance, availability and reliability, as well as energy efficiency, security and data protection, can only be improved over the long term through interdisciplinary research that ranges from the applications, from protocols and algorithms down to the physical level of the micro- and nano-systems.

The UMIC research areas include future mobile application and services, "intelligent" mobile radio transport platforms and high-frequency assemblies, and highly integrated heterogeneous systems. Over 20 chairs of computer science, electrical engineering and IT at the RWTH Aachen are involved in the UMIC research center, and six trainee professorships have been created. A central laboratory was set up to develop innovative components and set up complex test environments and demonstrators, which, like the new professorships and interdisciplinary workgroups, is also housed in a separate UMIC building.

## Industrial orientation and internationalization are important strategies

The focus on industry by RWTH Research has lured the industrial research centers of global players including AMB Generali Informatik Services, Ericsson, Ford, Microsoft and Philips to Aachen. The 1,250 or so RWTH spin-offs since 1985 include ICT companies that lead in areas such as airport and environmental information systems, ERP industry solutions for SMEs, high-performance surface inspection systems, corporate planning and consolidation, semiconductor plant engineering and electronic system-level design tools. Since 1991, the cooperation between universities and business has been concentrated in REGINA – the Regional Industrial Club for Informatics – that numbers more than 80 firms. A dozen technology centers facilitate startups and company relocations, and provide early access to the highly qualified Bachelor and Master ICT specialists, and almost 60 new Ph.D.'s turned out by RWTH Aachen University each year.

Internationalization has a long tradition in Aachen, a former imperial city near the borders with Belgium and the Netherlands, stretching back 1,200 years. International research networks and industrial development go hand in hand with attractive study and research opportunities for the next generation of international ICT specialists.

English-language master courses have competed for the best brains in the international education market since 2001. In 2003 this activity was given an additional impulse with the Bonn-Aachen International Center for Information Technology trust endowment (B-IT) together with university partners in Bonn and the Fraunhofer Society. The international master programmes in computer engineering, communication engineering, media informatics, software system engineering and life science informatics currently attract bachelor graduates from top universities in more than 50 countries around the world. Almost one third of Aachen's IT graduates now come from this area.

Mobile applications

Five doctoral training schools for selected young national and international scientists provide structured support in focal areas such as algorithmic synthesis, applied informatics, computational engineering, mobile communications and simulation science. The International Office provides foreign students and scientists at the RWTH Aachen support and service on all legal, social and integrative issues in its ultramodern "SuperC" students' center. Crèches and dual-career offers are designed to make it easier above all for women to pursue scientific careers in the promising ICT area.

## Konrad Zuse grants – Germany's contribution to bridging the digital divide

The Federal government has launched an initiative to close the digital divide. Starting in 2009, the next generation of IT specialists from developing nations have the chance of founding their own IT companies in their home countries. The program is named after the German inventor of the computer, Konrad Zuse. He designed the Z1, the world's first programmable computer back in 1935, following it up with the Z3 in 1941. People joining the program must have completed their studies in computer science or a related specialist area and submit a business plan that clearly and precisely lays out their ideas. The government also contributes an additional monthly grant of 1,200 euros for a period of up to twelve months. Based on their business ideas, the need for further training or internships in Germany is then explored together with the Konrad Zuse scholarship holders. The program includes seminars with top-ranking experts from the ICT sector, the sciences and government.

Through this initiative, Germany hopes that the scholars will be able to realize their business plans by applying the skills and knowledge they acquire during their stay in the country. Another aim is to support the countries of the southern hemisphere in setting up their own successful ICT sectors. This would represent not only a contribution to realizing the objectives set out at the World Summit on the Information Society (WSIS), but also go toward meeting the UN's Millennium Goals.

OECD Trade in ICT Goods, 1996 – 2004
USD millions, current prices – Export

| Country | Value |
|---|---|
| USA | 149.273 |
| Japan | 124.238 |
| Germany | 91.308 |
| South Korea | 86.099 |
| Netherlands | 58.302 |
| UK | 43.678 |
| Mexico | 41.336 |
| France | 32.579 |
| Ireland | 23.673 |
| Hungary | 16.984 |
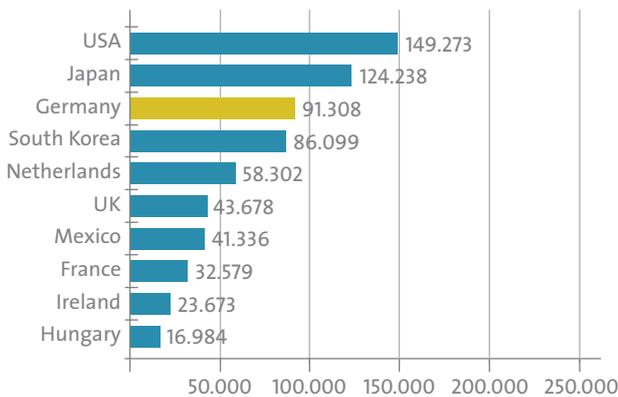
OECD Trade in ICT Goods, 1996 – 2004
USD millions, current prices – Import

| Country | Value |
|---|---|
| USA | 234.845 |
| Germany | 89.894 |
| Japan | 72.698 |
| UK | 65.936 |
| Netherlands | 57.637 |
| France | 43.306 |
| South Korea | 42.833 |
| Mexico | 41.019 |
| Canada | 29.868 |
| Italy | 29.844 |
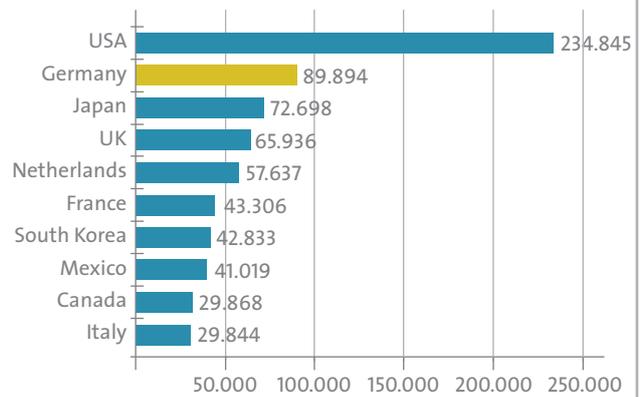
Source: OECD ITs database

### Prof. Heinz Gerhäuser, Managing Director of the Fraunhofer IIS

**Prof. Gerhäuser, what is certainly your establishment's most famous invention is in everyone's heads – the MP3 format. How did it come about?**
Well, I would tend to describe it as a development rather than an invention. Behind it is a process of many years that was worked on by a team that at times numbered up to 50. Originally, in those days of limited bandwidth, our research concentrated on coding music and language to find ways of using digital broadcasting channels such as digital radio. Without data compression, real-time transmission was simply out of the question.

**Describe the precise development environment if you would.**
As part of the EUREKA project, we were able to bring together partners to work on data compression from all over Europe. One pleasant side effect of this was that it gave us the necessary weight to gain international acceptance and later to pursue the spread of the MP3 format throughout the world. What appeared almost impossible at the time – due to tight bandwidths and the limited processing capabilities of the microprocessors available then – became feasible almost by itself according to Moore's Law, opening up the way to real-time transmission of compressed voice and music files.
We at the Fraunhofer Institute also had the tricky task of preparing the hardware for international tests: at the time, a risky venture that could easily have led to the failure of the entire project.


Antenna measuring hall

**What advantages did your home base in Germany bring you?**
Frankly, I cannot think of another place where we would have found such highly motivated and qualified young talents to support us in our work. Neither in China or the USA will you find students and young scientists who are as ready, loyal, efficient and independent as those colleagues trained in Germany.
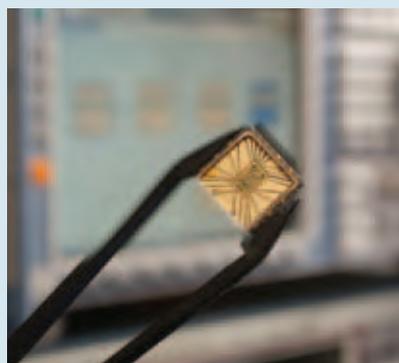

The ASIC IQ modulator developed at the Fraunhofer IIS

One thing is central in big projects like MP3: you need a fixed and stable team to push the work on at all times. This is not a matter of course in the international area, but indispensable for a project that runs over more than two decades.

So my recommendation, above all to students from overseas, is to spend at least one or better two semesters in Germany to gain familiarity with the potential working environment and – most importantly – the work mentality. We depend on these specialists of the future more than ever. The earlier we open up as a research institute to these future employees and lay the foundation of later partnerships the better.

# RIM: R&D center for EMEA in Germany

Research In Motion (RIM)

Research In Motion (RIM) is a market leader in the global communications market. The Canadian company's flagship BlackBerry solution is now a synonym for mobile e-mail. Europe, the Middle East and Africa (EMEA) count among the world's fastest growing markets.

RIM's success story began in Waterloo, Ontario, where it was set up in 1984 by Mike Lazaridis as a consultancy for computers and technology. The first BlackBerry smartphone appeared on the market in 1999 and changed the way people work and communicate with each other from the ground up.

## ■ From Canada to Germany and the world

RIM now ranks among Canada's most important firms. Its continuous success is based on outstanding technical development and scientific research. The company is renowned for its remarkable innovations and its efforts to ensure that complex technologies are always practical, stable and user-friendly.

RIM is also increasing its international reach, with 30 percent of its business already generated outside North America. Of the current global workforce of 8,500, some 700 are employed in the EMEA region alone.

The new Research and Development Center for Europe in Bochum opened its doors in September 2008. Through the new R&D center in Germany, RIM supports its European growth strategy in the development of ideal products for carrier partners and customers alike. Dovetailing with its global strategy, most research into device technology is carried on in partnership with local universities including the Ruhr University and technical institutes. The coming years will see RIM invest tens of millions in its Bochum site. The first of its funded scholarship programs with the university have already been approved.

This marks another chapter in its success story – aided by German expertise.



From left to right: Dr. Norbert Lammert, Christa Thoben, Mike Lazaridis

# Germany: Investment magnet number one

## Excellent workers

Germany has highly qualified and motivated workers.

Workers in Germany according to education (2007, in %)



Unskilled workers
20 %

University graduates
16 %

Trainees
1 %

University graduates
10 %

Skilled workers
53 %
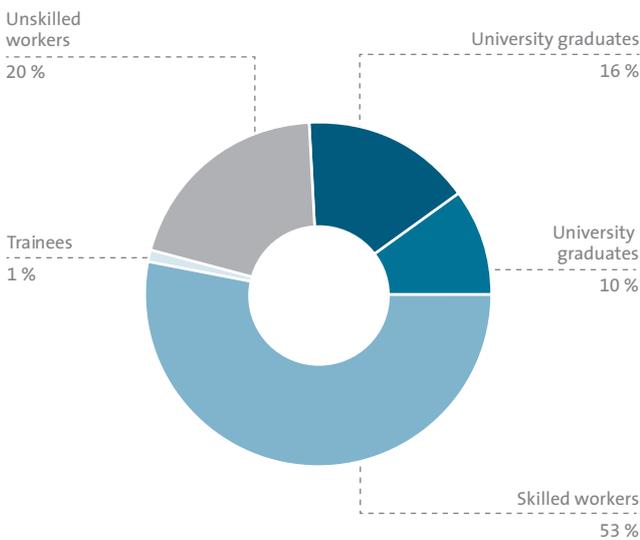
Note: 1 The dual education system combines practical and theoretical training over three years.

### Dual education system[1]

- Combining theoretical and practical training reduces the cost of hiring and employee orientation costs, and thus minimizes the risks of hiring.
- Vocational schools work closely with around 500,000 companies in Germany.
- The focus is on the requirements of each sector.

### University education

- Germany has 104 universities and 184 technical colleges.
- More than 44,000 engineers and 47,000 scientists graduated in 2007.

## Quality of life

The best of the German way of life.

2,389 kilometers of coast, 20 upland areas, 125 nature reserves and national parks.

80 operas, 5,600 museums and more than 550 festivals every year.

26,000 soccer clubs with 6.3 million active players, 1.8 million active tennis players and 646 golf courses.

More than 700 medieval forts and castles, and Europe's longest fortification system.

1,250 breweries producing more than 5,000 beers and more than 300 types of bread.

## A leading economy

Germany is Europe's largest market and generates 17 % of the EU's total GDP.

| Share of overall EU GDP and population (2008, in EUR bn) | | | | |
|---|---|---|---|---|
| | GDP | Share of total GDP (EU 27) | Population (in millions) | Share of population (EU 27) |
| Germany | 2.492 | 20% | 82 | 17% |
| UK | 1.812 | 14% | 61 | 12% |
| France* | 1.892 | 15% | 64 | 13% |
| Spain | 1.095 | 9% | 45 | 9% |
| Netherlands | 595 | 5% | 16 | 3% |
| Poland | 362 | 3% | 38 | 8% |
| Czech. Republic | 149 | 1% | 10 | 2% |
| Slovakia | 65 | 1% | 5 | 1% |
| USA | 9.699 | | 304 | |
| Japan | 3.330 | | 128 | |
| EU 27 | 12.507 | | 497 | |
| Eurozone | 9.209 | | 327 | |

Note: France GDP data from 2007

## Global players

Germany has been the world export goods leader since 2003.

Development of goods exports (2000 – 2008, in EUR bn)
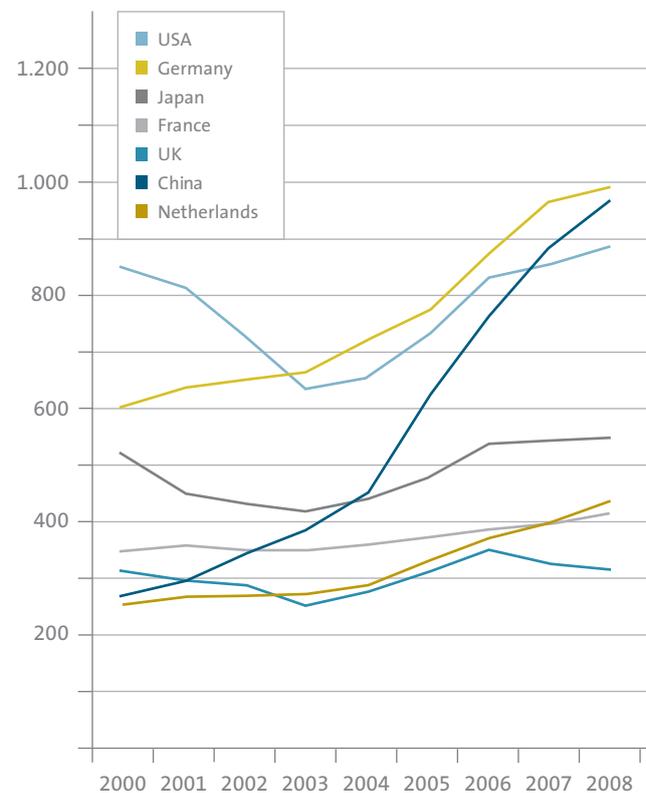
## High productivity

Germany has one of the highest productivity rates among industrialized countries.

Productivity for Manufacturing Industries
(2007, Germany = 100)

| Country | Value |
|---|---|
| USA | 108 |
| Belgium | 106 |
| Netherlands | 101 |
| Germany | 100 |
| Sweden | 88 |
| France | 85 |
| Japan | 80 |
| UK | 74 |
| Spain | 72 |
| Italy | 61 |
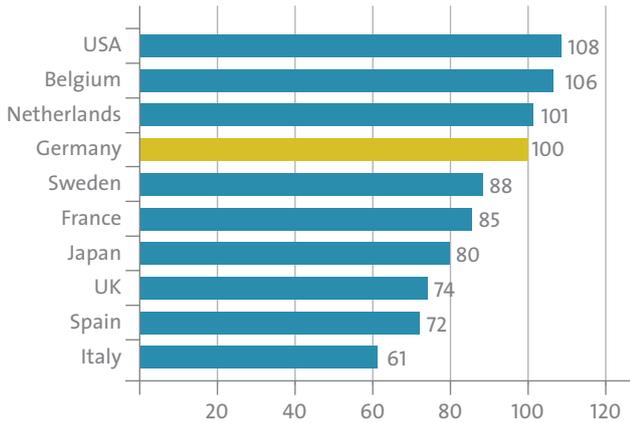
## Innovation potential

German companies lead the world in research and development (R&D) and are among the most innovative anywhere in the world.

Ratio of companies undertaking their own R&D
(2002 – 2004, in %, by sector)

| Country | Services | Processing industry |
|---|---|---|
| Germany | 21,0 | 37,0 |
| South Korea | 9,6 | 32,6 |
| Austria | 20,5 | 31,9 |
| Belgium | 22,8 | 31,2 |
| Sweden | 25,8 | 26,2 |
| Luxembourg | 29,7 | 25,1 |
| Czech. Rep. | 14,5 | 21,3 |
| France | 13,2 | 19,2 |
| Netherlands | 13,4 | 18,7 |
| Spain | 11,8 | 17,1 |
| Japan | 12,0 | 17,0 |
| Poland | 6,5 | 14,2 |
| Italy | 8,7 | 13,4 |
| Slovakia | 7,3 | 11,5 |
| Hungary | 6,8 | 10,1 |

■ Services   ■ Processing industry

BITKOM
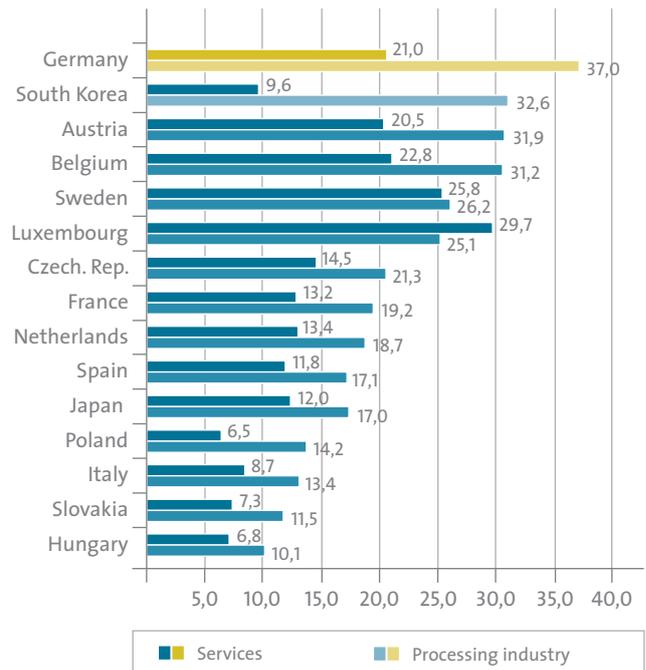
## First-class infrastructure

Germany's infrastructure is highly developed and resilient.

Freight transport (in bn tons per km)



| | Road | Rail |
|---|---|---|
| USA | 2117 | 2479 |
| Netherlands | 328 | n.a. |
| Germany | 232 | 88 |
| Poland | 110 | 45 |
| France | 197 | 42 |
| Japan | 23 | n.a. |
| UK | 163 | 22 |
| Czech. Rep. | 14 | n.a. |
| Spain | 12 | n.a. |
| Slovakia | 19 | 9 |
| Belgium | 55 | 8 |
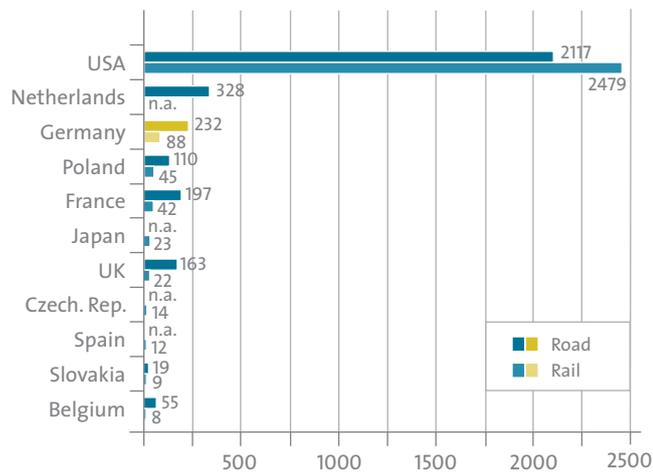


## Attractive development programs

Germany offers companies a wide range of grants covering both investment costs and operational expenditure.

**Grants**

**Investment grant offer** + **Subsidizing operating costs**

| Investment grant offer | | | Subsidizing operating costs | |
|---|---|---|---|---|
| Direct subsidies | Reduced interest-rate loan | Sureties | Employment promotion | R&D grants |
| Investment subsidy/ GRW | Development loans from the state development banks | State sureties | Support in recruiting | Grants |
| VInvestment grant/ IZI | Development loans from KfW Entwicklungsbank | Federal/state sureties | Grants for further training | Loans |
| | | | Integration grants | Silent/direct equity investments |

### ■ Germany has competitive tax rates.

Average Corporate Tax Burden (2008 or latest available year, in %)

| Country | Value |
|---|---|
| Japan | 42,43 |
| USA (NY) | 39,62 |
| France | 34,43 |
| Italy | 31,40 |
| Spain | 30,00 |
| Germany | 29,83* |
| UK | 28,00 |
| Netherlands | 25,50 |
| Czech. Republic | 21,00 |
| Slovakia | 19,00 |
| Poland | 19,00 |

(x-axis: 5 % – 10 % – 15 % – 20 % – 25 % – 30 % – 35 % – 40 % – 45 %)
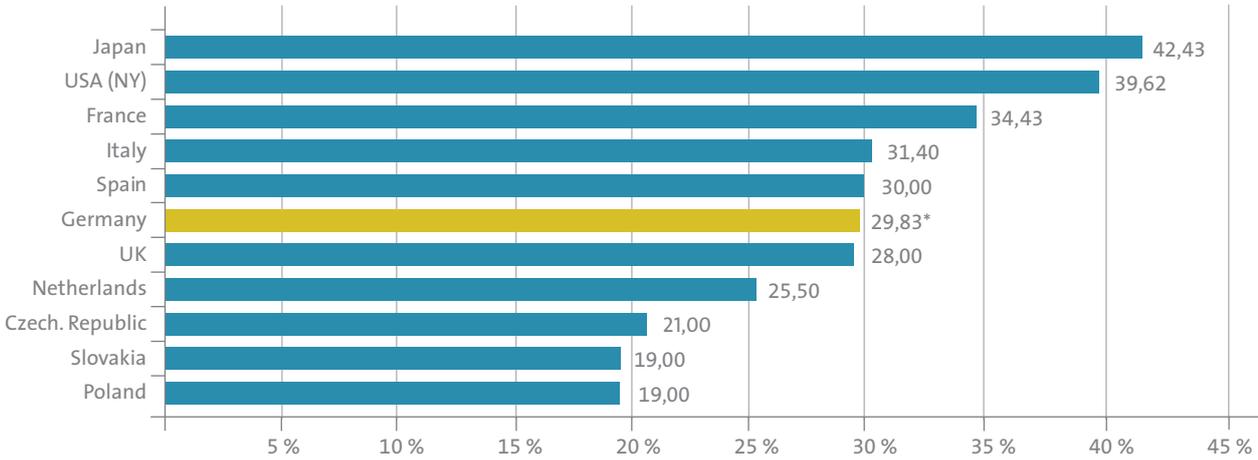
* Including 15% Corporate Income Tax (plus 0.83 % Solidarity Surcharge) and 14% Trade Tax (municipal collection rate: 400%)

### ■ Germany provides a solid base for investment projects.

A secure and stable business climate forms a solid basis for foreign investment projects.

Assessment of planning reliability (2008, opinion survey)

**Efficiency of Legal System**

Denmark
Germany
Netherlands
France
UK
Japan
USA
Spain
Czech. Republic
Slovakia
Poland

(scale: 1 2 3 4 5 6 7)

7 = efficient with clear, neutral processes
1 = inefficient

**Security of Intellectual Property**

Switzerland
Germany
France
Netherlands
Japan
USA
UK
Spain
Czech. Republic
Slovakia
Poland

(scale: 1 2 3 4 5 6 7)

7 = strict security conditions
1 = weak or non-existent

**Protection from corruption**

Denmark
Netherlands
Germany
UK
Japan
USA
France
Spain
Czech Republic
Slovakia
Poland

(scale: 1 2 3 4 5 6 7 8 9 10)

10 = high confidence level in country
1 = low confidence level in country

**BITKOM**

Bryan Quinn, expat at Software AG in Germany

### Mr. Quinn, how did you become an expat in Germany?

I have been interested in international business all my life and also wanted to work abroad. When a technological change produced the chance to work for a corporate leader, I saw it as my opportunity to put this interest into practice and gain interesting experiences. Since I was working for a German company at the time anyway, I came to Germany to work at its headquarters.

### What is your personal background?

I have a B.Sc. in Informatics, with a second in Psychology, from Northwestern University in Illinois (USA). After working as an engineer in the IT industry, I took a different professional course to focus on marketing. Before being deployed abroad I had never learned German, although I had two other foreign languages besides English.

### From a cultural perspective, what surprised you most on coming to Germany?

I was amazed at the importance Germans place on nature and how seriously they treat the subjects of health, fitness and sustainable environmental development.

### And what clichés proved correct (or not) in terms of Germany and the Germans?

It is correct that Germans are logically-minded people with a strong belief that there is a right and a wrong way of doing certain things and that you have to follow the right

way to the job properly. 'If a job's worth doing, it's worth doing well' accurately describes German precision, the will to work hard and the intelligence to work to a plan.

What is not correct is the cliché that the Germans are cold, unfriendly and humorless. It may be true if you meet an unknown German on the street, but once you've built up a relationship, Germans have an excellent sense of humor and help their friends wherever they can. The image of being cold rather comes from the Germans' efforts to be open and honest, including pointing out errors. That is not cold but comes from the belief that things must be in good order and, if not, must be righted. Germans really love fun – as you can see from the great number of festivals. Carnival time shows that the usually conservative Germans can

let their hair down – when the time and place are right.

Another cliché is that it's impossible to win an argument with a German. But actually Germans will change their opinion and position if they are presented with strong and durable arguments in a convincing way. To win them over you have to stick to your position, present a logically understandable argument and show good faith.

### When you came to Software AG, a leading European software house, what was done to make it easier for you to fit into a new country and a company based in Germany in the first months?

Software AG gave me excellent support during the immigration process and later settling-in phase. I was also assigned a personal language teacher.

**What career options are open to highly qualified foreign specialists in Germany?**

My experience is that Germany is egalitarian in career development, although there is strong emphasis on a formal education. But as I had a degree in informatics and worked at a software company, that was no problem. I still had the impression that in difficulties that would not be the case. That shows the country's egalitarian nature: provided that you can produce the necessary proof and have experience, all career options are open to any committed professional.

**How does the business climate differ from your home country?**

In general, the business climate is more conservative. Germans are not generally 'early adopters' of new technologies, but wait until they are convinced by results to avoid the risk of failure. What is interesting about Germans is that they can develop technology just as quickly as in the USA, but take much longer to actually apply this technology. In Germany it is far more common to plan things and then carry out the plan accordingly. Expectations must be formulated first and there is a far lower tolerance of errors. I think that the Germans' belief in order lies at the root of this. As a result, when an idea is advertised that will result in change, its technological superiority and successful application in practice must be demonstrated. As soon as these high requirements are met and the plan is approved, Germany moves with great speed, energy and precision toward its implementation.

**Turning to up-and-coming foreign talents: what would you advise them if they are interested in Germany?**

Learn German as soon as you can to prepare for your new job. Be prepared for a culture shock – perhaps later than you expect, but expect it nonetheless. Be open to the new culture and familiarize yourself with your internal logic so that you can adapt to it. Don't be discouraged by criticism, apparent failure or pressure. Everything is criticized in Germany and everyone without exception is put under pressure – but that's what the long holidays in Germany are there for: to relax. Use the time off to discover wonderful Germany and look forward to the experience of your life!

If you are American, go and see the film "Flight of the Phoenix" in the original 1965 version. The film aptly compares the American and German cultures; in particular where the American willingness to take risks and the Germans' precision when planning and thinking are concerned.

Cooperation is not always easy, but the cultures complement each other and can lead to amazing results.

BITKOM

# Cluster management for the IT and media sector

Baden-Württemberg – a case in point

Clusters – regional powerhouses made of know-how and resources – do not only raise productivity. They also offer advantages in the competition for location and innovation that have to be exploited. A quarter of Germany's strongest clusters are in Baden-Württemberg. But looking to the future also requires support for new networks.

To ensure that good ideas become marketable products, entrepreneurs, researchers and financiers must be brought together. Clusters, spatial concentrations of know-how and resources for a specific area of business, lay the groundwork. The upshot is an invigorating effect for the entire economy. But not every concentration that favors the regional economy is necessarily a powerhouse.

## ■ The north of Baden-Württemberg, in southwest Germany, is a top European IT cluster

The European Cluster Observatory in Stockholm has made it its duty to track down clusters and observe their development. The analysts' have compiled their latest results in a cluster map of 259 regions in 31 European countries. A quarter of the clusters that they judged to be Germany's strongest – based on size and specialization – are located in Baden-Württemberg. The richest among them are engaged in the traditional industries of auto engineering, production technology and metalworking. But even within the more recent sectors such as information and communications technology, clusters from the southwest are ranked in the top ten.

| Top 10 IT clusters in Europe |
|---|
| 1 Berkshire, Buckinghamshire and Oxfordshire |
| 2 Upper Bavaria (Munich) |
| 3 Karlsruhe (Northwest Baden-Württemberg) |
| 4 Stockholm |
| 5 Zurich |
| 6 Stuttgart (Northeast Baden-Württemberg) |
| 7 Közép-Magyarország (Budapest) |
| 8 Surrey, East and West Sussex (Brighton) |
| 9 Hampshire and Isle of Wight (Southampton) |
| 10 Oslo og Akershus |

| Top 10 IT publishing clusters in Europe |
|---|
| 1 Bucuresti-Ilfov |
| 2 Mazowieckie (Warszawa) |
| 3 West Yorkshire (Leeds) |
| 4 Veneto (Venice) |
| 5 Stuttgart (Northeast Baden-Württemberg) |
| 6 Madrid |
| 7 Attiki (Athens) |
| 8 Upper Bavaria (Munich) |
| 9 Inner London |
| 10 Cataluña (Barcelona) |

| Top 10 production tech. clusters in Europe |
|---|
| 1 Stuttgart (Northeast Baden-Württemberg) |
| 2 Emilia Romagna (Bologna) |
| 3 Tübingen (Southeast Baden-Württemberg) |
| 4 Karlsruhe (Northwest Baden-Württemberg) |
| 5 Arnsberg (Dortmund) |
| 6 Freiburg (Southwest Baden-Württemberg) |
| 7 Swabia (Augsburg) |
| 8 Lower Franconia (Würzburg) |
| 9 Slaskie (Katowice) |
| 10 Middle Franconia (Nuremberg) |

| Top 10 automotive clusters in Europe |
|---|
| 1 Stuttgart (Northeast Baden-Württemberg) |
| 2 Piemonte (Turin) |
| 3 Upper Bavaria (Munich) |
| 4 Braunschweig |
| 5 DoguMarmara (Bursa) |
| 6 Västsverige (Gothenburg) |
| 7 Karlsruhe (Northwest Baden-Württemberg) |
| 8 Lower Bavaria (Landshut) |
| 9 West Midlands (Birmingham) |
| 10 Sud-Muntenia (Ploiesti) |

Source: European Cluster Observatory/MFG Baden-Württemberg

Powerwall

For example, the north of Baden-Württemberg state, which includes the administrative districts of Stuttgart and Karlsruhe, is one of the biggest IT clusters in all Europe. This places the state even above the equally strong regions of Zurich and Île de France (Paris and surroundings).

"The exchange of knowledge and know-how across company and institution borders, as practiced for example in the state's strong IT cluster's, is once reason why Baden-Württemberg is so innovative," says Klaus Haasis, head of MFG Baden-Württemberg, the state's innovation agency for IT and media, which also manages cluster initiatives.

The latest study by the statistical office in Stuttgart has found that the region of Baden-Württemberg is the strongest in terms of innovative power in the EU. For example, measured against the population, no other European region has registered so many patents. And in its study, "Talents, Technology and Tolerance" (TTT), the Berlin Institute of Population and Development rates the state as the "frontrunner in Germany's creative economy".

Here, the links between clusters are crucial to a region's power to perform and profile, since the interfaces between various knowledge and expertise areas produce a good breeding ground for innovations. With this in mind, Baden-Württemberg puts a great deal of effort into networks. Successfully, too, as vouched by the figures from the European Cluster Observatory.

## ■ Visual Computing cluster initiative

In the area of visual computing (visualization and simu-lation technologies), Baden-Württemberg has an out-standing research environment and one of the strongest application clusters economically. In short, the state is an excellent location to handle the topic. To cement its lead, MFG Baden-Württemberg set up the Visual Computing cluster initiative. Its aim is to concentrate the creative forces on the ground and so better exploit potential. It also seeks to promote the transfer of research results into commercial products.

**Klaus Haasis, CEO of MFG Baden-Württemberg**

**There are many definitions of what a cluster is. How do you interpret it?**
Originally, clusters were seen in terms of a sector's value chain, grouping participants from business, science, education and government. Since the main focus of MFG is on the cross-sectional technologies of IT and media, we do not want to limit ourselves to this vertical line of vision. We also promote the development of horizontal clusters that run straight through various sectors – so-called 'clusters of knowledge'. One example of this is the Visual Computing cluster initiative in which physicians and material technicians apply the same visualization methods to wholly different tasks, learning from each other in the process.

**Why is an overarching sector and industry network so important for the economic success of a region?**
Innovation always involves a combination of parts that were not previously joined. As a result, innovations between various sectors and disciplines make an ideal breeding ground for innovations. As the state's innovation agency for IT and media, MFG has set itself the task of forming as many interfaces in the creative domain in Baden-Württemberg as possible, and promoting exchanges between research and user areas to produce innovations. Our knowledge platform is visited more than two million times a year and we have better than 100,000 documented technology relationships. We consider ourselves networking specialists.

**Is your networking focus solely on Baden-Württemberg?**
In recent years we have expanded our activities systematically to cover all Europe. We are currently working on EU projects with 25 partners from eight countries. For example, as part of our CReATE initiative, a project that promotes cooperation between small and medium-sized creative enterprises, we work with firms and institutions in Baden-Württemberg, Piemonte, Rhône-Alpes and the West Midlands. Our work in this area benefits small operations and SMEs in Baden-Württemberg that have few contacts abroad.

**You also foster international contacts through the global federation of cluster developers, TCI, and were voted onto its directorate in 2007.**
Yes. Together with other location developers, we are currently preparing for the International Conference on Cluster Formation being held in Jyväskylä (Finland) in 2009.

# Opportunities in embedded systems

It is not only the ICT sectors that is flexing its muscles – user markets are also riding high in Germany: in automating industrial plants, ABS and airbag controls for cars and in pacemakers and magnetic resonance tomography. They are all controlled, regulated and monitored by embedded systems. These software modules, data processing machines and microcomputers have all been developed to perform highly specialized functions, and are generally integrated out of sight in a technical environment.

IT providers expect sales of embedded systems to total 4 billion euros in 2008, ten percent up on the previous year. Employees in the user sector for embedded systems such as machine and automotive engineering generated a staggering 15 billion euros. They independently develop software and hardware in some cases, and market integration services. This puts the entire market for embedded systems in Germany at around 19 billion euros.

The majority of sales in this market is not generated with standard products, however. German providers can apply their strengths in the project business for customized solutions. Embedded systems are considered a development driver of innovations in the automotive, aerospace, electronic and engineering industries. Its strategic significance for all these sectors has made embedded systems a very important factor in Germany as a business location and will continue to do so.
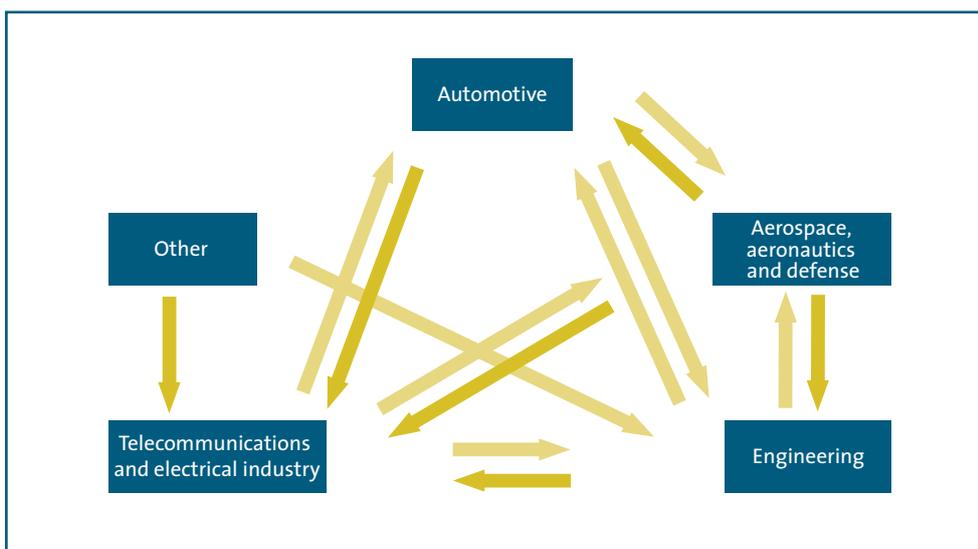
# G&D: The security to succeed

Trust pays off



Two words sum it up: creating confidence. Giesecke & Devrient, a family-run firm steeped in tradition, originally specialized in the production of banknotes. Today it is leading international high-tech group that also develops smart cards and security solutions for authorities the world over. But no matter whether banknotes, credit cards or personal identification: the customer's confidence plays a decisive role in all the company's areas of business.

Giesecke & Devrient (G&D) is a technology group based in Munich with a long history that combines a forward-looking business strategy and a strong emphasis on innovation. The firm was founded in 1852 as "Officin für Geld- und Werthpapiere" in Leipzig and is still in family hands today. Customer intimacy has been a core value for Giesecke & Devrient since the very beginning, and it is no surprise that the family firm with its 9,000 or so employees and global sales of 1.55 billion euros has operated branches beyond Germany for 50 years. It now has more than 50 subsidiaries and joint ventures in some 30 countries.

Confidence has been the decisive factor behind business success since the firm's beginnings. An example of this is the banknote sector, still an important area of activity for the group. In 2007 G&D posted revenue of

833 million euros in this field, in which it is a market and innovation leader, offering a broad range of products and services – from the paper to the printing, all the way to fully automated banknote processing.

## ■ ICT delivers opportunities

The company has also exploited the opportunities of the digital age to the full. Since the introduction of electronic payment systems in the 1970s, the company has continuously expanded its chip card business activities. It has supplied SIM cards for cell phones since the '80s. These days, the company is a global leader in solution provision for electronic payment transactions and SIM cards for uses in telecommunications. G&D currently supplies more than 200 cell network operators just in the telecommunications market. In 2007 it posted revenue of 577 million euros in the card sector.

Its business with authorities is also growing strongly. In the course of international consolidation, the interest of governments and authorities in counterfeit-proof documents is growing. Besides passports, ID cards and driving licenses, this area also includes electronic healthcare solutions, in Germany, a very promising topic.

## Progress through innovation

A high-tech company that aims to stay successful cannot afford to stand still. Accordingly, Dr. Karsten Ottenberg, Chairman of the Management Board and CEO of Giesecke & Devrient, backs profitable growth and investments in new technologies: "Customers' expectations on the performance of security solutions are growing continually. This trend fits in well with our plans. As an industry leader, we back innovations and invest more and more in research and development."

In 2007 alone, the corresponding investment volume was raised by just under 27 percent. One important topic for the future right now is Near Field Communication (NFC), which handles wireless data transmission over short distances, enabling cell phones to be used as a purse or travel ticket, for example. This is made possible by the latest generation of high-performance SIM cards being developed by G&D. Dr. Karsten Ottenberg: "As an innovation leader we benefit from being based in Germany. This applies both to cooperation with major research institutes as well as our highly qualified employees. After all, Germany plays an important role as an impulse-provider for many landmark developments in Europe."

BITKOM

# Showroom of the digital world – CeBIT

Even before you get there, you know that CeBIT in Hannover is an event of global significance. In the world's largest showroom for the digital industry, you can meet people from just about every country on the planet and find out today about the technologies that will enrich our lives in the years to come. But even more important than that, visitors and exhibitors are treated to the best conditions for doing successful business on the trade show grounds in Hannover.

## ■ An important social function

Every March, Hannover becomes the place to be in the digital world, with a covered area of almost half a million square meters, making it the biggest trade show in the world. During the course of its nearly 25-year successful history, CeBIT has always captured the spirit of the constantly changing computer age, offering at the same a sound forecast of its further development. In this way, CeBIT is far more than just a technical trade show, as, since its inception, it has taken over an important role in society. August-Wilhelm Scheer, president of BITKOM, explains: "Hannover is the meeting place of the elite from politics, science and high-tech, taking CeBIT on its way to becoming a Davos of the ICT sector." Evidence of this is that Chancellor Angela Merkel - like her predecessors - has regularly been on hand to open the show.

## ■ Unparalleled media interest

If proof were needed that CeBIT is in a league of its own, you only have to glance at the number of accredited journalists: while around 5,000 attended the G8 summit in Heiligendamm in 2007, more than 7,000 correspondents for the national and international specialist press came to CeBIT. The world of media looks to Hannover in March. The attention of the world on the fair is more than justified since CeBIT points the way forward for the ICT sector.

CeBIT 2009: Futureparc

## ■ The future in context

"We tackle all the major themes in the ICT sector," says Ernst Raue, member of the of the Deutsche Messe Managing Board responsible for the CeBIT."At CeBIT, visitors discover innovative hardware solutions, mobile life, digital learning and work, design trends and the potential of leading international research labs. Meanwhile, ICT solutions for the healthcare market are growing in significance." By integrating TeleHealth and eHealth, CeBIT ensures that the most important international congresses and trade shows for digital solutions in the healthcare market can benefit from the top-quality environment.

## ■ Top trend: Green IT

CeBIT tackles the industry's top themes, proving that the world's largest IT trade show takes its global responsibility seriously. By focusing on "Green IT" – environmentally-friendly information technology – it provides an outstanding platform to encourage efficient knowledge transfer and thus makes a significant contribution to protecting the earth's climate. "It is to CeBIT's credit that meeting these vital ecological goals can certainly go hand in hand with economic success," says Raue, pointing to the overflowing order books of its satisfied exhibitors.

CeBIT 2008: Green IT – at Tyco Electronics

## Number one marketplace

The many international specialists who come to CeBIT, frequently with concrete buying intentions, makes the event so invaluable to the ICT sector. "We had thousands of fans of innovation come to our stand," says René Obermann, CEO of Deutsche Telekom, reflecting on CeBIT 2008. "Our balance is extremely positive. The trade fair's appeal has continued to grow and CeBIT remains an outstanding platform for Deutsche Telekom."

## Career opportunities and promotion of young talent

It is quite natural that the meeting-point of software and hardware developers, database experts and communications specialists should also play the role of a huge job market for qualified talents keen to find employment in the sector. CeBIT lives up to their expectations with numerous sideshows. One is the Job & Career Market, which brings companies and specialists together in the best location for recruiting top-flight experts.



CeBIT 2008: Futureparc

BITKOM

# Invest in Germany – with state support

investment projects in Germany are supported by various grants. These are divided into a number of "subsidy packages" activated during the different phases of the investment process.

1. A package of measures to promote R&D projects.

2. A package of measures to offset direct investment costs (e.g. in the construction of new production sites, acquisition of new machinery/equipment etc.).

3. A package of measures to aid recruitment and employees' qualifications (e.g. training programs, payroll costs).

Each package contains many combinable measures and programs to ensure that grants are available in all phases of a relocation project.

As a rule, the award of grants is based on the investment volume of the project, the sector, size of the parent company, type of investment (new buildings, takeovers, conversion work, etc.) and the project's future (planned) location.

## ■ Development grants for R&D projects

The development of new technologies and applications within the ICT economy lays the groundwork in the evolution of new processes and procedures in most industrial sectors. In the process, ICT research and developments projects are given top priority and are strongly supported by public sources accordingly.

There are various programs and initiatives at the national and regional level. The German government operates most of its R&D programs for ICT projects within its "High-Tech Strategy". It concentrates on various industrial sectors, making variable framework budgets available for R&D projects. Various programs are available to each sector aimed at subsidizing their research activities. Subsidies are issued as direct grants – in other words, liquid funds – and are usually

granted within the terms of a competition or call for tenders.

R&D subsidy programs for the ICT sector are concentrated under this heading. Altogether, more than 1.18 billion euros is available to research projects which can be granted to companies and/or projects as part of different R&D programs.

One of the principal ICT sector programs within the High-Tech Strategy is "ICT 2020 – Research for Innovation". Up to the end of 2011, it is offering more than 2 billion euros in subsidies. The program focuses above all on R&D in the areas of:

■ electronics and microsystems (components and devices used in electronics manufacturing; electronic design automation (EDA); organic electronics; magnetic microsystems; RFID and smart labels); and

■ software systems and knowledge processing (software-intensive embedded systems; grid applications and infrastructure; virtual/enhanced reality; software engineering), communications technology and networks (new standards for future communication networks; network security and reliability; autonomously network sensor systems).

A maximum of 50% of the project costs can be subsidized by grants through this program, with higher levels of funding possible for small and medium-sized enterprises.

Both companies and research institutes can apply for grants from the ICT 2020 program. As a rule they are awarded on conclusion of a themed call for bids by the Federal Ministry of Education and Research. However, SMEs can be awarded ICT 2020 grants outside the bounds of a themed research focus.

Besides the German government's framework programs, the individual states also operate their own R&D subsidy programs. These are mainly aimed at SMEs.

As an alternative to subsidies by public research framework programs, the states' development banks can also make grants available in the form of special R&D research credits, which feature low rates of interest and long terms. The advantage of this R&D support is that the programs are focused on particular sector or branch of research, and generally cover higher project expenditure.

## Direct investment subsidies

Direct investment costs are usually issued as direct grants – in other words, liquid funds – which are granted at the federal level and regulated by the GRW; a national initiative aimed at improving regional economic infrastructures. While the GRW fixes the maximum level of financial assistance for the regions, the individual states decide on how the subsidies are awarded. The states are also free to decide how the maximum grant levels set by the GRW are utilized. In addition, each state can set up its own investment assistance programs, provided

Germany's competitiveness compared
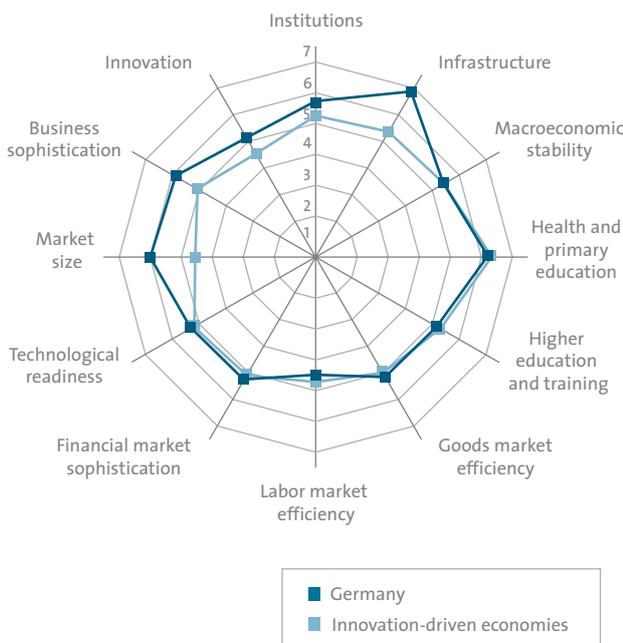


Source: The Global Competitiveness Report 2008-2009 (WEF)

that they fall within the GRW's guidelines on maximum subsidy amounts.

In eastern Germany, one element of support comes in the form of investment grants. Provided that the investment projects meets all requirements, these grants are automatically issued to all investment projects in the region. There are no drawn-out application channels as the level of financial support is guaranteed. The grants are effected as part of the tax declaration process and can either be deducted from tax liability or provided in cash.

## ■ Financial support for employment and qualification measures

The top goal of programs in this package is to improve the level of employment. Employers receive support in selected qualified staff, often in the form of special training and qualification programs for applicants, allowances paid to companies, and to grants for company training programs. Each state operates its own programs and offers based on its labor market structure. The local employment offices are generally responsible for running these programs.

# A society in love with technology

Almost **15** million German publish their photos online and **7** million have their own homepage. **13** million Germans between 16 and 74 buy goods on the Internet – one in five in this age group, and clearly up from the figures of several years ago.

In 2008 some **9** million digital cameras were sold in Germany and **11.6** million notebooks.

**28** percent of all Germans over 14 years play digital games. BITKOM expects revenue of **2.6** billion euros for the games market in 2008.

The 20 most-visited German news portals were accessed almost **2.4** billion times in the first six months of 2008, up **27.7** percent on the same period the previous year.

As of mid-April 2008 there were more than **100** million mobile phone connections in Germany. Statistically, this means that one in five Germans has **two** cell phones or mobile network cards. The growth in the number of UMTS connections also shows no sign of slowing: at the end of 2007 there more than 10 million UMTS subscribers in Germany, and this year that figure is set to rise by 60 percent to almost **16** million connections.

**15** million Germans have already booked a journey or part of one online – one in every four citizen over 14 years. **71** percent of Germans over 14 with Internet access has used the Web to compare prices before booking.

**BITKOM**

# IT services "Made in Germany"

Prof. Dr. Tilo Böhmann, Dr. Andreas Stiehler

The strengths of Germany as a base for IT services lie in international competition. What opportunities are there for players from Germany? Answers to this question can be illustrated by studying IT service providers that have achieved success on the international stage. These examples provide insights into a dynamic sector that can offer exciting and forward-looking areas of activity for young talents working from Germany.

The following analyses are the result of a joint project involving IT analysts Berlecon Research, the Services Delivery Excellence working group of industry federation BITKOM and the International Business School of Service Management (ISS) in Hamburg. The contents are largely taken from the Berlecon report "IT Services Made in Germany: Perspectives for German IT Service Providers in International Competition" of December 2008. The report was compiled by Berlecon Research as part of the INTERDIG (Internationalization of Service Providers of the Information Society) research project with support of the research focus group on knowledge-intensive services, both funded by the Federal Ministry of Education and Research (BMBF).

## ■ The IT services sector in transformation

The IT service sector is in transformation – from a pure growth sector to a sector that delivers to the world and is organized along industrial lines. The fact is that IT has changed from the ground up since the start of the new millennium.

■ IT is global: The global spread of the Internet, as well as steadily maturing remote technologies and service engineering concepts, have ensured that globalization is still advancing in the IT service market. As a result, the lion's share of IT services can now be rendered and traded across borders. Logically,

competition for customers of IT services is also on a global scale.

- IT becomes a commodity: With the increasing spread and maturity of IT technologies, understanding about their uses has also taken off. In a nutshell, IT has become an everyday commodity. One consequence of this is that IT know-how alone does not produce the competitive edge – and so the competition is only intensified in those IT-centric service segments, raising the pressure on costs.

- IT has advanced into all levels of business, but its transformation into a staple of everyday life goes hand in hand with rising customer requirements on service providers since there is hardly a business process that can get by without it. The upshot of this is that customers not only want the IT per se, but end-to-end process support. The hotly debated topic of IT's alignment with business is more and more of an issue for the service providers themselves.

## The IT services industry matures

A maturing process similar to the one the IT services sector is now going through has already been fully or partially achieved by other industries (automotive and engineering, chemicals and pharmaceuticals, finance), and they share much of the dynamics in this context.

The core trends outlined show that the discussion about opportunities and challenges for German IT service providers must confront and analyze the trend toward internationalization from a general perspective. In this sense, the inclusion of near- and offshore resources within the framework of global sourcing models is just one important factor among many in the sector's maturing process.

This is firstly because the subject of internationalization covers a lot more ground than just these aspects, also covering the trend to opening foreign markets (global supply) and global customer support. Secondly, the maturing process is also linked to an industrialization of IT services, a stronger fragmentation and hierarchization

of the value chain, and alignment of marketing strategies.

## Germany's strengths as a location

IT service providers from Germany have the opportunity of actively shaping these nascent developments and to push themselves to the top. It will be necessary, however, to seek opportunities to internationalize and develop existing strengths. As a matter of fact, being based in Germany gives the IT services sector considerable benefits that it can build on in its overseas dealings. This is confirmed by 26 IT service providers active overseas who were surveyed as part of the study.

The main advantages of a base in Germany are:

- Basic conditions: Just about every expert named political and legal stability, the well-developed and reliable technical and logistical infrastructure, and the high standards in security and data privacy as particular strengths of the location. For example, these conditions make it easier to offer top-quality data center services from Germany and to gain the trust of customers. They also encourage confidence in German service providers in the development and operation of IT solutions with high security and data privacy requirements.

- National IT market: Germany is a leading industrialized country. Companies based here are characterized by a high level of process maturity and a pronounced overseas commitment. German IT service providers thus not only enjoy a strong domestic standing, but also have many years of wide-ranging experience in the use of IT in optimizing processes and implementing complex IT projects. The overseas activities of industrial customers are both a springboard and a driving force in the efforts of German IT service providers to internationalize.

- SAP: Germany is not only headquarters to SAP and its many development centers, but also countless customers who have been using the software giant's systems for many years.

BITKOM

**Globalization**
- Global Sourcing
- Global Supply
- Global Support

**Fragmentation of value added**
- Strategic partners (OEMs)
- Supply industries
- Room for specialists

**The IT services segment comes of age**

**Industrialization**
- Standardization
- Modularization
- Automation
- Scalable models

**Fine-tuning marketing**
- Key accounts versus Mass markets
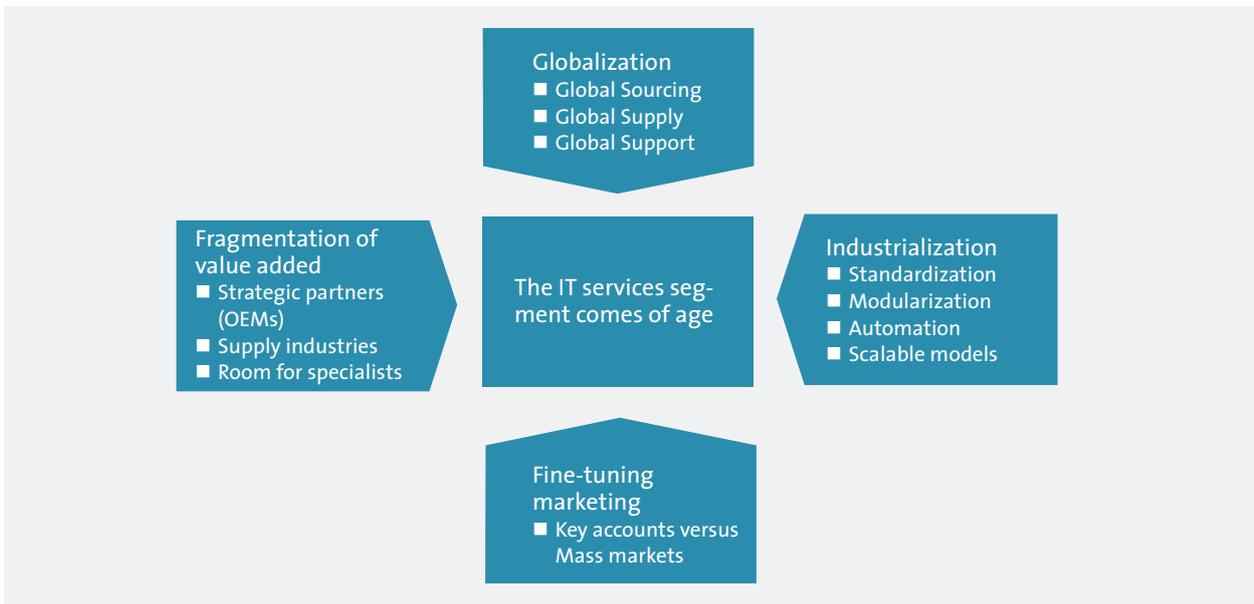
Development of the IT service sector: Core trends, Source: Berlecon Research 2008

- Workforce: A special feature of German employees is their low rate of fluctuation. This is a great plus in international competition, in particular when compared to offshore locations.

- Image and characteristic features: "Made in Germany" stands for precision, reliability and engineering genius. These qualities enable the specialist niches to be filled that are evident in just about every IT service segment. In addition, precision, engineering spirit and mastery of complexity are valuable foundations in gaining a foothold in the growth market of industrialization. Indeed, industrialization of the IT services business gives providers based here the chance to balance cost disadvantages and to position themselves at the top of this growth market.

## Success stories: IT services "Made in Germany"

The following selection of success stories show how international growth potential can be exploited from a base in Germany.

## ⬈ IT services "Made in Germany"

For more examples of internationally successful "IT Services Made in Germany" – including Atos Origin, adesso, Beck et al. Services, HP Deutschland, FIS-ASP, Fujistsu Siemens Computers, IDS Scheer, IBM Deutschland Customer Support Services, IBM Deutschland Business Services, Info AG, retarus, Revacom, SAP Consulting, TÜViT, GFT Technologies, noventum consulting – see http://www.bitkom.org/files/documents/IT_Services_Made_in_Germany.pdf.

## ◼ Becoming top specialists

Maturing markets open up opportunities to specialize, in IT services too. Examples show that "hidden champions" – in other words, companies that focus on specific themes and/or market segments and whose niche offers address a global market – can not only be found in the traditional industrial sectors but above all among IT service providers from Germany. This comes as no surprise since, as a base for IT services, Germany's large and mature national market and numerous international industrial customers have laid an excellent foundation for realizing niche strategies.

A key feature of these "hidden champions" is that they identify and pursue the latest trends early on. Here, a large and mature home market with its high quality, security and data privacy standards forms a good basis to test new offers early on and to then generate business. On the other hand, the most important growth driver in this type of business model is international distribution. In internationalizing business it is naturally an advantage if the home customers are also active abroad with an international customer base to match.

## Materna: Overseas course with ITIL

The MATERNA Group is a leading independent ICT service provider in Europe. Founded in 1980, the group employs more than 1,300 people throughout Europe and generated revenue of more than 175 million euros in 2007. One in six euros of this figure was from its European operations.

During the course of its history, Materna has proved adept at occupying a string of growth segments in the ICT domain, and has consistently built on this success by linking technical expertise and process know-how in these markets. For example, early on in the mobile phone boom, the company was able to expand its leading position as provider and operator of mobile solutions and has continuously developed this area of its business. It now generates a third of sales through its Communications division.

The mainstay of its second division, Information, are consulting and integration services aimed at the ITIL-compliant implementation of IT service management strategies in large corporations. As a consultant and enabler in ITIL, independent of any single manufacturer, Materna has a leading position in the German market. What's more, the IT service provider is also very active in the local government market, offering specialist applications, Internet projects and other products. Through its subsidiary cbs, Materna has also taken up a strong position in the SAP consulting business.

Materna has been intensively internationalizing its Information division for around four years, in particular in the area of IT services management. Examples of this include its 2005 acquisition of two companies in Finland and Sweden, the opening of an office in Bulgaria, the 2007 purchase of a Czech firm and majority interest in a Romanian company. Local service providers have been integrated into the group and now operate under the name of Materna.

The expansion of its international presence is necessary when it comes to bidding in international projects and in ensuring support for its globally active customers. At the same time, Materna aims to enter new markets. A major basis of this is its experience gained in Germany in realizing IT service management projects. Based on this experience, it has developed a consulting methodology (Service Excellence Model) that enables it to bundle offers at fixed prices. This concept is already gaining much ground, above all in its overseas business, since in this area standardized packages are in far stronger demand than in Germany.

Source: Interview with Uwe Scariot, Business Unit Information head, Materna GmbH, in August 2008.

## SQS: World champion through "home-shoring"

SQS Software Quality Systems AG is one of the world's biggest providers of independent software quality management services and testing. Founded in Cologne 26 years ago, the company currently has a workforce of more than 1,400 and posted sales of better than 120 million euros in 2007. More than half of its sales is generated beyond Germany's borders.

Its early specialization in software quality management and testing, and consistent implementation of its internationalization strategy, says Martin Wieczorek, who sits on the Executive Board of SQS Germany, have made a significant contribution to the company's growth. It became involved in the development of international standards for software quality management under the terms of ISO 15504 (SPICE) at an early stage, establishing itself as a specialist in innovative QA and testing methods in the process. This led to the firm becoming a consultant in the evaluation of IT systems and processes, and organizing and conducting their testing.

SQS began to develop and expand its international presence early on and now has branches in ten countries. In this strategy, the service provider caters to its most important customer group – large global players such as Deutsche Bank, Vodafone, Alcatel and BP. SQS has reacted to the increasing offshore competition and our customers' desire for integrated global resources by producing its own sourcing strategy called "Multi-Language Customer-Related Sourcing".

Its aim is to adapt the delivery model as precisely as possible to customers' individual circumstances while taking linguistic and cultural differences into account. As part of this strategy, SQS in 2008 opened a test center in Görlitz, its "Homeshore Managed Testing Center", to unite the cost advantages of a nearshore location with service quality "Made in Germany".

Source: Interview with Martin Wieczorek, SQS Germany Executive Board, in September 2008.

## ■ Case studies: Outsourcing specialists

### ⬈ B2X Care Solutions: global control of after-sales processes

As an end-to-end provider, B2X Care Solutions GmbH controls process chains in after-sales for globally active IT, telecommunications and consumer electronics manufacturers. The company's roots are in consulting and it is part of the Barkawi Group, which has been active in Germany since the mid-90s. The management consultant set up the B2X Group back in 2000 to handle the operative implementation of supply chain management und after-sales solutions. B2X Care Solutions GmbH was created through an outsourcing deal with BenQ in 2006 and brought together the entire after-sales process including assets and employees.

The Munich-based company currently employs some 60 people in Germany, with a further 40 employees active in its branches in Russia, Turkey and Latin America. Its core business is the central coordination of after-sales processes. B2X Care operates a network of more than 100 partners in 50 countries responsible for operating the service center, warehousing and provision of on-site services. The basis of process chain and provider management is a central IT platform that maps the customers' after-sales processes.

The idea to coordinate these processes from Germany and to develop and manage an international partner network for service provision has proven its worth. By 2008, B2X Care already had ten large customers on its books, including Fujitsu Siemens Computers (EMEA), BenQ (worldwide), Sony Ericsson (Hungary, Poland, Czech Republic) and Motorola (Caribbean and Central and South America). It expects to post sales of 40 million euros for 2008.

Source: Interview with Marcus Czabon, Member of the Executive Board, B2X Care Solutions GmbH, in July 2008.

### ■ Focusing on the needs of specialist sectors

With the increasing significance of IT in daily corporate life, the demand for strategic IT service partners who combine industry and process expertise to deliver genuine business support is also growing. This opens up excellent opportunities to IT service providers established as industry experts in the industrial power base of Germany to expand their business models internationally and tap into new growth markets.

The domestic market's size and the great many industrial firms based there have created a wealth of experience in Germany in the optimization of business processes and realization of innovative IT projects. By cooperating with German IT service providers, overseas customers – in particular those from emerging nations – can benefit from the best practices and experience of the players in this country.

## ]init[ AG: German e-government professional in the United Arab Emirates

]init[ AG is a full-service provider of IT services for the public sector. One of its particular focuses is on realizing complex portal systems for public sector customers. The Berlin-based e-government specialist's range of offers covers strategic consulting and design, Web and GUI design, editing, software development and system integration, all the way to operating systems in its own data center. ]init[ has a workforce of more than 200 and can look back on more than ten years of experience in the German e-government market. The company is also internationally active,

and since 2006 has an office in the United Arab Emirates. Its expansion of business activities to the Middle East came about through an international study and related customer survey.

The government office in Abu Dhabi responsible for IT tested Internet portal systems around the world to define benchmarks for implementing its own e-government project – including the German government's portals that were realized under the lead of ]init[. The upshot of the benchmark study was that ]init[ was asked by AD-SIC to draw up, at short notice, an offer and prototype to set up two online portals (www.abudhabi.ae and www.business.abudhabi.ae). The aim of the project was to make Abu Dhabi's local government information and services available to citizens and companies via the Internet.

The German IT service provider was awarded the contract and completed the project on time and at the required quality. ]init[ was in a good position to deliver the goods, since its processes and staff, including Arabic speakers, were already prepared for the move abroad. In this way, the customer's wishes for permanent support for its portal system were fully covered. Secondly, the company's on-site presence was also aimed at winning further orders and

customers in the UAE. This strategy came off, with the service provider receiving the commission from ADSIC to develop the portal into an SOA-based integration and service platform, as well as gaining four other government customers in the region. It can also boast serious enquiries from the other emirates such as Dubai.

## InterComponentWare AG (ICW): German e-health specialist in Bulgaria

InterComponentWare AG (ICW) develops and integrates IT solutions for the healthcare sector. The e-health specialist based in Walldorf supports global projects aimed at networking the various players in the health sector efficiently. Its scope of reference projects range from flexible networking solutions for clinics and doctors' surgeries, to personal health dossiers all the way to national programs to introduce electronic patient files. The hardware and software components this requires are developed by ICW, sometimes in collaboration with external partners such as Cisco, HP and Agfa HealthCare.

ICW was founded in 1998 and employs more than 650 people, around 450 of them based in Germany. It has national subsidiaries in Bulgaria, Germany, Austria, Switzerland and the USA (Wayne, San Mateo), and branch offices in Brazil and Hungary. Most of its sales are still generated in Germany, although foreign business is growing significantly.

The main foundation for its success abroad, says Hansen, are innovative IT solutions that were originally developed for the German market. One example is the introduction of electronic health cards in Bulgaria. The system was developed by ICW for the home market and field-tested in Walldorf as a reference for national und international takers. Hansen says that the technical solution's successful demonstration in the field test was decisive to the decision by the Bulgarian Health Ministry to carry out a pilot project on home ground for which it commissioned ICW and its strategic partners Cisco and Kontrax.

In this project too, the German IT service provider benefited from the fact that it already had its own subsidiary in Bulgaria, giving it extensive local expertise to begin with. The Bulgarian location was originally set up in 2000 as a classic nearshore development center. Over time, though, it became more and more an additional sales office and laid the foundation for on-site support of projects in the country. As a result, after implementing the health-card solution in December 2007, ICW received a commission for another big project – equipping 40,000 Bulgarian civil servants with e-government health records.

Source: Interview with Wolfgang Hansen, Business Consultant, ICW, in August 2008.

## Global SAP Services

Germany's role as home to SAP offers many opportunities for German service providers to establish themselves as SAP experts abroad. This is thanks to the huge global demand for experienced SAP specialists, of whom many are based here, and the corporate software's worldwide use, and the fact that many large corporations and other firms are currently tasked with harmonizing and consolidating their SAP systems, to name just one area of demand. Large IT service providers with German origins, some of which operate their own extensive global networks, and, on the other hand, can show numerous references in SAP projects, are superbly positioned in this growth market.

SMEs and IT service providers that cater to them also have good chances of growing overseas with SAP as a pivotal enterprise suite. In this way, Germany as an exporter is best-known for the many mid-sized industrials that have established bases abroad – and are looking for partners to help manage their SAP systems. For German SMEs in the IT business, the overseas commitment by the customer is both an opportunity and a challenge. On the one hand, to retain customers active abroad, they must themselves espouse the cause of internationalization. On the other, they are given the chance to grow with their customers and use these international activities as a springboard into cross-border business.
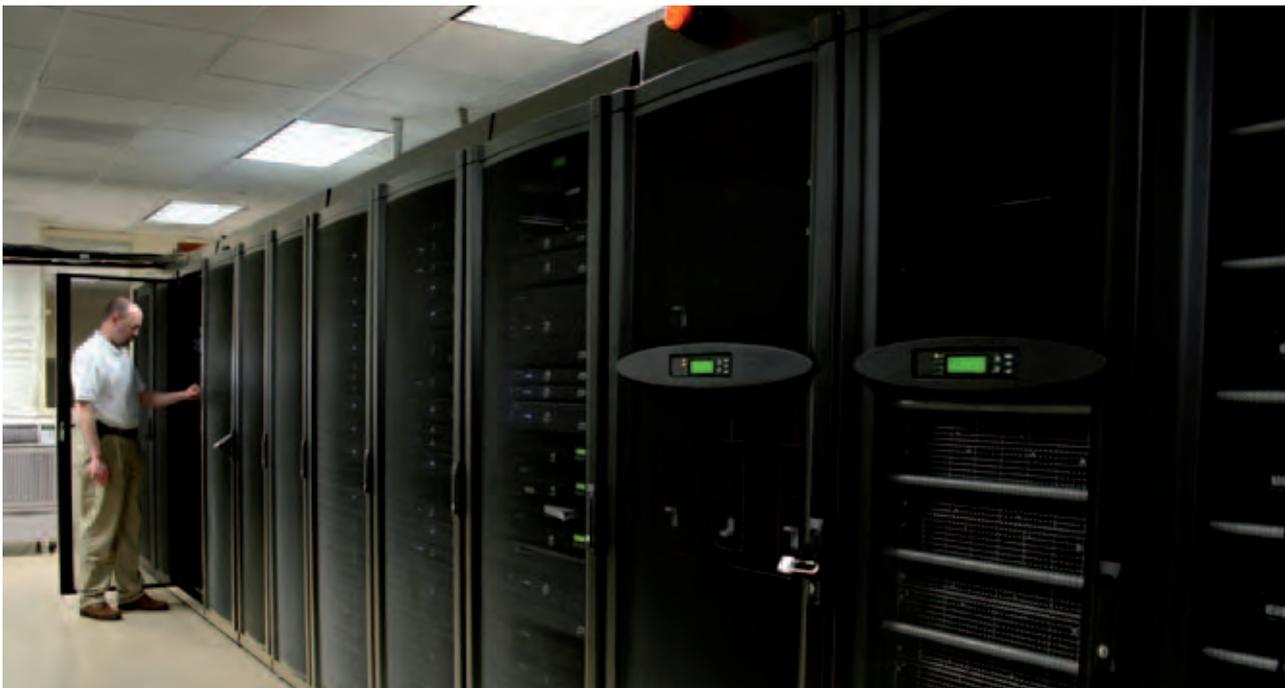
## Freudenberg IT: Quality "Made in Germany" plus local support

Freudenberg IT KG is a wholly-owned subsidiary of the Freudenberg Group – a family-run German firm with a long tradition and a diversified product portfolio. It has a global workforce of more than 33,000. Like many other IT departments in large German companies, Freudenberg IT was hived off in the mid-90s as an independent external service provider. The spin-off went to plan and in 2007 the start-up made around 60 million euros, two thirds of it on the external market.

In the IT service market, Freudenberg IT is an internationally focused full-service provider for small and mid-sized enterprises. Its offers concentrate on hosting and infrastructure services, SAP-related consulting and its proprietary MES software, Adicom. For the last four years, the firm has been putting even more effort into internationalizing its service offering. The reason for this is the calls of many German SMEs for global support.

Freudenberg IT is indeed ideally placed as a partner to globally active companies of this size: with a total of 500 employees, it is present in 12 locations in five countries (Germany, China, Hungary, the USA und Spain), and operates data centers in Germany, the USA and China. It was re-certified in 2008 as a SAP Global Hosting Partner and is the only provider within the group aimed at SMEs.

A central element of Freudenberg IT's service to its customers is the combination of quality "Made in Germany" with local support. Although the decisions on the global service offering is firmly rooted in Germany, on-site service are provided by local employees who know the circumstances on the ground and speak the customer's language. To keep to this pledge, Chinese employees were trained in Germany over two years. They were familiarized with the standards and guidelines at Freudenberg IT and learned German too, a boon to customer support for German companies in China.

The mix of quality "Made in Germany" and local support proved to be the starting point for the dramatic growth of overseas business over the last two years. So much so, that in 2007 the IT service provider earned every fifth euro outside Germany. In the USA alone, where two data centers were set up originally to support German customers operating there, more than 30 new customers have been acquired since last year. A third data center is already being established there due to the growing demand. Freudenberg IT is also reporting enormous growth in China – driven by a high demand for SAP consulting by German firms based there.

Source: Interview with Michael Fichtner, CEO Freudenberg IT, in September 2008.

## Siemens IT Solutions and Services: Global SAP consolidation and harmonization "Made in Germany"

Siemens IT Solutions and Services is the IT division of the long-established Siemens Group. Founded January 2007, the division saw the German group bring together the expertise in global IT solutions, services and software of Siemens Business Services (SBS), Program and System Engineering (PSE), Siemens Information Systems Ltd. (SISL), Development Innovation and Projects (DIP), and Business Innovation Center (BIC) into one powerful unit.

Siemens IT Solution and Services, which employs 41,000-plus people in better than 40 countries, posted revenue of 5.3 billion euros in financial 2008. More than 70% of that was generated on the external market, in other words with customers outside the Siemens Group. This places Siemens among the biggest one-stop IT service providers in Europe. More than half the group's revenue is earned outside Germany.

A key theme of its export trade is the global consolidation and harmonization of SAP systems. In this area, the provider is an excellent position to compete nationally and internationally. Among the strengths of SIS are its extensive service portfolio, which enables it to operate as a one-stop provider in SAP and other environments. The global setup, including its near- and offshore capacities and many years' experience in countless customer projects revolving around SAP, are further material factors in holding its ground against the big global players.

After all, in this area, Siemens can build on its image as a German provider with an engineering background. The fact is that global SAP consolidation projects are highly complex, requiring project management experience and reliability – all attributes associated overseas with "Made in Germany".

The long reference list of SAP projects undertaken by the German provider bear out the concept's effectiveness with top-flight German SMEs and global corporations now banking on its SAP expertise.

Source: Interview with Dr. Jens Eckstein, Head of Portfolio & Platform Strategy, Siemens IT Solutions and Services, in October 2008.

## Germany – at the center of IT industrialization

Standardization, modularization and automation of IT services, and the establishment of scalable IT service models can cut production costs and iron out payroll imbalances. The trend toward industrialization is still in its early stages, and Germany has good chances of establishing itself as a center of IT service industrialization and a driver of innovations in this growth area.

That's because developing IT services models to industrial norms requires precision, quality focus and engineering spirit – in other words, precisely those attributes suggested by the "Made in Germany" seal. Furthermore, the modern infrastructure, compliance with top security and data privacy standards, and Germany's mature national market, lay the best groundwork to test and export industrialized services.
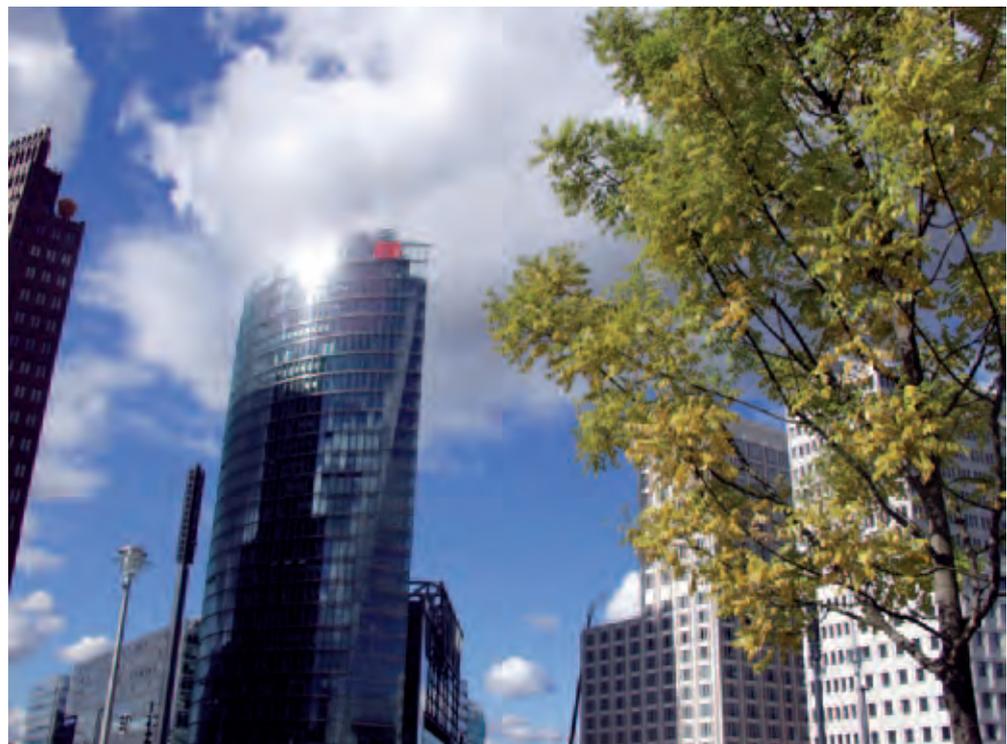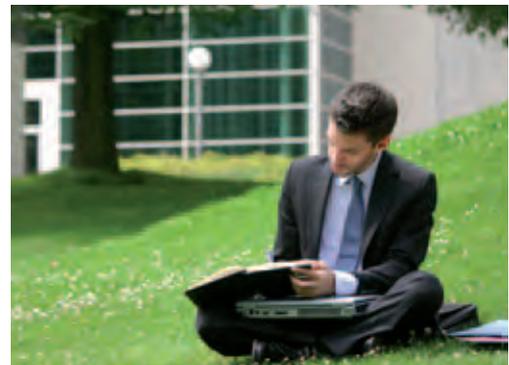
## IBM Research & Development GmbH: Innovation "Made in Germany"

IBM Deutschland Research & Development GmbH based in Böblingen is one of IBM's biggest research and development centers. In the global network of the more than 60 IBM research and development centers, some 2,200 information scientists, electrical engineers and physicists work in Böblingen and Mainz. Their focus is on the development of the next generations of microprocessors, mainframes, supercomputers and business process tools. The research center, founded back in 1953, is one of IBM's largest Linux and SAP integration centers.

The experts in Böblingen make a point of working together with mixed teams involving employees from around the world right from the proposal stage since planned projects have a better chance of succeeding only if the best talents, wherever they are, are involved from the get-go. Teams in Germany who want to take the lead in designing products and processes must open up and embrace cooperation with other IBM locations.

In fact, close partnerships with universities and state-run research establishments, added to practical orientation, are the requirements to taking a leading role in new ventures. Here, the IBM service units rely frequently on the expert knowledge of the research and development center, for example when new products require implementing and integrating. Internet software development, meanwhile, has already drawn a quarter of developers into customer projects, where they do not actually perform their original function. In this way, practical experience can be injected directly into R&D for new product generations.

The many successes notched up by German R&D centers prove that the openness and readiness to cooperate practiced in Böblingen pays off. One of these was its Websphere portal technology, which is now used in most large corporations, the Internet portals for sales and marketing and customer dialog, and was largely developed there. IBM's German R&D center is also the birthplace of the free and open operating system Linux on its mainframe, and took a leading position in the development of Web 2.0 technologies.

Source: Interview with Erich Baier, CEO, and Dirk Wittkopp, Director IBM Deutschland Forschung & Entwicklung GmbH, in September 2008.

## T-Systems: Scoring export points with dynamic services

T-Systems (Enterprise Services GmbH & Business Service GmbH) ranks among Germany's top ICT service providers. The retail division of Deutsche Telekom, which employs more than 50,000 people globally, posted sales of more than 10 billion euros in financial 2007. Almost 30% of that was generated outside Germany – above all in supporting ICT operations of German companies active in other countries.

The company sees itself as a pioneer in the development of innovative offers to facilitate provision and billing of ICT resources, all marketed under the "Dynamic Services" label. They in turn are based on a standardized platform that hosts the customers' applications, such as SAP systems, from a central location. The ICT resources required for their operation (memory, storage) are provided as a service that can be adapted as needed. This of course opens the way to efficient and demand-actuated utilization of ICT capacities.

T-Systems model, developed in Germany, has also scored points in the export market. In fact, the Dynamic Services model was one of the main reasons that T-Systems was awarded the one-billion-euro outsourcing deal by Royal Dutch Shell March 2008. In the five-year contract covering ICT support for Shell by T-Systems in more than 100 countries, the model is in the starring role. Its central feature is the transfer of most SAP services from Shell to T-Systems' Dynamic Services platform in Munich.

Source: Interview with Dr. Andreas Roth, Head of Innovation und Portfolio Management T-Systems, in September 2008.

## Quality "Made in Germany" in IT support

Service desks are often seen as a mere commodity, where savings and increased competitiveness can be achieved only by cutting the cost of operation and the payroll. Isn't it a fact, after all, that service desk workers do not require much in the way of IT knowledge – knowledge that you can get anywhere? One effect of this view is that the segment is often treated as a prime candidate for outsourcing to a low-wage country.

It is, though, a false conclusion since by the very fact that IT is becoming more and more of an everyday thing, the requirements on support for its users is only growing. At the end of the day, breakdowns of business-critical IT systems cost money – and more every minute that problems caused by inefficient support structures and communications persist. Not software systems and complex machinery come under the heading of business-critical, but also laptops and even simple desktop programs used by sales staff and knowledge managers. So there is certainly demand for top-quality service desk support that requires employees to possess not only specialist IT knowledge, but also an understanding of business and communication.

And Germany is very well positioned to fill this quality niche. It not only has a modern ICT infrastructure, but is also appealing to foreign employees as a lively environment where they can deliver the linguistic expertise desperately needed to communicate globally. The workforce in Germany is relatively better educated and can speak additional languages. This is vital when attempting to understand customers' business mindsets, taking into account cultural differences too.

## Getronics HelpYouDesk manages Kodak's Picture Maker Kiosks worldwide

The company is a subsidiary of Getronics Deutschland GmbH and part of the Getronics Group. Getronics is a global provider of ICT services and solutions, employing more than 20,000 people and posting revenue of more than 2.5 billion euros in 2007. On October 23, 2007, it joined the KPN Group, a leading international provider of telecommunications services headquartered in the Netherlands.

The Getronics HelpYouDesk places itself among the top German providers of helpdesk management services. Its portfolio ranges from hotline services, process and system monitoring and incident management, all the way to consulting for customers setting up their own helpdesk organization. Based in Berlin, the unit is the customer service und support center for national and international customers. It acts as a regional service center for the group and operates offshore in Kuala Lumpur and Singapore, and nearshore in Budapest, Glasgow und Beek. The Berlin Service Center is mainly involved in support for customers operating complex IT solutions, who have high requirements in terms of language skills, process expertise and the use of support tools.

Eastman Kodak Company was looking for a partner to provide support for its 12,000 digital Picture Maker Kiosks, that now appear throughout Europe in retail settings. The partner's main task would be to ensure the kiosks' technical functionality – termed "uptime". The call for bids attracted 21 offers conforming to the envisaged concept. In the end, Kodak awarded the order to Getronics, and since then the Berlin Service Center has been responsible for the kiosks' operation – from taking and handling malfunction reports, staffing the multilingual service desk, all the way to coordinating on-site services.

A decisive factor in Kodak's award to Getronics was its high level of process expertise coupled with excellent language skills. Besides the many mother-tongue speakers, the low fluctuation and the employees' excellent qualifications form the foundation for outstanding process expertise.

*Source: Interview with Hans-Jörg Tittlbach, CEO, and Simone Pofalla, Manager Business Operations, HelpYouDesk GmbH, in October 2008*

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The Federal Association for Information Technology, Telecommunications and New Media (BITKOM) represents more than 1,300 companies. Its 950 direct members generate a sales volume of 135 billion euros annually and employ 700,000 people. They include providers of software, IT and telecommunication services, manufacturers of hardware and consumer electronics as well as digital media businesses. BITKOM is working, in particular, to improve the regulatory framework in Germany, for modernization of the education system and for an economic policy which encourages innovation.