Steinbeis

TRANSFER

The Steinbeis Magazine

A strong network

Steinbeis on a local level
Knowledge and technology transfer
in the Karlsruhe region

Simulating the wind and the weather
Calculating the service life of wind turbines

A danger foreseen is a danger half avoided
Early detection and managing
the risk of new technology

Intelligent solutions
Performance management for SMEs
based on open source

03|2011

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Editorial

Dear Reader,

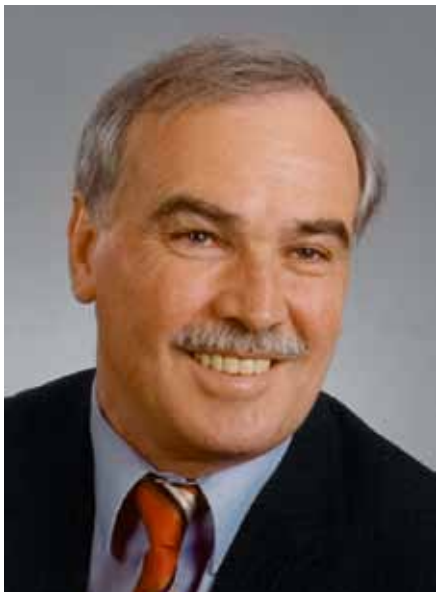
Germany as a whole enjoys a particularly strong reputation for its scientific and technological expertise, with some federal states playing a prominent role. By their fundamental and applied research, the higher education institutions provide an important foundation for innovation. But innovation only has a genuine impact on business when it is transformed into know-how, new products and new processes. This is why technology transfer and knowledge transfer play a pivotal role.

In the federal states, there are frequently university regulations demanding knowledge transfer and technology transfer between science and business. In Baden-Württemberg, Article 2, Section 4 of state university law says that "By the transfer of knowledge, of development and of technology, the higher education institutions help to implement and use the results of research and development in business life."

Transfer can take place on a number of levels: consultation, development projects, joint start-ups between universities and businesses, to give just a few examples. It is clear that people's expectations of technology transfer from universities into business not only depend on the type of technology or the sector, but particularly on the size and structure of the company. Especially with small businesses, both transfer partners face some major challenges. Yet it is generally accepted that small and mediumsized enterprises are one of the key players of the high-tech industry today and will be so tomorrow. Within universities and related institutions, there are actually many structures already existing to organize and improve knowledge transfer and technology transfer. It has been found that some hurdles are easier to overcome (or can only be overcome) in commercial set-ups. The Steinbeis Network is such a successful transfer model.

As a rule, universities ensure that their interests and rights are respected when working with transfer partners. The Steinbeis Foundation has officially signed a cooperation agreement with the State of Baden-Württemberg. Many indications and examples show that the Steinbeis Foundation makes sure that the "client company" benefits just as well as the universities. This latest edition of TRANSFER provides information about some recent Steinbeis projects, and I am confident that you will gain many new insights from it.

Prof. Dr. Karl-Heinz Meisel



Prof. Dr. Karl-Heinz Meisel is a member of the Steinbeis Foundation's Board of Trustees as a representative of the universities of applied sciences. He is President of Karlsruhe University of Applied Sciences, where several Steinbeis enterprises implement specific projects geared to the market.
Find out more about Steinbeis in the Karlsruhe region in the "Steinbeis on a local level" article on Page 4.

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Knowledge and technology transfer in the Karlsruhe region

Steinbeis on a local level

"The nanotech valley on the Rhine." "Baden's Silicon Valley." Tongue-in-cheek names like these for the Karlsruhe Technology Region prove one thing: Research and development play a major role here. R&D in the region looks to the future and has international visibility. Add to that a healthy mix of large companies, SMEs and smaller startups, and a good balance of different industries – including a large proportion of high-tech enterprises – and it's not hard to see why the Karlsruhe region is one of Europe's most successful business locations. The Steinbeis Enterprises based in the region also contribute to this, through knowledge and technology transfer that's close to the market and rooted in practice.

Steinbeis has been active in Karlsruhe since the creation of the Steinbeis Foundation in the late 1960s. Since then, local Steinbeis Enterprises have been helping to quickly turn scientific findings at Karlsruhe's universities into financially successful innovations. To do this, Steinbeis works together with following regional partners:

Karlsruhe University of Applied Sciences – One of Germany's leading universities of applied sciences, Karlsruhe University of Applied Sciences offers a range of study courses in technical and economic fields, as well as interdisciplinary courses. Practical relevance forms a key part of all of these courses. Founded in 2009, the Steinbeis Transferzentren GmbH an der Hochschule Karlsruhe is jointly operated by Steinbeis and the university and allows for even closer cooperation.

Baden-Württemberg Cooperative State University (DHBW) in Karlsruhe – The cooperative state university offers students dual study programs in technical and business-related fields. Close collaboration with businesses is a cornerstone of the university's study programs.

Karlsruhe Institute for Technology – Created in 2009 by the merger of the University of Karlsruhe with the Karlsruhe Research Center, KIT unites the missions of its predecessors. Research, teaching and innovation are the three strategic disciplines by which KIT defines itself.

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Innovative collaborations

The partnership between Steinbeis and Karlsruhe University of Applied Sciences has a long tradition: The Steinbeis Foundation first set up a technical consultancy here in 1969. Collaboration has intensified with a new cooperation agreement signed in November 2009 and the founding of a joint company called Steinbeis Transferzentren GmbH an der Hochschule Karlsruhe (STHK). Steinbeis is the university's preferred partner for knowledge and technology transfer.

The individual centers that make up STHK offer tailored technology solutions geared toward SMEs. For professors and staff at Karlsruhe University of Applied Sciences, this means that technology transfer through Steinbeis is now possible on an even greater scale. It also means that industry professionals can make even better use of the university's innovative power and prowess in applied research. The involvement of professors in real-world projects at STHK means the university's courses stay topical and include the latest innovations, techniques and findings. The Steinbeis projects also generate new topics for research at the university.

"We're intensifying the collaboration between Steinbeis and the State of Baden-Württemberg in an innovative way, while also strictly adhering to the established legal framework," explains Prof. Dr. Karl-Heinz Meisel, the university's president. "We're doing this because it benefits everyone involved – especially SMEs, which can benefit directly from the university's technological innovations."

> "By their fundamental and applied research, the higher education institutions provide an important foundation for innovation."
>
> Prof. Dr. Karl-Heinz Meisel

A discussion with Professor Klaus Gremminger

"A builder of bridges between university and businesses"

Professor Klaus Gremminger

Professor Gremminger, your Steinbeis transfer center, Innovation > Development > Application (IDA) is a shining example of technology transfer based on actual market needs. The center pulls together insights into innovative IT developments and applies them successfully to business. Your motto with projects is "intelligent, pioneering and future-proof." What do you currently consider to be a pioneering development in your specialist area?

Since coming to computer science at Karlsruhe University in 1989, I've always been interested in new issues. At the beginning, the emphasis was on database systems, but it shifted to distributed databases and then distributed information systems. At the moment, my focus and the focuses of the IDA are jQuery, jQuery Mobile, Android, the iPhone, Eclipse RCP, OSGi, Spring, Enterprise Service Bus and BPM.

The Innovation > Development > Application Steinbeis Transfer Center has become a bit of an institution within the Steinbeis Network. It was founded by professors at Karlsruhe University's computer science department in 1984. You took the helm in 2002. In 2004, the transfer center won the Löhn Award. Success spanning 25 years. What were the milestones over the years for the IDA and what's changed the most?

The IDA has improved continuously since 2002 and now has a broad base. It's worth mentioning the way we stand shoulder to shoulder with business in "Technology Region Karlsruhe" and our close collaboration with leading companies such as 1&1 Internet, dm-drogerie markt, EnBW, Fiducia IT, IDS, LUBW ÖR, Mercedes AMG, PTV, Rockwell Automation Solutions, Siemens Business Services and Systec & Services. We want to nurture these relationships and expand on them. The projects we've worked on range from VisITS in 1998, to Business Informer in 1999, Call Management System in 2000, Warehouse Management System in 2003, Point of Sale in 2004, Mobile Client Framework in 2005, Mail International in 2007, visionary control concepts in 2008, the OSGi in transportation in 2009 and Single Sign-on in 2010.

Evaluation and prototyping of new technology, quality management in software processes, innovation and technology management – that's just an excerpt from your portfolio. Which of your company's projects and services are particularly popular right now?

We used to run evaluations and prototype new technologies directly with the partner company. A good example of that was with the Karlsruhe drugstore chain dm. We first worked with their outlets in 2002, looking at the use of wireless handsets and barcode scanning to start ordering new stock. In 2006, we won a JavaScript pitch for a Stuttgart company, then we were chosen by 1&1 Internet for its development. Since 2007, the IDA has been working as a broker between regional companies and master's students at Karlsruhe University. Making a tangible contribution to synergies between the university and Steinbeis contributes to the university's image of being close to business practice. It also enriches teaching with innovation topics. At the moment, I see HTML5 as a higher-level platform to save time and effort with Android and the iPhone. Other topics that are inspiring students are business process management, cloud computing and business intelligence. When students conduct innovative projects and the services delivered by the IDA win

over customers, these customers request even closer collaboration.

The Karlsruhe region is a leading location for innovation and Europe's third biggest IT cluster. Among the areas of emphasis at your transfer center are product and process innovation for the regional IT sector. What are the main challenges when working on international projects, versus regional or even municipal projects?

We complete most of the tasks customers and business partners ask us to work on within a very short time. We also assume the role of a mediator linking local companies up directly as part of our R&D round, which is completed every six months.

There are two exceptions: an internationalization project with 1&1 Internet, and Rockwell Automation. At 1&1 we worked on an innovative Web mail system for gmx.com. At Rockwell Automation, our focus was on the development of a platform for the life sciences industry. But the main challenge for the IDA lies in regional projects where we support companies allied with our organization. The pleasing part here is that demand for graduates is growing continuously. We're also involved in more local projects where we use a variety of technologies to develop platforms and tools for different sectors of industry.

The IT sector is described by some as an innovation driver, for others it's hamstrung by complications. Current trends in this sector are often indicators for future technologies and areas of complication. What demands are the most recent technological development placing on your Steinbeis transfer center, and what goals do you set yourself for the future?

Since the market repeatedly changes and constantly expands the way it uses technology, the IDA in its role as a transfer center sets the new course at relatively short notice, depending on current convictions. In the future, we're planning to use HTML5 in the mobile area and OSGi in distributed systems. We don't yet see cloud computing as a top priority. Another focus will the steering of business processes and evaluation of mass data. To complete the picture, we believe we'll encounter embedded systems in a variety of areas and on a variety of levels. We're also highlighting our focus on software architecture and software quality.

The IDA sees itself as a builder of bridges between university and businesses. Its goals range from enhancing theory by relating it to business practice, to accelerating the learning curve of students and acting as an "earpiece for the market, research and development."

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Photo: wikipedia.de/meph666

The Karlsruhe Region

Innovation enjoys a strong tradition in the Karlsruhe region. It was here that Drais invented the dandy horse in 1817 and Benz invented the automobile in 1885. In 1886, Hertz demonstrated electromagnetic waves in Karlsruhe. The first ever email received in Germany popped up on a screen in Karlsruhe in 1984.

This tradition continues in Karlsruhe to this day, where a multitude of researchers, universities and research establishments work every day on cutting-edge research projects. The emphasis of projects lies in the areas of energy, the climate, the environment, nanosystems, microsystems, astroparticle physics, optics, photonics, transport, and ICT.

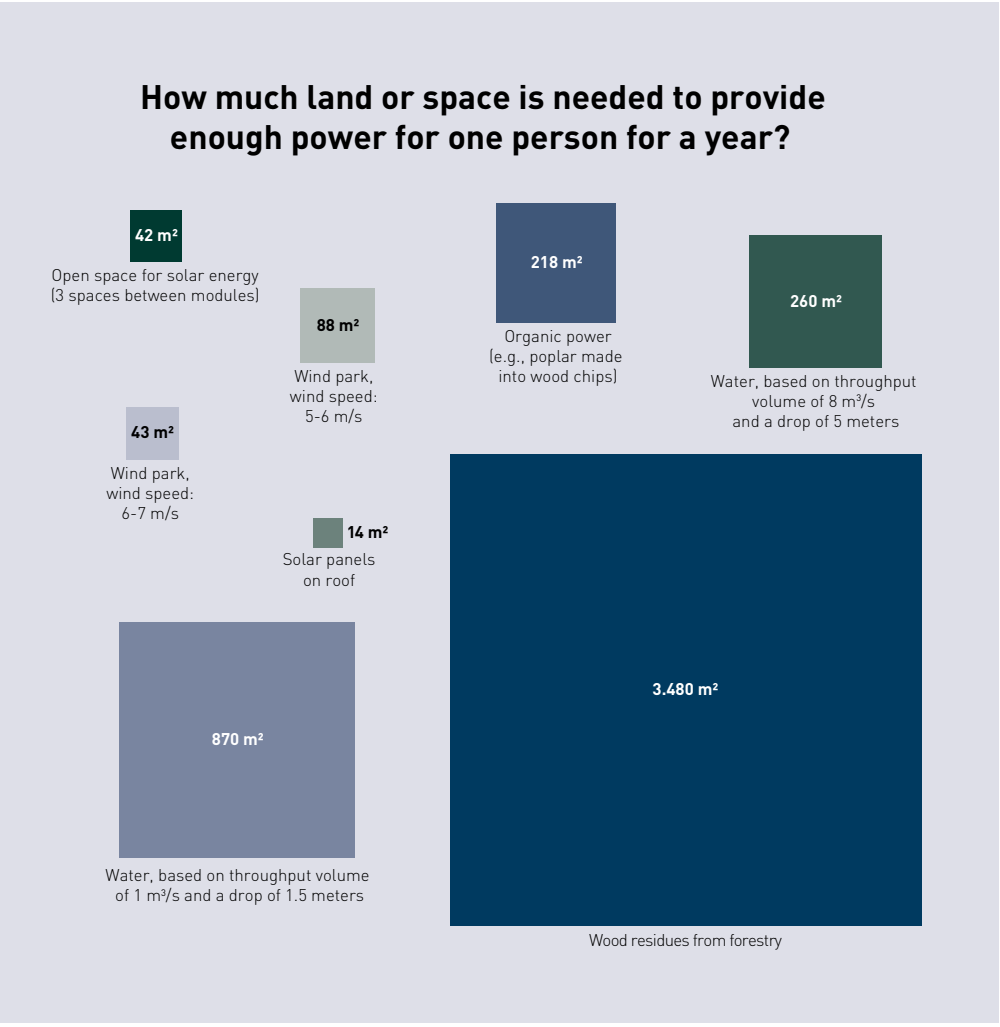
To ensure ideas can also be turned into innovations, knowledge and technology has to be transferred quickly from research and development into business. To facilitate this process, Steinbeis works in the "Technology Region Karlsruhe" with the University of Karlsruhe, the Baden-Württemberg Cooperative State University in Karlsruhe (DHBW) and the Karlsruhe Institute of Technology (KIT). There are also a variety of Steinbeis experts working at centers outside the universities and research institutions.

To find out more, go to:
www.steinbeis-karlsruhe.de

A holistic approach to analyzing land and areas for use with renewable energy

Environmental protection in the community – ERNEUERBAR KOMM!

Many communities could generate enough renewable energy to answer the needs of the entire local population. These are the findings of a research project called ERNEUERBAR KOMM! In fact, solar energy and wind power alone would often be enough to answer the needs of all private households. It would only require solar panels on ten percent of all available rooftops and five percent of unused land, combined with just half of the locations suitable for wind turbines. This analysis of renewable energy potential was carried out by Prof. Dr. Martina Klärle, head of the Weikersheim-based Steinbeis Transfer Center for Geoinformation and Land Management. To make her holistic assessment of land use, Klärle looked at core geodata and used geographic information systems (GIS). Her Steinbeis Center helps local authorities make practical use of ERNEUERBAR KOMM! findings.



Thanks to a 2008 research project called SUN-AREA, it was finally possible to automatically calculate the solar energy potential of rooftops. Once SUN-AREA was complete, Prof. Dr. Martina Klärle and her colleagues embarked on a project called ERNEUERBAR KOMM! Its aim: to create a renewable energy analysis that would calculate the potential of all forms of renewable energy – quickly, efficiently and precisely – based on existing geodata. Calculations would be made by individual community or rural district.

The system provides implementation guidelines, highlighting the potential to use different forms of energy in the community. A Web-based tool calculates and plots the energy potential by area. Users in the community can then calculate the potential of renewable energy in their area using an on-demand Internet platform. ERNEUERBAR KOMM! also features an online calculator developed using game-based learning techniques to encourage local authorities to use the tool.

A regional association in the Rhine-Main area around Frankfurt was selected to take part in a pilot project to estimate the potential of a local area, which encompassed 75 communities. Holistic evaluations of potential are currently taking place in the city of Worms, the Black Forest central region (Energy Region 2010), the Main-Tauber district, and a variety of other communities in the states of Baden-Württemberg and Bavaria. The ERNEUERBAR KOMM! project can be implemented in all communities throughout Germany.

To define the precise energy potential of an area, the ERNEUERBAR KOMM! system uses a geographic information system (GIS). This draws on official geodata and statistics held by the local communities, so it also includes information on the population, how land is used, exclusion areas, wind speeds, radiation

levels, rooftops and natural drops in flowing water. The baseline data needed to carry out the evaluation is generally quite thorough, so there is no need to carry out special searches. To analyze and refine data, existing planning guidelines are used. For example, exclusion areas are calculated by looking at designated conservation zones and rules relating to permitted distances (of installations like wind turbines) laid down under local bylaws. The calculations can be carried out by individual community. The figures show exactly how many rooftops or how much land in a community can be used to generate electricity through solar power, wind energy, biomass and hydroelectric power. They also show how much electricity this would generate and the percentage of private household demand this would cover.

The ERNEUERBAR KOMM! analysis is based on available land or open areas. The formulae used to make the calculations can be applied to all types of renewable energy to determine the relationship between the amount of electricity generated and the area needed to do this. What this means for users of the Web-based calculator is that the system will show, for example, that 100 hectares of designated farming land is suitable for biomass energy production. At the click of a button, the user can then select 10 hectares of this area and view the amount of energy this relates to. This allows users to see immediately how much land is being used for the chosen renewable energy in relation to the amount of energy produced. The database also ties in local population figures and electricity use per inhabitant to calculate how many households can be supplied with power from the areas selected.

Overall, the calculations do more than just show theoretical potential in technical terms. Mayors, local councils or citizens can actually use the online calculator to pull together their own energy package factored up by "utilization level." This allows users to select the proportion of potential energy to be provided by wind, solar, biomass or hydroelectric power. The Internet platform uses an interactive design to allow the system to calculate, on demand, the proportion of energy requirements that can be covered and plot this on a bar chart. It is easy to view and compare the yield of each energy form. For example, users can select 40 percent of rooftops suitable for solar energy and see that this would cover the electricity requirements of 50 percent of private households. Or the system would show users that biomass would be needed from 200 hectares of agricultural land to supply 4000 inhabitants with electricity, or use a single wind turbine.

Settings can be made for each type of energy in a separate window which shows how many of the available areas are technically compatible, or for wind power, the possible number of turbines. Users of the online calculator then factor in the proportion of these that should be utilized (the utilization level).

Who the key players will be in the emerging era of renewable energy is still not cast in stone. But it is clear that the authorities at all levels will play a central role in moving energy policy forward. ERNEUERBAR KOMM! now provides them with a hands-on tool to support them on their journey.

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Deggingen-based Steinbeis Transfer Center wins award

Promoter of innovation in southeast Europe

The Deggingen-based Steinbeis Transfer Center for East-West Joint Ventures was named "Promoter of Innovation in Southeast Europe" earlier this year. The award was bestowed as part of the first conference to be held in Rumania on collaboration in the Danube and Black Sea Region. The aim of the conference was to compare experiences and foster partnership to promote sustainable social and economic development in southeast Europe.

The jury was made up of leading experts under the direction of ambassador Dr. Liviu Bota, the former United Nations deputy secretary-general. The award has motivated the Steinbeis experts from Deggingen to keep supporting social and economic development in the Danube Region and Black Sea area. The transfer center has been focusing its efforts on the development of a European Danube Strategy since 2010. Its work centers on bringing together professional partners from each country. The projects are tailored to the needs of southeast Europe, offering innovative solutions designed to improve socio-economic conditions in the area.

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Factory planning software provides 360° views during site inspections

Keeping plans in perspective

CAx systems have been an established part of factory planning for years. They may offer many benefits, but they can also be extremely demanding. Companies need special software to run CAx systems and staff need special training. Sometimes technicians compare their project plans with the actual situation in a factory and despite (or because of) all the sophisticated technology, they still struggle to understand what they are looking at. To make site inspections easier, the Steinbeis Transfer Center for Factory Planning in Neu-Ulm has developed a platform-independent solution called Plan:view.

It used to be extremely difficult to compare digital planning data with the actual situation in a factory. CAx systems require extremely sophisticated hardware. Despite the power of modern laptops, which certainly have the performance technicians need, using a laptop on-site – e.g., next to production – is complicated and not exactly practical. Users point to the difficulty of storing data locally, transferring data and, in particular, operating the software – plus the understanding of CAx needed to do this.

When it comes to complex software, project managers and decision-makers are often out of practice. So the Steinbeis experts have drawn on cutting-edge technology to develop an application tailored to this target group. The aim was to create a system that is compatible with different end devices. A key priority was to maintain functionality but reduce the program to the bare essentials – or as the saying goes: keep it simple. Everything should revolve around user perspectives, which now, thanks to 360° views, is entirely possible. Standing anywhere in a building, the system accesses stored CAD data to provide a 360° view of the user's surroundings. As technicians walk around, they simply call up the relevant view on their handset. The system makes it easy to compare the actual situation with virtual planning data by providing identical perspectives.

To generate 360° views, the software used by the system accesses stored CAD data. Each perspective is pieced together out of individual images to provide a 360° view. These views can then be called up on the mobile handset using a standard browser. Once the information has been converted, the volume of data needed to provide views is only a fraction of the amount of data used in VR models.

Tablet PCs with touch-screens are particularly well suited to this new system in factory settings. A simple swipe is enough to change perspectives or zoom in on details. By clicking around the screen, users can jump straight to neighboring views. This allows them to follow paths through a building. The software also provides factory overviews with a display of all 360° views stored in the system. If operators inspecting the site notice any inconsistencies between the model and the actual situation, they can take advantage of a variety of functions to document these. For example, the user can store the coordinates of the current perspective and attach comments. A special reporting function allows the user to send the coordinates via e-mail as a hyperlink to other project team members.

Conversion of model data held in the CAD system is carried out fully automatically and data can be made available directly in a central system. As a result, users of the software always have access to up-to-the-minute information, made available through Web-based systems. The information provided to the user in the 360° views includes all data of potential interest to people working on a project. By contrast, using a 3D model to do this would offer no value-added, would raise costs and is nowhere nearly so user-friendly.

Plan:view

- intuitive controls
- documentation/reporting function
- no previous CAD experience required
- compatible with all devices equipped with a Web browser
- displays plans on computers, laptops, tablet PCs and smartphones
- no special system requirements
- no additional software license requirements

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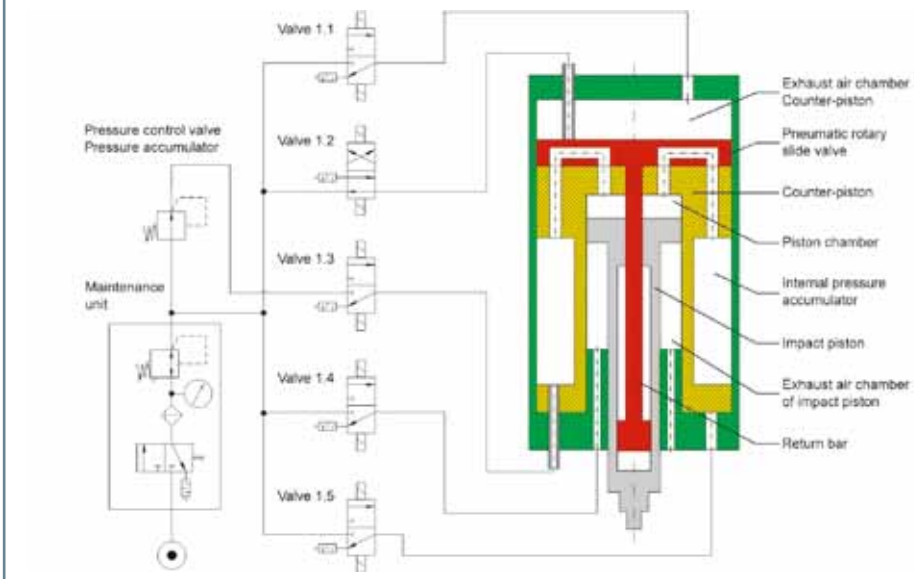
Flat clinching with pneumatic impact cylinders

A high-pressure environment

Pneumatic cylinders able to withstand high amounts of kinetic energy are called impact cylinders. In these cylinders, impact energy from compressed air causes the piston rapidly accelerate to a high speed within a defined stroke. Its kinetic energy is then transferred to other processes. The non-profit innovation center at the Steinbeis Transfer Center for Drive Engineering and Robotics in Engineering has developed an impact cylinder with reduced rebound which can be used for flat clinching, an innovative new joining method. The project formed part of an SME innovation and development scheme funded by the German Federal Ministry of Economics and Technology.

The difference between impact cylinders and conventional pneumatic cylinders is that in an impact cylinder, the piston does not use throttled exhaust gas and is not brought to the stop position via open-loop control. Instead, it is accelerated until shortly before it reaches the stop position. It therefore has greater kinetic energy. But the use of impact cylinders in industry has considerable disadvantages – especially due to the rebound forces upon starting the piston and the major mechanical stress that the housing is subject to upon impact.



Pneumatic circuit diagram of the impact cylinder for flat clinching

Together with the company Lehmann-UMT, based in Pöhl in the German state of Saxony, the Steinbeis team in Chemnitz ran an experimental study to develop a technical solution to reduce rebound forces in the impact cylinder when the piston is started. This was done by adding a balancing weight positioned axially opposed to the impact piston. As the piston and the weight are activated at the same time by the compressed air but travel in opposite directions, their momentums compensate each other, thereby reducing the overall mechanical impact on peripheral housing and drive components.

The impact cylinder is suited to a range of applications, primarily in the area of separating and joining via forming processes such as stamping, riveting and clinching. These require a large amount of force and a high forming energy applied at the joining point.

In partnership with the Department of Virtual Production Engineering at Chemnitz University of Technology, the Steinbeis team in Chemnitz managed to fit an impact cylinder with innovative flat-clinching technology. Developed at Chemnitz University of Technology, this punctiform, single-step joining technique results in joins that are flat on one side. This means that mechanically joined, friction-locked and form-locked joins can be used in visible areas or in functional surfaces. The technique is also ideal for joining different types of materials with each other, such as plastic and metal. As such, flat clinching is ideal for multi-material design with a short, effective process chain and for intelligent lightweight construction using different materials.

For the first series of tests, the team designed and built a prototype impact cylinder for an energy of 250 J. Using the flat-clinching method at operating pressures of up to 8 bar and a piston stroke of 100 mm, it was possible to join aluminum sheet of the types AlMg99.5 and AlMg3 up to a total sheet thickness of 4 mm, as well as DC04 steel plate up to a thickness of 2 mm. The result: a component surface ready for painting, without the need for any costly extra finishing beforehand.

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Training spotlight

Management training in professional speaking

Career talk

Monday morning: team meeting. A total of 24 sets of eyes look to the head of department, inquisitively, cautiously, defiantly – perhaps even bored. And the boss has to motivate everyone, organize activities, delegate tasks. Tuesday morning: board meeting. The presentation on a new project went well and becoming head of division edges closer. Wednesday, late afternoon: a one-to-one with a co-worker who's about to lose his job. The boss would like to come to an amicable arrangement. Thursday evening: networking at the local business club. In the spotlight again, only differently – trying to make a good impression. Friday lunchtime: a product presentation to a major lead. It went well, but somehow things didn't gel. No final decision, or not for now. Introducing the Professional Speaking certification course. It's designed for training managers to master such interactions professionally.

Managers often find themselves in situations where they have to win people over or present their company to outsiders. It doesn't matter whether they head up a team, a department, a business division or a whole corporation. Managers are almost expected to have a predisposition to communication and presentations. Yet they should also be excellent at working on their own skills and improving their performance. Easier said than done. Traditional training for managers is based on standalone sessions. But instruction would be much more effective if managers were offered a complete package of professional training. Professional Speaking training is a certification course organized jointly with the SHB. Broken down into a series of 13 modules over a six month period, the course covers all topics relevant to professional oral communication in business. As well as addressing conventional topics like multimedia presentations, use of the voice and body language, it deals with the structure, plot and staging of a presentation, effective use of story telling, the art of improvisation and issues such as authenticity and stage presence. It also specifically teaches speakers how to inspire an audience.

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Steinbeis Transfer Institute and DKB Immobilien AG form partnership

Joint research programs

The Steinbeis Transfer Institute for Financial Behavior and Ethics signed a scientific cooperation agreement with real estate company DKB Immobilien in June of this year.

Among other topics, initial research projects will focus on the satisfaction of German households over time, the socio-political significance and impact of social charters, and work satisfaction in the context of values held by DKB Immobilien employees. The aim is to facilitate scientific exchange through workshops, presentations and scientific publications. DKB Immobilien is also acting as a sponsor of Finethikon 2011. Finethikon is a convention on financial ethics organized by the Steinbeis Transfer Institute for Financial Behavior and Ethics in collaboration with domestic and international partners. It took place in Eichstätt in October 2011.

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Continuous professional development

Further development instead of early retirement – the Senior Executive MBA

There's plenty of lively discussion about the effects of demographic change – but few companies have actually started preparing for the expected impacts of this change. Business will have to gear itself to different work environments and an ageing workforce.

One possibility will be to tap into existing potential – assuming the right tools are available. Targeted at employees and managers with at least 20 years' experience, the Senior Executive MBA is one such solution. The degree, which dovetails with full-time employment, is offered by the School of International Business and Entrepreneurship (SIBE) at the SHB. Its aim is to help firms build on the performance of its experienced employees and thus safeguard their competitiveness. Practical experience is expanded on using the very latest management methods, with live business projects aimed at honing skills and providing the "silver generation" with sustainable answers to new challenges.

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Degree program in collaboration with the TÜV SÜD Akademie

Bachelor of Arts in Business Administration, with an emphasis on quality management

In March of this year, the School of Management and Technology at Steinbeis University Berlin (SHB) joined forces with TÜV SÜD to launch a Bachelor of Arts in Business Administration. Offering a major in quality management (QM), the degree is aimed at people in full-time employment. SHB modules in General Management are complemented by QM seminars run by the TÜV SÜD Akademie. For ambitious working people with previous experience, the degree is an ideal stepping stone into the promising field of quality management.

The SHB and the TÜV SÜD Akademie have been working in close cooperation to offer the new training program and provide students in full-time employment with a bachelor of arts degree in combination with a TÜV SÜD certificate in quality management. During their degree, students are equipped with management skills based on future trends. This offers them a solid academic grounding. As well as business administration and economics, the curriculum covers project management, marketing and financial management. There are also advanced courses on quality management. As with all degrees offered by the SHB, hands-on skills are a central theme of the degree in the form of "project competence": Throughout the entire degree, students work on a live project at the company. Supported by professors and lecturers, students work on innovative concepts to be applied directly to their work in actual projects. On completion of their degree, students are ideally prepared for their career that follows.

Companies also profit from the degree education of their employees. It's an investment in the HR development of top employees and improves motivation and commitment. The company also gains a reputation in the community by offering the prospect of special training. During the degree, students have the opportunity to ask lecturers and coaches about work-related issues and tap into their expertise. Helmut Holl, who works at Baufritz, is a strong believer in the concept: "Dovetailing studies with work allows firms to keep their workers. Even during the degree they bring back ideas to the business."

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Corporate University for business

Educating the best thinkers

Corporate training for companies is a form of made-to-measure education. The School of Governance, Risk & Compliance (School GRC) at the SHB provides businesses with customized programs in compliance, fraud management, risk management and corporate governance. The corporate programs are tailored to business needs, making them a kind of customized value-added.

It's in companies' best interests to provide employees with training in parallel to their work and allow them to gain more qualifications. This improves the long-term likelihood of retaining specialist workers and managers. To do this, firms require strong partnerships and training that is tailored to their needs. The School GRC has been offering such partnerships to companies since 2004. Businesses and their employees can also participate in other programs developed by the School GRC, which offer qualifications such as the Certified Compliance Expert (CCE), the Certified Investigation Expert (CIE) and the Master of Business Administration (MBA). These courses specialize in governance, risk, compliance and fraud management. The training program can also include individual workshops and case studies. The curriculum is agreed with company managers and tailored to the situation within the business, staff experience and their areas of responsibility. Managers appreciate the uniformity of their employees' acquired specialist knowledge, while students are primarily motivated by business-oriented training in a group – in a pleasant environment in which they gain recognition.

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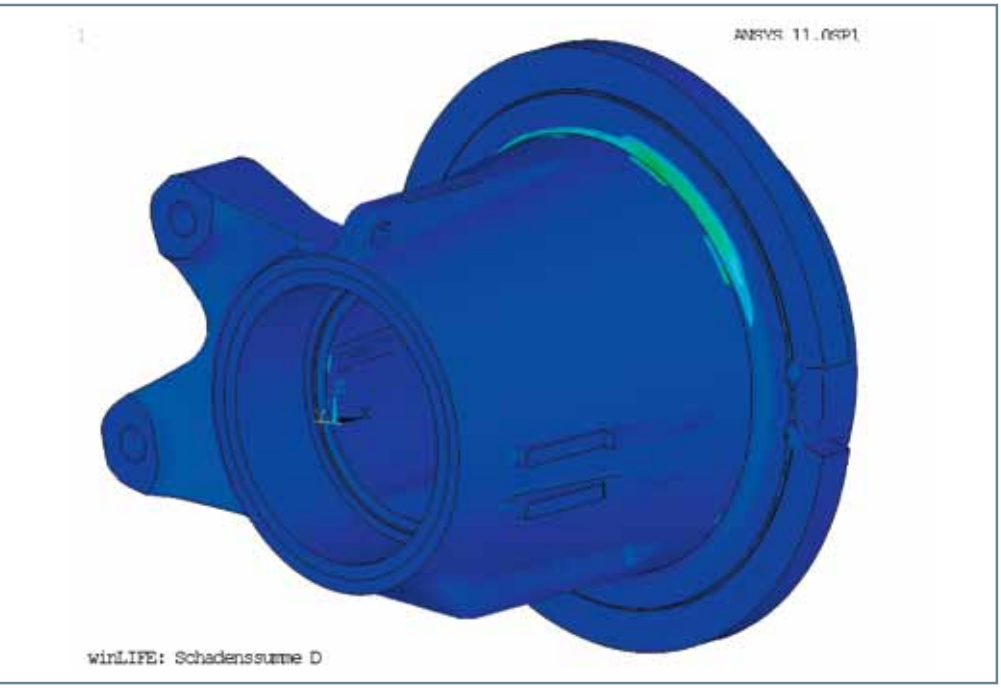
Calculating the service life of wind turbines

Simulating the wind and the weather

Wind power has the greatest potential of all methods of renewable energy generation. Why? Because the costs of wind power technology are comparatively low, and its suitability for day-to-day operation is well-established. Wind turbines have increased rapidly in size over recent years, as the larger a wind turbine, the more profitable it is. Today, turbines with powers of up to 6 MW are being built, and in the future, developers will continue to try to improve wind turbines without compromising their reliability and availability. The ultimate aim: to build wind turbines with a service life of 20 years. The Steinbeis Transfer Center for New Technologies in Traffic Engineering, based in Ulm, southern Germany, has developed special tools to help developers simulate the service life of wind turbines.



Results of a service life calculation for a gearbox. Lines show areas of equal damage. The color indicates the degree of damage, allowing developers to identify critical points and estimate service life (or degree of damage).

The technical challenge in building a wind turbine is that extremely heavy components (the rotor and nacelle) must be mounted on top of a relatively elastic beam (the tower). This vibratory system is subject to a high dynamic load by the wind, and in the case of offshore turbines, also by waves. Data such as the forces and moments in the rotor hub, measured under different wind conditions, is used as the basis for calculating the service life of a wind turbine. Infrequent events such as emergency shutdowns also have to be included in the simulation. In total, this results in several hundred scenarios. The damage in each of these scenarios, weighted according to its frequency, must be added together to give a realistic model of the events a wind turbine experiences over its service life.

The advanced state of wind power in Germany means that German standards in this area enjoy an excellent reputation worldwide, and German design principles have also been adopted around the world. Enter winLIFE. It's a simulation program developed by the Steinbeis Transfer Centers for New Technologies in Traffic Engineering and Traffic Engineering Simulation Software. In use for over 20 years, the program now uses these standards to generate S-N curves. winLIFE was originally developed for the automobile construction industry. But as the problems and processes in wind turbine development are very similar, winLIFE has been used successfully in this area for several years. Due to high demand, it is now being advanced specifically for wind turbines. One area of focus is making the program more efficient to use, especially with regard to automatic calculation in combination with the finite element analysis (FEA) to efficiently enable calculus of variations – a much-needed feature.

Due to the complexity of their operating conditions, wind turbines need to be simulated as complete systems, both for basic studies and for estimating reliability and service life. To do this, all environmental conditions must be included in the simulation. So wind, including all turbulence, is defined as a vector field as a function of time – and for offshore turbines, wave height is also defined as a function of time. The entire dynamics of the wind turbine are modeled in an multi-body system/FEA simulation, allowing all dynamic phenomena to be included. The software program S4WT (SAMCEF for Wind Turbines), developed by the SAMCEF Group, is an multi-body system/FEA simulation system that does all of the above. It can also be used to calculate the stress tensors for all relevant points. So to calculate the service life of wind turbines after running an multi-body system/FEA simulation, the Steinbeis team of experts integrated winLIFE into S4WT. Many rules and standards covering

the measurement of components in wind turbines are already incorporated into winLIFE. Now, with the integration of winLIFE in S4WT, industry professionals can simulate almost all components of a turbine and estimate their service life.

All around the world, huge amounts of money are being invested in wind turbines. Simulations during turbine development play an extremely important role in ensuring that these turbines really can stay operational for 20 years – with as few breakdowns as possible.

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Keeping track in an IT landscape that is developing in different directions

Keeping IT-infrastructures under control with CompactCheck

A successful and rapidly expanding medium-sized enterprise based in Villingen-Schwenningen, Fritz Kübler is one of the world's leader producers of counting and sensor technology. Its IT is in excellent shape for current requirements, but managers at Kübler realize that computer systems have to be geared to new, larger set-ups and greater complexity. To set the ball rolling, the company turned to the Steinbeis Transfer Center for Innovation and Organization (STZio) in Eislingen. The Steinbeis experts introduced Kübler to the STZio CompactCheck, a stocktaking tool that pinpoints the current status of computer systems.

Whether a company's putting out fires or overstretched by the number of contracts, there's always a reason why internal projects can be put off. Kübler found itself in a similar situation to many small and medium-sized enterprises in Baden-Württemberg; they're enjoying enviable growth at the moment. As a result of growth, a lot had been done to improve processes and procedures, but Kübler had basically muddled through IT issues, exacerbating shortcomings in the modernity of its technology. Computer systems had shot off in different directions, with too many isolated solutions and Excel being used to cut corners or multitask. There were also disconnected systems and ERP was being used as a process backbone and central database.

Central to the analysis carried out by the Steinbeis experts from Eislingen were issues with a strong impact on engineering: processing, IT, products, documentation but also marketing. The team also looked at organizational issues and HR, as these had a bearing on engineering processes. "In businesses with products that can be sold in catalogs, the interface between engineering and marketing can be key to the efficient definition of products," states Oliver Brehm from the STZio. As a result of the CompactCheck analysis, Kübler was provided with two alternative scenarios and a roadmap including key actions for the next five years. The plans included an analysis of current weaknesses, including causes with effective solutions, taking technical systems and process dependencies into consideration.

Kübler management was impressed at the way the STZio consultants leveraged their many years of experience and their detailed knowledge of IT systems to identify where the key dependences were and the best way to deal with this specific situation. The results of the CompactCheck enabled Kübler to lay the foundations for a systematic upgrade of its IT landscape. This immediately allowed the company to react more flexibly again – and not just stay ahead in terms of product technology, but also with its computer systems. For a relatively small outlay, it has established a vision for its IT systems and defined steps to be taken to achieve its goals. Depending on how things develop at the company, it can now gradually start addressing each area.

CompactCheck

The CompactCheck analysis developed by the STZio provides a quick overview of the situation at a company aimed at pinpointing current status, identifying causes, defining suitable actions and taking dependencies into account.

What areas does CompactCheck look at?

- The organization
- Processes
- Computer systems
- Products, special product features
- Human resources

Which systems does it scrutinize?

- CAD
- ECAD
- PDM/PLM
- ERP (focusing on products and core data)
- PIM (product information management)
- If necessary: mechatronic factors affecting systems

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Recovering heat from wastewater

Wastewater as a heat source

Energy efficiency is a hot topic. In light of rising energy prices and the need to reduce carbon emissions, the use of waste heat – especially from wastewater from industrial processes – is gaining in popularity. But conventional heat exchangers cannot cope with anything more than even slightly contaminated water; dirty water causes their efficiency and heat transfer to plummet rapidly. With this in mind, the company Jaske & Wolf Verfahrenstechnik, based in Lingen in northern Germany, drew up a concept for a continuously self-cleaning heat exchanger called DUPUR®. The implementation of this R&D project was sponsored by an international mechatronics funding program. Scientific support came mainly from the Steinbeis Transfer Center for Technology Marketing, the non-profit innovation center at the Steinbeis Transfer Center for Power and Environmental Engineering, and additional partners in the Netherlands.

The heat exchanger was first used in the Moskaubad outdoor swimming pool in Osnabrück. Local utility company Stadtwerke Osnabrück, the operator of the pool, wanted to use the new heat exchange system to halve its annual energy consumption for heating outdoor swimming pools. "Up to now, the Moskaubad pool has consumed 600,000 kilowatt hours a year," explained Jürgen August, head of pool technology, "but in future, we want to reduce this to 300,000."

The new technology will be applied in an area responsible for a large proportion of this energy consumption: heating fresh water for the pool. The filters need to be cleaned by rinsing several times a day, depending on visitor numbers, and each rinsing removes up to 35 cubic meters of warm water from the pool. Formerly, this water was disposed of directly into the sewers at 24 °C, and the fresh, cool water added to the pool was warmed to the pool temperature mainly using a gas condensing boiler. Now, the heat exchanger instead absorbs thermal energy from the 24 °C wastewater and uses it to raise the temperature of the fresh water from 12 to 22 °C. Pre-warming the water in this way means a lot less gas is needed to heat it to the pool temperature.

Contaminants and suspended matter, as commonly found in the filter backwash water of swimming pools, rapidly impair the performance of conventional commercially available heat exchangers. Particulate matter suspended in the water is deposited on the heat transfer surfaces, causing the machine's efficiency to nosedive. In the industry, this process is known as fouling.

The new DUPUR® heat exchanger solution solves the problem of fouling on the surface of the heat exchanger by using an intelligent pig system that mechanically cleans the heat exchanger when needed. The centerpiece of the multiple tube-within-a-tube heat exchanger is a pig valve that makes it possible to simultaneously pig all pipe sections during operation.

Using a dedicated control mechanism, cleaning intervals can be set as needed,

thereby ensuring high efficiency and economical operation. "Working together with the Steinbeis Transfer Centers and our partners in the Netherlands opened up a lot of new market opportunities for our company," comments Wolfgang Jaske, summarizing the benefits of the collaboration. "Without their support, we wouldn't have been able to make this project a reality so quickly and easily."

The DUPUR® system is suitable for strongly discolored waste water and water containing suspended matter and process fluids. It can be used in a variety of industries:

- Food, milk and starch processing
- Beverages
- Meat packing, sewage treatment plants, biogas plants
- Petrochemicals and chemical engineering, painting/varnishing machines, galvanization
- Swimming pools, geothermal energy
- Parts cleaning machines

Summary of features:

- Continuous heat transfer the whole time the machine is running
- Cleans itself during operation, taking just a few seconds
- Cleaning cycles can be adjusted to the level of contamination
- Subsequent heat pumping often no longer necessary
- No need for chemical cleaning, so operating costs are lower

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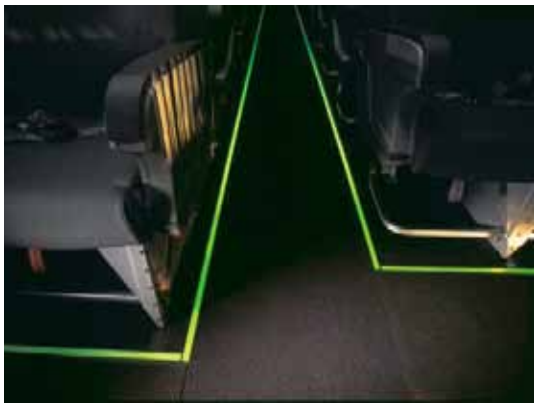
Emergency floor lighting in aircraft

Improving flight safety

Emergency floor lighting is an integral part of the interior of a commercial airliner. In emergencies, these lighting systems guide passengers and crew to the emergency exits, even if the rest of the cabin lighting has failed. But if the on-board electronics experience a complete failure, everyone is left in the dark. In response to this, Lufthansa Technik has developed the Guideline® emergency floor lighting system, which uses a photoluminescent material that absorbs light from its surroundings and re-emits it in the dark. Unlike electronic systems that use LEDs, the Guideline® emergency floor lighting system requires no external power source and is therefore entirely maintenance-free. The Steinbeis Transfer Center for Plastics and Recycling Technology has now adapted this system for use in specialized floor coverings.

Airplane galleys are moist environments, so they use non-textile flooring (NFT) instead of carpeting. This flooring is just 2 mm thick – which doesn't leave much space for floor lighting. The challenge: to develop floor lighting no more than 2 mm thick that is sufficiently bright and able to withstand high mechanical loads.

The partners in this project were Lufthansa Technik, the Institute for Polymer Technology and the Steinbeis Transfer Center for Plastics and Recycling Technology at Wismar University of Applied Sciences. Together, they developed the Galley-Light®, which is now a commercially available product. The main challenge in developing Galley-Light® was designing a process-optimized plastic casing for the photoluminescent layer that would not corrode due to external mechanical stress and was able to withstand day-to-day cleaning using conventional detergents without suffering long-term damage. The project team mastered this design challenge by analyzing these external influences using the finite element method, by testing and evaluating components, and by taking advantage of advanced plastic production techniques. The result: ultra-flat emergency floor lighting that can be integrated into non-textile flooring in the galley and meets all safety requirements.



Emergency floor lighting developed by Lufthansa Technik

Described as the "world's thinnest emergency floor lighting," Galley-Light® – a successful joint development by the three project partners – won the 2011 Crystal Cabin Award in the category of Material and Components at the 2011 Aircraft Interiors Expo in Hamburg.

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Consulting spotlight

Steinbeis-Study

Fuel shortages at wood-based heat and power stations

According to 2009 renewable energy legislation, wood from rural conservation areas and wood residues from forests are renewable raw materials, i.e., energy sources eligible for bonuses. A study into the sustainable use of these two types of wood carried out by the Steinbeis Consulting Center for Corporate Finance, has pinpointed bottlenecks for power station operators.

The study indicates that not enough is being done to exploit the full potential of materials, especially wood residues. Forestry organizations and other growers point to economic and ecological reasons for this. In some parts of Germany, less wood is gathered from residues and conservation areas per year than is used in local power stations. According to the Steinbeis study, demand is pushing up prices. Growers believe the annual rate of inflation lies between four and nine percent. A key driver of inflation is the cost of transportation: For every extra kilometer materials are shipped, the price as a proportion of all costs rises accordingly. After 100 km, shipping is scarcely viable. As a result, purchasing rates and the availability of fuel need carefully examining before each project, to ensure that power generation equipment pays in terms of capital investment.

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Carbon footprints

Green logistics in everyday business

If CO_2 emissions are going to be cut systematically, they have to be measurable. This is an issue being looked at by the Steinbeis Consulting Center for Transport and Logistics, which is using a standard procedure to measure carbon footprints – in this case the volume of greenhouse gasses emitted by logistics companies in connection with their services.

As part of a work group initiated by the company Vernetzte Transport Logistik, the Steinbeis experts gathered data on the shipping, loading/reloading, and administration of a general cargo collaboration, throughout a transport network covering an average distance of 150 to 300 km. The aim of the study was to measure the carbon footprint of each activity connected to the transportation network. The investigators measured a CO_2 share of 15.6% for incoming freight, 43.6% for the main carriage, 29.9% for the physical delivery, 6.4% for loading/reloading, and 4.4% for administration. This is the equivalent of an average CO_2 emission of 36.91 kg per shipment, or 47.33 kg for the whole system. The results indicate that the logistics industry supply chain still has plenty of potential to cut the amount of greenhouse gases being emitted, and this potential could be more fully exploited, especially at the interface between the customer and the logistics company.

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ESF funding programs

Finding consultants

The Steinbeis Consulting Center for Business Coaching has authorization from the Baden-Württemberg Ministry of Finance and Economy to conduct projects as part of ESF funding programs called "Coaching" and "Training consultations & HR development."

Steinbeis consultants can provide businesses with support, advice and coaching in the planning and implementation of corporate strategies. Project grants can be applied for from the State of Baden-Württemberg. Grants amount to 50% of expenditure, to a maximum of Euro 400 per working day of eight hours.

Coaching grant program
Funding for coaching projects in the following areas:
- Innovation projects
- Collaboration
- Reduction of energy use
- Demographic change
- Business handover

Depending on the field, funding may be granted for up to 15 working days.

Qualification counselling & HR development grant program
Funding will be provided for coaching in the following areas:
- Training and continuing professional development (A)
- Systematic HR development (B)

Grants are limited to one round of funding per company and location for each of the programs above. Type A projects can be sponsored for up to ten days, Type B projects for up to 20 days.

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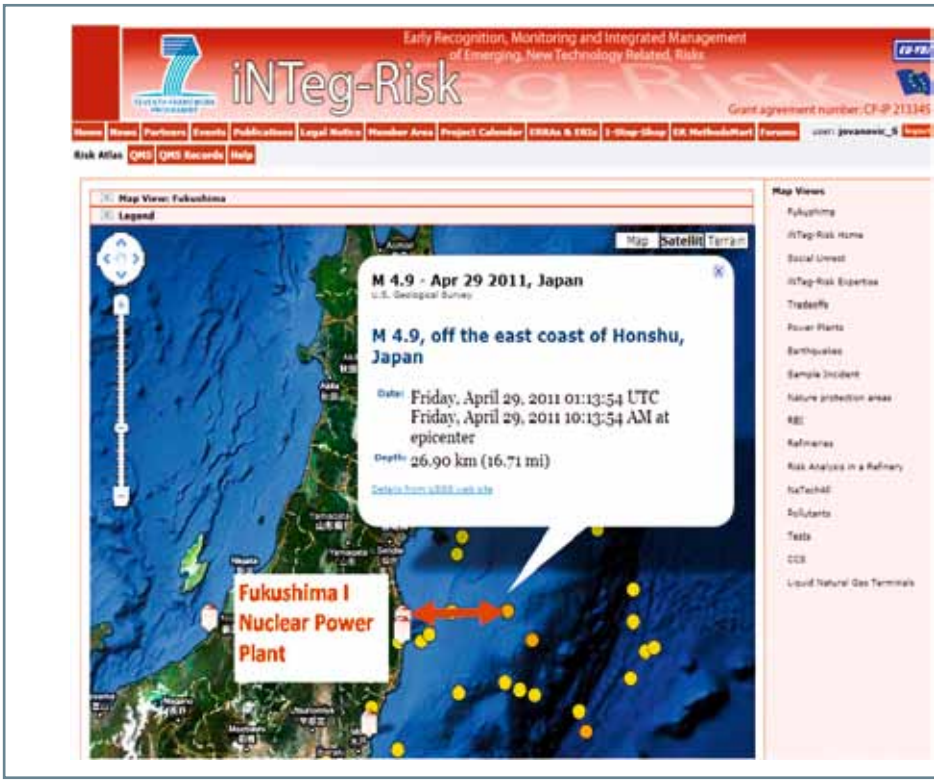
Early detection and managing the risk of new technology

A danger foreseen is a danger half avoided

In many sectors of industry, emerging technology can be a door opener to major growth. Few dispute the need to research and carefully manage the possible impacts of technology well in advance. But adhering to this principle in everyday business is often fraught with difficulty. Most companies have little access to the right tools to detect emerging risks early and understand how they could shape society and the environment. The Steinbeis Advanced Risk Technologies Group (R-Tech) has developed an integrated system that combines risk management – especially in the field of new technology – with a set of R-Tech software tools aimed at managing quality, projects, clients, knowledge, innovations and intercultural issues.

In complex industrial systems, businesses cannot survive without some form of risk management system to steer the safe application of new technology and safeguard the sustainability of innovations and technology transfer. Integrated, end-to-end risk management systems ensure that all products, processes, the environment and society as a whole remain safe in the long term.



The "intelligent and automatic" recognition of emerging risks (watchdog system)

Innovations are a key prerequisite to success, but only if the underlying innovation process is safe and sustainable. The system developed to this aim by the R-Tech Group has been certified and protected under trademark law. Customers benefit from the system in a number of ways: savings by mitigating risk, faster innovations through targeted R&D, proper conduct in business undertakings, improved safety and enhanced competitiveness. The system can be used by large industrial entreprises and SMEs. The Steinbeis Advanced Risk Technologies Group drew on state-of-the-art methods and technology in combination with the very latest innovation management techniques to develop methods for detecting risks early and assessing them using modern technology. Thanks to this approach, it's possible to match technology development, planning and management to new technological challenges.

Examples of the Steinbeis solution in use come from the insurance sector (project iNTeg-Risk) and the chemical industry (project MUST). Using the iNTeg-Risk system, professionals can assess risk in a clear manner in a way that is pertinent to business. As well as pinpointing potential risk early and assessing it, the system provides a clearer overview of processes at every stage of the product or technology life cycle. It proved its value during tragic events in 2011. The R-Tech Group has also become an established "knowledge trust agent" to the insurance sector, acting as a point of contact for reporting and summarizing risk-related information objectively and professionally.

The application used in the EU project MUST helps modern, active nanotechnology materials find application in corrosion protection. Aimed at the airplane industry, the materials facilitate a kind of self-healing process on damaged areas such as paint. The software application contains two modules, one designed to detect risks early, the other to model the behavior of nanoparticles in corrosion protection layers. Although the system is based on modern methods and highly complex meso-nano-scale modeling techniques (that describe the behavior of nanoparticles), SMEs can also use it in much less complex areas. Examples include looking at the optimum proportion of nanocontainers in corrosion protection layers, or the risk to staff using nanolacquers. In

keeping with the holistic approach to projects taken by Steinbeis, as well as addressing R&D, consulting and continuous professional development, the solution contributes also to with standardization.

This innovative concept, and the integrated system that comes with it, hold tremendous potential for further development. It can be built upon as new trends emerge or specific requirements arise. Subsequent developments and investigations into other possible areas of use or new applications will be carried out jointly with customers, business partners and other stakeholders. These include insurance companies, administrative bodies, international organizations, the EU and EU agencies. As part of a new EU project called PROMISLingua, the R-Tech Group is looking at issues of particular relevance to SMEs, such as languages, usability and the pre-selection of content for specific SME application areas. Outside Europe, the company is currently most active in China, particularly with its Safe China project.

R-tech system solutions offer a variety of components

- Modern services:
  - o Technology transfer
  - o Continuous professional development, including a master's degree in Risk Engineering and Management
  - o Commercialization and market-based sustainability
  - o European (EU) and international collaboration and presence
- Global networking:
  The R-Tech Group manages a database containing over 23,000 live contacts. Networking is considered a new approach to competence and capacity management.
- The very latest methods and tools:
  The R-Tech Group has developed a range of state-of-the-art methods and tools. These are delivered via the Internet and intranets.
- PPP-based financial concept:
  Entirely project-based financing (100% through third party funds).

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Donation presented to German HIV/AIDS charity

Steinbeis University research pays off

A donation of 1,075 Euro made to the HIV/AIDS relief association Deutsche AIDS-Hilfe – this was the positive by-product of a research project carried out by the SVI Endowed Chair for Marketing and Direct Marketing at Steinbeis University Berlin. The donation was presented in August to the association's managing director, Silke Klumb, by Professor Dr. Dr. Helmut Schneider, the incumbent Chair, and Ines Schönenberg, a bachelor's program graduate at the chair.

Ines Schönenberg, Silke Klumb, Helmut Schneider (left to right)

As part of her bachelor thesis, which was supervised by Professor Schneider, Ines Schönenberg examined the previously neglected area of purchasing behaviour in same-sex relationships. To provide an incentive, respondents were assured that for every completed questionnaire on completion of the research project, 5 Euro would be donated to the Deutsche AIDS-Hilfe, a non-profit nationwide network of authorities on the structural prevention and promotion of health in the context of HIV/AIDS. In total, 215 homosexual men took part in the survey, resulting in a donation amounting to 1,075 Euro. "We are delighted by the donation as we are dependent on the support of companies, social institutions and private individuals for funding. We will put this money toward our 2012 self-help convention, 'Positive Encounters', which is Europe's largest event for people with HIV and their friends and relatives. Thank you so much for supporting us in getting this important event underway", said Silke Klumb. The findings of the survey are currently being written up for publication in the Journal of Consumer Behaviour.

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Steinbeis Transfer Center in Constance supports businesses with XML services

Data processing with a view

Databases are omnipresent – in fact, it's impossible to imagine a modern system landscape that doesn't feature them as core components. Traditional relational databases specialize in managing clearly structured data. BaseX is the name of an open source, native XML database system developed in a research project at the University of Constance. The Steinbeis Transfer Center for Processing, Querying and Visualization of Very Large Datasets provides services based on BaseX for data-related problems.

Traditional solutions often have their limits, especially in highly dynamic business fields where business processes and data frequently change and need to be updated. XML has established itself as a data exchange format; using it removes the need to constantly update the architecture of cumbersome database systems in response to changing conditions and data formats. Short for Extensible Markup Language, XML is a simple and extremely flexible text format suitable for storing a wide variety of data in a form that both people and computer programs can read and edit. When business processes change, it is common practice to read out data from relational databases then edit and update it in XML format. Together with the fact that XML is a platform-independent data exchange format, this has led to an enormous rise in its use in companies. Software systems output their results in XML by default and expect input in the same format. Clearly in cases like these, the best database solutions are those that can work directly with data in XML, without needing to convert it first.

One example of this type of native XML database system is BaseX, which traces its roots back to the chair for Databases and Information Systems at University of Constance, headed by Prof. Dr. Marc H. Scholl. Spurred on by the challenge of providing optimal XML support in a database context and overcoming the various hurdles that semi-structured data like XML entails, the project team developed BaseX into a full product which now enjoys popularity around the world. During product development, the team focused on lean architecture and maximum efficiency combined with high user-friendliness – a rare quality for database systems. The project was started in 2007 by Dr. Christian Grün and since then has been driven by a dedicated development team. The overall system comprises the robust database kernel, the interactive user interface, multiple programming interfaces, plus comprehensive documentation. The basic idea behind BaseX was not to invent a new technology per se, but to leverage the findings from decades of research into traditional relational databases and apply them to XML. So the hierarchical tree structure inherent to all types of XML exists in BaseX as a relational representation. But instead of taking a superficial approach to the problem and using a relational database for storage, BaseX instead employs a special type of coding that allows XML query languages to work efficiently. The query language recommended for XML by the W3C is Xquery, and BaseX is one of the few implementations that supports all of XQuery's official features and extensions.

XML databases are set to experience a new renaissance as part of the NoSQL movement. Many application domains are still clinging to relational database systems and forcing semi-structured (XML) data into a relational format. More and more, solutions like these are emerging as inflexible. The aim of BaseX is to standardize these processes. The team of experts at the Steinbeis Transfer Center provide professional consultation, tailored programming, system integration and training relating to BaseX and XML.

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Silent Stars exhibition in the Wilhelm Wagenfeld Haus in Bremen

Innovative high-tech materials

Pushing boundaries and exploring new places is part of human nature. But the human body is weak and sensitive. Left unprotected, our skin burns after just a short time in the sun, and it disintegrates under water. Humans can't crack nuts with their teeth or work stone with their fingers. The need to protect ourselves against the elements and to make tools, and the desire to penetrate inhospitable habitats, are just some of the factors that have driven our use of materials and invention of new materials throughout history. And it's these materials that are the focus of a special new exhibition planned and created by the Steinbeis Transfer Center i/i/d Institute of Integrated Design in Bremen.

Developing new materials and new applications for materials is all about pushing boundaries and extremes. From the Arctic to the Antarctic, from the depths of the ocean to the edge of space, people never stop wanting to go further, higher, deeper or faster. To do this, they may need materials that are softer, harder, lighter, heavier, smoother, rougher, tougher or more flexible. The Silent Stars: Extreme Materials in Extreme Applications exhibition at the Wilhelm Wagenfeld Haus in Bremen is dedicated to this topic. Silent Stars focuses on recognizing and showcasing special materials which often remain out of sight despite their outstanding properties, and without which innovative, well-designed high-tech products would be impossible. The collection of over 120 products on show begins with specially designed suits to protect people against cold, heat, pressure or friction – for astronauts, racing drivers, firefighters and extreme athletes. The exhibition also includes a model of the special swimsuit – which has since been banned – that Michael Phelps wore when he set seven world records at the 2008 Olympic Games in Beijing. "He's too good for this world," commented Professor Detlef Rahe wryly as he guided a group through the exhibition. "Bremen Invest" – Bremen Economic Development – commissioned Professor Rahe and his team of Steinbeis experts to curate, design and set up the exhibition.

Another highlight of the exhibition was a shape-memory alloy, a metal alloy that remembers its original shape and, after being deformed, returns to it when heated. "Memory metals" like these have a range of applications, including in medicine: They can be used in stents, the small wire structures used to stabilize arteries. Medical technology is a major driver of innovation when it comes to materials – as also exemplified by items such as hydroxylapatite bone screws, which can be used to fix cruciate ligament transplants. Reducing weight and fuel consumption also help drive the development of new high-tech materials and surfaces. A carbon wind turbine blade segment developed by SGL Rotec demonstrated the extreme lightweight construction techniques that will be used in large-scale wind turbines of the future. Similarly, the exhibition also showcased a Tesla electric sports car with roll bars made of ultra-lightweight carbon-fiber-reinforced plastic. Also on show: the latest aircraft flap production technologies, plus innovative fuselage surfaces that improve aerodynamics and thus reduce the fuel consumption of Airbuses. Environmental considerations such as waste reduction, reusability, recyclability and compostability are also major drivers of innovative materials and applications. To reflect this, the exhibition also displayed the latest biodegradable organic materials that can even be composted. These are generally made from granulates that frequently contain a high proportion of starch. They can already be used in conventional injection molding without the need to invest in new production methods. The exhibition also presented translucent concrete, a surprising and ingenious combination of fiber-optic cables and lightweight concrete set to open up new possibilities in architecture. Also on show: the Inox-Spectral process, which can be used to produce colored, rustproof stainless steel without the need for any paints or dyes. With such a wide range of materials and applications being presented, the exhibition was lively and interesting, and met with an ex-

tremely positive reception both from people in the materials field and the general public. Over 5,000 people visited the exhibition, not including the many special guided tours, lectures and evening events that also formed part of the program. In recognition of its success, the Silent Stars exhibition even won the highly sought-after iF communication design award 2011 and was nominated for the German Design Award.

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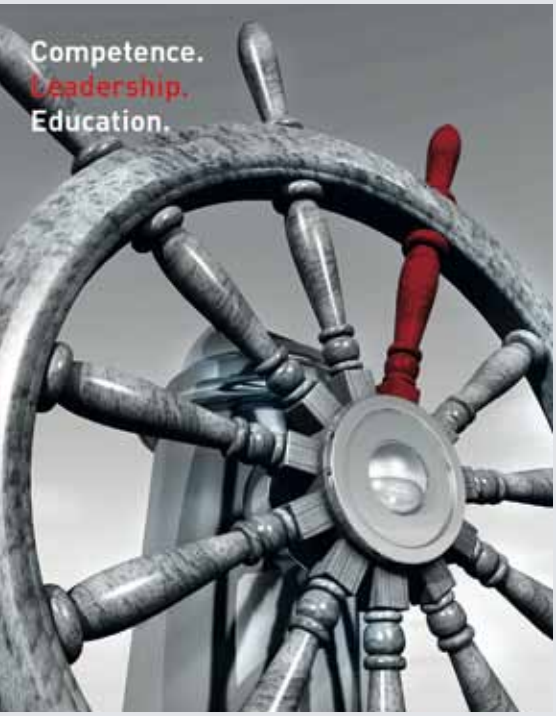

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Education – or the honing of competence in all areas of life – is neither a privilege of the elite nor an activity limited to specific vocations. In other words: Education is a right that each and every one of us is entitled to, almost a duty to everyone. But those most obviously affected by this duty are the people who occupy a higher profile in their role as leaders in society. Given the increasingly complex nature of society and the faster and faster pace, not only do we need well educated – i.e., more skilled – specialists, we need managers with a proper education. Experts from the world of science and academia will join their counterparts from business to examine and discuss these issues from a variety of angles at the 2011 Stuttgart Competence Day. Attendance is free, although registration is required.

The 2011 Stuttgart Competence Day

Competence.Leadership.Education.

Education is a core strategy – not just for individuals but also for society as a whole, to keep pace with a world fraught with more and more confusion, accelerating progress and sometimes revolutionary change. Let's say that education is the means for us as human beings to get fit and stay that way for modern living. Then, given the complex, fast-moving, revolutionary environment we live in, education should extend to the life-long development of our competence – as a means to cope with the new and different, as a must-have in staying part of this world. Educating people to be and become leaders is the core theme of the fourth Stuttgart Competence Day organized by Steinbeis University Berlin. This year it is being held at the Stuttgart "Haus der Wirtschaft" (House of Commerce) on December 2. This year's theme: "Competence.Leadership.Education."

Program (all speeches in German, agenda updated Sept 2011):

10:00 **Welcome**
Prof. Dr. Dr. h. c. mult. Johann Löhn, Steinbeis University Berlin

10:15 **Competence.Leadership.Education.: an introduction**
Prof. Dr. Werner G. Faix, School of International Business and Entrepreneurship (SIBE) at Steinbeis University Berlin (SHB)

10:45 **IBM Global CEO Study 2010: leadership in a world of complexity**
Roland Scheffler, IBM Deutschland GmbH

11:20 **Education and personality**
Prof. Dr. Rudolf Tippelt, LMU Munich

12:00 **Lunch**

13:00 **Leadership Education in the U.S.**
Dr. Ulrich Schreiterer, The Social Science Research Center (WZB) Berlin

13:40 **ABB: organizational development through systematic succession planning**
Udo Sturm, ABB AG

14:10 **Management competence**
Prof. Dr. John Erpenbeck, School of International Business and Entrepreneurship (SIBE) at SHB

14:40 **Networking break**

15:00 **Management development at Robert Bosch GmbH**
Carsten Schlichting, Robert Bosch GmbH

15:30 **The Senior MBA instead of early retirement. How to keep top performers fit for the future.**
Dr. Joachim Sailer, School of International Business and Entrepreneurship (SIBE) at SHB

15:45 **Leading.Performing.Targeting.**
Jens Mergenthaler, School of International Business and Entrepreneurship (SIBE) at SHB

16:00 **Leading the game in companies**
Dr. Barbara Niedner, Behavioral biology and leadership

16:30 **"Germany – Land of Ideas"**
Initiative in cooperation with Deutsche Bank
Klug³ prize giving – Master of Science in International Management

16:40 **Competence.Leadership.Education.: success!**
Prof. Dr. Werner G. Faix, School of International Business and Entrepreneurship (SIBE) at SHB

To find out more and register online, go to **www.stuttgarter-kompetenztag.de**

Entrepreneurial learning for tomorrow's decision-makers in the real estate industry

A playful way to figure out the key to success

Work on typical business issues from the real world of real estate – together or against each other. This was the task given to students enrolled in the Master of Science in Real Estate program at the Steinbeis Transfer Institute of Building and Property Industry at Steinbeis University Berlin. Drawing on the principles of game theory, the students developed "ideal" success strategies. It was all part of strategy training using a business case study. The underlying idea of the management training comes from a business game called Real Investor that was developed at the EURO Institute of Real Estate Management in Zug, Switzerland.

The students were divided into teams and given a case study based on an example from business: a real estate portfolio. The teams then went through a typical, albeit simplified, sales process. The seller's task was to figure out the most successful strategy for selling the real estate portfolio, simultaneously maximizing the selling price. Attention had to be paid to the competitive nature of relationships between sales leads. Once buyers and sellers had key information about the portfolio and their individual profit goals, they entered into intensive negotiations. The real estate experts became embroiled in a kind of "co-opetition", part cooperation, part competition. When the strategy coach analyzed the play of both parties and looked at the result of the negotiation, he immediately identified how rational decision-makers become. The actual transaction price can be calculated using an economic equation dictated by mutual interactions between both parties. For the sale of a real estate portfolio to work, it is crucial to win sales leads who are able to add the most value to price negotiations.

The price negotiation tactics adopted by the sales leads is generally dictated by their capital costs. What this means is that the sellers of a real estate portfolio can make a profit if they can find sales leads with cheaper capital than they have. If the capital costs of the buyer are lower than the market capitalization rate ("cap rate"), the selling price that can be achieved will be higher than the market value of the portfolio. The highest selling price will be paid by the buyer with the lowest capital costs. Because of the competition between the sales leads, the lower the second lowest capital costs of the buyers involved in the negotiation, the higher the buying price will be. The key to success when selling a real estate portfolio is thus to invite at least two sales leads to bid on a sale. Their capital costs need to be significantly lower than the cap rate. The transaction price will then be considered fair by both parties, as it will be significantly higher than the market value.

As the training progressed, the students worked on a success strategy for more complex business situations. This time, they had to develop a logistics property at Schiphol airport in Amsterdam. The owner of the land, Schiphol Real Estate, needed a business model that would allow them to add value by developing the property without having to invest any of the owner's own capital. The students were introduced to the Brandenburger and Naleboff's strategic behavior model PARTS, which results step by step in a more successful strategy.

Each team chose a role to adopt during the game. The result – a strategy for Schiphol Real Estate to adopt – was broken down into two parts. First, found a development company, with a logistics company acting as the anchor tenant, then develop a tailor-made building. Second, sell the development, including tenancy agreement with the logistics company, to a company with plenty of capital. During the game, the teams also worked out a financing model involving a property company set up as a "special purpose vehicle."

After the one-day strategy session, the students had to demonstrate their newly acquired strategic knowledge and skills in an exam. Their task was to organize a network of services provided by a real estate company and identify key customers, suppliers, competitors and business partners. They then had to establish a win-win collaboration with business partners and draft strategic plans for the financial success of the business.

The students involved in the business game clearly enjoyed it. They learned a great deal about commercial success within their own profession and can now play through the strategic implications of changing business scenarios – and make changes to their own advantage. This business game is a perfect example of the interactive learning approach used at the Steinbeis Transfer Institute of Building and Property Industry. Not without coincidence: In many areas of the real estate industry, there is growing demand for analytical, valuation-based, decision-making skills rooted in scientific knowledge.

Marrying the ability to understand methods and apply them, seeing the impact of one's own decision in the "safe" environment of a business simulation, drafting alternative strategies and trying them out – all these foster understanding that will come in handy in the years to come. This interactive approach to learning also gives students quick feedback and insight into themselves. For companies and up-and-coming managers, this is also a core requirement of future training.

What is the gamy theory?

A strategic business game is where participants are put into a dynamic situation in which the success of the decision-maker depends on the choices of others. The science of commercial behavior in dynamic situations is called game theory. The Real Investor business game is "real" in terms of its effect on actual success. According to the "The Right Game," a bestseller written by Brandenburger and Nalebuff, the five components of the PARTS strategic behavior model are:

Players	–	Which business partners should be won ever?
Added Values	–	What values should be added?
Rules	–	Which arrangements will be made?
Tactics	–	Which information will be used?
Scope	–	Which borders will be set?

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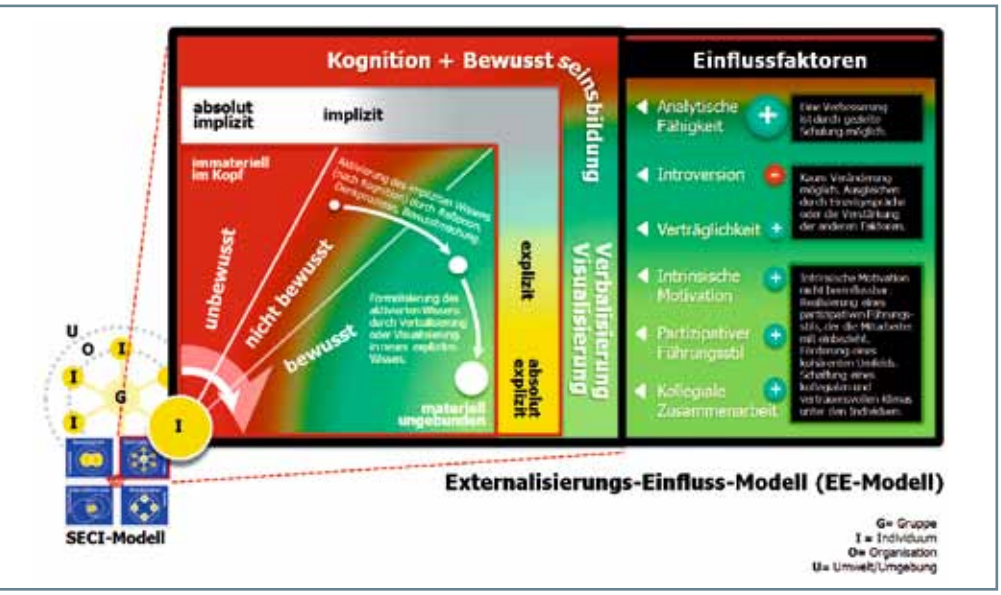
SHB Ph.D. student examines knowledge-sharing

Externalizing tacit knowledge

Knowledge has developed into a core production factor of the 21st century. Especially in knowledge-intensive sectors like the software industry, employee experience and insights – captured in tacit knowledge – hold tremendous potential for innovation. Companies have been attempting to externalize this tacit knowledge and channel it into fruitful outcomes for decades, albeit with limited success. Oliver Gilbert, a Ph.D. student at Steinbeis University Berlin, is the first to succeed in identifying key factors influencing the externalization of experience and insights held by researchers and developers in the software industry. Drawing on the findings of his key success factor research, Gilbert developed an action-based working model for R&D managers to support the transformation of experience-based knowledge into explicit, transferable knowledge.



The externalization influence model (EI model), an extension of the SECI model

The knowledge management models discussed in the literature that are aimed at externalization have not been successful in the long run. The same applies to the plethora of knowledge management software solutions, even those supported by Web 2.0 or social software applied to a business context. As a result, Oliver Gilbert's research project concentrated on factors that specifically influence knowledge externalization. He identified individual and institutional factors. Drawing on the latest knowledge research and knowledge management studies, and supported by theoretical research, Gilbert was able to explain the process of externalization in detail and map out the likely connections in a structural equation model using deductive-nomological techniques. A subsequent empirical examination of causal links yielded some fascinating results.

A standard Web-based questionnaire was used to question a large number of researchers and developers working in the R&D departments of small, medium-sized and large software companies. In total, 179 useable sets of responses were received. The descriptive findings confirmed the assumed situation at the start of the research: 36.4 percent of respondents stated that the need to externalize information in their companies was extreme, while 41.3 percent said there was a strong need. Despite this, 31.8 percent of questioned R&D experts estimated that less than 40 percent of the tacit knowledge held within the company was being used. This implies that a large proportion of tacit knowledge goes unused. In other words, the potential to innovate and come up with new solutions and products is not being fully exploited. It was also interesting to find that over 63 percent of respondents stated that knowledge management software was being used to apply and share knowledge at their company.

The reason that companies have been so unsuccessful until now in their attempts to externalize tacit knowledge therefore seems not to be technical issues, but individual and institutional factors. The model indicates that individuals' analytical capabilities are more likely to dictate the success of externalization. Other factors that also relate to the individual are intrinsic motivation and, in particular, personality. If an employee is easy to get along with, this has a positive influence on externalization. A person who is decidedly an introvert has a negative influence, even if a strong degree of extraversion could also not be confirmed as a key factor. This contrasts to two institutional influences that affect the overall situation. One is the participative style of leadership – the degree to which the experience and insights of staff are put center stage and used as a basis for a variety of management decisions. The other is how well people work in teams, and the working atmosphere among co-workers. This latter point was a noteworthy finding as until now, company culture has been considered a key success factor –

without any empirical information to confirm this fact. Thus, it is not values, relics or basic premises that act as cultural influences in dictating externalization, but the perceived quality of actual interactions between researchers and developers.

Oliver Gilbert fed these insights into his externalization influence model, an extension of the SECI model proposed by the scientists Nonaka and Takeuchi. The SECI model contrasts externalization – an understandable psychological process shaped by cognition, the forming of awareness and formalization – with key influences. It explains why knowledge should be seen as a continuum between completely tacit and completely explicit knowledge. Externalization can, however, only work with tacit knowledge that is not conscious, and can only be influenced by external factors. Even then, externalization can only work during the parts of the process in which individuals gain awareness and verbalize and visualize knowledge.

Oliver Gilbert's research shows clearly why externalization has enjoyed little success until now. The success factors identified provide managers with a number of pointers and show how to deal with tacit knowledge in companies in a more targeted manner.

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Steinbeis Consulting Center selected as "model location"

What if you could reinvent yourself?

Most visitors drop in just before noon, some just after noon. Women, men, adolescents. All are standing before a time of change, or are going through it, or are getting nowhere, or have noticed that they're not happy with a decision they made. The Coaching Workshop Steinbeis Consulting Center has been providing clients with supervision and coaching for three years now. Most clients come from Böblingen and the surrounding area. The aim of the center's workshops: to uncover new work, training or health strategies. The center was recently selected as a model location in Baden-Württemberg to help people make a new start in life.

The consulting rooms at the center feel just right. What better way for clients to transport themselves into different place or situation? On vacation. Calm all around. Relaxation. Take a deep breath. It soon becomes apparent that, at any given time, people really can, for a brief moment, imagine being someone else. And this someone else views the world differently, smells it differently, sees him or herself moving around in it differently – and thus feels different. Just because of the different location and the shift in attention. This important insight is a major door-opener for the consultation process that is about to begin.

Verena Burgbacher and Heidi Boner-Schilling head up the Steinbeis center. They both bring special therapeutic skills and an understanding of business to the unit – and to everyone's benefit. They know that clients always do the best they can, but for one reason or another they haven't necessary always done what was right from a personal standpoint. They also know that people have a number of sides to them. Sometimes they're more outspoken, more demanding. Or they try to fit in more, or withdraw. As a result, they can feel confused. The experts also always assume that people shape their own reality and are therefore in a position to change their reality in a way that matches their goals more closely (according to P. Watzlawick).

These are just some of the fundamentals underpinning the special advisory work carried out at the center – sometimes standing around a table, sometimes in an armchair, sometimes sitting at a desk, sometimes moving around the room. The duo work by combining structured choreography, family trees, work with props and physical tasks with conventional coaching and supervisory tools. What's special and novel about their work is the perfect mixture of four factors: cognition, physiology, kinesthetics and energy – a person's innate potential.

The Steinbeis Consulting Center was recently selected by Germany's Federal Ministry for Family Affairs to work with 17 other units, as part of 134 projects. The center is the only "model location" in Baden-Württemberg working on the topic of giving people a fresh start in life.

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Supporting people with functional illiteracy

Learning letter by letter

According to research recently conducted by the University of Hamburg on behalf of the Federal Ministry of Education and Research (BMBF), there are 7.5 million adults in Germany with a minimal ability to read and write. Now a new technique has been developed as part of AlphaPlus, a project sponsored by the BMBF. It makes it easier for people to get into reading and writing. The technology behind the technique was developed by a company called MediTECH Electronic near Hanover. The teaching system will be launched this year. An important foundation has been laid through close collaboration between Professor Franz Hinrichsmeyer, who heads up Uniform. Design Steinbeis Transfer Center and the Institute of Industrial Design and Interface Design at Magdeburg-Stendal University of Applied Sciences.

MediTECH has been based in the Lower Saxony town of Wedemark since 1996. Over the last 15 years, it has looked closely at testing and training processes used to promote speech, attention and perception. The new technology is based on the Warnke® Method, which helps children and adults whose language development has slowed as a result of central auditory problems. Instead of conventional exercises, the company uses special equipment to help the brain process and perceive language.

The company bought standard housings with analog controls and refashioned them into new technical solutions. The AlphaTrainer was developed in the same way, as a prototype to teach reading and writing. As the company expanded, it soon needed to design its own equipment and develop its own products. What was called for was a specially designed housing with different controls, especially for people with severe reading difficulties.

The MediTECH development department is not far from the specialist engineering and industrial design department at Magdeburg-Stendal University of Applied Sciences so this was an expedient way to redesign the AlphaTrainer. In a joint project with the Institute for Industrial Design's engineering and industrial design department, design student Eckhard Kaltenhäuser wrote a report as part of his bachelor degree at the Steinbeis Transfer Center for Project Management. This took place in close cooperation with graduates from the Institute of Electrical Engineering.

The first design was intended for serial batches of 3,000 units. It featured a twin-shell housing with a membrane keyboard. The project team looked for ways to injection-mold parts near Magdeburg, using a new kind of cost-efficient aluminum tooling process.

For optimal use in therapy sessions, the AlphaTrainer offers a variety of additional settings and usage options which can be matched to the user. Overall, operation has been made as clear as possible thanks to carefully designed icons that make it easy to familiarize oneself with the controls, even if people have limited reading ability. Every user can jump in at the right level. An intelligent brain-jogging program develops and expands specific skills needed to process spoken and written words.

Over a seven month training period, the people involved in the AlphaPlus project raised their ability to read and write by the equivalent of 1.5 school years. Around a quarter went straight from training into a job, often for the first time. By the end of 2011, approved establishments will also be allowed to use the special system. And the success of the project – on several levels – is now reflected in another recent development: Earlier this year, Professor Franz Hinrichsmeyer founded the Steinbeis Transfer Center Uniform.Design at the Magdeburg-Stendal University of Applied Sciences. Its field of specialization: the design of business-to-business products and medical technology.

The Warnke®-Method

To understand words quickly – and without special effort – and automatically identify the sound of letters, the listener has to be able to distinguish between the key sounds of a language, rapidly and with certainty. To write smoothly and shape the direction of letters, a person has to be able to control and readjust hand movements through observation. The Warnke® Method goes back to the early 1990s, when it was proved that there is a link between learning difficulties and low-level difficulties with hearing, seeing and motor skills. As well as improving cognitive processing, one side benefit of the technique is significant improvements in writing.

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A strategy to develop wharfs on the Neckar river in Plochingen

Full steam ahead

The inland waterways are the only transport network in Germany with significant spare capacity. Compared to the rail and road network, there is plenty of potential to take more traffic. Yet government forecasts indicate that the transport output of waterborne traffic (in 1000s of km) will "only" rise by 26 percent between 2004 and 2025, while rail output will rise by 65 percent and road haulage output will rise by 84 percent. Fundamental changes in freight traffic and logistics have affected waterborne traffic and riverside dockland areas, mainly as a result of the different nature of freight: Companies are increasingly shifting production from mass goods to value-added products and splitting the location of their value chain activities. To adapt to these changes, Neckarhafen Plochingen GmbH, which runs the docks on the Neckar river in Plochingen, asked the Sinsheim-based Steinbeis Innovation Center for Logistics and Sustainability to draft a long-term dockland development strategy.

The starting point for the project was a study looking at the principles of inland waterway traffic and dockland concepts. The study, which had been carried out as part of an update to the Baden-Württemberg general transport plan, estimated that the wharf in Plochingen on the Neckar river had the highest growth potential of all inland dockland areas in Baden-Württemberg. The dock's managers, a company called Neckarhafen Plochingen, needed a long-term dockland development strategy to put everything in place to cope with anticipated higher capacities and steel itself for processing future freight volumes.

The study was carried out in several stages, each of which builds on the others. First, the docks were analyzed in detail, complete with shipping users and existing superstructures. Starting out, the team looked at the current situation at the Plochingen wharf. As well as evaluating fundamentals such as general factors affecting the location and anticipated future trends, the experts also examined waterborne traffic that uses the docks. Then, the issues and challenges faced by companies using the docks were identified. These ranged from operational issues and general infrastructure problems (especially storage areas) to general transport links with the road, rail and waterway network.

The third priority was to work up specific recommended actions, in keeping with the long-term dockland development strategy. To be in a position to cope with freight volume increases of over 500 percent, it will be absolutely crucial not only to find more land, but also to make it available for use. One solution would be to convert a pool used as a safety dock inside the wharf. This would free up around 15,000 sq m of land for businesses and shipping companies to use. By narrowing the Neckar river, it would also be possible to free up space and add land next to the riverside mooring area. Although another area of land used by trains directly next to the dockland would not be available in the short term, in the long term it could be of interest for strategic reasons. If trains using the tracks no longer need this railroad infrastructure, it would free up yet more land and this could also be used to extend the docks.

One sign that docklands are flourishing is that new services start popping up. But to do this, companies need the right kind of land and transport connections to the road, rail and inland waterway network. In this respect, the wharf in Plochingen is actually already well connected. There are also plans in the pipeline to extend locks on the Neckar river. This move will be central in keeping the location attractive to dock users. Boats up to 135 meters in length will then be able to use the dock.

The dockland development strategy that Steinbeis Innovation Center for Logistics and Sustainability proposed for Plochingen has provided wharf managers with a basis for future decision-making and will help the company, Neckarhafen Plochingen, answer tomorrow's challenges and position itself as an innovative service provider.

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Vocational training in the Georgian wine industry

International knowledge-sharing

Business apprenticeships – providing business training in parallel to education at a vocational college or university of cooperative education – are one of the strengths of the German economy, mainly due to the way they marry theory with practice. Georgian winegrowers now hope to benefit from this German specialty. The Steinbeis Innovation Center of Wine Economy at Heilbronn University offers wine businesses a spectrum of transfer services, including consulting. Its recent project – aimed at providing vineyard owners with formal qualifications and setting up "dual" training within the Georgian wine industry – will introduce local winegrowers to this new concept of parallel education, and thus help modernize Georgian vocational training along the same lines as tried and trusted apprenticeships in Germany.

One of the main aims of the German-Georgian training scheme is to promote partnership between public educational bodies and private enterprise in the Georgian winegrowing business. This is similar to the approach in Germany and it is hoped this will improve vocational training in Georgia and the standard of the curriculum. The initiative ranges from the launch of dual education for vintners and heads of cellars, to staff training for managers and providing managers with official qualifications.

Georgia has a lot of catching up to do when it comes to providing managers at winemakers and wine processing companies with basic training and qualifications. After the old political system broke down, many training establishments were forced to close due to the lack of teaching staff and funding. To make up for these deficits in vocational training – in what for Georgia is a key sector of the economy – the experts at the Steinbeis Innovation Center have launched a two-year dual education scheme for winegrowers and vintners. It's all part of a project at the center of vocational education in the eastern Georgian region of Kakheti.

Theory is taught with German specialist literature which has been translated into Georgian and adapted to local needs. Vocational training takes place within the winegrowing companies in the region that signed on to the program. Potentially, when the young people doing the apprenticeships have completed their training, these firms will become their future employer. The winegrowers need the support of experts, especially in management, and it is hoped that much input will come from the apprentices.

The seminar and training sessions organized by the German experts – in Georgia and Germany – have already given teaching staff at the vocational colleges and managers of participating winegrowing companies plenty of new ideas. These new insights can now be handed on to the apprentices in Georgia – and knowledge transfer can start to accelerate.

Step by step, the German educational model will help enhance the long-term efficiency of Georgia's most important sector of industry and become an indispensable prerequisite for the sustainable development of the winemaking industry. Synergies generated by the project will be transferred to other programs of vocational training in the country, and the dual system will also be adopted by other industries. Lessons learned during the project can thus be built upon and applied to other areas of the farming and agrifood sector – also in other countries in the Caucasus region.

Given the deficits in basic vocational training and management education in other countries in the Caucasus region, it would certainly be worth transferring the project and, with it, the process to those countries. For emerging economies, taking on the principles of dual vocational training is a golden opportunity to improve qualifications, enhance staff competitiveness and thus provide workers with new prospects for their future careers.

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Documenting and valuing works of art in local museums

Art, expressed in numbers

To prepare their balance sheets, local authorities often have to value a variety of assets for the first time. Usually there is no comparable business data to refer to or tried and tested processes to turn to for valuing property. In a similar way to industry, the solution is to lay down detailed valuation guidelines and identify valuation methods that do fulfill requirements. This is particularly important with certain types of works of art, cultural possessions and collections owned by the community. Prof. Dr. Bärbel Held, the Steinbeis Transfer Institute head of the Institute of Economics, was invited to join forces with a commercial enterprise and not only work out a method for documenting works of art and cultural possessions – in a way that would work in practice – but also create a model for valuing objects, all of which had to be prepared for the balance sheets.

The project team was asked to document around 1.6 million objects, enter them into a table and then value them. The objects were held in seven museums, some of them renowned beyond the local area, at a variety of locations in a major city in the east of Germany. Some 470,000 of the objects were classified as works of art. Once the objects had been logged on the inventory list, they were valued. Doing this can involve a number of techniques. The most common is the "One Euro Principle," although Prof. Dr. Held has her doubts about the method. "With the One Euro Principle, the underlying purpose of capturing information on the balance sheet, from the shareholders' point of view, is ignored," states the Steinbeis expert.

To arrive at the best model, the team looked at a valuation model used in the State of Hesse, where officials lay down value categories and corresponding values. There are three categories. A is for extremely valuable objects, B1-B6 for medium-value objects, and C for low-value objects. The main problem with this method is figuring out which bands to put works of art into. What are the criteria for putting art objects into each value category, and in which order should objects be valued? The team had to define the right criteria for putting objects into each category and lay down procedures which would work in practice. They suggested the following valuation sequence, which is also designed to take current legal requirements into account when preparing local authority balance sheets:

1. Evaluation of acquisition and production costs
2. Evaluation of replacement value, based on known assessments
3. Evaluation of known insurance value/donation value/gift value
4. Evaluation of comparable values/ list prices
5. Evaluation based on the valuation model

According to the German statutes, equity held by local authorities is common property and must therefore be preserved and sustained for following generations. The model chosen by the team values objects by taking the significance of a work of art or cultural possession into account in a way that also considers the obligations of the local authority in preparing balance sheets. The team's proposal included one approach based on an indicative model. This centered on the possibility of using a special technique for evaluating immaterial assets in trade balances. But unfortunately, there is no standard technique for doing this kind of evaluation either, and there is no reliable or understandable way to value immaterial assets. As a result, the team decided that the most sensible method would be to use criteria and indicators to value art objects and cultural possessions. Objects' significance on an overall societal level could loosely be described as "social value" and with the multi-level model proposed by the team, this social value can be broken down into different categories.
To provide a basis for decision-making, Prof.

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Dr. Held reviewed literature on the issue of valuing art and cultural objects and assessed models used by insurance companies and auction houses. Ten different types of museums and establishments were surveyed using qualitative methods developed by Mayring. The Steinbeis consultants carried out two different types of interviews with experts. They encouraged interviewees to talk freely. This allowed the experts to work out the subjective criteria respondents use to judge specific situations, which would not have been perceivable through system-

atic questioning. The interviews focused on problems and were based on a discussion guide which pointed the respondents toward certain issues but allowed them to respond with open answers, i.e., without prompts. Based on this case-study approach, the following indicators were selected for valuing works of art:

- **Optional value:** An offer can be used for an individual, but if so required the option stands open.
- **Existential value:** Value lies in something like a historical building, which has value because it exists.
- **Legacy value:** This relates to an obligation to preserve a work of art for the following generations, even if they are not currently in a position to express how much they value an object.
- **Prestige value:** This helps strengthens cultural identity.
- **Development value:** As well as supporting cultural integration, artistic work fosters creativity and the development of aesthetic and other standards.

These social values provide a basis and legitimacy for public financing. The meaning of cultural possessions owned by a community lies in their "social and societal value." What's more, works of art sometimes have a value-adding component to them. This is particularly important when works are being valued for sale or they will be subject to similar market-based activities. Economic factors can include:

- **Authenticity:** The authenticity of an object such as a painting plays an important role in its value.
- **State of preservation:** The condition of an object has a bearing on the value of a work of art, although it is not always possible to ascertain this without complex technology. In such cases, a weighting

Safe, reliable solenoid actuators

Measuring safety

As safety and reliability requirements are rising all the time, reluctance actuators are being used more and more to improve functionality in modern machinery and equipment, in cars, and even in consumer goods. The reliability of the complex overall system depends on the functionality of the individual electromagnets. Actuator systems are found in automobiles, power plants, elevators, industrial safety engineering and medical technology. External and internal variables that may cause technical parameters to deviate from their original calibration, leading to malfunctions during operation, cannot be wholly ruled out. The damage that can result from this necessitates that measures be taken to significantly improve safety and reliability. Diagnostic systems that detect damage at the earliest possible stage are an indispensable tool. The Steinbeis Transfer Center for Mechatronics in Ilmenau has developed MagHyst®, a measuring principle to determine the magnetic state of reluctance actuators upon every switch, thereby detecting other changes, too.

The system detects changes in the field coil, caused by heat or wear, that can lead to magnetic short circuits. It can thereby prevent failures by ensuring actuators can be replaced in good time. In short: it makes predictive maintenance possible. At present, the functionality of electromagnets is normally determined mechanically by measuring the force-distance curves, which generally means that the actuators have to be removed from the propulsion system. Inspecting electromagnets in this way requires a lot of effort, and the method also does not include suitable sensors that are able to take direct measurements in the worn or damaged areas. MagHyst® is an innovative measuring principle that uses the field coils of magnetic actuators as sensors, making it possible to assess both static and dynamic behavior via $\Psi(i,\delta)$ graphs. The magnetic properties of a magnetic actuator generally remain stable over its entire service life, and its magnetic behavior is only affected by changes in the mechanical or electrical subsystem. The measured curves deliver information on an electromagnet's critical functional parameters and quality indicators such as switching time, friction in the system, energy reserves and changes in working stroke. As such, MagHyst® allows for a hitherto unrivaled standard of condition monitoring for complex, safety-critical systems. Errors can be detected at an early stage through continual monitoring and sampling, which also makes it possible to estimate a system's predicted working life. This type of functional diagnostics has now successfully established itself in a wide variety of safety-critical applications.

The graphs to the right illustrate the potential of this new measurement technology. Figure 1 shows the typical dynamic $\Psi(i,\delta)$ curves when an electromagnet is switched. The dynamic processes during switching are clearly visible: attraction (1-2) and decline (4-5), attraction delay and decline delay. Points 1 to 5 show the progression of the switching operation of the system being measured. Deviations from these points indicate the nature of the error that has oc-

should be used, based on a state of preservation model.

- **Signature:** When people start saying that works of art are in high demand and a name has more influence on behavior than quality, this is a statement in itself.
- **Market-freshness, marketability, market demand and fashion:** particularly the latter two factors typically add market value.

Scores are awarded during valuation based on numerical methods. For each indicator, scores are given using the German school grade system. This applies to all art categories. To do this, the project team made a proposal. Then, a weighting had to be given separately, for each criteria, for every work of art. For this part, a matrix was used for each art category, with weighting factors and reasoning behind each factor. Finally, the total score was calculated by multiplying grades by the weighting factor. The score was then put into an individual value category, from A to B1 and then all the way up to B6. To aid decision-making when evaluating pieces of art, a catalog was also set up. An Excel spreadsheet captured each item on a list, backed up by the corresponding scoring model. Accordingly, the evaluators only needed to know the category shown in the catalog, based on school grades in five categories. The value of the work of art is then calculated automatically and is transferred, again automatically, to the inventory list.

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curred; curves may deviate in either direction depending on the source of the error. Before testing an electromagnet, a reference curve like this must first be recorded. Comparing the test results to the reference curve as a whole or to individual points delivers information on the state of the magnets being tested. The magnet measured in Figure 2 (red) is displaying much higher friction than would normally be expected. Compared to the reference curve (black), a much higher current is needed to switch the magnet. This type of error reflects the condition of the mechanical subsystem. Figure 3 shows the curve differs in the case of an error in the electrical subsystem. In this case, there is a short circuit in the coil, leading to a reduction in magnetic power which can impair the functioning of the magnet.

These striking examples show that reliable, non-destructive inspection of reluctance actuators is possible – and that changes in the static and dynamic behavior of these kinds of actuators can be visualized. One major benefit is that measurements can also be taken under load, or of reluctance actuators integrated into other functional units. So changes not just in electromagnets but also in valves, clutches and brakes are easy to detect. This measurement technique can be used at any point in an actuator's service life: to verify performance parameters during development, as part of the final inspection during manufacturing, and in condition monitoring and error analysis during operation. The latter application in particular is of major benefit, as it allows machine operators to prevent malfunctions that could lead to major damage.

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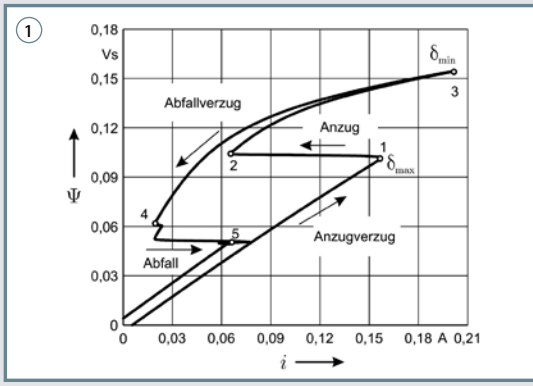
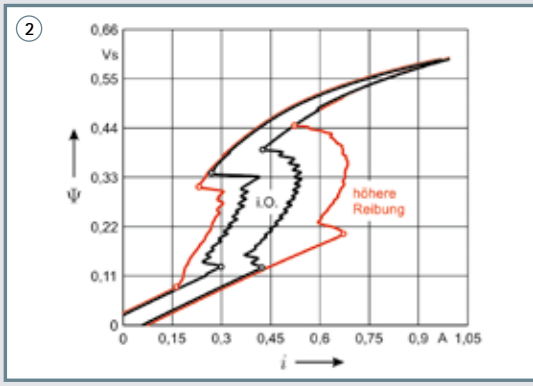
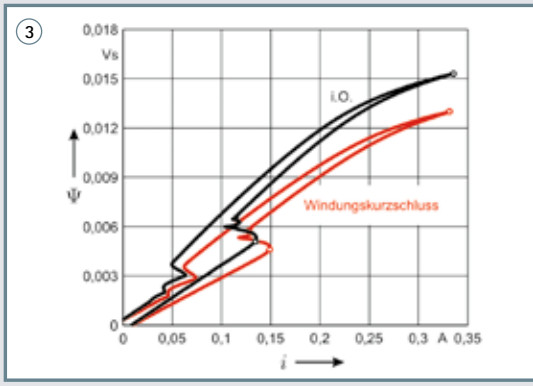


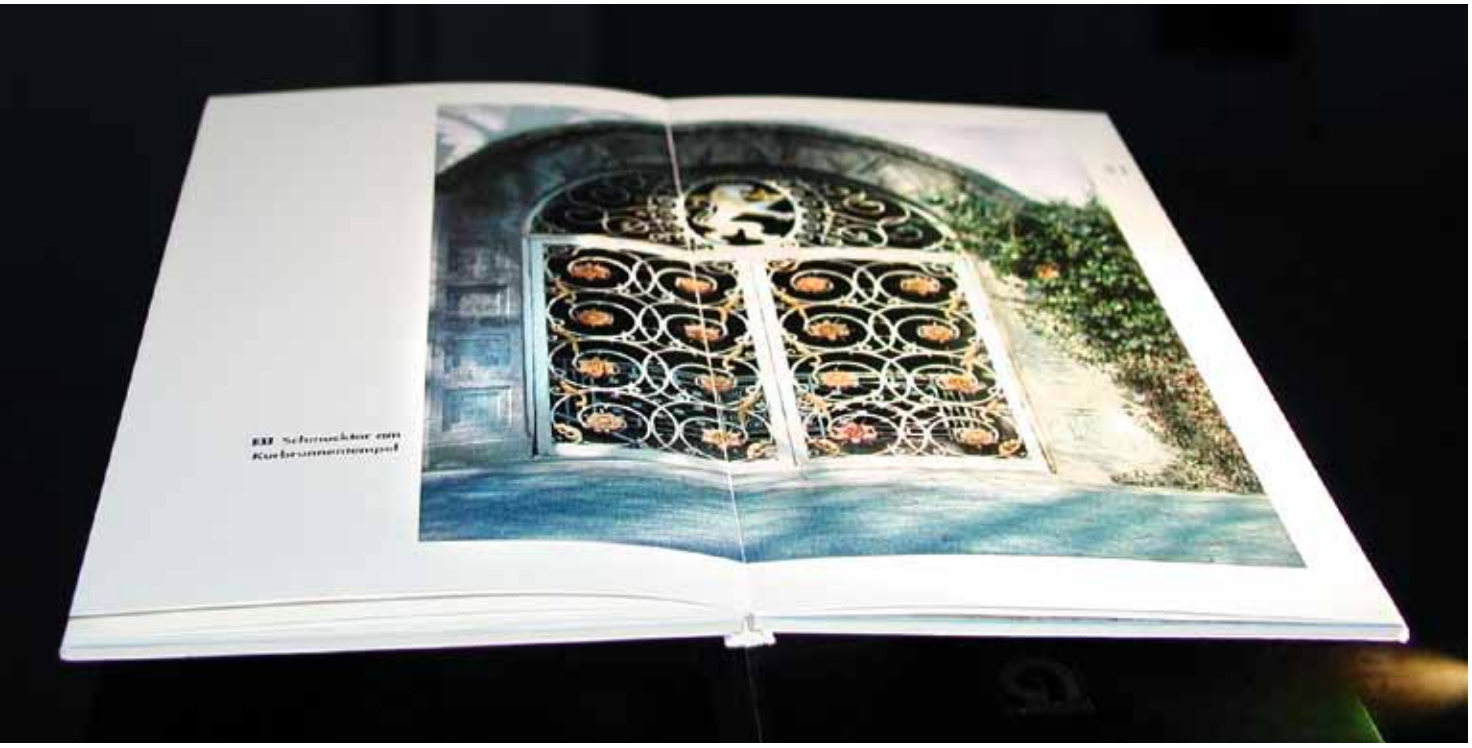




Special glue from Baden-Württemberg shakes up the market

An adhesive that the industry is stuck on

Ribler, an SME based in Stuttgart, develops, produces and sells bookbinding machines and comprehensive glue application systems for the print finishing industry. The company is extremely interested in international partnerships and is looking for foreign partners for research and development activities. Steinbeis-Europa-Zentrum (SEZ) successfully set up the right connections in Europe and helped Ribler become a partner in FAMOBS, an EU research project.



Ribler is a world leader when it comes to expertise in special adhesives for the paper finishing industry, especially complex digital printing paper. The company also manufactures bookbinding machines that use these adhesives. Ribler's special new adhesive enables lay-flat binding of almost any type of paper on the market. This process consumes less than five percent of the energy required by conventional bookbinding methods, and less than half as much adhesive. The adhesive itself is also environmentally friendly, and as its application requires no electricity, this technology is the only completely environmentally friendly bookbinding method currently in existence. Ribler's new bookbinding process is extremely flexible and reduces production costs by over 50 percent. Compared to conventional hot-melt binding, it is 100 percent environmentally friendly, as no vapors or toxic gases are released.

Thanks to the support of the SEZ, Ribler is now exploiting its expertise as part of a European research project. The SEZ has been providing Ribler with regular information on suitable funding opportunities and partner requests for several years now, as well as disseminating Ribler's own partner requests via the Enterprise Europe Network, which is made up of around 600 partners in 48 countries. Company profiles and technology profiles are distributed via the network, and partner organizations (such as the SEZ) identify possible international cooperation partners for companies in their local area.

Steinbeis-Europa-Zentrum supported Ribler with a joint research application together with 12 other partners, under the leadership of the Fraunhofer Institute for Manufacturing Engineering and Automation. The FAMOBS (Frequency Agile Microwave Bonding System) project received the go-ahead and is being funded for three years by the European Commission. The project's aim is to develop an open microwave oven for hardening adhesives. Microwaves can harden adhesives up to ten times faster than conventional convection ovens – and the microwave system is so compact that it can be integrated directly into an assembly system. This technology also has potential future applications in microelectronics and microsystems.

Ribler's technology is being used in the FAMOBS project. The company has developed an incredibly innovative and effective adhesive that reduces the hardening time in bookbinding to mere seconds instead of hours while minimizing the amount of energy required for hardening. Using microwaves to dry the adhesive means production costs can be reduced and productivity massively increased. The FAMOBS EU project gives Ribler the opportunity to work together with four other industrial companies and four research institutes from a total of eight different countries. Four SME associations are also involved in the project to represent the interests of their member companies and ensure the dissemination of the project results.

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Enterprise Europe Network

- European network comprising around 600 economic development agencies in 48 countries worldwide
- Targeted at European SMEs
- Aim: to support companies, universities and research institutes
- Helps SMEs establish contacts with commercial partners in other European countries
- Enables research and technology partnerships
- Allows innovative products and services from Baden-Württemberg to be distributed across Europe

Voluntary work in the community

Because life must go on

Steinbeis builds bridges between science and industry, always focusing on providing customers with tangible benefit. The approach is a leitmotiv for proactive, success-based technology transfer. But in everyday life, there are sometimes situations when this simply doesn't work. Targeted support has to come from a volunteer because the situation will have a lasting impact on a person's life. When a doctor has to tell someone that their child has cancer, it has existential implications for the child, parents and siblings. Totally different kinds of advice and support are called for to ease the burden of everyday life and help patients and those around them to learn to live with the situation. The Steinbeis Transfer Center for Manufacturing Technology & Machine Tools (TzPW) works with enterprise partners to support a Munich-based parents' initiative called "Elterninitiative Krebskranke Kinder München e.V."

Founded in 1985, the Krebskranke Kinder charity is run by volunteers and funded through donations. Its aim is to help children undergoing treatment in Munich for cancer, and by extension, to help their parents and siblings. Its work includes one-on-one activities plus assistance with organization and finances. Over the years, the charity has become an important partner to children's oncological wards. As well as working with doctors, nursing staff and psycho-sociologists, volunteers support the "School for Patients" at Schwabing Children's Hospital (the clinic and outpatients' clinic for pediatrics and youth medicine, Technische Universität München, Schwabing Clinic).

The parent initiative provides families with support in a number of ways – financial and psychological support, plus help with authorities. It also sponsors the work of KONA, a coordination unit for psycho-social follow-up care for the relatives of children cancer patients, and Jugend & Zukunft. This initiative also participates in a palliative care project for children with cancer called "Kleine Riesen."

The charity's work on the wards includes staff funding to maintain nursing standards. It also helps fund children's cancer research. This builds strong bridges, addressing medical needs and providing much needed help to individuals. Making a contribution to the work of the charity is easy: More information is available on the Internet.

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SHB research project on collective intelligence

Wisdom in numbers

Collective intelligence: a term we often see and hear these days. Scientist do not currently understand whether the outcomes of predictions that were based on collective experience can really be considered "intelligent" or "collectively intelligent." Plenty of examples point to the fact that groups of people have had considerable success making predictions, by using calculations that were based on their individual predictions. But still no-one knows when groups of people can be relied on to make predictions, or not. In July of this year, the Institute Organization Management (IOM) at Steinbeis University Berlin embarked on empirical research to investigate the phenomenon of collective intelligence.

Code-named KnowledgeCloud, the project aims to monitor various predictions made over two years in all areas of media and society. Predictions will be made by asking as many people as possible. The subjects do not have to be experts in a field; after all, the underlying aim of the study is to examine whether collective intelligence is a product of many people thinking together from a variety of different backgrounds.

The first round of KnowledgeCloud predictions ended in August. It looked at the market share of different smartphone operating systems in the first quarter of 2012.

Smartphone operating systems	Actual market share 1st Quarter 2011*	Predicted market share 1st Quarter 2012
Android	36.0 %	35.6 %
iPhone OS	16.8 %	26.4 %
Symbian (Nokia)	27.4 %	16.5 %
Blackberry OS	12.9 %	13.3 %
Microsoft	3.6 %	5.4 %
Other systems	3.3 %	2.6 %

*Source: Gartner,
quoted on www.statista.com

By the summer of 2012, it will be possible to see how good the "many" (170 people) were at making a prediction and if there are any first indications that collective intelligence exists, is growing or is non-existent. The second prediction round starts in October 2011. People can still take part by submitting predictions online to the following: What will the turnover of eBooks in fiction be in Germany for the whole of 2012?

Based on 2010 sales, which were Euro 20 million, and predicted sales of Euro 68 million in 2011, the German Publishers and Booksellers Association estimates that the 2012 sales of eBooks in 2012 will be Euro 136 million. The IOM is hoping that the KnowledgeCloud project will identify whether a collective prediction will be more accurate.

Researchers at the IOM will only be looking at short and medium-term predictions for their experiments, focusing on topics for which they have data or, where applicable, predictions from other sources. Once the two-year study is complete and many such experiments have taken place, it should be possible to spot patterns in the performance of the "collective intelligence" for these kinds of predictions. To work out the patterns, it is important that as well making a prediction, research participants must state how familiar they are with the field they are making the prediction about. This is so the scientists can analyze the extent to which being familiar with a topic improves or worsens performance.

For example, for the eBooks prediction, respondents were asked if they have ever bought an eBook or read one. This allows the IOM to evaluate whether predictions made by the volunteers with eBook experience are better, the same or worse than the respondents without such experience.

Based on this method, the KnowledgeCloud will generate a continual stream of different pointers over the next couple of years:

- How precise are the predictions made by the KnowledgeCloud – in absolute terms and compared to other predictions (if they exist)?
- How important is it for people to be familiar with a topic they are making a prediction about for their prediction to be accurate?
- Looking at rankings within the KnowledgeCloud: Which respondents perform better on each of the predictions?

The interim and final results of the KnowledgeCloud's performance will be published on an ongoing basis on the IOM Web site. The institute is also on Facebook and Twitter if people are interested in staying up to speed on KnowledgeCloud.

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The KnowledgeCloud experiment is open to everyone:

www.stw.de/su/1523

Steinbeis'CertifiedConsultant provides business qualifications

Certified skills

After a year of crisis in 2009, German business consultants quickly regained their road to success and, in 2010, the sector reported growth of 6.9 percent, equaling Euro 18.9 billion. That's almost double the growth rate of the German gross domestic product, which stood at 3.6 percent. Business consultants are also optimistic about the current year. These are the findings of a market study titled "Facts & Figures, The Consultant Market 2010/2011" which was presented by the German association of business consultants (known as the BDU) at its annual conference in Dusseldorf. Thanks to certification courses offered by the S'CC (Steinbeis'Certified-Consultant), consultants can address growing demands with the right qualifications.

The speed at which market conditions change and the increasing number of demands placed on small and medium-sized enterprises are also a challenge for business consultants. More and more, these professionals are being expected to pinpoint key issues based on solid analysis, suggest practical measures and stand by company directors during implementation as professional and trustworthy partners. Despite the current level of demand, SMEs are still sometimes reluctant to make use of the services now available to them. This is often because of the huge amount of variety and a lack of transparency regarding the quality of service providers. There are no entry requirements for people entering business consulting, no uniform training and no uniform standards.

This is where certification through Steinbeis'CertifiedConsultant comes in. Consultants are provided with certification to present to customers, showing their technical and methodical suitability for the role. Client companies can then rest assured that the advice they are receiving is of certified quality. To the consultants, the certificate is a useful USP that documents their suitability and experience for the client. The certification is the first standardized consultant profile to be introduced. It's an unequivocal reference for the quality of the consulting service and is thus highly regarded.

"At first I was more interested in getting the certificate, but then I was amazed by the process. The detailed expert interview in particular proved to me just how extremely high the standards are. The training given in the consultant workshop was probably the best training I've ever had. Yes it was intensive, but it was also personal and there were real-world examples which really lifted my methodical skills. The new consultant community is already working well. There's already a joint project in the pipeline with colleagues I met during training."

Frank Armbruster –
Project Manager Steinbeis Consulting Center Business Coaching

"When you specialize in regional economic promotion it's important these days to work professionally, with firms in all sectors. In combination with the tailor-made training at the consultant workshop, the certification you gain through the Steinbeis'CertifiedConsultant program was an important tool for me and I can only recommend it to any consultant who puts quality first. Of course, the certificate also acts as confirmation to clients that your service will be professional."

Ralf Lauterwasser –
Steinbeis Consulting Center Main-Tauber

"17 years' consulting in the Steinbeis Network. And then certification. Why? Because clients quite rightly expect consultants not just to have the obvious technical skills, but also a powerful array of methodical skills to apply to projects. The certification process challenges you to question your own methods and improve."

Jürgen Raizner –
Steinbeis Transfer Center EAST-WEST Cooperations

"IT work has become much more complex in recent years. We have to find solutions for a variety of issues and systems and these have to be the perfect fit for the company. IT also meshes much more closely with corporate development than it used to. This was one of the main reasons I moved deeper into consulting. The S'CC certification process gave me so many things to think about, especially the consulting side to IT projects."

Gerburg Joos-Braun –
Service Center Information Technology IT BruderhausDiakonie Stiftung Gustav Werner und Haus am Berg

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Performance management for SMEs based on open source

Intelligent solutions

Performance management methods, such as the balanced scorecard (BSC), are being used by an increasing number of small and medium-sized enterprises. There are now automatic systems for logging, mapping, adjusting and distributing key indicators in the form of business intelligence solutions which can even be useful for reporting operations at small and medium-sized enterprises. The TECHNUM Steinbeis Transfer Center, which specializes in technology-based business management, has been working with an SME partner on the development of a BSC-based solution which uses open source software to help companies standardize and automate data cleaning and the capturing and sharing of key indicators.

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Performance management systems provide users with structured, rapid-turnaround data for analyzing their company. As well as providing an overview, these systems assist users in examining data relating to key indicators in the company and core processes. The detail provided can help highlight possible risks well in advance.

The balanced scorecard introduced by the Steinbeis team on board helped managers with their strategic company planning and management reviews. It also helped document company performance for use with certification, audits and customers. Before the project with Steinbeis, the company only evaluated data on its balanced scorecard once a year, mainly due to the effort involved. So this exercise was only really useful for review purposes. The task was laborious because gathering, cleaning, calculating and finally evaluating information – on 20 key indicators, from a variety of sources – had to be carried out manually. So one of the Steinbeis experts' initial priorities was to automate the whole process of gathering and showing key indicators.

This highlighted several targets for the ensuing project:

- The BSC should remain clear and well structured, but information should be more detailed, both at the report level and when drilling down
- Reporting should be automated
- The software should be easy to use and expandable
- The software should not cost too much
- Data should be pooled automatically from a variety of sources

The team knew that the project would present several challenges. To map the existing balanced scorecard, the team members used a software package called BIRT (Business Intelligence Reporting Tool). This software already comes in an open source version, which instantly meant it would be cheaper to acquire and buy licenses for. It also provides plenty of inbuilt options to continuously upgrade features, generate new types of reports, change existing reports provided by the system, or even integrate new features.

To work alongside this solution, the team also decided to use an open source package called Talend with the aim of integrating information currently stored by the company in Excel spreadsheets. This software also supports extract-transform-load (ETL) processes. Talend makes it possible to maintain uniformity across the different types of data accessed by the BIRT system. The first step involved pulling the data needed for individual reports out of the database and cleaning up any rogue readings with specially designed filters. This automated query process is an effective way to keep data secure and keeps data uniform, even over extended periods. Armed with this data, the system is then in a position to calculate key indicators as required and graph them.

One of the advantages with the method used to display key indicators is that it provides dynamic drilldowns. This allows users to investigate indicators broken down by constituent part. The BIRT system also has dynamic diagrams produced by mouseclicks. It is also possible to merge individual reports into higher-level reports and visualize data with diagrams, thus allowing users to look at the whole BSC from different angles, such as

finances, processes, potential, clients and the environment. The main indicators provide an easy-to-follow overview of the key issues facing the company and how the situation has developed over time. In combination with the drilldown function and individual reports, users gain a precise appreciation of specific key indicators from a variety of perspectives.

Aside from looking at actual figures, the system was set up to allow users to add targets by key indicator and show these targets in the reports. The software marks up key indicators in color if they are not within target. If users need to quickly access more information while viewing the higher-level reports, there are links down to the individual reports making it possible to analyze possible causes and track a key indicator over time.

There are a number of ways to access the BSC. One is a reporting tool which allows users to call up reports manually straight from the system. At regular intervals, the system also automatically generates PDF files showing all the key indicators for a specific period of time. The decision to use open source software meant that as well as not having to pay for a license to use the solution, the company will always be able to extend the system. Moreover, because the data is based on a common format and the BSC scores are calculated automatically, it is always possible to view up-to-date business indicators. Thus, as well as addressing problems promptly, managers can now make logical and sensible decisions based on hard facts.

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Researching new materials

Killing germs with new copper-based materials

Left exposed on smooth, polished copper, bacteria will die before long. This is extremely useful in attempts to control dangerous infections. But pure copper becomes tarnished with brown and black copper oxide, which is not forcibly less beneficial for killing bacteria, but suggests an "unclean" optical impression. Saarbrücken-based Professor Dr.-Ing. Frank Mücklich, who heads up the Steinbeis Research Center Material Engineering Center Saarland is working with material scientists in an attempt to develop copper materials that help overcome this problem. Focusing on special surfaces and copper alloys, the team aims to create materials that can actively kill bacteria over an extended period. The project has Euro 300,000 of backing from the German Research Foundation.

"More and more hospitals are reporting cases involving multi-resistant germs, and even the strictest hygiene measures can't deal with them," reports Prof. Dr. Mücklich, Professor of Functional Materials at Saarland University. This could be a case for copper-based materials, for example as a coating on light switches or door handles. "But much more detailed research is needed," he continues, "to see how exactly copper makes bacteria harmless and how to maintain its efficacy over time." The material researcher is currently working with Marc Solioz, an international copper expert and pharmacologist at the University of Berne as well as microbiologists at Saarland University. The team will examine the efficacy of new types of copper materials in killing dangerous germs.

To change material surfaces, the researchers working with Prof. Dr. Mücklich are looking at a type of technology known as laser interference. This involves directing several laser beams at a material, bundled together, to create extremely precise patterns over an area of about one square centimeter. The effects are no bigger than several micro- or nanometers. "The light from the laser inflicts high temperatures on an extremely small surface area. We can practically melt all metals to one-tenth of the width of a hair," explains Prof. Dr. Mücklich. The intense heat of the laser beam can even change the topography of a surface so that it has tiny peaks or valleys. "These are about the size of an individual bacterium. So in theory it must be possible to form a kind of burrow, which the germs will fall into, like a trap, and then they're encircled by copper," suggests Prof. Dr. Mücklich.

The scientists are hoping that the laser treatment will also create material surfaces, which will not oxidize easily. "The antibacterial properties of materials should remain intact for as long as possible and not be compromised by cleaning materials or disinfectants," states Prof. Dr. Mücklich, describing the best-case scenario. To achieve this, the laser beams will also be used to change the inner structure of the material in a wafer-thin layer. "As well as experimenting with copper alloys, we'll also be using minute silver particles. Silver is known for its ability to kill off bacteria," adds Prof. Dr. Mücklich.

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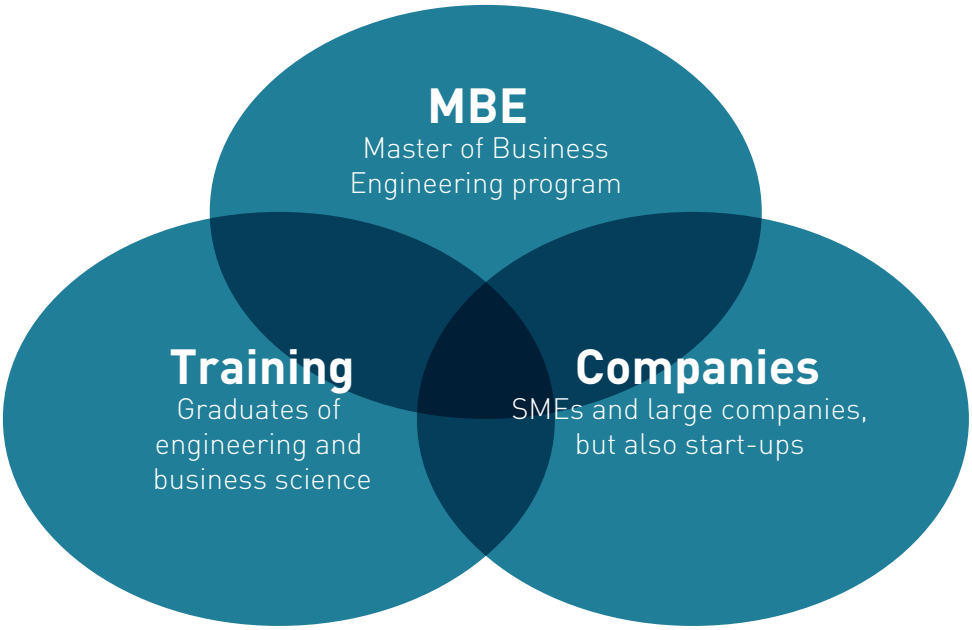
SHB launches master's program in Bulgaria

MBE – acquiring project skills beyond the borders of Germany

In June 2010, Steinbeis University Berlin joined forces with the Bulgarian Academy of Sciences, the VUZF University and the GIS Transfer Center Foundation in Sofia. It is all part of a cooperation agreement to set up the successful SHB Master of Business Engineering degree in Bulgaria. The first course gets underway in late 2011.



There are only a limited number of ways to enter "dual education," not just in Bulgaria, but in the whole of southeast Europe. Most degrees at local universities focus primarily on areas such as general administration and business. The SHB approach, which combines a live project at a company with phases of classroom teaching at the university, is not yet in use.

The idea of setting up the MBE program in Bulgaria is the result of more than ten years of collaboration between the Steinbeis Foundation and the GIS Transfer Center Foundation in Bulgaria. As part of a series of joint projects, the two parties became distinctly aware of some key problems in the countries of southeast Europe. Highly qualified workers, especially those between 24 and 45, are moving abroad – there's a classic brain drain. Also, young people are not really interested in engineering, and companies need people with project skills. The fact that there is currently a shortage of qualified engineers throughout Europe – and that university programs need to open up much more to industry and overall economic developments – only galvanized the resolve of all parties to push ahead with the project. After a series of preparatory meetings in Bulgaria and Germany, the official agreement was signed in June of last year by Professor Florin Ionescu, Director for East Europe, at the Steinbeis Center of Management and Technology (SCMT) at Steinbeis University Berlin. Work immediately got underway to set up the program. A series of information events are currently being staged to help companies of all sizes improve existing project management know-how within the business and introduce innovative methods of project administration and business intelligence systems. It is already clear from the first events just how challenging it will be to bring the Bulgarian business mindset in line with the approach underlying the MBE program.

The MBE principle of on-the-job training fits in with European training, research and innovation strategies. There are increasing overlaps between industry and science as companies invest more in the education of highly qualified workers in a push to secure loyalty to the company as an employer. First steps have already been taken to get the process underway, but there's still a long way to go to instill the concept of free market competition in Bulgaria. The MBE program at the SCMT is one such first step. The program partners' aim is to move toward international, practice-based training that offers truly integrated knowledge transfer. This benefits students just as much as the companies where they carry out their projects. Bulgarian staff involved in projects

then also receive regular mentoring as part of a one-year project skills program. The lecturers and mentors working on the current MBE program have been selected from experts at VUZF University. The project managers have also set up a database of project partners who will supervise students and oversee the running of projects within the companies.

The project partners

Founded in the 19th century, the **Bulgarian Academy of Sciences** is the oldest and largest research institute in Bulgaria. The academy has institutes actively involved in all areas of fundamental research and the applied sciences.

The **VUZF University** is Bulgaria's first private university specialized in the fields of finance, insurance, social security, management and marketing.

A franchise company belonging to the Steinbeis Foundation, the **GIS Transfer Center Foundation** is actively involved in the exchange of experience between science and business, as well as the transfer of marketable findings and technology.

The **Steinbeis Center of Management and Technology (SCMT)** is working on the project as an operating unit within the university. It is responsible for coordinating and running seminars and the degree programs in Bulgaria. The School of Management and Technology is one of the largest schools at SHB and the academic unit within the SCMT.

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Steinbeis marks anniversary in Göppingen

The TZM – 20 years of successful technology transfer

Two decades ago, Professor Jürgen van der List and Professor Heinz Osterwinter founded the Steinbeis Transfer Center for Microelectronics – now known for its successes as the TZM – on the Göppingen campus of Esslingen University of Applied Sciences. When it was founded in 1991, the Steinbeis center primarily aimed to make good use of the new state-of-the-art laboratories, including the clean room, at the recently established Göppingen campus. The first transfer projects were set up in person by the two founders, but the duo soon had to take on engineers to manage the volume of projects. Today, the TZM is an engineering service provider with over 80 development engineers working for clients in the automotive, medical technology and automation industries.

The type of technology transfer practiced by the TZM has changed since it was founded, but the center's work has always involved development, either in electronic hardware or software. TZM experts either work on location with clients' development teams or on the premises at the TZM in Göppingen. In the early days, the rooms were leased by the university, but the TZM soon ran out of space. The new Steinbeis building was officially opened in 2002.

An important chapter in the history of the TZM was the launch of a product portfolio aimed at addressing a variety of aspects relating to the new automotive "time-controlled bus system" called FlexRay. The TZM first became involved in the development of this system on client projects. It quickly became obvious that the bus system held tremendous potential, so TZM managers decided to develop their own hardware and software tools, even though there was no client mandate to do so. The tools to be developed should be used for running and testing the FlexRay bus system. Riding on the back of student diplomas, the development team quickly grew to 40 people. Most worked on behalf of leading automotive companies (and their suppliers) on the development of a variety of FlexRay bus tools. These tools were subsequently marketed through the TZM's own sales channels. The shift to standalone product marketing led to a spin-off of the development services arm of the business in 2008, which is now a successful company called Eberspächer Electronics.

As well as its detailed know-how, one of the strengths of the TZM is its long-term relationships with clients and the good atmosphere among workers. This is reflected in excellent customer feedback and employer awards such as "Top Job," which the TZM has won repeatedly since 2008. Thanks to its motivated young workforce, the TZM is ideally poised for future projects and will remain a significant player in the Steinbeis network.

TZM development projects

- Integration of control units in vehicles
- Application of established vehicle bus systems such as CAN and FlexRay
- Control unit development and testing
- Measurement and test engineering
- PC based software development
- Embedded programming

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New centers in the Steinbeis Network

The Steinbeis Network comprises around 800 Steinbeis enterprises spanning all fields of technology and management. Depending on the nature of their work, these may be Transfer Centers, Consulting Centers, Innovation Centers, Research Centers, Transfer Institutes or separate legal entities. The following new Steinbeis enterprises have been founded since May 2011:

RAVENSBURG

Human Capital Management (HCM)

Director: Prof. Dr. Benedikt Hackl

E-mail: su1532@stw.de

Range of services:

- Human Capital Consulting (HCC)
  - Consulting on human resource development and skill development (analysis in the fields of management, measuring competencies, and learning structures for human resource development)
  - Insourcing and outsourcing of HR
  - International HR, management systems
  - Human resource development in networks
  - Training in strategy, operational HR management and skills development
- Human Capital Research (HCR)
  - Studies on individual aspects of human capital management
  - Expert reports

ENINGEN

IT Service Management

Director: Gerburg Joos-Braun

E-mail: su1533@stw.de

Range of services:

The Steinbeis Consulting Center for IT Service Management has many years of experience in designing and introducing IT projects in social services. Common obstacles such as the lack of participation of specialist departments are avoided by using appropriate measures in the project design phase, so that all available expertise can go into the project. This also means IT managers can implement broad-based projects such as uniform paper output management without risk, and allows the potential benefits of restructuring to be realistically assessed then attained.

- Consulting on IT service management
- Helping IT departments become IT service providers in social services
- Development of tailored IT solutions including profit-sharing by specialist departments
- Consulting and project design in paper output management
- Consulting and development relating to user help desks in line with best practices
- Running workshops involving people from all levels of the organization aimed at developing individual project goals
- Decision management and support during the introductory phase
- Coordination and management of external service providers
- Use of suitable change management instruments

ULM

kompetenz institut unisono

Director: Gudrun Jürß, Peter Schust

E-mail: su1534@stw.de

Range of services:

- Coaching/consulting in specialized skills (business development and quality management) and social skills
- Software-supported training in specialized skills (business development and quality management) and social skills
- Certification in line with the STI's study and examination regulations

MÜNCHEN

Technology promotion and project financing

Director: Helmut Haimerl

E-mail: su1535@stw.de

Range of services:

- Technology promotion and consulting regarding funding
- Project financing and growth financing
- Creation of concepts, business plans and expert reports
- Strategy and innovation consulting
- Financial engineering (special situations, project financing)

KAISERSLAUTERN

Applied measurement technology

Director: Rüdiger Jung

E-mail: su1536@stw.de

Range of services:

- Proposals for and coordination of research projects
- Contract development in the field of applied measurement technology
- Consulting on project and project partners, and finding projects and project partners
- Specialist consulting on applied measurement technology

HEIDELBERG

Graduate Institute of Management – Middle East

Director: Prof. Dr. Britta Bergemann

E-mail: su1538@stw.de

Range of services:

- MBA courses
- E-MBA courses

HEIDELBERG

Medical Embedded Systems (MES)

Director: Prof. Dr. habil. Hans-Peter Meinzer

E-mail: su1539@stw.de

Range of services:

- Development of medical applications for mobile devices
- Development of server applications
- Support for mobile viewers and the server

TÜBINGEN

QP – Qualified Person

Director: Prof. Dr. Ingrid Müller

E-mail: su1540@stw.de

Range of services:

- Professional development in line with German pharmaceutical law AMG § 15 (2) "The required expertise of the qualified person"

LUDWIGSBURG

Academic Management, Marketing and Course Guidance – SAMS

Director: Silke Hartmann

E-mail: su1543@stw.de

Range of services:

- Marketing and PR consulting
- Support in setting up study centers
- Planning, organizing and running events
- Information and consulting regarding degree courses and professional development options

ILMENAU

Steinbeis Qualitätssicherung und Bildverarbeitung GmbH

Director: Steffen Lübbecke

E-mail: su1544@stw.de

Range of services:

The company is dedicated to applied research and customer-tailored development of special testing equipment, as well as components, devices and systems for industrial image processing and their production for industrial applications. We also offer consulting on quality assurance and quality management, industrial image processing, and measurement and testing technology. We also conduct training and professional development sessions.

RADOLFZELL

Institute for Stress Management and Holistic Preventive Medicine

Director: Horst Grässlin

E-mail: su1545@stw.de

Range of services:

- Professional development: holistic stress management for managers over 50
- Professional development: stress management
- Work-life balance for people in social professions
- Innovative coaching for caregivers

Specialist knowledge merges with social skills

Five stars awarded to stw unisono

Working as one is a success formula – as the Steinbeis Network expert in vocational training demonstrates, even under its new name. The former TQU Akadamie was renamed stw unisono training+consulting one year ago. The Ulm-based enterprise has been specialized in training for 20 years, with a focus on quality development and managing people. For continuous professional development to succeed in the long term, it has to place an emphasis on customers – a philosophy that has stood the test of time. The ITCR – International Training Center Rating® – has awarded the stw unisono its highest classification as a premium education center.

There is more to fostering skills than simply giving people the right tools to get things done. Successful work requires people to thrive on the responsibilities they are given. They also need the right soft skills and an ability to get along with managers and co-workers. Experience shows (and the statistics confirm) that companies have some major shortcomings when it comes to communication and interaction – and they desperately need support.

The training approach adopted by stw unisono is to combine specialist skills with people skills. During specialist training sessions, employees also learn soft skills. This can be one-on-one or in groups. Personal advice is, of course, also integral to training. Sessions are tailored individually to the needs of course attendees, who are invited to work on tasks and some fairly challenging exercises. Intensive and detailed courses tend to offer other activities, such as yoga, to help participants unwind and free the mind.

The ITCR is a unique classification method for rating leading providers of training and monitoring the performance of organizations involved in continuous professional development. The evaluation system covers six areas, based on no less than 110 criteria, ranging from IT systems to knowledge transfer, infrastructures and customer service, before, during and after events.

When it comes to adding value and valuing quality, stw unisono is now allowed to use the ITCR five-star quality endorsement for "optimal customer benefit." When people see this award, they know they can count on the vocational services provided by a company, training is efficient and enjoyable, and this has been validated. It acts as a useful guide in the jungle of different offerings when comparing choices and making decisions.

"Something we noticed immediately with stw unisono was the holistic and logistic approach it takes and the effectiveness and particular uniqueness of the company," explains Dr. Gerd Theobald of the ITCR after granting the award. "It's specialist skills in harmony with social skills, without airs and graces."

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New releases from Steinbeis-Edition

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Steinbeis-Edition, the publishing arm of the Steinbeis Foundation, regularly publishes works mirroring the scope of the Steinbeis Network's expertise. All titles can be easily ordered via our online shop at www.steinbeis-edition.de.

Court mediation

(In German only)
Anja Taschner | Bernhard Böhm,
Gernot Barth
ISBN 978-3-941417-66-3

Court mediation has undergone dramatic developments in recent years. A number of German States, such as Saxony-Anhalt, now actively promote court mediation. Between 2006 and 2010, mediation was tested in a variety of courts. But what can be achieved through court mediation? What are the processes involved and what procedures are followed? What are the challenges for court mediation and what opportunities do they present? What do judges carrying out the mediation sessions think of their role as a mediator? This book looks at these questions and a variety of similar issues. To begin, the authors went through no less than 2,862 court sessions that were presented as suitable for mediation to the judges acting as mediators. In 1,127 cases, the parties involved agreed to enter into court mediation. The focus of the authors of this book lies primarily in the perspective of the judges involved in court mediation.

About the authors/publishers

Bernhard Böhm and PD Dr. phil. Habil. Gernot Barth are professional mediators and heads of the Steinbeis Consulting Center for Mediation of Business within the Steinbeis Foundation Network. Its offices are in Leipzig, Stuttgart, Budapest and Vienna.

Principles of Head Office Planning

(In German only)
Bernd Appel
ISBN 978-3-9809373-8-2

When approached in the right way, corporate security – i.e., management tasks relating to security and safety – is a way of safeguarding corporate success. Technological advancements made in communication technology and computing have had an impact on security command and control centers (SCCs) in private and public institutions. Work processes are now more efficient, resulting in enhanced organizational procedures and improvements in personnel equipment. This makes it necessary to have a strong command of technological and organizational issues as well as people management experts. This Transfer Documentation Report (TDR) explains key issues in practical steps, making it possible to apply important principles to business. The emphasis in the first section of the TDR lies in the technology used in SCCs, before explaining in detail how targeted planning makes it possible to improve efficiency as desired.

About the author

Bernd Appel is an engineering graduate and has worked for a variety of manufacturing companies as a project and sales engineer in control center technology. The TDR looks specifically at the degree's major subject "security" at the Steinbeis Business Academy (SBA). The SBA has about 1,800 enrolled students and is the largest Network institute at Steinbeis University Berlin.

Business Intelligence & Controlling Competence. Financial Performance Management in Business

(In German only)
Karsten Oehler, Andreas Seufert,
Mario Schmitz, Uwe Hoehne
ISBN 978-3-941417-62-5 | Special Edition

"Business Intelligence und Controlling Competence" is a new business series published jointly by the Institute for Business Intelligence at Steinbeis University Berlin and the International Controller Association. Publications appear regularly and typically contain over 50 pages of detailed reports on innovative business intelligence (BI) practice and current developments in the field of management accounting. Each issue introduces the latest insights from BI, controlling research and practice. The results of empirical studies, case study analyses, theoretical assessments and task forces are described in a way that makes them accessible to non-specialists. This special edition focuses on: planning investment management, setting up corporate planning systems, corporate-level liquidity management, risk management in corporations, IT architectures in corporations, IT implementation proposals for corporate planning/cost accounting/liquidity controls, investment management, IT governance in group management control and the introduction of IT solutions in group management control.

About the publisher

The co-publisher is Prof. Dr. Andreas Seufert, who together with Rainer Gehrung and Prof. Dr.-Ing. Peter Lehmann heads up the Steinbeis Transfer Institute of Business Intelligence, a member of the Steinbeis Network.

Interaction of cultural and socio-economic variables in targeting ethnic consumer groups. Empirical analysis of Turkish immigrant consumers, resident in Germany

Bilgen Coşkun

ISBN 978-3-941417-68-7

This year marks the 50. anniversary of Turkish immigration to Germany. Even though Turkish immigrants constitute a remarkably important consumer market, there is still limited research concerning their consumer and communication behavior. Therefore, marketing communication approaches targeting this group are mostly far from representing the state of the art. In this dissertation, the Turkish immigrants in Germany are analyzed, in the first stage, on the basis of cultural and socio-economic variables in order to build more homogenous consumer groups. Thus, the suitability of the segmentation approach in the context of consumption and communication is tested by analyzing the differences between the members of the identified segments. Following this, the attitude of the members of each identified segment toward direct mailing is analyzed experimentally. Product (ethnic vs. non-ethnic), language (Turkish vs. German vs. bilingual) and timing (religious vs. regular day) are chosen as the independent parameters in the experiment. In the last chapter of the dissertation, implications for companies interested in the Turkish consumers in Germany are presented and theoretical implications for future research in the field of ethnic consumer research are introduced.

About the author

Dr. Bilgen Coşkun studied Business Administration at Bilkent University in Ankara. His work revolves around marketing and advertising. Coşkun worked at the SVI Endowed Chair for Marketing and Dialog Marketing at Steinbeis University Berlin, where he completed his Ph.D. in 2010.

Optimization of Web Application Security. Analysis of Common Threats, Countermeasures and Impact on the Software Development Lifecycle

Steffen Schneckenburger |
Uwe Dittmann, Alfred Schätter (Eds.)

ISBN 978-3-941417-69-4
Also available as e-book
ISBN 978-3-941417-70-0

The intention of the book is all about creating awareness in terms of web application security and to support the reader with several examples as well as best practices through the development of secure web applications. Software developers and their customers often do not realize the importance of these requirements within a contract or at least define them superficially. For this reason the objective of the book is to develop an annex comprising common threats and countermeasures as well as necessary adjustments of the software development lifecycle in terms of security to establish a common basis of security understanding between developers, managers, customers and other stakeholders. As a result this book is directed to anyone from developer to decision-maker who wants to get an overview of current web application security flaws and corresponding countermeasures. The book introduces current web application security threats and elaborates countermeasures in order to avoid or at least to reduce the impact of these flaws. In addition the security software development lifecycle of Microsoft is evaluated in order to avoid flaws in the first place. Several critical web application vulnerabilities are identified based on intensive research. They were individually ranked according to the related risks.

About the authors

Prof. Dittmann heads up the Steinbeis Transfer Center for Marketing, Logistics and Company Planning at Pforzheim University. Prof. Schätter is a project manager at the STC.

iNTeg-Risk Conference 2011. 3rd iNTeg-Risk Conference & 20th SRA-Europe Meeting

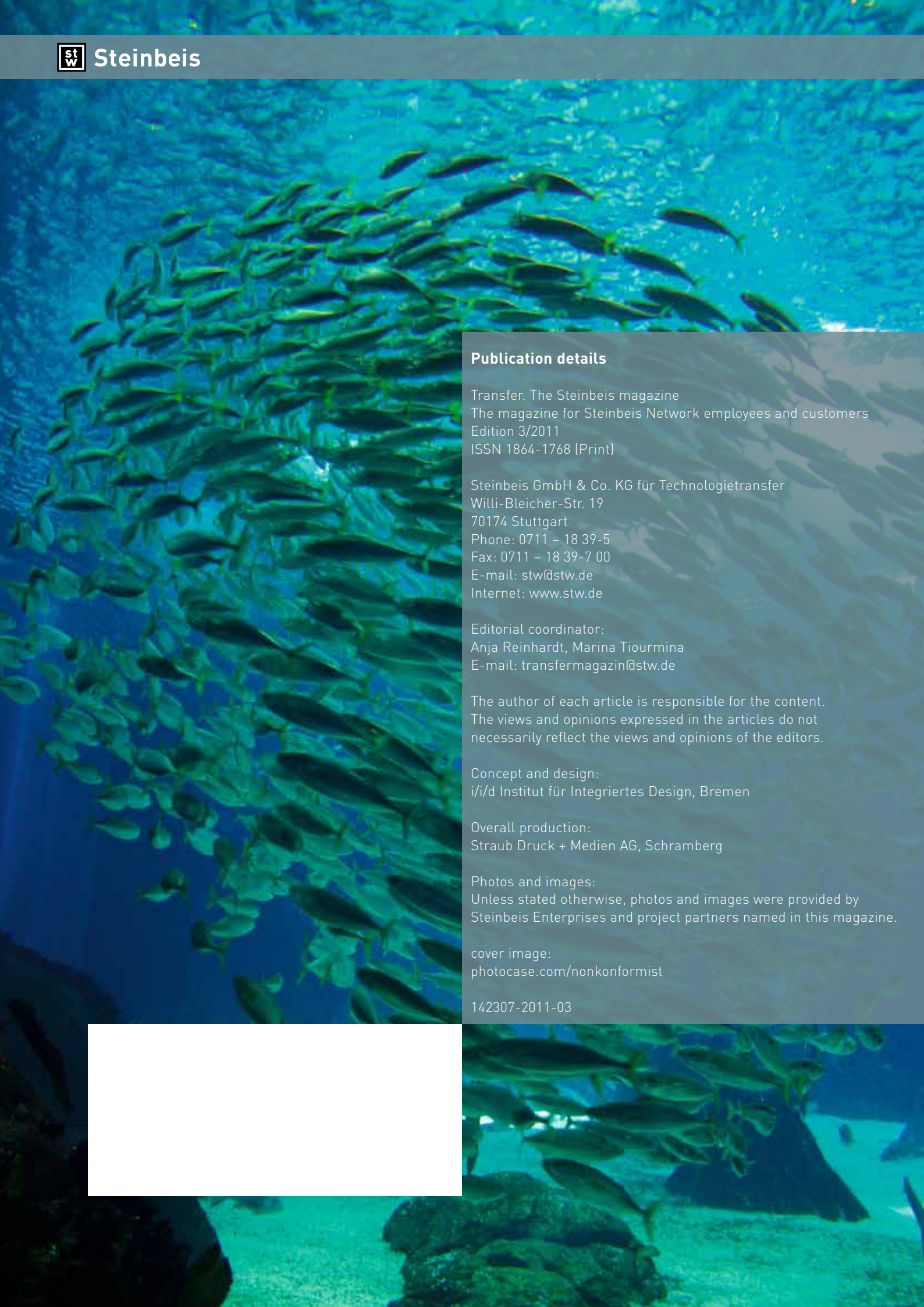
A. Jovanovic, O. Renn,
O. Salvi, M. Kuttschreuter (Eds.)

ISBN 978-3-941417-65-6

When, on October 02, 2006, about 25 professionals from EU industry, academia and research organizations met in Stuttgart, on the premises of the at the time newly incorporated European Virtual Institute for Integrated Risk Management (EU-VRi), three issues were shaping their brainstorming meeting: „New Technologies", „Emerging risks" and „Integration". It was clear that there were significant R&D needs in this area. The results of the brainstorming was the project iNTeg-Risk (Early Recognition, Monitoring, and Integrated Management of Emerging, New Technology related, Risks). The Conference provides a forum at which partners involved in the EU „flagship project" iNTeg-Risk discuss openly and thoroughly the results obtained in the project. In 2011, the Conference focused on the issues dealing with risk-risk tradeoffs, multiple and interconnected emerging risks of New Technologies and the presentation of the current iNTeg-Risk results: iNTeg-Risk early warning system RiskEars, emerging risk mapping, emerging risk management framework, emerging risk communication, methods and tools for emerging risk analysis.

About the authors

Prof. Jovanovic is head of the EU-VRi and the managing director of Steinbeis Advanced Risk Technologies GmbH. Prof. Renn is a professor of technological and environmental sociology at Stuttgart University, where he specializes in interdisciplinary risk research. Olivier Salvi works at the European Virtual Institute for Integrated Risk Management. Margôt Kuttschreuter is President of the SRA-E (Society for Risk Analysis Europe).



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