

# TRANSFER

*The Steinbeis magazine*

## **Innovation – Implementation – Benefit**

### **Committed companies**

A call for more corporate social responsibility

### **Precision in space and time**

High-power computer systems for aerospace

### **When the air starts drying up**

Groundbreaking process for conditioning patient gas

### **Tomorrow's hi-tech, tomorrow's entrepreneurs**

Final of the online competition for "Young founders"

### **An innovative boost to climate control**

Research project pinpoints locations for solar panels

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## Editorial

Dear Readers,

This year marks the 200th anniversary of the birth of the man many at Steinbeis consider our patron saint, Ferdinand von Steinbeis. Von Steinbeis was a pioneer of economic development and trade promotion in Baden-Württemberg. Driven by his tireless commitment, expertise and dedication to knowledge exchange, he quickly established a reliable network of professional partners. The results: outstanding transfer, economic development, and a dual education system.

Now, as then, these three pillars are central to every thought and action at Steinbeis. Our experts operate in some 50 countries worldwide in a close-knit network across a variety of specialist fields. Also part of this network, are more than 2500 students at the Steinbeis University Berlin, who draw on their acquired knowledge to the benefit of project companies. Steinbeis promotes economic development in a variety of local and regional markets, often within the framework of agency services.

In doing so, we provide competitive knowledge and technology transfer in the traditional sense of the word.

This knowledge and technology transfer is a powerful force, strengthening cooperation between the world of science and academia on the one hand and industry and politics on the other. It also provides a welcome boost to innovative processes. Particularly important are the plethora of transfer networks linking Steinbeis companies and local partners. Their work often results in strategic research partnerships which raise the potential of local innovation. This is complemented by Steinbeis' involvement with customers, who are in competition at national and international level, resulting in valuable synergies for all parties. Overall this gives companies an edge over the competition in recruiting top people.

This year's Steinbeis Day promotes the concept of forging links, with an emphasis on exchange of expertise between specialists in the network, and close dialog with customers. By presenting our centers' activities, we provide an insight into the multifaceted nature of Steinbeis technology and management expertise. This edition of Transfer Magazine aims to inject momentum into transfer, simultaneously acting as a kaleidoscope – revealing innovative ideas and fascinating insights, and hopefully making you even more intimate with the full potential of our network.



Sincerely,

Prof. Dr. Heinz Trasch

## A call for more corporate social responsibility

# Committed companies

The calls for companies to take a more responsible role in society are becoming noticeably louder. Politicians are calling on companies to become more responsible, or "practice corporate citizenship", and so are members of society. Businesses are now expected to see themselves as a responsible member of society, and provide support in tackling social issues. A good number of companies are answering this call. More and more of them are fulfilling their role as "a responsible member of society" and even becoming involved in charitable activities. They do indeed see themselves as part of the very society they aim to shape – in safeguarding their own long-term existence.



Picture: Jaraus

Companies become involved in society in many ways, shapes and forms. Activities can range from in-house projects working together with employees, to social causes within the company, and regional, nationwide or even global projects aimed at tackling specific issues. The decision – about which area to become involved in – depends to a great extent on the underlying motivation within the company with regard to charitable activities as a whole.

There are discernible trends in companies' underlying motivations. Small and medium sized companies have a leaning towards the personal interests of those involved. As a rule it is the owner or manager who selects the social cause, often based on their own personal networks. This was the tack taken by Volker Antelmann, a baker from Radolfzell, when he supported young people who had been unable to find an employer willing to offer them an apprenticeship (see Infobox). Companies also offer support to local sports

clubs or similar organizations in which the owner or manager is already personally involved.

The second approach is reflected by the extent to which a certain project or promotion influences activities within the company. The focus: company employees. First and foremost social involvement helps improve employees' ability to identify with the company, enhance teamwork, and strengthen the social skills of individual employees or

the workforce as a whole. These companies support organizations such as clubs and societies in which employees already play an active role, or undertake projects together with employees which will have a positive influence on the working atmosphere. This can range from building a playground outside the factory to organizing a charity fair.

With the third group, the decision of which charitable projects to become involved in, and how, centers on the effect outside the company. Social causes are about positioning a brand or a company in the market. The main priority is how the company portrays itself to customers and stakeholders. In selecting projects and issues, the company makes sure there is a good match with the image and perception the company has of itself. So chemical companies might become involved in environmental protection. The charitable project thus fulfils marketing needs and helps boost company esteem.

These are the three approaches towards social causes – in theory – but of course in practice there are many overlaps and lots of other reasons to become involved in charitable issues. But whatever it is that motivates a company to become involved in a social project, it is important to gauge what effect it has on society or the initiative or organization benefiting from the project. For a company to feel motivated enough to stay involved in a social cause – to shape and support the cause – it is all about win-win.

The Weingarten-based Steinbeis Transfer Center Social Planning, Qualification and Innovation is currently participating in a pilot project called "Unternehmen BE" organized by the Baden-Württemberg Ministry of Employment and Social Affairs. Its aim is to promote the involvement of companies in social causes. The Transfer Center is one of five organizations selected within Baden-Württemberg and is responsible for the area around Lake Constance plus districts in and around Ravensburg and Constance itself. Each organization is expected on the one

hand to promote social involvement, and to advise individual companies on specific projects on the other.

Organizational backing is provided in the form of events aimed at representatives from industry and associations, training sessions, detailed public relations support, and instigating "best practice" projects in individual regions and communities. The center also makes available resources to consult with companies requiring support to implement their social projects or that have asked for advice on implementing their overall social strategy at a company level. Companies interested in support should contact the local office in any of the five pilot regions.

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#### The future is oven-baked

Try as they might, politicians and businesses can not guarantee every school leaver an apprenticeship. For many young people in Germany, no apprenticeship equals no future, condemning them to a life on benefits, petty crime or more. Bakery owner Volker Antelmann from Radolfzell on Lake Constance decided to do something about it. His aim is to give young people something constructive to do with their time, providing them with on-the-job training at his bakery even if they were not given an official apprenticeship. The training prepares them for a real occupation. His idea led to a partnership in 2005 between organic baker Antelmann and the Diakonisches Werk in Radolfzell. Young people with behavioral problems on the NPO's "Arbeit und Zukunft" project have been working twice a week at the bakery ever since. None had been offered training elsewhere and many finished school without qualifications.

Under the supervision and direction of the master baker, the young people make a variety of bakery products which are offered for sale in organic food shops and Antelmann outlets. The proceeds are then channeled back into the project.

For the young people, working in a bakery is a totally new experience. They have to be punctual, reliable and work with others, something that does not always come easy to them and can take a lot of patient instruction. The participants flourish thanks to the program, as it is precisely these attributes – and not just practical skills – that they will need in their careers.

At the end of the project each participant is awarded a grade. If they did well during their internship they have the right references to work in other Antelmann bakeries in the region. Volker Antelmann's company is now involved more closely in the project and in late 2006 he offered two apprenticeships to participants on the "Jugend und Zukunft" project, which finished in the summer of 2007.

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## A software-aided sustainability index at John Deere

# The environment: in safe hands

**It was only in the past decade that business, politics and society switched onto the idea of sustainable economies. Yet companies have as much responsibility as anyone to incorporate the principles of sustainability into their long-term strategies. How to do this without placing a huge financial and administrative burden on a company was demonstrated by tractor and farming equipment specialist John Deere, which introduced a software-aided sustainability index at its four sites in Germany. A central role in the project was played by Hartmut Bauer, student at the Steinbeis Business Academy at Steinbeis University Berlin.**



In 2001, the Chairman of the Supervisory Board at Deere & Company, Robert W Lane, instructed all of its sites to gain environmental management system certification in keeping with ISO 14001. The aim was to create uniform environmental standards across all units. The John Deere works in Mannheim rose to the challenge and created its own sustainability index which was easy to understand for everyone involved; from managers and employees to the local communities where John Deere divisions are based.

In the meantime another three divisions have introduced a sustainability index – the John Deere works in Zweibrücken, the John Deere works in Bruchsal, and the European

replacement parts depot. The sustainability index helps company managers, employees, customers and investors to estimate the current status within the company and understand improvement potential. The project was managed by Hartmut Bauer as part of his Economic BBA degree at the Steinbeis Business Academy (SBA) at the Steinbeis University Berlin. Even during his current masters degree at the SBA, Bauer continues to play a central role in the project team responsible for launching and upgrading the index.

The sustainability index pulls together all key environmental figures at each site and regularly tracks changes, both positive and negative. The sustainability indices at the four John Deere divisions are subdivided in up to 10 separate categories. At all three worksites and the replacement parts depot, one of the pivotal factors is energy consumption. Other key criteria are the environmental performance of suppliers, packaging, waste volumes, VOC emission levels and recycling rates.

One person is responsible for each category and has to ensure figures are updated regularly. To raise awareness for the issue of environmental protection among departmental heads, the sustainability index has been integrated into the company balanced score card which is one of the company's most important management instruments.

As part of his student project, Bauer worked out that the ERP system used at John Deere (SAP R/3) could play an instrumental role in providing up-to-the-minute data for moni-

toring environmental performance, dovetailing with the sustainability index. After mapping the software constraints in providing data, he then had to save data and processes provided by SAP and set up organizational and technical interfaces. The result: a comprehensive list of requirements covering 20 criteria. This formed the basis for six alternative software solutions, the most useful of which turned out to be a partially automated, cost-neutral solution offering the flexibility needed to gain acceptance for the sustainability index within the company.

Bauer's next step was to create a specification list to be sent out to 35 pre-selected software providers. The provider finally chosen created a test version of its software solution which was then evaluated among an internal sample for user satisfaction. The test version was a resounding success as a result of which the software was recommended without reservation for immediate introduction at all four John Deere sites. The solution will soon make it possible to plot environmental performance within the company within a short period of time. Employees already have Internet access to sustainability index data – at all levels of the company. During the past financial years all four John Deere divisions improved their sustainability index, with some major successes in certain areas.

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## Medical and measurement systems – from inception to the finished product

# Bundled hi-tech know-how

For years, car companies have been calling on suppliers to develop and produce individual components for them, as well as end-to-end systems and even complete vehicles. Start-up company EOA is now doing similar things in the medical sector. The company is the result of a cooperation between five highly specialized Baden-Württemberg based businesses able to offer the complete range of services, from blue-sky concepts to development services, approvals, market launch and serial production. Steinbeis also has a stake in development partner EOA.

Over the past few decades, a number of global medical technology companies have outsourced business processes to concentrate on their core business or on the access to the market.

These companies have low internal resource levels in development. Instead they invest a lot of time and money managing a long list of suppliers in every corner of the globe. Providing these companies with all types of development services under one roof is Jürgen Haeberle, one of three directors at EOA: "Depending on the resources, know-how and requirement of the customer, we can manage the whole process. From initial concepts to the finished product and market introduction – or any part along the way."

For small and medium-sized medical equipment companies this represents welcome support in achieving the optimal time-to-market, or pulling in specialist knowledge. After all mechatronics products combine parts and modules from mechanical engineering, electronic engineering and software engineering. On top of this comes the casing which has to be appealing in design and form to the user.

In particular, start-ups, which have usually only worked in a laboratory set-up, can call on EOA as a partner with business experience. Haeberle joined forces with Joachim Hiller from Biomedical Engineering to set up the new company. But even before EOA took shape, the two often worked on medical technology solutions in their previous roles under contract for partner companies. They also launched the new products on the market.

The business model – based on an interdisciplinary approach to development – had proven its success even before the new company was set up. "Now when we develop medicines and measurement systems it's not a loose arrangement, we're within a solid company network," emphasizes Hiller.

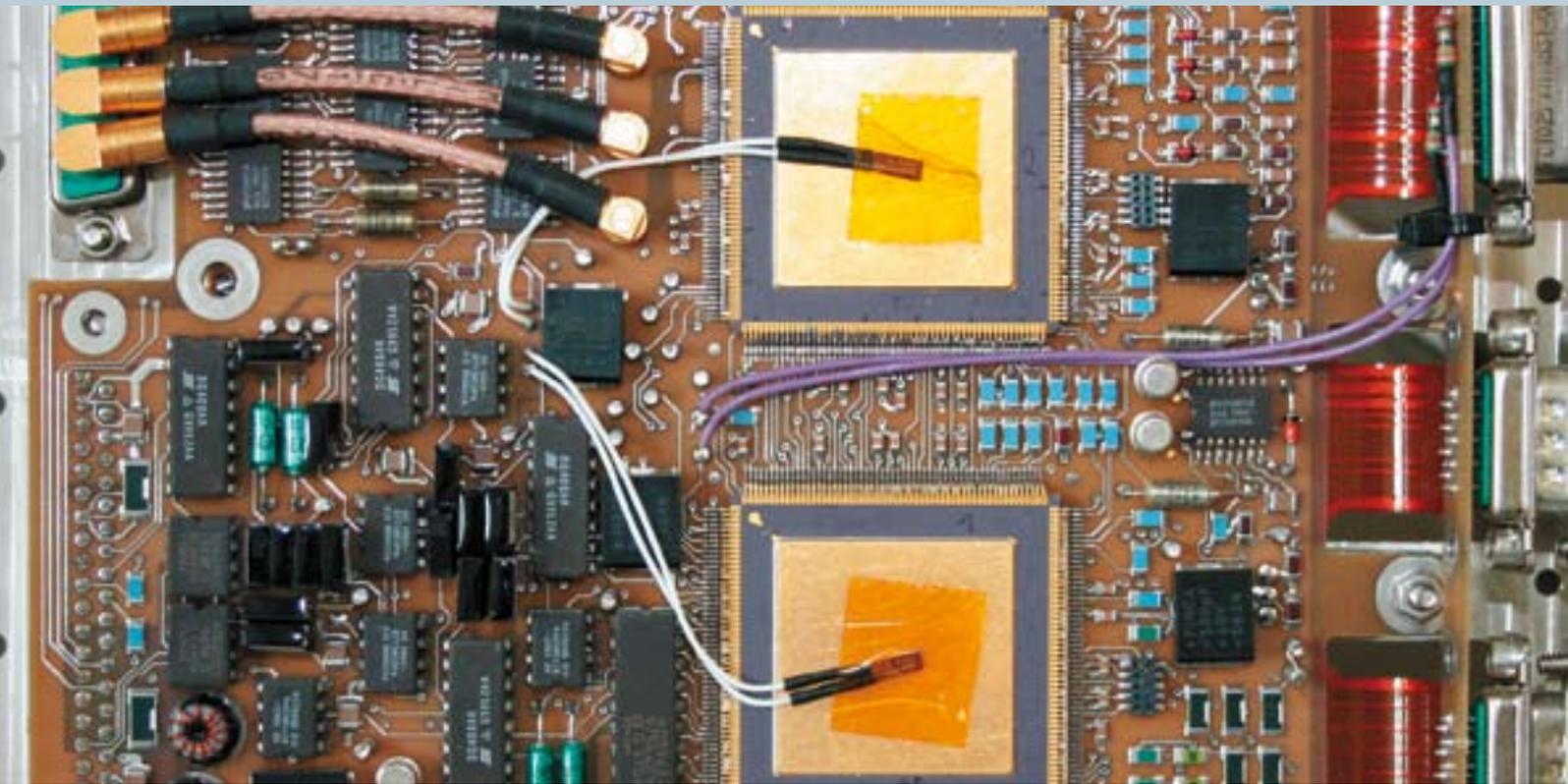
EOA banks on standard traceability and quality methods in carrying out development briefs but also a variety of international medical engineering standards. The integrated development partner works up a binding specification to complement the product specification already provided, which captures the customer's expectations and then models it. Using project management and financial controls, all stages of development are monitored along with milestones and costs. Concepts and feasibility are agreed between all five companies. Once approved by the customer, TRICON Design (from Kirchentellinsfurt) works on the industrial design. The company bebro electronic (Frickenhausen) takes care of the electronics, DMT (Holzgerlingen) manages the mechanics. The Steinbeis Transfer Center Microelectronics from Göppingen with about 130 employees is responsible for software development – one of the three core business areas in addition to FlexRay and engineering services. Once the customer has given their consent, Biomedical Engineering



and the other four partners takes care of official approvals, market introduction and product life cycle.

The company is organized into a development team of around 120 employees, while the number in production is even higher at 700. The five companies involved still operate as separate profit centers, however, but as soon as a contract involves at least two partners, EOA takes over the project based on the maxim EITHER ALL, OR NOTHING.

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## High-performance computer systems for aerospace

# Precision in space and time

**Computer systems used in the field of aerospace have to fulfill three criteria: they must be low in weight, low in energy consumption and highly reliable, year after year. But ask the standard types of microprocessor systems used in aerospace to make fast calculations and they quickly meet their match. To solve this problem, the Steinbeis Transfer Center Aerospace in Gäufelden produces a computer system that does away with microprocessors and uses instead field programmable gate arrays, or FPGAs. The technology is being used by the European Space Agency for the ACES Project (Atomic Clock Ensemble in Space).**

FPGAs are freely programmable logic devices which allow you to control processes as logic functions in hardware. Modern FPGAs make it possible to build systems as powerful as modern computer systems although in certain areas they are far superior in terms of performance. They greatly reduce mass and energy consumption compared to traditional microprocessor systems.

Normally FPGAs are programmed in hardware description languages such as VHDL or Verilog. These languages work on register levels, comparable with Assembler when programming microprocessors. Implementing complex algorithms is correspondingly long-winded. The developers at the Transfer Center Aerospace use Handel-C to program the FPGAs. Now available commercially, Handel-C was developed at Oxford University

and is a high level language which describes hardware with C-syntax. Compared to classic C, it provides additional language components matched to the specific capabilities of the FPGAs. This makes it possible to achieve huge parallelism, complex algorithms and dedicated switches on the gate level without having to do away with software techniques, as is common with high level languages.

A compiler translates the algorithms into a standardized network list which, using tools from the FPGA manufacturer, is eventually processed into the bit sequence loaded onto the FPGA. In contrast to ASICs (application specific integrated circuits), an FPGA can be overwritten with new algorithms as often as you want. Loading is extremely quick and can even be carried out while the system is in use, reducing restarts and reconfiguration

time to milliseconds. With hardware-based systems, doing away with layouts, masks and other production stages reduces the time taken between product development and market readiness to several months or even weeks.

As programs using FPGAs are not controlled by microprocessor systems in the software but by fixed processes in the hardware, all algorithms are worked through in synchrony with the clock of the FPGA. Within any one cycle complex operations can be carried out such as multiplications and additions. Speeds can be improved 40 to 100-fold compared to microprocessors. Dozens of input and output lines on the chip make it possible to create direct interfaces and buses to other systems – without additional controllers – which can be used simultaneously without delay.

FPGAs are therefore ideal for high intensity computational requirements in real time and boast the versatility to work in a variety of hardware environments. Because of the large number of libraries, external hardware such as DDR RAM, ADC/DAC, mice and keyboards can be controlled from the FPGA. FPGAs contain embedded block RAM storage making it possible to run applications with high storage requirements such as video and audio coding.

The ACES project (Atomic Clock Ensemble in Space) allowed the Steinbeis experts in Gäufelden to demonstrate the current capabilities of high level language technology and FPGAs. ACES is a scientific mission at the European Space Agency destined to be mounted on the external experimental platform on the Columbus module on the International Space Station (ISS). The aim of ACES is to provide a highly precise 100MHz frequency standard for scientific experiments.

To do this the system pairs the long-term stability of a laser-cooled cesium clock (PHARAO) with the short-term stability of an SHM (space hydrogen maser). As there is no gravitational pull in space, these clocks are ten times more precise than on earth, making it possible to compare frequency standards on a fixed object in space and on earth.

As part of the ACES project, the Aerospace Transfer Center developed the complex control and measurement algorithms for the Frequency Comparison and Distribution Package (FCDP). In the FCDP frequency and phase values are detected coming from the signals supplied by the atomic clocks. These are used to measure and regulate atomic clocks. The conventional approach using microprocessors and software would not have met the tight mass and energy restrictions so the Steinbeis team provided a convincing alternative with a direct hardware solution. The algorithms calculate the instantaneous

phase and frequency value in real time, as well as the spectrum of phase noise via an FFT. Together with the system telemetry data which are captured in parallel, they are processed in preparation for scientific evaluation and transmitted via a telemetry and telecommand channel to the ISS on-board computer system. Even while the system is running, this interfaced can be used by the system for reconfigurations stipulated by the scientists.

Using higher level language to program the FPGA made it possible to provide a highly complex system such as the FCDP module directly within an FPGA without compromising software flexibility or exceeding crucial mass and energy requirements.

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## Management in the trade sector

**The School of Management and Innovation at Steinbeis University Berlin now offers a new further education degree culminating in a "Master of Business Administration (MBA) – Specialised in Trade Management".**

As the global economy brings about more and more change, competitive pressure is intensifying for all types of companies involved in commerce and trade cooperatives. The result: rising demands placed not only on companies but also employees, especially up-and-coming managers. It was this development that prompted the SMI (School of Management and Innovation) at the Steinbeis University Berlin and the ADG (Academy of Germany Cooperative) to set up a joint MBA in Trade Management for people already in employment, specifically tailored to the needs of the trade sector.

Carsten Rasner, SMI Director states: "Our target group is ambitious employees and

managers in trading companies and cooperatives in search of key management qualifications." After General Management and Leadership, the third emphasis is Trade and Cooperative Management. "The subjects range from the latest developments in logistics and Supply Chain Management to strategic considerations in site policies, IT systems and cooperative management as a management instrument of the future," explains Rasner.

The degree lasts 24 months and takes place in Montabaur Castle, Berlin, the Head Quarter of the ADG. The MBA program also includes a study trip to Rotterdam with themed site visits and two study periods at the SDA Boc-

coni in Milan. The Italian Business School is one of the leading management schools in Europe and already started working with the SMI as an academic partner in 1999. To apply to the MBA in Trade Management one must have a Bachelor degree and at least two years of work experience.

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## FlexRay Gateway Module for onboard vehicle networks

# Complex networks

The automobile was primarily invented to provide a new means of locomotion. The inventors certainly achieved their goal, but beyond this there is still plenty of room for improvement – and there are a variety of new functions that could still be added. This is driven by the demand for cars to do more and more, as well as changing requirements and innovations. For instance, today's technical developments center on safety – although many technological innovations are developed in response to the need to fulfill legal requirements such as environmental regulations.

Technological developments in the field of entertainment have provided plenty of new ways to provide passengers with innovative ideas. Then there are driver assistance systems. These go beyond previous passive and active safety systems to provide drivers with

form of navigation systems in heavy traffic and driver comfort systems. But to provide all these new on-board functions, a vehicle has to be fitted with a huge number of electronic control devices, linked together by 'bus systems' (data bus).

Beyond CANs, vehicles now also include media oriented systems transport or MOST. MOST networks are used for infotainment solutions and telematics. For price-sensitive applications the most viable solution is a local interconnect network or LIN standard. As demands placed on systems grew (data speed, safety, availability) it became more and more necessary to complement these bus systems with another bus for data communication within the vehicle. The solution: a time-controlled bus system known as FlexRay which only went into serial production on the BMW X5 in recent months.

The number of functions built into vehicles has risen almost proportionally with the number of devices needed to control them, resulting in huge complexity. To manage this complexity, the system has to be partitioned for the entire vehicle. No systems on the market are currently capable of networking all components. To enable data exchange between subnetworks, media gateways are used in the form of gateway modules.

These gateways are either integrated into control devices or work on a stand-alone basis. Until now gateways have typically made it possible to form a cross-link between the commonly used bus systems such as CAN, LIN and MOST. As the FlexRay bus system will play a major role in many new vehicle networks, there will be growing calls for gateways that make it possible to link up with this time-controlled bus system.

The experts at the Steinbeis Transfer Center in Göppingen have been working on the de-

tangible support at the wheel. For example, a car can automatically detect potentially hazardous driving situations, putting it in an ideal position to react preemptively should things go wrong and allow the driver to steer out of trouble. Further support is provided to ease the burden on drivers in the

For more than a decade most car makers have done this with a controller area network, or CAN for short. The advantage with CANs is that they are particularly good at meeting the requirements of control systems in the drive chain and car body electronics.



velopment of hardware platforms for time-controlled bus systems for a number of years and have now come up with a gateway module known as FlexXCon compact. This module is used for rapid prototyping when testing vehicles with pre-production prototypes and release sample parts. A number of months before control devices go into series production, vehicle developers already need platforms on which to test vehicle communications out on the streets.

Through the integrated Freescale HCS 12- $\mu$  controller, the FlexXCon module can pass on the data in the bus system to be linked up like for like, although users can also use their own application software to filter or modify data. So developers have at their disposal a

highly powerful gateway module opening up a number of essential avenues to communicate with FlexRay buses on the vehicle.

The developers at the transfer center have paid a great deal of attention to the module's suitability to vehicles. So not only should it adhere to vehicle standard ISO 16750, it had to have a small housing. Once completed the entire module fitted into a housing no larger than 124 x 85 x 35mm. To develop existing and future vehicle networks, users in the automotive industry thus have at their disposal a highly innovative, powerful and strong gateway module for use in all types of vehicles, allowing them to link up directly with the new FlexRay technology.

The box developed by the specialists at the Göppingen-based Transfer Center Microelectronics offers the following features:

- a total of 4 vehicle communication channels (incl. one FlexRay)
- supports FlexRay, CAN, LIN and RS232
- flexible assembly physical layer modules
- BDM interface for programming application software
- compact housing suitable for vehicles
- suitable for battery voltages ranging from 9 to 42V
- several analog and digital I/Os

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## An image processing measuring system for interactive and automatic measurements

# Measuring every pixel – precisely

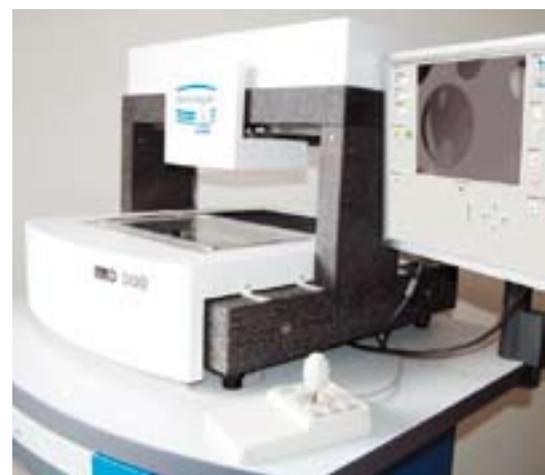
**Steinbeis experts at the Ilmenau Transfer Center Quality Assurance and Image Processing played a key role in the development of the IMD 300 image processing measurement system. They created an image capturing channel and developed the software. The compact tabletop device is controlled by computers and can measure objects as small as 300 x 200 x 40 mm down to individual sub-pixels.**

One of the biggest challenges faced by the team was the software. It had to control the camera, motor and illumination. Small parts can be measured optically in a single image but parts which are too big to go on one picture have to be measured by using the length measuring systems of each axis (based on X and Y coordinates). While this is happening, the software regulates the reflected light, a four quadrant LED ring light, and transmitted LED light automatically.

The software can be controlled individually by setting the area of interests as well as scanning contours automatically. A special requirement of the instrument was the macro-environment with a special 'teach-in' function. This allows the device to learn repetitive measurement procedures quickly.

The user interface is broken down into clear functional categories. For each category there are straightforward looking buttons outlining the main function. For example by selecting "Measurement" you are given instant options to measure shapes such as dots, straight lines, squares or circles. The device contains a comprehensive software library which provides the necessary image processing functions, statistics and filtering.

Some development work is still in the pipeline: the Steinbeis Transfer Center is currently working on a new concept for the software interface based on .NET framework technology – to pave the way for the latest Windows Vista environment.



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## Groundbreaking process for conditioning patient gas

# When the air starts drying up

**During artificial respiration and breathing therapy, unnaturally dry and cool gases often enter the respiratory tract. The effect of this is a severe reduction in the temperature of mucous membranes which become extremely dry. Everyone agrees that patient gas needs to be kept warm and moist during invasive respiration. But even with non-invasive respiration, cold and dry gases have a detrimental effect: the mucous membranes in the upper respiratory tract can become swollen – the throat dries out and patients can suffer bleeding and pain. Now, Gründler GmbH has introduced a new technology that allows you to actively heat and humidify medical gas.**

the area around the nose and pharynx. Air is heated and humidified safely and effectively by using a very large surface which exchanges all of its energy with the gas. As the gas exits the humidifier it is at almost the same temperature as the recirculating water. The same applies to the saturation level, usually independent of the actual flow of gas and other influences.

By recirculating liquid, it was possible to expand the heat exchange area between the water and the air – using the same natural principle found in the mouth, nose and pharynx. As a result, you no longer have to heat the humidifying water to high temperatures.

The HumiCare® 200 system is based on the principles of cold evaporation over a large, moist surface kept at a constant temperature. This is highly similar to the natural way air is humidified inside the human nose and pharynx. As it evaporates, the water turns into a gas. In this state humidity is held in the gas in the form of tiny molecules. This is crucial when it comes to hygiene as molecular humidity equates to smaller particle sizes and smaller particles are not able to transport micro-organisms such as bacteria or viruses.

This is one of the key differences with this humidification technique. Another highly effective hygiene barrier offered by the

HumiCare® 200, which also prevents the transportation of micro-organisms, are the smooth dry surfaces all around the heating tubes – ideally protected from condensates. The humidification chamber and piping system are available in an autoclave reusable version or as disposables, with no effect on function. The inventors of the HumiCare® 200 are confident that the function and hygiene benefits it offers make it possible to overcome the known side-effects of artificial respiration, as is currently being examined in clinical trials.

### Gründler GmbH

Gründler medical, a new company based in Freudenstadt south west of Stuttgart, develops innovative products used in intensive care. To create benefits for patients, users and providers, the aspect of practical everyday use is anchored firmly within the company philosophy. Gründler believes that only by bringing developers and users together, working effectively right from the beginning of the product development process, do you arrive at truly innovative products. As a result, doctors and care workers employed by Gründler medical are supported by experts and specialists from other areas, resulting in valuable input and ideas.

Conditioning patient gas offers two general approaches: passive or active systems. With passive systems most of the humidity and heat breathed out is kept inside a filter and fed back into the air going back into the lungs. With active humidification the breathing air receives heat and humidity from outside – such as by using electricity and water.

Gründler GmbH, a medical company partly owned by Steinbeis, has now introduced HumiCare®, a new technology that allows you to actively heat patient gas and humidify it. The HumiCare® system is based on the natural functioning of the human nasopharynx,

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## Machine cutting hardened adhesive bonds

# Bonded to perfection

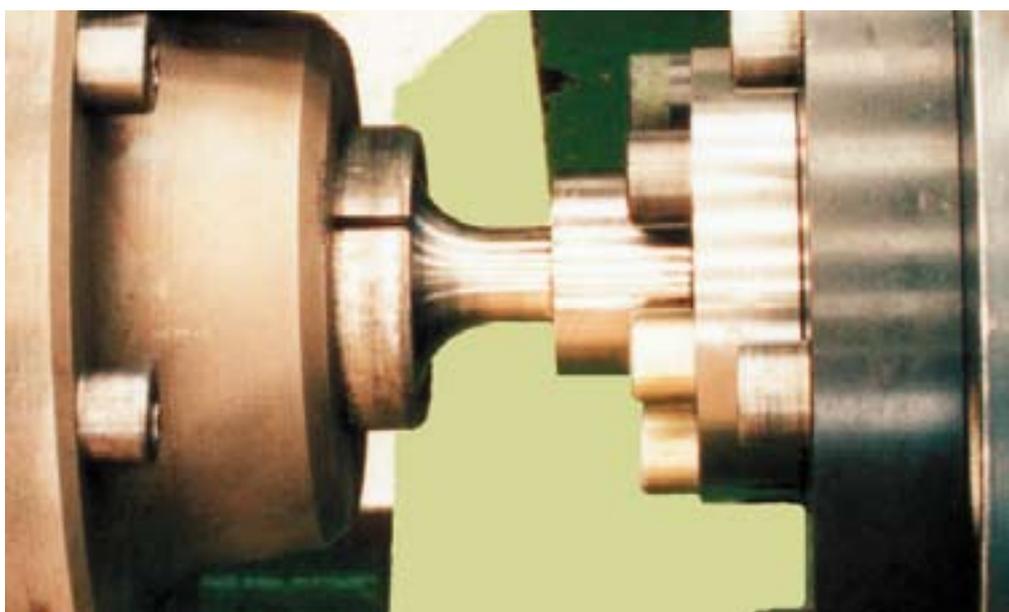
**What influence does machine processing have on the fatigue characteristics of longitudinal adhesive bonds – especially with lathing? This was the question posed by specialists at the Study and Research Center of the Steinbeis University Berlin at IMA Material Research and Application Technology Ltd in Dresden. Through a number of experimental trials not only were the effects identified, it was possible to make a number of suggestions for improving processing parameters.**

Elementary longitudinal press-fit joints are a simple and economical production option for joining shaft to collar connections. They have found many uses in many different sectors of mechanical engineering. Using adhesive as a lubricant when making connections makes it possible to transfer tremendous power and momentum.

To produce such bonded joint connection it makes sense from a technological point of view to machine cut the form as a complete part. Of course this is only possible if machining does not damage the point of adhesion. This is especially true for applications involving dynamic loads. For manufacturing, machine cutting a hardened adhesive bond is a new technological variation in processing complete parts. The advantages lie in superior manufacturing and product quality, more flexible construction design and more profitable production.

To generate a base of primary data for machining trials, researchers at the Study and Research Center of the Steinbeis University Berlin in Dresden developed a test and diagnosis strategy. Different production parameters and differing shaft and collar contours were examined, identifying the effect they have on the number of cycles to fracture that can be endured. Just one of the findings of the experimental trials was that for all contours, excess length has an overriding effect on the strength of the bond.

The effect of processing is not significant. The contour processing of the shaft, which adhered to design suggestions made in DIN 7190, shifts the point of failure from the



A torsion testing station with a unit under examination

bond to the shaft material. This is because of cross-sectional weakening. For this bond geometry the S-N curve of the smooth, unbonded material sample applies. When finishing the shaft contour it was found that the process parameters did have some effect, but this was on the strength of the shaft rather than the strength of the bond.

So the technological parameters selected (cutting speed  $v_c$ , feed  $f$ ) obviously seem to have no detrimental effect on the adhesive bond, either under the defined quality restrictions (required surface roughness) or with respect to productivity and costs when the cutting edge is sharpened for processing. Machining complete sample parts had no effect on the fatigue life of the product, but product quality – such as improved concentric running characteristics – can be improved by machining complete parts.

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## Multinationals and SMEs work in partnership on the Connect-2-Ideas project

# Tapping into strategic knowledge

To develop products and services, multinational corporations (MNCs) increasingly tend to complement the results of their own in-house research with inputs from external partners, many of them small and medium-sized enterprises (SMEs). At the same time, MNCs generate in-house knowledge that they can not actually use themselves so they offer it to SMEs. This corporate strategy of Open Innovation is especially interesting for SMEs, offering them hitherto unthinkable partnerships with major companies. The Steinbeis-Europa-Zentrum (SEZ) was assigned by the European Commission to help SMEs meet this challenge and develop corresponding business strategies.



Under the auspices of the Ministry of Economic Affairs and in collaboration with regional partners, the Steinbeis-Europa-Zentrum hosted, in the summer of 2007, four workshops on Information and Communication Technologies and Mechatronics, with two further workshops on Life Sciences scheduled to take place in autumn 2007. The aim was to raise awareness of the

partners included the Mechatronics Competence Centre, the Stuttgart Region Economic Development Corporation (WRS) and Festo AG. Here, the speakers came e.g. from the Siemens AG, the Karlsruhe Research Center and the IPA Fraunhofer Institute.

The Steinbeis-Europa-Zentrum considers the introduction and more systematic use of strategic intelligence a new key component in the process of Open Innovation and thus crucial for the sustainable success of a company, a cluster, or a region. Strategic intelligence instruments are important in two ways:

- for the companies to identify future business models, joint strategies and activities with partners and trading alliances (otherwise difficult to detect)
- for innovation policy makers to create long-term, sustainable competitive perspectives and framework conditions for all actors of an innovation system – especially in the triangle between business, science and politics.

In a world of "Open Innovation", the faster and easier SMEs gain access to strategic knowledge – e.g. through foresight and technology assessment activities – and integrate it in their company strategy, the more successful they will be. To help SMEs meet this challenge, public support is provided at regional, national and European level. One such example is the European funded pilot project Connect-2-Ideas focusing on three regional clusters in Baden-Württemberg: Information and Communication Technologies (ICT), Mechatronics and Life Sciences. Steinbeis-Europa-Zentrum is the Baden-Württemberg partner within the project; the other 6 partners come from the UK (including Procter & Gamble), Italy and Slovenia. Approximately 170,000 Euro of the project funding will go to Baden-Württemberg.

strategic significance of future developments for participants' companies and provide a platform for future-proof innovation and technology partnerships.

The workshops brought together different actors from the regional clusters, entrepreneurs, company directors and senior managers from development, research and engineering, but also universities, trade associations, chambers of commerce and local authorities. In the field of ICT, stimulating speeches were given by important global players such as SAP and IBM. The workshops were organized by SEZ in cooperation with regional partners such as the Centre of Excellence for Information Technology and Media (MFG), the company network Baden-Württemberg Connected e.V. (bwcon), and the Research Center for Information Technologies (FZI). In the field of Mechatronics, the

The objective of the workshops was to present various methods, concepts and approaches to strategic 'future management' within companies (corporate foresight) as well as their successful applications in the industry sector. Furthermore, the workshops aimed to encourage participants to act and think creatively, and to anticipate and discuss future developments in a 10-year time horizon. Possible options for action for com-

panies were identified so that they can now start to establish the foundations for a successful future.

Using strategic knowledge constitutes the basis for long-term corporate success. However, in order to build successfully on this basis, "classic" business and policy instruments have also to be applied. For this reason, a second focus of the workshops was the "market of opportunities" part. Participants were given the possibility to present their own technology profiles and also to check technology offers and requests submitted from all over Europe through the Innovation Relay Centres (IRC) database. This database enables each IRC to quickly bring into contact companies and research actors from its country with other European technology providers or seekers. The IRC network consists of 250 partners in 33 countries and has been supported by the European Commission since 1995. The Steinbeis-Europa-Zentrum is the IRC for Baden-Württemberg, Thuringia and German-speaking Switzerland.

Further activities of the Connect-2-Ideas pilot project include e.g. providing a new platform for coordinating technology requests and offers between MNCs and SMEs as well as compiling a best practice manual for international technology cooperations with MNCs. In a world of "Open Innovation" there are clear opportunities for SMEs: introducing strategic 'future management' and setting up strategic technology partnerships are key factors in securing the future success of companies.

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## Final of the online competition for "Young founders"

# Tomorrow's hi-tech, tomorrow's entrepreneurs

**"Jugend gründet" (Young Founders) is an online competition aimed at fostering entrepreneurial spirit and creating enthusiasm for hi-tech in schools. Originally launched by the Federal Ministry of Education and Research, it is open to schoolgoers throughout Germany. In 2006/7 the competition was organized and managed for the fourth time by the Steinbeis Transfer Center Business Development in Pforzheim.**

For a whole academic year, broken down into two halves, schoolchildren work on their very own business idea and a complete business plan for a hi-tech product. They then have to found their own virtual company. Teams consist of up to six members. "Young people learn how to develop creative thinking on the one hand and entrepreneurial business skills on the other," explains Barbara Burkhardt-Reich from the Steinbeis Transfer Center.

Their creativity and expertise certainly showed: the business plans ranged from medicines made from the poison of sea slugs to generating electricity from the weight of people walking over steel plates placed under floors. The 10 best teams from the 1200 entrants were invited to the final in Wolfsburg at the end of July to take part in a "Young Founders" investor fair. Their brief: sell their product idea to an expert jury made up of people from business, universities, the media and banks.

The winning team, selected for its creativity, the presentation and the underlying product idea, was Optilux from the Hansenberg boarding school in Geisenheim (Hesse). The schoolboys developed a streetlamp system based on LED technology that uses motion detectors and intelligent computer links between lamps to make sure that streets and roads are only illuminated when needed by traffic. The winning team won a trip to Silicon Valley paid for by Steinbeis to witness hi-tech in-



dustry first hand. Although only one team took home the first prize, all of the school children thrived on the experience of participating in the final and the year-long competition.

The "Jugend gründet" education initiative is sponsored by Steinbeis, Lenovo, Palm Deutschland, Vodafone D2, METRO GROUP, Volkswagen, Phaeno Experimentierlandschaft, Deutsche Bahn, MLP, Westermann Publishing Group und vdi-nachrichten.

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## Steinbeis Student evaluates the economic viability of wind energy

# Wind energy in the Australian outback

Powercorp is a medium sized Australian company specializing in isolated hybrid power supply systems. Apart from supplying power station components and the corresponding automation and control systems, Powercorp makes the intelligent stabilizing solutions to go with them. Eckhard Schultze who is studying for his Masters of Business Engineering degree at the Steinbeis University Berlin Career Center, went to work with the Powercorp Group as part of a business project in the Australian city of Darwin (Northern Territory). His brief: to analyze the economic viability and technical performance of wind energy solutions.



units had to be supplemented with a stabilizing solution. To do this, Powercorp offered the client two options although neither knew how well the solutions would perform, nor whether they would be profitable.

For his project, Eckhard Schultze evaluated both possible solutions. This meant examining the technical performance of each solution and economic viability then comparing. To make it easier for Powercorp to win new projects and acquire customers, his analysis also looked at client purchasing processes. This entailed looking at the buying process for his existing project – taking in all people involved on the customer side and within Powercorp – and, based on this work out a general

The model developed by Eckhard Schultze showed which power station would be the most economical over an investment period of 20 years. In his study, Schultze tabled a number of hypotheses on the options open to Powercorp to improve its marketing strategy. His analysis of the purchasing process was based on the underlying principles of buying centers, buying processes and buying categories. It uncovered a number of weaknesses within the existing Powercorp set-up, especially in the selling and communication process.

The insights provided by Eckhard Schultze's project were used to work up a general marketing strategy for Powercorp which will now form the basis of any other new projects in the pipeline. The simulation models created during the project and the freshly defined approach will also flow into new projects where they will help the company compare the economic viability and technical performance of power stations. Now Powercorp is in an ideal position to assess profitability and the technical performance of wind/diesel power stations. Not only will this help the company acquire new customers, it will also form part of the internal power station development process.

A Powercorp client had just entered the planning phase of a new wind/diesel power station to be set up in a small settlement north of Perth, Western Australia. The power station should include new wind energy generators able to survive cyclones – a recurring threat in the area. Neither the client nor Powercorp had any experience with such generators as neither had ever installed one.

To make sure the isolated power system met reliability requirements, the wind energy

eral marketing strategy for Powercorp.

To compare both power station options in terms of economic viability and technical performance, technical simulations were needed. These identified the parameters for factors such as fuel consumption for both power station options, or the number of operating hours for the diesel generators. The data generated by the technical simulations were then fed into a specially developed model based on standard investment cost accounting procedures.

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## The quest for innovation as a challenge to business

# No color televisions from Japan

**It is claimed that Max Grundig once predicted that the Japanese would never make color televisions. As we know from history, he was obviously badly informed. His naivety is a harsh reminder to all of us that it can be fatal to misjudge situations: companies that want to be successful and stay successful must work on success 365 days a year.**

The "international hunting line" is a business term used to describe competition between countries for products and production. It demonstrates how important it is to turn innovations into reality. According to the theory, in many areas of the global economy developing countries are competing with newly industrializing countries (NICs) – especially in south east Asia and east Europe. In these countries, more and more products that were previously manufactured abroad now come from domestic production. So in turn, the nations climbing the ladder are forcing NICs to challenge the position in "strategic markets" occupied mainly, for many years, by Japan. The outcome: they are providing good standard quality products at bargain prices. As the Japanese come under pressure, they also have to "trade up".

Examples of markets where the warm-ups can already be witnessed in the "relay race" in international competition are steel, ship-building or watch making. At the beginning of industrialization these industries were dominated by European and American companies. Then they were conquered by the Japanese, before being taken over by south east Asian countries. A similar, highly characteristic, shift took place in the consumer electronics market, computers and the automotive sector. As early as the 1990s "Japanese" microwaves and color TVs were not the only products emanating from factories in Thailand, Malaysia and the People's Republic of China.

As competition has become more and more intense, the industrialized nations were basically left with two options: leverage ongoing process innovations in old markets to create

enough leeway to maneuver prices upwards, or enter new markets with product innovations. Whichever direction it went one thing was almost inevitable: sooner or later NICs and developing countries would even erode this competitive advantage by copying ideas themselves or achieving cost advantage. The value of innovations was described by authors such as Michael Porter in his influential work "Competitive Strategy":

- Process innovations usually give companies the cost advantage and are pivotal to a cost leadership strategy
- Product innovations are normally central to quality leaders' strategies, enabling them to cash in on the buying propensity of consumers by matching the offer to needs. Irrespective of whether satisfaction arises from service quality, novelty or the ability of a product to solve a problem, satisfied customers are less price sensitive.

As the drives to innovate, reduce costs or be first are increasingly mutually exclusive, companies must aim to achieve cost and quality advantage by forging ahead with product and process innovations at the same speed. In countries like Germany many companies have already missed the opportunity to gain cost or quality leadership through process or product innovations. The problem with this is obvious: if you fail to find marketing instruments that build preference – for example

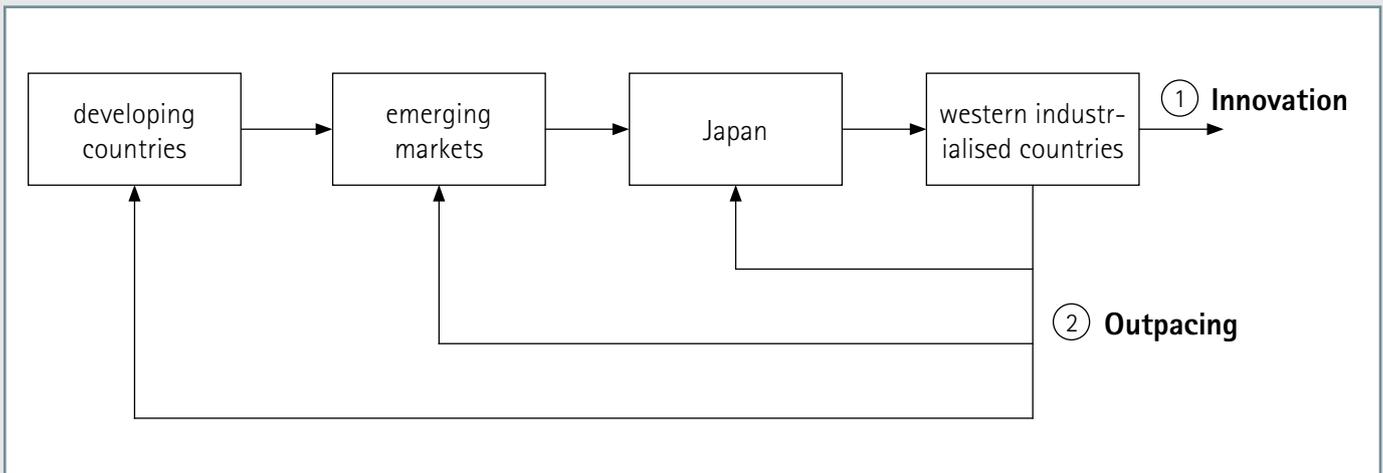
superior product quality or an image strategy – and are unable to rise permanently above the competition, the only unique selling proposition open to you to market the product, is price.

German companies struggling to innovate is usually a homegrown problem and often stems from a lack of imagination. In a study conducted on behalf of the Bad Harzburg-based management school "Akademie für Führungskräfte der Wirtschaft", some of the causes pointed to by managers were:

- Time pressures
- Employees do not feel innovation is their responsibility
- Senior managers do not make enough resources available
- Very little use of creativity techniques or relevant methods to bring about innovation

And even when companies come up with innovations, there is no guarantee it will succeed on the market. A number of studies show that lots of new products fail to make it to the decisive growth phase and fade away. Overall the flop rate stands at somewhere between 60 and 75 per cent. The consulting company Arthur D. Little developed an evaluation filter and came to the conclusion that a mere 15 per cent of all innovation ideas should make it onto the market, although no more than two thirds of these, i.e. 10 per cent of all innovations, will remain on the market.

There are a number of reasons why so many innovations flop. Often the product fails to make any headway because of the sheer number of competitors. Others fail to establish a new technical standard or do not appeal to enough customers because the company does not provide enough options for using the product.



### The international hunting line

To make things worse, companies face a huge time dilemma. Product life cycles continue to shorten, but product development is taking up more and more time, sometimes in multiples, increasing the risk of failure. Given all of these problems, there is increasing demand for effective and insightful market research to look specifically into innovations. This applies especially to products incurring the lion's share of innovation process costs during the development phase.

Under such circumstances creativity techniques can help tremendously. These help when thinking through and solving problems that are difficult to otherwise define or

quantify, problems that can not be tackled using standard techniques. The Mannheim Inventor Workshop is a holistic technique developed by the Steinbeis Transfer Center Market Research and Marketing Know-How. It offers plenty of potential to different sized companies from all types of sectors and is fast and efficient. The workshop already has a good track record in developing a variety of solutions to an even broader variety of problems, ranging from the development of environmental scenarios to application options for new technologies in private households and even new company names.

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### New Steinbeis Enterprises

#### Abbreviations:

SCC: Steinbeis Consulting Center  
SRC: Steinbeis Research Center  
SIC: Steinbeis Innovation Center  
STI: Steinbeis Transfer Institute  
STC: Steinbeis Transfer Center

The following Steinbeis Enterprises have been founded as of May 2007:

STI Political & Crisis Management, Berlin  
Directors: Dr. Henning Herzog  
Dipl.-Kffr. Birgit Galley  
Dr. Thorsten Hofmann

STI School of Governance, Risk & Compliance, Berlin  
Directors: Dr. Henning Herzog  
Dipl.-Kffr. Birgit Galley

SCC Business & School, Bonn  
Director: Prof. Dr. Günter Vollmer

Steinbeis Pharmatechnik GmbH, Irndorf  
Director: Helga Ziegler

STC Innovative Services in the Migration-, Social- and Healthcare-Area, Bremerhaven  
Director: Prof. Dr.-Ing. Franz-Josef Heeg

STI Academy for Social Aspects and Law, Berlin  
Directors: Dr. habil. Gernot Barth  
Prof. Dr. Lothar Langguth

SCC Culture and Economy, Willstätt  
Director: Dr. Martin Ruch

STC Computer Networks and Internet, Tübingen  
Director: Prof. Dr.-Ing. Georg Carle

SRC IT and Business Process Management, Aalen  
Director: Prof. Dr.-Ing. Rainer Schmidt

STI Public Management, Gärtringen  
Directors: Dipl.-Verwaltungswirt (FH) Hans Drexler  
Prof. Dr. Werner Faix

STC ByWire Tech, Stuttgart  
Director: Prof. Dr. Reinhard Reichel

SRC In-Vitro Assay Systems, Krauchenwies  
Director: Prof. Dr. Jörg Bergemann

SCC Technology Exploitation and Strategy (TES), Bonn  
Director: Dr. Stephan Haubold

SCC Healthcare Business Research & Management, Berlin  
Directors: Wolfgang Kast  
Dipl.-Kfm. Frank Boos  
Prof. Dr. Peter Dohm

## A furniture maker's involvement with in-house training

# Individual logistics training

**Industrial logistics are changing faster and faster. Terms such as globalization, just-in-time (JIT), outsourcing, supply chain management and raised logistics efficiency are no longer just buzzwords. They are an everyday reality, especially in small and medium-sized companies – like Ronald Schmitt Tables from Eberbach, which specializes in the manufacture of premium furniture items such as tables, wardrobes and TV/phono furniture.**

Ronald Schmitt faces the types of logistical challenges many SMEs have to overcome these days: improve process quality and volumes, despite the squeeze on costs. It is made no easier by the nature of their business. Companies like Ronald Schmitt often employ top craftsmen, but they have no or little formal training outside their manual trade. So at the start of this project, employees desperately needed training – everyone would need preparing for new logistics processes. Senior managers also wanted to kick off a continuous improvement process (CIP). In response to the brief, the Steinbeis Transfer Center Logistics and Marketing Management designed and ran a logistics training program tailored to the needs of the company for employees working in the warehouse and logistics.

The key task at the start of the project was to draft a detailed training concept. This involved a round of discussions with senior managers at the company, site tours and an analysis of existing logistics processes to pinpoint the specific target group for the training and work out who to train, how and when.

For training to succeed, the goals of the training program need to be tailored to individual needs, otherwise it is impossible to plan and monitor progress. The goals should define all skills and personal qualities to be learnt by participants by the end of the training program. The project team held several rounds of meetings to work up cognitive, affective and “psycho motor” learning goals, specify each goal and agree priorities.

The courses took place outside working hours on a fixed day of the week. Overall there were 12 sessions each consisting of two modules, first of all looking at the fundamentals of each topic before considering how this translated into everyday practice within the business – in combination with an analysis of processes and an opportunity to work up options for improving processes. Topics covered ranged from issues such as logistic processes overall to goods-receiving, warehousing and in-house transportation. To round sessions off participants were taken on a tour of logistics in a comparable company.

At the end of the program participants were tested on content. If they passed the test, they received a certificate from the Steinbeis Transfer Center Logistics and Marketing Management. Participants also received detailed hard copies of documentation and training notes to take back to the company and speed up employee inductions. Improvement potential identified during the course, such as more logical storage and more efficient warehousing technology, were then discussed jointly with advisors and translated into actions.

The logistics training program lasted six months and was completed in the summer of 2007. All goals agreed before the course were successfully accomplished with the added benefit of various process improvement suggestions. One thing the program demonstrated is that even though there are plenty of standardized logistics training pro-



grams, it really is worth tailoring training to individual company needs. Further, linking the program to a systematically organized CIP process can uncover huge potential to improve logistics processes – and thus cut costs.

### Success factors

A variety of aspects affected the long-term success of the in-house training program:

- Senior management support
- Dovetailing the program with areas overlapping closely with logistics
- Before starting: open dialog with all participants on the background and aims of the program, outlining personal gains
- Integrating employee insights and translating learning into daily business
- Matching course content to participants' needs: not over or under-demanding for participants, adapting to the ability and willingness of participants to learn, as well as mental capacity
- Adhering to rules regarding absenteeism, punctuality and involvement

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## From traditional publishing house to cross-media content provider

# Growth strategies in a changing media environment

**The RBVG (Rheinisch-Bergische Verlagsgesellschaft) is an international media group specializing in print media. It must continually adapt to new challenges brought about by fundamental changes in consumer media behavior and media customers changing their advertising strategies. During his masters at the Steinbeis University Berlin's School of Management and Innovation (SMI), Stephan Marzen, an investment manager at RBVG examined growth opportunities and strategies on behalf of his sponsoring company.**

At the beginning of the 21st century the RBVG could look back safe in the knowledge of decades of continual growth. But today it faces the new challenge of dealing with the effects of a media crisis and rapid changes in media consumption habits. As a first step, the company therefore had to fundamentally reorganize its operations across all business areas and streamline its business portfolio in all regional markets. It then had to address the issue of how to return the media group to its original path of growth, especially since it needed to remain a key competitor in a media environment increasingly marked by concentration and internationalization.

This issue was presented to Stephan Marzen during his MediaMBA studies at the School

of Management and Innovation, which he began in 2005 and successfully completed in 2007. A commercial graduate by background, Marzen has been working as an investment manager at the publishing company since 2004. Within this role, he is responsible on an operational level for existing investments in Poland and the Netherlands, plus moving image activities within the media group. He also manages new investments from initial acquisition through completion.

The aim of his degree project at the SMI was to pinpoint future growth opportunities and develop strategies to form specific recommendations for action at RBVG. Marzen's recommendations for next steps were based on a detailed evaluation of market offerings

and providers in each regional market, focusing on the two most pertinent regions for strategic reasons: North Rhine-Westphalia and the province of Kujawy-Pomerania in Poland. His task was to summarize key factors driving development and influences on each market and estimate further developments in the period until 2010. These market factors were complemented with an analysis of existing know-how and resources within RBVG. By comparing prospects outside the company with those inside the company, Marzen was able to arrive at specific steps to generate growth.

Out of the four growth options identified, Marzen recommended continuing to pursue a strategy of local market leadership, as

was the case in the past, and to position the company as a provider of local and regional content across all media segments – only to do this much more forcefully than before.

Even during his studies, actions and projects worked on by Marzen were already being put into place. For instance, the company invested in a new regional TV channel from Dusseldorf called center.tv. It also launched a lifestyle-oriented 'free-ads' newspaper in Poland. Based on similar evaluations, the company also embarked on and implemented a variety of growth projects in the regional markets of the Czech Republic and the Netherlands.

The center.tv channel went on air in 2006. It offers a round-the-clock program on all types of issues and events affecting Dusseldorf and the surrounding area. The schedule includes news, documentaries and people

from the local business scene and politics, as well as sports, arts in the region, talk shows and higher-quality program formats. Based on RBVG's positive experiences since going on air, the company is currently looking at ways to extend local TV activities to other cities in North Rhine-Westphalia.

Between July and September 2006, the company set up and launched a free advertising newspaper in two cities in Poland. The paper comes out every Thursday and covers a variety of topics related to leisure activities, sport, social events, fashion and travel. Its aim is to encourage readers to buy more and so provide advertising customers with the right format to advertise products. Here, too, RBVG is looking closely at ways to roll out the concept.

Over the past two years the publishing group has succeeded in bolstering its market stand-

ing within each region and even strengthen it. This is not least thanks to the efforts and specific recommendations made by Stephan Marzen. Today RBVG considers itself back on the path to growth. To make sure it remains successful in the market in the long term, Marzen recommended in his masters thesis that the company should work continuously on the areas of action already implemented and actively follow up and put into place the remaining identified actions – if necessary with added impetus.

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## Steinbeis Transfer Institute provides training on VDA Rating Standards Certified supplier excellence

**Rating has been growing in importance across Europe for years. Without a doubt this was brought on by "Basel II" – binding capital standards imposed on banks at the beginning of 2007, an issue that had been hotly debated for years. In the meantime trained advisors and analysts are noticing that there are many more areas calling for their types of skills and that their job is not just about preparing clients for internal bank rating.**

One area in particular that has embraced rating is the automotive industry where it is used to conduct "supplier ratings" as part of general supplier vetting. As early as 2004, the VDA (German Association of the Automotive Industry) already created standards with a private rating company. These are no longer just standards in name, they have become common practice for assessing suppliers. The VDA Rating Standard is a special software program based on a leading rating tool called R-Cockpit™ and specially developed for the VDA. Not only can it carry out balance sheet ratings, it offers holistic ratings based on qualitative criteria. In March

2006 Version 2 of this standard application came out and was sent to all members of the VDA to update the technical parameters of their rating software.

The Steinbeis Transfer Institute RaFin, which is based at the Steinbeis University Berlin, also trains students in the use of this software, preparing them for consultations with suppliers to the automotive industry. The way things are developing in the industry – which can be summarized by terms like "single sourcing" and "global sourcing" – this rating standard has major implications for large OEMs in selecting and evaluating sup-

pliers. As a result, trained rating advisors and analysts are now not just freelance management consultants, or financial advisors and certified accountants who have taken on new qualifications, they are also in-house "raters" – a type of trained financial accountant who vets suppliers and OEMs.

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## Steinbeis Certified Consultant

# Gearing qualifications to future requirements

**Experienced consultants – who place importance on further education, networking and successful competitive strategies – can turn to Steinbeis for certification. The Steinbeis Consultant Certificate gives accreditation to special consultant attributes and therefore sets the standard in response to growing quality requirements imposed by clients.**

The certification program covers a variety of modules including 1-on-1 coaching. Certification opens the door to an exclusive community of qualified consultants making it much easier and more effective to compare notes with trained professionals. The Steinbeis Consultant Certificate sets the quality benchmark in terms of consulting skills, such as social skills, specialist knowledge and methodologies. As well as confirming that consultants possess these qualities in the first place, the fact is made public over the Steinbeis website. This simplifies searches – reassuring clients that they are making the right decision.

The Steinbeis Consultant Certificate is primarily aimed at qualified, experienced consultants seeking to validate their skills and interest in further training through an independent, third party. Certificates are valid for three years, extendable for three years at a time by providing evidence of further successfully completed training and certification, or active contributions to the community.

Applications for the Steinbeis Consultant Certificate go through several stages: after each application has been assessed it starts with an interview with experts, hand-in-hand with a

special coaching session. During this session a customized training package is agreed with the applicant within the framework of the overall certification program. Training and additional qualifications are provided through a series of seminars and events organized in cooperation with Steinbeis Hochschule Berlin.

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## Playing the corporate strategy game

# Taking board games to board meetings

**Traditional board games such as chess focus strategic and operative thinking on just a few dozens of squares, pieces or stones and rules, yet resulting in an astronomical number of possible states. The aim of the game? One or other of the following outcomes: an outright win (a clear upper hand resulting from the specific relative position of the pieces) or a situation comparable to a win (a superior state resulting from a better position of the field of play with respect to the overall relative position of the pieces). The Steinbeis Transfer Center for Risk Management has developed a game for different strategic and operative decision making scenarios in everyday business management.**



The game was a playful by-product of management consulting and development projects. The roles of each piece are dictated by specific rights and responsibilities. Aims are dictated by the specific state on the board. The hard-

ware: a hexagonal board and pieces made out of solid wood. The software (in other words aims and roles) is literally written on paper.

The board and figures are used to make the goals, strategies and measures more visible. By changing the rules, roles and aims, the system can be made deliberately complex and cater for different types of games. The games are not driven by random selection from a tumbling dice. Chance, and with it unforeseeable future circumstances or outcomes, emanates from the decisions made by players for the coming move or a variety of possible moves. Chance also results from less prudent decisions. Basically this is the type of

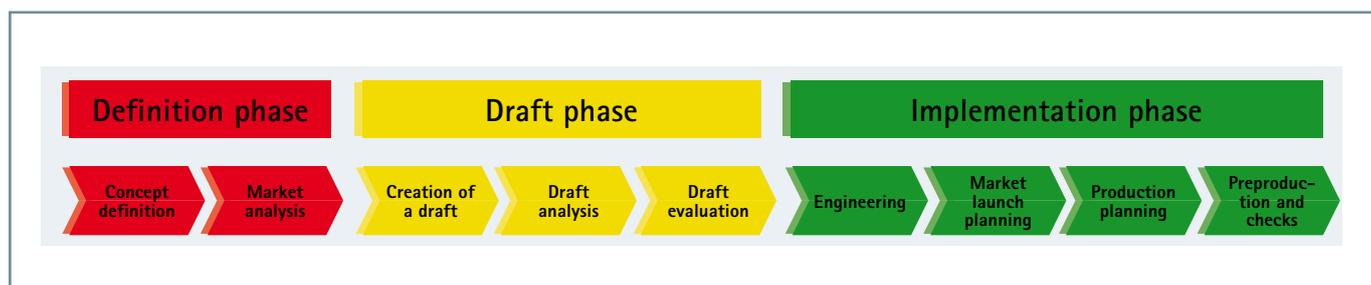
complexity governing enterprises and their business environment. Stimulus for the development of the game has always been the context of enterprise and business. The game also involves practical and theoretical considerations. One of the key starting points for the inventors was to show how taking gambles relates to decision making, and to demonstrate complexity (and with this: the limited predictability of future scenarios) in the form of a game.

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## Gaining an overview of risk on product development

# Risky – but under control

Market segmentation. Customized solutions. Terms and trends that are forcing more and more manufacturing companies to provide increasing levels of variety in terms of products and processes – yet shorter innovation and product life cycles. This results in more and more development and engineering projects, which essentially fall onto the lap of development, design departments and production.



Key decision makers are often asked to create uniform guidelines so that projects run smoothly. The solution: to interlink product engineering (matching it to PROducts) with industrial engineering (matching it to PROcesses, procedures and systems) and project engineering (matching it to PROject schedules, costs and in particular customer requirements). The Stuttgart-based Steinbeis Transfer Center for Management-Innovation-Technology (MIT) interlinks this network of influences with a method called 3PRO Engineering. This method gives you an exact overview of the product development process in specific companies – and standardizes it. Resources can then be applied more efficiently and, more important, you reduce risk throughout the entire project.

How does 3PRO work? First, scheduled projects are categorized using a decision-making template that takes into consideration the business's key success factors. Based on this, fundamental approaches to project implementation are identified.

Next, you draft a three part "Engineering Work Book" tailored specifically to company requirements and encompassing:

- A Work Compendium. The company-specific product development process and, based on this, product development

– routines and agreed production organization guidelines

- A Methods Set. Quick-fire tools for products and processes in keeping with cost and functional needs
- A Rulebook. A working manual for members of the project team. Rules include checklists and design rules for creating products and production techniques. These describe standards and routines in more detail.

How projects are implemented depends largely on the scope of each project: full-size, mid-size or slim-line. These designations dictate whether the Work Book is used in its entirety or individual modules. By using these methods and implementing them through the Work Book, project teams ensure that all engineering projects adhere to clearly defined, standardized procedures. This brings a variety of benefits: nothing is over-engineered, late customer requests can be quickly catered for and product costs can be minimized.

One company that profited from these Steinbeis techniques is a small to medium-sized manufacturer of electro-mechanical switches. The company product portfolio is aimed at the automotive sector among other areas. The company found itself having to respond to an increasing number of customer

demands to take on product developments – along with production processes. The product development processes are defined only by DIN/ISO so there is plenty of space to decide in everyday operations how to meet this norm. As human resources were tight, senior managers were keen to bring more efficiency into its project management. They also wanted to create standards for product development to reduce the long-term risk of failure.

By using the 3PRO Engineering method, the company successfully achieved its goals. One of the key elements of this was the creation of a Work Book to dovetail with existing process structures. This now dictates the implementation of all engineering projects. The company actually measured the benefit of the methods used and found that it had achieved double-digit improvement in terms of time schedule, cost and targets.

## Managing risks related to new technologies – a sustainable business opportunity

# Risk technologies @ Steinbeis

**Steinbeis involvement in activities related to and relevant for industrial safety has been increasing steadily in the last years both for industry and public sector. The Steinbeis Advanced Risk Technologies stands in the centre of this development and brings together the European and national stakeholders, promotes technology transfer, introduces new approaches to risk management, and manages and coordinates major European and industrial projects.**



is a prerequisite for improved productivity and competitiveness. Every interruption in the production or transport chain has negative implications for the EU economic system and the national economies which are getting increasingly inter-linked. Therefore, a uniform approach to safety across all European countries is needed and it has to be widely accepted in and coherently applied across all sectors of industry.

The main priority and goal of EU-VRi is to ensure that potential technology risks are managed safely, responsibly and transparently. In pursuit of this goal, Steinbeis Advanced Risk Technologies, as a part of EU-VRi, is leading an important initiative within the European "Seventh Framework Programme" (FP7). The initiative named iNTeg-Risk – "Early Recognition, Monitoring and Integrated Management of Emerging, New Technology Related Risks" aims to coordinate research and development activities worth more than 25 million Euros and ensure that safety, environmental friendliness and social responsibility remain the trademark of the "technology made in the EU".

According to European statistics, there were 7.6 million industrial accidents in the EU states in 2001. Out of these, 4.9 million accidents resulted in absence from work for more than 3 days and 4,900 of them had a fatal outcome. In other words every five seconds a European worker is victim of an accident at work and every two hours a fatality at work occurs. The industrial sectors mostly affected by these problems are the process industry, energy, transport and construction.

In order to deal with the problem, the European Union has laid down a series of goals for future research and development activities based on the collaboration and cooperation. At the Lisbon summit in 2000, the EU set the goal of becoming the most dynamic and competitive knowledge based economy by 2010. The Gothenburg 2001 summit laid an emphasis on long-term development and resulting issues affecting the environment, health and the economy. The two goals directly entail that industrial safety

This is still the vision yet to be realized, but the first steps on the way of its realization are already made. One of the most important among them is the creation of the European Technology Platform Industrial Safety (ETPIS: [www.industrialsafety-tp.org](http://www.industrialsafety-tp.org)) which nowadays coordinates the interests and activities of its more than 350 members from all key stakeholder groups. Steinbeis Advanced Risk Technologies actively supports and leads some of the ETPIS projects, in particular in the area of emerging risks. An outcome of these activities has resulted in the involvement of ETPIS in the drafting of the FP7 calls for the Thematic Priority NMP.

Furthermore, in cooperation with partners from Germany (University of Stuttgart), France (INERIS), Hungary (BZF) and Belgium (Technologica), the Steinbeis Transfer Center for Advanced Risk Technologies has founded the European Economic Interest Grouping EU-VRi (European Virtual Institute of Integrated Risk Management, [www.eu-vri.eu](http://www.eu-vri.eu)).

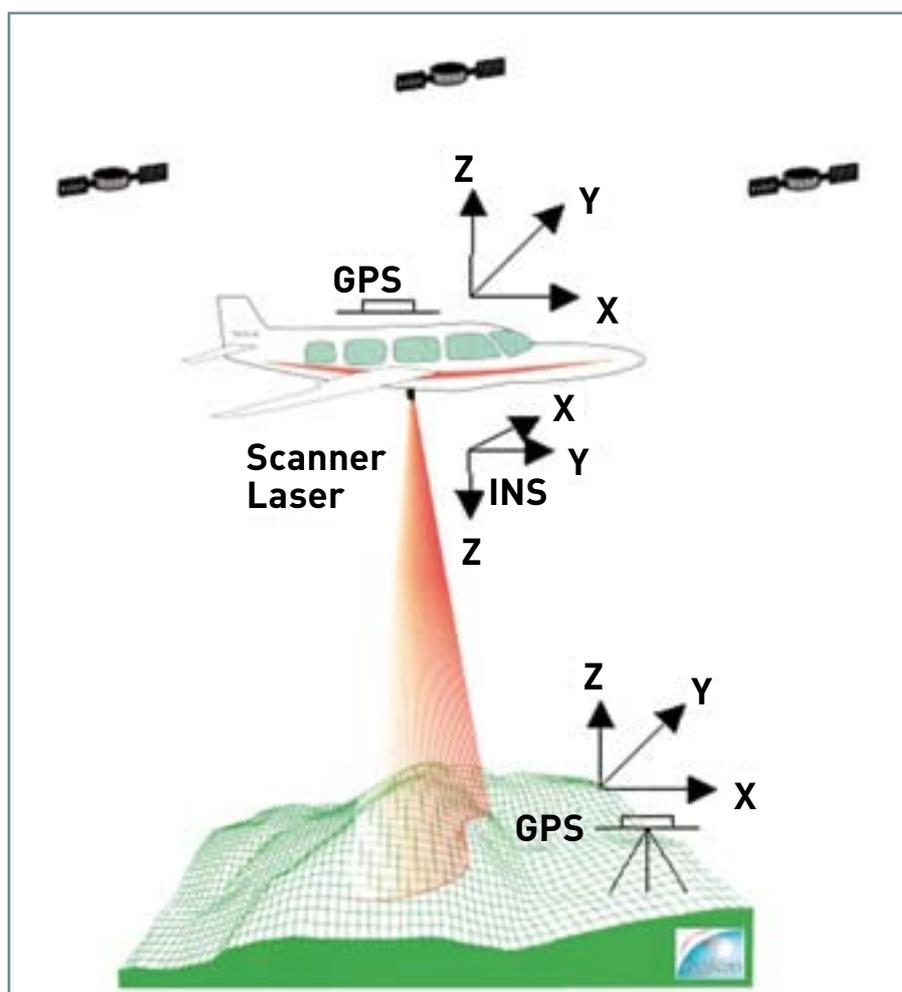
Steinbeis is following the same strategy in the field of risk management-related services for industry introducing the state-of-the-art innovation and technology in industry. For the oil, energy and other industries in countries like Hungary, the Czech Republic, Slovakia, Serbia, Romania, Malaysia and India, this was the main motivation to invite and use the services of Steinbeis Advanced Risk Technologies in the field of risk-based inspection (RBI), reliability-centered maintenance (RBM) and health-safety-environment (HSE) management, and implement these technologies successfully.

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## Research project pinpoints locations for solar panels

# An innovative boost to climate control

The sun deposits 10,000 times more energy on earth than mankind currently uses. Martina Klärle, head of the Weikersheim-based Steinbeis Transfer Center Geoinformation and Land Management joined forces with researchers at the Osnabrück University of Applied Sciences to identify a method to calculate the full potential of solar energy. In practical terms, the method makes it possible to evaluate solar panel locations using laser scanning data.



Gathering aerial laser data, Graphic: Wever

equipped airplanes with a sensor under the fuselage which scans the entire area.

Based on a "digital surface model", the laser scanning data is used to calculate and model the total roof area. Roofs stand at different heights so this has to be converted into a height value and x-y coordinates. The scanner can take in about four points per square meter with a height accuracy of about 15cm. By measuring more than one reflection of impulses (first pulse and last pulse) a concentration of points can be broken down into ground points and high points (vegetation and buildings). The system provides so much detail over such a large area that for the first time it is now possible to analyze local areas. A number of German Federal States such as Baden-Württemberg now have extremely precise three-dimensional aerial scanning data. Within the foreseeable future data should be available for the whole of Germany.

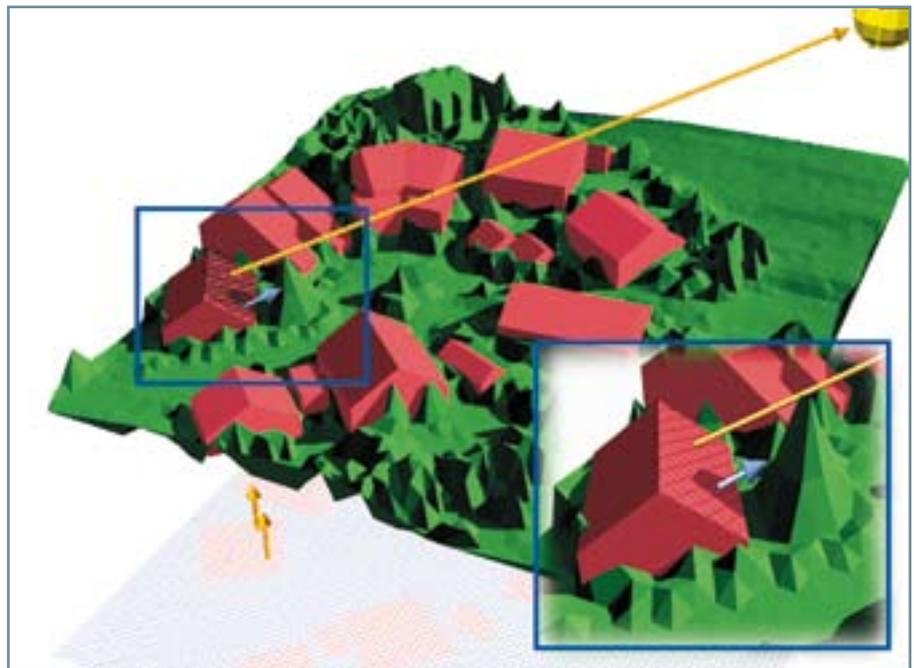
SUN-AREA allows you to work out how well, in which way and whether buildings and facilities would be suitable for solar panels. In the test region the team drafted a rulebook using a geographical information system that examines the suitability of rooftops for solar panels. Using a fully automated sequence of algorithms consisting of raster and vector functions the system assesses every rooftop for size, shape, inclination, direction and shade. An intersection average of individual scores is then used as a basis for calculating the potential energy of a whole area of a town as well as individual buildings.

The SUN-AREA research project looks at the best way to use solar energy captured by photovoltaic devices on the roofs of buildings. The aim of the project is to use existing laser scanning data across whole areas to pinpoint the best location to site solar panels for the generation of solar energy. This is now possible thanks to the development of computer-aided evaluation techniques which work out the shape, inclination, direction and shade on individual rooftops by using geographical information systems. The

system can reliably predict the resulting energy potential of huge areas. The test region used was the town of Osnabrück, an area of 120sq km.

A key feature of SUN-AREA is that it only uses existing data (height = laser scanning data; position = footprint/ALK). So the research forms a link in a value chain, enabling business to make use of high resolution laser scanning data. Data is captured by flying over the area to be analyzed using specially

In the first stage of the project algorithms were developed to calculate location parameters: inclination, aspect and area. The second stage analyzed shade. The direction the roof is pointing in has a key influence on the use of overall radiation. A south-facing roof can make 100 per cent use of energy. Even if a roof is facing east or west it can exploit up to 80 per cent of energy. The level of solar yield is closely linked to the angle at which the sun strikes the surface of the solar panel. The maximum value is achieved when the sun hits the panel at 90°. This is why the solar yield of a roof at an angle varies in the course of a year. Ideally, for a good annual yield, the roof needs to be set at an angle between 30° and 40°. A flat roof or changing the inclination by anywhere up to 70° will reduce the yield by up to 20 per cent.



Shade highlighted by laser data

The scanning data is so precise in terms of height and position that it is possible to calculate the shade for an individual roof by the time of day, time of the year and the latitude of the area. The direct solar radiation is calculated using the difference between the angle of rays striking the panel and the perpendicular to the surface of the roof or building. To calculate shade, the area of the surface is rasterized. Each cell within the raster is then checked to see if it will fall into the shade.

To calculate the average annual solar energy potential in kWh, you use the module efficiency, the size of the area in sq m, the overall average annual radiation, shade, roof inclination and aspect. Individual results are taken as pooled averages and then mapped.

To evaluate economic viability it is crucial to select the right location for solar panels. Positioning factors such as the angle of inclination, aspect, potential solar radiation and roof size are central to the successful operation of any photovoltaic installation. It is only by taking such factors into consideration that you can maximize the solar energy potential in built-up areas.

This method was first used in five test areas of up to 1sq km in the region around Osnabrück using conventional geographical information systems. Once the SUN-AREA rulebook has been applied to individual communities, one of the research project goals is to make it available for use for larger areas, including rural districts and entire Federal States.

The solar energy potential has already been successfully calculated for the test area. The 1sq km area (holding a total of 933 buildings, with an average annual energy consumption of 1500 kWh per person), had solar energy potential of around 3 GWh from all of the usable solar panels on roofs. The potential investment lay at 15 million euros. This would allow you to answer the energy requirements of around 2115 people per year, i.e. 48 per cent of the population living in the test area.

To make the results available to a wider audience the team plans to post them on the Internet. To present data for the test region of Osnabrück the team are using a geographical information system on the Internet. In a similar way to online maps, users can go to a specific location on the map and

call up individual buildings, streets and even complete districts. Apart from the authorities, users could be private building owners, citizen and even whole sectors of industry such as the solar panel industry and associated sales channels.

A number of communities and rural districts have already expressed a strong interest in the SUN-AREA method. This shows on the one hand how important it is to public authorities to calculate the energy potential of areas reliably. On the other, there is a need for meaningful maps. Ultimately, practice will show whether and to what extent the SUN-AREA method will improve the spread of solar energy throughout Germany – and achieve this more economically.

## Efficient product development through standard IT practices

# What counts is actual implementation

**Modern technology development often spans many countries, with teams distributed in all corners of the globe. People refer to “concurrent engineering around the globe” and in most companies such practice is par for the course. Sites work with the same IT systems, each site has access to the same technical data. So true global product development with local specialties and hitch-free mutual interfaces is a modern-day reality. Or so we are told, in theory. Reality is not always so rosy. Companies often do have different IT systems – passed onto them by their predecessors or taken on through acquisition.**

Modern companies try to spread work, flexibly – across sites. So sometimes activities might not be carried out by the most appropriate people. Even within development departments on the same site, the use of instruments and electro-technical equipment to develop products is far from ideal. The same applies to the programming of software in complex mechatronic systems.

It is still possible to link everything up, however, although this does mean harmonizing a number of factors and managers must be willing to make the right decisions. One key factor in this respect is organizational structure and its fit with IT. It is not difficult to create concepts for either, but implementation does take long-term management and commitment from plenty of people.

At one larger medium-sized company – medical technology, with more than 3000 employees at a variety of sites on different continents – such a transformation was carried out by staff at the Eislingen-based Steinbeis Transfer Center Innovation and Organization over a number of years.

The starting point: harmonize CAD systems. Installed at seven sites, with 16 programs made by different suppliers, some in 2D, some in 3D, these almost totally impeded cooperation. By involving all key sites a system was carefully selected and quickly introduced worldwide. This quick win was not only significant in establishing a new technology foundation, everyone everywhere saw that cross-site consensus was possible. Thanks to the new 3D CAD system it was



then possible to develop products at more than one location and users soon requested a cross-site data and document management system.

At a local level, development could manage with simple data and document management systems. But now that everybody needed access to a variety of documents used in the development process, it was time for a comprehensive PDM/PLM system. This was intrinsically necessary to do justice to the wide variety of quality management systems. To select the right PDM/PLM system, the company had to take into account a variety of different types of products and development procedures – without overcomplicating the system. In doing so they could remain flexible enough for each specific project in terms of project management, procedures and any document management that would be needed for the project. So simple products

would have simple processes set up in the PDM/PLM system and complex products – which would involve co-development across different sites – required comprehensive project and document set-ups.

Now all users were in a position to work with the same set of data even if the front-end applications were different: CADDesktop in engineering design, Easy-DM in product management, and classic SAP-GUI in logistics, sales, purchasing and management accounts. They now all have one key thing in common: a product document management system for the entire development project, from the initial concept to market-ready products and beyond. Implementation was only possible and user acceptance only realistic by keeping simple things straightforward and making complex processes more efficient.

Engineering disciplines are rapidly merging in the field of medical technology. Items that used to fall clearly into the field of mechanical products are now complex mechatronic systems similar to developments in many industries, with highly complex electronics and bullet proof software. So now ECAD systems are closely integrated into the IT infrastructure making it possible to investigate things such as the interplay between electronics and mechanics. For instance, you can conduct a spatial analysis of construction areas – for cable systems. Or a thermodynamic analysis of the heat emitted by electronic components. This is only possible in a closely integrated engineering environment. And naturally another welcome benefit is that this creates an integrated parts list, detailing mechanical and electronic components.

So now that the challenges imposed on development processes and IT infrastructures have been overcome, dealing with further requirements – such as integration into other fields – should be child's play. Complete development documents can be managed,

including software status at a variety of locations. In turn, this provides the development process with a structure and simplifies document management, resulting in less mistakes and more efficient processes.

During the IT overhaul and the introduction of the new development process, the organizational layout of worldwide product development offered the opportunity for restructuring. To help product groups and sites confer more closely an overall head of development was identified, now based in the US. For each functional area a development manager was put in place with global responsibility.

As a result of this wide-sweeping project, the company is almost within touching distance of its vision of up-to-the-minute, globally integrated development activities. Data transparency is excellent, with clearly defined data responsibility and ownership, facilitating efficient, fast and almost glitch-free development processes. The concept proposed matched the needs of the compa-

ny and project set-ups were geared to long-term needs, making it possible to dictate the direction in both areas early – and thus define and implement next steps in keeping with the overall solution.

One major reason why this is necessary is that the users at the center of the IT solution must perceive success and feel motivated to keep up the momentum. If people do not feel positive about a project, the difficult task of coordinating work across sites and departments will not be fulfilled. This is particularly true for further integration in non-technical areas such as marketing and sales as it is more of a challenge to integrate these areas for technological, organizational and even psychological reasons. Buoyed by positive results to date, the company is now taking next steps.

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## Material efficiency in small and medium-sized companies

**The 'materials support program' sponsored by the Federal Ministry of Economy helps companies with up to 1000 employees raise the productivity of resources, opening the door to improvements in competitiveness. Companies receive input from accredited head consultants.**

Companies that have already participated in the materials support program have made significant cost savings through product, process and operational improvements. Projects already budgeted for throughout Germany have the potential to save from 30,000 to in excess of 500,000 euros per year. Feasibility studies, project management and training can also be applied for, with subventions of up to 99,000 euros.

Companies can occur losses at many stages of the manufacturing process: right from

product development, to defining purchasing, raw material production, finishing, assembly and dispatch. This is why the State charged the German Material Efficiency Agency (demea) to go through the Federal Ministry of Economics and Technology and use its accredited head consultants on site to bring about long-term value chain improvements in companies with up to 1000 employees. Potential improvements range from 1.5 to 6.5 per cent of turnover, equating to savings of 70,000 to 1.2 million euros.

Current projects range from tooling time optimization on machines to the reduction of through-put cycles and market and competitive studies. The experts at the Steinbeis Material Efficiency Center in Gosheim are accredited head consultants certified by the German Material Efficiency Agency.

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## A plea for more reliability

# Whatever happened to good old-fashioned virtues?

**In the 'old days', were employees more reliable? Punctual? Equitable, fastidious, diligent and conscientious? It said so in their references. But some of these terms seem to have passed out of fashion. Is this why good old-fashioned values are 'out'? The ideal employee these days has other virtues. They are flexible, dynamic, lateral thinkers, lean workers, team workers. In times of quality management, we and our contemporaries know that quality only lasts if it is linked to reliability. No one disputes that product quality is unthinkable if people are casual, nonchalant, or even negligent. But what about quality when it comes to human beings?**

We dress more casually these days. We behave more casually. And we go about our work reliably. But can we be casual and reliable at the same time? If we enjoy being casual outside work, when we're relaxing and having fun, then yes, we can. One thing we can be sure of: everyone wants to know they can depend on us, on a private and professional level. In this article I want to focus our thoughts on reliability at the workplace. For me there's a clear difference between being quality conscious in production on the one hand and displaying the same virtues in administration or management on the other, even within the same company. But if my suspicions are right, which when we look at it they are, more casual attitudes can hinder success in the long term, independent of where the casual person is sitting (still).

Wherein lies the problem? An example: someone is unable to speak about an issue from a position of knowledge because somebody, somewhere, held back information. When people are too casual, the laissez-faire bug is much more virulent than the more slowly dispensed antidote: discipline. Casual treatment of others and casual behavior are fatally contagious at work.

What can we do about it? Think beyond the concept of quality management in production! There are still too many people "slacking it" in administration. In my opinion we should have reliable people on every chair, at every desk. They can still be flexible, dynamic, lateral thinking, punctual and hard-working. They are there (and allowed) to do their job as well as they can. If Reinhard Sprenger's

assertion (in his book *The Motivation Myth*) is correct, then everyone has enough intrinsic motivation and it is worth fostering and maintaining it. There are plenty of examples of, and reasons why, casual employees have a detrimental effect on the intrinsic motivation of others during their working career [...]

Thoughtlessness, indifference, pretentiousness, pomposity, casualness. When I take issue, I'm always told I'm being too harsh on people around me – they're only human and we all make mistakes, and anyway: let he who is without sin, cast the first stone! But wait a moment. I'm not casting stones. I make just as many mistakes as anyone. But when I do – I'm not blasé about it!

So I would like to make a few suggestions about quality management in administration and management. What should we be doing?

- Everyone should know the goals of their company/organization and support them
- There should be fixed arrangements concerning which information goes to whom and how: ask or provide? Casual comments such as "How am I supposed to know" are weak excuses we can do without.
- Improvement suggestions should not be hindered if they have been well thought through and substantiated. It is tremendously frustrating to see a good idea stifled with nonchalant shoulder shrugging or headshaking.
- [...unflappable self management...]
- Discipline and consequence in carrying out duties should not be idly pushed

aside. People only do this when they do not feel responsible for something.

- Delegating tasks should go hand-in-hand with delegating authority. Then the person identifies with the task and can take credit for success – or failure.
- To stop people everywhere within the organization being over or under-challenged, apportion work according to ability and skills and gain a feel for the breadth and depth of performance. Performance reviews must be carried out with sensitivity and people must have the courage to replace cushy, rigid job descriptions with flexible task sharing.

*Renate Fehrenbach (1933–2007)*

**Renate Fehrenbach** worked for the new Steinbeis Foundation right from the early days. Sadly, she passed away in June after a long and severe illness. We are publishing this article in honor of her work for Steinbeis, which she described as marked by "old-fashion virtues". The article first appeared in 1994 in *readme.TQU* magazine produced by the TQU Steinbeis Transfer Center in Ulm – and still holds true today.

Between 1983 and 1992, when she left Steinbeis, Renate Fehrenbach played a central role in establishing and building the Steinbeis organization. Her responsibilities included the founding and management of transfer centers, and quality management at Steinbeis HQ in the form of procedures and staff training on *LohnMethode* self-management. After 1993 she worked as a self-employed organizational consultant and ran seminars on self-management. Some of her undeniable virtues were quality, commitment, reliability and loyalty.

## New releases from Steinbeis Edition

Steinbeis Edition publishes works mirroring the scope of Steinbeis Network expertise – one of the many ways we share what we've learned. Our range of titles spans a broad spectrum of excellent single volumes and series on management and technology.

### Diversity management – Nurturing unseen potential

Christine Kuhn-Fleuchaus and Marco Bambach  
ISBN 978-3-938062-47-0

Diversity: an elemental management instrument for companies who plan seeing in the coming decades. Many corporations have already adopted this outlook in their profit centers. But what does diversity mean? In today's global, multi-cultural society, it means companies and their employees making the most of employees' diversity in terms of nationality, education, gender, sexual orienta-

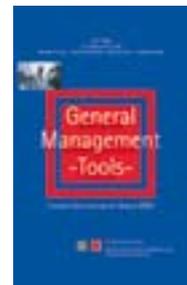
tion and physical ability. In leading a team, for instance, managers need to recognize every member's strengths and weaknesses, incorporating that knowledge into management tasks to everyone's benefit. The authors take an exclusive look at diversity management in NPOs – as managers at Caritas and AOK, they tackle diversity pragmatically and carefully analyze a survey done in their own companies. With the new EU directive and German General Equal Treatment Act now in force, diversity management is more pressing and relevant than ever. Title available in German only, **Diversity Management – Unsichtbare Potenziale fördern.**

### General Management – Tools Transfer-Dokumentation-Report

Kurt Nagel in collaboration with Werner G. Faix, Annette Schulten, Gerhard Keck, Joachim Sailer  
ISBN 978-3-938062-32-6

This Transfer Documentation Report (TDR) from the Steinbeis-University Berlin's Entrepreneurship, Globalization and Growth Institute Group introduces readers to salient topics in the field of general management. The book contains tools, instruments and methods for:

- analyzing a company's current situation
- analyzing a company's framework
- developing strategic models for defining a



company's opportunities, risks and strategies

- defining business objectives
- developing strategies for achieving business objectives

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## Young researchers recognize management's importance

The first series of workshops under the umbrella EU-FP6-Project TRAYSS PRIME came to a close during the XII Biotechnology Summer School at the University of Gdansk and at the GBM Autumn Meeting at the University of Hamburg. Over 50 young scholars – master's degree students, PhD candidates and professors among them – attended lectures with real-world relevance.

"This model – providing young academics with exposure to management and thus essential tools for later in their careers – is working. The interest the participants showed and the way they took part in the discussion demonstrates the need for management seminars for young researchers," sums up Henner Willnow, project manager at TRAYSS PRIME and an employee at Stein-

beis Team Nordost. TRAYSS PRIME ([www.scanbalt.org/trayss](http://www.scanbalt.org/trayss)) offers junior researchers in the life sciences seminars on project innovation and IP management as well as sessions on how to write applications for EU-FP7 research programs. These courses are organized by the Steinbeis Team Nordost in Rostock, Prosciencia Beratungs-GmbH and ScanBalt, the biotechnology network.

Additional workshops will be held in Cracow and Berlin and a spring session is planned for 2008.

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## Return on proficiency for technical specialists

**Considered a risk to German industries' ability to perform, the oft-bemoaned dearth of engineers has triggered numerous efforts to buck the trend. Several campaigns help young people take an active interest in technology; ep-Akademie programs – an initiative of the TQU my big apple GmbH and the e-people-group in association with the Steinbeis University Berlin – equip technicians, engineers, and computer scientists with the right skills on a part-time basis.**

Participants put their new knowledge to work straight away, development never loses its personal touch and impacts the company tangibly. Every phase of skill development concludes with a test. As an eengineer® level I, level II and level III, graduates demonstrate knowledge in defined areas for ongoing tasks. It's an innovative training model which ep-Akademie offers technical specialists whose gaps in skills are currently holding them back from performing to their full potential.

ep-Akademie offers participants training programs tailored to their individual needs and work-related assignments and links them to credits for bachelor's and MBA degree programs at the Steinbeis University Berlin. Graduates also earn the title of eengineer®. Key course content spans business management expertise, communications, management and specialized skills.

The central components of this part-time program: immediate practical relevance. Before the program gets underway participants' supervisors in their companies work with ep-Akademie to compile a set of tasks which participants must complete as they proceed through the program and learn along the way. Each of the ep-Akademie program's three sequences broadens horizons in well-defined ways. Consider eengineer® level I: they acquire specific expertise in a specialized area, rounded off by exposure to process and project management, innovative technologies, law and organization. Another important element is honing communication skills, especially those structured around objectives: chairing a meeting, moderating and presenting.

eengineer® level IIs learn how to optimize a product's or service's effectiveness and efficiency and how to put those ideas into everyday practice. They keep in touch with influential external experts and their suggestions are rooted in sound technology and a similarly sound cost/performance ratio. And as up and coming managers, they gain exposure to managing teams and change as well as working with management systems.

eengineer® level IIIs manage centers of excellence in a manner which puts objectives and people first, thereby giving the centers a head-start on technology. Given the overall context, they craft interdisciplinary approaches to problems and develop and put into practice ideas on how to optimize added value. They also pinpoint trends and opportunities in technology and take the initiative on projects involving innovations in products and services, knowing they can tap into a rich network of in-house and external experts and research establishments.

Whether they're technicians reaching for the stars, or young and driven, or mature engineers, all participants benefit from day one. Companies, too – since development revolves around their company and day-to-day tasks, employees expand and improve upon their core competencies; what's more, they feel greater loyalty.



ep-Akademie models aren't just effective, though – they're fun. Each level's supplementary description betrays how hard participants have to work. Level I, named K.I.S.S. ('Keeping Solutions Straight'), is more of an entryway to pique curiosity. Level II bears the name K.I.C.K. ('Keeping Competence Keen') and Level III is reserved for K.I.N.G. ('Keeping Networks Growing') – complete with everything participants need to achieve success in their professional endeavors.

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## Safeguarding expertise effectively

**Every year, white-collar crime and 'expertise espionage' drain billions of euros from SMEs. Yet this phenomenon has long gone unnoticed by entrepreneurs. These days, the matter of protecting know-how is the first order of business. Two Steinbeis Enterprises have significantly contributed to a manual which equips companies and researchers with effective strategies to safeguard their expertise.**

Safeguarding expertise has garnered the highest level of attention in politics. Both the German federal government and G8 summit participants in Heiligendamm have been investigating product piracy and the protection of intellectual property. And the numbers put out by the OECD are alarming: worldwide sales of counterfeit products in 2005 totaled nearly €00 billion, according to a current study published in Paris. This figure represents only cross-border commerce; some estimates put sales as high as €00 billion.

The economic fallout of these figures is disastrous. Copyright infringers have penetrated nearly every technical realm across an incredibly broad spectrum of industries. The German Federal Office for Information Security forecasts that the situation will become particularly critical for SMEs, as the threat turns increasingly precarious as international business and information services expand. And although business readily admits that an abstract risk exists, it seldom perceives it as a tangible threat to companies. Yet nearly one in two SMEs is affected by white-collar crime, information and expertise theft in particular. A recent survey found that after theft, embezzlement, breach of trust and fraud, information theft is the most significant risk faced by SME's.

Cyber attacks are just one of the ways a company can be parted from its proprietary know-how. Joint research efforts, changes in personnel, break-ins, theft and selective wiretapping of, confidential meetings are all methods of procuring sought-after expertise. Any one of them

could take a company's sensitive data relating to its expertise – and seriously jeopardize the company's livelihood.

How to combat the phenomenon? Set up systematic safeguards for expertise – a challenge fraught with complexity. For guidance, professionals can turn to *Praxishandbuch Internationaler Know-how-Schutz* (A Hands-On Guide to Safeguarding Expertise Globally, German only) published by Prof. Dr. Alexander Wurzer, managing director of the Steinbeis Transfer Institute Intellectual Property Management, and Dr. Lorenz Kaiser, head of the Rights and Contracts department at Fraunhofer. Frank Graage, head of the Steinbeis Research Center Technology Management North East, co-authored the compendium. The work takes a comprehensive look at various aspects of safeguarding expertise, in different industry and geographical contexts and concludes with tangible, real-life recommendations. The work is part of a range of titles brought out by Cologne-based publisher Bundesanzeiger.

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