Steinbeis

TRANSFER

The Steinbeis magazine

Experts – Transfer – Network

Practically palpable
Yesterday: 3D radiology. Today: modeling solid objects.

"The right environment to encourage entrepreneurs to take a lasting interest in investment"
An interview with Heinz Trasch

Thought through, carefully, digitally
Using digital factory planning to enhance planning processes

Equal opportunities: everyone's entitled
Putting the General Equal Treatment Act into practice

Pay, working hours and employment
An analysis of regional disparities in income

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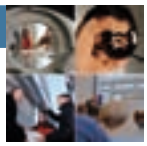

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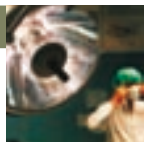

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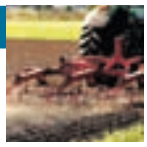

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Editorial

Dear Readers,

2006 was a successful year for Steinbeis. Like many other companies, we reaped the benefits of the latest – and unexpected – upturn. The bedrock of Steinbeis, our dedicated employees at our headquarters and throughout our Centers, played a key role in this outstanding achievement. In this edition of Transfer, we explore some of the many projects that make up what we offer.

Founding the Steinbeis University Berlin to profile our services was just the first step – over the last few years, we have continued to consistently build on our research and development and consulting services. The fruits of our labor: we're starting to see the effects of decentralized growth in the new organizations.

The changing business environment made no exceptions for universities and other institutions of higher education. We scrutinized our organizational structures in light of these new requirements and tapped into fresh business management insight to adapt them. In light of increased demand for a myriad of services in knowledge and technology transfer at universities throughout the country, Steinbeis will continue to maintain direct contact with university administrative boards to cement and expand on partnerships with sources of knowledge.

However, one thing has not changed. We would like to give our newly-appointed university faculty members an opportunity unique to Steinbeis: to bring the practical expertise you have acquired in your chosen industry into your classroom, demonstrating how close ties with business can tremendously impact lectures and theoretical work. The benefit to students is twofold. They take part in real projects and begin to establish their own professional networks.

Further down the road, our Centers will dig even deeper into regional markets to provide small and medium-sized enterprises with fresh expertise and fuel their drive for innovation. With this in mind, we will also support Centers in every one of their efforts in pursuing this goal.

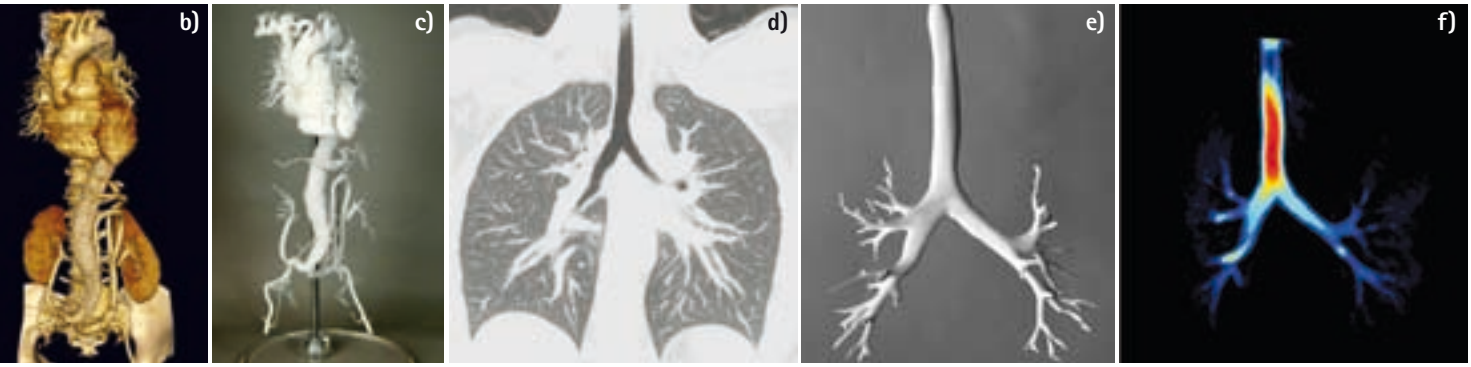
Sincerely,

Prof. Dr. Heinz Trasch

Yesterday: 3D radiology. Today: modeling solid objects

Practically palpable

Radiological imaging provides non-invasive insights into organ structures; in humans and animals as well as industrial materials such as plastics. Thanks to novel, sometimes revolutionary technology, radiological imaging has grown beyond the 2D visualize structures. Today's Multi-Slice Computer Tomography can handle up to 256 slices with rotation times shorter than one second, recording volumes at incredibly high spatial resolutions.



a) and d) frontal view of a 2D single-slice, reconstructed from transaxial computer tomography images;
b) virtual 3D volume view; c) and e) 3D models; f) flow measurement with a bronchial tree using helium MRI.

By processing and recording incredibly large streams of data, high-performance computers can perform state-of-the-art image postprocessing that transforms a radiologist's individual images into a 3D and even 4D world (adding synchronized motion). It's a technology that radiologists and hospital employees have used for some time. Minimally invasive vascular surgery is planned and performed almost exclusively using 3D imaging to pinpoint the extent of the disease and treat it accordingly.

Based at the Steinbeis Transfer Center Radiological Imaging: Consulting and Training (RICT) led by Prof. Dr. Hans-Ulrich Kauczor in Heidelberg, Dr. Frederik Giesel, Dr. Hendrik von Tengg-Kobligk and Dr. Christian Zechmann collaborated with industry partners to develop the Vital Recon® procedure. It takes the next step in visualization by using intricate mathematical algorithms to derive individual structures from radiological 3D volumes, transform those structures a number of times and alter them as appropriate necessary. This ultimately renders radiological image data into machine-readable data, the kind of data needed to create models – a procedure the automotive industry calls rapid prototyping. The researchers in Heidelberg successfully optimized this process chain for radiological image data.

Rapid prototyping quickly produces samples based on 3D design data. In its initial stage, this process is mainly devoted to producing 3D prototypes and models. The word 'rapid' should be interpreted rather figuratively – producing complex, individual models can take anywhere between hours and days. The automotive and space industries have relied on rapid prototyping in preliminary studies for years, such as small fuel injection pumps or massive titanium parts for the ISS.

Over the past eight months, Vital Recon® has helped produce a range of solid objects used for teaching purposes and in research establishments. Initial research results are on public display in exhibits at the Heinz Nixdorf Museum in Paderborn and the State Museum in Koblenz (both in Germany). At every step of the way – from acquiring raw data to image postprocessing and producing models – expert know-how shaped the procedure's success. Users must have a solid grasp of radiology and computer science as well as materials science. Thorough tests over the past few years using the latest technology have proven essential in defining a new market and creating fresh perspectives in the world of medicine. Certainly, Dr. Giesel, Dr. von Tengg-Kobligk and Dr. Zechmann are tackling those tasks with ambition.

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Promoting research in EU accession states

Research sans frontiers

In 2004, the EU welcomed Poland, Estonia, Latvia and Lithuania as new Baltic members. At the same time, the BOOSTING BALTIC FP6 EU project launched under the auspices of the Steinbeis Transfer Center Technology Management North East with the support of ScanBalt and the Swedish Research Council. The project aims to integrate researchers and entrepreneurs from accession countries into the structures of European research grants.

The overall objective: connect Europe's researchers with companies looking to innovate. Germany and Sweden forwarded their own records to National Contact Points for European funding activities in Life Sciences and established basic structures needed for successful transfer. The Steinbeis Transfer Network's many years of experience played a role here: as a founding member of ScanBalt, the Steinbeis Team North East has cultivated an excellent network within the Scandinavian, Baltic and Polish Life Sciences landscape.

Over several workshops, 600 participants explored questions concerning how applications are assembled and evaluation criteria. They also met experts from throughout the Scandinavian and Baltic region. Several successful applications for the most recent calls for proposals in the 6th research framework program were filed. In autumn last year, project partners reported on plans and themes of the 7th research framework program which launched at the start of 2007. Anna Pytko, a member of the Polish Academy of Sciences (IPPT PAN), proudly described her success: "We're very pleased that three projects with Polish involvement have already received support and got off to a smooth start. Our Polish Life Science community is now well-informed and well-prepared for the 7th research framework program."

In parallel with the workshops, project partners authored an 'electronic guide', designed to help those new to the process navigate application paperwork. Clicking on www.scanbalt.org/guidefp7 guides visitors through topics, documents and deadlines step-by-step. This tool was warmly received by everyone involved, as Anna Pytko observed: "The eGuide is a great help to anyone applying for an EU grant for the first time. Without it, several researchers I know of from the Baltic region and Poland would never have prepared and submitted their proposals."

BOOSTING BALTIC FP6 also set out to take stock of the Life Sciences research infrastructure throughout Estonia, Latvia, Lithuania and Poland. Project partners gathered key information on all Life Sciences researchers in participating countries and entered them into a database which was then integrated into the ScanBalt Yellow Pages (www.yellowpages.scanbalt.org).

These tools help in two ways: they simplify the search for international project partners and foster networks between research and technology transfer in the Baltic Sea Region. Though the BOOSTING BALTIC FP6 project came to an end in January 2007, the work with new-found partners continues. What's more, it gave Steinbeis the opportunity to lay the foundation for successful technology transfer – to the benefit of scientists and companies in Baltic countries, Poland and beyond. The Steinbeis Network – and especially Steinbeis enterprises in Life Sciences – saw several departure points emerge. ScanBalt has earned its reputation as the network for Baltic Sea bioregions and made real strides in integrating accession countries into the Life Sciences within the EU.

Workshop in Tartu, Estonia in September 2006

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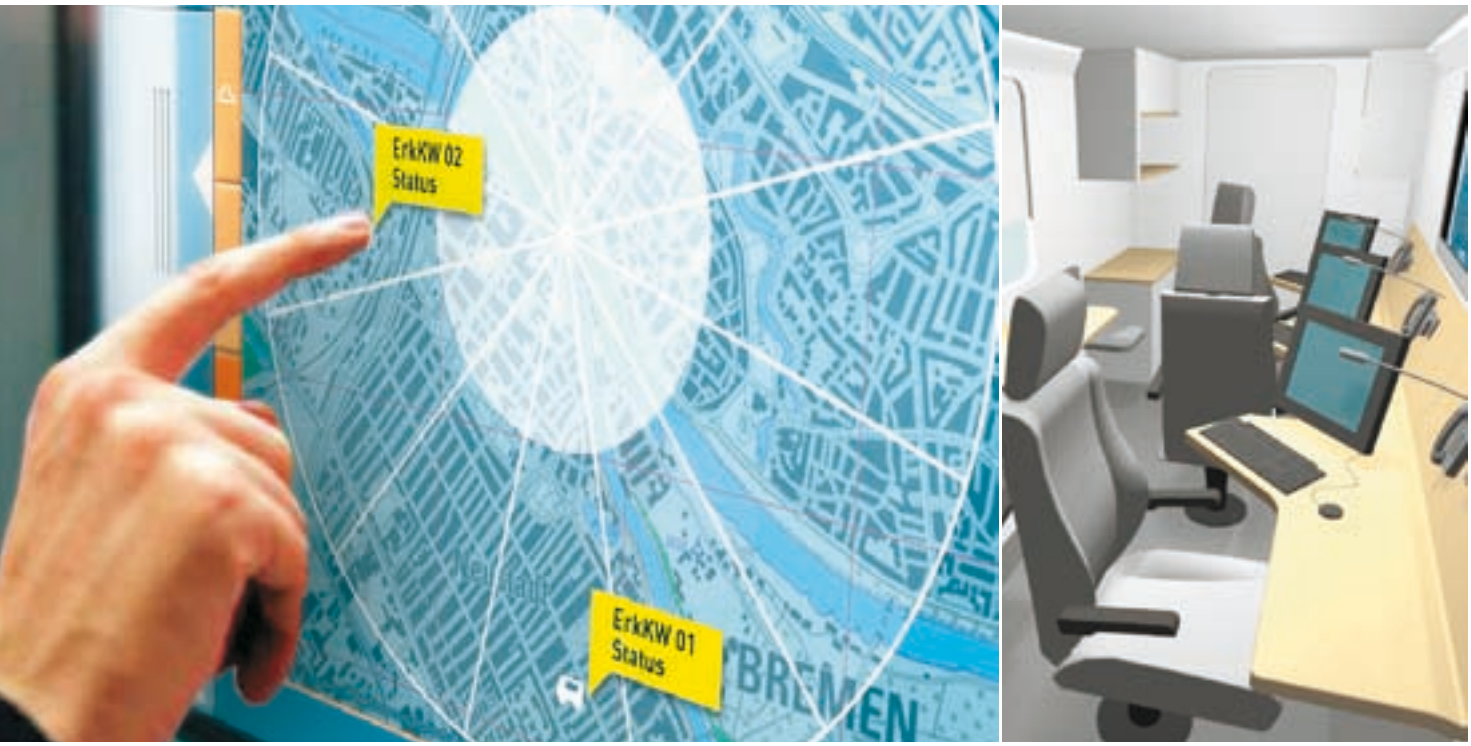
Rapid reconnaissance thanks to measure and control units

Design destined for disasters

Even before September 11, 2001, Germany's Federal Office for Population Protection and Disaster Relief took terrorist attacks very seriously. In response to conceivable scenarios, the Federal Office commissioned the development of a 'reconnaissance vehicle' to detect atomic and chemical irregularities in emergencies – accurately and error-free. A specially developed ‚measurement and control unit' (MCU) merges all relevant data into one viewable analysis. When it comes to protecting the population in an emergency, the MCU is vital in initially assessing the situation and helping personnel work without error under extreme pressure.



Left: touchscreen-optimized interface. Right: purposefully arranged workstations help the process run as smoothly as possible in stressful situations.

Should an emergency occur, the measurement and control unit coordinates a number of reconnaissance vehicles, evaluates gathered information and compiles test results. The Steinbeis Transfer Center i/i/d Institute of Integrated Design in Bremen collaborated with the Institute of Automation (IAT) at the University of Bremen to develop the MCU model. The project unfolded under the auspices of the IAT and representatives from fire brigades across Germany were also closely involved.

Experts at the i/i/d approached this project from two angles. First, they engineered an easy-to-understand software interface and a matching design to facilitate rapid, far-reaching decisions. The team also designed room layouts and ergonomic workstations.

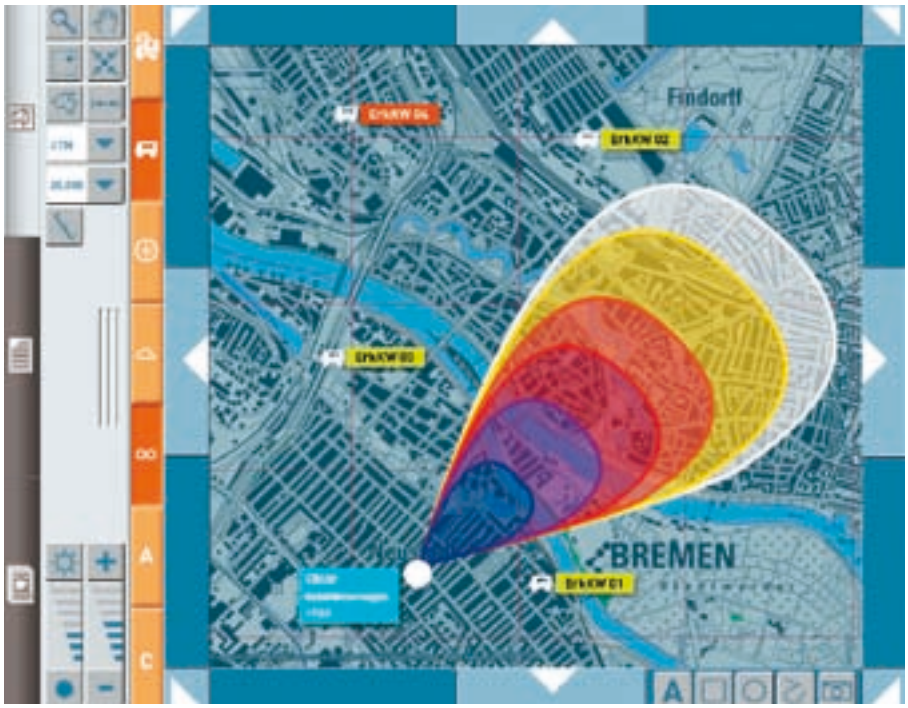
Conceptual design for tense situations

Installed in a mobile cabin mounted on a special vehicle, the MCU can cope with the demands inherent in different types of emergencies. Workstations are designed in keeping with ergonomic principles. The cabin's thought-through layout also serves multiple purposes. Every member of staff stays constantly aware of the situation's status and is able to communicate with every member of the team – meaning decisions are made quickly and based on complete facts. Workstations within the MCU cabin room are also arranged to allow personnel to communicate with one another across three levels. The first level, a large, interactive whiteboard, doubles as a projector surface. Visible to everyone at all times, it allows staff to monitor the situation without interruption. The second level consists of a screen at every workstation dedicated to special applications. The third level provides the director of operations with an overview of all relevant information. The cabin's conceptual design helps staff and directors work toward a common goal and maximize synergies – particularly during unfamiliar and stressful emergency situations. Every

surface, color, material and piece of lighting equipment was selected and coordinated to lay the groundwork for a focused, fatigue-free work environment.

Uniform interface

Each of the three employee workstations is dedicated to one of three specific tasks in the event of an emergency: dispatching the reconnaissance vehicles in the field, researching toxins in an internal database or on the internet and calculating predictions on dispersion. Different programs have been integrated into a uniform, touch-screen interface making it much easier for users to merge data and quickly switch between workstations and tasks. What makes the way the data is arranged so special? Rather than struggle with columns of numbers, users see data rendered graphically and inserted directly onto maps, giving them an instant and clear overview.



A chemical accident crisis scenario: incoming data from the reconnaissance vehicle are analyzed and immediately rendered as a graphic dispersion forecast.

Symbols on the map indicate where the reconnaissance vehicles are located and provide other key facts. Users can retrieve more detailed information by showing or 'fading in' the layers they need. A dispatch module is also on hand to send jobs such as taking measurements or samples to the reconnaissance vehicles. If a user calls up the dispersion prediction overlay, the calculation launches immediately. Initial forecasts are available after just a few entries.

During an emergency, users need to merge incoming data, prepare it visually and depict their complex interrelationships. Thanks to the interface's new design, people who are involved in the project to varying degrees can quickly and confidently assess the situation. Since the information is so intertwined and the relevance of the data depends on its context, the interface features a particularly flexible display format which renders that information visually. This allows users to grasp the entire situation while highlighting individual sets of data on the interface to reveal their own interpretations. Another distinguishing feature of this solution is how well it functions in demanding situations, such as while driving or periods of extreme stress, thanks to crystal-clear user controls and principles which repeat throughout. What does this mean for users? No matter what they require, each layer of the interface works with the same system, thus safeguarding a consistently high level of quality for the software interface.

Presenting layers in a new way

The user interface is based on a topographic base map to help orient users spatially and to initially appraise the situation. Arranged around the base map's outside edges, navigation items allow users to activate overlays – such as the data the reconnaissance vehicles measured, the wind's direction or the predicted dispersion – and spread several across the base map at one time. The interface is also flexible enough to allow users to build layers, depending on the application and their requirements, to incorporate all the information they need to create a picture of what is happening. At the heart of this interface model, the structure of layers accelerates the process of describing a situation – free of error. This prompts users to make predictions more quickly. By combining once-separate media such as maps, statistics, displays and measurements in one integrated area, the graphic interface empowers users to work more intuitively, rapidly and accurately.

This interface model can be readily adapted to meet needs beyond emergency management. It's ideal for capturing, steering and managing complex systems in a variety of environments such as air traffic control, steering traffic on roads and railways, managing large-scale machines in production or power supply.

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The intensifying search for new ways to extract raw materials from rubbish

What shall we do with the plastic waste?

The German Association of Plastics Manufacturers estimates that approximately four to five million tons of plastics waste is produced in Germany every year. Depositing plastics waste in landfills was declared illegal in 2005, yet waste incineration plants and cement works cannot handle the increased demand for disposal. Against this backdrop, procedures to recover feedstock are more sought-after than ever.

SYNTROL system in Baar, Switzerland

Reactions such as hydrolysis, alcoholysis and depolymerization can help recover the building blocks of many polymers. Thermal degradation of polymers also holds great promise. Dating back to the 1980s and 1990s, developments were in progress to apply cracking to recover hydrocarbons from plastics waste between temperatures of 350° to 500° C with no air present. Although more than 30 different cracking processes were attempted, only a few were pursued and refined. A limited number of manufacturers in the world offer ready-to-use systems. One of them, Nill-Tech GmbH, in Holzgerlingen, Germany, uses the SYNTROL® process. The Steinbeis Transfer Center Resource Technology and Management in Halle supports Nill-Tech in locating users for its process plants.

When planning its first technical system, Nill-Tech concentrated on the use of pretreated plastics, especially polyolefines like polyethylene (PE), polypropylene (PP) and polystyrene (PS) waste. Thanks to a new reactor model, Nill-Tech can now use this process to produce top-quality oils with yields of up to nearly 80 % from PE, PP and other polyolefine plastics waste at reaction temperatures between 400° to 500° C. The oil can be used as heating oil or as feedstock for the production of diesel oil. Other than the oil, the SYNTROL® process generates combustible gases and low amounts of highly caloric residue containing coke and inert contaminants. Residues of aluminum and other resources accumulate in much of the plastics waste – yet they can be isolated. The first technical SYNTROL® system, designed to handle 3500 to 4000 tons of plastics waste per year, was put into operation in May 2006 in Baar, Switzerland. Nill-Tech partnered with TÜV Süd to develop a safety concept for the fully automated process plant.

In the past, many developments failed because they claimed to be able to process any mixture of waste imaginable. However, the more uniform and pure the source materials are, the easier it will be to control the process and select the proper materials for building the reactor. Thanks to automatic sorting systems many waste disposal companies are now sorting and cleaning waste and supplying individual fractions. Due to these efforts plastics waste has become a valuable feedstock. Even plastics waste containing chlorine, sulfur and nitrogen – considered problematic today – can yield premium oils. Nill-Tech's system in Baar has the potential to help overcome prejudices in Germany against thermal cracking processes designed to recover feedstock from waste.

Hydrolysis
Splitting chemical bonds when a compound reacts with water. For example, during metabolism enzymes enhance hydrolysis of biomolecules, which break down to their building blocks.

Alkaline hydrolysis
A remnant of an alkyl group initially bonded to an oxygen atom and then inserted in another bond. Alkaline hydrolysis produces an ester end group, a substance group with organic bonds.

Depolymerization
The decay, decomposition or breakdown of polymer materials by a thermal procedure or acidic or alkaline hydrolysis.

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The in-line quality assurance of pipes using monitoring devices

Test but don't touch

To manufacture pipes, thermoplastic material such as plastic is forced in a malleable state through an extruder. By carrying out quality checks on extruded pipes during the actual manufacturing process, producers can steal a march on the competition. The destruction of faulty parts later in the process can be avoided altogether. For a number of years the Ilmenau-based Steinbeis Transfer Center Quality Assurance and Image Processing has been working with a client that has a highly successful track record in the production of multilayer pipe assemblies and the construction and manufacture of corresponding extrusion machines.

Quick Image PipeScan

Ilmenau Transfer Center was given a brief to use industrial image processing to arrive at a device to check the quality of extruded plastic pipes without interrupting production. In the course of the project, the experts from Steinbeis came up with two types of monitoring devices for carrying out online and offline quality checks on the multilayer pipe assemblies. Made in small batches, the resulting device was coined the Quick Image PipeScan. This state-of-the-art measurement instrument is ideal for industrial use and is capable of checking surfaces without touching the material.

The surface checker is unique as it was ideally matched to the idiosyncrasies of the client's extrusion machine to be integrated directly into their equipment. Of course the Steinbeis experts also ensured that all the experiences, wishes and demands of operators were taken into account. The first device was immediately used to develop a second version for pipes with much larger diameters.

The Quick Image PipeScan is now used permanently to check pipes directly on the production line. It can be set to two diameter ranges: 9–32 mm and 40–110 mm. By defining the precise rate of operation the maximum test speed is 36 meters per minute. The device is splash proof to IP54 as pipes have to be checked directly after leaving a water cooler.

The extruded pipe runs through the monitoring station and is checked from all angles by three CCD line scan cameras looking for surface problems such as indentations, bubbles, cracks and faulty colors. The error margin can be defined right down to 0.05mm². Simultaneously the station constantly measures the pipe diameter. If it discovers any faults it emits a signal, visually and aurally. Parallel to this, images can be evaluated on an industrial PC which is also used to control the device. To input parameters, operate the device and display and analyze scores, Steinbeis staff wrote their own software: PipeScan 1.1. The peripherals include an industrial monitor and keyboard, fitted with a touch screen if required. To simplify configuration and access to images of faults, the PC can also be integrated into company networks.

Further adaptations to the monitoring device are possible. For instance, the diameter range can be extended or the operating speed can be raised to monitor up to 40 meters of pipe per minute.

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A conversation with Prof. Dr. Heinz Trasch, Chairman of the Steinbeis Foundation Board

"The right environment to encourage entrepreneurs to take a lasting interest in investment."

TRANSFER: Transferring know-how and technology stands at the crossover point between the world of science and academia and the world of trade and industry. It ensures that the knowledge gained at universities and research institutes filters through to industry, and gets used. So what exactly does Steinbeis do to support know-how and technology transfer? And under what premises?

Heinz Trasch: There are Steinbeis Centers at all types of universities. Many people see them as a source of new knowledge. If we're approached by a customer looking for a specific methodology or technology to solve their problem, our knowledge is just like a raw material: 99 % of the time we have to process or modify it. Put another way, we have to adapt the know-how to the actual problem. That's the job of managers and experts at each Steinbeis Enterprise, as the professional on-site expert. Successful transfer benefits the client company on a business level, often in the form of an innovative product or process. The key thing is the generation of know-how – know-how becomes the permanent 'raw material' for economic growth. To make full use of it you can't go cutting research funding at universities. In fact it should be increased!

Steinbeis also invests a lot of time and effort addressing the needs of small and medium sized enterprises (SMEs). They often haven't got the financial means and human resources to invest in their own research and development. What specifically is the benefit of Steinbeis to them and what do small businesses get from working with Steinbeis?

Competition is constantly fiercer, so a lot of the companies approaching Steinbeis for know-how or technology transfer are SMEs with no in-house development, or SMEs which do have their own development department but need more of the latest thought and input from outside. It's the best way for them to boost their competitive standing. Staff in local Steinbeis centers often have a regional bias which makes them much more approachable. Lots of companies embarking on a new development simply lack the right infrastructure. Steinbeis provides them with the infrastructure and specialist knowledge to safeguard the process of implementing ideas. The quality of the resulting solution is generally enough to safeguard sustainability within the company, so it lays the foundations for continuity.

Research in Germany in particular is currently undergoing major change. What challenges do you see round the corner for academia and science? And how does Steinbeis and its network of several hundred Centers, most of them at universities and research institutes, plan to deal with these challenges?

I personally believe that competitive pressure will actually force research and development to become much more goal-oriented. It will be crucial for universities and other institutions of education to work in synergy with regional areas of industry. If regions are to avoid economic decline, companies in the area have to be in a position to forge contacts with local universities. They must be able to tap straight into know-how and technology transfer for a variety of business services. The way we see know-how and technology transfer is that the benefit gleaned by the company equates directly to the result of innovative transfer. For the professor at the Center, transfer is the ideal training vehicle and I'm sure they use the examples in plenty of lectures as live case studies.

There is still a lot of lively discussion about life-long learning. Do you think companies and workers really perceive the need to keep investing properly in ongoing employee development or do you think more needs to be done?

If you come up with an innovation then everyone has to be involved in the staff development process – along the entire company value chain. The way I see it, companies have to invest more in staff development to maintain motivation and commitment levels, and improve them. For me, you cannot innovate as a company unless people are motivated and training takes place internally and externally with clearly defined goals. At Steinbeis, everything is in place to respond to customer requirements flexibly and provide training programs specifically tailored to individual needs.

Are there any types of societal behavioral patterns capable of influencing company success, and if so what can know-how and technology transfer do to make a positive contribution to this?

The difference between successful and less successful companies is the quality of staff, the infrastructure, and internal company communication. Opportunities and risks are an intrinsic part of success and failure. When you succeed, others become envious. When you fail they often gloat in schadenfreude. The challenge for all of us is to suppress envy and schadenfreude and support as many business people as possible in their willingness to take risks and seek opportunities. Steinbeis bolsters companies by providing individual advice and development services to enable them to minimize calculable risks. They receive tangible solutions to their problems based on confidentiality and integrity, underpinned by clearly agreed contractual arrangements. So at Steinbeis technology transfer always culminates in exclusivity. In other words the client has access to all results emanating from the transfer project. At Steinbeis this is a given, it is part and parcel of our long-term contribution to partnership, to the benefit of the project company. We have a fundamental need in society for the right environment to encourage entrepreneurs to take a lasting interest in investment. Add to this a willingness to take risks and we're in an ideal position to keep building on our international standing as a high-tech country.

For many companies and sectors, 2006 brought unexpected business growth. Was this also the case with Steinbeis?

Companies experienced an upturn in almost all areas of business. Steinbeis is so close to market developments that it also shared in this upturn. The positive growth witnessed by companies in a variety of sectors was also reflected in turnover and staff numbers at Steinbeis although other factors also contributed to our success – flat hierarchies, quick communication, efficient organization. But we also do a lot to engender motivation at work and compete with market-driven products and services. The long-term key success factors at Steinbeis are: demand-based products and services totally open to free competition; Steinbeis experts working entrepreneurially in a decentralized structure. This allows us to react quickly and expeditiously to market needs.

Based on what we know today, how do you expect know-how and technology transfer to develop in the coming years and what developments are we witnessing already?

As globalization intensifies the pressure is mounting on companies to innovate. But the thinking is all about cost control and companies are shutting down research and development departments and delegating the task, which hasn't gone away, to third parties. Steinbeis is in a position to take up the reins itself or in cooperation with partners. If competition is becoming more intense then I think that service companies will have to diversify further. They'll have to target completely new areas and establish enough business to allow themselves to keep innovating in the long-term. In this respect, there are a number of contributions Steinbeis can make. One thing we can be sure of: in the future there will be more demand for know-how and technology transfer so growth is inevitable.

Using digital factory planning to enhance planning processes

Thought through, carefully, digitally

Digital Factory seems to be a generic term for a comprehensive network of digital models and methods such as simulations and 3D visualization. In essence, a Digital Factory allows you to put in place and control all key processes and resources in a factory, whereby everything links back to the product. True, the only companies able to digitize planning and production processes profitably are big companies, but advances in technology have come a long way. A growing number of small and medium-sized industrial enterprises can now reap the benefits of digital production. The outcome: the flexibility to achieve shorter product development cycles, shorten processes, reduce costs, and change the way you do business.

The aim of factory planning is to reduce production costs by improving the way machines and systems are organized, optimizing material and information flows and matching workplaces to production requirements. You have to put the right things in the right place, each plot of land, each production hall, everything according to a long-term plan.

To fit in with increasingly short throughput times, the overall planning process also needs to be streamlined and the time taken to do the planning needs to be shorter. The starting point is always current data: the means by which you derive key figures from completed projects. The Steinbeis Transfer Center Factory Planning in Neu-Ulm is a specialist in planning, advising industrial enterprises, and coming up with groundbreaking ideas.

The significance of factory planning is often underestimated but it should be a permanent management task as it creates competitive advantage, even in small and medium-sized enterprises:

- faster planning reduces costs
- the quality of planning improves
- product and process complexity becomes manageable
- communication improves
- faster product development cycles reduce costs.

A Digital Factory is a virtual map of a real factory based on an end-to-end data model encompassing geometric, technical, logistical and commercial data. The data model forms a link between existing processes and systems. The aim is to provide immediate access to up-to-the-minute information. This forms the basis of subsequent planning.

When you introduce digital factory planning, before purchasing any systems you have to design the underlying process. Once you have analyzed processes you are in a position to select the right software and provider so existing systems are analyzed to see whether it would make sense to link them.

Then when you select the new system one of the key considerations is integratability. Effective digital factory planning requires a highly efficient data management system to gather data and all relevant information quickly. The CAD system should have applications for a variety of planning activities to encompass computation and dimensioning. Other crucial components of modern factory planning are simulation, digital compositing with integrated collision detection, and virtual reality.

The development of high-performance low-price computers has made it possible to substitute traditional 2D layouts with 3D factory models. These models make it much easier to capture complex interactions and unlike 2D planning, they can pinpoint and eliminate collisions within individual stages of the planning process – the architecture, heating, ventilation, fittings, and logistics. The benefit: much less expensive trouble-shooting on the construction site. Overall then, digital factory planning ensures that factories function as a whole. Long before construction commences, the factory comes to life in a virtual reality world.

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Center of competence in the healthcare industry

Successful therapy

Over the coming years the number of beds in German hospitals is set to fall by around 20 %. Unless they come up with effective growth strategies, the capacity of many hospitals is under serious threat. One strategy is to focus on core business and set up centers of excellence. The role of these 'centers of competence' is to develop and refine knowledge and expertise as part of a networked cooperation initiative.

The IfQO – Institute for Quality Management and Organizational Development, a Steinbeis Advisory Center in Erbach, was established by helping clients set up centers of excellence. One of their success stories is the 'Breast Unit' and 'Bowel Unit'.

Every year, there are about 200,000 new cases of mamma carcinoma, a malignant build-up on the mammary or breast glands. Some 18,000 of these are terminal, or in Germany: 2.2 % of all deaths. Bowel cancer is the second most common type of cancer affecting people. Over several decades a variety of new therapy methods have improved the diagnosis of individual patients. There has been good progress with early detection, diagnostic methods, chemotherapy, operation techniques and the use of neoadjuvant radio chemotherapy to treat mammary and rectal carcinoma – just some of the successes in fighting cancer. This has made it all the more important to coordinate activities on an interdisciplinary level by safeguarding the quality of cooperation – in terms of content and structure. Better still: set up a breast and bowel unit.

At the same time, it is important to think about service providers in the healthcare industry – forming centers of excellence can help reduce costs and raise efficiency which is why it is all the more important to have centers organized by region in hospitals. This way many cases can be diagnosed and treated, thus building on experience and competence.

This is the approach used for the breast and bowel units. German specialist agencies estimate that by concentrating, centers could reduce the number of deaths by 10 % Further, patients would benefit from quality treatment on a par with international standards. The whole concept hinges not only on the transfer of knowledge between each local center and agreed diagnostic and therapy procedures, but also a common understanding of quality and agreed standards. Because certification is a joint process, the hospitals involved subsequently fulfil widely accepted European quality standards, technical standards laid down according to evidence-based guidelines, and of course legal requirements. To develop treatment methods further a number of joint studies are planned. Methods and successes will be shared in self-help groups and publications as well as discussed at congresses. Methods for individual cases will be agreed on an interdisciplinary level.

One ground-breaking project is the Breast Unit at the HELIOS clinics in Schwerin. The center of excellence management system is imbedded in the group's quality management. Regular surveys are carried out examining 400 selected criteria and evaluations in 'peer review groups'. These are used to ascertain key trends, developments and benchmarks, both inside and outside the group, to gauge whether goals are being achieved in four key areas: patient benefits, knowledge management, economic viability and growth. Compared to other German hospitals, centers of excellence such as the Breast Unit at the HELIOS clinics in Schwerin are not only hitting all targets by area, they are exceeding targets.

Photo: mclo/photocase.com

The Steinbeis experts from Erbach have now advised around 40 centers of excellence at hospitals. Results suggest that the joint quality management project facilitates a marked improvement in competence within participating organizations:

- Results are regularly measured and evaluated and participants perceive continuous improvements, stemming from clear responsibilities and lines of authority.
- Improved communication and interdisciplinary cooperation, with a positive influence on the coordination of treatment processes, agreed corrective measures and trouble-shooting.

Staff receive systematic training and inductions and there are agreed approaches for

dealing with errors and taking corrective measures. This also has a positive influence on agreed treatment processes, and vice versa. Compared to the situation at the outset – organizational deficits and the associated risks to patients – raising skill and competence levels has made patient care much safer.

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An online application to determine new technology requirements

Really ready for virtual reality?

Modern 3D CAD and Virtual Reality (VR) involve a variety of numerical simulation and visualization techniques. These can be extremely useful during standard development processes. They also make it much easier to overcome the challenge of dealing with technical details, extended development cycles, and internal and external communication problems. Despite this, many small and medium-sized enterprises in the construction industry still bank on 2D CAD systems. Not necessarily because of a lack of funds or 'technophobia' (a dislike for modern technology), but because many companies cannot cope with the highly complex migration process. Help is now at hand in the form of an online application which determines whether it would actually make sense to use 3D CAD systems.

A key weakness in many small and medium-sized companies is that they are simply not equipped to use 3D CAD systems. This can hinder – or, even worse prevent – further use of data internally in simulations, calculations and the development of digital prototypes. The same applies to detailed and comprehensive joint projects with more technically advanced customers.

Conscious of the problem, staff at the Eislingen-based Steinbeis Transfer Center Innovation and Organization joined forces with the Virtual Dimension Center in Fellbach, HSG-IMIT in Villingen-Schwenningen and the Upper Austria University of Applied Sciences in Wels. Their aim: to develop an online application enabling companies to analyze whether they fulfil the necessary criteria for using 3D CAD or VR. By examining the exact nature of the company, staff can work out the technology level to aim for. A comparison is drawn to existing equipment to ascertain project needs and pinpoint potential pitfalls. For example, the '3D CAD/VR Fitness Check for SMEs' unearths deficits in working together with more technically advanced customers, showing a companies actual capability to use visualization and simulations during the construction process.

The need for 3D CAD/VR technology is identified precisely by an online application, demonstrating the potential benefits. It takes into consideration company strengths in the existing system architecture and any broader factors such as the organization or the nature of the project. This allows companies to take a view on their current position and quickly work out for themselves project requirements if they do introduce new technology.

The evaluation is presented as a report in PDF format as soon as the last question has been answered so it can be used for arguing the case for new equipment. Experts from all parties involved can then interpret the results in detail, paving the way for specific project planning. To try out the 3D Fitness Check visit www.stzio.de.

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Accredited head consultants help to improve material performance

You have it on good advice

Resources are growing scarce. Material and energy prices are rising. Yet product costs still have to keep pace with global competition. To meet the demands of business, companies should steal competitive advantage by using materials judiciously – a material efficiency drive to improve products, technical and organizational processes, machines, and tools and working practices can provide a number of useful benefits. Help is on hand in the guise of the materials support program sponsored by the Federal Ministry of Economy. Three Steinbeis consultants based in Gosheim (Baden-Württemberg) are accredited consultants in 'material efficiency'.

Companies in the industrial areas of Baden-Württemberg – Lake Constance, the Black Forest, the Neckar-Alb region, the Alb-Danube region and Upper Swabia – have a new pool of experts to call on. Steinbeis consultants Petra Ohlhauser, Walter K. Staiger and Christoph Seyfried have founded a Material Efficiency Center at the TQI Innovation Center.

The three Steinbeis consultants gained accreditation as Head Consultants from the German Material Efficiency Agency which acts on behalf of the Federal Ministry of Economy. The German Material Efficiency Agency oversees aid money grants throughout Germany and certifies regional experts with consulting experience in industry to do this job. Backed up by a team of administrators, Ohlhauser, Staiger and Seyfried provide information on project support and provide backup during implementation of the material efficiency process in the company.

Dr. Wolfgang Domröse (second from right), Director of the German Agency for Material Efficiency, with Petra Ohlhauser, Walter K. Staiger (r.) and Christoph Seyfried (second from left) visiting a manufactering company. Photo: A. Villing

The Federal Ministry of Economics and Technology has launched two fixed-term support programs to encourage companies to handle materials more consciously. The types of companies that profit from the NeMat and Vermat programs ('company network for material efficiency'/'improvement of material efficiency in companies') use high volumes of materials and energy, have lots of machinery or carry out a lot of assembly – typically metalworking, plastics, electronics and applied chemistry. The companies receive subsidized advisory services through non-refundable money, in terms of share-financing.

Among the areas the NeMat aid program is targeting for improvement are: the analysis of material use, machine use, assembly and product ratios. This is where the Head Consultants from Steinbeis enter the equation. With the company receiving consultancy services, they evaluate the current situation or organize things like staff training. Especially for small and medium-sized companies, this improves a company's long-term potential to enhance material efficiency – and boosts competitiveness. Further, cutting material costs safeguards jobs, in fact it uncovers new avenues to create jobs.

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International scientific cooperation is often fraught with failure

A little understanding goes a long way

The globalization of markets has led to even more internationalization in industry and university research and development programs. Experience with international projects involving German universities and foreign industrial companies – as well as between universities from different cultural regions – have demonstrated how the success of international research and development projects hinges on those involved being equipped with the right intercultural skills. In fact, the people involved in the partnership must understand cultural differences, otherwise success is by no means guaranteed.

Based in Bingen in Baden-Württemberg, the Steinbeis Transfer Center Company Management, Organization Management, and East-West-Cooperation looks into the specific causes of the type of cultural misunderstandings and conflicts that can hamper work between scientists and different regions. Through consulting, instruction and courses the Center attempts to improve intercultural understanding in the field of science and research.

Poor understanding within intercultural teams is caused by different values, attitudes, opinions, and behavior – yet mutual understanding for other people's actions is precisely what you need for teams to function properly. So team members need to know about intercultural divergence and possible causes.

Apart from culture-specific anomalies on a more general, personal level – related to communication and behaviour – there are also important differences in the way people view science. Problems in international cooperation are often caused by people from one culture unilaterally imposing their understanding of science – analytical approaches based on stringent cause-effect models tend to take precedence over other, frequently less stringent approaches.

The evaluation of research findings, common in continental Europe, contrasts to the evaluation of harmony-based findings, or evaluating early indicator-based hypotheses – primarily demonstrating external effects. Also there are differences in the approaches used to gather data. Some approaches make sense in some cultures, in others they are simply not possible because of respondents culture-specific reactions.

International cooperation becomes even more fraught with hazard when team members start trying to prove themselves over others and fail to consider the personal contribution each member could make to the success of the overall team. Also something like a decision, such as how best to push a research project forward, can be tackled from a different angle. If people think differently about this issue, it can have a detrimental effect on progress and actions later on in the project. Scientific cooperation is practically doomed to fail if for one reason or another somebody feels unequal. Culture specific perceptions relating to gender, age, scientific standing and even skin color can sometimes render scientific debate almost impossible.

Intercultural skills in international scientific cooperation necessitates a sensitivity for why each culture acts, proceeds, judges and thinks differently and how this relates to each team participant. Steinbeis courses on these subjects include cognitive and experience-based training on the possible causes of cultural divergence and the extent to which various cultural norms differ. Steinbeis also recommends more detailed cultural training for people involved in partnerships with specific regions.

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German employers now have to implement the General Equal Treatment Act

Equal opportunities: everyone's entitled

The AGG, the General Anti-Discrimination Act, came into force in Germany in August 2006. It immediately caused a commotion as some of the new regulations could have wide-sweeping implications for companies and public administration. Under the AGG, companies must ensure that they avoid (or stop) discriminating against staff or applicants on grounds of ethnic origin, gender, religion, ideology, disability, age or sexual identity. E-learning and blended learning solutions provided by the Steinbeis Transfer Institute eBusiness & Management are helping companies and public bodies implement the new law.

The new AGG forces companies to introduce measures, even preventative measures to combat discrimination. If they fail to adhere to the new legal requirements, they risk being sued for damages or compensation. The Steinbeis Transfer Institute eBusiness & Management (part of Steinbeis University Berlin) has developed a series of effective and inexpensive e-learning and blended learning solutions in cooperation with Berlin solicitor Uta Radies. The training software is already being used successfully by a variety of companies and public bodies.

The new laws – and resulting changes in civil laws and labor legislation – are resulting in significant reforms for staff and managers. Even if a company does adhere to the rules of the AGG, it must be able to prove its exemplary behavior in court – another reason companies need to make sure that staff and managers in particular are sticking rigidly to the rules of the AGG. Apart from the legal implications, discrimination in companies severely affects the working atmosphere and can damage the external image of the company.

The e-learning programs provided by the Steinbeis Transfer Institute teach participants the key facts about the AGG by using case studies and setting them tasks backed up by practical solutions. The learning software also easily caters for company specific issues. It can be integrated into in-house learning platforms or link into the company Intranet. The Steinbeis Transfer Institute also offers participants the option of using the learning software via its Steinbeis Competence Center. If they take this option, all they need is internet access (so-called ASP = Application Service Providing).

AGG e-learning software

The are two versions of the software, one for staff and one for managers. Both are available in English. Staff learn about the overall aims and implications of the AGG with exercises on spotting the signs of discrimination and the consequences of the AGG in everyday business practice. Managers also learn how to analyze the risks posed by discrimination in their own area of responsibility, how to recruit staff without discriminating, recognizing and avoiding particular risks in management and how to introduce preventative measures. All learning programs finish with a test. If participants are interested they can then see their score and request a certificate to show they have completed their training so that, if necessary, the company can prove that staff and managers have received AGG training. This also enhances the company's standing if it should ever come to a dispute.

For management development purposes, the Steinbeis Transfer Institute offers the blended learning solution. This is a learning approach based on a mixture of self-taught modules supported by tutors, face-to-face instruction and content that can be applied to the workplace or integrated into knowledge management. This empowers managers to proactively shape the corporate culture in their area and ensure people are not discriminatory.

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The Steinbeis University offers training to become a qualified rating analyst

Rating for experts

The New Basel Capital Accord – abbreviated to Basel II – came into force for banking at the beginning of 2007. It is not due to be introduced to the United States until 2009 whereas it is already in use in all European countries, Asia and most English speaking countries. 2007 is a transition period to allow banks to juxtapose their existing systems with the new one. For borrowers it is particularly important now to make a good impression with investors and banks – ie, to present them with a good valuation, or 'rating'. Training staff in rating is therefore a highly significant issue for companies themselves, and for their consultants. The DStV, the German Association of Tax Advisers, has established a new job description: Credit Rating Consultant. Training is provided by RaFin, the Steinbeis Transfer Institute Rating & Finance.

Rating. If you are a tax adviser or work in management accounts, the mere mention of the word is enough to start an argument. For some the new requirements laid down by Basel II or Solvency II spell profit – rating models are already being used in company accounts issued to stakeholders. Others castigate the whole issue as a waste of time and actually damaging to the German economy and consulting professions. But some tax advisers and companies were quick to comprehend the opportunity the subject uncovers.

Organizations such as the German Association of the Automotive Industry (VDA) have already reacted to the development and are supporting their members by providing rating tools for them to react properly to the demands made by banks but especially to OEMs carrying out supplier evaluations. Adding to the many publications and pieces of software offering support, over the past two years the Steinbeis Transfer Institute RaFin Rating & Finance, which is part of the Steinbeis University Berlin, has become established as a key player in the rating market. It has done so by entering into exclusive training contracts with the DStV, the REFA and similar organizations.

The courses are among those accredited by the BdRA (the German association of rating analysts and advisors) and are used by banks, insurance companies and similar bodies to provide employee development. Many tax advisers and management consultants also turn to the Institute for training as a rating analyst or adviser. RaFin provides senior managers, financial accountants, tax advisers, chartered accountants and management consultants with a solid grounding in rating and a recognized qualification.

Training as a rating analyst is in strong demand

Studyprogramm for Ratingadvisor and Ratinganalyst

The program adheres to the university guidelines laid down by the SHB and BdRA guidelines for rating qualifications. Participants attend two courses, each lasting three consecutive days and are taught the principles of rating and regulatory and legal considerations. But in particular they are armed with practical tools for carrying out rating evaluations. This is done using rating software called R-Cockpit which is a core component of the course. Participants undertake comprehensive training involving case work and lecturers from industry and university. This is underpinned by homework and a final exam culminating in a university certificate. Armed with RaFin accreditation participants are later entitled to use the title Certified Credit Rating Analyst CRA, with DStV accreditation they become a qualified Credit Rating Consultant (more information: www.rafin.de).

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Bachelors degree in 'Supervision and custodial care' plugs the gap in university programs

Care you can count on

In Germany around 1.2 million people who suffer from a physical disorder or disability receive care. They are simply not in a position to care for themselves. Often making decisions on their behalf are legal custodians who are there to safeguard their right to determine for themselves how they lead their life. Care includes a whole host of activities: custodians need to understand law, medicine, psychology, the principles of teaching and economics. Despite this, until now there has been nowhere to turn for training.

Carers either tend to work on a voluntary basis, as is often the case in families, or as a profession – either under self-employment or on behalf of care organizations. In Germany anyone is entitled to become a professional care worker if they have the necessary skills and personal and work experience. To help people new to the profession acquire the right knowledge to enter care work, training organizations do already offer specialized seminars and training programs. The Academy of public administration, a Steinbeis Transfer Institute at the Steinbeis University Berlin, now offers the first bachelors program in the whole of Germany in 'Supervision and custodial care'.

"We need university education to make vocational care work professional and provide legal custodians and carers with the means to develop," states Dr. Andreas Urbich, Chairman of the academic advisory council responsible for the degree. The curriculum was drafted with experts in legal supervision and custodial care to ensure that it covers of all of the latest issues. The program is an official 'Project Competence Degree' at the Steinbeis University and is designed to provide detailed specialist knowledge. On completion, students earn a Bachelor of Arts degree. Foundation study examines the fundamentals of economics and law. Students are armed with core competence in organization, communication, project management, moderation and presentation. The main course then focuses primarily on supervision law and the key tasks involved, organizational issues, funding care, supervision planning and various approaches to social work.

Motivated to succeed: "Supervision and custodial care" bachelors degree students

Project work is an important part of the 36 month bachelors degree, allowing students to translate the latest scientific insights into practice. During project work, students are asked to look at a real issue encountered in their work. This ensures that self-employed carers or those working on behalf of care organizations gain direct benefits from their studies as they have to work closely with their employers in arriving at a solution to their problem. Explaining the concept, the head of the degree program, Ramona Groneberg says, "During their studies, students get to choose and work on a project relevant to their job. This allows them to link what they have learned directly to their professional experience and keep using it in their career."

Norbert Ahrend, Director of the Academy of public administration welcomed the first intake of 31 students to the program in Berlin in December 2006. Most participants have worked in care for several years but still have no degree. Ahrend: "I'm impressed by the highly motivated manner in which the students have embarked on their studies. Most look forward to discovering new ways to organize their care work more effectively. But they also value the opportunity to compare notes with others."

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Corporate strategy in the heating and energy industry

A strategy destined to keep burning

Agora GmbH & Co. KG is a Mannheim based producer and seller of energy and heating to large residential and business premises. The medium-sized company uses reliable, quality technology – fuelled primarily by natural gas and wood pellets. Financing the new, frequently expensive technical equipment means turning regularly to a bank or leasing companies. Just one of many aspects that made it necessary for the company to come up with a future-proofed strategy – a task for Michael Kuffler, student at the Steinbeis University Berlin.

Michael Kuffler studies at the Career Center at the Steinbeis University Berlin. The project company for his two year Executive MBA General Management masters degree was Agora. Between periods of study, Kuffler spent time inside the company applying standard strategy development techniques. The key issue to tackle first was whether the methods he had learnt would actually apply to a business start-up in the energy contracting sector. Based on his investigations and analysis, his task was to develop a strategy to improve the company's prospects of success, ultimately laying the right foundations to secure the long-term financing of the enterprise. It promised to be no mean task, so Kuffler would have to plan his approach very carefully.

Kuffler embarked on his analysis by looking at the strategic background. He then used this as the basis of a segmentation exercise, pinpointing current and future business fields, simultaneously estimating the market potential for heat and electricity. To make sure key issues relating to the company's business environment were not left out, he also carried out a separate evaluation putting the whole branch under the microscope.

This pulled together all the key data needed for the detailed business analysis, which involved evaluating the value chain and pinpointing core competences within the company. Without all of this, it would not have been possible for Michael Kuffler to achieve the aim of his project and draw up the business strategy. A key aspect of this was defining the specific business vision, a mission and the actual mission statement. As this is a fundamental need in any company, this turned out to be much more wide-sweeping than envisaged. To examine all strategic issues and weigh up the pros and cons properly, Kuffler looked at several key measures and showed their implications. The MBA student then placed the strategy required alongside each key measure.

Using agreed selection criteria, Kuffler chose one of the identified strategy options and used this to draft a business plan for the first five years. To complete the analysis, he carried out a 'Monte Carlo' simulation. This method allowed him to identify the main value drivers associated with the business model and gauge the quantifiable opportunities and threats to the business.

As a result of his project, the student concluded that the market for heat and electricity contracting could offer significant growth potential – a solid foundation on which to build any company and especially promising for a business start-up like Agora.

The added value of the project for Agora lay primarily in the analytical, comprehensible confirmation of the entrepreneurial concept. Directly based on this, the company had in place key stepping stones for the strategic development of the enterprise in a clearly differentiated strategy with specific steps and actions. Finally, Agora could use the business plan to make detailed decisions on future project financing.

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Steinbeis student arranges strategy plannings

Personal health comes first

Physiotherapy, physical therapy, massage, aroma baths, courses such as Nordic Walking and professionally supervised fitness training – the sort of services offered these days not just for therapeutic reasons, but also for your general well-being. One company already offering all of these products and leading the way in the health sector is radius, from Ravensburg. Juliane Lang worked as the personal assistant to the company directors of this small enterprise in parallel to her studies at the Steinbeis University Berlin.

Radius stands on the site of an old machine making company. The building still has a quaint, old-fashioned production panache about it – a disused hoist still hangs from one of the ceilings of a renovated hall, blending in perfectly with the bodybuilding equipment used for therapy and fitness treatment.

The small Baden-Württemberg company has grown continuously since being set up in 1999. Then as now, the company's strategic aim was to expand the portfolio of fitness and 'wellness' services and disentangle itself from the strong dependence on health insurance companies. This entailed converting a neighboring building with enough space to provide existing services – only in a more sophisticated manner – alongside new offerings such as keep fit, wellness and health programs for companies. The expansion in business went under the motto 'radius is on the move'.

As personal assistant to the company directors, MBA student Juliane Lang was given responsibility for the project. Lang was studying at the Steinbeis Transfer Institute for Business Administration and International Entrepreneurship at the Steinbeis University Berlin. Her brief was to coordinate all managerial aspects, encompassing staff recruitment and personnel plans, all marketing activities, organization of the expansion and associated procedures, financial planning and the strategy.

As a relatively young company, radius was not yet ruled by bureaucracy and established routines and had had little exposure to strategic management. So it would be crucial for the MBA student to transfer management techniques she had learnt into her project company. Some of the key tasks and issues Lang had to tackle were the introduction of a quality management system, strategy sessions to crystallize the business vision, working groups and applied strategy methodologies to define company control parameters. Lang's results were also needed for radius to select the appropriate strategy to be implemented and specify goals.

The company gained certification under DIN EN ISO 9001:2000 in April 2006, a sure sign that the structures and processes introduced as part of the radius quality management system had been successfully improved and put in place. This certificate awarded by the German technical inspectorate also confirmed that services adhere to international standards, a testament to the image of radius to people outside the company. In fact radius is one of the first physiotherapy companies in Germany to be granted this certification – tangible and useful output from Lang's studies.

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Analysing and projecting regional disparities in income

Pay, working hours and employment

Changes in gross wages and total salaries by region are dictated primarily by wage rises and developments in 'employee volumes'. As a result, both are key indictors in identifying gain potential and structural problems as they link back to employment opportunities and earning power. By capturing employment patterns both in the short term and across a whole year, it is possible to show the actual regional earning status of all workers subject to compulsory social security contributions. Figures across a whole year can be traced back to individual employment contracts. This makes it possible to allocate earnings totals clearly to each business, and thus each region.

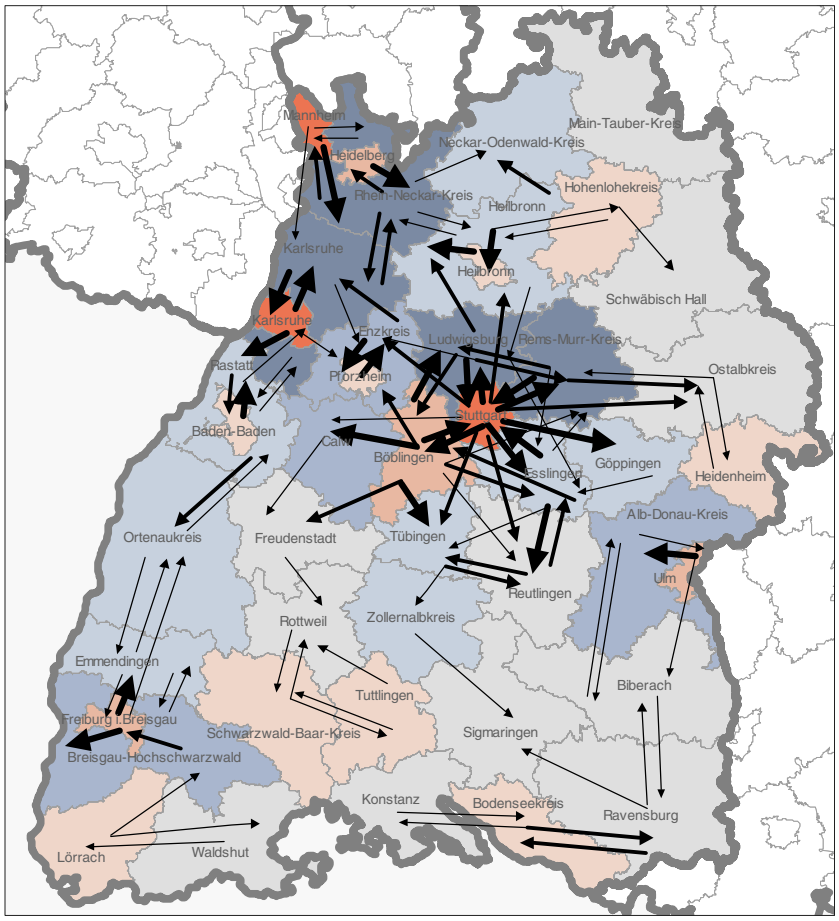
Most of the work carried out by Applied Systems Analysis (STASA) on the analysis and forecasting of regional developments. Working together with the IAB in Nuremberg (the institute for research into the employment market and occupations) the experts at STASA have developed a technique for analyzing and projecting regional developments down to a local level. Using a bottom-up approach, they can trace regional developments in total gross wages and salaries back to regional changes in the total 'employee volume' and the corresponding regional income distribution and wage structures. This allows you to map regional disparities. Using scenario techniques you can then examine and calculate the effect of different political decisions. Gross annual wage per employee is calculated from annual figures provided by the Federal Employment Agency. Data covers some 34 million people in employment subject to compulsory social security contributions, ie' all employees who over the course of a year – in some cases only temporarily

– had a job where they had to make social security contributions. This figure is higher than the number of people on a specific date or the annual average. This makes it possible to capture the overall level of all gross wages and gross salaries in jobs affected by compulsory social security contributions so it is not just a snapshot.

Resident numbers by region change as people move and demographics change. But the number of people moving is also affected by things happening in the employment market and the housing market. So regional development is closely interwoven with supply and demand in the employment market.

Income subject to social security contributions is generated in the place of work. So if an employee lives and works in a different area or district this is seen as a 'transfer of income'. By balancing the number of commuters into and out of an area and looking at gross wages per employee in each district you can estimate the transfer of income by individual district.

The transfer of income caused by commuting paints a clear picture, especially in towns and cities where the concentration of work places intensifies commuting patterns. Linked to this, by looking at the balance of transferred income you sometimes discover major deficits in the towns and cities. This is especially the case in Baden-Württemberg in the state capital of Stuttgart but also Mannheim, Karlsruhe, Heidelberg, Ulm and Freiburg.



Calculating regional income

Calculating regional income down to a district level takes several steps:

- Model and project population changes by district based on migration behavior models.
- Based on regional demographic structures, calculate of the number of people able to work (15 to 65 years).
- Ascertain the number of employees obliged to make social security contributions by each place of residence (the actual number of people able to work), based on the proportion of people in the district obliged to make social security contributions – occupation rate.
- Calculate the number of employees obliged to make social security contributions at the place of work taking into account the patchwork of commuting behaviour within those employees obliged to make social security contributions.
- Derive the number of employment instances from the number of employees obliged to make social security contributions multiplied by the number of jobs per employee.
- Calculate the regional 'employee volume' (measured in work days) from the number of employment instances multiplied by the days of employment per employment instance.
- Define total wages and salaries, based on the total employee volume measured in work days and regional wages per day.

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Consultants' performance bonuses come under spotlight

Paid for success

A clause in Germany's Federal Lawyer's Act makes it illegal for solicitors to charge client fees according to the outcome of their work – so-called contingency fees. In particular, a solicitor is not entitled to a share of a promised financial claim. This contrasts to practice in the United States where contingency fees are par for the course. A solicitor in Dresden has now complained about the law forbidding contingency fees, citing the German constitution. And indeed, giving in to that complaint Germany's Federal Constitution Court ruled the complete ban on performance-related fees to violate the German constitution.

In many areas of consulting, nobody has ever questioned the legality of paying contingency fees. But just because rewarding somebody on their performance is legal does not necessarily mean that it makes sense. As part of one of its projects, the Bochum-based Steinbeis Transfer Center Incentive Management and Organisation Design examined the reasons why a consultant or client would or would not want performance related fees, and if they did: what type.

From the consultant's point of view, the needs of the client should take priority over their own. For the client, there are two challenges to overcome when hiring professional consulting services. Clients are not in a position to make a totally informed judgment about the quality of a consultant, especially if they are hiring them for the first time. Once they have hired them, it remains to be seen if the consultant really will do everything they can to bring the assignment to a successful conclusion, or hold back a little. It is times like this that performance related fees can help. Why? Because an initial meeting is not enough for a client to say with any certainty how good a consultant is. Charlatans are often just as convincing the first time you meet them as their more professional counterparts. Even reference projects sometimes fail to plug the gap and erase uncertainty. Bad consultants should be easy to spot as they cannot provide references, but neither can some highly professional consultants who are new to the occupation, so it is hard for them to enter the market.

Performance related fees make all of this easier. If a consultant is serious about their ability and know they will make a concerted effort to help the client, they will offer a fee

based on performance. Their less reliable counterparts will refuse to accept such payment models because if they do not succeed they are unlikely to earn any money. So there are some powerful and compelling reasons to opt for performance related fees which go beyond normal financial considerations.

Apart from quality, motivation also plays an important role. If a client arranges contingency fees, they will spend much less time worrying about the consultants motivation than if they have agreed daily rates or fixed prices. Daily rates could actually encourage consultants to do too much. Fixed prices could encourage them to do too little. Both are less likely to happen with contingency fees as the consultant has a vested interest in striking a healthy balance between time invested and returns. This becomes particularly pertinent when the client is not working directly next to or with the consultant as it is difficult to gauge exactly how much time the consultant is investing.

Further, arranging a contingency fee redistributes project risk to the clients benefit. Business activities are intrinsically subject to uncertainty, even consulting. Things sometimes simply do not work out, even if everyone does their best to achieve the best results. But sometimes things go much better than anticipated. With contingency fees the consultant also reaps part of this 'upside risk'. As such, the consultant is indirectly providing insurance which should normally be paid for. If the consultant succeeds in providing the expected results this provides additional revenue potential. At this point it is worth looking again at the United States. Even if you have to treat all income statistics with a certain degree of scepticism, everything points to the fact that solicitors who are paid on performance achieve significantly higher hourly fees than their counterparts who are not. If we add client interests to this then the picture is even clearer. If a client goes to court, the prospect of having to pay a high fee to a solicitor – even if they lose the case – is highly unpalatable. If they win, the client will feel a lot more comfortable about paying as they will also be awarded damages.

As a result clients really are willing to pay disproportionately higher fees to cover the solicitors additional 'insurance premium'. This is how things work in other consulting areas. There are probably many more ways to arrange contingency fees, each with pros and cons regarding quality and risk-sharing. Straightforward fees for successful outcomes can match the type of consultation received, as can a combination between daily rates and fixed fees with a success bonus. If the client and solicitor can set sensible success criteria, contingency fees hold equally promising added potential for the client and the consultant.

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New Steinbeis Enterprises

German abbreviations:
SBZ: Steinbeis Consulting Center
SFZ: Steinbeis Research Center
SIZ: Steinbeis Innovation Center
STI: Steinbeis Transfer Institute
STZ: Steinbeis Transfer Center

The following Steinbeis enterprises have been set up since December 2006:

SFZ Connecting Semiconductors and Luminescent Substances, Erlangen
Manager: Prof. Dr. Albrecht Winnacker

STZ Information Technology and Network Technology, Bielefeld
Manager: Prof. Dr.-Ing. Lutz Grünwoldt

STZ German-Spanish Technology Transfer, Karlsruhe
Manager: Dr. Johannes Gottlieb

STZ Water Management und Hydraulic Engineering, Biberach
Manager: Prof. Dr. Anton Nuding

SBZ Fluidics, Stuttgart
Manager: Dr. Stefan Schulz

SIZ European Projects, Freiburg
Manager: Dr. Ekkehard Lippold

Saphir GmbH, Herrenberg
Manager: Prof. Dr. Werner G. Faix,
Dipl.-Ing. (FH) Peter Wittmann

SFZ Heat Management in Electronics, Stuttgart
Manager: Prof. Dr.-Ing. Andreas Griesinger

TQU my big apple GmbH, Ulm
Manager: Dipl.-Ing. (FH) Helmut Bayer, MBA

STZ Logistics and Management, Bremen
Manager: Prof. Dr. Frank Giesa

SIZ Wireless Communication, Lörrach
Manager: Prof. Dr.-Ing. Axel Sikora

SFZ IVCRC International Vision Correction Research Center, Heidelberg
Manager: Prof. Dr. med. Gerd Auffarth

STMT GmbH, Stuttgart
Manager: Prof. Dr. Dr. h.c. mult. Johann Löhn

STZ Medical Quality Networking (MQN), Heidelberg
Manager: Prof. Dr. med. Gerd Auffarth,
Dr. med. Johannes Bräuning

STZ Energy Management and Building Services Engineering, Horb
Manager: Prof. Dr.-Ing. Martin Hornberger

SIMT gGmbH, Stuttgart
Manager: Prof. Dr. Dr. h.c. mult. Johann Löhn

Steinbeis University Berlin introduces its Test Engineering degree program

The Steinbeis University Berlin begins 2007 with its new Test Engineering degree program, bringing together the natural sciences, technology and management steeped in academic and scientific excellence. Students can enroll in Berlin, Dresden and well-known universities outside of Germany. Scientific and industry advisory councils also manage course development to ensure practice-oriented instruction.

In the Test Engineering degree program, students explore test methodologies, experiments and simulation technologies which identify the service value and lifespan of components, structures and systems. As the degree program falls under the Steinbeis University's Project Competence model, students manage a complete project on a company's premises, taking a genuine hands-on approach to what they have learned in the classroom.

The Steinbeis University Berlin has partnered with IMA Material Research and Application Technology in Dresden and the German Association for Materials Research and Testing in Berlin to launch this program. The alliance also founded a joint 'Study and Research Center' housed at IMA. Over 70 Institutes within the Steinbeis University Berlin offer trendsetting state-recognized degree programs and certification training courses in a broad range of management and technology sectors.

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Site analysis and baby food

A child, a career – no longer mutually exclusive. This thinking has definitively shaped the corporate culture at the Steinbeis Transfer Center Geoinformation and Land Management led by Prof. Dr. Martina Klärle in Weikersheim, Germany. By transforming her stance into such an impressive model for the workplace, Dr. Klärle's consultancy firm was named one of '365 Landmarks in the Land of Ideas', an initiative of the federal government and German business to highlight one place of innovation and inventiveness for every day of 2007.

Klärle (5th person from the left) and her team

Ten female engineers work at Dr. Klärle's office. Thanks to flexible working hours, an on-site nursery, and equal parts resourcefulness and motivation, these academics have managed the balancing act that many women can only dream of: juggling a family and a career. They manage approval procedures, land utilization plans and site analyses for live projects and arrange child care at the same time – with no financial assistance from the government. Together, Dr. Klärle and her colleagues have 15 children; the 16th is due in April.

Praise for Dr. Klärle's work overflowed at the award ceremony. Günter Mächte from Baden-Württemberg's Ministry of Labor and Social Affairs stated that Dr. Klärle was a perfect example of the drive needed to create a sustainable future and balance families with careers. Frank Arlaud, customer consultant at Deutsche Bank, presented Dr. Klärle with her award sculpture. The 'Germany – Land of Ideas' initiative launched the '365 Landmarks in the Land of Ideas' project in partnership with Deutsche Bank. More than 1500 establishments, institutions and companies entered the award.

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The Security Award for Baden-Württemberg

In 2007, the Security Forum Baden-Württemberg will present its first-ever Security Award for outstanding projects in occupational safety designed to protect expertise. The Security Award is a joint initiative of the Minister of the Interior and the Minister for Economic Affairs of Baden-Württemberg. To be short-listed, exemplary projects must address the real steps involved in design, implementation and monitoring to establish internal corporate security. This may include optimizing pre-existing structures or launching completely new mechanisms.

As well as raising overall levels of awareness about security in companies and organizations, the Security Award also aims to document and promote the potential for innovation in security within Baden-Württemberg. Submitted projects can address private, technical, organizational or legal data security. A written security plan must accompany every project submitted for the jury's evaluation. Plans must outline the particular innovation and exemplary nature for the safety infrastructure or safety directives, or both.

The Security Award is also open to the general public, companies and organizations. The Security Forum Baden-Württemberg welcomes entries from companies across all industries based in Baden-Württemberg or with an in-state branch office as well as municipalities, organizations, institutions and universities based in Baden-Württemberg or individuals who are permanent residents of Baden-Württemberg. Deadline for entries is June 15, 2007.

A jury consisting of Security Forum Baden-Württemberg members will decide who wins the Security Award. All winners will receive a Security Award sculpture and a certificate of merit and recognition. The official awards ceremony will be held in the fall of 2007.

Founded in 1999, the Security Forum Baden-Württemberg is made up of representatives from businesses, chambers, associations, research establishments and public authorities throughout Baden-Württemberg. In particular, the Security Forum is committed to assisting small and medium-sized enterprises in safeguarding their expertise and innovations. Its role in pinpointing diverse risks will help forge a 'culture of security' within companies and organizations. Although electronic and personal means are still the primary methods of draining information, companies and organizations would be well-advised to attend to other aspects of security, such as specific ways of designing technology, employee integrity and reliability, protecting intellectual property and preventing corruption.

Application forms and contest information:
www.sicherheitsforum-bw.de

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Corporate espionage in the limelight

A brochure recently published by the Baden-Württemberg and Bavarian State Offices for the Protection of the German Constitution provides an overview of the main sponsors and areas most at-risk as well as what causes and propels corporate espionage. The brochure also details how espionage is investigated. Apart from the 'classic' threat of agents, technology has given rise to new menaces – web and email surveillance, attacks on telecommunications systems and hardware theft to name just a few.

Intelligence-based espionage occurs in one of three arenas: business/science, politics and the military. Recently, foreign intelligence-gathering services have taken a noticeable interest in German business and science. "A 2005 study estimated that illegal channels of information could cost Germany upwards of 50 million euros per year," explains Johannes Schmalzl, President of the State Office for the Protection of the Constitution Baden-Württemberg, "so it's essential that small and medium-sized enterprises learn how to safeguard their expertise."

Baden-Württemberg's and Bavaria's economic and scientific infrastructures have helped a dense network of innovative companies and scientific institutions flourish. Closely linked to one another, both fields in southern Germany are very attractive targets for international espionage. Dr. Wolfgang Weber, President of the State Office for the Protection of the Constitution Bavaria, shares this view: "It comes as no surprise that foreign countries continue to pursue intelligence surveillance activities in Baden-Württemberg and Bavaria, both high-tech states. At a time of limited capacity, it made sense to work together and jointly issue a brochure to make people more aware of the risks that could arise."

The brochure aims to warn the industrial sector and academic and scientific institutions about the problem. Cases can often become so complicated that an outsider is in no position to immediately detect – and without a doubt declare – whether intelligence espionage is at work. As a result, the State Office need only suspect to intervene. A shipment of goods, for example, may be illegal under the Foreign Trade and Payments Law and the War Weapons Control Act or violate German foreign trade regulations. Other grounds for intervention: if the shipment was handled in the interests of a foreign country or the companies who procured the shipment used hidden methods to conceal the final recipient or the shipment's purpose.

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Supply Chain Project of the Year 2006

A total of 13 teams from BASF from around the country entered the Supply Chain Project of the Year 2006 award. The winner: a project entitled 'Implementing a Global S & OP Process'. A substantial portion of the project's concept can be credited to Thilo Lindner's MBA project work at the Steinbeis University Berlin. This award recognizes innovative supply chain solutions and outstanding performance in putting supply chain models into practice.

Led by Peter Fayterna (BASF), Rolf Zentgraf (BASF) and Thilo Lindner, a culturally diverse team from Performance Chemicals for Coatings, Plastics and Specialties division was called on to launch the awarded project. It showcased a global sales and operations planning process (S&OP) designed to bolster the monthly planning process with standardized plausibility checks and ultimately forge a consensus in keeping with 'one number' principles. This new process helps companies manage themselves more efficiently, considerably improves stock and expense situations and raises the level of service in the business unit.

The awards ceremony for Supply Chain Project of the Year 2006 was held in Ludwigshafen in December 2006. Dr. Kurt Bock, CFO and Gabriel Tanbourgi, President of Global Logistics and Procurement, were on hand to present the winning team with their award.

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The Production and Component Parts Properties conference

As part of the new 'Applied Technologies' series of conferences, Steinbeis is partnering with the German Association for Materials Research and Testing to organize a panel of research and industry experts on June 20, 2007 at the Haus der Wirtschaft in Stuttgart. Under discussion: various issues in production and component parts properties.

This conference will explore the intersections of materials, production and component parts properties. Experts will examine these issues:

- specific requirements on materials for producing various kinds of steel, light metals and alloys and plastics
- using production processes to attain particular properties of component parts for realistic strains and ambient conditions
- simulating production processes numerically with regard to component parts properties.

Presentations will also address approaches to quality assurance and production costs. Though aimed at engineers and designers in mechanical, plant and railway engineering, vehicle construction and the aerospace industry, employees from quality assurance, production and testing will also benefit from the conference. The fee for this one-day conference is € 450 (also covers the cost of the transcript and lunch). A poster exhibition will accompany the event.

Registration and further information:
www.steinbeis-symposium.de
symposium@stw.de

In the pursuit of pain

A European Union–funded research project is developing new substances destined for pain therapy. Researchers restricted their attention to patients in the advanced stages of cancer. The new drug treatments aim to make life more bearable for those patients. Eleven institutes and organizations from six EU countries work as partners within the Normolife research consortium – with Steinbeis researchers and managers among the experts.

Throughout the project, the scientists use a cell sensor system developed mainly in the German state of Mecklenburg-Western Pomerania. This system grows nerve cells on electric sensors and discharges electrical signals to test how cells react to substances, thus eliminating animal testing in the preclinical phase.

Prof. Dr. Dieter G. Weiss, Director of the Steinbeis Transfer Center Analytical Visualization Techniques, heads up a University of Rostock research group within the project. "We're looking for drugs which will relieve – or eliminate – pain in cancer patients even during the final stages," he explains. "Until now, patients have been given opiates or transdermal plasters. These therapies are certainly effective, but their side effects pose a real struggle for patients who are already quite weak." These drugs often cause breathing difficulties, sweating, nausea and disturbance of equilibrium. In light of this, the research consortium aims to develop the next generation of drugs to treat cancer pain.

Studies have shown that humans perceive pain because electrical signals originating from the organ in question travel through the spinal cord and terminate in the brain. New 'smart drugs' actually block these various pain receptors, promising a much better effect than previous drugs which impact only one target molecule. Instead of engaging just one receptor, the new drugs are designed to prevent pain signals in the brain from traveling along the spine's neural pathways.

The Medical Research Center of the Polish Academy of Sciences in Warsaw is managing the project. German Normolife partners are the University of Rostock and longtime associate Pattern Expert, a bioinformatics company. The Steinbeis Team North East in Rostock also assist the research consortium in management concerns.

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Study on cross-media publishing confirms complexity and diversity

In recent years, cross-media publishing has grown more and more important for companies to create media efficiently. This type of publishing relies on a media-neutral data base system to generate different forms of media. Andrea Müller, a doctoral candidate at the Steinbeis University Berlin, closely examined the strategic design and management underlying a cross-media publishing system.

Müller conducted telephone interviews with over 140 companies in the electronics industry and mechanical engineering, asking them about their individual processes in cross-media publishing. She published the results as a study entitled "Cross-media publishing: 2006 market study – Actual degree of implementation in German companies" (available in German only, German title: „Cross Media Publishing: Marktstudie 2006 – Aktueller Umsetzungsgrad in deutschen Unternehmen").

The study heightens readers' awareness of the difficulties companies face in product information management, identifies possible solutions to optimizing performance and highlights still-hidden potential in the cross-media publishing process. This study is aimed at decision-makers in upper management, sales and marketing and also compares a benchmark company against the average.

As the growing importance of time to market coincides with more and more complex customer requirements and shrinking marketing budgets, product publications must appear on the market more and more quickly, cost-efficiently and customized. Since products differ so widely in technology and each overseas market and target group has its own requirements, it is essential to differentiate products and marketing publications according to the target markets: sale program, content, language. What's more, companies need to respond to market demands by supplementing their print media with new media such as online catalogs, product catalogs on CDs or electronic catalogs for marketplaces and procurement systems.

Within many companies, this fast-paced trend runs contrary to existing structures and processes for creating product publications – one of Müller's main findings in her study. Even frontrunner companies using highly sophisticated products and efficient production processes often come up drastically short in this area. In these instances, product and marketing information is spread between numerous data cells and spreadsheets within corporate divisions. This means employees have to merge data manually, a labor-intensive task which ties up valuable resources.

Müller outlines several steps companies can take to set up proper technical support in cross-media publishing. Apart from centralized data keeping, companies will also benefit from maintaining stocks of re-usable text modules, standardized catalog structures as well as content in multiple languages. Müller also points out that software-based process support featuring a standardized workflow, transparent responsibilities and scheduling of individual steps will gain in importance in the coming years. Companies can also look forward to integrating their existing software solutions more smoothly thanks to consistent interfaces and other standardizations.

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New releases from Steinbeis-Edition

Steinbeis-Edition publishes an array of reference works. Steinbeis-Edition's range of titles mirrors the scope of expertise found in the Steinbeis Network.

An Introduction to Commercial Biotechnology
Christoph Müller, Lars Dreesmann, Frank Mühlenbeck, Ralf Otto, Markus Werner

2nd completely revised edition 2007
ISBN 978-3-938062-46-3

Ethical qualms about stem cells, setbacks in gene therapy and genetically altered plants never lack media exposure. However, the fact that biotechnology opens up a fascinating world of helpful technologies, attractive markets and sensible products often goes unnoticed by laypeople. "An Introduction to Commercial Biotechnology" provides a clear, easy-to-read and easy-to-grasp synopsis of issues relevant to commercial biotechnology. It explains the fundamentals of natural science so that companies and their business models can be evaluated. Other chapters trace how the founding of biotechnology companies has developed and describe biotechnology's role in the chemical and pharmaceutical industries. Title only available in German („Einführung in die kommerzielle Biotechnologie").

**Look alive, town!
Resuscitating towns – Saving spaces**
Edited by Aktionsgruppe LEADER + and Ingenieurbüro Klärle

1st edition 2007
ISBN 978-3-938062-53-1

The town is dead. Long live the town! "Look alive, town! Resuscitating towns – Saving spaces" is a print collection of 18 town and development models in Germany's Hohenlohe-Tauber region. Experiences and findings gleaned from individual cases culminate in recommendations and strategies to help towns develop integrated, long-term strategies when planning for the years ahead. The publisher's engineering consultant, Dr. Martina Klärle, was honored in "365 Orte im Land der Ideen", a German nationwide competition. Title only available in German („Dorf Komm + Dörfer beleben – Flächen sparen").

Spontaneous pupil oscillation and its relation to the central nervous system's level of arousal
Barbara Wilhelm

1st edition 2007
ISBN 978-3-938062-34-0

In this publication, PD Dr. med. Barbara Wilhelm explores the basic physiological and neuroanatomical principles underlying spontaneous pupil oscillation when measuring daytime drowsiness. The findings presented are based on the author's habilitation thesis. Wilhelm thoroughly explains the method developed by her team to study this phenomenon and the resulting measurement procedure. The Pupillographic Sleepiness Test (PST) is already established in German sleep medicine and sleep research arenas. Its objectivity opens up new opportunities in clinical medicine and research. Title only available in German („Über die Spontanoszillationen der Pupille und ihre Beziehung zum zentralnervösen Aktivierungsniveau").

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Steinbeis

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