Steinbeis

TRANSFER

The Steinbeis magazine

Transfer – Success – Advantage

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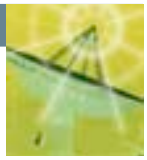
03|2008

Editorial



News

Editorial

Dear Readers,

the Steinbeis network plays an active role in transferring technological insight from universities and research institutes to trade and industry. Often, without the "Steinbeis concept", these cooperative efforts would never even have got off the ground.

Our aim is to minimize barriers to entry and provide professional project support and expertise exactly when it is needed as part of long-term relationships with satisfied business partners. Indeed, in business our long-term survival depends on our ability to maintain professional skills, and one our qualifications and competencies.

The Steinbeis transfer center for Applied Systems Analysis (STASA) and Steinbeis Angewandte Systemanalyse GmbH subscribe wholeheartedly to this philosophy. Applied systems analysis is a holistic, systematic approach to analyzing highly complex systems based on iterative feedback processes. It involves modeling systems as simply as possible and visualizing the results – in keeping with Albert Einstein's philosophy that, "Everything should be made as simple as possible, but not one bit simpler."

Modern systems analysis comprises activities such as data analysis, modeling, simulation, and optimization. It can be applied to almost all types of systems, from physics to biology, demographics, economics, geography, engineering, and IT.

As a member of the S4 European Network of Excellence (Spatial Simulation for Social Sciences), NECTAR (Network of European Communication and Transport Activities Research) and ERAN (European Regional Airports and Stakeholders Network), as well as our work on a large number of domestic and EU research programs, we have established an excellent position in the field of R&D.

In 2004 our STASA QC software, which was developed in house, won the doIT Software Award. This software makes it possible to optimize processes and predict manufacturing process quality online. Our goal is to exploit valuable developments from the cutting edge of research to provide customers with a head start in terms of technology know-how. Our clients gain tremendous benefit from the strengths of the Steinbeis network, as do we, the actual Steinbeis companies. How? By leveraging synergies and the solution-oriented way we work together – free from red tape.

This latest edition of Transfer, details a variety of transfer projects carried out by Steinbeis Enterprises. I draw tremendous satisfaction in knowing that these articles about the Steinbeis network might act as an inspiration to your projects in transferring specialist know-how.

Sincerely

Prof. Dr. habil. Günter Haag

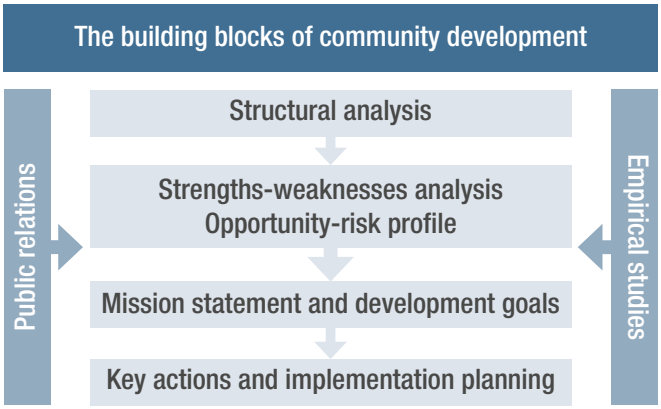
Günter Haag is managing director of the Stuttgart-based Steinbeis Angewandte Systemanalyse GmbH - STASA, one of around 750 companies in the Steinbeis network.

To find out more about STASA's involvement in the transformation of old military airports into regional airports, see the article on page 15.

Thinking beyond the trees in the Black Forest town of Bad Peterstal-Griesbach

It's worth thinking about the future, or you might not have one

Demographic change – and its influence on local communities and the population – are probably some of the most talked about social and political issues. Especially in rural communities, the effect of the declining and ageing population is already noticeable. It is these smaller communities that are having to put most thought into ways to safeguard the standard of living and housing. One such community, the Black Forest spa town of Bad Peterstal-Griesbach, has placed proactively shaping the process at the top of its agenda. Supporting it on this important undertaking is the Steinbeis Consulting Center for Regional and Urban Development.



The Bad Peterstal-Griesbach community development model

One of the key issues to be tackled by the team is which foundations need to be laid to safeguard the provision of key services in the decades to come: whether provided by private or public bodies, people need a social and physical infrastructure, not to mention retail outlets. The political will to start tackling the challenges of tomorrow – today – prompted the community in the Black Forest spa town to invite the Steinbeis consultants from Kaiserslautern to work up a community development concept. The Steinbeis consulting company specializes in regional and urban development issues as well as location consulting and "regional and location marketing". Everything they do is based closely on actual practice.

Two of the most pressing issues in the community at the moment are: the double-figured decline in population in percentage terms – partially caused by young people moving away for their education; the decline in the number of local jobs. The percentage of older inhabitants is already disproportionately high, and is set to keep rising. By contrast, local kindergartens and schools are bracing themselves for even lower attendance rates.

Basic supplies and everyday services such as buying groceries or going to the post office or bank are already in place today, but given the trend for retailers and service providers to gradually withdraw from peripheral areas with weaker infrastructures, how can the community ensure that there is still plenty of choice and variety in the future? The aim of the project, and the main task for the Steinbeis consultants is to provide pointers and development goals to help create a sustainable future for the Black Forest community – a type of template providing orientation and development guidance, across the board. Building on a structural analysis, which involved an evaluation of the current situation, the strengths and weakness of the community were mapped in key areas such as: population, housing trends, transport, economy, the employment market, education, social infrastructure, retailing, services, recreation, and tourism. The team then highlighted opportunities and threats facing the community in the future. By using empirical research techniques such as written surveys and interviews conducted by experts, the analysis also took into account the local population's opinions, wishes, and expectations, as well as those of key figures in the local community.

By the end of 2008, the Steinbeis consultants will present the community of Bad Peterstal-Griesbach with future strategies, specific measures tailored to the local situation, and actions for translating the strategies into practice. The key priorities will be aspects such as the population, housing, the economy, employment, tourism, the health system, the infrastructure, utilities and retailing. An action and implementation plan will provide the community with a template for future developments on the one hand and a platform for carrying out community projects on the other.

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Cardiovascular perfusionists undergo academic training at the SHB

Technology that gets your heart beating

Think about heart operations and most of us imagine people working in hospitals – heart surgeons, anesthetists, medical staff. The member of the team (or "cardiothoracic surgical team" as it is officially known) few of us have heard of is the cardiovascular perfusionist. Since April of this year, Steinbeis University Berlin has been providing perfusionists with special academic qualifications.

The number of tasks perfusionists have to perform has risen sharply in recent years. The role ranges from minimal invasive surgery using specialized technologies (navigation devices, telemanipulation) to cardiac support systems (artificial hearts) with the corresponding post-operative treatment of out-patients, processing of autologous blood, therapeutic treatment such as the detoxication of patients with liver disorders, caring for patients with implanted pace makers and defibrillators, and general hospital management tasks. With health companies coming under increasing pressure to cut costs and a plethora of often identical medical products offered by different companies, perfusionists need the qualifications to make informed and careful choices.

The perfusionist's job is sometimes compared, in terms of profile, to that of an air traffic controller. As well as making sure all apparatus fulfils technical requirements, perfusionists monitor physiological parameters while the heart-lung machine is running.

Especially when starting the heart-lung machine or reducing pump output at the end of an operation, the patient's circulatory and respiratory systems are tuned to extracorporeal circulation, balancing physiological and technical parameters which are set and controlled by the perfusionist. The slightest mistake in interpretation could be fatal. There is also very little time to make adjustments.

Standard training procedures are no longer sufficient to equip perfusionists with the right skills. Until now, perfusionists went on a two year training course at the Academy for Perfusion at the German Heart Institute Berlin, or DHZB. On an international level the profession requires at least a bachelors degree, with some countries stipulating a masters degree.

In cooperation with the German Heart Institute, Steinbeis University Berlin has been offering a bachelors of science degree in Cardiovascular Perfusion since April 2008. Graduates on the program are also given the opportunity to sit federal perfusion examinations for the state of Berlin and gain a parallel qualification. As a result, after two years' study they are in a position to embark on medical roles in Germany and other countries. Once they have completed their degree, graduates have the qualifications they need to work in hospitals and clinics worldwide, as well as the biomedical engineering industry.

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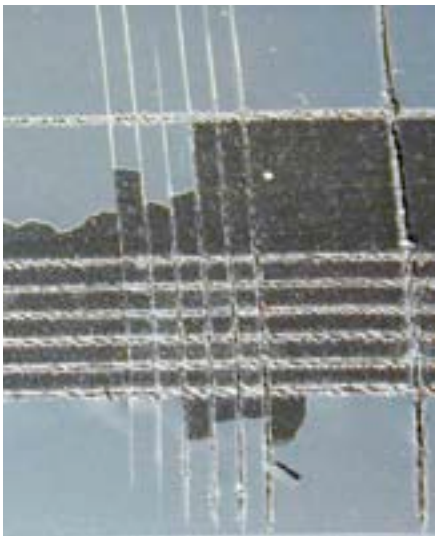
Steinbeis supports a company launch and product development

Painting polypropylene surfaces without pre-treatment

Paint developer Gerd Niemeyer is an expert in special coatings which adhere properly on polypropylene (PP) without any pre-treatment, as used to be required. You'll find lacquered polypropylene on parts like bumpers, side trims, plus a whole variety of components in car interiors, although it is also used on household items and consumer electronics as well as a host of other components. The key advantage with the new generation of coatings is that they cut the cost of adding finishes to polypropylene parts. The Steinbeis Transfer Center for Project Development has been working with the specialist paint developer since 2004.



Non pre-treated exterieur parts (PP-EPDM) painted with top coat as in serial production, **without** POLYSIL primer N1110. Cross-cut test according to EN ISO 2409, large sections of the coating came off.

Non pre-treated exterieur parts (PP-EPDM) painted with top coat as in serial production, **with** POLYSIL primer N1110. Cross-cut test EN ISO 2409 approved and climate test DIN 50017 approved.

The initial focus was on running pilot projects with new types of lacquers. This led to the founding of POLYSIL GmbH – a company partly owned by Steinbeis Beteiligungs-Holding GmbH. In the meantime, Autovision GmbH has also taken a shareholding in POLYSIL, giving the wholly owned VW subsidiary access to the technology of POLYSIL.

Later in the project, the Stuttgart-based Steinbeis Transfer Center for Project Development pinpointed potential customers for pilot projects involving the lacquering of polypropylene components, before guiding them through testing and documenting the results. At first, the focus lay on customers from the automotive sector, as this is a very clear area of the market. The Steinbeis Transfer Center also put these customers in touch with Volkswagen in Wolfsburg, where the necessary testing was carried out on POLYSIL coatings in VW's central laboratory.

After a series of meetings with companies it became clear that this new technology could also help cut costs or improve product performance in other areas. Applications included:

- Coating of expanded polypropylene (EPP)
- Improving adhesion between PU foam and PP
- Improving adhesion in PP to be veneered
- Coating of PP films
- Clear coating of colored PP parts
- Printing PP surfaces
- Coating of PP furniture surfaces
- Coating of cosmetic packaging
- Printing materials for subsequent water transfer printing

POLYSIL was founded at the end of 2005 on the "Innovation Campus" in Wolfsburg. Even at this early stage, Steinbeis had a shareholding in POLYSIL GmbH, underpinning the company's potential as an innovator and lending it extra weight in dealing with other investors. Finally, in March 2008 Autovision GmbH became a shareholder in the young company.

In the meantime, the Steinbeis Transfer Center for Project Development is working on a global sales strategy for POLYSIL, establishing contacts with customers and partners. The aim in building up a sales network for POLYSIL is to keep things simple, so the focus in international sales is on partnerships and licensing. A licensee has already been found for South America. The team is currently actively seeking more sales partners for states in eastern Europe and other industrialized countries. Here, too, when looking for partners in specific countries, Steinbeis's global network really comes into its own.

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Service quality in IP Management

Securing success, with norms!

In markets driven by innovation, without question intellectual property such as patents, trademarks, and registered designs are pivotal to business success. The systematic process of creating, implementing and exploiting "intellectual property" (IP) is now encapsulated in the term "IP Management". In most companies it features more and more in the innovation process. Despite this, there is no standard for assessing the quality of IP Management services. Steinbeis Transfer Institute for Intellectual Property Management set about changing this – with DIN, the German Institute for Standardization.

Photo: photocase.com/dot.ti

As well as performing an important role in economic terms, IP Management has led to the development of a broad spectrum of services designed to help companies reap the benefits of IP. On the one hand, these services provide companies with innovative options for leveraging IP and holding their competitive ground. On the other, they provide business with specialist support which, without them, would mostly be unavailable in-house, or at least not available to a sufficient degree. Small and medium-sized enterprises (SMEs) in particular are heavily dependent on quality services to exploit the full potential of IP. Unfortunately, the services they need to do this differ greatly in terms of format and quality, not only in Germany but also the rest of the world.

The problems customers have judging quality – as well as the problems providers have communicating quality – are of course not restricted to services. In fact it is an issue prevalent in all sectors of industry. So we have standards or norms. According to an estimate made by the US Congress in 2005, some 80% or 7.3 billion dollars of global trade is directly affected by norms and similar specifications.

The Steinbeis Transfer Institute for Intellectual Property Management at Steinbeis University in Berlin has embarked on a project with DIN with the aim of creating a standard for the quality of services in IP Management. The project is being funded by the Federal

Ministry of Economics and Technology as part of an initiative called "Innovations with Norms and Standards" (INS). The aim of the initiative is to create a "Publicly Available Specification" (PAS) in partnership with companies and service providers. This would then provide a quick and practical starting point for a DIN standard to act as a guideline for IP Management services. To achieve its aims by the completion date in 2009 and the date of the PAS publication, a working group will be set up with companies, customers and providers involved in IP Management services. The Steinbeis Transfer Institute is responsible for managing the content and format of the PAS.

The PAS concept has already proven its worth on a previous project run by the Steinbeis Transfer Institute and DIN. PAS1070, which laid the "General Principles of proper patent valuation" received a warm welcome from industry. In fact the project was so successful that the results were presented by Professor Alexander Wurzer, Head of the Steinbeis Transfer Institute, during the G8 summit in Heiligendamm. It is currently undergoing fine-tuning for a possible development into a worldwide ISO standard.

This innovative approach towards standardizing service quality is designed to capture the different types of IP Management services, the quality benchmarks to be used, the skills and knowledge the providers of the solution should possess, and the processes they should follow. As well as providing the effective means to foster the commercial success of companies, this will add impetus to the German and international market for IP Management services. Especially in SMEs, marrying IP Management services to the company's innovation processes defined specific service methods and aims for the PAS.

In the early stages of innovation processes in research and development, this basically encompasses the provision and utilization of technical information, whereby patent information is the most valuable, core source of information. Patent information-based research and analysis services are a key success factor in innovation, especially if they help reduce development times and costs, and avoid problems such as unnecessary parallel developments.

During the later stages of the innovation process, when technology exploitation and market launch become the main priority, the key task is to safeguard the returns on the innovation and provide support in the form of services for selecting and combining IP. At this point methods and options for transferring technology play an increasingly important role for individual companies as well as the business as a whole, necessitating licensing and trading platform services, as well as implementing and defending protective rights. Another important part of IP Management services relates to the design, creation, and management of IP portfolios with respect to the competition, technology and market trends.

For all types of services, the better the quality of the service and service provision, the more likely the company benefiting from the service is to translate its knowledge into a commercial success. The way services currently stand, they are not captured systematically enough, let alone standardized. One reason for this is that there are so many different service providers operating in different areas and disciplines. In the IP Management field, there are patent agents for drafting and enforcing property rights. Then there are innovation intermediaries such as the Steinbeis network and consultants specializing in jurisprudence, business and technology. This heterogeneity creates major differences and problems with the quality of IP Management services. Interdisciplinary training programs such as the CEIPI's "Master of IP Law and Management" and "Intellectual Property Management" run by Strasbourg University in partnership with the Steinbeis Transfer Institute for Intellectual Property Management are just one way to meet these multidisciplinary quality requirements.

The aim of the joint project with DIN is therefore to capture quality standards for a variety of IP Management services in the innovation process, and to lay down appropriate quality benchmarks and assessment criteria for service providers and customers of such services. Further, it will be necessary to define quality requirements and measures for safeguarding the quality of services and procedures. Another aim of the project is to use the PAS as the basis of a proposed standard which should subsequently be adopted as a DIN standard, or ultimately become a standard applicable on an international level (CEN and ISO).

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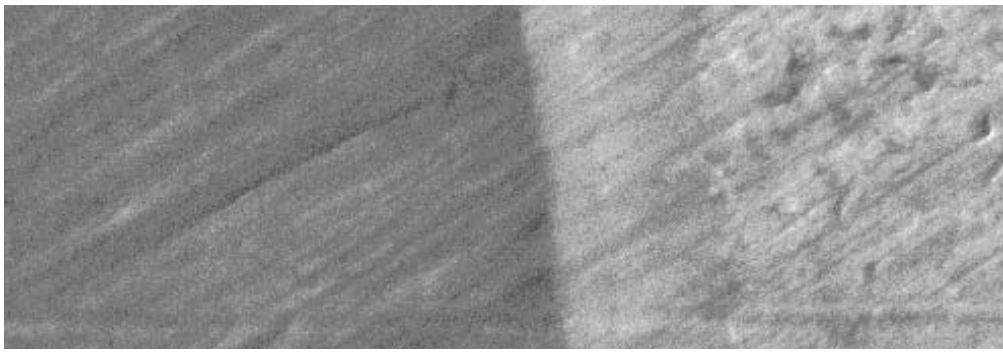
Investigating and proving bonding processes

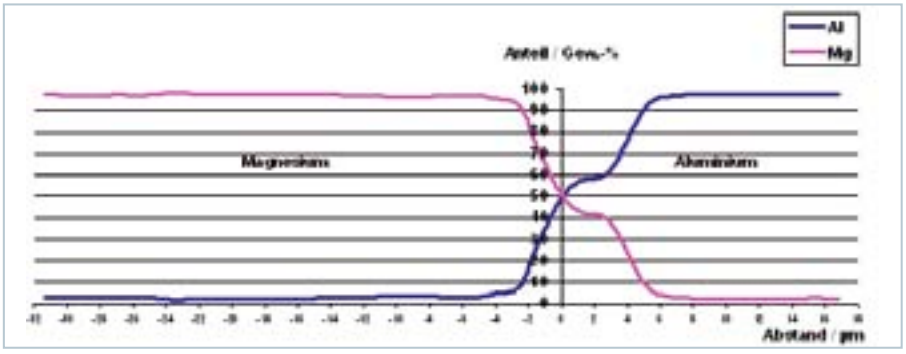
Diffusion in aluminum/magnesium composites

As part of a special research project examining "high strength aluminum-based lightweight materials for safety components", the Chemnitz-based Fraunhofer Institute for Machine Tools and Forming Technology (IWU) has been looking at the production of aluminum-magnesium composites using incremental reforming processes. Supporting it on this project is the Steinbeis Transfer Center for Industrial Surface Engineering, which is responsible for producing oxide-free surface specimens, developing layer systems (mediator layers), and evaluating test samples using optical and electron microscopes.

In the automotive industry, aluminum/magnesium composite materials have every potential to open up new areas of application. For years, one of the car companies' biggest aims has been to slash exhaust emissions while at the same time reduce fuel consumption. One highly effective way of achieving this is to drastically reduce vehicle weight by using alternative materials with similar properties but a lower mass. For example, magnesium has a higher strength-to-weight ratio than steel. Also, it is more rigid than aluminum and is excellent for machining. As a result, magnesium compounds are particularly well suited to lightweight constructions. The only problem until now has been the relatively low levels of corrosion stability, meaning that their use in automotive construction remained fairly limited.



Electron-microscope image of the diffusion area at 4000 times magnification



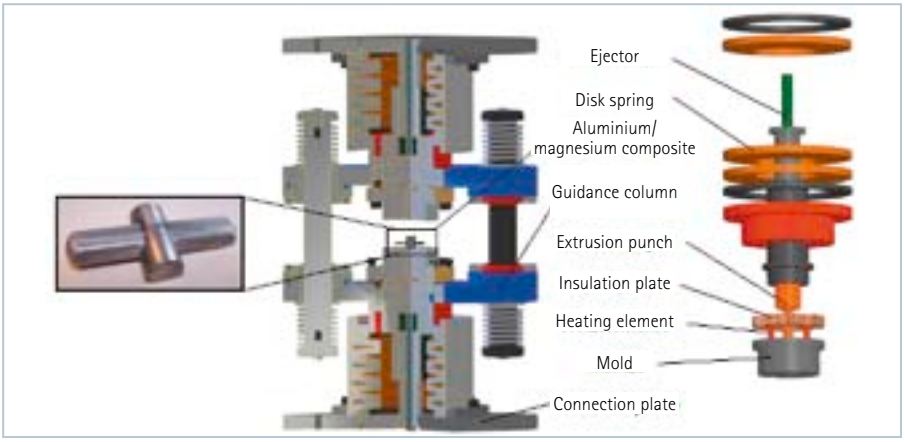
EDX point analysis measuring the percentage by mass of Al/Mg in a diffusion zone approximately 8 µm in width

Of course, one way to protect materials from the onslaught of corrosion is to use corrosion-resistant metallic layering. The advantage of this approach over varnish or plastic layers lies in the higher mechanical resistance. Two or multi-layer compounds, which, depending on requirements, can be several millimeters thick, can only be made using mechanical processes. The best known machine-based processes are roll or explosion cladding, but there is also extrusion, or extrusion molding. Compared to layering techniques in which the intended change in material properties or functional characteristics is restricted to the area near the surface, these approaches make it possible to produce semi-finished cross sections with optimized structures. According to recent investigations into compound extrusion, metallic bonding is possible between aluminum (face-centered cubic crystal system) and magnesium (hexagonal close-packed system), despite the different lattice structures. Under certain conditions, it was known that a distinct diffusion zone could be created between a wrought magnesium alloy (AZ31) and a standard aluminum alloy (6060). The microstructure of the resulting join was examined using a standard optical microscope. Nearly all samples contained fissures and a porous area near the boundary. How these came about was not examined further. A firmly-bonded, sufficiently strong join can only be expected if there is free flow of matter beyond phase boundaries between the two materials. As well as the chemical requirements, the following factors are also decisive for the initiation of a solid state reaction: "near-ideal" contact between the reactants, a high degree of disorder in the lattice structures, and the addition of energy ("activation energy"). As such, for this bonding to occur it is necessary to control the parameters which allow maximum enlargement of the boundary area under high standard stress levels. Another decisive aspect is the temperature at which the reforming occurs. As well as dictating the flow

properties of each bonding element, it provides the energy needed to activate the flow of matter.

We know from literature that the chemical requirements for diffusion in the solid state are fulfilled in the case of an Al/Mg pairing. Generally, it is only possible for matter to move beyond phase boundaries if the system involves single-line mixed crystals. Apart from this fundamental prerequisite, the diffusion process is influenced by a string of external factors, which must be quantified to be able to control the bonding mechanism as desired. Progress is made when process-specific parameters fields can be successfully replaced by differentiated quantitative models. The biggest advantage over the commonly used process-oriented view is that the knowledge gained can be applied generally. Such approaches require a differentiated description of the local factors in the boundary layer using measurable parameters. The relevant variables for the bonding process were identified based on its phenomenological description in the literature. A pilot experiment was used to verify the parameter field determined in this way.

The best way to do this appeared to be to an analogy experiment based on lateral extrusion experimentation, allowing for a wide range of relevant parameters. Samples of the material combinations to be investigated (diameter size 20 by 45) were put through the die in a hot state. The surface areas were compressed onto each other under high pressure, and during the whole extrusion process, they had to stay within the separation layers of the die. Deviations can arise due to major differences in flow stress or differences in the tribological properties of the materials being investigated. To keep samples at the right temperature, the die had heat-controlled matrices. The applied extrusion pressure, which depended on the molding direction, was tracked with an integrated force-displacement measurement device. The functional interdependence between influencing factors directly affecting the formation of the compound and parameters defined as part of the experiment could then only partly be ascertained through analysis. The temperature and stress distribution in the boundary area under defined marginal conditions were pinpointed using a finite element method simulation.



Experiment setup for controlling contact conditions in the creation of composites – analogy experiment with AZ 31/Al 99.5 at ϑ = 450 °C

Metallographical sections traversing the join area between the two materials were cut from the extruded samples. In certain areas, even under optical examination at the highest possible magnification (1000x) no joint could be seen in the zone between each substrate. Using an electron microscope at 4000 times magnification, a join measuring around 5 µm could be seen between the two materials. The parts had been completely joined in this area due to the compression. To prove that diffusion had occurred, energy-dispersive X-ray spectroscopy (EDX point analysis) was used along the line of separation between the two materials. The center of the zone was set as zero. The measurement was started in the magnesium around 30 µm from the center, and ended in the aluminum around 17 µm from the center of the zone. This made it possible to prove that the border layer – which was about 8 µm thick – contained both magnesium and aluminum. Another observation which made sense was that compared to the magnesium, the diffusion layer in the aluminum was thicker, due to its lower atomic mass.

Further experiments are now planned to examine the influence of the main process parameters on the quality of the compound – such as the surface preparation of the bonding materials, and the pressure, temperature and speed of extrusion.

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Aicher Präzisionstechnik GmbH: discovering unused potential

Material Efficiency Center makes its mark in Berlin

The Steinbeis Transfer Center Material Efficiency Center (MEZ) in Gosheim has successfully supervised 16 projects to improve the material efficiency value chain in the Lake Constance, Black Forest, Neckar-Alb-Danube and Upper Swabia areas. The Gosheim consultants have been awarded one of the largest ever sponsorship programs from the German Federal Ministry of Economics and Technology.

Franziska Aicher, Aicher GmbH, Walter K. Staiger, MEZ, Mario Schneider, demea, Christoph Seyfried, MEZ, Harald Bader, HBi Robotics GmbH (from left to right) Photo: A. Villing/AVi MedienDialog

The center's projects focus on product, technique and process improvement. Set up over the last two years, they received a positive reception from the German Material Efficiency Agency ("Deutsche Materialeffizienzagentur" or demea) in Berlin. Agency manager Mario Schneider inspected how the projects were put into practice in two different firms. At Aicher Präzisionstechnik GmbH in Königsheim, the local demea-accredited consultants showed the agency some of the measures from the potentials analysis which had been successfully implemented so far. Aicher, a medium-sized automotive supplier of machine-cut precision components, has been optimizing its internal materials flow and plant structure since February 2007 using the sponsorship program "Improving material efficiency" ("Verbesserung der Materialeffizienz" or Ver-Mat).

During a company tour, commercial manager Franziska Aicher told the impressed head of demea about Aicher's accomplishments since establishing an improved production and process chain. With technical help from the MEZ consultants, they were able to inspect the company production flows quickly and precisely for potential sources of error and loss, and rearrange them where necessary. Franziska Aicher says that as well as the savings this achieved, Aicher was also able to improve its core skill – machining.

The company, which has 124 employees, has used VerMat to perform a potentials analysis, as well as run two follow-up projects for implementing the process and product improvements deemed necessary. With the program set to continue until the end of 2008, managers are already wondering whether to expand the process optimization in further projects.

"The Federal Ministry of Economics and Technology is keen to foster small and medium-sized businesses, and support their global competitiveness via development programs which can be implemented quickly", says Mario Schneider, head of demea, who wants to encourage others to use material efficiency and value chain analysis, e.g. individual projects focusing on anything from optimizing set-up times to reducing complaints or using automated fault finding in production. Subsidies of up to 99,000 Euro are offered for potential analyses and feasibility studies, and supervising the implementation of results.

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Online marketplace from ZEIT Online and Marc Drüner, Professor at Steinbeis University Berlin

Where companies and students meet

ZEIT Online and Marc Drüner, Professor for Marketing and Innovation Management at the School of Management and Innovation (SMI) at Steinbeis University Berlin, have launched the online platform 15Talents.com as part of a joint venture. 15Talents is a project marketplace for companies and students: it allows companies to outsource projects to students, simply and flexibly, and so profit from the extensive knowledge and skills they have gained through college, practical placements and extracurricular activities.

As such, 15Talents provides a service not yet available in the German market. Although there are already a few online project marketplaces for freelancers and trades people, for instance, cooperation between companies and students has previously been limited to established forms such as diploma projects and practical placements. "15Talents has discovered an exciting and highly promising niche," says Marc Drüner. "Students can use 15Talents to gain work experience and put their skills and knowledge into practice. While companies benefit in terms of short-term projects, and they are also able to use it to recruit."

Using 15Talents, companies can save a considerable amount of time and resources when establishing project partners. Instead of having to prepare several weeks or months in advance, companies can place a project on the platform practically as soon as the need arises, and students with the appropriate knowledge and skills respond within a few days. 15Talents is therefore a particularly valuable alternative when it comes to short-notice tasks for which there are no resources available in the company.

Once the company has published a project on 15Talents, specifying the amount of work required and the financial reward, an innovative matching algorithm finds students whose skills and abilities best match those required for the project. From this initial selection, the company can choose one or more suitable students to work on the project – only a few days after having first entered it on the platform. 15Talents also allows companies to establish early contacts with students from all subject areas, which may even become long-term, as the case may be.

For 15Talents, the quality of the online platform is of central importance in meeting the high demands of companies and students. This is why not just anyone can register to use it. Students can only obtain access to the online marketplace if invited by an existing member, if they apply to register on the website, or via one of the exclusive invitation codes handed out by 15Talents through certain student initiatives and study courses. Since it launched in May, more than 8000 students and over 90 companies have registered.

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Interview with Dr. Rainer Esser, managing director of ZEIT, and Marc Drüner

"Gain practical experience and earn your rent money"

Companies and students can both profit from the online marketplace 15Talents.com – so say Dr. Rainer Esser, managing director of the ZEIT publishing house, and Marc Drüner, professor at the Steinbeis University Berlin. TRANSFER discusses the new platform with its creators.

Dr. Esser, why is ZEIT Online involved in 15Talents?

We liked the idea right from the start – it's excellent, very forward-looking, and we think it fills an interesting niche in the market. It's currently the only online marketplace allowing company projects to be completed by students. We're particularly interested in students with above-average levels of commitment and talent, which is why 15Talents fits in wonderfully with our existing activities in the university market: we've been publishing the student magazine ZEIT CAMPUS every two months since 2006, and it also has daily reports online. As well as our activities in print, we've expanded our university events in recent years, to include things like panel discussions offering careers advice, political debates, and entertaining talks with prominent figures.

Professor Drüner, what benefits can 15Talents offer companies and students?

Students can use 15Talents to gain valuable practical experience, and earn money to pay their rent at the same time. Companies can make use of students' skills on a flexible, short-term basis. On top of this, it's also a good way for both sides to get to know each other, and ask questions like "Is this student suitable for an entry position?" or "Is this company an interesting employer?"

Dr. Esser, why are students so important to you?

Students have always been an important target group for us. Traditionally, DIE ZEIT has a strong standing in universities. We want students to start reading DIE ZEIT at university and stay with us after graduating.

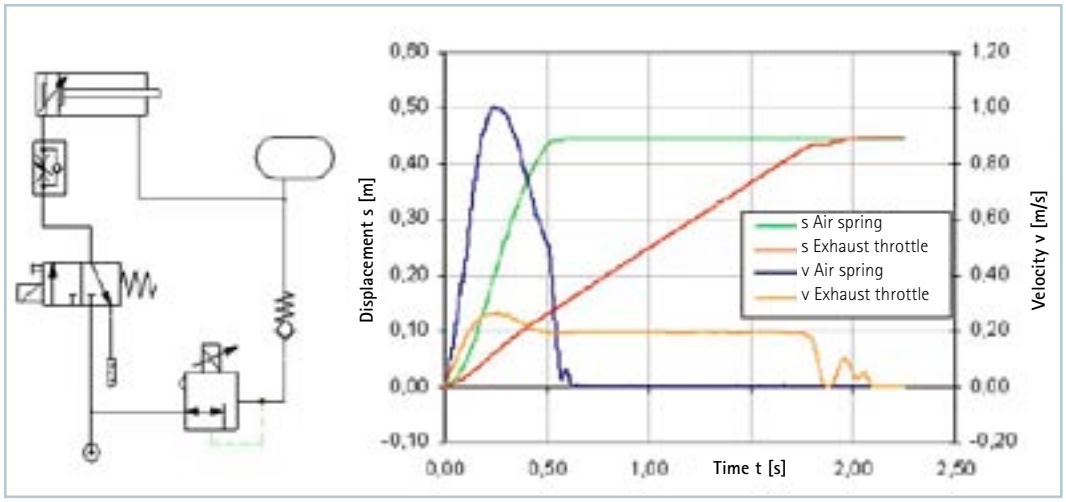
Professor Drüner, is 15Talents directed towards students studying particular subjects?

No. We're interested in students of all subjects. It's all about what the companies require – and they're usually looking for highly specialized students. The reactions we've had so far from companies as well as students have shown us that our approach is the right one.

"Air spring" shortens travel time and reduces compressed air consumption

Improving the dynamic behavior of pneumatic actuators

In a development project sponsored by the German Federation of Industrial Research Associations, the Steinbeis Research Institute Processing Machines and Systems has been working to significantly improve the dynamic behavior of working cylinders and reduce travel time. This can be achieved by using the energy of the discharged air via a reserve, to dampen the cylinder in its final position.



Comparison of conventional actuator and air spring

Conventionally, pneumatic actuators are operated according to the principle of exhaust throttling, and using open-loop control of the final position. With this method, after a short acceleration phase, a constant speed is established at which the actuator reaches its final position. The residual kinetic energy is dampened using standard methods such as hydraulic dampers, pneumatic final position dampers and elastomer cushions. This final damping often results in the formation of a large dynamic load on the system, which can destroy it. The problem can be counteracted by reducing the actuator speed, although this leads to a huge increase in travel times.

The disadvantages of insufficient dynamics are particularly evident at large stroke lengths and high effective loads. In such instances, a sufficient cycle time cannot be reached, despite high dynamic loads. If the final position brake and the external throttle check valve are ideally set, the cylinder reaches its final position after approximately 1.72 seconds. The speed of travel reaches a maximum value of approximately 0.25 m/s and remains roughly constant over two-thirds of the stroke.

In the "air spring" system, developed by the Chemnitz-based Steinbeis Research Institute together with Dr.-Ing. Eberhard Zipplies from the Chemnitz University of Technology for a medium-sized firm in Saxony, the discharged air space of the working cylinder is connected to a pre-stressed pressure reserve. The air mass expelled by the piston flows into the reserve and increases the reserve pressure in proportion to the displacement. The resultant increase in the pressure of the discharged air acts in opposition to the actuator motion and noticeably brakes the actuator before it has reached its final position. Compared to the exhaust throttling method, the actuator dynamics can therefore be significantly increased for both directions of travel. However, the "air spring" system can also be operated so that the pneumatic energy of the compressed air in the reserve is used to perform an exhaust-throttled return stroke. This also leads to a significant reduction in compressed air consumption.

Compared to conventional actuators, the cylinder reaches its final position much sooner in the new system, and its maximum speed of travel increases to approximately 1 m/s. This transmission method significantly improves actuator dynamics and reduces cycle times. This development means pneumatic actuators can be used in more situations, as well as increasing the allowable effective dynamic load. As a side effect, compressed air consumption can be lowered by up to 50 percent for unilateral transmission.

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Project to increase the competitiveness of regional airports

Regional Airports Interaction for Regional Development

Since the fall of the "Iron Curtain" in 1990, the conversion of former military airports into civil airports has become a hot topic. In many largely isolated regions, a well-functioning regional airport is an important factor which can substantially improve economic, social and territorial cohesion in the long term. Encouraging sustainable economic development and improving competitiveness are some of the objectives of the INTERREG IIIB CADSES program.

The RAIRDev (Regional Airports Interaction for Regional Development) project forms part of the INTERREG IIIB CADSES Transnational Cooperation Program, which is partly financed by the European Union. RAIRDev's main goal is to boost the economic development and competitiveness of regional airports and the regions they serve, by better integrating them into an efficient, integrated multimodal transport system. This is done in cooperation with all decision makers in air transport, transport planning and regional development.

The ERAN network (Regional Airports and Stakeholders Network) was founded in July 2008, and continued and grew once the project period ended. It has enabled the transfer of knowledge and exchange of experience between airport operators and regional representatives, as well as interested parties from the regional economy and other involved parties. The ERAN network can already point to initial successes.

Over the past two years, the Steinbeis Transfer Center Applied Systems Analysis (STASA), together with partners from eight European countries, has been investigating issues regarding the local economic impact of regional airports as part of the RAIRDev project, including:

- What effect does a regional airport have on the economic performance of a region, and how can this be evaluated?
- How many jobs and investments are directly or indirectly linked to the airport?
- What can be learned from the development and experiences of individual regional airports so far, and applied to the development of other airports?
- How can regional airports be better linked to one another to improve synergistic effects?
- What effect do accessibility and other factors have on the growth of passenger and cargo volume?

Quantitative answers to these questions can only be obtained using a mixed methodology developed by STASA. In each participating country, a regional airport is singled out and evaluated, and suggestions for improved regional integration and sustainable regional development are compiled. As well as the usual literature review, the evaluation of the airport's impact also includes identifying appropriate indicators which can be used to measure the regional economic effects, combined with a classic statistical analysis over time. In addition to this, a shift-share analysis developed and adapted by STASA for identifying regional effects was implemented. In the case of Karlsruhe/Baden-Baden airport, newer statistical analysis methods were applied to assess small-scale effects along with their regional correlations. Interviews with experts also formed part of the evaluation.

The German case study included an evaluation of the economic impact of Karlsruhe/Baden-Baden airport as a location factor, with respect to creating new jobs, attracting new companies and residents to the surrounding area, and increasing tourism. The results of the evaluations supported the theory that regional airports have a positive effect on the economic growth of their local area, and lead to improved economic, social and territorial cohesion.

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Starting point of the virtual maintenance scenario in SecondLife

2D and 3D hybrid platforms for electronic business

Virtual machine maintenance

Mechanical engineers and plant construction firms are forced to devote a considerable portion of their people and practical resources to servicing and maintaining customer equipment. 2D and 3D hybrid platforms can significantly reduce this expenditure, as in the future, machines will be able to report and display their maintenance needs in a virtual 3D space – and even order replacement parts themselves if necessary. This allows next-generation systems for electronic business to be developed, which take care of today's 2D business using future scenarios of 3D processes.

As part of a pilot project, the Steinbeis Consulting Center Electronic Business (SBZ-EB) proved that this vision can become a reality. Working together with businessMart AG and GfIM mbH, a sample scenario was set up in a virtual 3D environment and implemented live in the online virtual world SecondLife. SecondLife was used to generally represent 2D and 3D hybrid platforms which support integrated electronic business (in its standard form, based on a full integration of online shopping systems and ERP systems) and can translate virtual 3D worlds into real business processes.

The aim of the pilot project was to work through a typical maintenance situation for many German toolmakers. To do this, a virtual stamping press with a built-in tool was created. It receives status and error signals from the real-world machine and displays them in the virtual world. If an error occurs, such as a stamp breaking inside the machine, then the virtual stamping press contacts a shop system to order a replacement. For this, the electronic shop system has to be directly integrated into the ERP system of the supplier/manufacturer. After checking the availability and price, the required replacement part can then be ordered by an employee or by the virtual stamping press itself. As such, the "self-maintenance" of the stamping machine can enormously reduce the level of maintenance effort needed. Small and medium-sized toolmakers and engineering firms which do not have a maintenance service in some countries can save significant costs and time by using this self-diagnosis and error display system. The maintenance can also be performed by less qualified service personnel, as a service technician from the main office can meet the on-site service technician in the virtual world. They can look at the virtual machine and discuss the errors and how to install replacement parts. This also means that a machine can be visually monitored in the virtual world from anywhere on the planet.

The pilot project shows that using 2D and 3D hybrid platforms can significantly optimize maintenance processes in the area of electronic business. As well as the example used here, there are many other conceivable uses for the hybrid platforms, such as direct training of service staff using the virtual machine, or setting up complete virtual supply chains.

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Degree course in Education Management at Steinbeis University

New leaders in education

Good education requires strong management and communication skills. Any experienced mother will tell you this. Despite this, jobs in education have been relegated to the sidelines for decades, and receive little public recognition. Studies such as PISA have dramatically shown that the quality of early childhood education and youth services needs to be enormously improved. At the Institute for Education Management IfPM, part of the Steinbeis University Berlin, experienced teachers can take degree courses alongside their jobs, even without a university entrance qualification. The scheme is sponsored by the financial investor Permira.

For more than 250,000 teachers working in Germany, classical university courses in education are not a viable way to enhance skills. Lacking a university entrance qualification and the inability to attend full-time study courses due to economic dependence on their job can be an insurmountable hurdle. This is made even more serious by the fact that according to the German Youth Institute, they are the occupational group most interested in further education.

"Educators need prospects. They need the chance to develop and study, which is why we need new ways of learning – parallel with employment – such as those offered by the IfPM."

Dr. Annette Schavan, Federal Minister for Education and Research, Patron of the IfPM

Photo: photocase.com © Tommy Windecker

The Off Road Kids foundation, a youth services organisation that works with street children nationwide, wanted a practical way to give experienced teachers access to higher education and help them transition to leadership positions. It has teamed up with the Institute for Education Management IfPM at the Steinbeis University Berlin to offer a part-time bachelor's degree program in Education Management. From now on, students can earn the nationally and internationally recognised Bachelor of Business Administration (BBA) degree alongside their job in only three years, without the need for a traditional university entrance qualification. Affordable and family-friendly, the program is geared towards students from all areas of education and social services, including managers and employees.

The Education Management degree program teaches basic skills in educational science, including areas such as communicating in education, managing teaching and learning processes, and coaching different types of groups. In addition, the different modules also prepare students for leadership and management tasks in educational facilities. To do their jobs properly, employees in institutions such as kindergartens or youth services facilities need to master the basics of finance, management and communication - skills which are just as important as knowing how to teach.

Students also receive a solid grounding in economics to help them develop a strong sense of how business works. Modules in business management, company organization, social entrepreneurship and other related aspects help lay further groundwork, ensuring graduates of the program can successfully apply their management skills in educational facilities.

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Plan your day more efficiently

"Time management" and self-management in industry

The world's economy grows more global every day. Demands for increased productivity are on the rise – again. Individuals take on more and more responsibility. With circumstances like these, employees and managers have to budget their time more efficiently than ever. To answer this challenge, the firm ND SatCom GmbH is offering its employees and managers training in time and self-management. The aim: to teach them how to make the best use of time.

Photo: photocase.com © Venture

"Stress" has become a buzzword. These days, it's easy think that if you're not stressed, you're obviously not busy enough. Stress can cause illness, professional and personal problems, disrupt your work-life balance and lower your quality of life. Before you know it, you're not living any more - you're existing.

ND SatCom, the world's leading provider of satellite-based broadband VSAT, broadcast and military communications networks, turned to the Winnenden Steinbeis Transfer Center Advisory Services for Small and Medium-Sized Businesses for two reasons. First: to prevent stress from developing in

the workplace. Second: appealing development programs always spark interest among managers and employees with their own non-monetary rewards. The Center developed a tailor-made, in-house workshop on "time management" and self-management lasting two days.

The first step was to help the training participants pin down their short-term, mid-term and long-term professional and personal goals. The focus here was on actually doing the right things, not just thinking about the most efficient way of doing them. The next step was a personal activity analysis, where participants pinpointed their personal "areas for improvement" so that they could make the right changes in the right places. Participants had to ask themselves what they used their time for and how they performed tasks.

We often have a false impression of how we use our time each day. Critical self-reflection is an important tool in combating stress and helps us see the situation more clearly. After noting all "time-wasters" and disruptive factors, participants dealt with or discussed the major ones. They assigned priorities to tasks using a so-called ABC analysis. This differentiates between A-tasks (very important), B-tasks (important) and C-tasks (unimportant). The Eisenhower principle was also introduced during the training – this goes a step further and divides tasks into four groups according to their importance and urgency:

- Important, urgent tasks are tackled immediately.
- Important, non-urgent tasks are scheduled to be performed.
- Unimportant, urgent tasks are delegated to someone else.
- Unimportant, non-urgent tasks are discarded.

The next step was all about planning. The participants received weekly and daily schedules. These helped them to learn to keep their desks and noticeboards free of endless post-it notes. The schedules also doubled as overviews of pending tasks, and participants could even prioritize what they had to do. Various calendar and planning systems for drawing up a daily plan were recommended, along with the ALPEN method. The workshop also covered the importance of biorhythms – these differ from person to person and determine your individual performance curve throughout the day.

The participants were asked to think about their decisions – were they made always on time or were they late? Correctly timing decisions is an important skill. Workshop participants learned to make a decision after gathering all the facts they could.

Another aspect of the training explored "delegation as a management task". If you're going to actually save time – not squander it – by delegating, you have to ask some thought-provoking questions first:

- What am I delegating?
- Why am I delegating it?
- Who should do it?
- How should they do it?
- When should they do it?

A common problem in day-to-day business is the inability to say no. This may be due to a desire to help, or a lack of courage. If they say no, people are often afraid that colleagues will label them as stubborn and egocentric. To counter this reaction, workshop participants learned how to say no and stand their ground. It needs to be said, however, that "no" is a judgement call. You have to weigh that action against your own situation, your own goals, the priority of what you have to do and the time you have to do it in.

This workshop gave employees and managers of ND SatCom the time and self-management the skills they need to plan their days and weeks more efficiently, avoid stress, and maintain a healthy work-life balance.

The German **ALPEN method** is based on five steps:

- Write out tasks, activities and deadlines
- Estimate time of activities
- Build in buffer times
- Make decisions
- Perform final checks

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New development for characterizing metal-filled plastic composites

Non-destructive inspection method

Plastic are an indispensable part of daily life. After having replaced other materials in less complex areas, they are increasingly being filled with fibers and employed for more complex purposes, in the aerospace industry and in automotive or civil engineering. One disadvantage of these composites, however, is their low or non-existent electrical conductivity.

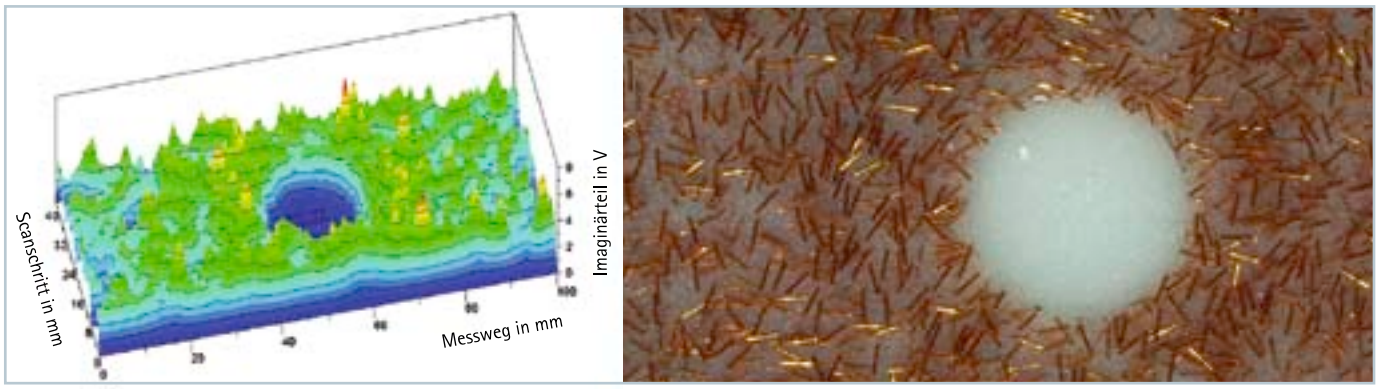

Diagram: Three-dimensional depiction of misaligned and agglomerated fibers in a fiber composite

The electrical properties of plastic composites can be significantly improved by using extrinsically conductive plastics. To obtain high functionality when using fiber-filled plastics commercially, it's helpful to not only know the manufacturing process, but also the fiber content, as well as the local and planar distribution and the alignment of the fibers. The inspection methods currently used for composite materials, such as thermography, x-ray and ultrasound, are highly elaborate and difficult to automate.

As part of a research project sponsored by the German Federation of Industrial Research Associations, the company imq-Ingenieurbetrieb für Materialprüfung, Qualitätssicherung und Schweißtechnik GmbH and the Steinbeis Innovation Center Application-oriented Material-, Production-, and Process-Technology have developed a new non-destructive inspection method using eddy current for characterizing metal-filled plastic composites.

This method measures the effect of the eddy current induced in the material on the test sensor. The plastics filled with metallic fibers cause a change in the eddy current which creates a signal consisting of displacement currents and conduction currents from in and between the fibers. Whereas the conduction currents depend on the fibers themselves as well as their volume and contact to each other, the displacement currents are determined by the dielectric properties of the plastic matrix, as well as the diameter and length of the fibers and distance between them. The displacement currents are seen as capacitive components in the measuring signal.

During the experiment, researchers analysed how measurable these effects are and what information can be derived from them. Initial results showed that this testing method makes it possible to determine the fiber content of a composite, as well as the local and planar distribution and alignment of fibers in long fiber composites. More extensive investigations are currently underway. As a result, it is now possible to detect metal fibers in plastics and even locate metal structures. This is particularly useful in the case of non-visible components, which result in conditional positioning, and for hybrid structures and mixed structures with metal areas such as inserts and load transmission elements.

The eddy current method can be successfully used on composites to non-destructively determine their material properties or find irregularities. It can be easily automated and is suitable for use alongside the manufacturing process. When combined with analysis of carbon fiber reinforced plastics, the eddy current method is incredibly convenient in investigating and characterizing plastic composites.

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University certificates for professional employee development

The "certified by Steinbeis University" seal

Stressing over exams in Sindelfingen: after several months of professional development, seven employees are taking their final tests to earn certification as Lean Management specialists. Candidates must demonstrate what they've learned in a written exam paper as well as present the projects they completed. But can you combine theory with practice? Are the savings realistic? Can the board of examiners give every participant the green light when it comes to certification? The Steinbeis University Berlin certificate vouches for each graduate's excellent soft skills and high level of expertise – and is a pillar to build a career on.

The Institute for Business Excellence at Steinbeis University Berlin has been working with high-profile companies for a number of years. Working with key people within every company, the Institute develops the in-house employee development curriculum, draws up examination and certification regulations, and co-chairs the board of examiners with company experts. It also performs quality control checks on employee development programs, provides instructor education, and prepares and runs certification exams. With 700 certificates already awarded, the appeal of this university course is growing. The "certified by Steinbeis University" addendum has evolved into a genuine seal of approval with regard to professional employee development.

Photo: photocase.com © fanny18

"Since they're so well thought through, the programs the Institute has developed have helped our instructors and students become much more disciplined in the way they approach learning. In fact, this impact is one of the main reasons why our ongoing education courses are so successful," explains the head of HR at an international corporation in Dusseldorf. The enterprising owner of a learning center near Freiburg believes that joining forces with Steinbeis University Berlin has resulted in "a drastic improvement that our participants have welcomed with open arms." The Steinbeis Enterprise TQU Academy in Ulm also uses and supports the course offering with great enthusiasm. The Academy has for many years, for instance, offered integrated certification exams in its successful Six Sigma program. "The international standard behind this certification program is proof enough that my instruction is built on a firm foundation," says the Six Sigma Master Black Belt at the TQU Academy.

The Institute develops internationally accepted testing standards for popular courses of instruction. To help people already in employment prepare in a way that best meets their needs, the Institute developed a series of materials tailored to the written section of the certification exam. These materials also show instructors what subject matter must be covered. In addition to "integrated" models (as the certification exam is a component and the final stage of the development program), the "open" format is highly sought-after. This gives working professionals with plenty of practical experience and sound theoretical knowledge the opportunity to translate their expertise gained "on the job" into a recognized university certificate. The training materials are an excellent way to spot any gaps in a professional's education and keep knowledge up to date thanks to self-directed study.

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Renewable energy in the tri-border region Germany – Poland – the Czech Republic

BioEnergyNet

As part of the project called BioEnergyNet – the Network for Biomass and Renewable Energy in the Tri-Border Region, the Steinbeis Consulting Center (SCC) Dreiländereck Neiße has helped build an active and broad network of key players, many of them energy producers. Studies on the potential of biomass as well as the advantages of using renewable energy over the long term have revealed new findings and given the movement fresh momentum. By working with the University of Applied Sciences in Zittau/Görlitz and the International Graduate School in Zittau, the SCC has laid the cornerstone for promoting development and economic growth throughout the region.

Aside from BioEnergyNet, a host of other projects such as RegioSustain as well as a number of studies have yielded a treasure trove of findings on biomass and renewable energy. The BioEnergyNet project pooled the information and is now organizing it. The next step: use that information on the region's biomass potential to create a decentralized energy supply for industrial areas and new residential developments.

Another study entitled, "Waste Materials to be Incorporated into Reusable Materials for Regional Material Flow Management," is in the pipeline. End-to-end material flow management aims to capture two things: a) every material flow in the region that is tied to the use of the material and energy contained in agricultural and silvicultural biomass and b) recyclable materials – in other words, all kinds of waste materials. The study is being conducted by the district of Löbau-Zittau, the Sächsische Energieagentur and the German Centre for Biomass Research. The district's council on economic development as well as the SCC Dreiländereck Neiße have also pitched in with an "energy strategy for the district" to be implemented starting in 2008. In doing so, the district's key players are also taking part in the nationwide "Bioenergy Regions" competition.

The BioEnergyNet project and its initiatives have borne fruit with the founding of a "Coordination Centre for Biomass and Renewable Energy". This cross-border agency bridges the gap between energy production and economic development. The SCC was chosen as a sponsor due to its activities in managing energy, raw materials and partnerships. Other criteria: the Center's cross-border emphasis on Eastern Saxony and Northern Bohemia as well as its existing dual-country sponsorships. Experts are busy at the German and Czech project sites. The next step: getting involved with the "Wood and Forestry in Saxony" cluster.

BioEnergyNet casts its net much further than other projects – namely, towards the biomass and renewable energy for and from Northern Bohemia and the entire Lusatia area. The goal is ambitious: an interactive "energy atlas" for the region, one which has recorded data such as the potential, the producers and the energy plants and presents that information in a visually appealing yet easy-to-understand way. This instrument will benefit investment managers, optimize logistics and smooth central communications. Schools and the tourism industry can also use this tool as an "energy educational trail".

The SCC hopes that end-to-end material flow management will act as the perfect entryway to making the best use of biomass for energy or material purposes. The Center is ready to go public and break new ground with project work – and begin earning a reputation as a center of excellence.

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Steinbeis-Europa-Zentrum is Partner in the European Project CReATE

Creative Europe

The project CReATE supports the strategic co-operation of innovative clusters in the field of creative industries in Europe. CReATE is funded under the "Regions of Knowledge" initiative of the European Commission, which aims to support regional research-driven clusters and to strengthen the research potential of European regions. Steinbeis-Europa-Zentrum supported the writing of the project bid and is partner in the project. The project is coordinated by MFG Baden-Württemberg.

The creative industries sector is one of the emerging lead markets of the European knowledge economy. Simultaneously, the Information and Communication Technologies (ICT) play a key role in the creative industries in developing internationally competitive products and services. Against this background, CReATE intends to identify, implement and disseminate ICT induced innovations in order to improve the innovative capacity of the regional cluster actors.

In the framework of CReATE, SEZ cooperates with MFG Baden-Württemberg as well as further European partners from Rhône-Alpes, Piedmont and the West Midlands. Building upon the know-how generated in previous projects, SEZ develops regional strategy processes, supports elaborating an interregional research agenda, conducts training activities on strategic cluster management and consults the project partners on all strategic questions.

The development of an interregional research agenda will help to reach a higher mobilisation of RTDI investments and to guide them in seminal research areas and does, thereby, help ensuring more effective and efficient RTDI investments in the involved regions. Furthermore, the further development of the European Research Area is supported by the interregional exchange of knowledge as well as the initiated research cooperations.

The predecessor project, RegStrat, had been coordinated by Steinbeis-Europa-Zentrum until March 2008 and aimed at supporting regional decision makers in the development and implementation of successful research, technological development and innovation (RTDI) strategies. Within this process, SPI tools such as Foresight, Technology Assessment, Evaluation, Benchmarking and Innovation Audits were important. By a combined and systematic use of these instruments, the regional innovative and competitive capability should be strengthened in the long term. The results of RegStrat are now integrated within the project CReATE.

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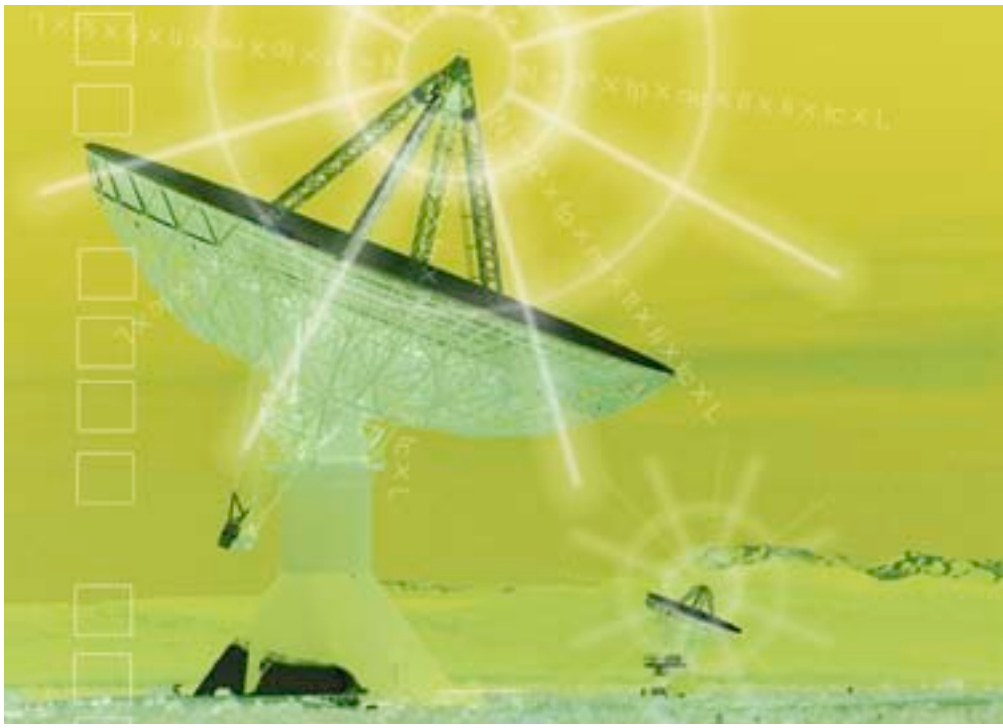
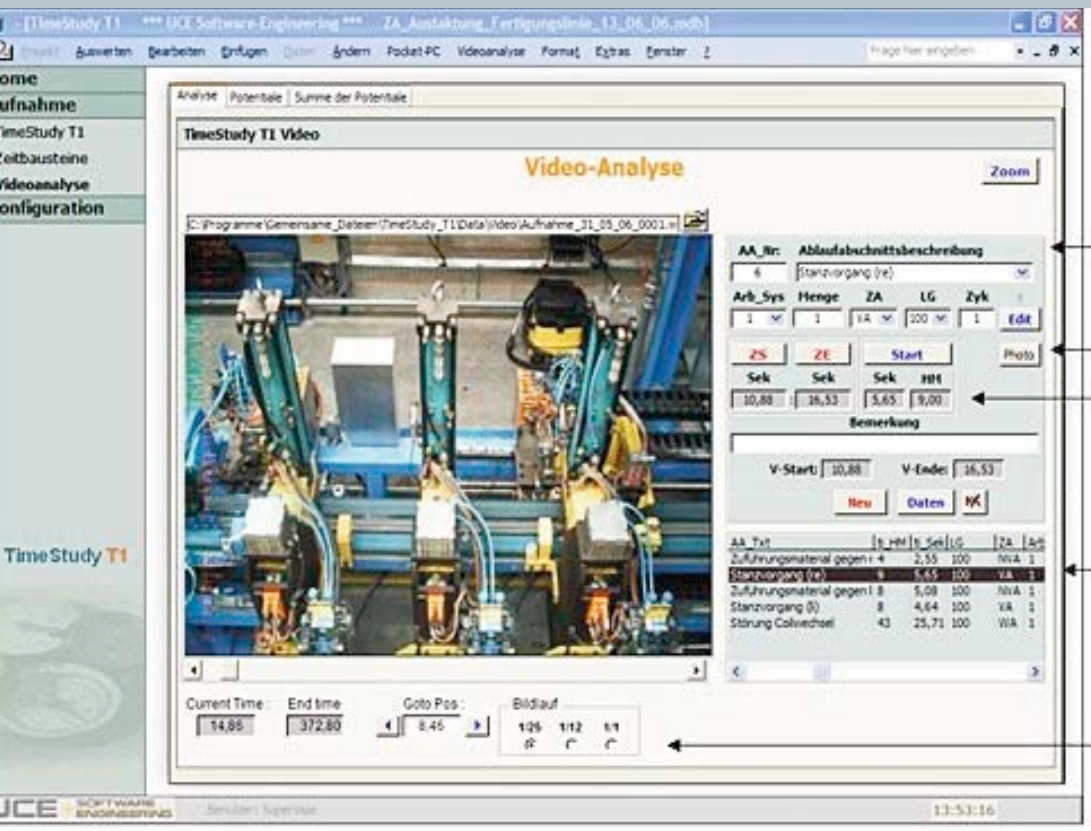
The Project CReATE

To realise the above mentioned objectives, the project will

- develop concepts and a common methodology for analysing regional research-based clusters of the creative industries;
- analyse the state of play and the most promising technology and market potential in each region regarding ICT innovation in creative industries and, thereby, initiate a strategy process within the creative clusters;
- prioritise and harmonise the outcomes of the different regional strategy processes in the form of a Cross-Regional Joint Research Agenda;
- initiate concrete common project ideas and cooperation activities;
- implement related training courses for enhancing the innovative capacity of cluster actors; and
- increase the impact and European outreach of the project through concrete dissemination and training measures.





Systematic video analysis in production and logistics

A picture is worth more than 1000 words

Sport isn't the only area in which video technology is regularly used to evaluate and analyze how athletes and their equipment perform. Production, development, process technology – the use of video is gaining ground in each one. Recording processes on video is the simplest way of obtaining information. But this method is quickly hampered by its limitations, leaving the door wide open for professional systems of detection.

Video recordings made with the TimeStudy T1 tool allow users to quickly and effectively spot where working processes could be improved. Co-designed by the Steinbeis Transfer Center Lean Operations & Reengineering, TimeStudy T1 dissects the recorded processes to strip them of their complexity. Equipped with an easy-to-use mask dialog, the TimeStudy1 first determines to what extent each step of the process adds value. It then documents the potential for improvement and even includes a suggested course of action.

Capturing today's production processes involves much more than merely looking at a particular sequence. Why? Processes are much too fast to record manually. And processes that are performed in "capsules," (such as laser welding) make it impossible to see what is happening.

Evaluating video images is critical, especially when completed processes are scrutinized. Video analysis using TimeStudy T1 is an efficient starting point for identifying ways to improve processes. At the same time, employees involved in those processes – no matter what part of the company they work for – must be involved in interpreting what the video has recorded. Past experience has demonstrated that making the recorded processes "repeatable" greatly simplifies and accelerates the path to a solution – especially when discussed during workshops.

TimeStudy T1 simplifies the evaluation of video analyses considerably, even though these evaluations must meet the same requirements as time and motion studies. Other useful findings (such as those needed to time assembly and production lines) are easy to generate from the video analysis using TimeStudy T1.

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How much and what kind of commercial property does a dynamic area need to do business?

Growth down the road: a commercial property model for Regensburg

With competition between regions intensifying, planners and economic development advocates at both the city and regional level have a new priority: create conditions that sustain an area's appeal and continue to support companies on their path to success. One essential element of this process is providing commercial property and businesses premises that businesses can actually use. The Steinbeis Consulting Center Regional Development and Economic Development partnered with Pan Geo, a Stuttgart-based urban planning agency, to investigate the current state of commercial property in Regensburg and compile a recommended course of action for future city growth.

Many cities and regions in an economic upturn are finding that in just a few years, local companies will have few – or zero – spaces on which to expand. These cities and regions must "re-designate" commercial properties or play an active role in converting fallow land.

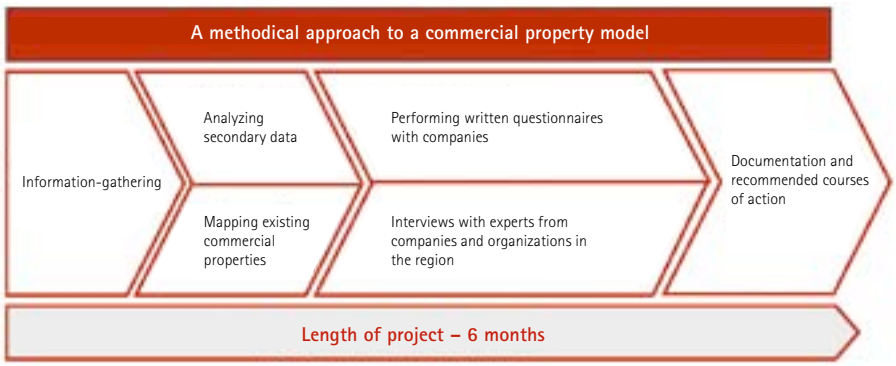
This is the challenge facing Regensburg. Situated in Germany's Upper Palatinate, the city boasts a dense concentration of technology and industrial companies, making it an epicenter of growth in Bavaria. In 2007, the city commissioned Steinbeis and Pan Geo to devise a "commercial property model." Drawing on an extensive analysis, the city would then use this model to accomplish two things. The first: specify the guidelines on how commercial property would be developed in the future. The second: redefine which industries would use these properties in the greater Regensburg area.

Steinbeis and Pan Geo thoroughly reviewed the existing data and conducted a written survey of Regensburg-based companies. They also interviewed selected experts and key players in the community. Using the information from the questionnaire, the duo was able to provide real information on what commercial properties would be needed by 2015, and why. These findings were checked and confirmed using GIFPRO, a forecasting system accepted by scientists everywhere.

During the second stage, the "needed" space already calculated was juxtaposed with the results of an on-site mapping exercise. As well as helping the consultants identify and assess potential premises, this compared the results to companies' requirements. The results of the analysis were included in an overall course of action that set out the guidelines on how to develop commercial property. One finding stood out: cities and regions must work with their neighbors in developing planned commercial properties. Thanks to its extensive analysis and recommended measures, this model for commercial property development will prove highly valuable to Regensburg city planners and give urban developers and economic growth advocates real guidance on what steps to take.

Prospective pockets of industry and commerce

- existing pockets of industry and commerce
- larger potential properties inside city limits
- possible commercial areas shared by communities (outside city limits)



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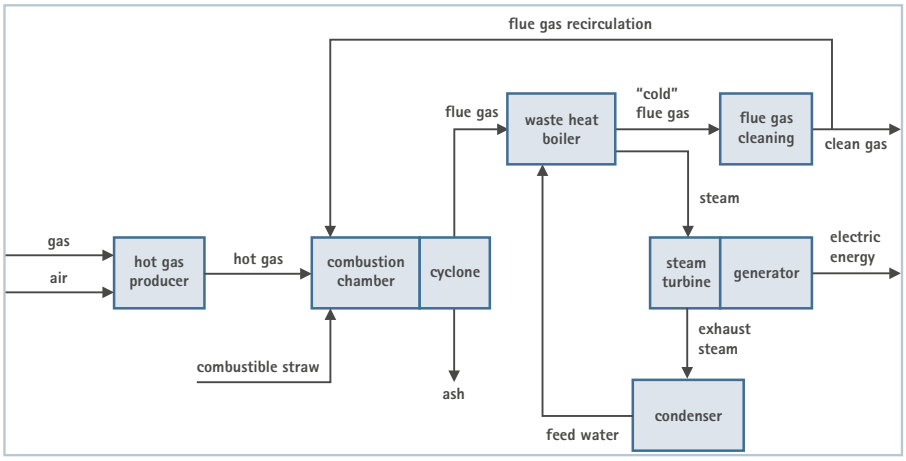
Thermal treatment of rice straw using the flight-stream/cyclone process

The search is on for alternative energies

The limited supply of fossil fuels, growing concerns over climate change and rapidly rising energy costs – each of these has intensified the search for alternative materials used to run power plants. In particular, using energy from solid biomass as a fuel presents a major alternative to burning fossil fuels such as gas, oil and coal. While the conversion technology for burning wood is more or less perfected, the applications of other biomass such as rice straw and its use in thermal power plants have not been explored to the same extent.



The block diagram of the new process

To be able to use solid biomass as a fuel, it is important to understand its chemical and physical properties. As well as having a significant impact on the type of combustion, these properties also greatly determine how the fuel has to be transported, how systems need to be run, how the exhaust gas has to be cleaned downstream and how ashes can be recycled. Biomass fuels are generally categorized as "delicate" fuels, as experience with the level of energy conversion, ignition, burnout, the risk of slagging, and corrosion has highlighted their differences to fossil fuels. More than anything else, it is slagging and corrosion that impact a machine's availability, ultimately making single and multi-unit incineration systems for biomass less cost-efficient.

Enter a new thermal process, derived from the calcination that occurs during the production of cement and designed along the lines of the flight-stream / cyclone process; this technology poses a genuine alternative to previous industrial methods of burning straw. In the flight-stream/cyclone process, conditioned rice straw which is capable to fly is oxidized in a combustion chamber consisting of a riser and a cyclone. A steam power process then uses the energy released into the flue gas to generate electricity. According to this principle a large-scale plant with a firing thermal capacity of 50 MWth is scheduled to be realised for the first time in Italy.

To obtain basic information about the behaviour of the combustible rice straw in a large-scale plant and to be able to estimate whether the flight-stream/cyclone process is generally suitable for the oxidation of rice straw, the experts of Steinbeis - Transfer Centre for Process, Energy and Environmental Engineering in Heilbronn designed and built a pilot plant to run incineration experiments. The aim: to shed light on the process and to disclose problems that need to be solved.

Since this procedure involves several state of- the-art components – such as steam turbine and waste heat boiler – the pilot plant was designed to build and investigate only the "unknown" part of the flight-stream/ cyclone process. In other words: producing hot gas, preparing and feeding in rice straw, the combustion chamber, the cyclone, the ash discharging and controlling the process.

Multiple series of tests yielded important information about the behaviour of the combustible rice straw in the pilot plant. The tests showed that the flight-stream/cyclone process is generally suitable for the thermal treatment of rice straw. Materials achieved burnout ratings of less than five percent and CO values in the flue gas close to the emission limit of 250 ppm. The process also runs stable over longer periods. Compared to other procedures, maintaining this kind of system should involve much less time and effort because the combustion chamber contains no moving parts. This work has laid the cornerstone for the realisation of a large-scale plant.

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Five tenets of greater productivity and market opportunities

What does success boil down to?

"Winning" – that's the title of Jack and Suzy Welch's latest book. For years, the pair has worked as management consultants. Depending on the situation, their philosophy can make affected parties feel good or bad, back up decisions already made or gnaw at self-confidence. Some disagree with the Welch approach entirely, countering that many companies and organizations – if they were managed "Jack's way" – would fall into ruin.

The circumstances in which companies find themselves are as varied as the businesses themselves. To lend this landscape some clarity, Helmut Bayer, managing director of the Steinbeis Enterprise TQU Business GmbH, has compiled five tenets on how to approach management as a whole.

1 | Expertise has its own life cycle

Being an expert means that when challenged, you have the right skills to deliver the best performance. If you're a manager, this means knowing what skills your business needs to make the right decisions and act on them. If you're an employee, being an expert means knowing what's in store for you, what's expected of you – plus plenty of opportunities to learn and build on skills. For years, Microsoft led the world in leveraging expertise against the competition. But now that empire shows signs of toppling. Nowadays, we can clearly see that expertise moves through a life cycle – just as products do.

2 | Lean management interrupts evolution

Every company evolves. The dynamic, pioneering enterprise in someone's garage grows into a successful company, one which knows the business inside and out and sets standards – as befits the "top dog". That successful company swells into a sluggish giant, forced to keep a lock on its original customer base through further acquisitions or price fixing. Ultimately, this defensive play falls apart under the pressure of competition – and the end draws near. And can drag on and on. Take AEG – that process lasted 113 years. Yet Toyota – the "hungry giant" – seems to have followed a different path. The Japanese company is worth emulating, but what's their secret? Having the mind of a successful company and the heart of a pioneer. Clearly, lean management is an effective antidote to the natural aging process.

3 | Six Sigma cultivates a healthy core business

Miele is synonymous with expertise in premium household appliances. If you want to be successful in the long term, you can never stop improving. Company founders Carl Miele and Reinhard Zinkann came to that realization in 1899. Their motto, "always better", has remained the company's guiding principle. The Miele core business is healthy, and buyers can rely on Miele products and services. But how do you recognize healthy core business? Look at where it touches the customer. Deviations in quality (also called variations in Taguchi's system) don't belong at any of those points. Six Sigma keeps variation to a minimum. "Realize with Six Sigma" means: define, measure, analyze, improve and control. This paves the way to moving innovation in the right direction and successfully creating products and services. With a clean bill of health, the core business can finance visionary pioneers.

4 | Most work within their system, few work on their system

The lion's share of employees work within set systems. Only a few are given the task – and even fewer the authority – to work on the systems themselves. In other words, designing and improving systems that govern work and operations. We equate employee development with making a distinction between tasks. Employees working within the system must be able to develop their expertise in operations; this is what safeguards quality and added values. Employees working on the system must be able to hone their organizational and methodical expertise; this is what helps companies to more closely align their systems with their customers.

5 | Self-imposed benchmarks need regular checkups

The desire for "operating excellence" at every stage of a company's development is palpable. Losses, mistakes and underperformance are tolerated less and less. But where is the limit? Real life demonstrates that the limit is reached when a company believes it leads the market in terms of price while offering a reasonable customer benefit. Yet the downward spiral continues. What, exactly, is reasonable? Who sets the standards? Companies are faced with a choice: sit on the sidelines, act, or react – whether driven by others or taking control of their own situation. A company's own benchmarks need to be examined at appropriate intervals.

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An exceptional Place in the Land of Ideas: "Jugend gründet"

On 10 June 2008, "Jugend gründet" was named one of "365 landmarks" by the Land of Ideas campaign, an initiative promoting Germany as a place of business. Not only "Jugend gründet" is innovative, it is sustained by passion and a can-do spirit. In the online competition, teens exploited a high-tech product idea just as they would in real life.

Jugend gründet

The competition for secondary school and vocational students is run by Steinbeis Transfer Center for Business Development at Pforzheim University. More than 3330 students participated last year. "Jugend gründet" is sponsored by the German Federal Ministry of Education and Research and is on the list of government-founded competitions of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany. The initiative also belongs to the consortium for nationwide secondary school competitions.

"Jugend gründet" stands for

- competing to have the best idea
- Call it "having fun at work".
- where intensive talent meets entrepreneurial mindedness

Students can learn "dry" business basics in an exciting way, from hatching a business idea to successfully managing a virtual company. Part of the competition involves students picking up business skills "on the job" – even the ground rules of business administration. "Jugend gründet" helps students to become team players and provides insight into the impacts of business decisions. The competition also encourages students to work and conduct research under their own steam as well as to put inventive ideas into practice within given structures.

This helps participants to learn more about their individual strengths – essential knowledge when later choosing a profession. Students do not need previous knowledge of business administration, but they must be curious, ready to take responsibility for their own learning and enjoy deciding and playing an active role in how they unfold themselves. Anyone can participate, but prizes are restricted to secondary school and vocational students between 16 and 21. The grand prize: a trip to Silicon Valley (USA), financed by Steinbeis Foundation.

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netvico nominated for design award

Awards for excellent design are thick on the ground in Germany. The Design Award of the Federal Republic of Germany, however, is known as "the award of awards". All the more reason for netvico, a fledgling company supported by Steinbeis, to celebrate: three of its products garnered a Design Award 2009 nomination.

The Design Award is synonymous with the strictest of requirements. Products which are nominated must be able to point to national or international awards already in their trophy cabinet. Furthermore, companies cannot submit their own names for consideration – only the collected Federal Ministries of Economics, both at the state and federal level, decide who is allowed to compete.

Founded in 2001, netvico develops and distributes software for out-of-home media. With the nomination, this Stuttgart-based company will let a jury pass judgement on its complete range of products. The digital directional assistance system (storey directory), the LED floor and the illuminated wall – three innovative communication systems from netvico, nominated for the Design Award 2009 and already recognized for their excellence with other accolades, such as the red dot award, the if communication award and the viscom award.

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Knowledge transfer in education

The right start is everything in education. For the first time in its history, Steinbeis is giving schools and preschools new momentum, by founding the Steinbeis Transfer Center Learning and Education. It is directed by Eva Schumacher, a professor of elementary education at the University of Education Schwäbisch Gmünd. "Our highly capable professionals are what make us so successful in knowledge and technology transfer. Until now, our educational system in Germany hasn't made the most of what preschool kids can learn. Especially at this age, children can absorb a lot – and quickly. This is where our work begins," says Uwe Haug, explaining the Steinbeis Foundation involvement. He currently heads up the foundation's R&D.

The Steinbeis Transfer Center assists the city of Oberkochen in establishing a local "education network". Says Mayor Peter Traub: "Education is essential. But it doesn't begin at school. That's why the city of Oberkochen is joining forces with the Steinbeis Center to build up an 'education network.' Its aim: promote early childhood education and help schools and kindergartens work together more closely. This will also help ease children's transition from kindergarten to school. Right from day one, our city, the Steinbeis Center and educational institutes achieved a good working relationship in taking stock of the current situation, and this has uncovered resources that we can capitalize on."

Daycare centers and elementary schools are increasingly becoming one entity. This development is in line with the state's new education policies, ones that resurrect the ideas of education reforms from a hundred years ago. Hence, the Steinbeis Center also offers Montessori degree courses – and the demand is running high.

The ALMONTE "modular course" at the State Academy in Bad Wildbad (in cooperation with the Ministry of Culture and Education as well as the State Association for Montessori Education) is based on a new idea hatched at the Steinbeis Transfer Center. Here, schoolteachers and childcare professionals complete joint training programs, including both theoretical and academic components. This project is supported by the Heidehof Foundation, EnBW Baden-Württemberg and the University of Education Schwäbisch Gmünd.

Different kinds of transitions between schools are the focus of EXPAT, a project planned jointly with the Singaporean-German Chamber of Industry and Commerce. EXPAT supports families that are being relocated abroad by an employer. Many traditional preparation sessions held by companies concentrate on where the employee will be working. The factors behind a fulfilling family life are often neglected. The EXPAT-Service also assists children and teenagers stay on the right educational path, helping them move smoothly between schools. Partners and spouses can also take advantage of intercultural instruction. Principal Günter Boos, former director of the German European School in Singapore and EXPAT co-founder, explains, "Parents coming from Germany come from different areas throughout the nation, so they each have different expectations of the school system in their new environment, based on their own school experience. This is why individual consultations are so important – wherever they are, children need to feel comfortable in their day-to-day lives. This means finding the right kind of schooling for them, one that allows them to continue their studies when they return to Germany." The first workshop is scheduled for Spring 2009 and will cover destination countries in southeast Asia.

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New Steinbeis Enterprises

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

The following Steinbeis Enterprises have been founded as of June 2008:

STI Globalisation of Business & Technology Development, Berlin
Director: Dipl.-Ökonom Vassili Toropov

STC Bad Mergentheim, Bad Mergentheim
Director: Prof. Dr. Michael Stricker

STI Education Management IfPM, Berlin
Directors: Birgit Gaida
Prof. Dr. Volker Reinhardt
Markus Seidel

STC Integrated Product Development and -Preparation, Bretzfeld
Director: Prof. Dr.-Ing. Hans Dieter Wagner

SIBE Steinbeis School of International Business and Entrepreneurship GmbH, Herrenberg
Director: Prof. Dr. Werner G. Faix

SRC Dialogue Systems, Blaustein
Director: Prof. Dr. Dr.-Ing. Wolfgang Minker

STC Hydraulics Systems, Ulm
Director: Prof. Dr.-Ing. Josef Kurfess

STC Medical Technology, Karlsruhe
Director: Prof. Dr.-Ing. Rüdiger Haas

STC Software Engineering, Steinheim
Director: Prof. Roy Oberhauser

TQU unisono training + consulting Institut für soziale Kompetenz, Ulm
Director: Gudrun Jürß

Applied technologies – successful product and process innovations

Participants numbered over 300 at the Technology Day in Bolzano, Italy, co-hosted by the Steinbeis Technology Group and the TIS innovation park in Bolzano. Held at the end of July, the event was part of a larger Steinbeis "Applied Technologies" program.

Luisa Gnecchi, Chief Advisor for Innovation, Christof Oberrauch, President of the Business Association of South Tyrol, and Dr. Alfred Guarriello, President of the TIS, opened the event by welcoming representatives from business, academia and politics. One of the underlying ideas of Technology Day: technological advances are far more important to stimulating economic growth in industrial countries than playing a numbers game to boost the "work" and "capital" factors of production. As a result, the conference focused on how technology can drive innovation. Guest speakers and attendees alike explored and discussed how to master, design, refine and apply industrial production technology within the larger frameworks of the "product-technology complex" as well as factories and organizational structures.

Dr. Hubert Hofer, Director of the TIS innovation park in Bolzano, spoke about the fundamentals of knowledge and technology transfer and elaborated on the role TIS plays in the South Tyrol economy and in meeting international needs. Prof. Gunter Henn, a professor at the Technical University in Dresden and an architect whose projects include the Autostadt in Wolfsburg and the "Gläserne Manufaktur" in Dresden, gave a speech entitled "Rethinking Working Environments". Intellectual activity demands concentration and communication – without them, innovation will grind to a halt. Professor Henn also touched on the options and solutions facing companies such as Volkswagen. Andrea Bonfatti, head of R&D at Lamborghini, discussed the car manufacturer's structured approach to making technological breakthroughs. Lamborghini is the Italian standard-bearer in terms of ceasless product innovation and using the latest technology and materials. Managing director of Cicrespi Spa, Antonio Villi won the 2007 Best Innovation Award 2007 from Boccon University. He provided details on how Cicrespi developed original solutions to identify, keep track of and launch products and processes. He also explained how his company manages to maintain and build on these high technological standards over several years.

In his speech, Prof. Ulrich Günther of the Steinbeis Technology Group covered science and business, international networks, and our preparedness and willingness to step up to challenges down the road. He outlined the defining aspects and track record of Steinbeis technology transfer, pointing to the technical degree programs at Steinbeis University Berlin to demonstrate how the constellation of "transfer, training and employee development" can have a lasting impact.

Lectures were supplemented with advanced workshops. Dr. Hofer und Prof. Günther closed the event by unveiling the new European platform for working partnerships. Having expressed a firm desire to help Europe grow together, all parties involved agreed to join forces in knowledge and technology transfer, supporting training and employee development and learning from each other's expertise. Those assembled also signed an agreement to work together across borders and live out their principles: master the basics, shape innovation, push for progress in technology. The group included: CCSO Fribourg, CET Wrocław, the Fraunhofer Institute for Material and Beam Technology, the IMA company in Dresden, the Steinbeis Technology Group, the Steinbeis Foundation, Steinbeis University Berlin, transIT at the University of Innsbruck and the TIS innovation park in Bolzano.

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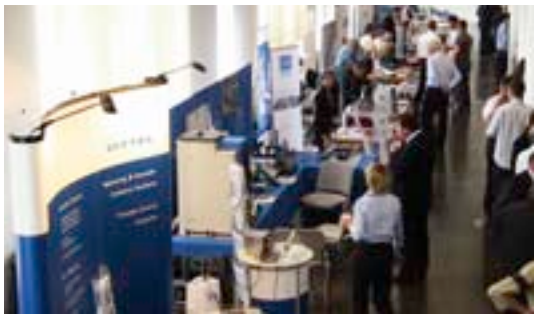
Cutting-edge grinding technology and superfinishing seminar a rousing success

Baden-Württemberg is known throughout Europe for its high density of mechanical engineering, automotive and medical technology companies. Premium quality – not the production of inexpensive products – lies at the heart of the region's success. One reason behind that success: a solid command of superfinishing and grinding technology. This past spring, the seventh annual "Cutting-edge grinding technology and superfinishing" seminar explored this very topic in the Haus der Wirtschaft in Stuttgart.

Boasting over 370 participants, the seminar is the largest of its kind in the world, spotlighting 21 issues in superfinishing and grinding technology raised by research and industry specialists. A matching exhibit was on display. The conference was organized by Taghi Tawakoli, Director of Steinbeis Transfer Center Advanced Engineering Technology and the Center of Excellence for Grinding Technology and Superfinishing at Furtwangen University. Attendees were welcomed by Baden-Württemberg's State Secretary Richard Drautz and Prof. Dr. Rolf Schofer, Dean of Furtwangen University. The guest speaker list was a "who's who" from industry and research institutes such as the University of Stuttgart and the University of Bremen, the Technical University of Berlin, RWTH Aachen University, the Swiss Federal Institute of Technology Zurich and Furtwangen University. Industry's strong showing demonstrated the relevance of these issues, revealing that new findings in grinding technology and superfinishing are urgently needed – and expectations are high.



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SUB master's degree program for civil servants

In keeping pace with the changing demographics of civil servants and coping with growing competition for qualified employees, it is essential for authorities to hire and retain mid-level and senior managers – managers who are able to think and act strategically and are equipped to tackle complex problems. To meet this need, Steinbeis University Berlin offers a two-year master's degree program for people in employment.

Coursework explores strategic alignment and how to create a firm course of action based on the strategies that public authorities and their organizations use to achieve their goals. This helps employees move from a more bureaucratic mindset to one guided by the tenets of corporate management.

This postgraduate Steinbeis master's degree is based on the dual principles of transfer and application. It also includes a specific, on-site project at the student's current or future place of employment. The degree program runs for two years.

Practical coursework covers
- project management
- innovation management
- information management and analysis
- strategy management
- marketing management
- financial management
- HR management

as well as a study trip abroad.
Students who succeed in this program can apply their newfound knowledge to a number of areas: HR and financial management, budgeting, conducting cost-performance analyses, corporate investment, building and energy management, sports, cultural activities and NPO management, city and regional planning, as well as managing projects in civil engineering and urban renovation.

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New releases from Steinbeis-Edition

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

Customer Empowerment im Zeitalter des Web 2.0
Wieviel digitale Kundennähe verträgt Ihr Marketing?

Published by Sonja Salmen, Brigitte Schober-Schmutz, Robert Huber
E-Book and print (German)

Web 2.0 has turned relationships between companies and customers upside down. Thanks to today's truly interactive network, passive consumers have evolved into active "prosumers." They have flocked to the Web to rate, choose and even configure products and services. In the coming years, no industry will be able to skirt this development – global corporations and SMEs are on equal footing here. And to be able to leverage customers' productive force, companies will have to relinquish universal control over the value-adding process. Before making a commitment to Web 2.0, marketers must ask themselves how much of that marketing will reach the customer and which solutions look promising.

The "Customer Empowerment in the Web 2.0 Era" study answers these questions and gives professionals the opportunity to reflect, helping marketers navigate the way ahead. Part of a project for an Electronic Business degree program at Heilbronn University, the study was conducted by Prof. Dr. Sonja Salmen and Dr. Brigitte Schober-Schmutz with the generous assistance of Robert Huber and Sven Haber from DOWNTOWN New Media, an online consulting firm.

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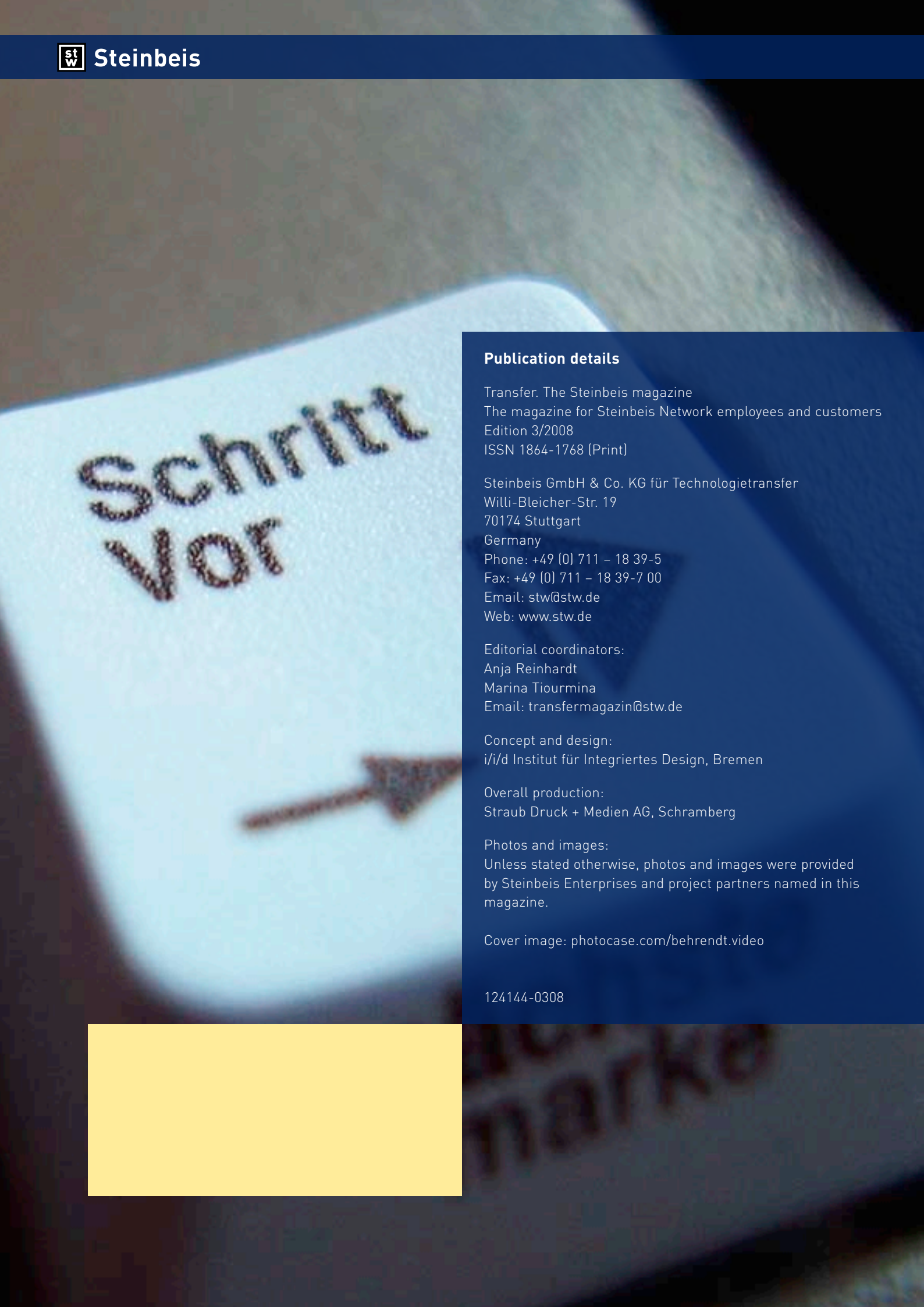

Publication details

Transfer. The Steinbeis magazine
The magazine for Steinbeis Network employees and customers
Edition 3/2008
ISSN 1864-1768 (Print)

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Concept and design:
i/i/d Institut für Integriertes Design, Bremen

Overall production:
Straub Druck + Medien AG, Schramberg

Photos and images:
Unless stated otherwise, photos and images were provided by Steinbeis Enterprises and project partners named in this magazine.

Cover image: photocase.com/behrendt.video

124144-0308