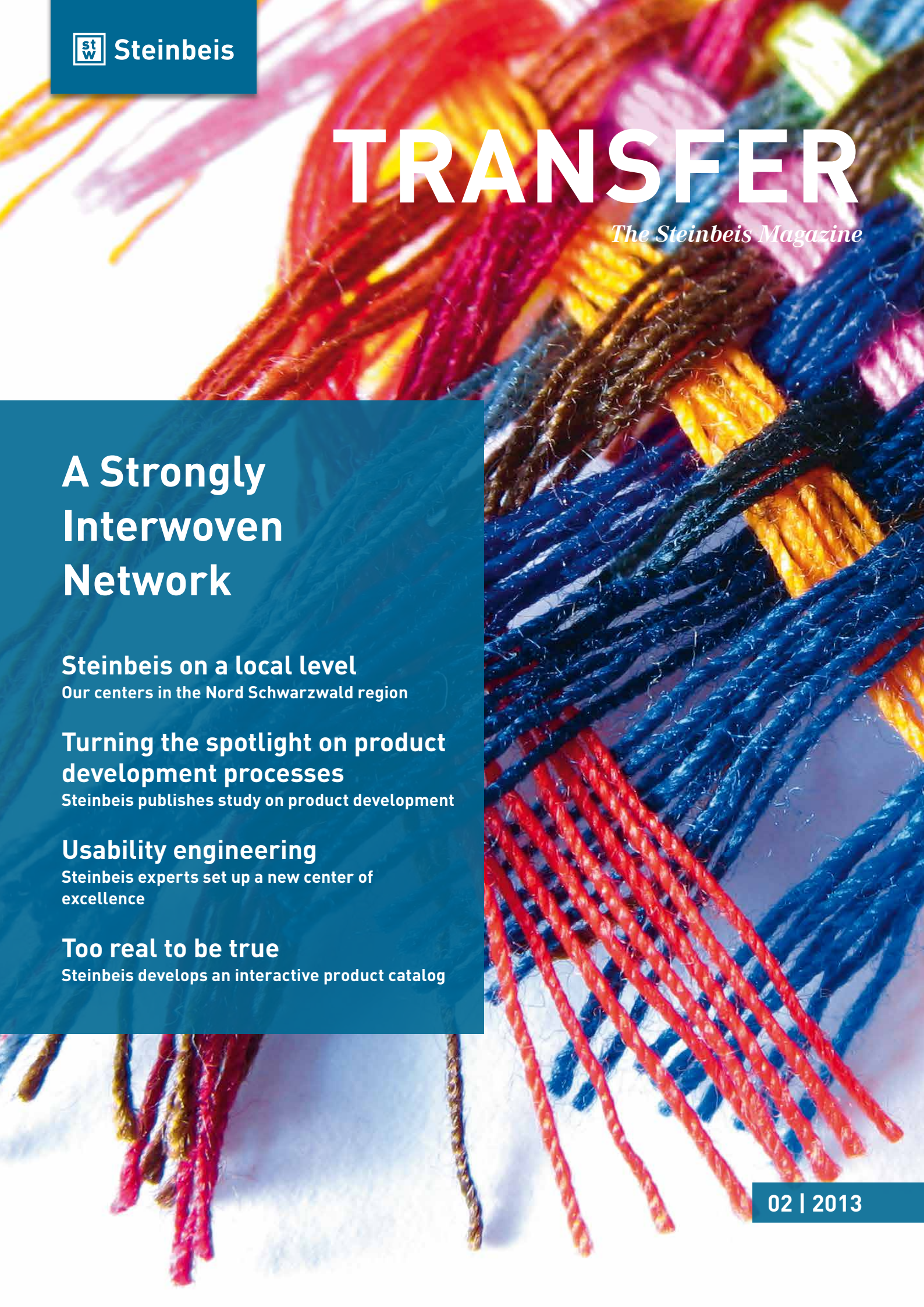
Steinbeis

TRANSFER

The Steinbeis Magazine



A Strongly Interwoven Network

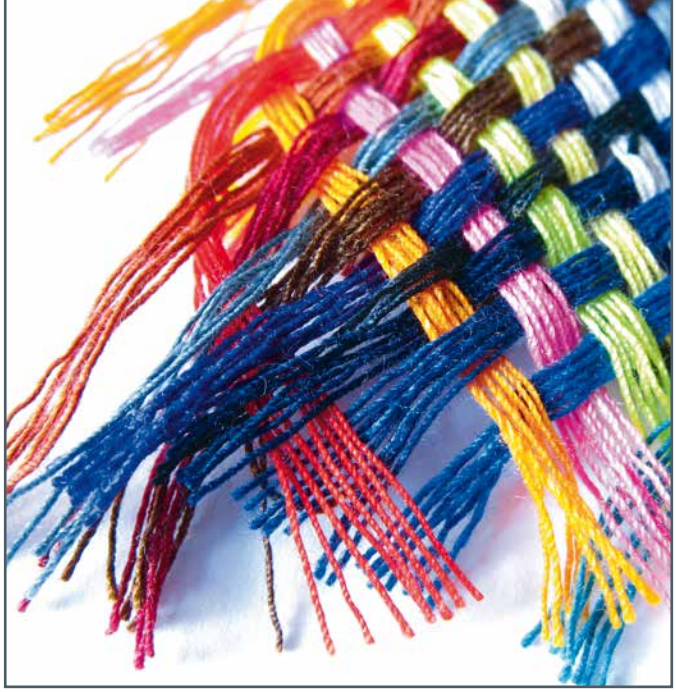
Steinbeis on a local level
Our centers in the Nord Schwarzwald region

Turning the spotlight on product development processes
Steinbeis publishes study on product development

Usability engineering
Steinbeis experts set up a new center of excellence

Too real to be true
Steinbeis develops an interactive product catalog

02 | 2013



Find an overview of all Steinbeis Enterprises and their services on www.steinbeis.de → our experts

Dear readers,

Prof. Uwe Dittmann is the director of the Steinbeis Transfer Center of Marketing, Logistics and Business Planning at Pforzheim University. The center is one of more than 20 Steinbeis Enterprises in the Nordschwarzwald region. All Steinbeis centers in the area are presented on pages 4 to 6.

the southern German region of Nordschwarzwald, or the North Black Forest, offers many appealing places for high-skilled technology companies to work from. It is also nestled in charming countryside with plenty to do and a high standard of living. Industry in the area revolves primarily around engineering and tooling as well as the tier one/tier two supply of a variety of automotive companies. There are also a number of materials technology specialists in the region, plus companies involved in process technology, jewelry, creative services and relaxation/activity vacations, all stemming from the area's unique blend between nature and innovation.

Nordschwarzwald is home to a large number of hidden champions, examples of which include Arburg (injection molding machines, from Loßburg), Fischerwerke (connection solutions, from Waldachtal and Horb), Härter (stamping technology, from Königsbach-Stein), Schmalz (high-efficiency vacuum technology, from Glatten) and Witzenmann (flexible metallic elements, from Pforzheim).

The bread-and-butter business of companies in the area ranges from the construction of forward- and backward-integrated machine systems to the production of system-based assembly units ready for integration into complex solutions. There is a wealth of experience in the region coupled with a detailed understanding of a variety of specialist fields, the hallmark (for customers) of made-to-measure solutions and genuine innovations. An important partner in all of this is Steinbeis and its network of experts.

The MLU Steinbeis Transfer Center is a specialist in marketing, logistics and company planning and is based at Pforzheim University. It has been collaborating with companies for 18 years, most of them based in the Nordschwarzwald region. The experts at the MLU support companies in a variety of industries, providing a shining example of knowledge sharing between universities and business. The MLU's specialists comprise nine professors and seven co-workers in the schools of design, engineering and business planning. All share a commitment to knowledge transfer, and many of their projects involve the delivery of consultation services to small and medium-sized enterprises. Apart from its work in marketing, logistics and business planning, the MLU offers solutions in the fields of IT, media, business process improvement (BPI), environmental and resource management, and the development of communication concepts for use in Web applications. The center has also developed an instrument called the DKA (dialog-based communication analysis) to quickly and efficiently identify system weaknesses. As well as looking at the people who work within companies, DKA methods actively involve these people in entrepreneurship. This instrument thus acts as an incubator of ideas, providing implementable recommendations which also play a major role in motivating people.

I hope you enjoy reading this latest edition of TRANSFER!

Prof. Uwe Dittmann

There are 21 Steinbeis Enterprises (SEs) in the Nordschwarzwald region (which lies at the northern end of the Black Forest in Baden-Wuerttemberg): five on the Horb Campus of the Stuttgart-based Baden-Wuerttemberg Cooperative State University (DHBW), 13 at Pforzheim University of Design, Engineering, Business and Law, and three centers in other locations.

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

Steinbeis on a local level

Knowledge and technology transfer in the Nordschwarzwald region

The region of Nordschwarzwald (North Black Forest) lies in the southwest of Germany and includes the city district of Pforzheim and the separate districts of Calw, Enz and Freudenstadt. The area holds much appeal, not only because of the delightful countryside at this northern end of the Black Forest, but also due to its reputation as a flourishing business location for medium-sized enterprises. The manufacturing companies in the region span a multitude of business sectors and modern technologies, and many firms are actively involved in export markets. This has enabled many traditional, owner-managed family businesses to take their companies into leading positions in their respective markets. With innovative companies and world-class universities in the region, the combination of several key factors provides an excellent foundation for knowledge and technology sharing – with a focus on business practice and market needs. Drawing on a broad spectrum of services, businesses in the region receive valuable support from the Steinbeis Enterprises based in the area.

Steinbeis has been active in the Nordschwarzwald region since 1986, paving the way for scientific insights to be translated quickly into successful business innovations. To this end, Steinbeis works with the following partners in the area:

The Horb Campus of the Stuttgart-based Baden-Wuerttemberg Cooperative State University (DHBW): Over 900 students are currently enrolled in courses at the Horb Campus of the DHBW. The cooperative degrees offered at the university bridge the gap between theory and practice. The Horb Campus offers six internationally accredited bachelor programs at the school of engineering, providing technical education in parallel to the most important academic qualifications. At the same time, work with business partners allows students to gain practical experience on the job.

Pforzheim University – Design, Engineering, Business and Law: Pforzheim University offers 24 bachelor programs and 13 master degrees through its schools of design, engineering, business and law. With around 5,500 students, it is one of the biggest universities of applied sciences in Baden-Wuerttemberg. The university collaborates closely with trade and industry, has cooperation agreements with a variety of sister universities around the world, and is actively involved in international networks.

Steinbeis Enterprises in the Nordschwarzwald region:

Baden-Wuerttemberg Cooperative State University (DHBW), (Stuttgart, Horb Campus)

Institute for Plastics and Development Technology
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Prof. Dr.-Ing. Bernhard Rief
E-mail: SU0374@stw.de
Web: www.steinbeis.de/su/374

Management Training
Prof. Dipl.-Ing. Rolf Richterich
E-mail: SU0765@stw.de
Web: www.steinbeis.de/su/765

Power Management and Building Services Engineering
Prof. Dr.-Ing. Martin Hornberger
E-mail: SU1112@stw.de
Web: www.steinbeis.de/su/1112

Development Technology
Prof. Matthias Vogel
E-mail: SU1287@stw.de
Web: www.steinbeis.de/su/1287

Institute of Holistic Solution Engineers (I-HSE)
Prof. Dr.-Ing. Ulf-Rüdiger Müller
B.Eng. Swen Niebann
E-mail: SU1481@stw.de
Web: www.steinbeis.de/su/1481

Pforzheim University – Design, Engineering, Business and Law

Signal Processing Systems
Prof. Dr.-Ing. Frank Kesel
Dipl.-Ing. (FH) Andreas Reber
E-mail: SU0139@stw.de
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Marketing, Logistics and Company Planning at Pforzheim University
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Prof. Dr. Barbara Burkhardt-Reich
E-mail: SU0587@stw.de
Web: www.steinbeis.de/su/587

Material Development and Testing
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Prof. Dr.-Ing. Gerhard Frey
E-mail: SU0627@stw.de
Web: www.steinbeis.de/su/627

Systematical Innovation
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Web: www.steinbeis.de/su/716

Production and Organization
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E-mail: SU0735@stw.de
Web: www.steinbeis.de/su/735

Laser Processing and Innovative Manufacturing Technology
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Web: www.steinbeis.de/su/775

Pforzheim Management Institut PF-MI
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Technology Evaluation and Innovation Consultancy
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International Management at the Pforzheim University of Applied Sciences
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Web: www.steinbeis.de/su/610

Marketing – Intelligence – Consulting
Prof. Dr. Konrad Zerr
E-mail: SU1011@stw.de
Web: www.steinbeis.de/su/1011

IT-based Processes of virtual Organizations (IVO)
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Engelsbrand-Salmbach

Product Development
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Nagold

Strategy, Management, Innovation (SMI)
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Clinical Anatomy
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E-mail: SU1560@stw.de
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Neuenbürg

System-Oriented Management, Evaluation, Technology
Dipl.-Ing. (FH) Rolf Eglitis
E-mail: SU0792@stw.de
Web: www.steinbeis.de/su/792

Wiernsheim

Material Development and Testing
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The Nordschwarzwald region

The region of Nordschwarzwald lies at the northern end of the Black Forest in the southwest of Germany and spans the city district of Pforzheim and the separate districts of Calw, Enz and Freudenstadt.

Nordschwarzwald is an booming business location with a high standard of living. Not only is the countryside magnificent, the area is an exquisite place for a spa break or relaxing holiday. The North Black Forest Nature Reserve is ideal for the kind of leisure time activities associated with such forest areas. Overall, the region is marked by low employment and the varied business infrastructure of the services and manufacturing sectors. There is a wealth of medium-sized production companies in the region.

The universities and educational establishments in the Nordschwarzwald region provide training in a variety of specialist fields. There are five technology and entrepreneur centers and Steinbeis Enterprises in the area. These serve not only to bridge the gap between business and the world of academia in the region, but also to strengthen its predominantly medium-sized companies.

Facts and figures
Area: 233.988 ha/903 sq. miles (56% forest)
Inhabitants: 590,843
Municipalities: 70
Officially employed: 181,385
Universities: 5
Degree programs: 68 (as of December 2012)

Sources: www.nordschwarzwald-region.de; www.nordschwarzwald.de

Young entrepreneurs at the 2013 „Jugend gründet" final

"We shape the future with our projects!"

An interview with Prof. Dr. Elke Theobald and Prof. Dr. Barbara Burkhardt-Reich

Professor Theobald, Professor Burkhardt-Reich, your Steinbeis Transfer Center for Business Development, based at Pforzheim University, develops business intelligence tools for SMEs as well as large companies. In addition, you offer business simulations which give teenage students vocational guidance and internet platforms to promote women's positions in senior management for example. How did this fascinating and somewhat unusual mix come about?

Our professorships allow us to combine technological and contextual know-how in our Steinbeis Centers. That is why the mix is not so unusual but rather entirely logical to us. The internet technologies we have mastered as part of our software development activities can be applied to many subject areas and they enable the realization of innovative projects with profound content depth. Combining technological know-how with an emphasis on applicability creates a solid foundation on which we develop marketing intelligence solutions for businesses, offer business simulations for vocational guidance or startups, run internet platforms and databases. Our team consists of software engineers, project managers, graphic designers and editors. The teamwork across all disciplines is outstanding.

Professor Theobald: Your Steinbeis enterprise was founded 12 years ago. In 2009 your MANAGEMENT MONITOR software was awarded first prize at the CeBIT for being the most innovative business intelligence solution. Which developments, technical and social, have influenced your center's work ever since its inception?

Our work is influenced by our customers' close involvement in product development processes and by the way we integrate emerging technologies. When developing software we tap into the latest developments, i.e. social media, big data analysis or responsive design. We create added value for our customers by making their everyday business easier or by unlocking new potential. Most of all we help internationally active companies gather market and marketing information in a comprehensive knowledge database with the MANAGEMENT MONITOR. It also has a strategic planning and analysis tool which enables one to effectively use insights. In general, a software's interface design and usability requirements have become much more important. Managers consider the support of mobile end devices as commonplace nowadays. Also, just like many other IT companies, we have problems finding qualified employees.

Professor Theobald, Professor Burkhardt-Reich: Your Steinbeis enterprise is based in the northern region of the Black Forest (Nordschwarzwald) which is known for its business potential. Many small and medium-sized companies in the area are considered to be market leaders in their industry sector. What implications does this have for the projects you work on in the region?

The companies you're referring to hold tremendous sway in terms of business influence and development potential. In many cases the companies in the Nordschwarzwald region are active on an international level and need help with their internationalization strategies. We can provide excellent support in this area with our MANAGEMENT MONITOR. Many companies in the region can be attributed to the engineering sector or other related industries. Such technology driven companies have great potential in marketing. Much can be achieved here, especially in online marketing.

The Nordschwarzwald region started addressing the issue of recruiting qualified personnel early on – our Steinbeis enterprise planned and implemented a series of projects with schools in the area. One of these was the „Nordschwarzwald-Cup" during which we conducted business

simulations with teams consisting of apprentices and students. We also helped set up education partnerships of 115 different companies with 30 schools in the area. Moreover, we are currently conducting an innovative vocational guidance project in German grammar schools (Gymnasium) which includes guided tours of companies.

Professor Burkhardt-Reich: You organize the business simulation competition „Jugend gründet" which is sponsored by the Federal Ministry of Education and Research and has enjoyed uninterrupted, nationwide success since its introduction. Over the course of one school year students develop an innovative business idea and found their own virtual company which they guide through all the ups and downs of a startup business. You oversee the competition and get to know the teenagers who turn into young entrepreneurs for the duration of the competition. What would you say is the biggest difference between these young entrepreneurs and the „real-life" managers later on in life?

There aren't that many differences. The participants of „Jugend gründet" identify closely with their business idea, inspire the jury with their presentations and are often really good team players. As the competition progresses they acquire business acumen and hands-on skills while also experiencing the joy of making independent decisions and creating freely. Unlike established managers the students and apprentices think more freely – unrestrained by business limitations – and can therefore develop innovative ideas and turn those into business ideas. The teenagers' innovative strength fascinates us year after year. Their ideas range from automatic teeth-cleaning systems to wheelchairs that can overcome stairs and a CSR marketing concept for team-building exercises in orchards. In the future we want focus on this even more. We're convinced that these teenagers can come up with the innovative answers that companies are looking for in the future.

Willy Brandt once said that the best way to predict the future is to create it. What challenges do you foresee for your center and what goals do you have?

We've proved that we shape the future over the past twelve years: with new products and projects, but more than anything else by identifying with the tasks we've taken on in our Steinbeis Center and by pushing developments ahead passionately. We've also been successful in putting together a great team and in convincing customers and the government authorities of our worth. Building upon this we will develop new products by remaining in constant dialog with customers and project clients. Our goal is moderate, continuous growth. The two areas we work in enrich and complement one another excellently leading to a constant stream of new opportunities which we will seize.

Steinbeis Transfer Center for Business Development, Pforzheim University

Directors: Prof. Dr. Elke Theobald
Prof. Dr. Barbara Burkhardt-Reich

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Phone: +49 7231-424460 | E-mail: su0587@stw.de

Services

The team of 15 offers products and services for a variety of target groups:

- For students, teachers and educators with an interest in vocational guidance at schools, business education at schools and the promotion of entrepreneurship in the education system: consulting, business simulations and e-learning modules
- For women in senior management positions: internet platforms and e-learning modules
- For SMEs and large companies: consulting and implementation of marketing intelligence solutions
- Marketing communication and online marketing: support of companies and public institutions concerning communication planning, implementation of communication campaigns, set up as well as maintenance of internet platforms

Key Areas

- Schools and businesses
- Entrepreneurship education
- Vocational guidance in schools and educational institutions
- Women in senior management positions
- Marketing intelligence and MANAGEMENT MONITOR
- Online marketing
- Marketing communication

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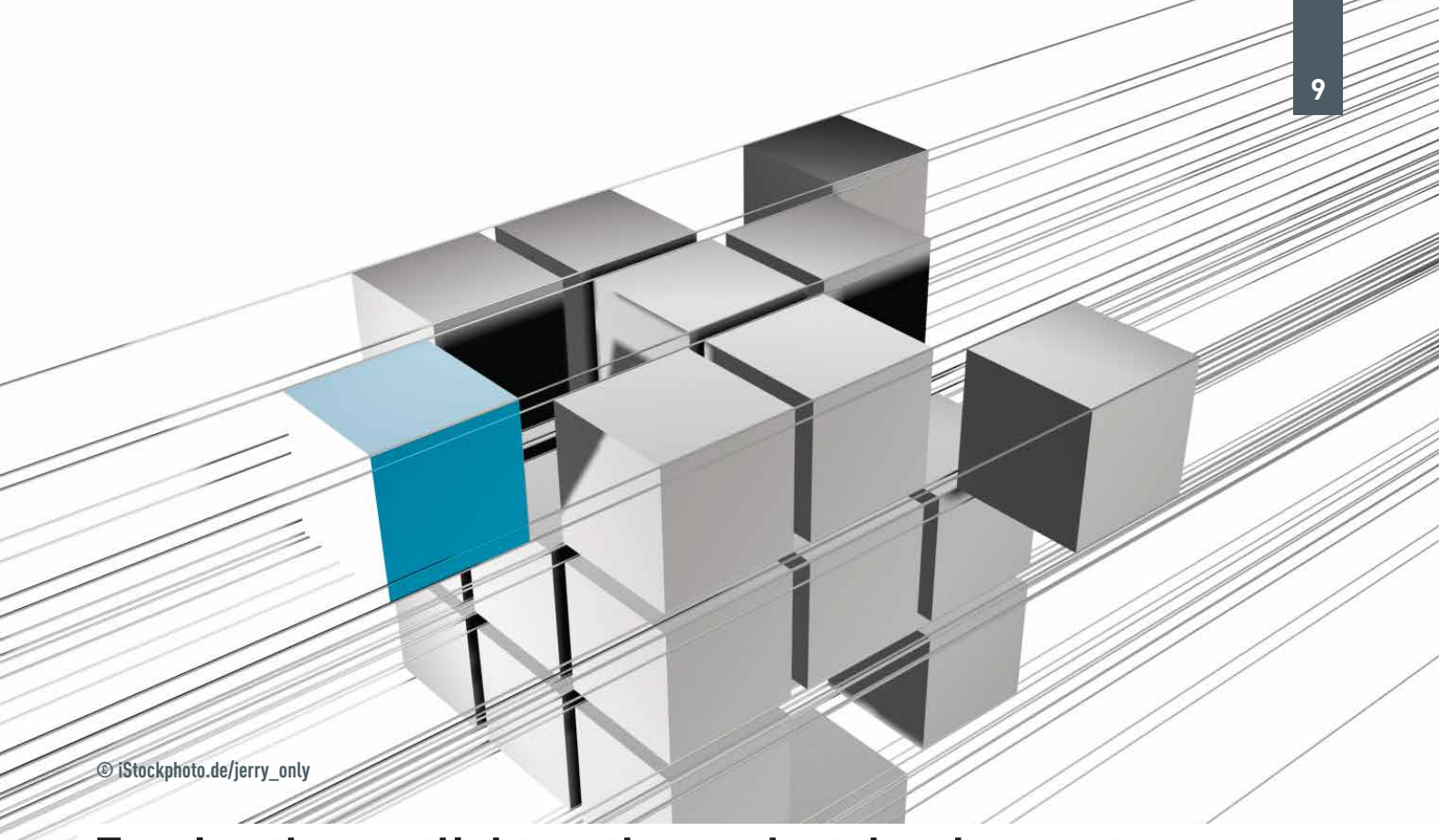

Turning the spotlight on the product development process

Steinbeis publishes study on product development at manufacturing companies

Products are becoming increasingly complex, not only in terms of function but also in terms of the requirements they have to fulfill in global mass production. Short market cycles, converging technology and cutthroat price competition are also forcing businesses to develop new and successful products on increasingly tighter deadlines. For companies, a successful product development process (PDP) is an important foundation for maintaining a competitive edge and adapting to future market conditions. A consortium of experts formed by centers in the Steinbeis Network has now analyzed the PDP as part of a new study that was presented at the Steinbeis Engineering Day (see also page 20).

In the study, the Steinbeis experts examined the conditions needed for the PDP to succeed at a manufacturing company. By identifying and analyzing problem areas, key success factors and potential solutions in the product development process, businesses can uncover hidden potential and put this potential to use. The Steinbeis Engineering Study provides basic advice on how to meet current challenges successfully.

One of the findings of the study was that many problems encountered in the PDP stem from the way people work across departments. For example, although 80% of the respondents believed that communication within departments involved in the PDP was good, only just over 40% of respondents said the same about communication between departments. Even communication with third-party business partners was given a higher score than communication between departments. Another finding clearly indicated that product managers involved in the PDP play a significant role as "promoters". In the future, the involvement and qualification of product managers at small and medium-sized companies will be a key challenge.

The results of the study have been documented in two publications, both issued by Steinbeis-Edition. Part 1 contains a detailed analysis of the survey findings, complete with the topics and issues raised by telephone interviews. The aim of this part is to point to unused potential in product development and make proper use of it. The Steinbeis-Europa-Zentrum was responsible for designing the study, running the questionnaire, conducting the in-depth interviews and subsequently analyzing the results. It also wrote a summary of Part 1 of the study. Part 2 draws on some of the issues in the product development process, analyzes these and adds specific solutions developed by the experts from Steinbeis. The reader is also provided with methods, materials and tools that can be adjusted to the in-house PDP as required. This part of the study was pulled together under the leadership of experts at the Steinbeis Transfer Center for Production and Management and the MIT Steinbeis Transfer Center (Management - Innovation - Technology).

Both publications are free and can be ordered by writing to edition@stw.de.

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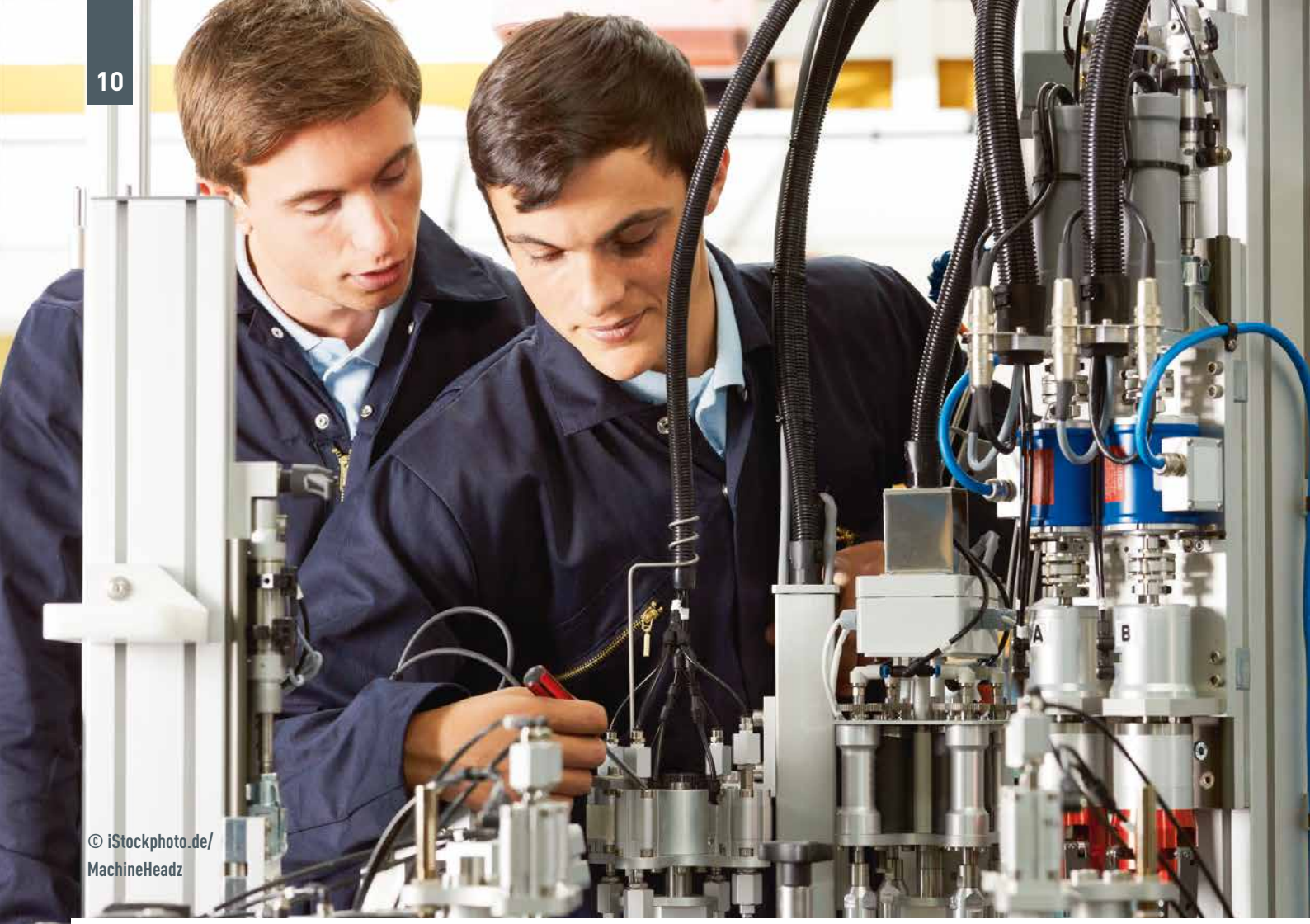

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Corporate Vocational University: Aligning skilled labor qualifications with the needs of multinational manufacturers

Research at Steinbeis University Berlin

For multinational manufacturers with production sites in all corners of the globe, qualified skilled labor represents a critical success factor. Though novel manufacturing technologies are now available at locations anywhere in the world, many countries find they have a skilled workers shortage. Getting the right people to work correctly and efficiently in manufacturing facilities is no easy task. Not all countries have national education systems that fall in line with internationally comparable training standards to meet the demands of companies. As a result, companies have to think of approaches that go beyond proposed state and institutional models. Thomas Eichberger has concentrated on this issue as part of his doctoral work at Steinbeis University Berlin. He has researched the global availability of skilled labor with comparably good qualifications for multinational manufacturers.

In an empirical study, Thomas Eichberger researched the needs of companies and of potential candidates seeking qualified training. Based on his findings, he developed a concept for internal company training measures for skilled workers. His idea? A "Corporate Vocational University".

Productivity, quality, costs, flexibility, innovation – these are the typical keywords ascribed to the standard repertoire of every manufacturer. Increasing globalization, as well as ever-shorter product life cycles for increased product variants and shrinking batch sizes, are the challenges that companies must face if they are looking to survive and thrive in international competition. This production strategy is a key element of the overall business strategy of multinational manufacturers. Companies are always looking for ways to efficiently network their manufacturing locations in order to make the most of possible synergies. This is because, in contrast to products, manufacturing know-how cannot be readily copied by the competition. So it can present companies with a real competitive advantage.

Labor costs are one criterion in the selection of manufacturing locations. However, the wage disparity between industrialized countries and so-called low-wage countries is shrinking.

But even customer demands have changed. These days, customers expect the highest quality at the lowest possible price and maximum flexibility, even for consumable goods manufactured in batches of millions of units. One way to try and meet these demands is through the imple-

mentation of innovative manufacturing technologies that offer a high degree of automation. Machinery and processes can be made readily available in Asia, the U.S., Latin America and Europe. The difference lies in the effectiveness and efficiency in their handling. That is, it ultimately depends on the qualifications of the operating staff. In comparison, automated manufacturing calls for fewer workers, but these workers must be capable of handling the technical systems involved. To meet this need, companies are looking for sufficiently qualified skilled workers on a global scale, particularly in commercial, manufacturing-related fields. In terms of management, the leadership levels at international companies have long achieved parity. But this is distinctly different when it comes to the professional level of the skilled workforce. The competence levels for completing comparable tasks varies greatly across the manufacturing locations, a byproduct of globally varying educational systems. Multinational manufacturers, however, would like a more balanced level of know-how across global production sites.

Thomas Eichberger's empirical research covers three main questions: What significance is given to worldwide access to skilled labor, particularly with respect to the global manufacturing strategy of companies? How do multinational manufacturers and potential trainees envision internal company training programs for skilled workers? And how would such a concept be established in the form of a "Corporate Vocational University", in order to meet the needs of both target groups?

Companies regard skilled labor qualifications as a key success factor. The research shows that 87% of the companies questioned do not deem current vocational training systems suitable for meeting the global demands for a skilled workforce. 69% of the company experts see this as having an adverse effect on the implementation of their global manufacturing strategy. It is also interesting to note that 60% of these company experts do not assess the wages and social status of skilled workers as sufficient within the company.

Companies expect an internal company training program to promote the social and intercultural competence of its trainees. From the onset, potential trainees ask for transparent development perspectives and a higher appreciation of their vocational training in comparison to academic qualifications. It would be particularly interesting to research how different training program formats might influence the preferences of company experts and skilled workers with respect to the overall training concept. Interviews and group discussions with both experts from multinational manufacturers and trainees were held as part of a pre-study devised to address this aspect. The main study took the form of an online Discrete Choice Experiment (DCE) in which company experts and skilled workers from Germany and the U.S. were surveyed. Participants were presented with pairs of potential program formats from which they could choose their preference. A total of 477 datasets were evaluated. Among other things, the results show that companies and potential trainees, alike, place a high value on the training spectrum covering several qualification levels and also including non-specialist learning content. In terms of delivering the learning content, both target groups prefer more flexibility in the form of additional educational offerings.

The results of the empirical study have served to elucidate the demands of companies and trainees, and have helped to identify how individual attributes of a training program can affect their preferences. The sample training concept of a "Corporate Vocational University", which was developed based on the results of the study, is comprised of the following six components: basic structure and training spectrum, curriculum design, teaching and learning methods, testing and certification concepts, and organization structure and business models. The curriculum design is based on the guiding principle of a "training triad" which places the "practical", "theoretical", and "social" training areas in context and on an even footing. Further guiding principles of a "Corporate Vocational University" are neutral graduate titles such as "Operator", "Specialist", and "Expert" in addition to transparent development paths – both horizontal and vertical. A case study spanning several years would be necessary to investigate whether this model could establish itself in the competition for talented trainees across educational systems, particularly in comparison to traditional vocational training systems. The research project is currently being finalized and includes the core elements of a "Corporate Vocational University" as a recommendation for companies thinking about offering global, internal company training for skilled workers.

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Real-time incident alerts for the Alpine region

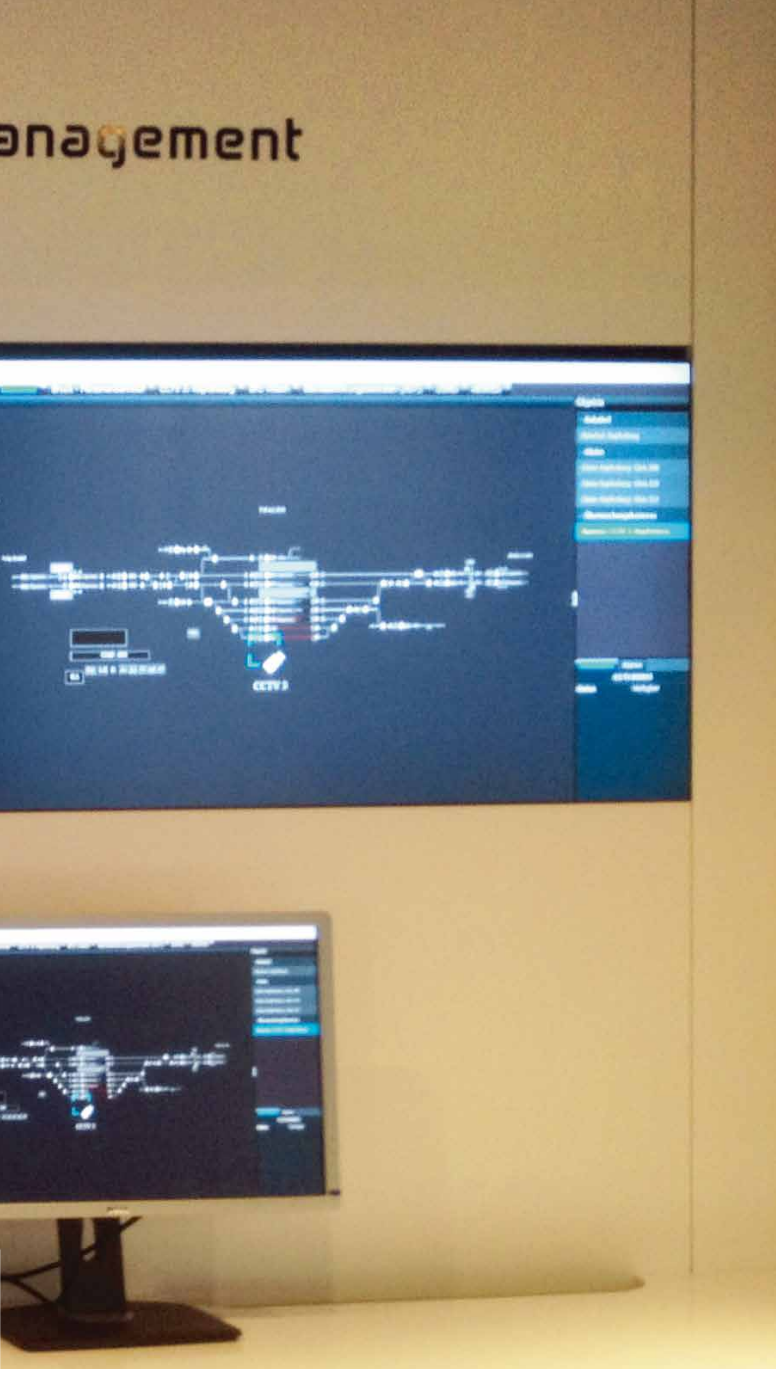
Steinbeis involved in TranSAFE-Alp EU project

Cross-border collaboration on the management of major traffic incidents has always been a challenge for everyone involved, especially in difficult places such as the Alpine region. The transit roads running through the Alps face more and more serious dangers: accidents in tunnels, avalanches, mudslides or flooding – colossal problems that can cripple key traffic routes and cause havoc to road and rail traffic. The Steinbeis Innovation Center for Logistics and Sustainability is a partner in an EU project called TranSAFE-Alp. The aim of the project is to establish a real-time platform to map critical traffic and transportation areas in the Alps.

The goal of TranSAFE-Alp (or in its entirety: "Connecting transport regional networks to security and emergency advanced strategy frameworks of European and Alpine regions") is to provide decision-makers with a software-based decision-making platform to help them quickly manage emergencies and dangerous incidents. The platform should build on previous experience with incidents in the Alps.

The platform will be called JITES (Joint Integrated ICT Technologies for Emergency and Security Management), and when it is ready it will be in a position to capture real-time data on incident-critical transportation routes in the Alpine region. It will then draw on this data to calculate and suggest intervention scenarios. The platform works along innovative simulation lines, taking different factors into consideration such as efficiency, safety and communication, essentially bringing together each regional crisis management plan.

The project involves eleven partners from Italy, Austria, Germany and Slovenia. The project partners from Germany are from the Sinsheim-based Steinbeis Innovation Center for Logistics and Sustainability (SLN), plus the geographic information system (GIS) working group at the University of the Federal Armed Forces in Munich. The Steinbeis center was invited to work on the project to assess the requirements of different user groups while using the IT solution. This was as part of empirical studies which the center carried out in collaboration with DIAPS, the German Institute of Active and Passive Safety. The study involved surveying 47 experts from the different countries in the Alpine region. The largest group within the sample consisted of 27 people working in traffic management, followed by 15 traffic infrastructure operators and 7 people working in civil defense and for rescue services.



The survey found that there are already a number of actors in the Alpine region collaborating on cross-border initiatives. But it also found that there are repeated problems with data sharing because of the variety of interfaces involved. Currently, over 60% of the respondents working in traffic management encounter problems with data sharing. It is therefore important for this group to have interfaces that are compatible with existing technical platforms. Time and again, the quality of data is also proving a new challenge for the people involved. There are sometimes gaps when integrating additional information such as weather reports/conditions and rescue plans for specific incidents.

The potential users of such Web-based platforms are extremely interested in real-time information to support decision-making. The success of the JITES platform will therefore hinge on a variety of factors, such as the compatibility of the platforms already in existence, how up to date they are, and user-friendliness. All factors come together with the new JITES platform.

TranSAFE-Alp

Alpine SPACE
THIS PROJECT IS CO-FUNDED BY THE EUROPEAN REGIONAL DEVELOPMENT FUND
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EUROPEAN TERRITORIAL COOPERATION

Steinbeis Innovation Center for Logistics and Sustainability

Services
- Research
- Consulting
- Implementation plans
- Project management

Focus areas
- Goods transportation
- Logistics
- Sustainability

Project examples
- "Logistics energy efficiency" implementation plan
- Long-term dockland development plan, Rhine River Docks, Karlsruhe
- Setting up of a network of vocational colleges for implementing business projects – sustainability and sustainable logistics in the 21st century
- Action plan aimed at improving the road safety of small transporter vans
- Fundamental research into a dockland concept in Baden-Württemberg
- POSMETRANS – Policy measures for innovation in transport sector with special focus on small and medium-sized enterprises; factors and recommendations for success and sustainability
- ÖKOLOGIK – Ecology, logistics, communication
- Training and continuing professional development of truck and bus drivers to improve road safety
- BLOOM – bite-sized learning opportunities on mobile devices
- Improvement of health and safety at work in ground transportation of goods

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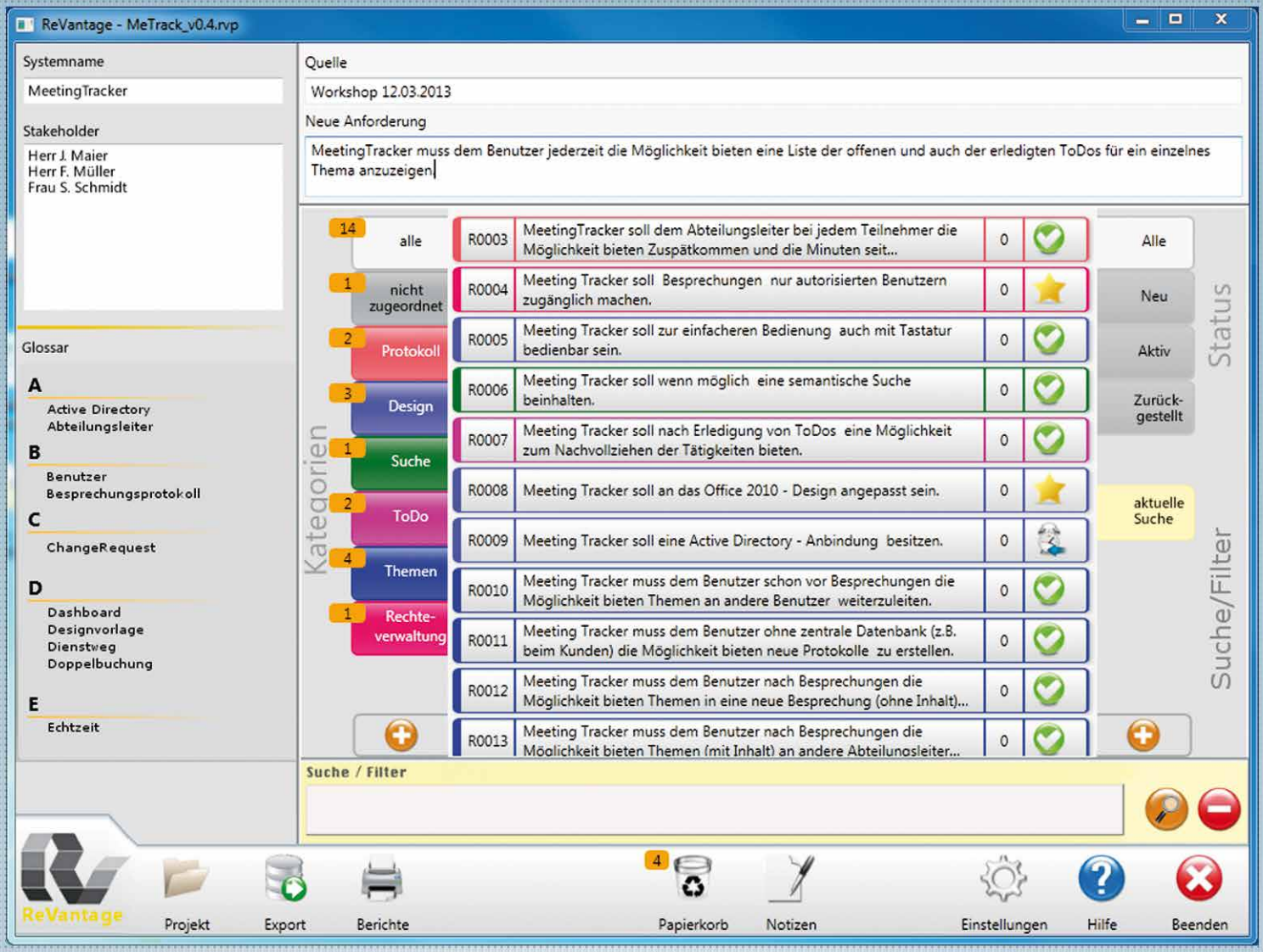

Well and quickly captured

A new software for requirements management with intuitive user handling

Incomplete requirements specifications are often the most significant reason why projects fail. Conversely, accurately defining requirements and strictly managing and tracking them are crucial aspects of successfully implementing a project. The Steinbeis Transfer Center for Microelectronics (TZM) has developed the software ReVantage for Windows. It allows the quick and efficient management of requirements written in natural language.

A lot of companies are interested in solutions for requirements management because they know that it plays an important role in the success of their projects. Despite this, they often rely on simple text and spreadsheet processing applications – like those included in standard office software packages – for their requirements management. This choice is often made for cost reasons, and the known drawbacks of these solutions are taken into account. The ReVantage software developed by Steinbeis experts bridges the gap between market heavyweights like Doors and standard office applications. It does this by combining note tools with requirements management tools. Through its innovative design based on easy-to-use mobile devices, ReVantage sets new benchmarks in terms of user-friendliness and convenience. The intuitive and ergonomic user in-

terface underscores how the software was designed to best support users through quick, keyword entries for requirements.

For example, attendants of a requirements workshop can get started by entering a title or the date of the workshop. They can then immediately begin entering requirements. Each requirement can be prefixed with the name of the originator, ensuring traceability for users. Convenient drag and drop functionality allows users to assign all entered requirements to a freely defined category or to set a status for the requirement. The software also allows requirements prioritization and commenting. If any terms used during the workshop require further explanation, they can simply be added to the integrated glossary.

Requirements are often similar from project to project. The advantage of ReVantage is that it offers users a list of all requirements that have been entered in the past – across all projects – and tagged with a particular keyword. Users can select any desired requirement(s) from a list of stored entries by dragging and dropping it to their current project. In this way, the list of requirements acts as a type of checklist. Most requirements will have been specified and defined after only a few workshops. What's more, with ReVantage, requirements can serve as templates for easy use and reuse. If recorded requirements are deemed irrelevant over the course of a workshop, their status can temporarily be set to "on hold". Requirements can also be moved to the trash and restored from the trash at any time. After the workshop, the user can further develop the requirements by adding more detail. The history of all requirements is automatically recorded, making all changes, dependencies, and refinements traceable at all times.

For better distribution and further processing with other tools, requirements lists can be exported in various formats. They can also be printed as a report. Full text searches and filtering options are also available. These can be set through simple commands in a markup language. ReVantage allows users to enter requirements of any kind, for any industry – regardless of whether they are intended for internal development or for transfer to a supplier or service provider.

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Prof. Dr.-Ing. Heinz Osterwinter

Obituary

Steinbeis mourns the loss of an esteemed member of staff. Prof. Dr.-Ing. Heinz Osterwinter, 55, died last May while hiking in the mountains of South Tyrol. He was co-founder of the Steinbeis Transfer Center for Microelectronics in Göppingen.

Osterwinter enthusiastically embarked on his career as an engineer after earning his degree in electrical engineering at the University of Bochum. Upon receiving his doctorate, he led many projects in research and industry, and was offered a professorship at the University of Applied Sciences in Esslingen in 1990. He soon became actively involved in establishing the university's Göppingen campus, where he taught for the faculty of Mechatronics and Electrical Engineering until his passing.

Prof. Dr.-Ing. Heinz Osterwinter was not only a devoted teacher and researcher. He was also actively involved in technology transfer: In 1991, he co-founded the Steinbeis Transfer Center for Microelectronics (TZM) together with Prof. Dr.-Ing. Jürgen van der List. The TZM supports customers in the field of engineering services for electronics, software, and measurement and test engineering. At the center, Osterwinter was successfully responsible for the departments Assembly and Connection Technologies, Microsystem Technologies, and Circuit Technology. He was a member of both the German chapter of the "ISHM/IMAPS Society" as well as its European umbrella organization, the ELC. Additionally, he served as a part-time lecturer at Steinbeis University Berlin (SHB).

Heinz Osterwinter exemplified reliability and was always ready to help students, colleagues, and customers. He was a man who believed that actions speak louder than words, and thus tirelessly dedicated his concerted efforts to the common good from behind the scenes. His professional skill, dependability, innate ability to impart knowledge, as well as his trustworthy work on the founding of the TZM and the further development of the Steinbeis Network are part of what made Heinz Osterwinter such a highly regarded and greatly valued Steinbeis partner. He will be dearly missed.

Prof. Dr. Michael Auer | Manfred Mattulat
Steinbeis Foundation Board

Training to become an EOL infer:zert health trainer

Certification course at Steinbeis University Berlin

To those affected, burnout syndrome feels like an existential threat. For friends and relatives, it can also be extremely trying. It can create financial difficulties, and for employers it can result in a loss of know-how. There are an extremely high number of people affected by or at risk of burnout. It takes a great deal of skill to deal with the conflict, as well as stamina, sound judgment and an ability to make the right decisions. Taking steps toward prevention is a must. The competence institute unisono, a Steinbeis Transfer Institute, now offers training to become a health coach (EOL) as part of a cooperation agreement with the Institute of Experiential Learning (Institut für Erfahrungslernen) at the clinic in Wollmarshöhe and SHB.

According to the World Health Organisation, the fundamental conditions and resources for health include stable self-esteem, a positive attitude toward one's own body, acceptable social relationships, a meaningful occupation and healthy working conditions. Training to become an EOL health trainer establishes a foundation for a successful career as a health promoter. Participants on the course learn to see health as a personal experience and sharpen their own perception through experiential learning by recognizing individual and collective thoughts, feelings and behavioral patterns. The course spans five training modules each lasting 2.5 days, and covering topics such as successful living, the distinction between health and sickness, "healthy" organizations and the interactions between body, soul and spirit.

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The 2013 Career Prize

The DZ Bank Group bestows award on Andreas Aulinger

The DZ Bank Group career prize awards € 24,000 to the best six "Banking and Finance" theses written for a master's or bachelor's program. An honor is also given for the commitment of the student supervisor. The 2013 prize was awarded to Prof. Dr. Andreas Aulinger.

Andreas Aulinger, director of the Steinbeis Transfer Institute of Organisation and Management at Steinbeis University Berlin, was presented with his prize at the career prize awards ceremony in April. The jury praised his commitment during his supervision of projects at the Transfer Institute. The theme for the awards presentation was "It's a hard climb to the top. We make it worth the effort." This year's prize received 143 submissions.

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Information for the taking!

SHB student develops information portal for musicians from the greater Stuttgart area

The illegal downloading and free sharing of music through the internet has fundamentally changed consumer behavior over the past ten years, bringing the music industry head-to-head against a consistent drop in music sales: Between 1999 and 2011, global sales figures dropped from 26.9 to 15.9 million dollars. Writing good music is no longer enough to survive as a musician in terms of profits – image, marketing, and networking are important factors for success. Most artists haven't "made it" as professionals yet, and they rely on basic funding and essential know-how in getting a start. Steffen Geldner developed the digital information platform "artistguide" as part of his master's studies at the School of International Business and Entrepreneurship (SIBE) of Steinbeis University Berlin. The platform fosters the exchange of basic information related to the music industry.

Steffen Geldner works at the "Popbüro Region Stuttgart", an office dedicated to promoting popular music in the greater Stuttgart area. The Popbüro steps in during the early stages of an artist's development, particularly during market debut. Most of the Popbüro's daily business lies in conveying basic information to artists, and this is where "artistguide" took root. The platform was founded on the vision of contributing to the sustainable advancement of the music industry in the region, providing more information for local artists, and securing financial success for regional music companies. The daily workload of each staff member at the Popbüro will likely be reduced by 20% by offering basic support to musicians online. The project would be considered a success if the monthly site hits reached at least 10,000 after the first year. It is hoped that 50% of these visitors will be from the Stuttgart and Baden-Wuerttemberg regions.

Steffen Geldner guarantees maximum usability for "artistguide" on account of its clear and user-friendly design as well as the high quality of information it provides. Since it is regional, it cannot be confused with other similar portals founded based on the same basic idea. In designing the site, Steffen Geldner placed a lot of emphasis on including regional music artists in the site content. Apart from the actual site programming, everything was done in-house: from web and print design to content editing.

Steffen Geldner uses social media marketing and advertising – primarily through Facebook and Google – in his online marketing campaigns for "artistguide". These marketing measures are supplemented through search engine marketing and optimization, cross marketing, and press releases. Use of Google ads and website optimization for better visibility among user search hits are crucial to this approach. All online activity is supported through print media and the regional dissemination of information.

Site visitor numbers for "artistguide" are currently at 37,000 hits per month, exceeding the original goal of 10,000 by nearly four times. 67.37% of the site users come from Baden-Wuerttemberg. Though queries from musicians coming into the Popbüro reduced only minimally over the course of the project, the staff workload reduced considerably. This is because although the level of questions has increased dramatically, these queries tend to be quick requests for more detailed information. The musicians seem to be much better informed of industry basics thanks to "artistguide". This means that individual artist consultations are more customized and of a higher quality. In more concrete terms: while the number of monthly queries has stayed approximately the same, staff efforts have reduced on average by 13%.

The "artistguide" platform's influence is also reflected in the number of visits to the Popbüro site. The project's profits amounted to approximately €50,000 over its 12-month duration. Add to this the financial and informative value the platform has generated for its users. With "artistguide", Steffen Geldner has shown that institutions without vast financial resources can use their own initiative to fuel their offerings in an exciting way in order to maximize its usefulness in society.

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Usability engineering for mobile business software

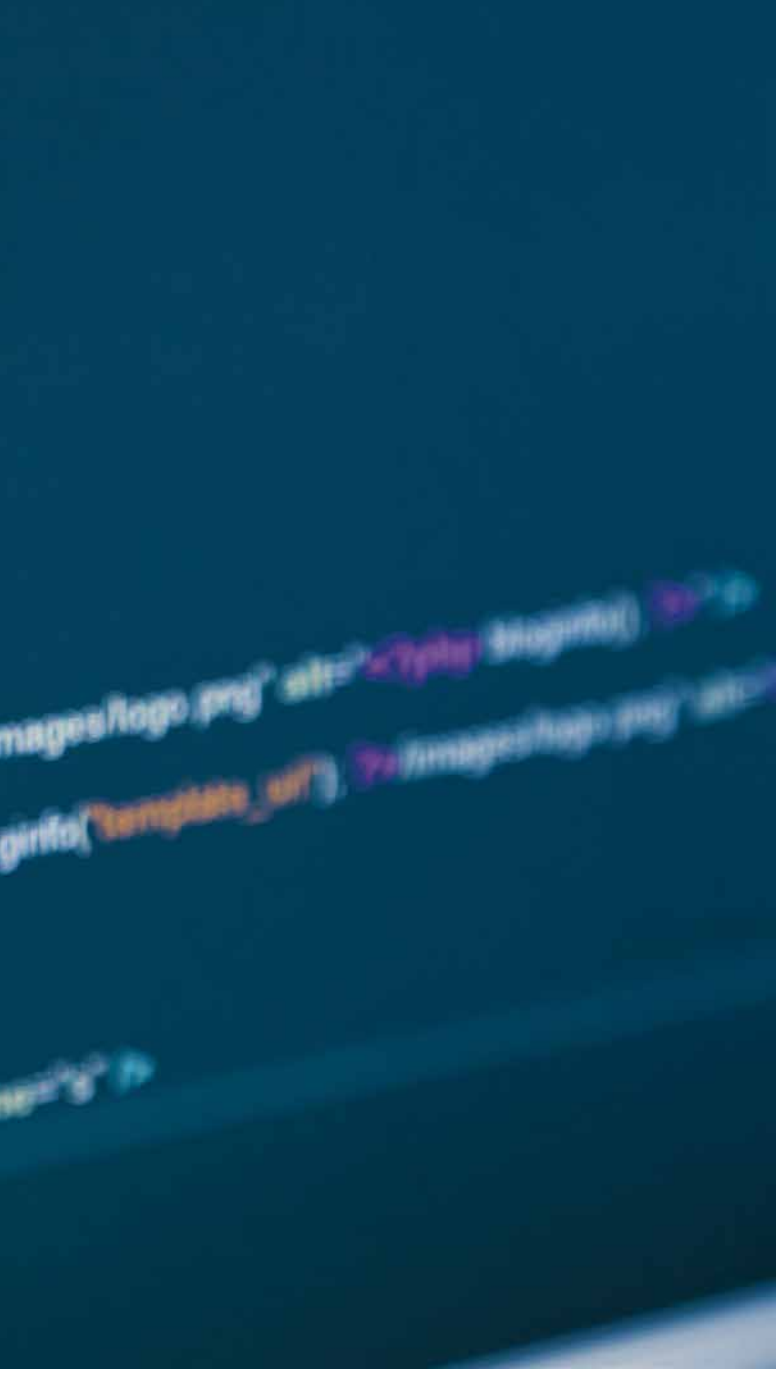
Steinbeis experts establish competence center

Mobile devices are very popular among mainstream consumers and businesses. And the applications for these devices – better known as apps – are judged heavily in terms of usability. If an app isn't user-friendly it won't be used, minimizing its chance to meet the demand for increasing efficiency and effectiveness in a business setting. But the development of applications can be difficult, especially for small and medium-sized enterprises (SMEs) because existing systematic approaches are "oversized". A new development method is now being engineered within the scope of a research project sponsored by BMWi. The "Competence Network Usability Engineering for Mobile Business Software – by SMEs for SMEs (KMUsability)" is aimed at offering a suitable development method to SMEs, one that doesn't approach mobile software development as a purely technical discipline, but rather integrates usability engineering into the process. Within the scope of the project, the Steinbeis Transfer Center for Usability and Innovative Interactive Systems for Information Flow (UIIS) is establishing a competence center in the area of usability engineering for mobile business software in Karlsruhe. Through its experts, the center brings 15 years of experience in the field to the project.

Neither current software engineering methods nor current approaches to usability engineering are sufficient to SMEs for implementing useable mobile solutions. What SMEs need are suitable processes based on practical templates and useful information services. This would effectively support usability engineering. Mobile business software systems are increasingly showing themselves as viable, even for small and medium-sized companies, as a great way to integrate branch office staff into the organizational information chain.

Implementing the method developed through the project "KMUsability" should lead to the development of competitive, user-friendly mobile products that prove financially beneficial to both the manufacturers and the SMEs using the product. The KMUsability project is a key sponsorship area of "SME Digital" (German: Mittelstand-Digital), an initiative of the German Federal Ministry of Economics and Technology to promote the development and broad-based utility of ICT applications in SMEs and skilled trade.

In terms of usability, peculiarities of mobile software systems have ultimately led to project failures in the past. To achieve optimal "ease of use", the developed mobile software must be optimized to "minimal deviations", and this can only be achieved in real-life situations through



active users and early adoption of the software solution or its prototypes. To bridge the knowledge gap between the developer (who knows the technical possibilities) and the user (who knows the specific requirements), only iterative processes are considered. Initial prototypes are used to give even non-technical users an overview of the technical potential and stimulate their creativity. At the same time, existing interaction concepts need to be adopted from the user domain, to show ways in which the mobile solution can be used. Basing the interaction concept of the app on existing platforms means users have a lower learning curve and platform-independent "user experience". To achieve a maximum of expected conformity, the developers of mobile systems have to have access to this user experience themselves, and they must be able to make comparisons to other, similar platforms. If this is not the case, development projects result in applications that are technically functional, but which do not exploit the full potential of a given platform or offer a recognizable look and feel of the software product. Ultimately, the locations in which the mobile systems are to be used need to be structured, comprehensively analyzed, and documented in order to derive important usability criteria for the development of the solution. Possible security breaches by third-party users of the system must be anticipated and blocked by the application.

The consortium of the KMUsability project is made up of research partners (FH Aachen), industry partners (CAS AG, cluetec, GRÜN Software AG, Yellowmap) and supporting players (German Association of Small and Medium-sized IT enterprises). The Steinbeis Transfer Center for Usability and Innovative Interactive Systems for Information Flow in Karlsruhe bundles methodological competence and also develops target-group-oriented training courses and services related to all aspects of usability engineering for mobile information systems. Key areas for training courses and workshops in the area of mobile business software include usability methods, integration of prototypes and multiplatform development.

The KMUsability project is part of the sponsorship program "Simply Intuitive – Usability for Small and Medium-sized Enterprises". The program is sponsored within the framework of the initiative "SME Digital – ICT Applications in Business", a program funded by the German Federal Ministry of Economics and Technology. The aim of this sponsorship is to promote the use of modern information and communication technologies (ICT) in small companies and skilled trade businesses. "SME Digital" is an amalgam of several sponsorship initiatives. This includes the "eCompetence Network for Business" along with its nearly 40 eBusiness guides, "eStandards: Standardizing Business Processes, Guaranteeing Success" and its eleven sponsorship projects, and "Simply Intuitive – Usability for Small and Medium-sized Enterprises" and its ten current sponsorship projects.

Mittelstand-Digital

Gefördert durch: Bundesministerium für Wirtschaft und Technologie aufgrund eines Beschlusses des Deutschen Bundestages

Criteria for the development of mobile business software systems

1. Compared to software for stationary systems, mobile solutions require a lot less attention.
2. You reach user groups that haven't previously been reached or have only been minimally affected by office automation (i.e., tradesmen, nursing staff, etc.). Their user domains are generally foreign to software developers who are prototypical office workers.
3. There are a number of mobile platforms, all with their own approach to user interaction.
4. The systems are implemented in changeable locations with varying user contexts (light, noise, networks, etc.).
5. Mobile applications are usually implemented in a third-party infrastructure (such as UMTS networks).
6. Mobile end devices are often fitted with sensors (camera, GPS, etc.) or with actuated sensors.

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Systems.Methods. Added Value.

175 people attend the 2nd Steinbeis Engineering Day

Don't just keep up with the competition, outrun them – this goal was underscored once again at the 2nd Steinbeis Engineering Day, which took place in Stuttgart on April 17 of this year. Delegates were provided with valuable suggestions and practical solutions, arming them with ideas for making further improvements throughout the entire production development process. As well as presenting the 2012 Steinbeis Engineering Study, experts from the Steinbeis Network met with representatives of business partners to discuss their experiences.

As we compete with the best, we're less likely to risk falling behind in terms of technology than we are to "get bogged down" in less effective organizations. Companies that become leaner, but fail to prepare for new growth, create an organization engaged in "naval gazing." This is not the way to win the race for the future! This was the clear message of a speech given by Prof. asoc. univ. PhDr. Arno Voegele (Steinbeis Transfer Center for Production and Management). The ability of a company to adapt must therefore match the speed of change in the business environment. But an individual can ultimately only "be innovative" or assume responsibility, by not only possessing the undisputed specialist qualifications it takes, but also by receiving the right training. Knowledge in itself is not enough. Rather, the sharing of knowledge to foster competence engenders "strength across the board." Knowledge relating to the skills of a company adds value; knowledge management generates added value, which benefits the company.

How do successful SMEs also win in a market characterized by challenges and problems? Can previously proven product development processes (PDPs) continue to succeed in the future? Christian Albrecht (Steinbeis-Europa-Zentrum) presented the results of the Steinbeis Engineering Study on the PDP. The results demonstrated, from a number of angles, the strengths of SMEs, but also the areas in which they struggle (see also page 9).

Deluges of new product variants and models, plus the drive to shorten innovation cycles, have resulted in development departments having to deal with more and more projects and new initiatives. Dietmar Ausländer (Steinbeis Transfer Center for Logistics and Factory Planning) used a best practice case study to demonstrate how companies can meet this huge challenge. In a case study, the company's holistic approach to change management – using value streams and maturity models – resulted in significant improvements. These included faster development projects, higher output from the development department (stemming from improved organization and work coordination), and smooth integration of sales/customer feedback into development work and launch management.

A speech by Prof. Rainer Göppel (Steinbeis Transfer Center TMS Management Systems) demonstrated how companies can plan and successfully implement selected engineering methods. The result can be more systematic procedures and transparency while working through the tasks of the PEP. Three factors in particular create the necessary basis for this: the selection of the right methods for that specific company, choosing the right time to implement those methods, and coordinating how results generated by the methods are put to use.

Knut Hoyer (Testo) showed a holistic approach used in the PEP to develop modules "decentrally," i.e. across different divisions. More than ever, products now have to answer increasingly differing customer requirements. This leads to more variants and product variety, which can only be addressed with adaptable product platforms specifically designed to provide a tool kit for all future products. This can reduce average development outlays per project, and the resources this frees up can be channeled into the development of new applications and innovations. It is not enough for companies to rely on the conventional reutilization of components or on simple module libraries. Organizational structures and working methods also have to be adapted.

The energy sector is a relatively conservative market that takes a severe hit when systems fail. As a result, the emphasis lies in tried-and-tested products with guaranteed long-term compatibility and spare parts for decades. This was a point underscored by Dr. Michael Zerrer (Pfisterer Kontaktsysteme), and it is a particular challenge in product development. For example, adaptable yet uniform processes are needed for a broad spectrum of products or projects. A 5-stage model has proven valuable: from the preparatory phase until pilot production, with approvals at the end of each phase. Being adaptable means, for example, no detailed subdivision of small projects, which only need one round of approvals.

Zerrer's conclusion: The PEP must allow for some adaptability, it must be possible to compare the project plan with PEP milestones, and project progress must be measurable and controllable through monitoring instruments.

Friedrich Obermeyer (Zeitlauf drive technology) showed how long-term research partnerships can fuel continual advances in innovation, drawing on the example of the development of a new crown wheel drive. If a company is short of resources in product, process and technology development, it has no choice but to collaborate with professional partners to translate its ideas into reality and launch them in the market. After several years of development, collaboration with business partners and universities made it possible to launch a well-received "novelty" successfully. The innovation is still going strong through this collaboration and is being continually updated with new technology modules. Quick developments and quickly implemented innovations are rare. What is more is important is to approach the development of innovative processes and products single-mindedly and with perseverance.

Many core processes (such as production development and production, but also the peripheral support processes that these require) have been cast in stone by companies – mainly due to ISO standards. In the experience of Prof. Dr.-Ing. Günther Würtz (Steinbeis Transfer Center: Management – Innovation – Technology, moderator for the day), these are insufficient on everyday tasks if companies want to improve efficiency and effectiveness. Instead, engineering projects should be carried out according to routine, standard processes.

The engineering part of the PDP covers a broad spectrum of activities, from product portfolio planning to design, development, production planning, materials management, production, assembly, pilot production and technical sales, extending all the way to the market or client. According to Prof. asoc. univ. PhDr. Arno Voegele, who summarized the day and presented an outlook, this demands modern methods and approaches, since even excellently engineered products can be copied. So it is increasingly important for companies to gain a decisive edge through process excellence. The focus on processes in the provision of products will become a key factor for market-oriented business organizations. The outcome must be a significant improvement in productivity and efficiency, as well as more powerful organizations. To make possibilities a reality, companies must continually attempt the impossible. Money and strategy are a key prerequisite of innovation, but success stems from the people.

The next Steinbeis Engineering Day takes place on April 15, 2015 in Stuttgart. To find out more, go to www.steinbeis-engineering-forum.de.

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Successful commitment to transfer

Steinbeis financial results 2012

"Continuing success" summarizes succinctly the message presented by Prof. Dr. Michael Auer and Manfred Mattulat, board members of the Steinbeis Foundation, to the Foundation board of trustees in April. What started out 30 years ago as 16 technical consulting centers at Baden-Wuerttemberg universities of applied science subsequently laid the foundations for the "Steinbeis success model" and by 2012 had evolved into a network of 918 enterprises. Dr.-Ing. Leonhard Vilser, chairman of the board of trustees, thanked all employees in the Steinbeis Network on behalf of the whole committee for their commitment over the past year.

There were 918 enterprises in the network in 2012. These span all Steinbeis Enterprises (SEs). Depending on the specialist discipline and the focus of work, these SEs employ experts in either legally dependent Steinbeis Transfer Centers, Steinbeis Research and Innovation Centers, Steinbeis Consulting Centers, Steinbeis Transfer Institutes or companies of an independent legal nature. The Network also includes Enterprises operating under franchising arrangements or minority shareholdings. In 2012, 101 new Enterprises joined the Steinbeis Network. The majority of SEs are managed by staff at the universities, universities of applied sciences or research institutions.

With services in research and development, consulting, training and employee development, and evaluation and expert reports, Steinbeis Enterprises achieved a total turnover of 141 million euros in 2012. This success is thanks to the commitment of over 6,000 employees. The Steinbeis projects conducted in 2012 involved 1,572 employees, 752 professors and 3,697 independent contractors.

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Costing individual items

Steinbeis helps develop a new cost index

In March of this year, VERSA, the German consolidated freight transport association, introduced the first "cost index for system-based consolidated freight transport." This index will replace "house-to-house proposed tariffs" based on recommendations made by medium-sized businesses. On the one hand, these prices were proposed by third parties for business services, but they were regularly much lower than needed due to margin effects. On the other, there were major problems with the pricing system, primarily because processes were ignored. Professor Dr. Dirk Lohre, director of the Steinbeis Consulting Center for Transport and Logistics at Heilbronn University, provided scientific input on the design of the index.

The new cost index is based on the process of general cargo service provision and can basically be applied to all kinds of tariff agreements. To arrive at a price, key cost categories were defined and distributed according to each process required to dispatch consolidated freight. Toll charges were deliberately not included due to the nature of the system. The result: Between 2011 and 2012 the cost of a consolidated freight consignment rose by 3.37%. Within individual categories, staff costs rose by 3.03%, fuel costs rose by 4.50% and material costs rose by 3.29%.

The benefits of the cost index are totally apparent as it makes it possible to refer directly to individual company pricing structures. This was impossible with previous proposed tariffs. Cost trends captured by the index will also make it easier to find one's bearings during price negotiations.

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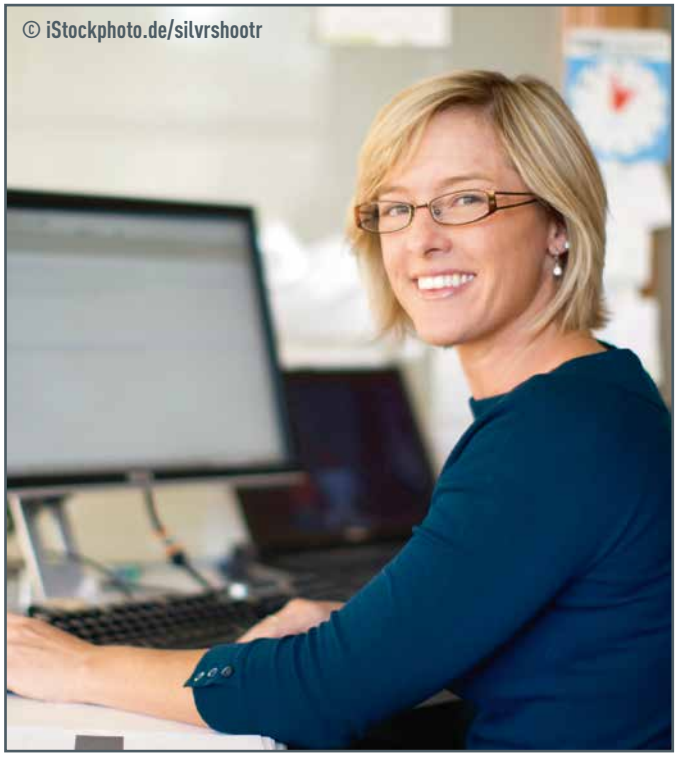
Certified job coaching

Steinbeis helps mothers return to the workplace after maternity leave

For three years, the Steinbeis Consulting Center for Systems – Projects – Potentials accompanied mothers returning to work after a break to look after children. This was part of a model program developed on behalf of the Federal Ministry for Family Affairs. Another success: Four out of five women returned to work!



The plan is to build on this momentum. The District of Böblingen has now asked the two consultants, Verena Burgbacher and Heidi Boner-Schilling, to keep supporting men and women during the return-to-work phase after caring for children or loved ones. A follow-up program is also being provided by the Stuttgart Employment Agency. Women can register with the agency and receive certified coaching through the VIVA WORK program at the Steinbeis Consulting Center in Böbligen.

The joint project has been running successfully for years due to the collaborative efforts of the municipal authority, the local employment agency and Steinbeis, and it is carrying out important groundwork to mobilize "hidden reserves" of highly qualified women. Verena Burgbacher and Heidi Boner-Schilling are providing support to women and men with know-how and ideas developed in-house over a number of years. "There are parallel systems here, the family and work, and the complexity of each has to be understood in order for them to be reconciled," explain the Steinbeis experts. Their success lining up work in recent years shows they are right.

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Patent law dimension

7 criteria

e.g. regional validity of patent, remaining patent term, document status

Market dimension

11 criteria

e.g. marketing options, substitution products, achievable selling price, market growth rate

Technology dimension

14 criteria

e.g. technological uniqueness, technological advantage, known patent breaches, marketing value of technology

Financial dimension

6 criteria

e.g. development costs, production costs, profit contribution

Qualitative valuation

Uncovering hidden treasures, trimming the fat

Steinbeis Transfer Center develops an innovative system for evaluating patents

Patents can be used by their owners, or sold, or licensed to others. Alternatively, they can be used as a credit guarantee. Patents exist not just to protect companies against competitors. They are also a suitable instrument for generating sales or simplifying access to much needed funding. But it is important to ascertain whether the costs of upholding patent protection outweigh tangible benefits. So it is important to place a value on patents. The Technology Evaluation and Innovation Consultancy (TIB) is a Steinbeis Transfer Center now offering a patent evaluation system that makes it possible to place concrete value on a patent in a clear and understandable manner.

Just like the "network for market and technology assessment system" already offered by the TIB, which began operating 16 years ago, the newly developed patent evaluation system can also be used for company financing purposes. In fact, it can actually open the door to funding. It is important that people with little or no knowledge of patents are given a clear and understandable assessment of a company's property rights and that they gain appreciation of their true value. The new system draws on the experience gained by the Steinbeis Transfer Center while working on projects for the DIN 77100 standards committee ("Patent Evaluation – Principles of Monetary Patent Evaluation"). The aim is to achieve the best possible quality when assessing patents.

The following example shows how the system works in practice. Adaptonics International asked the TIB Steinbeis Transfer Center to assess part of its patent portfolio. The company develops and produces innovative adaptive systems used to reduce structural vibration and noise. Its solutions are used in places like airplanes, aerospace systems, tooling machines and cars. The company required a quick patent evaluation by an objective expert to make it easier to gain access to funding. After a detailed initial consultation and assessment of the patent, the TIB was asked to conduct an official evaluation.

The patent evaluation experts carried out detailed research and added their own information on patents, drawing on available data from companies. After sifting through the information and structuring it, the TIB Steinbeis Transfer Center made use of its specially developed patent evaluation system. A patent evaluation is broken down into two parts. In the first part, the quality of the patent is determined by assessing four dimensions. In the second part, the monetary value of the patent is determined using suitable evaluation techniques, which typically involve qualitative aspects, as these are an important part of patent value.

The results of the evaluation were handed to the client in a comprehensive report. Close collaboration with the Steinbeis experts allowed Adaptronic International to ascertain the value of its patent portfolio quickly through an independent source, and this became part of the funding application. According to Harald Breitbach, CEO of Adaptronic International, collaboration with Steinbeis went extremely well: "The feedback from banks and funding providers on the patent evaluation provided by the TIB Steinbeis Transfer Center was consistently positive. It is clear, well laid out and easy to understand."

Apart from using patents to secure credit or gain access to funding, a company can use patents as a clear indication of its ability to innovate – given an independent assessment, patents say a lot about a company's dynamism. A patent evaluation is also useful for defining or checking the suitability of licensing arrangements during contract negotiations. It also makes it possible to monitor patents and gain an independent estimate of the cost-benefit ratio. This can help hedge against the risk of using urgently required resources to keep patent protection going, even though it is actually no longer needed – resources that would otherwise be unavailable to develop new products or business interests. The patent evaluation system offered by the TIB Steinbeis Transfer Center is therefore a useful instrument for companies to uncover hidden treasures and can help pinpoint out-dated property rights – and thus trim the fat.

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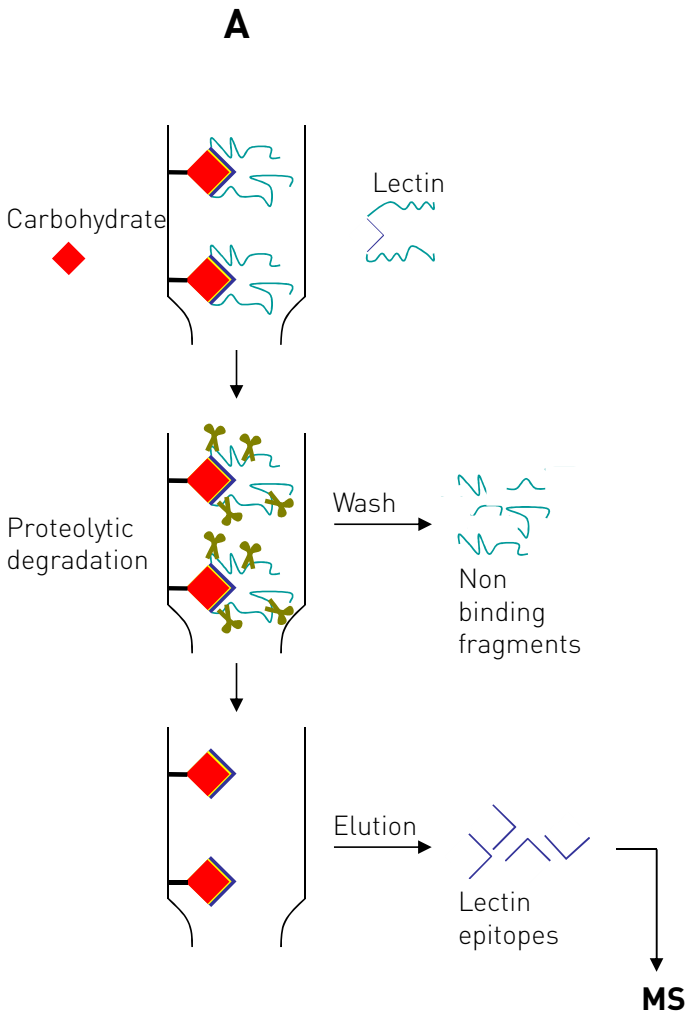


(A), Analytical concept of proteolytic excision mass spectrometry (CREDEX-MS) for identification of carbohydrate-ligand-binding peptides [2]. (B, C) MALDI-MS spectrum of the elution fraction of the CREDEX-MS experiment with lactose and galectin-3 and identification of lactose-binding peptides, as well as the X-ray crystallography structure for comparison. The crystal structure (PDB files 1W60 and 1A3K) shows the identified peptides (in red) and the amino acids in direct contact with the lactose.

New routes to biologically-inspired peptide active ingredients

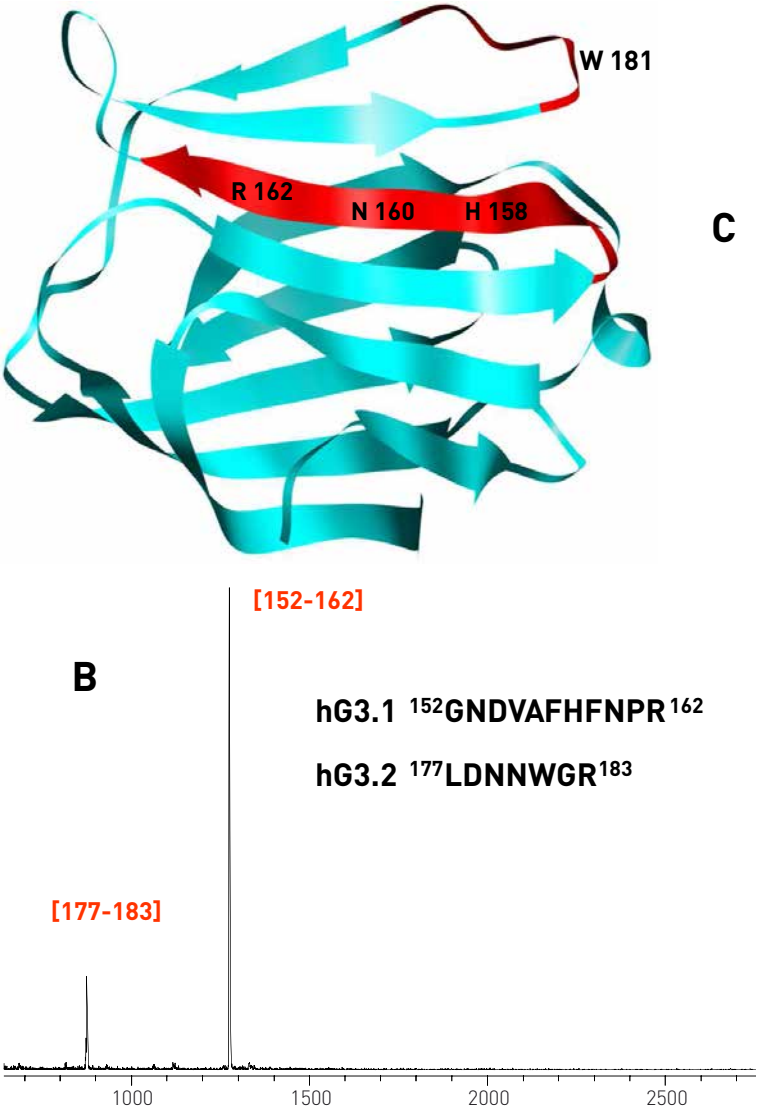
Steinbeis team develops procedure to identify carbohydrate-specific lectin peptides at the molecular level

Glycosides are formed when carbohydrates are bound to non-sugar molecules such as proteins by specific enzymes (glycosylation). Glycosylation is extremely common, and over half of all proteins are glycosylated. Protein-carbohydrate interactions are among the most important biological interactions involved in recognition and signal transmission on cell surfaces, in cell membrane transport processes, in infections, and in tumor cell metastasis. A number of carbohydrate-binding proteins act as starter molecules for investigating and designing peptides as new active ingredients, such as antitumor agents. The team of experts at the Steinbeis Transfer Center for Biopolymer Analysis and Biomolecular Mass Spectrometry at the University of Constance has developed a new method called CREDEX-MS ("Carbohydrate REcognition Domain EXcision – Mass Spectrometry") to identify these kinds of biologically inspired biomolecules.

CREDEX-MS combines enzymatic proteolysis with mass-spectrometric identification of the specific affinity-bound peptide fragments of a carbohydrate-binding protein. The Steinbeis team used it to identify the exact carbohydrate-specific binding epitope peptides in galectins, which have an antitumoral effect. This procedure makes it possible to determine peptide biomarkers of lectins at the level of molecular binding sites from very small protein quantities, as a basis for developing new antitumoral peptide agents.

The wide-ranging biological functions of protein-carbohydrate recognition processes harbor significant potential for medical applications [1]. One example of this: the interactions of galactosides – glycosides that contain galactose – which are important binding partners for endogenous lectins due to their strategic location on cell surfaces and their major role in cell-cell recognition. Beyond their function as glycol-biomarkers, galactosides are also important bioactive ligands for the development of lead compounds for new lectin-based carbohydrate active ingredients. Galectin-1 and galectin-3 (Gal-1, Gal-3) are two of the best-known human galectins, and their functions include acting as cell effectors in cell cycle control and as prognostic factors for the spread of tumor cells in tissue. As such, the identification and availability of peptides that imitate the specificities of galectins could enable the development of diagnostic tests to prove the presence of malignant processes. Consequently, designing biologically-inspired peptides that imitate the binding site(s) of a receptor is an area of growing focus.

(152-162), (177-183) Lactose binding sites



How does the CREDEX-MS procedure identify carbohydrate-binding peptides? In an experiment (called "excision"), the Steinbeis experts immobilized lactose (a disaccharide comprised of galactose and glucose) on a gelatinous solid carrier (Sepharose 4B). 50 µg of galectin-3, which regulates human growth, was then bound with 200 µL of the resulting affinity matrix. The lectin recognizes and binds the lactose to form a complex. Excess lectin and non-binding material (impurities) were removed by washing. This was followed by proteolytic degradation of the affinity-bound Gal-3 lactose complex by trypsin. The parts of the lectin bound to the sugar are protected from the degradation by trypsin and remain bound, including after washing. The non-binding trypsinized peptides were completely removed by washing. The remaining affinity-bound peptide fragments were detached with lactose or a suitable organic-water mixture and analyzed via MALDI mass spectrometry. The MALDI mass spectrometry showed the presence of two specific peptides, hG3.1 (Gal-3(152-162)) and hG3.2 (Gal-3(177-183)), which contain all of galectin-3's main lactose binding sites and thus represent the biologically active sequences of lectin, in full agreement with the X-ray crystallography structure of the Gal-3 lactose complex (see Fig. 1 B, C) [3]. Lactose binding experiments with the synthetic peptides hG3.1 and hG3.2 fully confirmed the binding specificity [3]. It is of particular interest that the synthetic peptide ligands are shown to specifically inhibit binding of galectin-3 to tumor cell surfaces. In recent experiments, the CREDEX-MS method has already been successfully applied in a series of lectin carbohydrate complexes: in all cases, specific bioactive peptide ligands were identified, in most lectins without the structural data of the carbohydrate complexes being known.

The results so far clearly demonstrate the potential of the CREDEX-MS method to directly identify bioactive peptides through proteolytic excision with minimal quantities and only low purity requirements for carbohydrate complexes. The peptide sequences identified always contain the main interactions of the intact lectin. This combination of proteolytic excision and mass spectrometry establishes an important basis for investigating and optimizing bioactive peptides from lectins and other carbohydrate-binding proteins. It harbors a range of promising opportunities such as the development of specific peptides that regulate tumor growth, the development of peptides for T cell communication, and the identification of secondary or extended carbohydrate binding sites.

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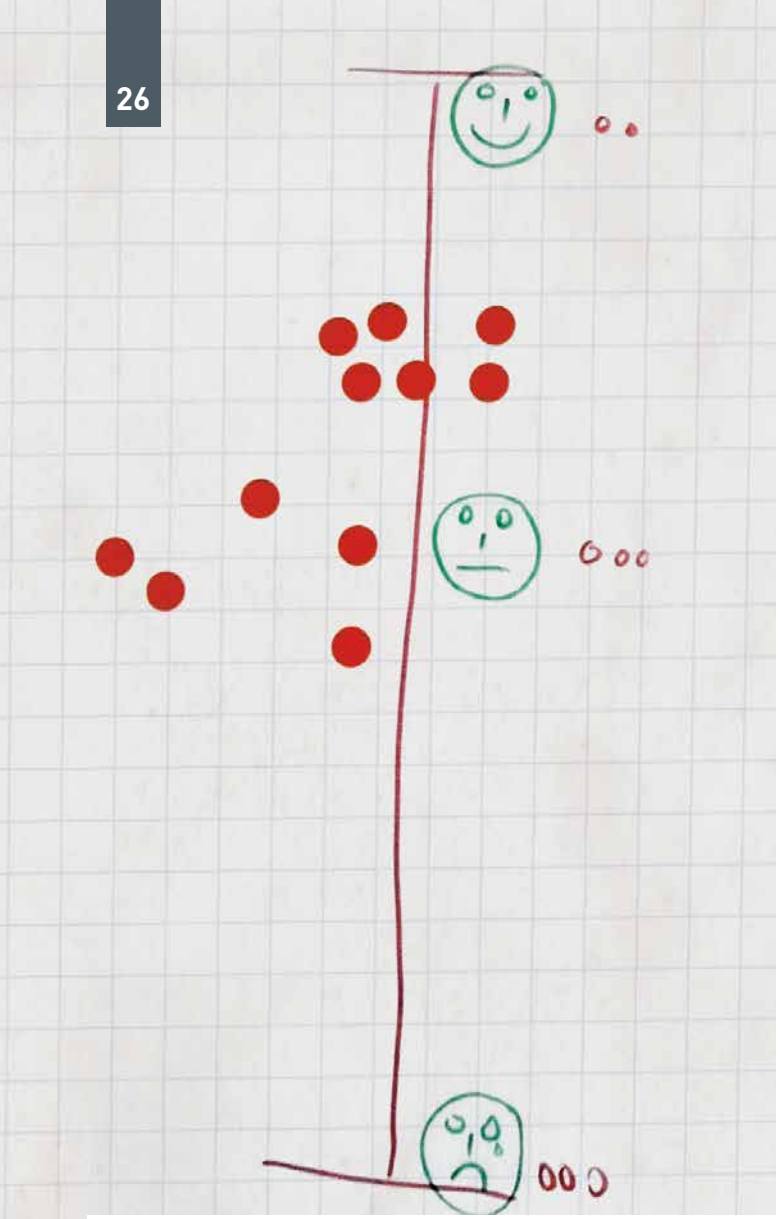

IT team meets the user

Service management paves the way for reliable, target-based delivery of IT services

Many smaller IT teams are suffering as the tasks they are working become increasingly complex. Only a decade ago, the "IT guys" could manage all network features alone. Today, faced with tasks such as managing the mail server or whole clusters of servers, people become more and more specialists. Many teams have evolved into a unified group of specialists with no one in a position to stand in for others. Simultaneously running IT involves an increasing number of different tasks, which all have to be managed properly. IT staff needs the right strategies to work out ways for the existing team to deliver the right IT services as smoothly and ergonomically as possible. A method called Shift Left involves passing tasks from the key expert to other team members. It is based on documentation and knowledge sharing. The Steinbeis Consulting Center for IT Service Management supported a medium-sized company with the introduction of the method.

Apart from task sharing, communication plays a pivotal role in making IT services easier to use and gaining more acceptance. Malfunctions, updates and new systems have a simultaneous impact within many IT systems simply because of mutual dependencies. So to manage a crisis, good team work is essential. But quick help is not about trying to sidestep an issue or pass the problem on to someone else, clear processes are needed with the right documentation of planned and completed maintenance work.

Looking at the list of alternatives, it is apparent that clearly defined systems are needed and a "clear deck," even if one alternative would be to outsource the IT service desk to a third party. The medium-size company Steinbeis was working with decided to find a solution within the existing team. This was because the queries and faults users were reporting to IT were some of the most useful indicators of how to manage the IT. Shifting activities to a third-party provider would have meant no longer having direct access to these insights.

Wich one of the existing frameworks – COBIT, ITIL, CMMI or ISO 20000 – is helpful in this respect? And would it be scalable, to any sensible degree, to small teams? In general, if there is "good practice" for small IT teams in companies, what is it? And how can a team acquire the right knowledge, without being overcharged when resources are already tight? The established goals would need a complete overhaul of IT and that could not be achieved by simply installing new software on the service desk. Rather, changes would be needed on several levels. An alignment of the IT strategy with the overall business strategy would only be possible by putting control mechanisms in place. But to do this, day-to-day operations would have to shift from being purely reactive to being a proactive process.

Gerburg Joos-Braun, director of the Steinbeis Consulting Center for IT Service Management, introduced agile methods for the project to involve team members in the process from the outset, with all their different points of view. This was also to gain the necessary acceptance for the changes that would come. A number of key factors were central to securing the long-term and sustainable success of the project:

- Transparency to the ongoing project activities resulting in earlier cohesion between expectations and relating to one another
- Team members taking the initiative when dealing with users
- Continuous improvements in working practices by involving team members directly in the adaptation process of the new system
- Maximized learning by working together toward solutions
- Assumption of responsibility for the result of the solution

A team has to work out a commitment to any features that are going to be introduced. The effort invested at this point means that team members have to clearly become more proactive and motivated to share in identified solutions.

The question is: where to start? Once Gerburg Joos-Braun had defined the broad brushstrokes of the solution with her customers, the first step was to map out existing processes with team members. These were specified using a technique caked "business process model and notation" (BPMN). Processes were captured in a uniform format. Meanwhile, there was a dummy run and the kinds of questions that could be expected were evaluated, thus laying the technical foundations for the software selection process.

Irrespective of the actual software system selected, it is crucial to carefully consider how this software is introduced to the company, so the

ability of the software to adapt to customization needs is an important criteria. The IT team helps designing the system and make it their own tool. To achieve desired results in terms of knowledge sharing and substitution, the aim should be to integrate all "sub-lists" into the system as well as standardization of communication with users and administration procedures. In practice, many of the adaptations that are needed only arise when systems go live, so it was useful that an SaaS solution based on Web 2.0 was chosen with parallel test entity to allow the system to develop "on the go."

The centerpiece of a service desk solution is the configuration management database (CMDB), which must make all the information available needed to map out 80% of the most important processes. The setup of the CMDB, with the items in the IT infrastructure and the organizational data of the company, provides a basis for incident management. A clear strategy for availability and procedures for the IT staff serving as single point of contact as well as information on the immanent system change is needed before going live with system.

During the subsequent adaptation stage, the development achievement was done with the team. Questions from the team, as well as errors and requests for further functionalities were captured in "user stories" on cards, pinned up on a project board, which were then checked and worked through. After these had been approved in the test system, they could be adopted in the real system. This made progress transparent and comprehensible for everyone involved. Even during the turbulent stage of change management, during which many features have to be implemented in parallel, this mapping process helped specialists maintain an overview.

During the launch phase, those affected by the integrated design became participants. The support provided by the system related closely to live procedures, something the team members witnessed bit by bit in their everyday work. Validation of the goals was conducted continuously by using the advantages of the flexible architecture to monitor replies from the team during the actual development process. Within 12 weeks, the CMDB had been put in place, complete with automatic data updates, incident management, change management, service requests (including a service catalog) and a new knowledge management system. Several third-party service providers were also integrated into processes as well as their ticket systems. Many routine tasks have now been totally simplified with clear processes underpinned by workflows. The whole team has access to all fault and error information. Data needed for everyday operations helps provide tools for controlling the system and planning strategic IT priorities. Later down the line, the system can be used to develop an internal portal to provide users with online information regarding questions or information from the knowledge database, all on a self-serve basis.

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The 2013 Steinbeis Day

Friday, September 27, 2013
Haus der Wirtschaft (House of Commerce) Stuttgart

10:00	**Steinbeis Day 2013 opens**
10:15	**Award ceremony: Prof. Adalbert Seifriz Award 2013**
Start: 11:00	**Steinbeis Network exhibition**
11:15-12:15	**SteinbeisIntern** Internal event for Steinbeis managers
12:00-13:30	**Light lunch**
Start: 12:00	**Steinbeisers' Corner** Short lectures by Steinbeis Enterprises
13:00-16:30	**Supporting program** (by invitation only)
17:30	**Day program ends**
Start: 19:30	**Evening event** Internal event for Steinbeis managers

(Updated 06/2013)

The Steinbeis Day is free but visitors are kindly requested to register. To find out more and register online, go to:
www.steinbeis-tag.de.

Simply the best – give the problem a chance

Steinbeis trainers share problem-solving methods for employees from manufacturing

New production concepts, changes in business organization and technical transformation are placing higher demands on employees at all levels of company hierarchy. Add to that growing complexity, cooperation across workspaces, and shifts in the distribution of leadership responsibilities. These are all key components making up the duties of the workshop personnel serving as shift and plant manager or group coordinator. Bosch and Siemens Household Appliances (BSH) equipped its employees to improve processes through a comprehensive training program. The program focused on the "shop floor belt" and was held by the STW unisono training+consulting. The employees are not only encouraged to report deviations from the standard, breakdowns and problems, but also to become active while essentially driving the problem-solving process – even across workspaces. In doing this, they learn to sustainably overcome not only the symptoms, but also the causes of problems.

More than 70 participants from the first manufacturing squad of the assembly workshop got to know more about various thought and information processing methods in order to react adequately in different problem situations. With the practiced problem-solving techniques, they can quickly, confidently and systematically analyze, describe and solve problems – with little effort, but lots of impact. Their knowledge of workplace organization according to the 5S method minimizes loss and maximizes security through order and cleanliness. The total productive maintenance (TPM) method expands their overall understanding of zero-error production and loss.

The training was organized in three theoretical and three practical components. During the four-week practical portion, participants were able to apply their new knowledge in their own work areas. Manufacturing managers were present for regular feedback sessions. The participants could discuss the results and management demands directly. Many issues were discussed and solved during the training, which created trust and acceptance.

The methods and instruments used in the training have been around for a long time, and are just as reliable as ever. Focus was placed on social skills like communication, appreciation and trust. By including all involved parties in the workshops, a foundation for successful, sustainable implementation of the strategies and work processes was laid. The implementation concept is "simple", yet effective. The key aspects:

- Rules for work and communication
- Collaborative definition of method purpose and benefits
- Alignment of theory with practical requirements of the workspace
- Employee flexibility for strategy/process design
- Active employee involvement for better acceptance
- Supported employee contribution, breakdown of barriers
- Celebration and honoring of successes

The presence of management staff contributed significantly to the overall success. Numerous prospective projects generated from the trainings also offered reason to celebrate. After roughly a year, over 70 employees were granted their "shop floor belt" certificates at a commencement ceremony with the management and STW unisono trainers.

The closing statement of the BSH management says it all: "Our expectations have been more than met. The certification has already paid off! During the "shop floor belt" practical training, our workshop managers developed the skills they needed to practice, implement, and sustain the methods of modern shop floor management. New improvement projects have been tackled with lots of motivation; great solutions have been established and implemented – in part, at little expense. A success story that is sure to continue!"

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*Schlepp*MAXXE reloaded 3.1

Steinbeis Transfer Centers and students develop battery-operated pushback tug

The Steinbeis Transfer Centers for Project Management and Uniform.Design at the Magdeburg University of Applied Sciences offered a particularly unique project to emerging designers last winter semester: the students redesigned an electric pushback tug for Como Systems GbR, a company based in the Lower Saxon city of Visbek.

Como Systems had already developed a battery-operated pushback tug called "Schleppmaxxe" for the no-hassle towing of smaller aircrafts out of airport hangars/gates. Following an in-depth briefing from the company, the students – under the direction of Prof. Franz Hinrichsmeyer – drafted a new design concept for the tug. The concept included plans for components, configurations, interfaces and color concepts. The project aimed to create a new generation of wirelessly controlled aircraft tugs and to develop prospects and concepts for future innovation. Special emphasis was placed on rearranging the individual machine components in order to generate stowage space.

The students discussed the developed design concepts with Como Systems employees on-site in Visbeck. The concepts were then evaluated and checked in terms of production feasibility. Thanks to a huge level of commitment, a design concept was implemented with CAD software in cooperation with the Steinbeis Transfer Center Uniform.Design. A prototype was then presented at the Hannover Messe 2013 industry trade fair . The "Schleppmaxxe 3.1" can lift almost all aircrafts (whether with simple or dual rear nose wheels) in seconds without cumbersome removal, repositioning or attachment of tow bars. In addition, it enables on-the-spot maneuverability thanks to a swivel-like mechanism.

A model with a 1:4 ratio portrayed the tug's shape and options for manufacturing. Paper behaves similarly to sheet metal during processing, which made it the perfect material for simulating the overall prototype. The design of the new model closely resembles it predecessors. The triple color pattern on the front housing was maintained, but the colors themselves were replaced with a more neutral paint. The students positioned the key operational elements in the center of the machine and separated them from the others with an extra fitting component. A panel at the top of the machine indicates the direction of movement and operational processes.

The patented new concept is now also equipped with a wireless security control system offering accurate control from all sides. The pulley system, also patented, allows for a fast and easy retraction of the nose wheels without additional rigging or connections. The aircraft can be turned at a moment's notice without the bypass pins on the nose gear having to be removed. The machine's ability to approach at low speeds serves to prevent accidents and damage. The BleiGel batteries are long lasting, and operational; maintenance and service costs are low. The students' work left an all-round positive impression.

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Cutting-edge technology for historic cities

Efficient LED lighting in public spaces

LED technology has the potential to create huge energy savings, which can mean reductions in energy costs, more options for intelligent control systems and a significant improvement in light quality. The results of the "Freiburg LED Master Plan" demonstrate how LED technology can already be implemented in lighting for public spaces. The Steinbeis Transfer Center for Illumination Optics and Lighting Engineering was involved in the project.

With its "Communities in a New Light" contest, the Federal Ministry of Education and Research (BMBF) sponsored ten "Lighthouse Projects" with the aim of demonstrating the vast potential of new LED lighting technology in practice. A transition to cutting-edge LED lighting has put the Freiburg city center in a new light, accentuating the city's landmarks, such as its minster, the street intersections (typical of such cities founded by the Zähringer nobility), the city gates and the historic city hall square.

Freiburg's Parks and Highways Department contracted the Steinbeis Transfer Center for Illumination Optics and Lighting Technology for scientific assistance on the project. As a part of this, light measurements as well

as surveys were carried out prior to and after the switch to LED lighting. The planners of the new lighting had to make sure that the conversion would accommodate the masts in the existing city lighting as well as their arrangement – which created limitations for the planning process. These were typical of the challenges that arise in this type of conversion project. Therefore, the finalized lighting solution could be perceived as representative and applicable to other such projects.

The level of conformity for the LED lights (according to DIN EN 13201 standards) as well as potential improvements or maintenance of lighting levels were established through lighting measurements in precisely defined measurement fields in representative sections of the historic city streets. Streets now emitting a lower level of lighting than they had prior to the conversion had been proven to exhibit excessively high lighting levels. Overall, the new lighting made an improvement on the evenness of the light and, thus, the actual light quality. The new LED lights are particularly energy efficient; energy savings amounted to between 50 and 68 percent. These results exceeded the project expectations and demonstrate LED technology's potential for large-scale implementation in outdoor lighting. A further positive aspect of the conversion was a reduction in the use of high-pressure mercury bulbs – no longer permitted as of 2015 – in the Freiburg historic city center.

As the project's commissioner, the BMBF placed heavy emphasis on allowing the public to evaluate the new lighting and hoped to win public approval by breaking down typical stereotypes of LED lighting as being "too cold". A survey developed by Steinbeis experts was used to analyze all relevant areas of light perception as well as all subjective opinions of the lighting, both before and after completion of the project. A total of 300 surveys were filled out. The purpose of the survey was also to incorporate the results of the lighting situation before the project into the new LED lighting plan. For example, 52% of participants described the previous lighting using warm white tones as "ok", while 36% found it "too cold". Accordingly, planners seriously put a lot of thought into the lighting tones, and a warm white hue was chosen for the newly developed LED lights – especially for the city park.

The results were resoundingly positive: after the conversion, 76% were satisfied with the light tone; only 15% felt the lighting was "too cold" and 5% "much too cold". The brightness of the new LED lighting also received positive feedback. While 63% of participants rated the lighting neither too bright nor too dark prior to the conversion, 85% were satisfied with the brightness level afterwards. 56% answered "very good or good" to the question "How is the new lighting?" Only 7% and 5% answered with "neutral" or "bad", respectively. All in all, it can be concluded that the LED lighting received very positive responses from the survey participants, especially in the areas of security, recognition of people and obstacles, glare, tone and brightness.

With the Freiburg LED Master Plan, a conclusive and holistic lighting concept was developed that connects modern technology with the city's historic elements – enhancing the city's overall image. Despite its many successes, the project still met with technological limitations and problems in the supply chain. In particular, the newly developed lights revealed their technical limits in real-life application: the LED light source modules were put to the test in terms of irreplaceability and interchangeability, and the depth of manufacturer guaranties had to be redefined over and over. In this case, LED manufacturers and lighting companies had to undergo a maturity process to reconcile the worlds of opto-semiconductors and the preparation of high quality light for general lighting use.

This and many other issues relating to LED technology is the focus of the third International LED Professional Symposium + Expo (LpS 2013) from September 24-26, 2013 in Bregenz (Austria). The symposium is receiving scientific support from the Steinbeis Transfer Center for Illumination Optics and Lighting Engineering. This key convention and trade show has plenty to offer, from expert presentations, workshops, and technical panels to a lighting art project and countless exhibitors. With over a thousand expected visitors, it has established itself as the leading event on LED technology for Europe's lighting industry.

Steinbeis Transfer Center for Illumination Optics and Lighting Engineering

Portfolio of services
- Development of lights/lighting and feasibility studies
- Development and optimization of optical systems (illumination optics) through simulations
- Lighting system measurements
- Standardized and ergonomic light planning
- Spectroscopic testing of light sources
- Consulting and professional development in the areas of technology and innovation management

Key areas
- Light engineering (lighting development and measurements)
- Development and optimization of optical systems (illumination optics)
- Technology and innovation management
- Efficient and ergonomic light planning

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Too real to be true

Steinbeis develops interactive product catalog

How do you define processes that are hardly visible or even invisible? How are the competences of a company demonstrated, if broad areas of in-house know-how are hidden? This is an issue the Coperion group of companies has been thinking about for years. As a leading global supplier of compounding systems, bulk material machines and components for the plastics, chemicals, minerals and food industries, the company has always been on the lookout for transparent sharing options and presentation instruments. An application called Extended Paper, which was developed by the Steinbeis Research Center for Design and Systems, is now able to provide a complete interactive product catalog – a digital extension to the current Coperion solutions catalog.

The system uses "markerless" tracking to recognize products in the new solutions catalog. This happens the instant an image is held under the camera. Users can then view simulations, explode the view and call up additional information directly, interacting intuitively with the catalog and looking at items in detail. The application was unveiled at the Powtech trade show in Nuremberg in 2013.

Unlike purely virtual systems, this kind of "augmented reality" (AR) gives a virtual complement to real human perception. The technology works like the "X-ray eye" in products like AR glasses (e.g. Google Glass) and head-up display in vehicles. Alternatively, it can enhance a live camera image. Virtual and real objects relate directly to one another in 3D.

Using a mouse as an interface to interact with 3D content is a challenge for some users, who find it hard to navigate in "space." More complex input devices optimized to match the technology – such as space navigator or 3D mice – are also difficult to relate to. Using a real book as the input medium immediately makes it easier to master even the most difficult images, without anyone having to learn a fundamentally new interaction logic. Sharing content at a trade show involves precisely the same kinds of requirements in terms of interactive product presentation. Users want to quickly gain access to content without having to come to terms with complex technology first. The Extended Paper application makes it possible for the first time for Coperion to show a variety of individual solutions clearly while circumventing huge logistical outlays caused by presenting real components. The application basically extends the possibilities of virtual simulation via the intuitive usability of printed media.

The system renders and displays fully functioning, 3D machine components completely in real time. It does this by processing existing CAD data and adding process simulations. Otherwise invisible processes or parts inside machines can be made more tangible by showing parts transparently and exploding views. Depending on how he or she holds the printed reference material in front of the camera, the user has access to different presentation modes of the 3D graphics by simply rotating or sliding the device in the right direction.

One of the biggest priorities with the system was to match how content is presented during typical meetings. To do this, the Steinbeis experts developed presentation scanners with integrated cameras. These no longer need additional input devices because of the AR interaction logic. All inputs, queries and detailed information run directly through the catalog. Even unversed users and trade show visitors found they could operate the system easily and independently. As well as using the system to view the products they are interested in, and examine them in detail, users can practically "hold" components that would otherwise weigh tons in their hands. This interactive experience is rounded off by

make social and business interactions comprehensible, but also help optimize commercial and social projects through new knowledge-based technologies and the development of experimental concepts.

other mixed-reality media such as light and audio material related to the product, thus intensifying the immersive perception environment as much as possible.

To program the environment for the project, the developers chose openFrameworks, a C++ framework. It was important for the programmers working on the tracking procedure at the Design and Systems Steinbeis Research Center to avoid using conventional markers and use a more complex markerless recognition protocol instead. This makes it possible to use straightforward catalog pages, without additions, rather than classic machine-readable markers. This meant that the designers of the print medium did not have to consider any special requirements. Also, digital catalog content can be added to, at will, at any time.

Aside from designing and writing the presentation software, the Wurzburg-based Steinbeis Research Center also designed and developed the entire hardware package and the presentation equipment. The research center took care of everything in-house, from initial design of the booth to individual light controls, software programming and on-site implementation. The AR scanners will now make their way to trade shows worldwide. For selling purposes, the system will be extended with a Web application so that the tool can be used online at any time.

The Steinbeis Research Center, which is headed up by Prof. Erich Schöls and Sebastian Gläser, has been working in close collaboration with the design department at the University of Wurzburg. Students and graduates at the university are involved in applied R&D in the field of digital information and communication media. They explore issues related to communication design and IT on a multidisciplinary level in order to develop precisely this kind of innovative technology. The designers are practically multimedia translators of stimuli and codes that not only

Steinbeis Research Center for Design and Systems

Services

- Applied, interdisciplinary research and development in the field of digital information and communication media
- Development and design of new types of information and communication tools (knowledge tools)
- Development of cutting edge interaction scenarios and implementation of specific interfaces
- Planning, development and realization of sustainable exhibition concepts and holistic installations
- Prototype development
- Strategic consulting

Key areas

- Research of new knowledge technologies and future-concepts for digital communication
- Expansion of the application areas of digital tools and adaptation to specific application scenarios
- Information design, augmented and virtual reality, interface design, real-time visualization, data visualization, mobile computing, computational design, real-time 3D applications and renderings, physical computing, development of interfaces

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Environmental protection at a profit

Savings through resource efficiency in surface technology

In its "Europe 2020" strategy, the European Commission describes strategies for sustainable growth in Europe. Transformation in the use of energy and materials plays an important role. Due to scarcity of natural resources, increases in energy prices, and climate change, small and medium-sized enterprises (SMEs) have no choice but to develop and implement new strategies for managing resources. The Steinbeis-Europa-Zentrum (SEZ) is supporting SMEs in the German federal state of Baden-Wuerttemberg in overcoming this challenge using resources from European funding programmes.

After having completed two successful environmental projects in 2012, the SEZ is now a partner in three additional projects. One of these is the EURESP+ (European Regional Environmental Services Platform Plus) project. Its offer is geared at SMEs from the Baden-Wuerttemberg region in the field of surface technology as well as related branches like metal processing and packaging technology.

Many SMEs lack their own environmental officers. Potential in terms of economic and ecological impact is often unknown or completely neglected. Through the EURESP+ project, SMEs learn about the options for becoming involved in energy and environmental management as well as green technologies, and about the range of funding programmes available. The offer includes thematic workshops and customized initial and follow-up consulting for businesses. For this, the SEZ is cooperating with regional energy and environmental consultants.

The environmental workshops are being offered in cooperation with clusters and environmental initiatives from Baden-Wuerttemberg, or as a part of visitor programmes at industry trade fairs – as was the case in 2012 with the SEZ's "Costs and Resource Efficiency under Green Scrutiny" workshop at the O&S International Trade Fair for surface technology and coatings and the AMB, a trade fair for metal processing. Following the environmental workshop, participants can book an initial consulting session aimed at analyzing their company's environmental impact. Here, consumption levels and costs are identified using an "environmental check". A subsequent evaluation of the data via an environmental consultant then lays the foundation for a follow-up consulting session. Companies also receive consulting on European funding for green technologies and services. With the help of an innovation audit, the SEZ assesses project ideas and recommends a suitable European funding programme. Companies can get highly in-depth advice on the EU Eco-

Innovation Programme, an initiative developed especially with the demands of SMEs in mind and which is accepting project applications through September 2013. During the follow-up session, participants work with environmental consultants to develop concrete improvement strategies for environmental management in their business. In addition to the cost-controlling effect of improved energy efficiency or an optimized waste management strategy, legal aspects also play an important role due to their contribution to site security ,as well as improved occupational safety. Companies are also given recommendations for systematically anchoring environmental protection in business processes, including a long-term timetable.

Within the framework of EURESP+, the SEZ awards SMEs with vouchers for a potential analysis. Mezger Verpackungen, a packaging company based in Ellwangen, took advantage of this offer in 2012. The company manufactures a variety of packaging for the foodstuffs industry, such as gourmet cups made from synthetics and the biodegradable raw material PLA (polyactic acid). It also produces foils of different thickness with the help of an extruder. After a consulting session, savings potential in the areas of lighting and compressed air were identified at Mezger Verpackungen. Improvements were also made in the area of waste management through better trash separation and selection of containers. The combined programme, which included a checklist and subsequent consulting through the IWU (Private Institute for Business and Environment), elicited time savings as well as concrete, practical improvement measures. As a result, environmental costs and damage were reduced. Furthermore, additional topics like REACH, environmental law, and hazardous substances are being investigated.

The SEZ will continue granting its environmental vouchers through the end of 2013. Its offering is perfectly tailoured to the needs of SMEs and, thanks to EU funding, completely free of charge. It provides an initial look at the possibilities of energy and environmental management systems. It follows that SMEs, in cooperation with environmental consultants, will be able to settle on long-term strategies for environmental protection in businesses.

EU Eco-Innovation Programme

Between 2008 and 2013, roughly €200 million will be made available to finance projects promoting eco-innovations in Europe. The aim is to strengthen Europe's position in terms of environmental protection and competitiveness. In promoting solutions that protect the environment, the programme hopes to create a growing market for "green" technologies, management methods, products and services while breaking down market barriers. The following types of projects are being supported:

- Initial applications and market launch of innovative technologies and techniques
- Bridging the gap between research, development and industry
- Overcoming existing market barriers in the way of the success of eco-innovative products and services, especially those developed by SMEs in Europe.

The initiative has five priorities: recycling, buildings and construction, food and drink, green business and green consumption, and water management. As a national contact point for SMEs, the SEZ offers free customized consulting for companies regarding the eco-innovation programme.

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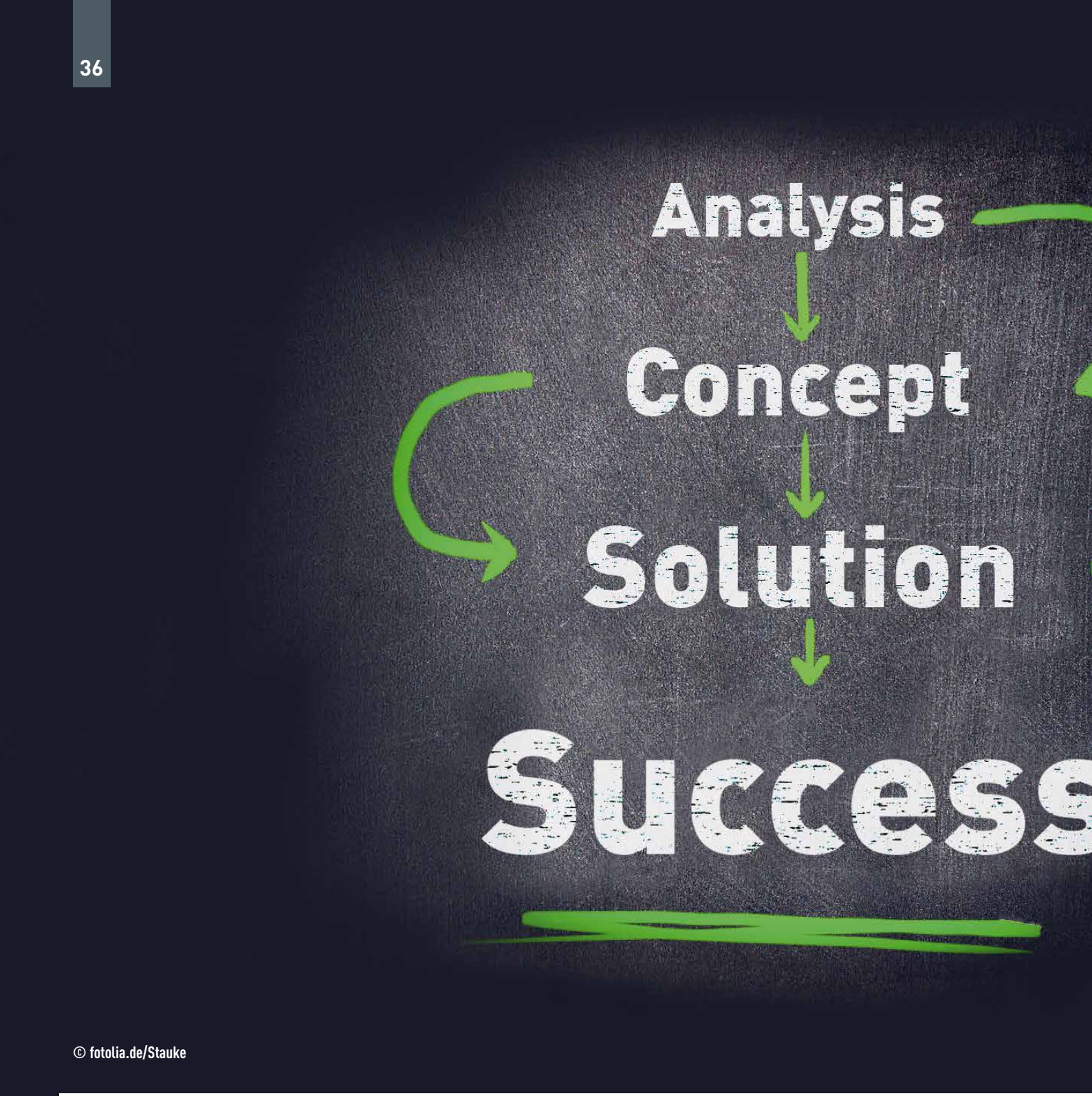

Successful launch into the solar market

SHB student writes a business plan for Sika AG

Without a business plan with good, qualitative content, a strategic business unit has no chance of successfully conquering a market in the long term. How can market opportunities and risks be recognized without having to observe them directly within the market? Which growth opportunities might emerge, and how can a business define and build on its own market position? Which tools and resources can be applied, in what form and when? Frank Holzäpfel set out to answer these questions for Sika as a part of his bachelor's degree program at the Steinbeis University Berlin (SHB) School of Management and Technology (SCMT).

Common elements of a business plan include selecting the right customers and sifting out their demands. If this information is known, production and services can be adjusted accordingly. To stimulate strategic product development, improve services and find the ideal positioning for a business's organizational or strategic business unit structure, it is essential to determine and research customer demands.

Frank Holzäpfel from Sika focused precisely on these topics for a project as a part of his bachelor's degree at the SHB. Sika, based in Baar, Swit-

zerland, is an international company in the field of specialty chemicals which supplies the construction and manufacturing industries. Holzäpfel first evaluated the current market standing of the company to align its strengths to this position and ensure that the strategic business unit keeps as far ahead of the competition as possible. Furthermore, the company needs to develop USPs and maintain, protect or even innovate them on the market.

After determining the current status of various market forces, Frank Holzäpfel analyzed these findings and developed an appropriate strategy. To do this, he considered the company philosophy and other objectives of the Sika Group. The marketing mix was adjusted according to these aspects and everything was put in place to make this possible. It's important to have a clear, transparent and well-communicated goal setting process for this to work. To keep sight of overall objectives and ensure milestones are achieved – not only within the set timeframe, but also given the existing conditions – monitoring instruments have to be in place. These can be adjusted according to key indicators such as profits, margins, costs, market share and earnings before interest and tax (EBIT). Additional softer values or financial management instruments also have to be worked into daily business practices so people can take corrective action at short notice.

Through its acquisition of its first noteworthy customers, Sika demonstrated how writing a business plan and its key elements can have a long-term impact on the success of a strategic business unit.

This was made possible in part by market know-how gained through the preceding market analysis. In addition, realigning not only a single product, but also the entire product portfolio to the demands of the solar market – including release certificates, guarantees and a solar module based on the ascertained customer benefits in terms of process and operation – made a key contribution to the company's success. The cataloguing of all company projects and clients potentially interested in Sika solutions and services in the future also had a huge positive impact.

Adjusting Sika's existing and upcoming product portfolio also played a huge role: using multiple instruments, Frank Holzäpfel filtered customer demands to trim the existing product lines to the company's new positioning in the solar market (e.g. by introducing a product group for the solar market). Product innovations have now been defined, with prospective USPs, and these are captured in the brief to development. These will be launched for field testing step by step over the next few months. Several patents have already been registered for this purpose. Also, sales and marketing have been realigned to be more competitive with the addition of another key account manager to the team. This will make it possible to penetrate the market more intensively to accommodate the stipulated rapid growth. Resources for marketing activities have been approved and have already been accounted for in the budget. Finally, an in-house solar team has been established, growth potential in the solar market has been approved by senior management, the organizational focus on becoming a market leader has been signed off, and managers of the German business unit have already been shown the company's first success stories.

Despite the volatile environment, the German solar industry was able to double its sales compared to the previous year. The same doubling of revenues is being targeted for 2013. The chances of achieving this goal look good. Frank Holzäpfel's involvement has certainly made a significant contribution.

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New centers in the Steinbeis Network

The Steinbeis Network comprises around 900 Steinbeis enterprises spanning all fields of technology and management. Depending on the nature of their work, these may be Transfer Centers, Consulting Centers, Innovation Centers, Research Centers, Transfer Institutes or separate legal entities. The following new Steinbeis enterprises have been founded since January 2013:

Bad Oeynhausen

Business Management and Innovation

Director: Daniel Heine, MBA
www.steinbeis.de/su/1696 | E-mail: su1696@stw.de

"Today, more and more people are looking for modular educational opportunities to build on their skills set. Businesses, organizations and associations also increasingly need individualized offers for their employees or members. We see ourselves as an innovative, reliable partner for the development and implementation of such educational offerings."

Services

- Certified higher education programs
- Bachelor's degree programs
- Master's degree programs
- Innovation management

Bremen

Health Care Industry and Organization (SIGO)

Director: Diplom-Pflegepädagoge Gerrit Krause, M. A.
www.steinbeis.de/su/1694 | E-mail: su1694@stw.de

"We face huge challenges in the healthcare industry. The new healthcare market needs core innovations and new fields of competence in order to overcome these challenges. With the foundation of the Steinbeis Transfer Institute of Health and Organization (SIGO), professionals in healthcare careers gain the opportunity to expand their academic skills and introduce new projects into their companies. SIGO graduates should consider themselves crucial drivers of innovation in the healthcare industry."

Services

- Certification courses
- Bachelor degree programs
- Master degree programs

Donauwörth

Clinical Hematology-Oncology

Director: Dr. med. Dirk Hempel
www.steinbeis.de/su/1695 | E-mail: su1695@stw.de

"Practical science for business practice!"

Services

- Development of software-based expert systems in oncology and hematology
- Research treatment in hematology-oncology
- Development of tools to measure treatment quality in outpatient and inpatient oncology and hematology

Freiburg

Center for Economics and Administrative Studies (WVZ)

Director: Betriebswirt (VWA) Peter Graf
www.steinbeis.de/su/1686 | E-mail: su1686@stw.de

"The institute's aim is to provide a unique part-time study program for business professionals, a symbiosis in the transfer of science into business practice. As such, the economy – in all its complexity – stands at the center of the program, which offers the best opportunity for an accredited set of skills. More elective majors allow for integrative specialization and complete the program. Furthermore, the WVZ goes to the students to offer a degree program near their place of residence or business."

Services

- Master's programs
- Scientific studies

Educational Management

Director: Dr. Ekkehard Lippold
www.steinbeis.de/su/1691 | E-mail: su1691@stw.de

"European Union citizenship gives everyone in the union the right to live, study and work in any member country. The open borders also open up new opportunities in the areas of training and professional development. Although acceptance requirements and the shape of educational systems still lie in the hands of individual EU countries, the EU certainly contributes to the development of superior educational standards by promoting cooperation between member states. For this reason, a series of educational programs have been developed to intensify institutional cooperation between educational institutions through the exchange of students and teachers as well as encourage mobility and the foreign language skills of job seekers in Europe. The Steinbeis

Transfer Institute of Educational Management offers consulting and support for the development and implementation of training and professional development projects within the framework of European development programs."

Services

- Development and implementation of training and professional development projects

Furtwangen

Cyber and Information Security

Director: Prof. Dr. Dirk Koschützki
www.steinbeis.de/su/1685 | E-mail: su1685@stw.de

"Information security, whether it's for research findings or personal data, is a key issue for companies of every size. We are their partners during the planning and implementation of information security concepts. In doing this, we take a holistic approach, placing emphasis on people and the company organization, and not just on the implementation of singular technical measures."

Services

- Consulting during the planning and implementation of security concepts for information security and data protection.
- Workshops and seminars about information security and data protection.

Gerlingen

Process and System Consulting

Director: Prof. Dr.-Ing. Harald Stuhler
www.steinbeis.de/su/1702 | E-mail: su1702@stw.de

"We support you with the optimization of complex processes and products. One of our key approaches is the statistical design of experiments for the control of strongly coupled systems."

Services

- Beratung: Bewertung der Potenziale von statistischen Verfahren und Optimierungsverfahren in Produktentwicklung und Prozessoptimierung
- Seminare und Weiterbildung: Teilnehmer erlangen die erforderlichen Kompetenzen, um statistische Verfahren für die Optimierung der eigenen Produkte und Prozesse zielführend einsetzen zu können
- Support: Unterstützung von Entwicklungs- und Fertigungsingenieuren bei Planung, Entwicklung und Anwendung neuer Prozesse und Produkte

Energy and and Electromagnetic Compatibility

Director: Dr.-Ing. Thomas Heck
www.steinbeis.de/su/1704 | E-mail: su1704@stw.de

"The center focuses on product energy while taking quantity and quality into account. Geared to meet the requirements of the DIN EN ISO 50001 standards, the center offers consulting, support and the delivery of related organizational frameworks (action policy, system design, organization, structures, processes). It also delivers technical operating systems (operative energy management, action system, measures, implementation)."

Services

- Risk reports, export reports, auditing documents on CE declaration
- Consulting, planning, implementation and approval of energy generation and usage instructions
- Energy controls and monitoring related to the supply, conversion, distribution and use of electrical energy
- EMC consulting and EMC approval measurements, EMV reports, drafting of EMC project data sheets and confirming with (sub-)suppliers

Göggingen

International Management Studies

Director: Dipl.-Betriebswirtin Sibel Sagdic
www.steinbeis.de/su/1703 | E-mail: su1703@stw.de

"Through strategic cooperation with various business organizations, which we use to supplement our career-integrated, project- and transfer-oriented programs of study, we are able to offer a comprehensive range of training and professional development. Specially selected partners bolster these offerings with their expertise, ensuring our customers gain the most out of this close partnership."

Services

- Bachelor degree programs
- Master degree programs
- Continuing professional development seminars

Gundelfingen

Applied Statistics

Director: Prof. Dr. Marco Wölfle
www.steinbeis.de/su/1701 | E-mail: su1701@stw.de

"Confidence with statistical, mathematical methods is becoming increasingly important in order to appropriately describe and examine complex economic issues. The transfer of statistical theorem into practical business settings is the goal of this STI."

Services

- Development of Web-based modules for calculations
- Market research projects
- Setup and academic administration of databases for the finance and real estate sectors
- Seminars regarding market research statistics and business mathematics

Kaiserslautern

Technical Processing Applications in the Field of Mechanical Engineering

Director: Dipl.-Ing. (FH) Rüdiger Jung
www.steinbeis.de/su/1699 | E-mail: su1699@stw.de

"Researching and developing with businesses to generate innovation."

Services

- State-funded research projects
- Commissioned research for industry
- Education and training in the field of food processing technology

Kassel

Technology Consulting BWDesign

Director: Prof. Dr. Bernd Witzigmann
www.steinbeis.de/su/1697 | E-mail: su1697@stw.de

"Computer-based modeling is an important element in the area of photonics and electronic development. It contributes to the understanding of the functionality of components and systems before the time- and resource-intensive implementation of technology. We develop optimal design solutions through collaborative projects with industrial partners who work on opto-electrical building components and their application in communication, lighting, materials processing, and sensor technology."

Services

- Technology consulting based on theoretical model calculations
- Technology consulting in the field of nanoscience
- Consulting on simulation issues in optics or electronics, the field of numerics and algorithms

Kronau

Automation in Software Systems Analysis

Director: Dr.-Ing. Jan Aalmink
www.steinbeis.de/su/1693 | E-mail: su1693@stw.de

"Value creation in large companies is controlled by enterprise software systems. To define processes, optimize systems and make adaptions, it is vital for companies to have the right technical integration know-how. Competitive edge can be created through sustained expansion of integration – an expensive endeavor which, in practice, can require intense consulting. We see ourselves as a reliable partner to industrial enterprises. Our innovative concepts make it possible to automate systems analysis."

Services

- Diagnostics tools and systems for root cause analysis
- 360° tomography
- Introspection
- Simulation, calculation and evaluation of settling networks
- Search Engines in networks

Leinfelden-Echterdingen

New Technologies to Market

Directors: Dr.-Ing. Jürgen Streng, Dipl.-Ing. (TU) Lars Schubert
www.steinbeis.de/su/1698 | E-mail: su1698@stw.de

"The new contact-free technologies for controlling software, devices and machines with hand gestures and body movement present vast potential for development and new approaches across all industries and fields of technology. This includes the areas of mechanical engineering, aerospace, security, automotive manufacturing and medical engineering. Project results demonstrate high potential for applied technologies to identify movement and gestures as well as for computer-based processing. Data can be retrieved, tools and machines can be controlled, and movement profiles in medical diagnostics and therapy can be logged. The Steinbeis Innovation Center for New Technologies to Market carries out research and development using cutting-edge technology and creates market-ready systems."

Services

- Research and development
- Development of functional samples and prototypes
- Consulting
- Expert reports
- Software development, integration of Hard- and Software

Lörrach

Healthcare Excellence

Director: Dipl.-Betriebswirt (BA) Jürgen Hausin
www.steinbeis.de/su/1689 | E-mail: su1689@stw.de

Services

- Consultancy, project management, interims management with focus on healthcare/pharma:
  - Commercialization strategy and launch readiness
  - Operational excellence sales & marketing, sales excellence
  - Leadership and coaching
  - Organizational development, change management, capability building
  - Negotiation skills
  - Market access

Münster

Institute for Ethics, Leadership and Human Resources Management

Director: Prof. Dr. Thorn Kring
www.steinbeis.de/su/1705 | E-mail: su1705@stw.de

"An authentic, living company and management ethic is a key determinant of success – in managing people and the company, and in providing services to customers."

Services

- Research
- Study programs and teaching
- Certified training and professional development
- Consulting

Tübingen

Sustainable Resource and Energy Management

Directors: Diplom-Forstwirt Norbert Wagemann, M. Sc., Dr. Bertram Lohmüller
www.steinbeis.de/su/1687 | E-mail: su1687@stw.de

"In times of scarce resources and price hikes, we are research partners for industry and medium-sized enterprises. With you, we research and develop technologies and strategies to use your resources sustainably and to optimize energy consumption within the company."

Services

- Establishing of research programs with partners from industry
- Assistance and moderation of research and development projects
- Assistance in the acquisition of funding from external parties
- Evaluation of projects

Hemocompatible Medical Devices

Director: Prof. Dr.-Ing. Hans Peter Wendel
www.steinbeis.de/su/1706 | E-mail: su1706@stw.de

"The hemocompatibility of medical devices is key to their long-term success in clinics. We see ourselves as an innovative and reliable partner to businesses in medical engineering, providing access to our years' of expertise ranging from systematic hemocompatibility evaluation to the development of cutting-edge, intelligent implant surfaces!"

Services

- Consulting
- Analysis
- Organization of research and development projects
- Expert reports
- Consulting on acquisition of funding
- Development of models and testing procedures
- Recruitment of partners for preclinical and clinical studies
- Training, continuing professional development, seminars
- Tapping into new markets
- Scientific human resources decision-making and recruitment
- Selection of consultants
- Evaluation of scientific projects

Weil der Stadt

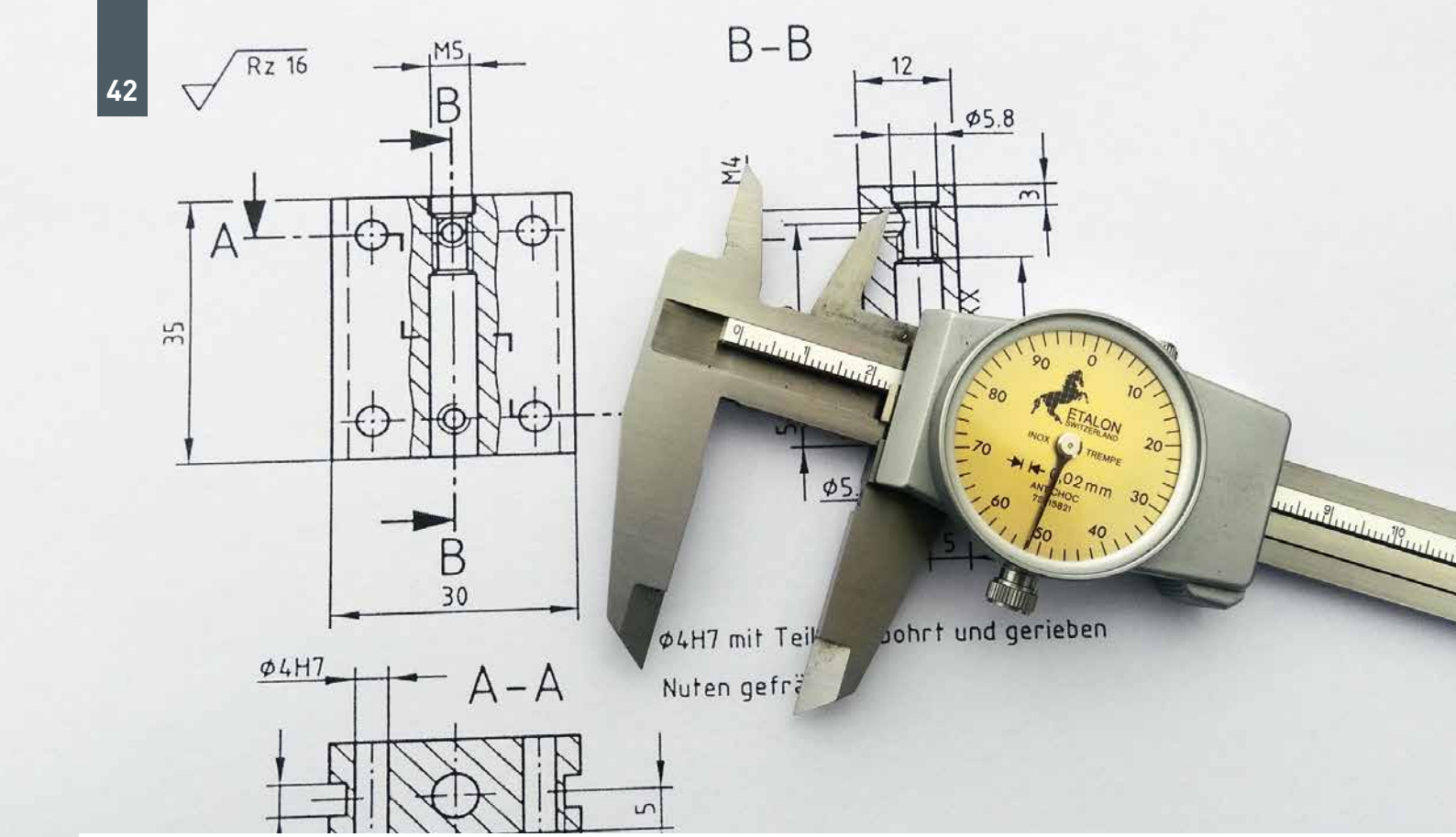
three | consulting + management | projects, processes, sustainability

Director: Prof. Dr.-Ing. Hermann Hütter
www.steinbeis.de/su/1690 | E-mail: su1690@stw.de

"The center's portfolio of services focuses on projects, processes and sustainability in the area of construction and other industries. As a young company, drei | consult + management combines consulting, management and applied research to the benefit of its customers. Our consulting and management services allow us to cover all key areas for successfully functioning projects. In everything we do, we focus on the big picture and aim to reduce negative impacts on people and nature."

Services

- Project management, third-party project management and consulting, coaching
- Process planning, process management, coaching and consulting
- Sustainability evaluations of buildings (life cycle costs, environmental aspects)



Technology within reach

SHB seminar brings businessmen closer to technology

The "Industrial Technology for Businessmen" course, offered by the Steinbeis Transfer Institute Business School Alb-Schwarzwald of Steinbeis University Berlin (SHB), is one "aha" moment after the next: "Chemistry is anything that splutters and stinks," but what happens when ten people have to grapple with the ins and outs of industrial technology? The spark ignites! And Berthold Villing, director of the Business School Alb-Schwarzwald, proved it. And anyone who participates in his 10-days course leaves viewing the world through different eyes.

Understand it in the morning, see it at night: that was one chipper participant's summary. Indeed, theory isn't merely banished to the pages of a book in this course. In its early hours, participants get fascinating insights into metal and plastics processing, electrical engineering and electronics. A diverse program full of possibilities to see theory in action ensures it sticks. Because anyone who's seen an injection molding machine, an automatic welder, an example of turned parts production or circuit board assembly knows not just how these processes work, but also just how much refined technical skill is behind our cars, cell phones, kitchen appliances and furniture.

"This course is perfect for anyone wrestling with technology," says one prospective junior director expected to take over his father's firm. "You don't get swamped with mathematical formulas. Instead, everything is explained so that it's understandable." This certainly can be attributed to course director Berthold Villing's vivid course design. Villing is not just a trained engineer with a degree in electronic engineering from a university of applied sciences and a Master of Science in biomedical engineering. As an industrial engineer and director of the Business School, he also has a mind for business. He effortlessly changes from the purely business perspective to the technical perspective, guiding his audience along the way. "Before this course, I only had a bird's eye view of the 'technology pie'. Now, it's like that pie has been cut into perfect slices right before my eyes, and I can see each individual layer: the whipped cream, the crust and the fruit filling," reflects one participant, who has actually specialized in accounting. "The most exciting part is seeing it all in practice. It's remarkable how much effort goes into a water bottle!" The participants also benefit from exchanging insights with one another since they come from a variety of industries and areas of expertise. Although they bring insights from their own experiences, they now know all too well that everyday life would be quite a bit more empty, depressing and especially more uncomfortable without technology.

The Business School Alb-Schwarzwald, located in Gosheim, offers extra-occupational business programs and courses in technology, management psychology and business management at its locations in Ballingen and Rottweil. Facility visits and highly practice-based work are order of the day.

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Why do bacteria die on copper surfaces?

Researchers unravel a significant piece of the puzzle

It is a well-known fact that copper surfaces can stop the proliferation of dangerous germs. But it isn't entirely clear why germs die when they come into contact with copper. Working with materials researchers from Saarland University, biochemists at the University of Bern have now unraveled an important aspect of this phenomenon. Lab tests revealed that bacteria only die when they come into direct contact with copper surfaces. This discovery will help materials researchers develop coatings that could hinder the spread of bacteria, for example, for door handles and light switches in hospitals.

According to the Robert Koch Institute, nearly 500,000 people contract an infection in hospitals each year. Experts estimate that between 15,000-40,000 patients die yearly as a result. "That's more people than die in traffic accidents," compares Marc Solioz, professor of biochemistry at the University of Bern. The Swiss copper expert now plans to develop antibacterial coatings together with Frank Mücklich, professor of functional materials at Saarland University and director of the Steinbeis Research Center Material Engineering Center Saarland (MECS). Through their work, they hope to reduce the spread of dangerous infections in hospitals. "To create new materials like this, we must first understand how the copper actually kills the bacteria. This is because, while copper is known to have this deadly effect on bacteria, it is also the third most common dietary mineral in the human body – and it doesn't seem to be as lethal to bacteria in that environment," explains Solioz. At least five different explanatory models are currently being investigated by scientists around the world. But the fact remains, under an electron microscope, researchers can see evidence of copper ions inside the dead bacteria. It still isn't clear how the copper gets into the interior of the cells, or what triggers the damaging process in bacteria.

Researchers in Saarbrücken used laser interference technology at the Steinbeis Research Center Material Engineering Center Saarland in their lab tests. A copper plate was coated with a thin layer of synthetic material. The materials researchers then used a laser to perforate this coating with tiny holes formed in a honeycomb pattern. The holes, only half a micrometer (or one millionth of a meter) in size, were smaller than the diameter of the bacteria. "The surprising result for us was that the bacteria didn't die on this surface, although they were exposed to the copper ions," explains Frank Mücklich. In contrast, a control test with an uncoated copper plate and the same concentration of copper ions showed that all of the bacteria died in just a few hours. "This indicates that the bacteria die primarily when exposed to direct contact with the copper surface. Apparently, in this process, the cell envelope is attacked first, creating the ideal conditions for the copper ions to completely destroy the cells," concludes the interdisciplinary research team. It can thus be assumed that complex electrochemical processes play a role in the interaction between the copper plate and the bacteria on the surface. These processes now need to be researched in more detail in order to start developing actively antibacterial surfaces for materials.

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Swirled, not shaken!

Grüna-based company wins award for innovative technology developed with Steinbeis

Working with the company BMF in Grüna, the Steinbeis Innovation Center for Drive and Handling Technology in Chemnitz developed innovative technology for sandblasting, especially suited for small components. Together, they created a prototype. This novel invention – called "Twister" – had its debut presentation at Intec, the mechanical engineering trade show in Leipzig. It won the Intec Award in the category "Companies with up to 100 Employees".

The technical level, innovative power, and market potential together with the exceptional performance of the small company won over the jury, landing them an award endowed with €5,000. The innovative process developed by the two project partners allows for the treatment of the surface of small components – for inside surfaces as well as underneath. What makes the process so novel is that the work pieces are fastened in a central "satellite" holding fixture and moved in a type of "orbit" around the also rotating centrifugal wheel. The quick and easy exchange of multiple components allows for the simultaneous treatment of up to 40 pieces. Very little energy is expended, and the amount of sandblasting materials needed is minimal. The award for this category was sponsored by the Competence Center for Mechanical Engineering Chemnitz/Sachsen e. V., the RKW Sachsen GmbH, the Leipzig Department of Economic Promotion, and the Leipzig Trade Fair. The project was sponsored within the framework of the ZIM program of the Federal Ministry of Economics and Technology.

The Intec trade fair is considered the top industry meeting point for the metal processing industry in Europe. Intec focuses on machine tools and special-purpose machines as well as on manufacturing technology.

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Walking off the stress

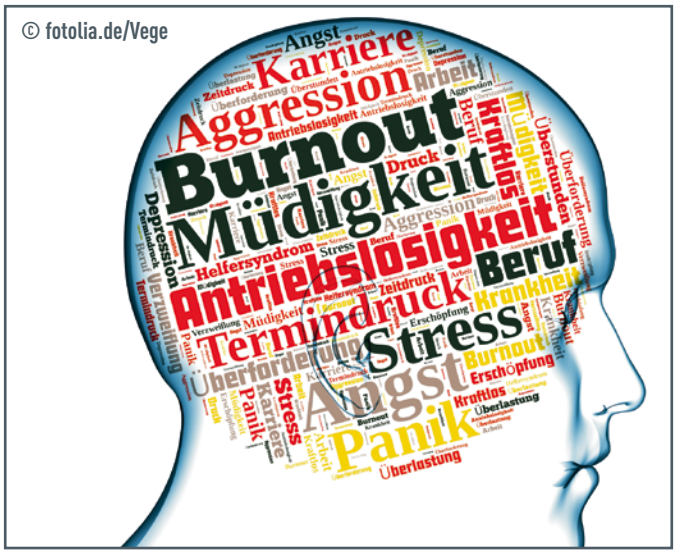
Walk'n'Coach helps with the detection of burnout, plus prevention

Work, more work, even more work. Not enough time. Burning the candle at both ends. Constant availability. All things that place more and more strain on society, our bodies and our state of mind. The result: an increase in physical and psychological disorders, absenteeism, mistakes at work, unhappier people and less fulfilling lives. The Burnout and Stress Prevention Steinbeis Consulting Center has joined forces with companies and business experts, coaches, psychologists and medical practitioners to work on a new innovation project: Walk'n'Coach.

Walk'n'Coach is part of a long-term health initiative aimed at companies. It works by incentivizing employees. To address root causes, staff members are taken on a 4-day coaching and hiking seminar and taught about the early signs of burnout as well as prevention. These topics are made tangible through the exchange of real experiences. The training covers all levels of stress prevention currently known to scientists.

"Acquiring effective everyday strategies to counteract a broad variety of stress factors is ideal when it's combined with moving around in the countryside. It's there that your parasympathetic system is stimulated, and this enables you to have completely new experiences away from the office environment," explains Vivien Brugger, director of the Consulting Center.

Companies on the project benefit from a combination of teambuilding exercises and staff development processes, complete with tools of the trade that can be integrated into everyday situations. In the long term, this raises staff satisfaction and with this, enterprise value.



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Manufacturing-based planning of castings

Practical training in the foundry lab at Aalen University

In March of this year, the GTA Steinbeis Transfer Center (Technology Foundry Aalen) organized the first two-day practical training course in the Aalen University foundry lab. The course – Manufacturing-Based Planning Of Gray And Nodular Cast Iron Parts – was targeted at product design specialists, production planners and purchasing managers involved in the construction and supply of cast iron parts used in machines and mechanical engineering.

Prof. Dr.-Ing. Lothar Kallien, director of the GTA, started with a theory session on the different properties of cast iron with flake graphite and nodular cast iron, including production methods. Dr.-Ing. Alexander Baesgen then discussed the individual steps of manual and mechanical cast production. During the practical session, course participants made casting molds out of bentonite and cold-setting molding sand, complete with corresponding castings. Finally, the cast iron was smelted with spheroidal graphite and cast iron alloys in varying degrees of concentration in the laboratory's 100 kg induction furnace and poured off.

On the second day, the course examined the key principles of casting-related component design. In the theory session, Dominik Krieger, CEO of the Aalen-based model manufacturer Krieger Modellbau, showed how clever component design can result in major savings even before parts are cast, not just in production but also during later processing of castings. During the practical session, the castings produced the previous day were evaluated by making metallographic microsections and then subjected to statistical tensile testing. The course finished with a discussion on casting flaws like blowholes, undesirable areas of hardness on the test parts, and corrective actions. The premiere proved such a success that further courses have already been scheduled.

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Picture (left to right): Gitta Schlaak (P.E. Schall GmbH & Co. KG), Helmut Bayer (TQU Business), Nicole Moser (Meba Metall-Bandsägemaschinen GmbH), Mark Diener (Meba Metall-Bandsägemaschinen GmbH), Mr. and Mrs. Schall (P.E. Schall GmbH & Co. KG), Dr.-Ing. E.h. Martin Herrenknecht (Herrenknecht AG), Dr. Nicole Gross (Forschungszentrum Informatik, FZI), Prof. Dr. Heinz Trasch (Steinbeis).

World-class award winners

Bestowal of the Baden-Wuerttemberg Competence Prize

The "Control" trade show in Stuttgart got off to a traditional start with the sixth bestowal of the Baden-Wuerttemberg Competence Prize for innovation and quality. The initiators, the TQU Group and P.E Schall, award the prize to companies that overcome the sometimes conflicting issues of innovation and quality, but that successfully translate these principles into business and thus achieve excellence. The 2013 prize went to the Westerheim-based metal bandsaw manufacturer MEBA, with a business personality prize going to Dr.-Ing. E. h. Martin Herrenknecht, chairman of Herrenknecht. The Research Center for Informatics Karlsruhe (FZI) was awarded an honorary prize. Steinbeis is the patron of the award, which is bestowed in cooperation with the Südwestmetall employers' federation, the Baden-Wuerttemberg State Association of Industry (LVI) and the German Chemical Industry Association (VCI).

As CEO of TQU Business Helmut Bayers confirms, the competence prize has developed into more than an integral feature of the business environment in Baden-Wuerttemberg over the years. A great importance is attached to the award, a fact that is underscored by the number of entrants and the variety of participants: "We're contacted by research institutes, machine makers, equipment manufacturers, pharmaceutical, software and electrical engineering companies, even the construction industry." The quality and innovative flair of the companies in Baden-Wuerttemberg is reflected by the award winner, MEBA Metall-Bandsägemaschinen GmbH. Its semi-automatic and fully automatic saw solutions for vehicle construction, metal manufacture, steelmaking and heavy industry have made the metal bandsaw maker the number one worldwide. The company's modern machinery includes the MEBAe-cut, the world's first completely hydraulic-free, high-performance sawing machine. The competence prize jury was won over by the innovation, sustainability and performance of the company's products. CEO of MEBA, Mark Diener, was delighted with the award: "We're a family-run business and place a great deal of emphasis on organic growth through systematic processes, quality in all areas, and the development of new, groundbreaking products. We consider these three pillars to be the key to the future survival of MEBA," emphasized Mark Diener, with special thanks going to his co-workers.

For many years, experts worldwide have considered Dr.-Ing. E. h. Martin Herrenknecht and his company an entrepreneur of the utmost professionalism. The jury awarded Herrenknecht the competence prize for his "entrepreneurial vision," for treading "unconventional paths," and for his "amazing, courageous work and impact in commercial and social areas." Presenting the award, Professor Dr. Heinz Trasch summarized it succinctly: "He may have done things the unconventional way in his successful career, but he always proved to possess entrepreneurial farsightedness, and he led his company to number one position worldwide. He's created a jewel in Baden-Wuerttemberg and thus has not just impressed the jury, but lots of other people as well with his unerringly courageous commitment in commercial and social areas." Martin Herrenknecht thanked the initiator, quoting Robert Bosch: "It's better to forfeit money on a project than trust." Trust is the foundation of quality and innovation, which in turn are a prerequisite of engineering and export.

A special honor was awarded to the Research Center for Informatics Karlsruhe (FZI), which enables information transfer at the interface between university research and practical business application. The FZI applied for the Competence Prize 2013 for a new kind of research environment, the House of Living Labs (HoLL). The HoLL impressed the jury as an approach toward a new kind of research for science and business, as a user-based training location for young scientists, and for providing interdisciplinary collaboration options to different partners.

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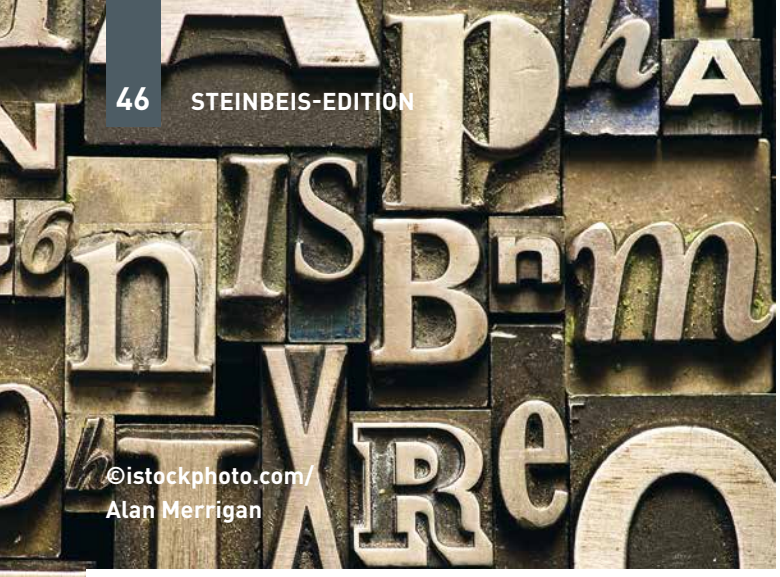

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Manager Cookbook. What Managers Can Learn from Cooking

Ulrich Holzbaur

2013 | hardback, color | 204 pages, German
ISBN 978-3-943356-35-9

About the author

Ulrich Holzbaur is a professor in the industrial engineering faculty at Aalen University of Applied Sciences and director of the Steinbeis Transfer Center for Applied Management in Aalen. Prof. Dr. Holzbaur has worked on university and Steinbeis Network projects in many countries, with an emphasis on South Africa, South America, the Caucasus region, Bosnia-Herzegovina and Hungary.

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International Management

Stefanie Kisgen, Anne Dresen, Werner G. Faix (publ.)

2013 | hardback, b&w | 694 pages, German/English
ISBN 978-3-943356-08-3

About the publishers

The publishers work in a variety of capacities at the School of International Business and Entrepreneurship (SIBE) at Steinbeis University Berlin, which has almost 800 students enrolled in master's degree programs in the field of business management.

More online

Prototyping Tools for Mobile Applications

Sandra Bochmann | Thomas Ritz

2013 | paperback, color | 234 pages, English
ISBN 978-3-943356-45-8

About the authors

Sandra Bochmann completed a Bachelor of Science degree in 2012. For her bachelor's thesis, she examined prototyping tools in detail for the first time. Based on her thesis, she published "Prototyping Tools for Mobile Applications" in collaboration with Prof. Ritz. Sandra Bochmann has been working in Hamburg as a front-end development specialist since 2013. Prof. Dr.-Ing. Thomas Ritz is director of the Mobile Media and Communication Lab (m2c Lab) at the Aachen University of Applied Sciences, which is doing research in the field of mobile applications, the future of the retail trade and future mobility solutions. Prof. Ritz has been director of the Steinbeis Transfer Center for Usability and Innovative Interactive Systems for Information Logistics since 2012.

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Max Syrbe Symposium 2012. Focus: Science and Research Management

Steinbeis Foundation (publ.)

2013 | paperback, color | 114 pages, German
ISBN 978-3-943356-01-4

About the symposium

The first Max Syrbe Symposium took place on March 28, 2012 with an agenda revolving around just one of the conditions for specific know-how and technology transfer excellence à la Steinbeis: successful science and research management. This issue was examined by representatives of universities, universities of applied sciences and research institutions, as well as people involved in transfer and the application of knowledge, all approaching the topic from a multitude of angles. The next Max Syrbe Symposium takes place on March 26, 2014.

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Steinbeis Entrepreneur Forum 2013. Networking forum for SMEs

Steinbeis Foundation (publ.)

2013 | paperback, color | 50 pages, German
ISBN 978-3-943356-61-8

About the business forum

The first Steinbeis Entrepreneur Forum, which took place in March 2013, established a platform for participants to share information with others

and set new ideas relating to current issues in motion. The event revolved around tandem speeches based on the Steinbeis principles of project competence: one Steinbeis expert examined fundamental topics by drawing on theory, directly followed by a Steinbeis project partner talking about the same topic from a business practice perspective. During the subsequent Q&A session, remaining questions were then discussed with everyone in attendance.

More online

Corporate Mediation – 01/2013

Gernot Barth, Bernhard Böhm (publ.)

2013 | magazine, color | 96 pages, German
ISBN 978-3-943356-46-5

About the publishers

Associate professor Dr. habil. Gernot Barth has been working as a mediator and trainer of mediators since the foundation of IKOME® (the Institute of Communication and Mediation), the Steinbeis Consulting Center for Corporate Mediation and the Academy for Social Aspects and Law (Steinbeis Transfer Institute at Steinbeis University Berlin). Bernhard Böhm is a qualified attorney and has been working for more than 12 years as a mediator and expert in mediation and extrajudicial conflict management. He is also an executive project manager at the state-approved conciliation office of the Steinbeis Consulting Centers.

More online

EuMaT Strategic Research Agenda. 2nd edition – 2012

The European Technology Platform for Advanced Engineering Materials and Technologies (publ.)

2013 | paperback, color | 140 pages, English
ISBN 978-3-943356-54-0

About the technology platform

EuMaT, the European Technology Platform for Advanced Engineering Materials and Technologies, was established to safeguard optimal collaboration between industry and key stakeholders in the process of laying down R&D priorities in the field of advanced material engineering and technology. EuMaT is designed to improve coherence in the field of material research and development in existing and planned EU projects.

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6th Energy Conservation Symposium. Variant comparisons in building energy technology – measurement, calculation, simulation, evaluation

Jörn Krimmling, Bernd Landgraf (publ.)

2013 | paperback, color | 134 pages, German
ISBN 978-3-943356-52-6

Presentation slides are also available from Steinbeis-Edition as an e-book: ISBN 978-3-943356-53-3

About the publishers

Prof. Dr.-Ing. Jörn Krimmling is a full-time professor in the department of civil engineering at Zittau/Görlitz University of Applied Sciences where he lectures on "Technical Building Management." Bernd Landgraf is director of the Steinbeis Transfer Institute of Building and Property Industry at Steinbeis University Berlin (SHB), which offers a Master of Science in Real Estate as part of the project skills program at SHB, as well as certification courses on energy management in the real estate industry.

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More on the e-book

The 2013 Steinbeis Engineering Day. Systems.Methods.Added Value.

Steinbeis Foundation (publ.)

2013 | paperback, color | 32 pages, German
ISBN 978-3-943356-57-1

About the proceedings publication

The Steinbeis Engineering Day, which took place on April 17 in Stuttgart, offered managers in medium-sized enterprises a practical business platform for tapping into the experience and know-how of experts, colleagues and counterparts from other areas of industry. It was also an opportunity to explore people's ideas regarding applications and implementation to take back to the workplace. The second event in this series was titled "Systems.Methods.Added Value. – thanks to a targeted product development process." This volume contains summaries of speeches given at the 2013 Steinbeis Engineering Day. The Steinbeis Engineering Day takes place every two years and looks at current issues and challenges, as well as medium-term trends and prospects for the future.

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The Steinbeis Engineering Study 2012. Part 1: Results of Survey. Factors and conditions

Steinbeis Foundation (publ.)

2013 | paperback, color | 84 pages, German
ISBN 978-3-943356-50-2

About the study

The Steinbeis Engineering Study 2012 sheds light on the factors and conditions contributing to successful product development processes within companies. In addition to providing initial insights into current success factors, problems and possible solutions in the product development process, the aim of the study is to reveal unexploited potential and make full use of this potential. The Steinbeis Engineering Study 2012 is based on a survey of 280 employees in the manufacturing industry in Germany. The respondents work at companies of all sizes and across all departments involved in the product development process.

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The Steinbeis Engineering Study 2012. Part 2: Best Practice Organized, structured, methods-based product development processes

Arno Voegele, Günther Würtz (publ.)

2013 | paperback, color | 176 pages, German
ISBN 978-3-943356-51-9

About the best practice volume

The results of the Steinbeis Engineering Study 2012, which focused on the product development processes, highlight the problems faced by small and medium-sized enterprises from a variety of angles. This basis is used in "Part 2: Best Practice" to examine issues and challenges, demonstrating the main areas in which companies surveyed in the study share a sense of hesitancy or need for urgent action. Part 2 is not designed to act as a substitute for the broad range of existing specialist publications in this area. Instead, the authors' aim is to share the experience and know-how gained while working on many Steinbeis Projects with SMEs – in a structured, concise format, as a useful overview, thus adding impetus in each area examined.

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Strategy Paper for Enhancing Reciprocity in EU-China Science & Technology Cooperation

Emilie Bertrand, Eduardo Herrmann

2013 | paperback, color | 66 pages, English
ISBN 978-3-943356-56-4

About the authors

Emilie Bertrand was a project assistant at Steinbeis-Europa-Zentrum Karlsruhe (SEZ) from 2010 till 2012 where she worked on a variety of projects. Toward the end of her time at the SEZ, she became increasingly involved in the ChinaAccess4EU project, resulting in the writing of this publication. Eduardo Herrmann (M.A. European Studies) is a Senior Project Manager at the SEZ where he is responsible for production technology, economics and social sciences. He is also a team manager/senior project manager for the strategic delivery of projects in his team. Another important area of focus in his work is the submission of applications for EU projects, which involves advising and supporting clients from initial project concepts to the drafting of applications, project delivery and completion.

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Back in print:

Collective Intelligence. Methods, Experience, Observations Documentation from the 2009 SMI Spring Workshop

Andreas Aulinger, Max Pfeiffer (publ.)

2009 | paperback, b&w | 220 pages, German
ISBN 978-3-943356-60-1 | 2nd unedited reprint, 2013

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Steinbeis is an international service provider in tangible, implementation-oriented knowledge and technology transfer. The Steinbeis Transfer Network is made up of about 900 Steinbeis Enterprises and project partners in 50 countries. Specialized in chosen areas, Steinbeis Enterprises' portfolio of services covers consulting; research and development; training and employee development as well as evaluation and expert reports for every sector of technology and management. Steinbeis Enterprises are frequently based at research institutions, universities and colleges, which are constituting the Network's primary sources of expertise. The Steinbeis Network comprises around 5,800 experts committed to practical transfer between academia and industry. Founded in 1971, the Steinbeis- Stiftung is the umbrella organization of the Steinbeis Transfer Network. It is headquartered in Stuttgart, Germany.

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