

TRANSFER

The Steinbeis Magazine

Transfer sans frontières

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Insights from Steinbeis experts throughout the world

Bond or Turing?

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Keeping Warranty Costs Under Control

Steinbeis forecasts infrequent failure rates

Leading Like Hidden Champions

Steinbeis conducts research into more effective leadership

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Dear Readers,



Jan E. Bandera is director of two Steinbeis Enterprises: International Technological Cooperation and Economic and Technology-Policy Dialogue. Working in collaboration not only with partners in the Steinbeis Network but also with transfer partners outside Germany, these centres offer consulting and project management services, concentrating on areas like Turkey, India, Latin America, South Africa, Malaysia, and Georgia.

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In the early days of the Steinbeis Network in the 1970s, the main focus lay in the state of Baden-Württemberg. Since the 1990s, the network has been expanding on an international scale. As the Single Market was established in the European Union, small and medium-sized enterprises developed a strong interest in collaboration with partners in other parts of Europe. Consequently, the Steinbeis experts started to adapt to the requirements of their customers and turned more to international markets. Initially Steinbeis focused primarily on technology-based business collaboration with companies in the United Kingdom, Italy, and France. Collaborative research projects in Europe handled by Steinbeis-Europa-Zentrum play a major role till date in promoting research and innovation within Europe. At present, there are Steinbeis Enterprises in around 20 countries throughout the world. Expanding its footprints globally Steinbeis Enterprises are located in 20 countries across the globe today, covering all the five continents.

With increasing collaborative agreements and consequently the declining demand for support in Europe, Steinbeis identified the opportunity of growing demand for its services in countries outside Europe. To respond to this, Steinbeis set up a network of trusted and reliable collaborative partners beyond the borders of Europe. The partnership commenced with collaboration with the Kobori family in Japan, resulting in the foundation of Steinbeis Japan in 1999.

At the turn of the new millennium, the state of Baden-Württemberg evolved into the number one region for innovation in Europe. Interest grew in this region's secrets of success, especially among newly industrializing countries (NICs). These were filled with ambition and the prospect of becoming industrialized countries, primarily by placing topics such as SME advancement, innovation, and collaboration between universities and industry on the political agenda.

Experience of its own development as an organization and the model of collaboration with the institutions in its immediate surroundings resulted in Steinbeis establishing a new field of consulting, which revolves around international projects. The majority of these consulting projects are financed through public development funds, on a national and international level. Many of our Steinbeis colleagues have been involved in such projects over the last 15 years, in countries ranging from India to Russia, South Africa, Turkey, South Korea, Malaysia, Mexico, Tunisia, and Indonesia. The most common issues that are faced in these countries are the result of a tendency to focus on top-down approach (also called push approach) and the tendency to equate technology transfer to patent registration.

In 2010, the increasing interest among NICs in topics such as technology transfer, innovation management, SME advancement, and dual education resulted in the foundation of the Steinbeis Transfer Centre Economic and Technology Policy Dialogue. Work at the centre benefits strongly from Steinbeis' own experience in Baden-Württemberg, the model of best practice, and successful technology and education policy not just in Europe but also throughout the world. This is especially the case when it comes to developing technology based SMEs in the manufacturing industry, part and parcel of the German approach toward the social market economy. This is based on the principles of subsidiarity, social equality, and environmental responsibility. Technology transfer and innovation consulting revolves around the sometimes conflicting interests of the state, research, academic education, and industry. The aim of our work is to establish an independent market for technology services among small and medium-sized enterprises in each of the countries where we provide our services. Development collaboration projects at our Steinbeis centre always involve a large number of Steinbeis colleagues, who are involved as experts on a project basis. There is strong demand for these specialists due to their practical experience and the desire to see how technology transfer works under the real conditions of an industrial project at local companies. The specialist and practical know-how puts them in a good position to work outside Germany, as do their language and intercultural skills.

The emphasis of this latest edition of TRANSFER magazine lies in our international activities within the Steinbeis Network. I hope you gain plenty of interesting insights and enjoy reading about our international projects and services.

Dipl.-Ing. Jan E. Bandera

Bond or Turing?

Digitalization and technology convergence: Are people and technology merging into one entity?

There are now smartphones, smart homes, and smart factories. Everything's connected, and in the future, maybe there will even be smart blood (if Spectre, the latest 007 film, is anything to go by). The merging of different worlds of technology seems unstoppable. This convergence appears to be affecting technologies just as much as people and technology. Convergence on a general level refers to a process in which something merges into one or becomes assimilated. When technology or people and technology converge in a digital world, one must inevitably ask the question of what is actually converging and what is just becoming more closely linked.

Until now, there is no standard definition for technological convergence, neither in the world of science nor in business. The only thing people do agree about is that an assessment of converging technology always involves a debate about its societal impacts and consequences. The somewhat scientific term converging technologies (CT) refers to the convergence of nanotechnology, biotechnology, information technology, and cognitive science (NBIC) in order to enhance the hitherto limited capabilities of humans with technological solutions. From a practical standpoint, convergence already appears to be an everyday reality, since intelligently combining different features and functions already stands at the core of every technological (re-) development. Given the digital revolution, technological convergence could also be seen as an increasing degree of networking, which in turn results in a convergence between people and technology.

Technological convergence takes place in a kind of digital dialogue, due to the influence of digitalization. Digitalization creates interfaces through which different technological developments communicate with one another using the required software in order to achieve the same objectives, with or without people. It is estimated that the number of objects that will be connected wirelessly to one another (without smartphones or computers) will rise from 5 to 21 billion by 2020. This dialogue between different forms of technology is driven by our willingness to make more and more data available. Fridges, smart watches, windmills, and production robots are constantly gathering information. The increasing degree of networking and our thirst for information are continuously creating new realms of data. In turn, the data this provides is used to create new services – such as windshield wipers, whose movements can be used for real-time weather reports – and these can ultimately be more profitable than the products themselves. This turns the economy into a data economy in a race to develop new platforms. It's no coincidence that personal data is being called the most valuable raw material of the 21st century.

So as technologies converge, a process that can be seen as digital networking, the interface between humans and technology already has a fundamental significance. At the same time, the dividing line between man and machine is evaporating before our eyes, not least because of developments in the field of nanotechnology. From a scientific standpoint this plays a key role when it comes to converging technologies. Nanotechnology makes it possible to integrate technology into the human body and its environment almost invisibly. The fact that nanopar-

ticles are being used in the blood to monitor a person's location as well as his/her bodily functions is no longer the stuff of James Bond movies and can be seen at Google X, which is currently working on nanoparticles that are able to identify cancerous cells in the blood before they multiply irreversibly. In the field of IT, there is already discussion about the impact of machine learning. This makes it possible to process increasingly large volumes of data as a basis for decision-making. A combination of this artificial generation of knowledge with nanotechnology developments plus our own willingness to make data available through an increasingly broad network of products will mean that in the future it will no longer be possible to distinguish between humans and computers, at least not according to the criteria of Alan Turing.

Convergence of technology thus has a mutually reciprocal influence on the convergence of man and technology. The merging of different technologies on the basis of closer networks as well as multidisciplinary technological developments, especially in the field of nanotechnology, is having a crucial influence on the distance between people and technology, both physically and digitally. Industry's thirst for information and our fascination with data are paving the way for digitalization, new services and increasingly for the independent evaluation of information. Ultimately, mutual convergence will have its sights set on new targets: the expansion of human capability and of the (thinking) capacity of computers – both Bond and Turing.

Steinbeis Swipe! is a regular feature in Transfer Magazine in which an author takes a look at a specific topic and may even take a swipe – left, right, up, or down – along the lines of a critical commentary.



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Feature Topic: Our International Activities

Insights from Steinbeis experts

Globalization in business and science, plus the threats and of course the opportunities this entails, are just some of the key issues faced when going international. In this edition of TRANSFER magazine, our Steinbeis experts will introduce readers to some of these issues. Prof. Dr.-Ing. Dr. h.c. Norbert Höptner, Director of Steinbeis-Europa-Zentrum, starts with an introduction to European funding. He is followed by Da Li-Schumann, director of the Steinbeis Consulting Center China, who examines the best way for German SMEs to succeed when they enter Chinese markets. Giwang Lee, director of the Steinbeis Technology & Innovation Centre – Republic of Korea, a Steinbeis partner location in Seoul, reports on how international knowledge and technology sharing works between Korean and European companies. Prof. Dr. Werner G. Faix, founder, managing director, and associate member of the School of International Business and Entrepreneurship at Steinbeis University Berlin, examines why education has become so crucial in times of globalization. Vineet Kumar Goyal, director of the Steinbeis Centre for Technology Transfer India shows how the Steinbeis model of specific knowledge and technology transfer can also work in India. Prof. Dr.-Ing. Aleksandar Jovanovic, director of the Steinbeis Advanced Risk Technologies Group in Stuttgart, provides an introduction to risk and risk management. Sandra Haltmayer and Prof. Dr. habil. Heiner Lasi of the Steinbeis Transfer Center called Innovationsforum Industrie (STCII, at the Ferdinand Steinbeis Institute), outline the work carried out by the German country team of the Industrial Internet Consortium. This is followed by a description from Dr. Abdul Reezal, who heads up a Steinbeis partner enterprise called the Steinbeis Malaysia Foundation, of the steps his company is taking to help the growing Malaysian industry for medical products. Ardin Djalali of the School of International Business and Entrepreneurship at Steinbeis University Berlin then writes about the new demands placed on managers as globalization sweeps through the modern business world and discusses the steps they can take to manage these demands. Finally, Prof. Dr.-Ing. Dr. h.c. Norbert Höptner, Dr. Petra Püchner and Heike Fischer of Steinbeis-Europa-Zentrum expand on different ways to make key enabling technologies in Europe more accessible to SMEs.



“Companies now face huge challenges in international competition”

An interview with Prof. Dr.-Ing. Dr. h.c. Norbert Höptner, the Commissioner for Europe of the Baden-Württemberg Ministry of Finance and Economics and Director of Steinbeis-Europa-Zentrum.

Prof. Dr.-Ing. Dr. h.c. Norbert Höptner talks to TRANSFER magazine about European funding and how Steinbeis-Europa-Zentrum helps SMEs navigate their way through different authorities. He also looks at the challenges SMEs can expect to face in the future at an international level.

Professor Höptner, Steinbeis-Europa-Zentrum (SEZ) was founded over 25 years ago – the first Commissioner for Europe traveled off to Brussels to introduce small and medium-sized enterprises to European funding programs and thus get them more involved in innovation partnerships in Europe. How has the EU funding landscape changed since then?

European collaboration has become increasingly important over the last quarter of a century. When SEZ was founded by the Commissioner for Europe in 1990, there was the 2nd Framework Programme for Research and Technological Development – FP2 – offering funding worth €5.4 billion for four years. This was followed by FP3 with €6.6 billion of funding. Now there's the Horizon 2020 program with over €80 billion for the seven years from 2014 to 2020. Funding is provided for research and innovation projects as well as related activities. The European Commission has also worked continuously over the years to improve conditions for small and medium-sized enterprises. For example, under Horizon 2020, for the first time there's an SME instrument focused exclusively

on SMEs and this also makes it possible to submit proposals without even finding a partner. This makes it much easier to access EU research funding for SMEs.

You were well connected with other European institutions, even at the beginning. Which ones are now your most important partners?

The first one I would name is the Enterprise Europe Network. It's the largest network for transnational technology transfer, with just under 600 partner organizations in over 50 countries throughout the world. Steinbeis-Europa-Zentrum was already involved with its predecessor networks, the Innovation Relay Centre (1995-2007) and the Value Relay Centre network (1993-1995). This network has also expanded and built on synergies with other networks, so now the Enterprise Europe Network is the central point of contact when it comes to funding innovation, market launches in Europe, EU guidelines, and technology transfer. Other important European networks we collaborate with are the Global Practitioners Network for Competitiveness, Clusters and Innovation,



Technology Innovation International, and the European Cluster Alliance.

In what ways have the support services provided by SEZ to innovative companies changed?

We still support companies, universities, and research bodies with the submission of proposals under European research and innovation programs. To move forward with innovations, we also do a number of other things to provide support. For example, we help companies with innovation management, we provide strategic advice on entering markets, and we bring all key innovation players – including representatives from politics and public administration – together with partners in Europe. The issue of gender and diversity has been on the agenda for over 10 years and we take this into account in all projects and services.

Looking back over the last 25 years, you've developed some extremely useful competences with your colleagues at SEZ. Can these be used to the benefit of Baden-Württemberg?

The mandate given by the minister to the commissioner for Europe resulted in close dialogue with a variety of specialists at the state ministry, especially in the Ministry of Finance and Economics of course. Being

in such close contact with the European Commission also allows us to support state administrators on a political level when planning funding programs. Not only does this ensure that all of the measures we work on are not just useful on a European level, we also always remain conscious of the benefit to companies, research institutions, and universities within our own state.

What new challenges will SMEs face in the future?

Companies now face huge challenges in international competition. Open innovation and "smart specialization" have been fuelling new opportunities and demands for some time now. Opening up innovation processes within the companies for strategic reasons is a decisive factor of competition. Developing products quickly and successfully now requires international collaboration. Especially when it comes to key technologies and how they're used – for example, to introduce more digital processes in business in production, planning, and processes, or to create new products or services – so it's important that small and medium-sized enterprises open up more. Otherwise there's a danger that they'll miss out on new opportunities and that the major players dictate standards and the markets. This affects all sectors of industry where "smart" applications are needed more quickly. The service strategy of Steinbeis is tailored to the needs of SMEs and this makes it the ideal partner when it comes to translating these challenges into an advantage for the companies.

Image: © Europäische Kommission



Prof. Dr.-Ing. Dr. h.c. Norbert Höptner is director of Steinbeis-Europa-Zentrum (SEZ). SEZ was founded in 1990 under the initiative of the Commissioner for Europe of the Minister for Economics in the state of Baden-Württemberg. Its task is to make it easier for companies to reach out to Brussels. SEZ also acts as an EU advice center, not just for small and medium-sized enterprises but also for universities in Baden-Württemberg.



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LTM 莱通新风净化器

TL 200-50 结构示意图

技术参数	性能参数
适用面积: 20-30 m²	换气量: 100 m³/h
噪音: 28 dB(A)	能效等级: A
功率: 15-20 W	滤网寿命: 3-6 个月
重量: 3.5 kg	尺寸: 300 x 150 x 150 mm

新风净化器
室内空气质量终极解决方案
换掉比净化更直接
全面替代传统空气净化器

TL 200-50 结构示意图

技术参数	性能参数
适用面积: 30-50 m²	换气量: 150 m³/h
噪音: 32 dB(A)	能效等级: A
功率: 20-30 W	滤网寿命: 3-6 个月
重量: 4.5 kg	尺寸: 350 x 180 x 180 mm

der Benährte -TL 1230

der Kompakte -TL 200-50

Thermo-Löfner

NEU

LTM 莱通新风净化器

www.ltm-germany.com

Combatting Air Pollution in China – the German Way

Successful market entry thanks to Steinbeis

An enterprise with a strong focus on international markets, the Steinbeis Consulting Center China (SBC) helps companies set up and expand their business connections in other parts of Europe and China. It takes a holistic approach to this. How it works to the benefit of clients can be seen by the successful market entry of LTM GmbH in China.

Most SBC clients are small and medium-sized enterprises spanning a variety of sectors of industry with a plan to enter new markets. To help them, the Steinbeis enterprise offers a broad portfolio of services, from setting up a company to procurement, marketing, and sales.

LTM, a provider of ventilation technology based in Meinerzhagen (east of Cologne), has been producing innovative ventilation equipment with built-in heat recovery since 1992. Its units are used in new residential buildings, renovated properties, public buildings, and on commercial premises. LTM's specialist knowledge of ventilation technology has fuelled a successful track record across Germany and Scandinavian countries going back over 20 years. In 2014, the company decided it was time to enter the Chinese market, mainly because of the dramatic rise in air pollution in larger Chinese cities and the related hike in demand for efficient ventilation systems for both residential buildings and office complexes. To take the right steps, the company received support from experts at the SBC. The SBC takes a holistic approach to supervising projects, from an initial market analysis to help with strategy planning to more frontline activities such as sales and marketing.

The project resulted in the foundation of LTM Electronics Co., Ltd. in Shanghai, in November 2014. This move allows LTM to hand the exclusive right of representation on the Chinese market to a partner in the country. Only 12 months after setting up the company, LTM China successfully launched its products in the Chinese market, all of which still

bear the hallmark of products "Made in Germany." The company also received professional support from the Steinbeis experts with its sales activities. The resulting promotional plan kicked off in 2015 and included:

- A promotional video on the most visited Chinese video-sharing website Youku
- A presentation of LTM products by the PR China Ministry of Construction, Energy Saving and Smart Cities, which described them as particularly innovative technology
- A special exhibition at the Beijing Institute of International Technology Transfer Center
- An exhibition booth in several Chinese cities, for example at the Shanghai Exhibition Center for quality housing

Given the increasing levels of air pollution in China and stricter regulatory requirements, the environmental technology market is expected to continue to expand in China. As a result, LTM is planning to set up production in China, again with the support of the SBC.

The SBC is also involved in promotional activities and exchange revolving around the issue of energy and the environment. Since 2014, it has been part of a partnership with the CDE, a Sino-German energy alliance based in Frankfurt. Regular events with the alliance have quickly resulted in strong interest from Chinese companies. Other alliance members work for leading German or Chinese companies and research bodies in the energy industry and they have detailed specialist knowledge and business experience.

Image: The LTM product catalog in China



Da Li-Schumann is director of the Steinbeis Consulting Center China (SBC). The consulting center supports companies with their expansion activities outside Germany, especially in China. Its services range from planning to strategy development and hands-on support with actual implementation. This not only involves taking business considerations into account, but also soft factors such as business culture, business philosophy, and issues such as ethics.



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Steinbeis Transfer in South Korea

Successfully shaping the international transfer of knowledge and technology

A Steinbeis partner enterprise established in 2014, the Steinbeis Technology and Innovation Centre – Republic of Korea (STIC) offers its clients consulting services as well as continuing education and training programs – making a valuable contribution to the international transfer of knowledge and technology between Korean and European companies.

One of the most important aspects of STIC's work is providing support for the vocational training program launched by South Korea's Ministry of Trade, Industry and Energy (MOTIE). It aims to improve the nation's industrial competence by applying lessons learned from modern European vocational training systems. The program supports participants for a maximum of three years as they train to become master craftsmen or complete specialized high-school diplomas. Training takes place in European countries or South Korea; after completion, graduates will work for South Korea subsidiaries of European firms. The participants' training and travel expenses are paid by the South Korean government. Because Germany and Switzerland are among the global leaders in vocational education and training, most of the program's partners are German and Swiss companies. In close cooperation with the Steinbeis Transfer Centre Korea – Europe, the STIC looks for companies who are willing to participate in the program, supports the program for qualified university graduates, monitors its status, and coordinates the interests of all parties.

In addition, in October 2014 STIC organized the first Steinbeis Korea Day in Seoul, focusing on "German Innovation Strategy." One of its aims was introducing South Korean companies to the Steinbeis philosophy and strategy. Some 100 professionals from government agencies, universities, research institutes, and companies attended the event to gain a better understanding of the innovation strategy of German industry and the Steinbeis network.

Many South Korean companies have been turning to STIC recently to learn more about Industry 4.0 and the German automotive industry. The Steinbeis partner enterprise offers German market research and helps forge networks between potential customers and a matching Steinbeis enterprise.

The core competencies of STIC include management consulting, training in business model development, and intellectual property management. It serves as a technical and marketing partner to South Korean companies as they enter European markets, thereby facilitating knowledge exchange. STIC also supports European companies looking to partner with South Korean firms. The enterprise provides both South Korean and European companies with tailored consulting services to help them solve problems related to R&D, marketing, sales, and technology-related partnerships.

Image: Steinbeis Korea Day 2014



Giwang Lee is director of the Steinbeis Technology & Innovation Centre – Republic of Korea, a Steinbeis partner located in Seoul, South Korea. The enterprise specializes in the commercial application of technology and training services, never losing sight of the on-the-ground realities of South Korean industry.



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“Education, Education, Education!”

An interview with Prof. Dr. Werner G. Faix, Managing Director of the School of International Business and Entrepreneurship (SIBE) at Steinbeis University Berlin

Prof. Dr. Werner G. Faix explains why education is particularly important in times of globalization, and outlines his views on the mutual relationship between digital technology development and globalization.

Professor Faix, you came to Steinbeis in 1995 from a management position in human resources at an international company. Since then, factors such as globalization and internationality have dictated not only the focus of your Steinbeis Enterprise but also the services it provides. Which developments in these areas do you consider the biggest challenges for you and your transfer enterprises?

Globalization is resulting in certain changes in the world in that it's becoming a smaller place, more networked – events on the other side of the world really do have an impact on us; the famous flapping of a butterfly's wings in China has an influence on our weather here. This butterfly effect can create a storm, but the winds it sets in motion can also drive away storm clouds. Sticking with this image of winds of change, I'd like to quote Confucius: "When the wind of change blows, some build walls while others build windmills." We shouldn't see globalization as a threat that we need to protect ourselves from. We should actually see globalization as an opportunity for us to grasp. Change creates uncertainty, especially if it's radical like the sweeping change caused by globalization, and this creates fear because it puts a question mark over what existed until now. Sometimes these were things we loved and cherished. These are feelings that are not just sensed by individuals, but also by organizations and companies, and even entire societies sometimes feel this way when faced by globalization. These feelings are understandable, but it's also clear that in themselves they're not exactly a solution. The only thing that really helps us in such a situation is the ability to – the volition to – actively shape change. In my opinion, one of the best ways to do this is to come up with innovations, so to a certain extent, you meet change with change. That's

because yesterday's solutions are rarely suitable, if at all, to solve pressing issues and problems of today – let alone tomorrow. But how can we get individuals, organizations, and entire societies to develop this ability and volition to see globalization and sweeping change in the world as an opportunity? My answer to that is: education, education, education! That being said, education must not be reduced to knowledge acquisition through reading or by attending lectures. Just so we're clear about this: Naturally, knowledge also lays the foundation for education, but over and above that it requires an education that moves people – deep down inside, in terms of personality – not just for these times of change, but actually because we're in times of change. That's because we need people who, for example, know what globalization actually is. It takes people who have the ability and the volition to positively shape globalization. This has always been the challenge taken on by the School of International Business and Entrepreneurship (SIBE) – offering an education that puts people in a position to be innovative, to turn knowledge into a value-adding reality.

Skills training is now central to your work. Is there such a thing as a required globalization competence, and if there is, how can companies train people to have this and promote it? Alternatively, if it doesn't exist, why not?

For me, competence is the ability to act with a specific objective in mind in the face of the unknown – so for me it's intrinsically linked to action. This is why all of the degree programs at SIBE are strictly based on the principle of project skills; that is, every degree at SIBE revolves around a specific project at a company or organization and it gets students doing things that mean they have to translate their knowledge into a

reality. It's only when this active transfer of knowledge into practice takes place that knowledge becomes a skill – a competence. To develop competences, the right things have to be in place for people not just to passively take on knowledge but instead to actively apply that knowledge in order to solve a problem. In other words, to develop a competence, you need both things in place: a solid foundation of knowledge but also the possibility to translate this acquired knowledge into action. As far as globalization competence is concerned, I believe that people can actually be trained to do this by showing them how to prepare themselves with the necessary knowledge and by giving them ways to translate knowledge into action as part of a project – based on this knowledge, and using this knowledge, they can then actually shape something. A key factor in developing globalization competence is that the topic of the project has something to do with globalization, for example a project on the internationalization of business operations, purchasing or selling, or the like. In the same way that you acquire the ability to ride a bike by actually riding a bike, you develop globalization competence by being actively involved in the issue of globalization or by actually doing something. SIBE has already worked successfully with a number of companies in this area, for example with Lidl, who was looking to expand its business operations in Eastern Europe. As for whether there is a specific thing called globalization competence, I don't think there is. I believe such a competence is a mixture of things, transcending other competences like a willingness to learn, an openness to change, the ability to come up with ideas, the ability to get things done, adaptability, flexibility, and more.

Do you think digital development – or digitalization – accelerates globalization? And if you do, what opportunities does this create?

As I said before, globalization means that the world's becoming a smaller place, it's pulling together and becoming more networked. Digitalization accelerates and facilitates this pulling together and networking. Globally integrated companies would be inconceivable without the widespread introduction of computers, the Internet, email, instant messaging, and ERP systems. International work sharing takes on a whole new meaning with digital solutions. I see a major opportunity that comes hand in hand with digitalization, because we can delegate increasingly complicated tasks to technology and algorithms. One major threat I see lies in blindly believing in technology; this results in delegating all complex problems to technology and algorithms.

Your work at the university means that you're closely involved in management education. What particular challenges do managers have to face with respect to internationality – today and tomorrow – and where do you think the emphasis should be placed in education?

The conditions in which people have to manage have changed dramatically since the beginning of the 20th century. The new normal is that change is more the rule than the exception. Managers surveyed as part of IBM's global CEO studies keep saying that the world overall and business in particular have become alarmingly fast-moving, and more so – more uncertain, more complex, and different in structural terms. Exaggerating to make a point, for many managers this means there's not a single day they can go to work and know what will happen that day. The

reasons for this are things like the megatrends of globalization and digitalization I mentioned before. Also, managers face new attitudes from co-workers when it comes to expectations, and these are expressed quite openly, especially when it comes to younger people in business. People want to be more closely involved, they ask to do work that they enjoy and has meaning. The perceived acceleration in life overall – and as part of this the acceleration in business – places greater pressure on managers to make decisions. And finally, if it hasn't happened already, since the year of crisis in 2008, managers are also finding themselves more and more the subject of media attention. Given all these things, to lead competently managers need the ability to involve others, to empower them, to network them. Also, more than ever in the past they need to see themselves from a creative standpoint. The future of a company depends on people being able to recognize their own abilities and the potential to get things done, people who unleash this potential and apply it effectively, as part of entrepreneurial undertaking. So for developments in business to leap ahead, managers are needed who are able to pinpoint solutions creatively and independently and implement them. To put this another way: for the challenges of today, tomorrow, and the day after tomorrow, managers are needed who have – or are – a "creative personality."

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Knowledge and Technology Transfer Made in India

Steinbeis successfully introduces its model

India is the seventh largest country in the world. With over 1.2 billion inhabitants, it is the second most populated country on Earth. India sees its diversity as a unique selling point and has masterfully adjusted to international change. The small and medium-sized enterprises (SMEs) in India drive in 8% of the its GDP, they employ more than 69 million people, and they produce more than 6,000 products – ranging from traditional products to high-tech components. The Steinbeis Centre for Technology Transfer India lends support to this by placing its focus on fostering knowledge and technology transfer in India.

India's national manufacturing policy (NMP) was launched in 2011. Its aim is to raise the manufacturing share of GDP to 25% by 2022. In 2010, manufacturing only accounted for roughly 16% of GDP, while in other Asian countries it makes up at least 30% of GDP. Now the hopes are to create at least 100 million new jobs by 2022, while also improving international competitiveness, domestic added value, technological penetration, and the environmental friendliness of domestic growth.

To achieve this, Indian SMEs must improve in areas like quality, productivity, and market access by leveraging innovations and technologies introduced to business in order to gradually enhance products and services. This would allow them to achieve forward integration in the value chain and tap into new markets, which are looking for more variety. To this end, experts from the Steinbeis Centre for Technology Transfer India are on hand to lend support.

The Steinbeis Centre for Technology Transfer India was jointly founded in January 2009 by 2E Knowledge Ventures Pvt. Ltd. and Steinbeis. It offers its customers a variety of services:

- Technology consulting and publication of research findings. Among other things, this includes projects carried out in the field of smart travel solutions, smart cities, smart villages, eMobility solutions, financing, design and project planning for photovoltaic facilities, and other facilities for renewable energies, energy efficiency, and business cluster programs for lean management (subject to approval by the Lean Management Consulting Organization of the National Productivity Council within the Indian government).
- Technology scouting, marketing, transfer, applied R&D, expert reports and evaluations of technologies and IPs. This is offered in collaboration with other enterprises in the Steinbeis network, with technology transfer partners in North America, Hungary, Russia, South Korea, Taiwan, China, Singapore, Australia, and Sri Lanka, as well as with the

European Enterprise Network (EEN) and an independent innovation partner in North America.

- Professional training, continuing professional development, and independent certification. These services cover areas such as photovoltaics and renewable energy, the automotive industry, smart travel/eMobility, machine tools and production, technology transfer management, and more. The Steinbeis Centre for Technology Transfer India has been accredited as a center of excellence by the European Centre for Renewable Energy for its training courses on renewable energy and energy efficiency. Other accreditations include: certification as a national training organization by the Indian government's Ministry for New and Renewable Energy (MNRE) for working in line with the country's national solar targets; certification as a center of excellence by the National Institute of Solar Energy; certification from the MNRE as a partner of the solar energy training network (SETNET); certification as a training partner by the Indian Electronics Sector Skill Development Council and the National Skill Development Corporation; certification as a training partner by the Andhra Pradesh State Skill Development Corporation of the Andhra Pradesh government. The Steinbeis partner enterprise is also currently establishing an evaluation and certification system for technical training programs.

The current projects conducted by the Steinbeis Centre for Technology Transfer India are very diverse. For example, the enterprise is currently working with select premium institutions in India, preparing training programs for innovation management at SMEs and technology brokering organizations. This project is supported by the GIZ, a German association for international collaboration. The Indian Steinbeis Enterprise also worked closely with Steinbeis Technology Transfer GmbH & Co. KG to submit offers for two large-scale projects, both of which are being funded by the World Bank through the Indian Ministry of Micro, Small & Medium Enterprises (MSME). These projects are related to modernizations in automotive, electronics, and technology centers and Steinbeis has the technical qualifications to tender for these projects. What's more, the Steinbeis Centre for Technology Transfer India is working closely with IPEX Singapore on the transfer and commercial use of technologies in India. This project is being financed by the Asian Development Bank.

The Steinbeis partner enterprise was also involved in Humboldt University Berlin's megacity project in Hyderabad. The German Federal Ministry for Research and Education supports sustainable megacities in many cities across the globe through this project. In addition, the Steinbeis team supported technology transfer from Germany to India related to photovoltaic power inverters. As part of this project, a joint venture was established between a German company (which owns the intellectual property rights for the solar-hybrid power inverters) and an Indian SME working in the field of photovoltaics.

Together with the European Business and Technology Centre (EBTC) – as part of a project funded by the European Commission and the Union of European Chambers of Commerce and Industry (UECC) – a report was published on Holistic Mobility Solutions for Indian Cities along with a Compendium for Technology Transfer with Case Studies from Europe to India. More than 50 training programs have been carried out in cooperation with the experts at the Steinbeis Centre for Technology Transfer

Steinbeis Technology and Innovation Centre Network in India:

- AAUTOSYNC – Steinbeis Centre for Innovation, Punjab
- Steinbeis Centre for Automotive Technologies & Training, Pune
- Steinbeis Centre for Renewable Energy Technologies & Knowledge Transfer, Manipur
- Steinbeis Centre for Solar Technologies and Training, Chennai (SCSTC), Chennai
- Steinbeis Centre for Solar Technologies Training, Cochin
- Steinbeis Centre for Technology Transfer India, Hyderabad
- Steinbeis Solar Research Centre (SSRC), Chennai

India in India and Germany – all of which were in various technology areas including: photovoltaic technology, surface coatings, molding technology, production, machine design, automotive project planning, industrial sensors, and technology transfer management.

Image: Solar V channel technology, developed by the Steinbeis Solar Research Centre, Chennai, Tamil Nadu, India



Vineet Kumar Goyal is director of the Steinbeis Centre for Technology Transfer India and offers Indian companies technology consulting, technology transfer, applied research and development, and the development of training courses and continuing professional development programs.



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“Risk management isn’t a luxury”

An interview with Prof. Dr.-Ing. Aleksandar Jovanovic, director of the Steinbeis Advanced Risk Technologies Group in Stuttgart

Professor Dr.-Ing. Aleksandar Jovanovic talks to TRANSFER magazine about his fascination with risk and explains why risk management plays a particularly important role when it comes to emerging technologies, sustainability, and innovation.

Professor Jovanovic, you’ve been an active part of the Steinbeis Network since 2001 and you now spend a lot of time thinking about risks and risk management, especially in an international context. Why does it fascinate you so much?

You said I “now” spend a lot of time thinking about risk? More like I always have! It was a conscious decision at the time to continue my work on risk, safety, and risk management when I joined Steinbeis. I found it really exciting to see how interest has risen in such topics, how the dividing line between individual aspects has evaporated, and how suddenly multidisciplinary and interdisciplinary are like the new commandments. I worked for years as an engineer and machine builder looking at the safety of industrial plants, such as nuclear power stations. But around the end of the 1990s and the turn of the millennium it became obvious that no one was in a position to carry out a proper risk analysis if they don’t take aspects like perceived risk or societal acceptance into

account. Everywhere, the world over! If a new technology like nanotechnology, fracking, drones, or terahertz radiation technology is accepted on one side of the mountain but it’s not on the other, then you have to look into why. You have to understand the risks in as much detail and with as much objectivity as possible. Doing that often involves applied risk research and international collaboration. Steinbeis offers a number of advantages in this respect. There’s no other “innovation infrastructure” with anything like the effective and efficient ways we have to collaborate directly with industry, research, universities, and, in some cases, the authorities and international organizations such as the EU, OECD, ISO, UN and so on. It’s something we’ve proved within the Steinbeis Advanced Risk Technologies (R-Tech) Group in more than 100 projects until now. Our portfolio spans an extremely broad spectrum of projects from huge projects worth up to €0 million for the EU or € million for companies, right down to small-scale services for SMEs.

Risk management is a challenge in itself for companies, even more so if you add the challenges of globalization and going international. What would you say are the key instruments for tackling such complexity, or complexities?

Risk management isn't a luxury. There's something called the risk paradox and in his book of the same name, Ortwin Renn explains that people can't quite cope with the risk paradox, or they're scared of the wrong things (or the other way round), and because of this what's needed is a risk management model that revolves around business practice, that's credible and transparent. To do this, the model has to be "open" since the biggest risk is the risk which we overlook, or we don't recognize, or don't actually want to recognize. We've systematically developed a model along these lines in the R-Tech Group and applied it to practice. This model has also been firmly anchored into standards that have been developed in Europe and elsewhere in the world under the auspices of Steinbeis. These Steinbeis standards are in use across the world in European EN standards, CEN standards, and DIN-SPEC in areas such as the "risk-based maintenance of industrial plants" or "the risks of emerging technologies." The concept, these standards, the specialists we educate and train at Steinbeis University Berlin – they're the elements, in some cases even the "instruments" if you will, that you need to manage and control risk in a "brave new complex world." What you mustn't forget at any point is the aspect of resilience. With some risks the most interesting question is not necessarily how often, or what will or can happen, but how will my complex system react? If a system does go down, for example, some of the new energy supply systems based on renewables, what will happen to society, to the economy, or to organizations? How quickly will the systems "recover?" How resilient are these systems to cyber attacks or terrorism? All of these questions are now occupying the thoughts of lots of specialists in Europe and the rest of the world. The European Virtual Institute for Integrated Risk Management (EU-VRI) is a European Economic Interest Grouping and part of the Steinbeis R-Tech Group, and with the support of other members of the group, it's spearheading a new EU project called SmartResilience. Its main objective is to determine indicators – including those stemming from big data – and to identify and monitor these in order to recognize potential weaknesses on time and manage them successfully.

You've now set up franchise companies in Serbia and South Africa. What was the background to that and in what ways does this benefit your customers?

We have to work where (a) there's need and (b) there are the resources. Thanks to the support of Steinbeis, the South African energy provider Eskom now manages plants with a capacity of over 40,000 MWe in 14 major power stations – that's 95% of the whole country's capacity! And Steinbeis R-Tech is responsible for this! To set up the right teams on site, not only do we have to work together closely but we also have to achieve some kind of integration with local partners. More than half of the people working for the Steinbeis R-Tech teams on site are from South Africa; all we do is provide "services for an energy supply company," so we build up a better local infrastructure, we train people, we involve groups of people in society who were previously disadvantaged. To do this you need people on the ground and a good way to do that is

to have a Steinbeis franchise company. This works to the benefit of Steinbeis, to the benefit of South Africa, to the benefit of everyone involved in the project. It's a win-win combination. We have a similar setup in Serbia, where the client is in the oil industry, although in this case we want to use local resources for other projects across the world and in Germany. In simple terms, instead of bringing people to Germany the people working over there in the Steinbeis franchise company perform a kind of nearshore outsourcing function, which again works to the benefit of everyone.

Is there major interest in the topic of risk, especially with respect to emerging technologies, sustainability, and innovations, both on a national level and on an international level, and does this interest result in actual management practice that works globally? And if not, why not, if there are still increasing occurrences of risk?

Of course it's sometimes too difficult to "be a prophet sitting by the village fire," but when someone from Steinbeis goes to an international risk convention and gives a keynote speech about the risks of Industry 4.0, then people "back home" do notice. There's no question that our strength has to be "Vorsprung durch leading risk management." There are lots of people who can talk about risk, but not everyone has actual solutions or services in this area. The Steinbeis R-Tech Group can "walk the talk." We've proven that already and will do many times more in the future through close international collaboration. This is also why we're involved in the process of international standard setting for things like ISO standards 31000 and 31010, in which the Steinbeis R-Tech Group is playing an active part. In fact we're just starting a new project – with the Chinese actually in China – called Risk Radar China.

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Professor Dr.-Ing. Aleksandar Jovanovic is director of the Steinbeis Advanced Risk Technologies Group in Stuttgart. The alliance of enterprises offers its customers a variety of services related to business risk management, the analysis and management of technical risk, data analysis, and project management.



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Industrial Internet for the Competitive Edge

German Country Team in the Industrial Internet Consortium is based at Steinbeis

The Industrial Internet Consortium (IIC) was founded in March 2014 by companies including AT&T, Cisco, General Electric, IBM, and Intel. As an open organization that is managed by its members, it has grown to more than 250 members from 26 countries. The IIC aims to accelerate developments related to the Industrial Internet as well as the Internet of Things and other commercial services. The German Country Team joined the IIC in September 2015. The team is based at the Steinbeis Transfer Center Innovationsforum Industrie (STCII), putting it right under Steinbeis' roof.

The IIC coordinates initiatives which raise new requirements and develop specifications for new (Internet) protocols and standards. The focus lies in creating cross-domain interoperability and interconnectivity. Common architectures and open standards are key here. This should clear the way for business model transformation and give new service providers a way of becoming integrated into established value chains through digitalization.

One of the primary activities of the IIC and its members is to coordinate and implement what it calls "testbeds." This involves using Industrial Internet solutions in specific usage scenarios on a controlled, experimental platform, and testing them in a real scenario under live conditions. Groups of IIC members come together in a testbed to develop and test cross-domain solutions related to the Internet of Things. Networking in various IIC working groups thus brings about new and innovative products, services, and processes in the field of Industrial Internet.

The number of testbeds currently working within the IIC runs into double digits. Of these, the IIC Steering Committee has declared nine as openly accessible and in the later stages of their work:

- Asset Efficiency Testbed involving Infosys, Bosch, Intel, and PTC
- Condition Monitoring & Predictive Maintenance Testbed involving IBM and National Instruments
- Edge Intelligence Testbed involving Hewlett Packard Enterprise and Real-Time Innovations
- Factory operations visibility & intelligence Testbed involving Fujitsu Limited and Cisco
- High Speed Network Infrastructure Testbed involving GE, Cisco, Accenture, and Bayshore Networks
- Industrial digital thread (idt) Testbed involving Infosys and GE
- INFINITE Testbed involving the EMC Corporation and Cork Institute of Technology
- Communication & Control testbed for Microgrid Applications involving Real-Time Innovations, National Instruments, and Cisco
- Track And Trace Testbed involving Infosys, Bosch, Cisco, National Instruments, and TechMahindra

The testbeds are flanked by working groups. These raise overarching requirements in general areas such as architectures or trust and security. They also develop suggested specifications for each of these areas. These then flow back into the testbeds and they have also led to the crea-

tion of the Industrial Internet Reference Architecture (IIRA). This reference architecture serves as an important regulatory framework and offers companies extensive support in their digital transformation. The IIRA specifically addresses the cross-domain use of Internet technologies, since it presupposes an increasing merging within industry on account of increased numbers of value chain networks arising from Internet technologies. The focus of the IIRA thus lies in cross-domain interoperability and interconnectivity.

There is a big difference between this and the Reference Architecture Model for Industry 4.0 (RAMI 4.0), which was published by the Industry 4.0 platform. The latter focuses on manufacturing domains from the perspective of the Industrial Internet and has an industry category for manufacturing. For industrial enterprises this then raises an essential question: How compatible are the reference models? This is because, based on the current focus, one could expect significant added value from merging the two. A task force made up of IIC and Industry 4.0 platform members is looking into this and Steinbeis has representatives from the Ferdinand Steinbeis Institute on the task force.

The IIC has gained incredible momentum through its activities over the past two years – to such an extent that the initiative has garnered worldwide attention and is being accelerated. In addition to Asian companies, more and more companies from Europe and Germany are becoming active partners of the IIC. Since the topics being pushed by the IIC are so important for the German economy – especially the strong base of industrial SMEs – in 2015 a German Country team was founded within the IIC. The contacts on the management board include Dr. Richard Soley (Director IIC), Prof. Dr. Heiner Lasi (Ferdinand Steinbeis Institute), Prof. Dr. Hans-Georg Kemper (University of Stuttgart), and Viktor Paland (Sigs Datacom). The focus of the German Country Team's activities partly lies in strengthening cooperation between German IIC members. In addition, the STCII also acts as an intermediary between the IIC and German SMEs, processing and making available any IIC contents that might be relevant for SMEs. What's more, small and medium-sized enterprises based in Germany should be given the opportunity to participate in testbeds and use cases through the German Country Team. They also need to exploit the STCII's role as an agent of transfer in order to share various issues and concerns within the IIC. To this end, the German Country Team can support the IIC's activities in Germany while taking local factors into consideration. For SMEs that are unable to actively represent themselves in the IIC, it also offers the option of participating in the development of the Industrial Internet as it gets out of the starting blocks.

Looking back: Industry 4.0/Internet of Things (IoT) Forum @ OOP 2016

The first Industry 4.0/Internet of Things (IoT) Forum was held on February 4, 2016 as part of the OOP in Munich. Organized by the STCII, specialists from the fields of engineering, information technology, and company management presented some powerful concepts, especially those implemented through IIC testbeds. Dr. Richard Soley, CEO of the IIC, delivered an outstanding keynote speech, which was followed by contributions from companies including Infosys, AIT, Oracle Deutschland, Noser Engineering, RTI, IBM, and Sulzer. The forum was moderated by the two members of the STCII management board, Prof. Dr. Heiner Lasi and Prof. Dr. Hans-Georg Kemper.

Save the date: The STCII at Hannover Messe 2016

The STCII Team will be on site in the IIC Pavilion in Hall 8 (Stand C24) from April 24–29, 2016. We look forward to seeing you there!

Image: Dr. Richard Soley, Sandra Haltmayer, Prof. Dr. Heiner Lasi (left to right)
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Sandra Haltmayer



Professor Dr. habil. Heiner Lasi

Sandra Haltmayer and Professor Dr. habil. Heiner Lasi are directors of the Steinbeis Transfer Center Innovationsforum Industrie, which runs the German Country Team within the Industrial Internet Consortium. Further key areas of activity include sharing new insights and linking committees, especially within the context of Industry 4.0.



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A Booming Industry: Medical Equipment from Malaysia

Steinbeis Malaysia Foundation promotes collaboration aimed at sharing know-how and technology

The Asian market for medical equipment was worth around USD 4.6 billion in 2013 and is expected to hit USD 9 billion by 2019. Malaysia, Thailand, and Indonesia currently account for 65% of the medical product market in the region. The Steinbeis Malaysia Foundation is providing support to Malaysian business to help them register their medical products and promote them in international markets.

The economies of the countries in Southeast Asia are flourishing. According to figures issued by the International Monetary Fund (IMF), the average annual GDP growth in Asian countries was 4.8% in 2014. This significant economic growth has fuelled an expansion in the middle classes, and, in turn, this is fuelling health care spending in the region. The result is further growth for the medical equipment industry. In Malaysia, the industry is highly diversified, ranging from rubber to latex, textiles, plastics, mechanical engineering, and electronics. The industry now manufactures a broad spectrum of products and medical devices: medical gloves, implants, orthopedic devices, dialysis machines, equipment needed in diagnostic imaging, laparoscopic devices, equipment used for medical, surgical, dental, or optical treatment, and general medical instruments.

Malaysia is an important producer of rubber and the leading supplier of latex products. These include products such as syringes and surgical gloves. According to estimates, roughly 60% of all rubber gloves and around 80% of catheters used in the world were made somewhere in Malaysia. In recent years, the country has witnessed growth in the export of diagnostic imaging devices, especially electrocardiographs and other electronic diagnostic devices.

The Malaysian government considers the health care industry one of the most important sectors of the domestic economy and the country is currently investing huge sums in setting up the right infrastructure and supporting clinical research. At the latest count, there were more than 350 hospitals in Malaysia, of which 150 are run by public authorities. The market for medical equipment in Malaysia was worth USD 1.36 billion in 2013, of which USD 1.17 billion was invested in imported products. The market is expected to keep growing at an average of 16.1% (CAGR) and should be worth USD 2.87 billion by 2018. There will be tremendous demand for medical consumables and dental products.

The key players in the Malaysian medical equipment market include domestic manufacturers, suppliers of raw material and services to the companies producing medical equipment, and importers and exporters of medical devices. Currently there are over 190 companies operating in the Malaysian medical equipment market, most of them small and medium-sized enterprises, and most of these produce medical gloves. There are more than 20 medical equipment multinationals that also produce gloves for non-medical purposes. They have chosen to operate in Malaysia and to use it as an off-shore location for their production. Significant multinationals have invested in Malaysia, including Agilent, B. Braun, St. Jude Medical, C.R. Bard, Symmetry Medical, Teleflex,



Resmed, Convatec, Ciba Vision (a subsidiary of Novartis), Accellent, Kelpac Medical, Eurocor, Criticare, Ambu, Toshiba Medical Systems, and Haemonetics.

Malaysia sees itself as the ideal location to invest in medical products because it strictly regulates the protection of intellectual property rights. It is also a favorable strategic location in geographical terms. Other factors that work to the advantage of investors are the number of highly qualified production and administration workers and these go hand in hand with an as-yet unsaturated domestic market offering plenty of growth potential. Working through the Malaysian Investment Development Authority (MIDA), the Malaysian government has introduced incentives to stimulate interest among foreign companies to invest in the Malaysian market.

A process has been underway for some time to introduce medical equipment regulations step by step. The first phase started on January 12, 2006, allowing companies to register voluntarily. On February 9, 2012, a medical equipment act was passed in parliament. This came into effect on July 1, 2013, by which time all medical products had to be registered if they were produced in, imported into or sold in Malaysia. There is a two-year transitional period for registering medical products and companies have one year to take care of registration, after which the law is enforced without restriction. The aim of introducing the new legislation in 2012 was to protect patients and other customers against unapproved or substandard medical products. Medical equipment is categorized into four categories from A to D depending on the level of risk they in-

volve and their intended use. Under the new regulations, the producers and importers of equipment also have to be registered with the medical equipment authority, a separate department at the Malaysian Ministry of Health. Its responsibility is to oversee the medical equipment industry. The Malaysian medical equipment laws are intended to help Malaysia gain international recognition as a reliable producer of medical products. It should also help attract direct investments from overseas, instill more confidence in the market, and open the door to more domestic companies entering into joint ventures with foreign enterprises.

Malaysia has the potential to raise its profile as a key player in the medical equipment market, not only in the field of R&D but also as a producer. This is because the supporting industries for medical equipment are already well established. These include the production of sterile medical packaging, precision technology, tool and mold making, material processing, contractual injection molding, assembly, mechanical engineering, and electronics. This supporting infrastructure bolsters the standing of Malaysia as a location for outsourcing and as a global provider of components to be used by companies that produce medical equipment and instruments.

The primary aim of the Steinbeis Malaysia Foundation is to provide a link between universities on the one hand and industry on the other, particularly in the field of medical equipment, and in doing so, to foster efficient and effective collaboration when it comes to sharing know-how and technology. Thanks to its international network of experts, the Steinbeis Malaysia Foundation is in an ideal position to offer industry ways to "outsource innovation." The portfolio of services offered by the Steinbeis partnership enterprise range from short consulting sessions, to setting up transfer centers at the overlap between business and science, and ascertaining the requirements of industry. Steinbeis Malaysia will continue to provide support to industry players, irrespective of their size or specific field of activity.

Image: © sudok1 – Fotolia.com



Dr. Abdul Reezal is director of the Steinbeis Malaysia Foundation, a Steinbeis Partnership Enterprise. Its key fields of activity include health care, nanomaterials, electronics, and electrical engineering.



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Entering New Markets and Supporting Existing Activities Overseas

SIBE at Steinbeis University Berlin helps prepare companies for international business challenges

As economies become increasingly global, workers face new challenges, as do their managers. The School of International Business and Entrepreneurship (SIBE) at Steinbeis University Berlin has recognized changing needs and offers companies ways to meet these challenges with its Going Global Program.

German exports hit record levels in 2015. According to the Federal Statistical Office, last year German companies exported goods worth almost €1.2 billion to every corner of the globe. Compared to the previous year, exports rose by 6.4% and imports were up by 4.2%. So for enterprises, globalization is making it possible to access new sales and procurement markets. Companies that previously focused more on internal markets now also face more competition and the pressure to act quickly. For example, price competition is more intense, there is more competition in terms of quality, and there is increasing competition for qualified workers and (young) managers. Ultimately, taking the step abroad will no longer just be an option for such companies.

The findings of a long-term study on key success factors affecting German companies abroad (Faix et al., 2013) underscore the fact that product quality, selection of the right business partners, and good networks are key factors in a company's business success outside Germany. For half of the companies surveyed, a proper understanding of markets and qualified workers are extremely important.

To meet these challenges, especially at small and medium-sized enterprises, the School of International Business and Entrepreneur-

ship at Steinbeis University Berlin offers a tried-and-tested program of professional support services. This involves selecting and recruiting young managers with at least four years' work experience in the target export country. The managers then do a post-graduate management degree at SIBE in parallel to work as a management assistant at a German company.

The program has been in place since 1998. Since then, SIBE has worked with 250 companies, and 456 students from 17 countries have graduated through the program. The various challenges that students have tackled on behalf of the companies as part of their SIBE degrees include foreign market entry (typically the home country of the management assistant); new integration into international supply chains by sourcing raw materials or semi-finished products; solving a problem faced by an existing subsidiary.

The concept is highly successful and over 80% of program participants remain at the company after completing the program. These international graduates now work in management positions such as general manager or sales manager for their German partner company in locations like China, Brazil, eastern Europe, India and the Middle East. Sixty percent of the firms are involved in manufacturing and

processing, such as mechanical engineering, the automotive industry, and chemicals.

Gao Wei is one of the students who graduated on the program. In 1989 he completed a first degree at Harbin University of Science and Technology culminating in a bachelor in engineering. He then worked for 10 years for a Chinese research management company in Beijing. In 1999 he went to work in Canada as the general manager of a company called Roctest. He participated in the SIBE program between 2004 and 2006, and looking back now, he summarizes his degree thus: "Over the course of the SIBE Going Global Program, I systematically acquired new management know-how. The parent company gave me a great deal of support throughout the duration of the program and I was given time to exchange ideas with my German colleagues every day. I got to know German culture and the detailed insights I gathered allowed me to appreciate German business culture better. Focus, taking things seriously, planning, processes, discipline – lots of Chinese people consider this German doctrine old-fashioned and conservative, but personally, I think it's these values that are the key to the long-term success of German businesses. I've now worked for nearly eight years in a position of responsibility at the company and the annual turnover of Novotechnik in China is now nearly 35 million yuan. Our clients are leading enterprises in the manufacturing sector who place emphasis on quality and the long-term reliability of their products. We remain extremely optimistic regarding future business in China. Company sales and profitability are rising continuously."

During the Going Global Program, which runs for a duration of 2½ years, the management assistants work full time for the partner company. In parallel to this, they receive post-graduate management training at SIBE as part of a project competence degree (PCD). The focus of the PCD is a specific project at the company, the aims of which typically have something to do with setting up or expanding international business activities. The project is one way of ensuring that know-how gathered during the PCD is channeled into concrete results. Directly implementing know-how – stated another way: actually transferring knowledge – is the only way to ensure that students develop competences that will help safeguard the long-term success of the company. A typical project may be setting up sales, a network of suppliers, or production capacity, or maybe finding a business partner, launching new products, establishing new processes in the target country, or training young managers.

To help students solve their task, business coaches provide them with an understanding of the methods of international management and the practical skills they need to carry out analyses, or draft and implement a business plan in the target market in a way that matches the plans and needs of the company. The students analyze the current status and the business conditions affecting their specific company project. They also gather more information on the market, forge contacts among clients, partner companies, and suppliers, and enter into negotiations with the authorities in the target country. This provides a foundation upon which to determine goals, write strategies, and draft action plans with the project company before ensuring ideas are properly implemented. The final degree paper describes how the business plan was implemen-

ted for the company in the target country. SIBE experts and consultants provide supervision on implementation of this plan with regular reviews of completed tasks in coordination with the company.

The clients of SIBE use this model to systematically solve international business challenges.

Steinbeis School of International Business and Entrepreneurship

Services

Going Global Program (GGP): for "high potentials" with a previous domestic or international university degree, initial work experience, and a focus on international projects. Degree: Master of Arts (M.A.)/Master of Business Administration (MBA; USA). Field: Management

Master of Arts: two-year Project Competence Degree (PCD) in parallel to full-time employment, culminating in a Master of Arts (M.A.). Field: Management

Master of Science: two-year Project Competence Degree (PCD) in parallel to full-time employment, culminating in a Master of Science (M.Sc.).

Fields: Management, medical technologies

Master of Laws: one-year Project Competence Degree (PCD) in parallel to full-time employment, culminating in a Master of Laws (L.L.M.).

Field: Law

Image: © photodune.net



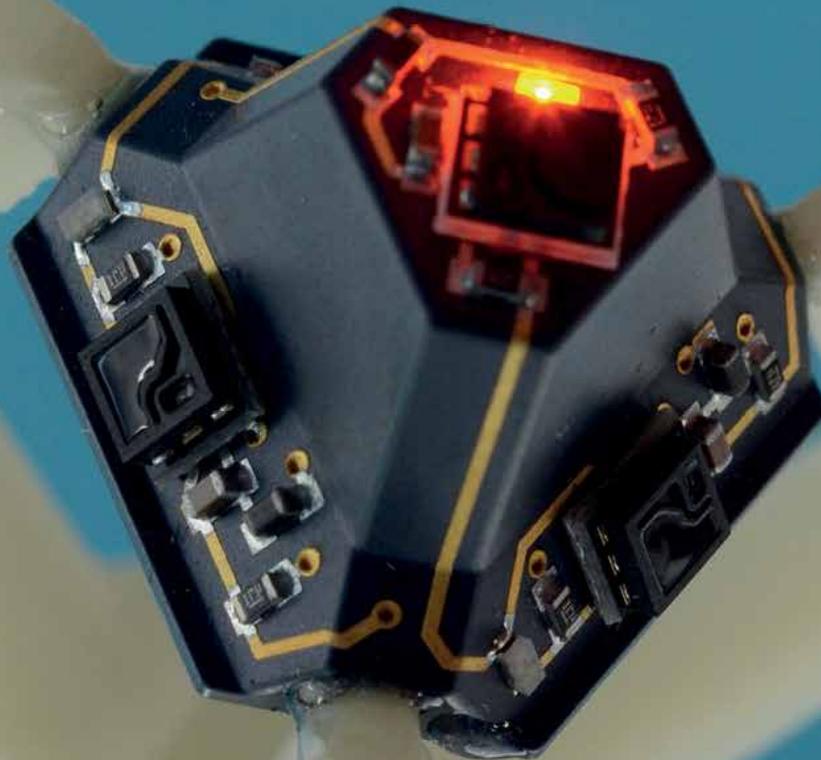
Ardin Djalali School of International Business and Entrepreneurship (SIBE) at Steinbeis University Berlin. He is currently working on a Ph.D. at the chair for learning sciences and education research at LMU Munich.



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Pooling Competence

Steinbeis sets up platform to provide SMEs with access to key enabling technologies in Europe

For small and medium-sized enterprises, gaining access to key enabling technologies (KETs) is still not as easy as it sounds. SMEs often lack the right networks and contacts to business clusters. Working on behalf of the European Commission, Steinbeis-Europa-Zentrum (SEZ) has now set up a Europe-wide platform of professional providers of services in six KETs fields. To do this, the SEZ has categorized technology providers and their infrastructures according to quality criteria. The information generated is now accessible online.

KETs are multidisciplinary technologies that demand a great deal of knowledge and capital. They are being introduced to a variety of sectors of industry due to their significant commercial potential. There are six KETs in Europe: nanotechnology, micro and nanoelectronics, photonics, industrial biotechnology, advanced materials, and manufacturing technologies.

To stimulate dialogue between European centers of technological excellence with the right KETs know-how, SEZ has been working in collaboration with a Greek company called Q-Plan on behalf of the EU, and has embarked on a special research project. This resulted in the selection of five technology centers across Europe and these centers are already collaborating closely: AeroSwedish ICT (Stockholm, Sweden), Johanneum Research (Weiz, Austria), LEITAT (Terrassa, Spain), the Manufacturing Group Warwick University (Coventry, UK) and Hahn-Schickard (Stutt-

gart and Villingen-Schwenningen, Germany). Each organization signed on to a fast-track, two-year exchange program and rounds of visits in each country. As the collaborative project got underway, a working group emerged which is regularly attended by 24 experts.

Steinbeis-Europa-Zentrum organized visits to all five locations in Europe which were attended by all key players. The aim was to explore research priorities, business models, and the strategies pursued at each establishment. This was followed by an exercise to derive a common strategy for future collaboration with a focus on KETs. Different topics were placed on the agenda for each of the five visits. At the first meeting in Stuttgart, the experts started by examining possible collaboration and synergies in the field of advanced manufacturing technology and nanotechnology. On the second visit to Barcelona, the emphasis lay in industrial biotechnology and advanced materials, whereas at the third

meeting in Graz (Austria) the key topic of conversation was photonics and micro nanoelectronics. At the fourth and fifth meetings in the UK and Sweden, collaboration went into more detail and internal exchange between the experts was extended to include external, public events. A key reason for this was to involve small and medium-sized enterprises. These SMEs were asked to talk about their needs and give feedback on the services offered by the technology centers, particularly when it comes to KETs. Work was also carried out on a list of recommendations to be sent to the European Commission. Overall, this round of exchange involved 44 different companies.

One company that benefited from this process of exchange with experts was Hahn-Schickard, which has positioned itself as an institution of excellence in the state of Baden-Württemberg in the field of KETs. The visits resulted in channels of communication becoming established for the long term between several key players. This has resulted in the submission of a joint European proposal.

SEZ discussed the results and recommendations with 60 key players at a closing conference in Brussels in October 2015. The results were pulled together into an action plan and this was presented as part of a study on KETs in December 2015. The 187 providers – which the European Commission calls KETs technology infrastructures – are also listed on the website of the European Commission. The website provides a map for SMEs to filter out KETs providers pertinent to their work not only in the local area but also across Europe. This involves entering technology keywords and the nature of the offer.

The KETs European brokerage event and Horizon 2020

A brokerage event will take place on May 12, 2016 in Mainz (near Frankfurt) to help coordinate collaboration as part of the European Union's NMBP Work Programme 2016 – 2017, which in turn is part of Horizon 2020. The aim is to help line up future collaboration between attendees

The event will revolve around:

- Nanotechnology and advanced materials
- Industrial biotechnology
- Advanced manufacturing and processing
- Energy efficiency in buildings (PPP EeB)
- Factories of the future (PPP FoF)
- Sustainable process industries (PPP SPIRE)
- PILOTS

Participants will have the opportunity to present their own project concepts and meet representatives from companies, universities, and research organizations in order to exchange ideas during pre-arranged meetings. The brokerage activity will be supported by Steinbeis-Europa-Zentrum, representatives of national contact points and the members of the Enterprise Europe Network.

The website has made it possible for the first time for companies to gain a comprehensive overview of technology centers and infrastructures relevant to their fields of activity. This makes it easier to access know-how across Europe, as well as services and KETs themselves.

Collaboration with the KETs technology centers is helping SMEs launch their products and implement innovations more quickly before introducing them to the market. All centers provide a key contact (national contact point) for SMEs and offer the following services:

- feasibility studies and laboratory testing
- development of prototypes and testing
- pilot production and production demos (pilot lines and series)
- product validation and certification

Image: Optical 3D gap sensor in LDS/MID technology © Hahn-Schickard



Prof. Dr.-Ing. Dr. h.c.
Norbert Höptner



Dr. Petra Püchner



Heike Fischer

Prof. Dr.-Ing. Dr. h.c. Norbert Höptner and Dr. Petra Püchner are directors of Steinbeis-Europa-Zentrum where Heike Fischer is also a project manager. The aim of SEZ is to provide support to companies, universities, and research organizations in Baden-Württemberg on issues relating to European research programs and technology collaboration.



Prof. Dr.-Ing. Dr. h.c. Norbert Höptner

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“We all need to be more courageous and be pioneers”

An interview with Guy Selbherr, managing director of the loan guarantee bank Bürgschaftsbank Baden-Württemberg GmbH and managing director of the SME investment/affiliation company Mittelständische Beteiligungsgesellschaft Baden-Württemberg GmbH.

Guy Selbherr talks to TRANSFER about the role played by Bürgschaftsbank Baden-Württemberg and Mittelständische Beteiligungsgesellschaft Baden-Württemberg (MBG) in helping to finance small and medium-sized enterprises who lack financial security. He also looks at whether there really is too little funding for innovation or whether other factors play a role.

Herr Selbherr, when it comes to funding, MBG and Bürgschaftsbank are now important partners to small and medium-sized enterprises in the state of Baden-Württemberg. What led to this success?

We've been closely linked to economic development in the state for over 40 years. We know the key players in the state and they know us. Communication is quick when it comes to partner searches. If you lack financial security, Bürgschaftsbank makes it possible to find financing, and we're an important enabler for the financial institutions and businesses in the state. The MBG is a funding partner that's interested in long-term partnerships. We work with companies during different stages of business development from inception to business growth and even succession planning. As well as providing money, we offer know-how and a valuable network that can help companies open doors.

You hear and read time and again about there being too little money available for innovation. Is it really about a lack of money or are other things getting in the way?

It definitely makes things easier if you have more choice, but that in itself that doesn't fuel innovation. Of course the question is, what exactly is an innovation? We pore over lots of concepts and not all of the

ideas we see have the right market potential, so this makes them uninteresting for venture capital. That being said, investors don't just look for growth potential, they also want to know about exit value. If they can't see the potential, they don't invest. But that's just one side of the coin. The other is that big companies in Baden-Württemberg invest major sums of money in R&D. They're highly innovative and have enough internal funds to finance innovation. Because lots of young and talented people work for these big companies, and also because of the strong employment market at the moment, they're "missed" – for want of a better word – by the entrepreneur scene.

One important target group for venture capital (VC) comprises entrepreneurs and new companies. MBG is the management company of "VC Fonds Baden-Württemberg," which offers VC to innovative and rapidly expanding companies in the state. What motivated your organization to manage this highly specific investment fund?

We were appointed by the investors to manage the fund. Why? Firstly, because we have a wealth of experience in this area and we're also the central point of contact for particularly interesting concepts – in other words our "deal flow" is appealing. Secondly, we can also offer other funding through MBG Baden-Württemberg, either through the network

or in collaboration with a high street bank and the guarantee bank if the VC fund simply isn't a good fit.

This year is just getting underway, but it's already becoming obvious that it won't just be the opportunities and challenges presented by changes in society that will dictate business for companies, but digital transformation and technology convergence. What do you hope will happen, for the companies and your own institutions?

Companies won't stand still. Our perception is that they're always moving forward and are willing to change. They're open to new technologies, and at the moment, they building a bridge between the old world and information and communication technology – something they know as Industry 4.0. The last financial and economic crisis also went hand in hand with a huge leap in productivity and innovation. We sense that the pressure that digital change is having on business models isn't being underestimated, so the companies are not going to ease up – even if things are going extremely well in some sectors.

As for Bürgschaftsbank and MBG Baden-Württemberg, I'm certain that we'll succeed in profiting even more from digital change, although that doesn't mean there will be funding via smartphone apps one day. Despite this, we all need to be more courageous and be pioneers. As in other areas, our customers have high expectations. They want quick channels of communication, direct contacts, and rapid decision-making to know if funding will work or not. I believe that this all works well if we work together as partners in the state, as we have until now – this pools strengths and know-how.

Image: © Sunny studio – Fotolia.com



Guy Selbherr is managing director of Bürgschaftsbank Baden-Württemberg and managing director of MBG Mittelständische Beteiligungsgesellschaft Baden-Württemberg. MBG often invests across different sectors of industry, typically as a dormant partner offering long-term, "business-friendly" terms to small and medium-sized enterprises in the state of Baden-Württemberg. Its financing models are similar to equity capital options, creating new room for additional funding. If required, Bürgschaftsbank can provide this alongside a bank guarantee. The benefit to companies of this approach is that it is holistic. Guy Selbherr will be a speaker at the Steinbeis Financing Arena in the Stuttgart Hospitalhof on April 7.



Guy Selbherr
MBG Mittelständische Beteiligungsgesellschaft Baden-Württemberg GmbH
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Prof. Dr. h. c. Lothar Späth

Obituary

"Instead of getting bogged down with overcomplicated ideas, we wanted to get people excited about our ideas and put them into practice – that was something we both firmly believed in."

Lothar Späth (1937 – 2016)

Steinbeis mourns the loss of its long-time companion Prof. Dr. h. c. Lothar Späth, whose political, technological, and entrepreneurial foresight laid the foundations for the restructuring of the Steinbeis Foundation in the early 1980s.

During his time as Minister President of Baden-Württemberg, Lothar Späth was quick to recognize that the time was ripe for political action to cope with the state's changing business landscape, much of which is shaped by small and medium-sized enterprises. Undeterred and despite the criticism he met with at the time, he pushed ahead with the appointment of a Government Commissioner for Technology Transfer, singling out Johann Löhn to perform this role in parallel to his position as Steinbeis Foundation Board Chairman. This laid foundations for the Steinbeis model.

Steinbeis honored the outstanding achievements of Lothar Späth with the bestowal of the 2013 Special Award from Prof. Dr. Dr. h. c. mult. Johann Löhn. Lothar Späth's strategic foresight, his dedication and efforts, and his personal support given to building the Steinbeis Network – especially in the former east of Germany – were fundamental to the success of our network today. His competence and his inspiring hands-on approach will be missed by all of us. Steinbeis will preserve the memory of Lothar Späth and continue to develop the organization based on the cornerstones that he laid.

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



Keeping Warranty Costs Under Control

Steinbeis uses statistical model to forecast infrequent failure rates of engineering components

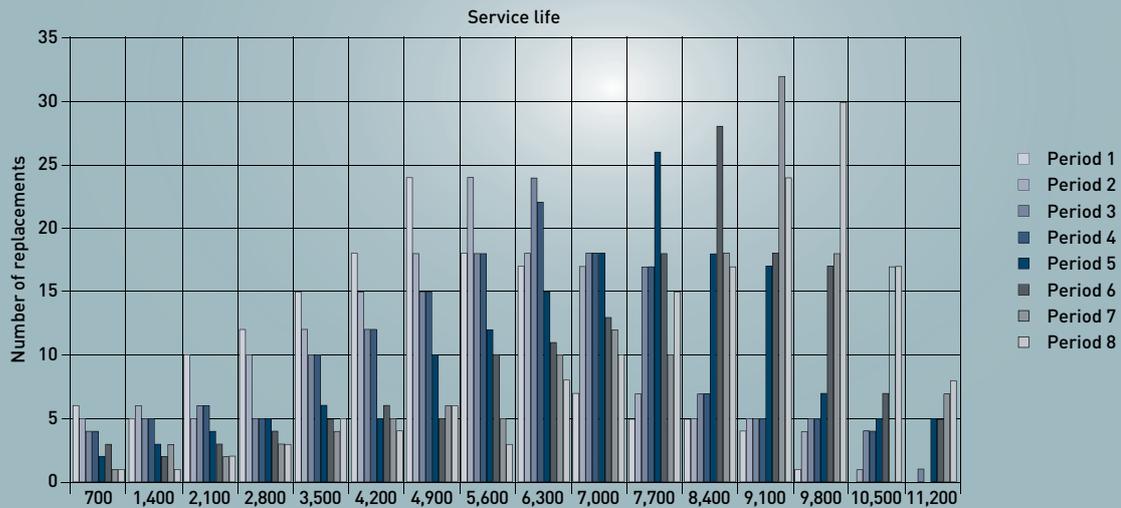
When components fail on complex machinery, the costs to the customer in terms of replacement parts and downtime soon start to add up. If parts fail when they are still under warranty, the producer bears these costs, so it is essential to calculate if this could happen. Estimating such factors can be a major challenge with parts made in small quantities, or with new models, and with machines that come in different varieties. The Stuttgart-based Steinbeis Transfer Center for Applied System Analysis (STASA) is specialized in the statistical analysis of complex technical systems and it now has a solution to this problem.

Schnell Motoren AG, an engine maker based in the city of Amtzell in Germany's Allgäu region, has been selling modern cogeneration units for biogas plants since 1992. It develops its system in house and the components used vary dramatically in terms of wear and tear, mainly because the conditions on farms (where the equipment is typically used) can also vary dramatically, plus there are few standard setups. If parts fail while they are still under warranty, it can be an expensive process just trying to work out the causes. The experts at STASA have been helping and advising the company with the identification and prediction of component failures on its biogas plants, also in an attempt to predict the expected warranty costs in the future.

The project team's first aim was to look at the engine components that account for most of the warranty costs and develop a technique to determine and predict their running time and service life. Based on this, the Steinbeis experts developed a statistical model that was individually tailored to the challenges faced by Schnell. This could predict the number of failure incidences and the resulting warranty costs for a period of 36 months. The advantage of using such a model is

that scenarios can be set up using different assumptions for subsequent developments and this makes it possible to estimate the number and rate of failures that can be expected as well as the associated costs. This would make "guesstimating" warranty costs based on gut feelings a thing of the past.

Even if there are perfect customer service records, or running times have been logged – theoretically making it possible to calculate the known service life of an exchanged part – it is still difficult to capture and evaluate all failure statistics. Conventional statistical methods such as determining Weibull distributions based on component failures can only be used under certain circumstances. Consideration has to be given to the small number of instances, as well as the service life of certain components over time. For example, supplier quality problems can be enough to cause data blips and shorten service lives. It is also quite normal for components to have different average service lives on different types of units, simply because these cause differences in wear and tear.



The solution that was identified for Schnell showed that even a small number of failure incidences can be enough to make reliable forecasts of failure rates. What is important is the choice of method for the particular application and this has to be tailored properly to specific needs. The team at STASA analyzed the failure rates for individual components at Schnell. Based on this they developed a statistical model for forecasting future numbers. To do this, they took the statistics for part replacements and examined how these developed over time over the previous two years. They also looked at the running times of components still in active use. This has now made it possible to predict the failure rates of individual components in relation to the units that a company is expected to use in the future. By looking at replacement costs, it is also possible to calculate and predict anticipated warranty claims. This also takes into account that the warranty period is reset each time a component is replaced. Calculations can even be made for more complex warranty arrangements, such as the pro-rata warranties offered by Schnell Engines. With this model, clients only have to meet a portion of the costs after expiration of the statutory warranty period, irrespective of the actual running time of the defective part.

It is already possible to validate the results of forecasting. After just four months, the actual warranty costs are within the best-case-worst-case forecast made by STASA. Failure rates over time will be checked regularly by the experts at STASA so that adjustments can be made to warranty forecasts if necessary. The aim is to keep accruals needed to cover warranty costs within a sensible range. At the same time, regular checks are a useful early warning system that there may be a quality issue with suppliers. Summarizing the positive results of the project, Viktor Gaspar, Chief Operating Officer at Schnell, says, "The outcome of the analysis carried out by STASA made a decisive contribution to the accuracy of our strategy planning and it helped us by providing a good illustration of a difficult situation. We were extremely impressed not just with how quickly they got their minds around the complexity of the information but also how professional and amicable the collaboration was."

STASA Steinbeis Angewandte Systemanalyse GmbH

Services

The focus of this enterprise is applied systems analysis; i.e., data analysis, visualization, modeling, simulation, and the optimization of technical and social-scientific systems.

Key areas

- Applied systems analysis in development, production, and logistics
- Predictive Analytics
- Modeling and simulation of complex technical data
- STASA QC: software for optimizing manufacturing processes (in-house sales development, Kistler AG, Switzerland)
- Quality forecasts
- Development of expert systems for early error detection and production optimization
- Algorithms used in mass data analysis
- Consulting and training in process optimization
- GIS-based systems and analysis
- Population projections, economic forecasting

STASA GmbH won the transfer award of the Steinbeis Foundation – the 2011 Lohn Award – together with the Institute Dr. Foerster GmbH & Co. KG for its DATA2LINE® project (an automated process for detecting duds in UXO clearance).

Image 1: An engine unit made by Schnell Motoren AG
Image 2: Service life over time © STASA GmbH



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Learning Factory Industry 4.0: Training Future Specialists

Steinbeis helps local authority apply for funding

The Baden-Württemberg Ministry of Finance and Economy is providing subsidies to help set up 15 so-called Learning Factory 4.0 programs at vocational colleges. One of the 15 Learning Factories is planned at vocational colleges in Crailsheim and Schwäbisch Hall. The district of Schwäbisch Hall will receive a state subsidy worth 500,000 Euro. Further funding will come from the district itself and companies participating in the project. To help with funding applications, the Steinbeis Consulting Center for Regional Development and Economic Development joined forces with the Ferdinand Steinbeis Institute at the Steinbeis Foundation to provide the district authority with advice and help in coordinating the project group alongside other participants from the vocational colleges, the rest of the district and business partners.

The aim of the Learning Factory is to demonstrate to students at the colleges, as well as the companies and their employees, that there are a number of ways to network production and allow them to experiment with innovative and intelligent production systems. Sharing and practicing the methods of the all-embracing Industry 4.0 philosophy is about getting technology, IT, and business people to work at an interdisciplinary level not just at different companies but also in different locations.

Strengthening Regional Innovation and Promoting Networks

New innovation and technology transfer center helps project partners sit around the same table

After detailed preparation and a number of rounds of joint planning, on November 27, 2015 it was finally time for project partners to press the start button as the first non-profit limited liability company (gGmbH) was founded under the name Innovations- und Technologietransferzentrum Heidenheim (ITZ). The aim of the collaborative innovation and technology transfer center is to bolster innovation in the region by helping universities and businesses to forge networks and work together on development projects.

The majority shareholder of ITZ is Forschungs- und Innovationszentren gGmbH – a research and innovation enterprise that is a subsidiary of Transfer GmbH, which itself was founded jointly by Steinbeis and the Baden-Württemberg Cooperative State University (DHBW) in 2013. Other partners with equal shares in the business are the Friends and Supporters of DHBW Heidenheim, the City of Heidenheim (represented by Heidenheim Technology Center), and the District of Heidenheim.

The idea of setting up ITZ was first thought of in 2010 when a group of lecturers at DHBW Heidenheim were looking for a platform for students to move forward with innovative developments. Steinbeis came on board in spring of 2015 and the initiative was given a statutory framework. The aim is for ITZ to make a significant difference in allowing graduates at the DHBW Heidenheim to move forward with their innovative ideas, partly by becoming involved in startups with the support of partnering companies of the DHBW, or with professors. This should en-

This is simulated through the different locations of the colleges and each of the specialist departments.

To implement the project together, the Schwäbisch Hall Learning Factory 4.0 is working with vocational and commercial schools, the Cisco Networking Academy, and a number of external institutions such as Packaging Valley (which has a virtual reality center), Elabo-Lab and Trumpf Cloud Services. Together, they are forming a virtual value creation network to reflect the real situation encountered in the networked economy.

The network is also open to other partners and sponsors. The plan is for the Learning Factory 4.0 in Schwäbisch Hall to open its doors in the fall of 2016. By the end of the year, companies interested in the project will be able to book training courses or use the Learning Factory as a kind of vision and testing center, for example to try out new business processes.



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sure that innovative individuals in the region stay in the area and that companies draw benefit from the university in the region.

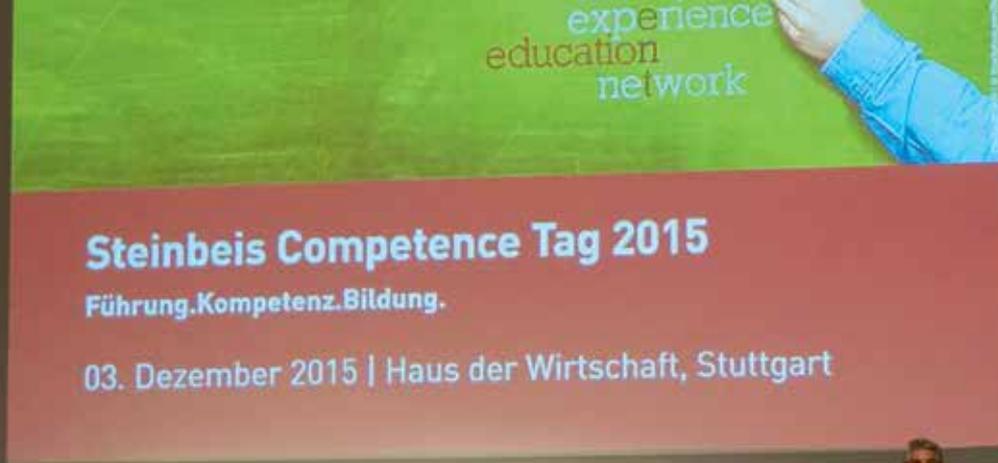
Companies based in the region, primarily small and medium-sized enterprises, will be able to attend scientific events and access publications, making it easier for them to tap into emerging economic, social, and technology developments and trends. To this end, there will be more courses in the future offering plenty of variety.



Left to right: Meinrad Schad (Friends and Supporters of DHBW Heidenheim e. V.), August Musch (Steinbeis), Friedrich Frieß (ITZ), Georg Würffel (Technology Center Heidenheim GmbH), Thomas Reinhardt (District of Heidenheim)



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Managers of the Future: How will they be Educated?

The 2015 Steinbeis Competence Day

Education is of strategic importance, not just for individuals but also for society as a whole. It keeps everything moving forward in a world that is becoming increasingly complex, exacerbated by accelerated change – and occasionally revolutionary change. What could, indeed, what should be the best way to educate leaders in the future? This was the focal topic of the seventh Steinbeis Competence Day, which took place on 3 December, 2015 in the Stuttgart Haus der Wirtschaft (House of Commerce).

This topic was also the focal point of a special research project looking at Leadership Education. The project was spearheaded by the School of International Business and Entrepreneurship (SIBE) at Steinbeis University Berlin and the chair for General Education Science and Education Research at LMU Munich. The research project was presented and discussed over the course of the day, alongside findings to date.

A key issue looked at in all speeches was the topic of competence, which according to the definition of Prof. Dr. John Erpenbeck (SIBE) is the ability or disposition to organize actions oneself. A point highlighted in the opening speech by Prof. Dr. Werner G. Faix (SIBE) was that competence only arises in situations that are challenging. Thus, such an aptitude is particularly crucial in business, which is becoming increasingly fast-paced and also more uncertain. Prof. Dr. Rudolf Tippelt (LMU Munich) talked about the early "socialization" of managers: what they have in common are resumes that show volunteer work or time spent abroad. Tippelt noted that education now aims to go beyond mere specialist training and that it's important for up-and-coming managers to learn to deal with uncertainty and about collaborative networking.

The subsequent talks by staff at SIBE included the recent findings of academic papers. Following a survey of managers, Stefanie Kisgen formulated education goals for master's management degrees. Kisgen asked managers what they think leadership education will be like in 2030. One of her findings: The surveyed managers believe that management degrees will place more emphasis on personality in the future rather than on knowledge. The topic being examined in studies by Silke Keim (Saphir Kompetenz GmbH) is the competence measurement method used for KODE®, a test completed by all SIBE students several times during their studies. These tests make it possible to determine students' management potential by examining self-assessments and the third-party assessments of business mentors. The comparisons shed

light on skills relevant to management such as acquisition strengths and analytical abilities. Measurements from a variety of student courses showed that the self-assessments very frequently overlap with third-party assessments. Furthermore, the two values improve over the course of studies with the sharpest rise for innovation propensity and resilience. Competence was another topic looked at in a talk by Ardin Djalali, who compared the efficiency and effectiveness of teaching methods used on MBA degree programs worldwide. Jens Mergenthaler talked about an education model aimed at empowering people to lead others. This also involved taking a closer look at the word "lead" with questions such as "Can you lead a stone?" His response was no, because a stone does not have the option of not following instructions. As a result, leadership means wanting to have an influence on the actions of others, who nonetheless are free to decide if they will follow. Within his model of leadership, Mergenthaler therefore looked not only at leaders themselves, but also at those being led, thus bringing the seventh Steinbeis Competence Day to a close.

The next Steinbeis Competence Day will take place on 6 December 2016.

Videos of selected speeches are available in German at www.steinbeis-competence-tag.de.



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Image 2

Safe and Sound Indoors

Steinbeis experts optimize storm clips used on house roofs

There has been a sharp rise in the number of buildings damaged by storms in recent years, in some cases even as a result of hurricanes. One of the most badly affected areas of a building is the roof. To make sure tiles are kept securely in place, even when the wind reaches storm force, one preventative measure is to attach storm clips to hold them firmly in position. Wurst Metal Technology, based in Höchenschwand in the Black Forest, has been working with two Steinbeis Transfer Centers (STCs) – the STC for Innovation and Implementation and the STC for Process Development – to develop an effective storm fixture that can be clipped on without needing to use tools. The project was backed by the state of Baden-Württemberg as part of the innovation voucher program (voucher A and B).

In Germany, roofs are typically covered with tiles or slate. These are spaced carefully and hooked over roof battens. The hump on each tile fits neatly into the groove on the next tile to form overlapping rows of tiles that can cover an entire roof without gaps. Usually the combined inherent weight of the tiles provides enough downward force to keep everything in place.

But if there is an extremely strong wind, reaching gale force, the weight of the tiles is not enough because the combined speed and direction of the wind creates uplift. In physical terms, wind pressure or suction is created in the slipstream on the downwind side of the roof. To prevent the roof tiles from taking off, storm clips can be fitted between each tile and the horizontal battens. The functional principle is similar for all kinds of storm fixtures: a mechanical part is used to affix the tile to the batten underneath. The actual nature of the fixture can be different, however, with everything in use from screws to wires, plates, brackets, or clamps. Sometimes the fixtures are quite difficult to attach so roofers prefer clipping devices because they can simply be attached without the use of tools and they are easy to take off again.

The storm clips made by Wurst have been in use for many years and although they do the job in technical terms, they do not adhere to failure criteria under standard EN 14437. This is especially the case with respect to uplift resistance requirements, which until now the clips could not meet. This was where the Steinbeis managers Georg Villinger and Prof. Karl Schekulin came in, bringing many years of technical experience with them. To analyze the geometrical and physical properties of the storm clips, they set up a full-scale (1:1) laboratory installation. The storm clips are basically the shape of a clamping spring which is attached between the roof batten and the tile itself. The experts soon discovered that there was not enough spring in an area along the connecting piece between the upper arm and the lower arm of the clip. They then doubled the depth of reinforcement beads along the whole side, lengthened it by another 50% and made it 20% wider. In experiments, the Steinbeis team ascertained that the breadth of the metal strip had little impact on stiffness, so it would be possible to reduce the width of the metal by 15%, which also made a noticeable difference in terms of material savings in production.

Schekulin and Villinger also improved performance decisively by changing the type of steel used to a low-alloy construction steel with a 0.2% yield strength of at least 320 N/mm² and a tensile strength of at least 390 N/mm². The area around the reinforcement beads is highly deformable offering partial hardening, with metallurgical benefits in terms of

spring capacity. Laboratory testing revealed that the clamping effect was up to 5 times the inherent weight of the tiles. For Wurst Metal Technology, this meant that the clip had no problems fulfilling failure criteria according to EN standards.

To validate laboratory testing in a real environment, another test installation was set up with a variety of roof tiles. These were used to cover a sample test roof on a scale of 1:1 in order to determine uplift resistance in keeping with the EN standards. The test installation can also simulate the functional performance of a variety of roof coverings in combination with clamping devices in order to determine the ideal positioning and the number of storm clips needed.

The test installation was a fine example of a development strategy based on intelligent low technology (ILT). All functions and forces can be tried out using simple mechanical parts without any need for pneumatics, hydraulics, or electronics. For example, the lean on the roof can be set to any angle using a rack and pinion jack, the spaces between roof battens can be set to any width using sliding blocks, and tension can be placed on the roof tiles by using a cable winch. One particularly interesting feature is the hoisting frame, which runs at exactly 90° to the tensioning device and uses a ball and roller bearing. This is to ensure that no sideways forces are exerted on the tiles as these would affect readings. Thanks to the success of the project, Wurst is now certain that the simplicity and high quality of the identified solutions will also go down well in the market.

Image 1: The test installation

Image 2: A storm clip



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Wanted: Effective IT Systems

Experts test modular software development tool through the Steinbeis Network

As more and more parts of the economy shift toward digital solutions, there are growing expectations that productivity will move forward in leaps and bounds as business and work processes are underpinned by ICT. One key challenge presenting itself in this context is how to provide IT systems that make the grade in terms of flexibility – people have strict requirements. Dr. Holger Gast, director of the Steinbeis Consulting Center for Agile Development of Information Systems, offers his customers an innovative software tool that makes it possible to create custom Web apps from standalone, adaptable modules.

Modern IT systems have to meet two key requirements. Firstly, the software has to be an exact fit with company's business processes. Secondly, it must be multi-client capable – in other words, users should only be able access the data they actually need to get their job done. Often it's only possible to address these two goals by fully custom software and implementation timescales typically mean that this comes with a major price tag.

The lack of 100% appropriate IT systems in everyday business means that the data people require is often stored in spreadsheets or placed in carefully organized folders. This is probably the worst possible scenario because users have to be intimately familiar with the folder structures and check with others before they access files. Sometimes only certain users know how to use the data in the first place and the opportunity costs in terms of time investment are largely ignored.

To tackle this problem, Holger Gast is taking an innovative approach to software development: he turns the software developer into a true engineer. Using a graphical user interface that resembles a CAD environment, he pieces together basic, flexible elements into a functional model of the required software. The resulting model is taken by a special software tool to create a Web-based app building on industrial JavaEE

standards. His principle is called "modeling instead of programming." Gast has already worked on a number of projects and successfully shortened development cycles to between one sixth and one eighth of the normal time required. Depending on the complexity, a typical user screen can be created in no more than 30 minutes, including a suitable relational database. The development effort becomes comparable with creating an advanced Excel spreadsheet. IT systems to be used in special applications could be made available from scratch in some cases within a matter of weeks.

The new tool was tested as part of a collaborative project between two teams: Gast and his consulting center colleagues and their counterparts at the Business Start-up Steinbeis Consulting Center. The latter center helps business founders in a number of ways, including applying for startup vouchers funded through the European Social Fund and the Baden-Württemberg Ministry of Finance and Economics. These vouchers provide startups with an opportunity to develop their business ideas further with the support of experts. The new software will be used to administer their vouchers more efficiently at the center and avoid mix-ups. It will also reduce the time needed to administer the more than 350 advisory sessions conducted each year.

The first step of the process for business founders involves submitting their application. This is now taken care of through an online questionnaire which founders use to enter their personal details and information about their business ideas and current plans. This information is assessed by a Steinbeis employee who decides whether to approve the application. The founder is then allocated to a consultant and the number of approved consultation hours is defined. The business founder and the consultant are then informed about the decision at the click of a button and are sent access details for the project data. They can then

work together on taking the planned startup to the next stage.

One of the advantages with integrated software is that the system pulls together all relevant information and automates work-intensive processes. Until now, the details submitted by startups had to be transferred manually from written forms. Now the business founders can download forms as complete documents and just have to sign them. Invoices are

also issued fully automatically. Finally, at the end of the year, a written record can be exported in uniform Excel templates to provide to funding partners.

The test project showed how important multiple-client capability and coordination between individual processes are. Business founders, consultants, and Steinbeis employees can only access the information they need to perform their individual tasks. They are guided through each step by user screens that are a precise match with each task.

This new approach to software development also makes it possible to set up special screens to deal with one-off situations. For example, Steinbeis employees who manage projects can now go back through consulting records and delays encountered much more easily than previously, simply by accessing separate screens. To access project data quickly, all they have to do is enter certain search criteria. Such special solutions are cost-efficient if the time spent to set up a special screen is negligible. With these examples it only took between 20 and 30 minutes – just a fraction of the time it would take up in administration without the software.

The system also plays strongly to the recent trend toward self-service IT solutions. Ideally data can be gathered in distributed locations – where it emerges – and processes can be initiated without relying on central service units. A typical example of this is when staff apply for annual vacation. Very often, the human resources department enters information submitted on paper into the administration software. If there is a system that allows employees to enter data themselves, HR can focus more on its core tasks of planning and decision-making. The new software created by Holger Gast allows startups and consultants to enter detailed statistical information and billing data at distributed locations. At the same time, the

complex interrelationships in the data are checked immediately during entry, which results in fewer queries and corrections.

The Steinbeis project team has underscored the advantages of information systems that can practically be made available ad-hoc. After an initial planning phase of three weeks, the system was successfully introduced and tested within six weeks. The time and effort needed to program the software was a mere fraction of the investment normally needed to maintain the data. All in all, it was a win-win situation for everyone involved in the project!



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Dr. Christian Schefold, Dr. Ariane Loof, Bertram Raum and moderator Birgit Galley (left to right) during the panel discussion. Image: © Mathias Richter

How Will Data Transfer Work in the Future?

Panel discussion at the Steinbeis Management Series at School GRC

In January, the new year of events got underway at the School of Governance, Risk & Compliance (School GRC) at Steinbeis University Berlin (SHB) as part of the latest Steinbeis Management Series. The topic for discussion this time was "Inquiries and due diligence after Safe Harbor – How will future US data transfers work without data?"

The event was organized after the Safe Harbor agreement was declared invalid last year by the European Court of Justice. Judges ruled that data protection was insufficient in the United States, and, as a result, companies and bodies were no longer permitted to simply transfer personal data to the USA. The implications of the new ban – on internal

investigations or due diligence related to company transactions – were just some of the aspects discussed at the event by Bertram Raum (Federal Commissioner for Data Protection and Freedom of Information), Dr. Christian Schefold, and Dr. Ariane Loof (Dentons law firm). The panel also explored the changes that are likely as a result of a new EU data protection agreement with the USA and the impact of new data protection guidelines on companies in all sectors of industry.

The evening was moderated by Birgit Galley, director of School GRC. After a lively discussion, the 50 guests enjoyed the atmosphere. The evening was organized with the support of the Dentons law firm.

The Steinbeis Management Series has been running since 2010 to provide a debating for partners and friends of School GRC from the world of politics, public administration, business, and teaching. The panel typically explores current issues relating to compliance and white-collar crime. An anniversary publication of the Steinbeis Management Series containing extracts from the first 13 exciting panel events can be ordered through the school website.

School of Management and Technology (SMT) Expands Portfolio

Business School Memmingen merges with the SMT

Business School Memmingen (BSM) and the School of Management and Technology (SMT) have stepped up their cooperative agreement and are now operating as a single school. The two establishments have already enjoyed a close relationship for a number of years, and since late last year, Business School Memmingen has been an integral part of the School of Management and Technology. The merger means that the SMT now has a new campus in Memmingen and its degree program has been extended to include a Bachelor of Arts in Business Administration and a Bachelor of Science in Business IT.

Business School Memmingen was founded in 2006 as a Transfer Institute belonging to Steinbeis University Berlin (SHB). This resulted from an initiative launched by the authorities in Memmingen to strengthen the educational infrastructure of the region of Swabia for the long term. Ever since, it has collaborated closely with the Steinbeis Center of Management and Technology (SCMT) and its School of Management and Technology. The focus of BSM on bachelor's degrees is a good complement to the master's degrees of the SMT.



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The next step will be to raise the level of collaboration. In October 2015, BSM was completely integrated into the activities of the SMT. The site in Memmingen will be retained to serve as a new SMT campus. This continues the aim of bolstering Memmingen's standing as a city of education. The master's degrees offered by the SMT help expand the local offering, and the region as a whole will benefit from many years of educational experience.

Boosting Memmingen as a location also allows SMT to work on new degree programs as it continues to expand its portfolio of services. The agreement has already started bearing fruit and plans are currently underway to launch another master's degree: a Master of Science in Business IT is scheduled to kick off in the fall of 2016.



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The 2015 graduates of the School of Management and Technology

Award-Winning Graduates and Lecturers Graduation ceremony at the School of Management and Technology

41 graduates bid farewell to the School of Management and Technology at Steinbeis University Berlin. The goodbyes were part of a ceremony held in January and attended by more than 150 guests. The 2015 Professor Pleitner Prize and a variety of other honors were awarded at the event.

In an opening speech by the President of Steinbeis University Berlin, Prof. Dr. Dr. h.c. mult. Johann Löhn appealed to the managers of the future to remain open to change, to always keep an eye on things happening in related areas, to bridge gaps between the apparently irreconcilable, and to identify new potential.

During the evening, Matthias Kraft was honored as the top student on the bachelor program. His university supervisor Georg Villingner praised Kraft for his highly structured approach to work and for his amazing stamina and scientific discipline, likening Kraft with a master's student. Kraft carried out his project for Schüller Furniture Works, who as sponsor of his degree project gained tremendous benefit from the program; in the past year, the SHB graduate rose to become head of organizational development.

The top master's graduate on last year's program was Christian Kolodziejczak, who was also the class representative. His supervisor Prof. Dr. Friedrich Augenstein was full of praise for the graduate for his achievements and contributions to lectures, acclaim that was mirrored by his employer, the consulting firm Ernst & Young Deutschland GmbH.

The third award of the evening came with the bestowal of the Professor Pleitner Prize. This award was introduced in acknowledgement of Prof. Dr. Hans Jobst Pleitner and honors the best lecturer on the program. Of the 65 lecturers on the program, Dr. Daniel Villiger was named 2015 Lecturer of the Year. The award winner expressed his gratitude for the honor via video link as he was unfortunately unable to attend due to a work commitment.



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100% Interactive: Online@SIBE

SIBE now offers two degree programs completely online

The School of International Business and Entrepreneurship (SIBE) at Steinbeis University Berlin (SHB) recently launched two new degree programs. The two programs, Master of Laws (LL.M.) and M.A./MBA (USA) are part of a new concept to offer international students a chance to share degree courses. These students are on the Master of Arts in Management program at SIBE and the MBA degree at Post University, Malcolm Baldrige School of Business in Connecticut. The degrees are not the only things that are new, since the approach to teaching is also now different. Previously, the SIBE executive degree programs revolved around classroom-based teaching. Now it is possible to study for these programs online so there is no need to travel to seminars or exams.

Speaking at a university conference on digitalization, Cornelia Quennet-Thielen, who is the State Secretary and Department Head at the Federal Ministry of Education and Research, recently challenged people to, "Do more to exploit the potential of digital technology." By offering this new degree program, SIBE can be considered a pioneer in leveraging this potential. Being able to take part in the program online is a decisive factor for students on both of the degree programs, especially when it comes to studying toward a degree in parallel to managing a career or family. For people in employment or people living abroad, such "asynchronous" online degrees are an ideal way to gain a high-quality academic education.

When planning the online degree program, the key issue was therefore not just to ensure that such a degree will work in technical terms. It was much more important to safeguard the teaching quality. To this end, SIBE worked with Post University in Connecticut, which has already been involved in Web-based teaching for 30 years. The Connecticut university offers an online MBA which is ranked by the U.S. News & World Report. Collaboration has resulted in a method that allows students to learn the curriculum interactively online. Working in small groups, students regularly participate in discussion forums and collaborate through online platforms. This process is supervised by experienced teaching professionals. The degree revolves around real-life teaching methods based on actual management projects. These always relate in one way or another to leadership. The key idea is not just to acquire knowledge, but also to develop important skills like creative thinking and critical assessment. Key aspects of the LL.M and M.A./MBA (USA) offered by SIBE are a close affinity with other students and teaching staff, carefully posed questions, well-prepared teaching materials, and instruction that focuses carefully on the needs of students.



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Participants on the Especialista en Iluminación y Eficiencia Energética certification program in Costa Rica

Certified Continuing Professional Development Courses on Lighting and Energy Efficiency

Steinbeis Transfer Institute certifies program in Costa Rica

The Costa Rican chamber of commerce (CICR) represents the interests of companies in Costa Rica and plays an important leadership role in promoting better terms, work conditions, and sustainable development in the manufacturing industry. One factor that has a direct impact on the competitiveness of manufacturing enterprises is energy. In 2012, CICR joined forces with GIZ GmbH (the German Association of International Collaboration) to work more closely on improving energy management in industry. As part of this work, it has developed a program to become an Administrador de la Energía. Its training has now been certified by the competence institute unisono, a Steinbeis Transfer Institute at Steinbeis University Berlin.

Spanning several courses, the program instructs students on how to set up more professional, effective, and efficient energy management at their company. Since launching the program four years ago, more than 40 experts have shared their know-how with over 130 people working in industry in Costa Rica. To do justice to the rising number of demands placed on companies when it comes to energy efficiency management, a course has been developed and now launched to specialize in lighting and energy efficiency. To improve the quality of knowledge sharing and take a first step toward making the curriculum more uniform, the chambers of industry in the region decided that their energy efficiency courses needed certification. This led to the organizers meeting with the experts at kiu (the Steinbeis Transfer Institute called kompetenz institut unisono), which is part of Steinbeis University Berlin. The collaborative

project is already bearing fruit and now all members of the Federation of Industry Chambers of Central America (FECAICA) are in a position to offer certification courses to participants under the name "Administrador de la Energía" with a specialization in "Lighting and Energy Efficiency."

The first step involved sealing the collaborative agreement between the CICR and kiu to go ahead with the certification program. The next step will now be to expand the agreement to include other chambers of commerce, especially in Honduras and Guatemala, where the aim is to start offering the first courses in lighting and energy efficiency within the next year. Training lasts 80 hours and covers a variety of practical and theoretical modules, technical workshops, and a business report as a concrete example of applying what has been learned to a real situation. The report has to examine a specific issue facing the business based on the premise that several energy efficiency measures will be introduced to a business.

Ten participants enrolled in the current program applied for certification from the Steinbeis Transfer Institute kiu. They completed their specialist course in lighting and energy efficiency in December 2015, which concluded with an official ceremony at the chamber of commerce headquarters in San José, the Costa Rican capital. Speaking at the closing ceremony, Ana Lucia Alfaro, coordinator of the 4E program run by GIZ for Costa Rica and Panama, highlighted that, "CICT's development of employee training programs in collaboration with their integrated CIM experts is making a significant contribution to the competitiveness of industry, thus helping to compensate effectively for continual rises in energy prices."

The program director, Didier Cascante, expressed his delight with the highly practical nature of the training, saying that he believes there is huge potential to use new lighting technology and energy more efficiently, not just in Costa Rica but also throughout the region of Central America.



Peter Schust, Didier Cascante

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Welcome to the Steinbeis Network

Steinbeis know-how: There are currently more than 6,000 experts actively involved in knowledge and technology transfer at around 1,000 Steinbeis Enterprises. The portfolio of services offered by the Steinbeis Network ranges from research and development to consulting, expert reports, training, and continuing professional development for all fields of technology and management. And this network continues to expand. For an overview of our most recently founded centers, go to www.steinbeis.de/en/news. Welcome to the Steinbeis Network!



Information on recently founded enterprises in our Network can be found at www.steinbeis.de



More on recently founded enterprises in the Network can be found at www.facebook.de/Steinbeisverbund



The Meeting Turbocharger

Steinbeis lends a helping hand to software start-up

Studies show that almost 50 percent of meetings are considered unproductive. The most frequently mentioned reason for this dissatisfaction: poor communication. Clearly something has to be done. And symm – systemic and systematic meeting management – can get things moving in the right direction. The key to the solution is a web-based workflow system which structures and documents the meeting process from planning to follow-up, lifting some of the burden from the shoulders of the meeting organizer. Steinbeis helped the partners who developed this product set up their own company.

The founders of symm already had a good grasp of how the world works. Michael Hundsinger is a specialist for lean, quality, and project management (PMI) and has worked as a consultant for major DAX-listed corporations. And before Hans-Martin Burr started working as a business coach and team builder, he served as editor-in-chief of several trade journals. Both men have decades of professional and management experience. But neither of them had ever founded a company. Fritz Schneider, a Steinbeis consultant specializing in setting up businesses, was at their side as they established their limited liability company.

Although Schneider helped them explore different financing models, his primary focus was on developing a business plan. Discussions about revenue and cost expectations are an important and helpful part of the process of breaking into a market – and it is useful to have an extra pair of expert eyes to look at everything. Because behind each figure, there is the question of where it comes from and what needs to be done to achieve it. There is just a short leap from a dry conversation about numbers to exciting questions of market launch strategy, marketing, and communication.

This process resulted in the decision to make project managers and project management consultants the target group of the launch. The team also came up with the idea of developing a software module especially for project status meetings. "That's where people struggle the most," as Michael Hundsinger knows from his many years' experience putting out fires in large-scale projects. "Excruciatingly long meetings that don't lead to any real conclusions, to-do's that evaporate into thin air, and project team members who sometimes don't even know why they're at the meeting in the first place." symm aims to counteract these difficulties with topic-based attendance planning at the click of a mouse, automated status queries, and follow-ups that facilitate professional topic planning. Saving time and money, better meeting results, successful communication, and motivated employees all combine to make a tangible and often decisive contribution to the success of the project, and

therefore of the company. And this is precisely what the founders of symm set out to do.

The path that brought the founders to Steinbeis was unusual. Hans-Martin Burr had been on a training program in systemic team coaching offered by a Steinbeis enterprise in Stuttgart. At an event organized by the Steinbeis Foundation, he connected with Fritz Schneider and found out about his consulting services for start-ups. This is a perfect example of how the Steinbeis transfer network works – and not the only one. "The Steinbeis Network has been incredibly valuable," says Burr, describing the significance of the contacts. "Mr. Schneider and Mr. Lauterwasser arranged for us to pitch our company to investors in Berlin – a very important experience for us."

Shortly afterward, the contacts forged there led to a meeting with MBG Baden-Württemberg, venture capitalists based in Stuttgart. Investment manager Sascha Fritz verified the viability of the business plan – the product of much hard work – and the business model, laying the foundation for further targeted discussions should capital needs arise. And the contacts to transfer partners facilitated by Steinbeis have been just as important. As a result of this networking, symm has successfully marketed their meeting management software to two business partners. "They were so impressed by our product demonstration that they want to start using the software right away," adds the symm team. Once again proving the effectiveness of Steinbeis.

Image: A southern start-up in Berlin: Hans-Martin Burr of the symm team attending a start-up get-together with venture capitalists organized by a state delegation from Baden-Württemberg.



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Stepping into Asia

Junior Consultant at SCMT GmbH sets up company in Korea

German Synthetic Fiber Producer Seeking to Set Up Toothbrush Manufacturing Facilities in Thailand – not the normal thing you read in the Wanted ads, but the offer caught the eye of Anja Reimann just after completion of her bachelor's degree in Amsterdam. The headline was linked to a job advertisement placed by SCMT GmbH for Hahl-Pedex as part of their executive master's program for MBEs at the School of Management and Technology (part of Steinbeis University Berlin). The 27-year-old graduate is now gathering her first management experience as the Representative Director and CEO of BBC Hahl-Pedex Filament Ltd., a Hahl Pedex Co. joint venture in Asia.

The Steinbeis Center of Management and Technology (SCMT) calls itself the first "project establishment" in the Steinbeis Network. Its focus lies in delivering consulting projects of a national or international scope, typically looking at issues of a business, scientific, or even technical nature. To date, over 3,500 successful consulting projects have been carried out through the SCMT, which looks back on many years of in-depth experience, primarily in the fields of management and technology. The project establishment's portfolio is rounded off by degree programs offered by its own business school, the School of Management and Technology (SMT), which works under the auspices of Steinbeis University Berlin (SHB). These degrees are based on the "project skills degree" concept developed by SHB. Each degree revolves around a project with a direct bearing on business practice at a partner company. As well as working on the consulting project for Hahl-Pedex, Anja Reimann is currently completing her Master of Business Engineering at SMT.

Once competitors in the production of synthetic filaments, Hahl and Pedex merged in 2007 to become Hahl-Pedex. The Pedex part of the new company now specializes in dental, cosmetic, and 3D printing products whereas Hahl focuses on producing synthetic filaments used in technical textiles and abrasive filaments needed by the tool industry. The company recently joined forces with the PerlonNextrusion Group and now falls under the umbrella of the Serafin Group, the largest filament producer in the world. As the company has grown, international expansion has become more and more important.

Anja Reimann's starting point for the project was thus to immediately start drafting a business plan for a joint venture already being lined up with a company in Thailand. Negotiations had reached an advanced stage with the potential business partners but shortly after Reimann joined the project team, everything ground to a halt. A search for a new Asian partner had to be started, resulting in negotiations with a Korean brush producer called Best Bristle Company (BBC). This fired the starting gun for Reimann's project in Asia. While negotiations were underway with the new potential partner (BBC), Reimann also worked on the theoretical parts of her degree at SMT, which ran in parallel to the project. This gave her detailed insights into the company in areas such as production, machine maintenance, and sales. Central to this part of the project was also an introduction to the technical features of the filament production machines, primarily thanks to the support of the engineering manager Vitali Hanikel.

As negotiations with the Korean partner went into more detail around the middle of 2014, Reimann travelled more and more frequently to Korea. At this point, experience with the cultural differences in business came in handy for the junior consultant. After just one year, the negotiations were completed and the project moved into the local implementation phase. For Reimann, this meant it was time to wave goodbye to a relatively tranquil life in Germany. In January 2015, she embarked on a new life in Seoul – alongside 10 million other people. For Reimann, everyday challenges such as finding an apartment, opening a bank account, getting telephones connected, and most importantly learning a new language, seemed not to present any problems and business issues were also dealt with quickly.



After a short delay of only two months, it was time to start commissioning the machines, which had now arrived from Germany. Three of Reimann's Hahl-Pedex colleagues flew out to Korea from Germany to train local colleagues and help them set up the machines. Reimann also joined in practical aspects of the project. It turned out that there were not yet any training materials in English and a training plan had to be drafted quickly. The first machine entered production in 2015 and then things really became intense. Significant cultural differences soon emerged, mainly relating to the different work mentalities of the Germans and the Koreans: "The Germans think first and then act, the Koreans work the other way around. Neither approach is necessarily better or worse, but the problem is that this underlies basic expectations," explains Reimann. The plan of Hahl-Pedex was to do a test run for one month in order to embark on regular production afterwards. The BBC plan was to test for half a year and if any problems still arose these could still be solved in regular production.

Everyone was aware of the different approaches to intercultural collaboration, but the question was whether there was enough middle ground to provide a good enough starting point to solve the problem. One thing Anja Reimann is now certain of is that it is crucial for colleagues to exchange ideas regularly, not only to find areas of overlap but also to gain acceptance of the different work philosophies of two such different cultures. Hahl-Pedex and BBC are both keen to make things work.

Personal relationships also play an important role in business in Korea. It is rare for people to capture contracts and other agreements on paper. Instead, many things are based on jeong: a relationship and sense of connectedness, or in plain terms trust in business partners, family members, or friends. Relationships on a purely business level often do not work in Korea and the rest of Asia. It is also important to establish a personal rapport with people and without trust in a business partner, it is impossible for a business to grow.

SCMT GmbH

Services

- Consulting projects in many fields ranging from management to technology
- Consulting projects in the field of IT
- Recruitment of qualified personnel
- HR development
- Corporate Academy: individual HR development and continuing professional development programs

School of Management and Technology

Services

- St. Gallen Management Seminar
- Strategic and Innovative Management Seminar
- Bachelor of Arts, Business Administration major
- Bachelor of Science, Informatics major with a specialization in Business Informatics
- Master of Business Administration, Business Administration major with a specialization in Business Intelligence, SME Management, Strategic Innovation, Integral Leadership
- Master of Business Engineering, Business Engineering major with a specialization in Business Intelligence, General Management, Technical Sales
- Master of Science, Management major with a specialization in Consulting and Controlling, Business Informatics
- Master of Engineering

Reimann's work still involves working more closely on these cultural differences. It is not always easy to adapt to local differences but it will be absolutely necessary if Hahl-Pedex wants to keep expanding in Asia. One thing the SCMT consultant has come to recognize over the last two years is that her project is moving things in the right direction. The German and Asian co-workers at the company now talk to each other regularly and a number of close friendships have developed. This is why Reimann once again emphasizes that, "Internationalization should not just be seen as a pure business concept – it's always about colleagues from different cultures growing together through their work."

Image: Opening ceremony for the BBC Hahl-Pedex filament JV



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Building for the Future

Qualifications, consulting, and certification for sustainable construction

The fundamentals of modern construction are driven by climate and environmental factors as well as the need to save resources. Requirements related to functionality, flexibility, health protection, and comfort are becoming increasingly important. To assess whether these standards are met when new buildings are constructed, the German Federal Ministry for Construction established the Assessment System for Sustainable Construction (German abbreviation BNB) in 2010. The system assesses the sustainability of non-residential, public buildings built in Germany. As a BNB system provider, the Steinbeis Transfer Institute for Building and Property Industry is recognized by the ministry and offers training and certification as a Technical Expert for Sustainable Building (SHB). The institute also offers conformity audits for BNB assessments produced by the technical experts.

The basic principle of sustainability – finding a balance between ecological, economic, and socio-cultural factors – is supplemented with technical and process-related requirements when a new building is constructed, and this applies to the entire life cycle of the building. The BNB system makes it possible to assess the qualities people expect in a building subdivided into 46 different criteria. The sustainability assessment is either checked by the federal government or by certified conformity auditors. These then award a governmental seal of approval in bronze, silver, or gold.

Since 2011, the Steinbeis experts working with Bernd Landgraf at the Steinbeis Transfer Institute have certified more than 100 technical experts, all of whom offer their services throughout Germany. These experts are currently overseeing 20 BNB projects not only from the federal government but also from various states and communities. The projects include office buildings, teaching facilities, and laboratory premises, all of which are assessed and certified by Steinbeis after completion. The Steinbeis team is currently conducting research into the assessment criteria for complete refurbishments. This would be aimed at new buildings and renovation projects at schools and universities. "In 2015 we simultaneously developed new assessment standards for ecological audits and life cycle cost analysis based on extensive model calculations. These have been applicable nationwide since 2016," Bernd Landgraf explains.

The advantage of sustainability certification is that the quality of key aspects of the building are documented and tested. Achieving these qualities requires a process to be integrated into planning and implementation. This process documents the expectations of the end user and serves as a basis for measuring the overall results. In essence, this entails looking carefully at the interplay between the solutions used to design rooms, make the building itself, select materials, and plan the structural engineering during the entire building life cycle – in relation to simulated usage and operational scenarios. This approach demands

integrated teamwork and everyone involved must be knowledgeable about the interplay between the various solutions that come from the different disciplines. Integral planning also requires a shared understanding of the ultimate goal and a willingness to create synergies by merging individual planning solutions with unique functions. Sustainability assessment systems allow for an independent assessment of different kinds of solutions.

Every building can be planned, built, and run sustainably, regardless of where it is located and how it is ultimately used. The first office building certified by the Steinbeis team is the Ludwig Bölkow House in Schwerin. It was built and is currently occupied by the Schwerin chamber of commerce. The Steinbeis experts awarded the building silver certification. The building features conference rooms and office space for the chamber of commerce and third-party tenants. Special conditions at the building site allowed for a pile foundation with energy posts to recover geothermal energy. Heat recovered from the ground is used through concrete core activation, making the building incredibly easy to heat at low environmental and economic costs. Thanks to the floor plan design, a smaller section of the building can be rented out externally. The functional and well-designed façade is of extremely high quality and bathes the workplace in natural light. Using durable, low-emission construction materials has made the building a healthy work environment and at a low total cost of ownership. The Steinbeis team unanimously agreed: it is an exemplary model of sustainable construction.

Image: The Ludwig Bölkow House, Lake Schwerin



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Keeping Close Tabs on Business Competences

Steinbeis provides teaching concept support to Würzburg-Schweinfurt University of Applied Sciences

The Steinbeis Company Competence Check® (UKC) is a holistic analysis of the competence held by a company. Using the tool helps firms to systematically capture which know-how they already possess, identify strengths, and proactively take on new challenges. As well as looking at the personal skills of workers, it also takes the overall organizational competence of the company into account. For the first time, the UKC has now been introduced at a German University, and in the winter semester of 2015–2016, Würzburg-Schweinfurt University of Applied Sciences (FHWS) started teaching the concept to show students how the tool works as a basis for company evaluations.

As part of a group exercise, a team of four students had already worked up a comprehensive didactic concept for teaching the UKC. Their aim was to pinpoint the right approach needed to ensure that all fundamentals are covered including application of the instrument and that the results it provides are understood. The UKC was intended to become an established part of teaching within the university's organizational development curriculum.

The team's recommendation hit the mark. The teaching concept starts with fundamental instruction on the contents, underlying approach, and methods of the UKC. This gives students detailed insights into the principles of competence management, the measurement and scope of business competence, and the methods of competence analysis using software.

The next step is to carry out a live investigation into a virtual company using a case study and the UKC. The information on the virtual company has been pulled together into a case story which is given to the students to pore over before starting the analysis. Students then start a role playing exercise (including senior management, sales reps, development experts, consultants) and their job is to evaluate the company from their particular standpoint. All of the students then receive an automatic evaluation and a comparative analysis is carried out by the UKC software. They then break off into small groups to discuss the information, interpret the differences, and present their findings. The teaching part is completed by working out what the data implies in terms of implementation, the best way to categorize results, and how to best translate these into actions as part of a systematic consultation with the UKC.

For the first time, the concept was used at a half-day workshop involving around 40 students specializing in organizational development. The project was initiated and supervised at the university by Prof. Dr. Arnd Gottschalk (director of the Steinbeis Transfer Center for Human Resources & Organizations) working alongside Dr. Michael Ortiz, UKC project

manager from Steinbeis headquarters, who provided support as a development partner. The plan is to keep developing the concept over the next couple of semesters in order to one day offer students the prospect of assessing a real company with the support of a lecturer. The UKC would also provide a good basis for a possible thesis.

The Steinbeis Company Competence Check (UKC)

The UKC is targeted at all kinds of organizations and companies that want to build the competence of workers and lay a foundation for successful innovation and business in the long term. It is a useful analysis tool, not just for small and medium-sized enterprises but also for major companies and corporations. The concept has also been developed to be useful in manufacturing enterprises, as well as service providers and trading companies.

The UKC makes it possible for consultants to embark on consulting projects systematically according to a clear structure. A number of consulting tasks are carried out automatically by a variety of assessment modules, which create evaluation reports, project summaries, charts, and diagrams. The UKC can also be used for a series of assessments over time and it helps interpret findings by providing (internal) benchmarks, industry comparisons, and regional correlations.



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The Height of Hygiene

Steinbeis experts develop a measurement device for beverage tap units

Lightly carbonated with small bubbles and absolutely pure – that's how a fresh draft should be. Perfectly timed to coincide with the 500-year anniversary of the German purity laws, a team of experts at the Steinbeis Innovation Center for System Solutions in Measuring and Automation Technology in Mannheim have achieved a breakthrough in a rather tricky area: keeping beverage tap units clean for utmost safety and quality. The team worked together with Flexxibl GmbH in Braunschweig, Franz Mathes GmbH in Manching, and THONHAUSER GmbH in Austria to achieve this new development. So now an automated and certified cleaning option will help keep a centuries-old quality standard in place for continued drinking indulgence.

The idea of developing a measurement device to determine the cleanliness of a beverage tap first came about in 2013 during a visit to Vienna. At the time, the Steinbeis Innovation Center was working with other partners on a research project that involved developing a cleaning agent for the food industry. Once back in Germany, the Steinbeis team developed an initial concept for a hygiene sensor system. This involves colorimetric analysis to determine and display the degree of impurity detected (based on a traffic light system). The HSS16 conductivity sensor developed by the Steinbeis experts is used to check whether there are any residues in the system. The beverage tap unit only reverts back to full use once the system gives a green light, indicating there are no more cleansing suds in the unit. Thanks to this double confirmation (colorimetric analysis paired with conductivity), it is possible to retain quality and actively prevent accidents with cleaning agents.

The first cleaning step involves flushing the tap unit with water and then filling it with a 3% solution consisting of Desana™ disinfectant mixed with water. This solution is left to take effect over a given period of time. When the unit is then subsequently cleaned, the color of the cleaning solution is checked. If the solution came into contact with organic residues, the color will change making it possible to check if the cleaning process was actually successful. If the color changes, the sensor issues a command to repeat the cleaning sequence starting with step 1. If the color remains the same, the unit is flushed with water in three steps. During the third rinse, the HSS16 sensor measures the conductivity. If any residues of Desana or living/dead organic matter are detected, the unit is rinsed once more with water. As soon as the HSS16 sensor stops finding residues of the cleaning agent, the cleaning process stops automatically and the beverage tap unit is released for use.

The HSS16 is equipped with two connectors, each capable of attaching a 9mm hose. These allow the cleaning fluid and water to run in and out of the device and they are connected to a casing that's sectioned off into two measurement chambers. The first chamber is fitted with two display windows to track color changes. The conductivity sensor is built into the second chamber. An 8-pin connector has been



Image 2: The Steinbeis development team – back row, left to right: Fabian Brey, Angelika Uranin, Slavtcho Bonev, Marc Hargesheimer, Thomas Numrich, Rüdiger Jung, Sek Hoong Leong, Christoph Layer; front row, left to right: Jasmin Baum, Z-Win Yee, Michael Mayer, Daina Medda, Marina Diether, Daniel Berka

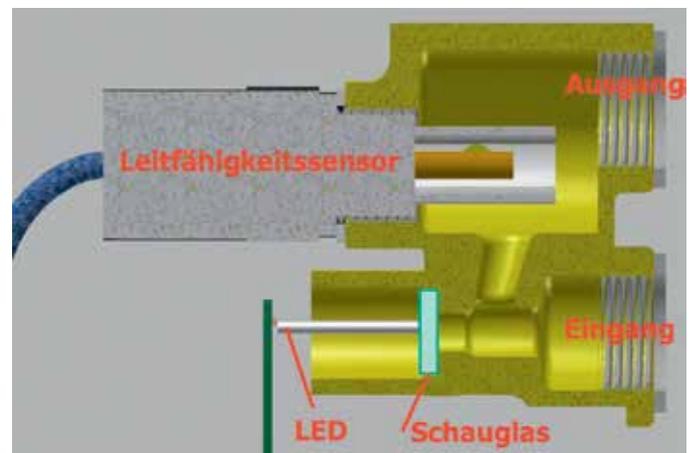
mounted on the casing to allow the HSS sensor to communicate with the tap unit and to deliver power to the system. There is also a USB interface to allow connection to a PC. An LED was also installed to give the user visual feedback on the current status of the sensors. Measurements can be started manually using a switch.

The measuring system used for color detection consists of a white LED that shines into the measurement chamber through a viewing pane. In addition to this source of light, an RGB sensor has also been installed. Its job is to determine the spectral characteristics of the light source. This is necessary to compensate for age-related changes in the LED and how it reacts to rays of light. An additional RGB sensor is mounted outside of the measurement chamber at an angle of 90°. It acts as a receptor (through a viewing pane) for light modulated by the fluids in the measurement chamber. The data of both RGB sensors is standardized and then converted into HSV color space data. This data is then converted into the HSL color space. There are two advantages of this compared to the RGB color space: it provides a scale of color values that makes it possible to determine the H value of scattered colors. Also, saturation can be used to determine the smallest amount of fluids containing color.

A sensor made by a company called JUMO is used to measure conductivity and thus detect whether the system is free of cleaning agents. An evaluation is carried out via a measuring circuit and the conductivity is calculated using Ohm's law. The built-in temperature gauge is used to keep conductivity constant despite temperature fluctuations. Once a cleaning process is initiated, the conductivity of the water is measured in a predefined cycle to determine a threshold value. If the measured temperature falls short of this during flushing, the system is deemed free of cleaning agents.

The innovative beverage tap unit developed by the Steinbeis experts was first presented at SME Day in Berlin in 2015. Further presentations of the sensor system followed at the BRAU trade show in Nuremberg and the 27th expert round table for beverage tap units in Weihenstephan. Many experts expressed interest in the sensor and the results produced by the system. That's because to date there is no automated and validated cleaning method for beverage tap units. The plan is to start using the HSS16 beverage tap unit sensor this year. As a result of this innovative breakthrough in beverage tap unit

cleaning and beverage tap solutions overall, the two project partners (Flexibl GmbH and the Steinbeis Innovation Center for System Solutions in Measuring and Automation Technology) have successfully licensed out the results of their research to a measurement device manufacturer. Franz Mathes GmbH will be exclusively responsible for selling and marketing the HSS16 sensor. Redl GmbH (from Hollabrunn, Austria) is set to become the first company to come on board from the beverage tap industry. It will use the sensor in an automated tap cleaning system called Cleaning Mate. Before the product is rolled out on the market in the summer of 2016, numerous tests will be carried out on the two prototype units at the Technical University of Munich (Weihenstephan campus) to ensure the system has been carefully inspected.



Gefördert durch:



aufgrund eines Beschlusses
des Deutschen Bundestages



Image 1: Beverage tap unit with the HSS16 conductivity sensor

Image 3: Measurement chamber



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Customer-Specific Product Variants as Standard – Just a Pipe Dream?

Steinbeis supports medical equipment companies with the development of a modular product and production concept

Ondal Medical Systems is a medium-sized producer of medical equipment based in Hünfeld, northeast of Frankfurt. The company manufactures pendant systems for large hospital suppliers. These systems are designed to carry a variety of medical devices. The customers often demand customizable solutions for their products to differentiate themselves from the competition. As the number of product variants grows, meeting expected delivery times becomes an ever-greater challenge. The Steinbeis Transfer Center for Management – Innovation – Technology recently supported the company by developing a modular product and production concept for a new product portfolio. The company pins its hopes on hitting its growth targets with the new group of products.

When the time came to develop the next generation of the company's core products from their central axis product range and spring arms, one of the key requirements outlined in the briefing document was the development of a platform to serve as the basis for the various product modules that would also have to be developed. As the product manager at Ondal Medical Systems emphasizes: "The most important requirement mentioned by our sales colleagues was not to limit the perceived number of product variants for our clients but to increase the number so we could secure more market share." This aim led to quite a dilemma: offer enough variety to external parties – that is, offer the customer utmost product diversity – but at the same time reduce variety internally (variants numbers in the company). This should help the company deliver on an important customer promise: quicker deliveries and improved product availability.

The ideal solution seemed clear from the start: the new central axis units and spring arms should be made up of as many standard components and modules as possible, just like in a LEGO set. If a given customer places an order, these could then be customized by adding a handful of customer-specific components. The advantage? Production and logistics should be able to create the specific customer variant relatively

late in the production process, thus exploiting the benefits of pre-assembled components, shorter warehousing times, and faster reaction times. The project team would have to include representatives from all of the involved departments to meet sometimes conflicting aims. Support was offered by the experts from the Steinbeis Transfer Center for Management – Innovation – Technology.

The new design is based on the principles of toolkit development. To some extent, this meant rethinking the way things were designed in the past. "Sometimes individual components have to be equipped with more features than an individual customer actually requires – but that means a component can be produced independent of actual orders, so in some cases this drastically reduces indirect costs," reports Ondal project manager Sebastian Timm, "but this advantage isn't always immediately apparent, since it is difficult to measure."

A good way to illustrate this is to take a simple example based on the variant hierarchy that is created if this method is used. Variant hierarchies provide a good overview of how a product variant is developed by using design principles that allow various features (the so-called variant drivers) to be combined as the product is assembled. The aim is to crea-



te the variant as late as possible in assembly, that is, to keep it as neutral as possible for as long as possible throughout the production and logistics processes. The success of these design principles has been enough to convince even the most skeptical critics. Originally there were 49 different joints, now there are only three – without the slightest loss in functionality. The process was just as successful with slip rings: just 4 instead of 35.

But this is certainly not the end of the project. "Many companies still believe that all you need to solve the problem of variant diversity is a new product architecture – but that's only half of the equation," says Prof. Dr. Günther Würtz, director of the Steinbeis Transfer Center for Management – Innovation – Technology. "Without changing the entire value chain – including suppliers – it is only possible to achieve a fraction of the potential productivity enhancements."

This is something they had already realized at Ondal. That's why a new production concept is also being developed to match the new design concept. This is based on a clear focus on value flows in the organization, or rather, a holistic optimization of assembly processes, material flows, and information flows with a strict regard for customers in order to meet targets in terms of delivery times and product availability. "The core principle of a variant-optimized value flow lies in letting the variant drivers flow into the production process as far down the line as possible – at best, directly before delivery," Günther Würtz says to explain the basic principle. "This means that the value-adding can be independent of the customer order for as long as possible and so the process

is less prone to interruptions. This is impossible without the right design concept."

It's important to note that variant management is not just a one-off exercise. New product needs come along throughout the entire product life cycle. The skill is to know how to handle these new requirements because variant management does not mean there are no more new variants or changes once the project is finished. The most methodical way to deal with this is to take out an old variant if a new one comes along. This principle helps keep the number of variants from growing, but it overlooks a very important issue in variant management: the cost-benefit ratio. This brings financial factors into play. If a new variant makes sense in financial terms beyond the existing design phase and into production, it makes sense to introduce it.

Ondal sees the variant-based development of their new product generation for central axis units and spring arms as a complete success. The company not only presented its new product at the latest leading trade show, but they also shot a brief movie to highlight the project and give customers deeper insights into their new processes. "We got a lot of positive feedback," says Swen Heimeroth, development manager at Ondal. "Our customers not only welcomed the fact that we will continue to meet their needs for the highest possible product diversity – external variety – but also that our modular products will mean we can offer better delivery terms. And we will also gladly continue to offer our customers specialized solutions – but under different terms and conditions than our standard products."

Ondal will have to do a bit of homework before the next product family is overhauled along similar lines. The toolkit will need to be entered into the variant configurator, further work is needed on the value flow principle in production, and much more. "But we will continue to use variant management" – that's the unanimous opinion of the project team, as Sebastian Timm rather proudly summarizes.

Image: © fotolia.de/Gundolf Renze



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Leading like Hidden Champions

Steinbeis conducts research into more effective leadership

It is rare for traditional approaches such as annual target setting, incentive systems, or even personal pressure to fuel key success factors amongst employees like trust, loyalty, intrinsic motivation, or team spirit. Instead it takes transformational leadership skills, as practiced by highly successful companies such as small or medium-sized global leaders. The Institute for Management Innovation, a Steinbeis Transfer Center, has confirmed and validated such practices as part of an empirical study involving over 14,300 respondents.

"There's a tendency among German companies, consultants, and staff training organizations to adopt new management models from the U.S. without really thinking about them or checking critically whether they work just as well in Germany," asserts Prof. Dr. Waldemar Pelz, director of the Bad Soden-based Steinbeis Transfer Center. The aim of his study was therefore to develop a German version of transformational leadership. To do this, the Institute for Management Innovation (a Steinbeis Transfer Center) conducted preliminary face-to-face interviews with 34 managers of small and medium-sized global leaders. This was followed up by a further 153 written questionnaires among managers and based on these results, an online questionnaire was conducted with 14,348 respondents. The aim was to gain insights into two key questions: What specific skills and behaviors encountered in day-to-day management have the greatest impact on commercial success; what is the difference between successful and unsuccessful managers?

In the early 1970s, Frederick Smith, the founder of FedEx, was asked about the main reason for the success of his company. He named customer satisfaction – stating that this stems from employee satisfaction and that high revenues and growth rates are a natural consequence of that. Smith did not judge his managers primarily by how well they managed their budgets or supervised workers, but instead by how well they fulfill their management duties as perceived by their co-workers. The experience of the logistics company contributed to the international expansion of transformational leadership, both in theory and in practice. The social scientists Bernard Bass and Bruce Avolio developed a test that makes it possible to measure the concept of transformational leadership and empirically test its usefulness in practice.

There is general consensus in business that motivated and qualified employees are the key to the (commercial) success of a company. But what

are the specific characteristics of such employees? They are loyal to the company and their boss, they continually improve their performance, they enjoy taking responsibility, they are disciplined, and they contribute to team spirit. But it is the behavior of their bosses that brings out these qualities. The reason for this is that the factor that has the biggest influence on employee behavior is a perception that they have a role model to look up to.

The required behavior of managers can be categorized into seven transformational leadership competences. How effectively managers practice these competences can be identified by looking at the reactions of their co-workers.

1. Role model and trust

To what extent do the personal goals, values, and convictions of the manager come across as genuine?

2. Goals and prospects

To what extent are employees prepared to perform and learn?

3. Ability to learn; support

Do employees have the necessary skills and resources to carry out their tasks independently?

4. Communication and fairness

Are interpersonal interactions based on values such as sincerity, openness, and transparency?

5. Results orientation

Do employees know what is expected of them and what the implications are if they do not meet expectations? To what extent is there an atmosphere of personal responsibility?

6. Entrepreneurial attitude

Do thinking and action revolve around opportunities and threats, and their commercial implications?

7. Implementation strengths

The most important attribute of transformational managers is their ability to translate goals, opportunities, and intentions into measurable outcomes.

When it comes to management behavior, people's personal perceptions often differ from the perceptions of those around them. Many managers do not even realize how their behavior comes across to others and thus what impact this has on company culture. And without valid "diagnostics" it is not possible to work out the most effective measures to improve management culture. Two particularly successful diagnostic tools are employee surveys and 360° feedback exercises. These allow managers to assess themselves and get feedback on their behavior from the next up in line, as well as colleagues, co-workers, and in certain cases, external parties such as customers. There are many instances of companies using these diagnostic instruments but having bad experiences with them. This has generally been because non-validated questionnaires were used for the surveys. This is also an issue that was looked at by the Steinbeis experts when designing the questionnaire for their study.

Key success factors only deserve this name if they are typical for successful people and atypical for unsuccessful people. Based on this premise, Waldemar Pelz and his colleagues compared the most successful ten percent of respondents in the study with the least successful ten

percent. Naming the top five behaviors of good managers, respondents said that colleagues:

- help with the development of personal skills and prospects
- boost self-confidence in achieving targets
- ensure that interpersonal relationships are fair
- create an atmosphere of "awareness of responsibilities"
- make it clear how each individual can contribute to the company's success

Managers that give positive responses to these questions make an important step toward the above-average (commercial) success of their organization. Managers can test their leadership and implementation skills for free on the German website: www.managementkompetenzen.de.

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Image: Principles of Transformational Leadership © Waldemar Pelz



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Health at the Workplace

Pilot project in and around Reutlingen to promote occupational health management

Occupational health management (OHM) depends a lot on the individual organization and its attitude toward corporate responsibility. It requires a long-term investment that could help keep employees fit for work over the long run, even as the legal retirement age keeps creeping upward. To be implemented properly, companies have to carefully consider the entire OHM process and systematically make all the necessary resources (time, finances, personnel) available for the long term. The Baden Württemberg Ministry for Work and Social Order, Families, Women, and Senior Citizens is running a pilot project called **Planning, Setup, and Implementation of Occupational Health Management in SMEs in the County of Reutlingen**. The project reflects the current situation in the working world and how willing companies are to implement occupational health management. The Reutlingen regional health alliance is working with the Steinbeis Consulting Center for Operational Health Management in on this pilot project.

The Reutlingen regional health alliance established a community network called the Dialogue on Work and Health in 2014. The network attracted numerous parties within different communities in Reutlingen county. It soon became clear that the network had no shared understanding of how to best define and implement such a complex issue as OHM. In light of this, the idea of a key influencer model was discussed. Its aim would be to develop a shared understanding of OHM, collect examples of OHM success stories in the region, and develop appropriate methods for implementing OHM.

The key influencer model consists of two groups. The first is a superordinate group called the Dialogue on Work and Health Network, which is open to all. The parties involved see themselves as OHM advocates and the idea is that they become empowered to competently and convincingly promote occupational health management. The other group is an internal training group, which takes part in OHM training courses. The idea here is to provide instruction on the theory of OHM and put this into practice within the participants' organizations. The combined theoretical knowledge and practice-based experience during implementation then becomes an instrument for OHM. At the end of the training course, this knowledge and experience is summarized in a handbook that can be passed on to the key influencers.

Ulrike Niethammer, Director of the Steinbeis Consulting Center for Operational Health Management in Herrenberg, developed the concept for the subject-specific and systematic structuring of the OHM training course. "The aim of the course is to develop a shared understanding of OHM, test how well the implementation steps can be taken in practice, help participants identify with occupational health management in the process, and motivate participants to implement OHM in their respective organizations," she explains, describing the road map for the course and its seven workshop units. Something of utmost importance to Ulrike Niethammer: "On-the-job learning is crucial – the theory is always tested for viability in practice. This way the OHM requirements can be adapted to match the specific needs of the organization."

In November 2015, five SMEs successfully completed the first OHM training course. They are now more aware of health issues in the working environment and implement OHM at their own companies through a variety of measures. In Reutlingen county, these companies serve as success stories for OHM. Training course participants have given very positive feedback. The chamber of trade in Reutlingen was one such participant and praises the fact that "any apprehension about occupational health management was eradicated through the theoretical and practice-based application" and "an in-depth exchange of experiences was possible thanks to the unique makeup of the group." To continue to support employees and work more systematically, the chamber of trade plans to implement a long-term occupational health management program. One company, SchwörerHaus KG, had already taken first tentative steps toward an occupational health promotion but what it lacked was a clear structure for occupational health management. Participating in the course gave it the push it needed to establish OHM and extend it to other areas.

The regional alliance recently published a handbook it has written on occupational health management at SMEs. It promotes the handbook through the Dialogue on Work and Health Network in the area. The participants from the first run of the course are listed as contacts for companies with an interest in finding out more, so they can share their own experience with occupational health management and point to its merits. The Dialogue on Work and Health Network hopes to take its handbook beyond the borders of Reutlingen county and pique an interest for occupational health management and the key influencer model.

The German-language handbook entitled "An Introduction to Occupational Health Management in SMEs" can be obtained by contacting the regional health alliance through the Reutlingen authorities or through the Steinbeis Consulting Center for Operational Health Management.



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The OHM training course

Workshop 1: Taking stock

- Which factors are decisive for successful health management?
- How big should a company be to require an OHM steering committee?
- Who exactly should be involved in the process in order to achieve high acceptance rates for OHM?
- How does the executive level feel about the OHM process?
- How can it be ensured that people will provide the necessary resources – time, finances, personnel?
- How does the company inform its employees about the OHM process?

Workshop 2: Setting strategic targets

- What are the aims of OHM, how do these fit in with the company strategy, and how do they fit to the company's mission statement?
- What do people expect of OHM?
- What does physical, mental, and social health mean?
- Which factors are decisive for health in the workplace?
- How can health be promoted in terms of salutogenesis-based models?
- What concepts are needed to understand OHM?
- What is the flow of an OHM process and what do the implementation steps look like?
- What measures are used in occupational health management? Which of these promote awareness of people's personal attitude toward health issues?

Workshop 3: Analysis of the current situation

- What data needs to be collected for strategic OHM targets?
- Which existing data can be used?
- What is the best way to formulate the strategic target agreements?
- What is the best way to collect the data?
- What needs to be considered when carrying out an employee survey?
- Which requirements for occupational health management can be derived from the eight management principles?
- How can these be implemented step by step?

Workshop 4: Setting operational targets and systematic steps for interpreting data

- What is the best way to analyze and structure collected data?
- How can interpreting the data raise awareness of the interrelatedness of health and work?
- What criteria must be fulfilled by an "opportunity to enhance health?"
- What's the best way to identify health risks?
- Which work areas, groups of individuals, and areas of health have

the most urgent need for action?

- Which OHM targets can be implemented effectively with relatively little effort?
- What are the key performance indicators for OHM?

Workshop 5: Health measures

This workshop explains how to derive OHM measures from the defined OHM targets, and how these can be planned and implemented. A practical example is used to illustrate a specific health risk and the situation in the workplace is examined using the Ishikawa cause-effect model.

Workshop 6: OHM evaluation

An effectiveness test answers the question of whether the derived measures helped achieve the desired improvements, or whether there is further need for improvement. At this point, participants have completed one full OHM cycle based on an example. The procedure can start again from the beginning, but only if all of the health risks have been dealt with and all "opportunities to enhance health" have been exploited. The workshop also emphasizes the need to document the OHM process, and the contents, targets, and benefits of DIN SPEC 91020 for OHM are briefly presented. This standard is highly recommended for use as a manual when implementing occupational health management. In conclusion, there is an overview highlighting the various options for HR policies based on people's stage of life and the issue of psychological stress in the workplace is discussed.

Workshop 7: Review and completion

A final review summarizes the individual OHM steps one last time. A brief presentation illustrates the various ways in which systematic, salutogenesis-based techniques can be combined with a greater emphasis on collaboration to motivate people to become involved in occupational health management.

PD Dr. H. Lasi,
Leiter Ferdinand-Steinbeis-Institut der Steinbeis Stiftung
„Das Potential I4.0 ist gewaltig – es muss
richtig genutzt werden.“

„Industrie 4.0 bietet große Chancen für
SMEs – es ist jedoch noch viel zu tun.“

Dipl.-Ing. G. Müller,
Geschäftsführer Logaer Maschinenbau GmbH
„Wenn ich mir nicht selber helfe,
kann mir keiner.“

Are SMEs Ready for the Future?

Industrial forum and Steinbeis Transfer Arena at Jade University of Applied Sciences in Wilhelmshaven

Industry 4.0, the German government's high-tech strategy, is in place. Now practical concepts and applications are needed to bring the strategy to life. And Jade University of Applied Sciences (Wilhelmshaven) and Steinbeis answered the call at the end of 2015. Global industrial enterprises, Steinbeis, and regional firms took a closer look at Production 4.0, presenting the latest innovations and developments. The event was organized by the German Welding Society (DVS), a student group at Jade University of Applied Sciences in collaboration with the team from the Steinbeis Transfer Center for Applied Production and Joining Technology. Students, scientists, and representatives of private-sector firms were invited to participate as part of the Jade Career Day. Rahmen des Jade Karrieretags an der Jade Hochschule.

The focus of the industry forum was how digital networking is revolutionizing production in small and medium-sized enterprises (SMEs). The objective was clear – SMEs in particular need to be shown ways to improve industrial processes and workflows from the ground up, because right now this represents the greatest challenge facing companies. A challenge that was summed up in the question addressed by the forum that day: "Are SMEs ready for the future?"

Experts and professionals participated in a Steinbeis transfer arena and two blocks of lectures to grapple with key aspects of Production 4.0 and explore potential ways to introduce more forward-looking production concepts. Kicking things off with the question "Industry 4.0 – What does that even mean?", Steinbeis expert Sven Gorny showed that SMEs are particularly unlikely to understand the thinking behind the Industry 4.0 initiative. Companies only rarely respond to the new technological and organizational challenges.

Under the leadership and moderation of Prof. Dr.-Ing. Dieter Liebenow and with the participation of student representatives, the arena discussed contrary aspects of transferring university research findings and the potential benefits for industry, especially SMEs. Several experts took the podium, including Prof. Thomas Wegener, Vice President of Research and Transfer at Jade University of Applied Sciences, Prof. Dr. Heiner Lasi, Director of the Ferdinand Steinbeis Institute (Steinbeis Foundation), and, representing industry, Gerhard Müller, Managing Director of the Emden-based engineering company Logaer Maschinenbau GmbH.

Lasi highlighted the many opportunities to be found in the high-tech strategy, but also pointed to many issues that still need to be resolved, particularly within SMEs. He underscored that the potential of an Industry 4.0 revolution could be enormous – provided it was exploited correctly. There are many global challenges that need to be solved, and these

are often riddled with far-reaching local organizational consequences for companies. This discussion also demonstrated that transfer via Steinbeis and the network's initiatives plays a decisive role in facilitating and applying innovative solutions in SMEs.

The arena event was followed by talks focusing on live business examples from the fields of welding technology, industrial robotics, and automation engineering. These met with keen interest, offering a thought-provoking accompaniment to the simultaneous exhibition at the university. Renowned representatives from the fields of welding technology (including FRONIS Deutschland GmbH, EWM AG, and LORCH Schweißtechnik GmbH), industrial robotics (KUKA Roboter GmbH, FA-NUC Deutschland GmbH), and regional systems providers presented practical examples of technologies and solutions as well as automation concepts from the perspective of Industry 4.0. At the Steinbeis Plaza, Steinbeis enterprises demonstrated the expertise which they leverage to make a significant contribution to the transfer of knowledge from science to industry.

There was such a positive response before the event that there was not enough space for all interested exhibitors. Large numbers of visitors from the scientific community and regional companies were impressed by the capabilities showcased by the exhibitors, plus their innovative systems, which were all designed to meet the challenges of Industry 4.0. There was much lively discussion at the booths and the hands-on demonstrations of the systems helped forge new contacts and in some cases actual partnership agreements.



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And the winner is...

Readers vote for the best article in TRANSFER magazine in 2015

The state of Baden-Württemberg has scooped prizes on two fronts. Katharina Eide, a Steinbeis University Berlin student from Amstetten, was the grab bag winner after voting for the best article in TRANSFER magazine in 2015. It was her lucky day so she can now read issues of TRANSFER on her very own iPad Air2. The author of the article that was voted best feature is also from the state of big thinkers and busybody inventors: Prof. Dr. Peter Neugebauer is director of Automotive Testing, the Steinbeis Enterprise at Karlsruhe University of Applied Sciences.

The deluge of emails that came into the TRANSFER office nearly set our inbox on fire. More than 700 readers voted for the best article and there was a clear winner with 133 readers voting for the article on "The Future of Transportation - Will Tomorrow's Cars be Determined only by Technology?" The article was written by Peter Neugebauer and was part of the 1/2015 feature topic on the automotive industry. In his article, the author made a critical assessment of the technical and societal challenges posed by the shift to e-travel.



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Business 4.0: real vs. digital challenges

The Steinbeis Consulting Day 2016

Digital transformation across entire sectors of industry, the intensified convergence of key enabling technologies, and the increasing amount of networking going on within markets and commerce – trends that are a central challenge to the effectiveness of modern businesses. This year's Steinbeis Consulting Day will take a detailed look at Business 4.0. The event will take place on June 29, 2016 at the Haus der Wirtschaft in Stuttgart.

During the day, Business 4.0 will be looked at from three angles. In the first session, the topic will be introduced from the viewpoint of human resources. A speaker from the world of science and academia will give insights into the latest research findings and an experienced business consultant will critically review these from a more practice-based standpoint. Following this, a company will discuss the changes it is making to adapt to "working world 4.0" in a simulated consulting session as part of a "live case" exercise.

The second session then takes a closer look at process management. This will also involve a speech followed by a live case exercise. The third and final session will present the main keynote speech of the Consulting Day 2016: Business 4.0 – a Revolution in the Working World? This will be followed by an interactive panel discussion with a select group of experts. All speakers and the audience will have a chance to get involved at this stage.

Attendance at the Consulting Day is free. To find out more and register online, go to www.steinbeis-consulting-tag.de.



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Collaboration on the Internet of Things Industry 4.0 platform and the Industrial Internet Consortium to join forces

At a recent meet-up in Zurich between representatives of the German platform Industry 4.0 and the American Industrial Internet Consortium (IIC), both parties agreed they should work together more closely in the future. Much of the conversation revolved around the overlaps between two architecture models called the reference architecture model for Industry 4.0 (RAMI) and the industrial internet reference architecture (IIRA). The aim should be to safeguard the future interoperability of the two systems. The German team working on behalf of the IIC will operate under the auspices of the Steinbeis Transfer Center Innovationsforum Industrie (STCI).

The delegates at the meeting in Zurich also decided that both initiative groups will collaborate more closely on standardization and agreed they should share common testing environments. They drafted a joint roadmap for this. The delegates at the meeting consisted of an open and informal group of representatives from Bosch, Cisco, IIC, Pepperl + Fuchs, SAP, Siemens, the Ferdinand Steinbeis Institute (Steinbeis Foundation) and ThingsWise.

Prof. Dr. Heiner Lasi, director of the Ferdinand Steinbeis Institute and the German team representative for the IIC, confirmed that, "The meeting was a total success and collaboration between the two organizations is

a necessary and important development for companies involved in global competition that face the challenges posed by digitalization."

The meeting was the result of an initiative started by Bosch and SAP, which are both members of the steering committee of the two organizations. The informal group that gathered at this first meeting will continue its work in bringing the IIC and the Industry 4.0 platform together. The output of work carried out by a collaborative task force will also flow into activities being carried out by the German members of the IIC.

More information about the German team representing the IIC:



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SAVE the DATE

STEINBEIS DAY 2016

Steinbeis-Haus für Management und Technologie (SHMT) Stuttgart-Plieningen



Steinbeis Day 2016

30 09 16

Steinbeis-Haus für Management und Technologie (SHMT)
Filderhauptstr. 142 | 70599 Stuttgart



Steinbeis

Steinbeis Networking Platform for SMEs

Steinbeis Entrepreneur Forum combines theory with practice

The central theme for the fourth Steinbeis Entrepreneur Forum will be digitalization and innovation. The event will take place in the Haus der Wirtschaft in Stuttgart on June 17, 2016. The day is being organized by the Steinbeis Center of Management and Technology GmbH (SCMT) and the Steinbeis Foundation to provide a forum to exchange notes and experiences with other experts. The event involves talks given in pairs and roundtable sessions to stimulate discussion.

The event in Stuttgart is open to people working at SMEs, Steinbeis clients and business partners, and students and graduates of Steinbeis University Berlin. The aim is to draw inspiration from emerging developments, and the event is intended to provide a communication platform for people to talk about their own experiences in one location.



Closer Collaboration: Steinbeis innomas GmbH

Steinbeis raises share in mechatronics company

The engineering services provider innomas, which is headquartered in the Steinbeis House in Ilmenau, was founded in 2001 by former employees of the Ilmenau University of Technology. The company now belongs to the Steinbeis Network following a move by Steinbeis to raise its share in the company and thus extend its know-how in the field of magnetic engineering.

The company's increasing involvement in the Steinbeis Network is also reflected in the name change. The enterprise will now operate under the name Steinbeis innomas GmbH, a limited company offering the services of its experts with a focus on the development of electromagnetic drive systems. Development activities will run in parallel to scientific concept studies and feasibility studies. The experts will be able to draw on a wealth of experience from projects in industry, ranging from designing processes to dimensioning new actuators, producing samples, making prototypes, and producing linear or rotary micro actuators and macro actuators.

The core competence of the team of experts lies in the development and simulation of electromagnetic actuators, intelligent drive systems, and mechatronic systems. The experts use FEM models to simulate ultradynamic systems as well as static flux density distribution systems. An

increasing amount of energy has to be invested in redeveloping simulation models, primarily due to the increasing demands placed on the design of magnetic drive systems.

Presentations will be made in tandem. First a Steinbeis expert will examine the principles underlying a particular topic from a scientific angle, then this will be followed by feedback on the practical aspects of the same issue from a Steinbeis project partner. To give the audience a chance to discuss the topics in more detail with the speakers, each tandem talk will be followed by roundtable sessions. The moderator for the event will be Dr.-Ing. Walter Beck, director of SCMT.

Attendance at the forum is free. To find out more and register online, go to www.steinbeis-unternehmerforum.de.



Sabine Ziebart
Steinbeis Center of Management and Technology GmbH (Filderstadt)
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The development projects worked on at the company stem from a variety of industries and can involve the advanced development or redevelopment of products. The innomas experts have already completed a number of successful projects in the automotive sector, including fuel injector optimization, the design and dimensioning of an electric engine used in hybrid vehicles, and the design of actuators to improve the feel of operating systems. Projects in the field of manufacturing have ranged from self-sufficient energy recovery on rolling bearings to recloser switchgear on high voltage grids and the optimization of welding guns.

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A university city without almost 7,000 students, Ilmenau offers a highly developed infrastructure. A large number of innovative firms have been set up around the university, one of which is innomas. Collaborating with the university makes it possible to access a variety of measurement and testing instruments whenever necessary and there is tremendous potential to involve students in projects. "We see stronger integration into the Steinbeis Network as an excellent opportunity to improve links with partners in industry," says Bernd Malsch, managing director of Steinbeis innomas GmbH, "and based on our experience over the last 15 years, the trust this engenders among customers and the recommendations this leads to also help acquire new development projects. Working with the Steinbeis Network means we now have a partner with an extremely good reputation and strong awareness levels." So coming under the Steinbeis umbrella means there will be no stopping more successful developments from the specialists!

Image: The Steinbeis House in Ilmenau



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Price Transparency in Real Estate Markets Tim Sebastian Nädele

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About the author

Tim Sebastian Nädele studied economics, majoring in real estate economics at the University of Freiburg. Then he worked as a research assistant at the Center for Real Estate Studies (CRES) at Steinbeis University Berlin and is currently a researcher for the German Real Estate Federation (IVD). Among other activities, this has involved setting up an affordability index for residential property.



Factors Influencing the Purchase of Real Estate for Personal Use Tayfun Erbil

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About the author

Tayfun Erbil studied business, majoring in real estate at Berlin University of Applied Sciences (HTW). Then he worked as a research assistant at the Center for Real Estate Studies (CRES) at Steinbeis University Berlin and is currently a researcher for the German Real Estate Federation (IVD). Among other activities, this involved setting up a real estate investment calculator. Erbil also played a leading role in the development of a tenement housing market report and a study on real estate developments. He also helped draft a macro-level study on the profitability of energy renovations to residential property.



Sentiment Indicators in Portfolio Management Tim Weller

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About the author

Tim Weller studied business, majoring in finance and the banking industry at the University of Augsburg. After graduating in 2008, he worked as a research assistant at the Steinbeis Research Center for Financial Services where he gained work experience on numerous projects with an emphasis on asset management, banking, and payments. Weller earned a Ph.D. at Steinbeis University Berlin in 2015.



Corporate Foresight at Energy Supply Companies Christian Buske

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About the author

Christian Buske studied industrial engineering at the Mannheim University of Applied Sciences between 2000 and 2004, majoring in the energy market and management accounting. From 2004 until 2012, he worked in variety of sales roles and management positions at MWV Energie AG before completing his MBA studies at Steinbeis University Berlin. Buske also earned his Ph.D. at Steinbeis University Berlin in 2016. He currently works at Verivox GmbH as the division head for energy sales.



UltraMag – Integrating Ultrathin Mag- netic Field Sensors in Intelligent Auto- mation Components Institute of Microproduction Technology, Leibniz Universität Hannover (Ed.)

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About the author

The UltraMag Report is the result of collaborative work at the Steinbeis Transfer Center for Mechatronics on a joint project revolving around the integration of ultrathin magnetic field sensors in intelligent automation components (UltraMag). The project was sponsored by the Federal Ministry for Education and Research (BMBF) with the aim of enhancing the performance of electromagnetic drive, control, and measurement systems by introducing ultrathin magnetic field sensors and making it possible to take magnetic field measurements in previously inaccessible areas due to the low thickness of parts.



Steinbeis Foundation Transfer Prize – Lohn Award 2004-2015
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About the Steinbeis Foundation Transfer Prize

The transfer prize of the Steinbeis Foundation – Lohn Award – was introduced by the Steinbeis Foundation in 2004 in honor of the outstanding achievements of Prof. Dr. Dr. h. c. mult. Johann Lohn. First awarded that same year, the prize recognizes excellence in competitive technology and knowledge transfer between science and academia on the one hand and business on the other.



Ferdinand Steinbeis
1807-1893
Günter von Alberti |
Steinbeis Foundation (Ed.)

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About the author

Dr. Günter von Alberti was a senior civil servant at the Baden-Württemberg State Ministry of Sciences, Research and the Arts. After entering retirement, he supported the Steinbeis Foundation with his wealth of experience, his exceptional knowledge, and unparalleled abilities. Von Alberti worked for Steinbeis until shortly before his death and the Dr. Günter von Alberti Prize was introduced in honor of his achievements to be bestowed each year to the best students on the project competence degrees, Master of Business and Engineering (MBE), and Master of Business Administration (MBA, Entrepreneurial Management).



The 11th Business Intelligence Symposium Status Quo – Opportunities and Challenges
Andreas Seufert, Peter Lehmann, Klaus Freyburger, Thomas Becker (Ed.)

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About the editors

The editors work in roles at the Steinbeis Transfer Institute of Business Intelligence (IBI) at Steinbeis University Berlin. Founded in 2004, the aim of the institute is to foster, develop and network know-how between universities and partners in business in the field of business intelligence. To this end, the IBI works with its partners to organize business-oriented research, staff training sessions, and events.



Crisis Communication – Strategies in Times of Emergency
Gernot Barth, Bernhard Böhm (Ed.)

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About the editors

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Future-Proof Leadership
Wilfried Mödinger, Jens Mergenthaler,
Werner G. Faix

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Steinbeis is an international service provider in entrepreneurial knowledge and technology transfer. The Steinbeis Transfer Network is made up of about 1,000 enterprises. Specialized in chosen areas, Steinbeis Enterprises' portfolio of services covers research and development; consulting and expert reports as well as training and employee development for every sector of technology and management. Steinbeis Enterprises are frequently based at research institutions, especially universities, which are constituting the Network's primary sources of expertise. The Steinbeis Network comprises around 6,000 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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