

staufen magazine

A journal for change from STAUFEN.AG

2021 | No. 4



HILTI

LEAN@HILTI:

"THIS PROCESS NEVER ENDS"

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CELONIS

RESOLVING THE GOAL CONFLICT
BETWEEN ECONOMY AND ECOLOGY

Page 34

INSIDE EVERY COMPANY THERE IS AN EVEN BETTER ONE.

HELLO AGAIN



Staufen AG is proud to receive the "Best Consultants" Award. For the eighth time in a row.

As an international Lean Management consultancy, we believe that inside every company, there is an even better one.

With this conviction, we have been advising companies around the world on the path towards holistic transformation for over 25 years.

Dear Readers,

What do you think of when you look at the title photo of the new Staufen magazine? Is the car going up hill or down? How many cars go off the road here each year? Perhaps you also feel the "scary-nice feeling when the car leans into the curves," as the German newspaper "Die Zeit" wrote last year about Bov Bjerg's new bestseller "Serpentines."

In any case, the curves and uphill or down course fits everything that we've been through since spring 2020. An alternating bath of feelings between lockdown and loosening of restrictions, deceleration and catch-up effects, home office blues, and COVID-19 catalyzer. For me, the photo also represents three additional facts. First, the path to a goal is almost never a straight one. Second, that you should always be attentive and react quickly in order to be able to manage sudden changes of direction. And third, that there is no way to avoid a rational combination of economy and ecology.

How companies and entrepreneurs around the world take these three points to heart and implement them each day is the core of this year's issue of the Staufen magazine. The examples from Brazil, China, Romania, Italy, and the lower Rhine and the Swabian Alb in Germany show clearly that permanent and accelerating change is a global challenge.

I hope you enjoy reading this issue when we take you, among other things, on a trip to the factory of the future and discuss the sustainable production of food and the stability of supply chains with well-known scientists. In addition, global players such as Bosch, Hilti and Dürr report how they are managing comprehensive transformation and setting themselves up so they are fit for the future – without being run off the road.



WILHELM GOSCHY
CEO, STAUFEN.AG

OPERATIONAL MANAGEMENT



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DR. STEFAN NÖKEN
Member of the Executive Board
Hilti Aktiengesellschaft

LEAN@HILTI: "THIS PROCESS NEVER ENDS"



MANY COMPANIES USE LEAN MANAGEMENT METHODS TO IMPROVE INDIVIDUAL AREAS. BUT LEAN IS MUCH MORE THAN JUST A TOOLBOX. AS A CORPORATE PHILOSOPHY, IT ENABLES HOLISTIC TRANSFORMATION, AS THE EXAMPLE OF THE LIECHTENSTEIN-BASED HILTI GROUP

SHOWS. DR. STEFAN NÖKEN, MEMBER OF THE EXECUTIVE BOARD OF THE WORLD'S LEADING PARTNER FOR PROFESSIONALS IN THE CONSTRUCTION INDUSTRY, HAS ACCOMPANIED THIS JOURNEY FROM THE VERY BEGINNING.

OPERATIONAL MANAGEMENT





Ten years have passed since Hilti's Executive Board decided to align all areas of the company with Lean Management principles. Time and resource waste was to be eliminated, and processes were to be optimized even more in the best interests of the customers. The aim of Lean@Hilti: Operational Excellence.

Dr. Stefan Nöken, a member of the Hilti Executive Board since 2007, has helped shape the transformation from the very beginning. How much has Hilti changed since then? "Massively," is his assessment. "It's a very different company today than it was back then." Hilti, he says, is now twice as big, much more international – with more diverse structures, more dynamics, and has become more flexible and more agile. The company is even more customer-focused and has a broader, more comprehensive offering.

Nevertheless, change was never implemented just for the sake of change. The Hilti motto "We passionately create enthusiastic customers and build a better future" still holds true. Likewise, Hilti's strategy elements – differentiated product and service offering, direct customer relationship, a high performing global team and operational excellence – were retained. The culture of "Care & Perform" was also kept in place by the group. Stefan Nöken: "We challenge each other, but at the same time we are there for each other."

"We work with each other with decency, respect, appreciation and openness."

What has changed, on the other hand, is the way managers work. "Especially at the mid-level, managers today act as partners and coaches. They lead by asking questions, and rather than giving ready-made solutions, they provide help for self-help," explains the Hilti manager. The result: While technical expertise is a necessary prerequisite when recruiting new managers, it is more important that they are compatible with Hilti's culture.

"Even in the onboarding process," Nöken continues, "there have already been cases in which it was determined that they were not a good fit after all." What matters is the manager's value system. The clear message: "It's about employees acting with decency, respect, appreciation and openness with each other."

Breakthrough improvements as a management task

At Hilti, managers are also expected to continuously optimize the ongoing business. However, these improvements alone are not enough to drive the company's long-term development. Senior



executives, in particular, therefore have the task of initiating real breakthrough improvements. "To do this, you have to fundamentally break with certain paradigms, structures and processes," Stefan Nöken is certain.

If, for example, there was a need to cut the lead time in production in half or to save one third of the costs for a product line due to fierce competition, enough pressure would be built up to activate the team and initiate new thinking and change. Implementation is then carried out by a cross-functional team. Says Hilti executive Nöken: "It's incredible how much creativity and commitment is generated this way."

Integrating lean into the daily routines of 30,000 employees

In addition, Hilti has always seen and used crises such as the 2008 financial crisis, the 2015 Swiss franc shock or the COVID-19 pandemic as opportunities or catalysts. "Of course, every crisis shocks a company – including us. But it also creates a compelling need to act," Nöken describes. The willingness to question and change things is also much higher in such times. In terms of the transformation process, the financial crisis made Hilti more flexible, the franc shock accelerated internationalization, and the pandemic led to greater resilience in the supply chain, he said. But how do you motivate 30,000 employees worldwide to work continuously on improvements, even away from crisis periods? Hilti offers a variable profit-sharing scheme for employees at all levels.

The decisive factor, however, is the emotional satisfaction that everyone derives from making a contribution and being successful, according to Stefan Nöken: "Everyone wants to be part of a winning team." The pinnacle of emotional satisfaction, he says, is the Lean Award for Operational Excellence. In the plants, there is the Lean Winner of the month and of the year. Around the world, the best of the best then compete for the Global Award, which is presented for continuous improvement, as well as for innovation: "It's an incredible moment full of emotion and pride when the trophies are presented."

How does Hilti train its workforce to be lean? "At the core, every employee needs to understand that lean is not a project. It has no end, so it's about making lean a daily routine and building it into the workflow," explains the Hilti executive. Scaling and consistency are essential in the lean process, he said. To provide formal training in lean, the company offers special modules and workshops in its own academy, for example on Kaizen or Shop Floor Management.

"Lean is a larger transformation process that requires a holistic approach. A single measure is not enough."





We inspire our customers and build a better future.



1941

Founding year



120

Countries



30,000 +

Employees



5,300

Mio. CHF in sales

Even more important, however, is on-the-job training, i.e., experiencing lean in daily operations with colleagues and superiors and applying it in one's own work. One of the ways Hilti measures how successful this is, is with a Lean Assessment, which shows how an area has developed over the past twelve months.

"A transformation process that requires a holistic approach"

Looking back on the past ten years of Lean Transformation, Hilti is very satisfied with the company's financial performance, employee engagement, ESG responsibility and innovation performance. "But not everything worked, and there is still a lot of potential," summarizes Hilti manager Nöken. Digitalization will also bring about major changes in the construction industry over

the next ten years. Hilti will have to expand its offering accordingly, further digitalize customer interaction and also adapt its operational system.

What can companies that want to start with lean learn from Hilti? "Lean is a larger transformation process that requires a holistic approach. A single measure is not enough," emphasizes Stefan Nöken. "Anchoring it in the company's strategy and culture is therefore fundamental. Without a clear message from the top and perspective, employees won't follow along." ■



PROF. DR.-ING. GISELA LANZA
Institute Director Production Systems
Karlsruhe Institute of Technology (KIT)
wbk Institute for Production Technology



DR. THILO GRESHAKE
Partner Automotive
STAUFEN.AG

ORGANISATION & LEADERSHIP

GREEN TRANSFORMATION IN THE AUTOMOTIVE INDUSTRY:

"THERE IS A LOT OF PRESSURE AT THE BACK OF THE SUPPLY CHAIN"





“Our annual study 'Green Transformation in the Automotive Industry' shows very clearly how seriously the industry is approaching this topic right now. **Precisely for the suppliers, this transformation requires great effort, now as before.**”

DR. THILO GRESHAKE
STAUFEN.AG



IN THE INTERVIEW WITH DR. THILO GRESHAKE, INDUSTRY MANAGER AUTOMOTIVE AT STAUFEN AG, PROF. DR.-ING. GISELA LANZA EXPLAINS WHERE THE AUTOMOTIVE INDUSTRY IS WITH REGARD TO CLIMATE PROTECTION AND WHICH STEPS SHOULD BE THE NEXT ONES TAKEN. THE INSTITUTE DIRECTOR PRODUCTION SYSTEMS AT THE KARLSRUHE INSTITUTE OF TECHNOLOGY (KIT) FOCUSES AMONG OTHER THINGS ON MORE CLIMATE-FRIENDLY PRODUCTION.

Prof. Lanza, our study "Green Transformation in the Automotive Industry 2021" shows that the industry is making progress along the path to the green transformation. Is this also your impression?

Yes, however the focus is only on linear resources and energy production, namely on CO₂-neutral production in the production chain from OEM to Tier X and documenting this cleanly.

How well is this working?

The suppliers are surprised how quickly this topic is being advanced and how quickly they are supposed to compensate for the CO₂ they produce. Of course, many of them are not prepared for this, among other things because there were previously no clear standards, so that apples and oranges are being compared to one another. And it has to be clearly regulated who is to provide what data. However, I am optimistic that this will work well in the automotive industry.

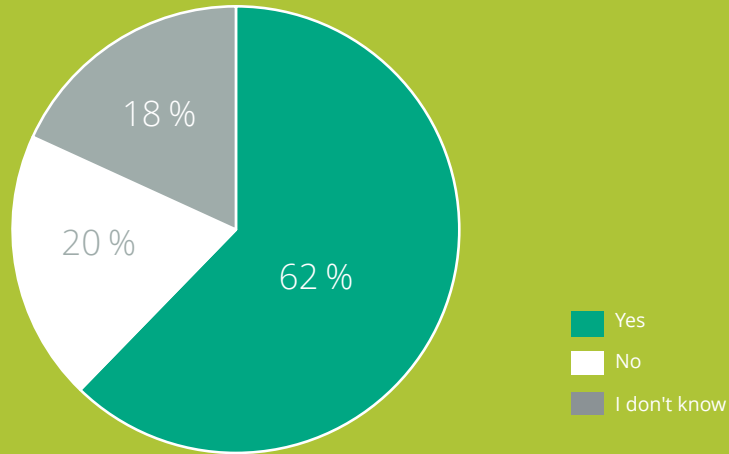
For in the industry there is a clear power pyramid: if the OEMs want something, they will get it. At the moment there is a lot of pressure, also at the back of the supply chain, since there is a great need for catch-up there.

But isn't there also a lot of inertia and skepticism, precisely with regard to CO₂ neutrality?

Yes, because some companies think there is a lack of logic when it comes to this topic. You can't discount the fact that some suppliers achieve EBIT of just 2 to 3%. They don't have any time to worry about this topic, to ensure transparency with regard to energy efficiency and savings; their primary concern is how to survive. We have to ask ourselves the question: what happens to companies whose ecological balance sheets don't look good? Do these companies have the financial power to play along? How can you help them if necessary?



Has your area implemented an **ecological improvement measure** in the last three months?



A LOT CAN BE DONE: THE GREEN TRANSFORMATION IS BEING EXEMPLIFIED IN THE AUTOMOTIVE INDUSTRY.

And this applies to more than just small suppliers at the back of the chain; current climate activities present an enormous challenge even to large companies. And they're just the start of things, aren't they?

In research, we're thinking further ahead. I am focusing especially on the topic of the circular economy. The topic of circularity is something companies have not yet tackled. The concern here is raw materials such as lithium. It is taken from the earth and there is a finite supply. But do we really want to mine all the lithium that is indispensable for battery manufacturing from scratch? At least in the battery and fuel cell sectors, companies are starting to consider circular models.

And beyond that, not a lot is happening?

No, in comparison to the 1980s, we are sooner moving away from the circular economy. Once upon a time, electronic components could be repaired. Now, they end up in the trash, just as used devices do.

And we're not making any progress with the topic of remanufacturing either. Here, the old products are returned to the factory, repaired, and then they have a second life. They are about 30% cheaper. This whole scenario plays out mostly in low-wage countries; nevertheless, remanufacturing is only rarely worthwhile. The products cannot compete with gray or inexpensive products from Asia.

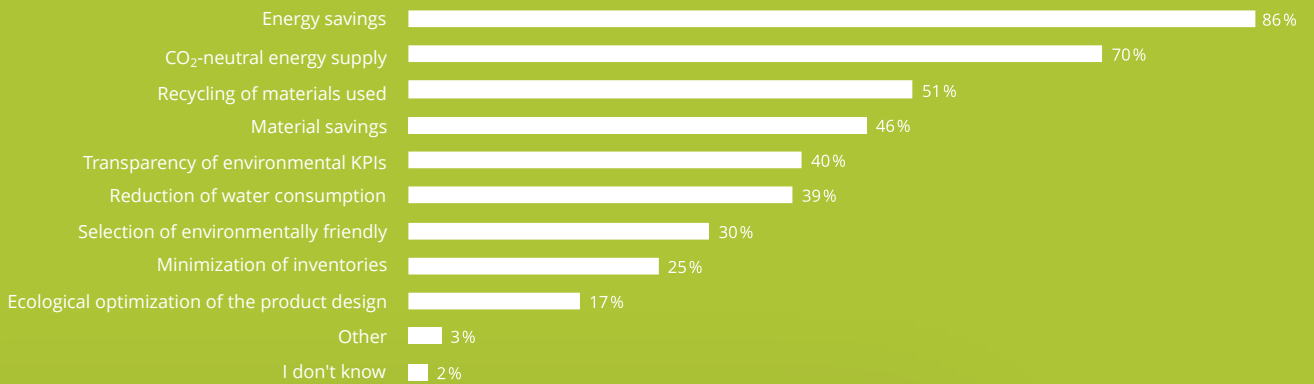
How can a circular economy even work?

There is no contradiction between economy and ecology. If sustainable, circular business models arise for companies, they will act. That's why legislation should create reliable framework conditions for a circular economy, and this has to be done on the European level. ■

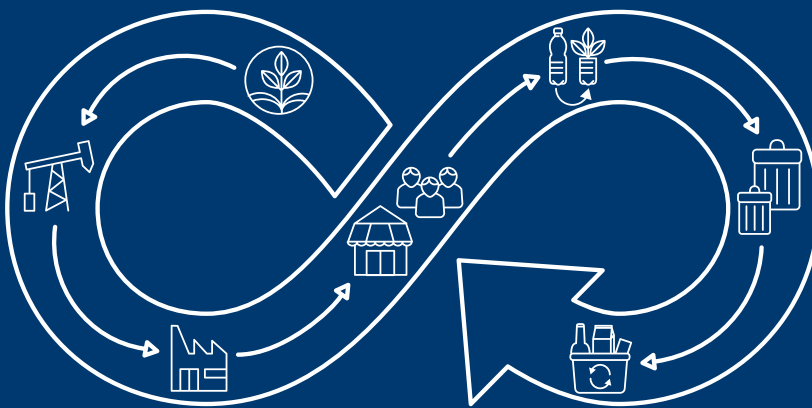


Which of the following **ecological goals** are being pursued at your company **with regard to the use of resources**?

SAVING ENERGY AND THE USE OF CO₂-NEUTRAL ENERGY ARE AT THE TOP OF THE AGENDA.



ORGANISATION & LEADERSHIP



CIRCULAR ECONOMY



For more information about the "Green Transformation" study:
www.en.staufen.ag/study-green-transformation-2021



STATIONARY FUEL CELL (SOFC)
in the Bamberg omnibus station, Germany



CLIMATE PROTECTION PIONEER

WITH MORE THAN 400 LOCATIONS WORLDWIDE, BOSCH HAS BEEN CLIMATE-NEUTRAL SINCE 2020. A CUSTOM IOT SOLUTION WAS DEVELOPED FOR THE CONSISTENT IMPROVEMENT OF ENERGY EFFICIENCY. WE SPOKE ABOUT THIS WITH DR. CHRISTIAN FISCHER, MEMBER OF THE BOARD OF MANAGEMENT AT ROBERT BOSCH GMBH.



DR. CHRISTIAN FISCHER
Member of the
Board of Management
Robert Bosch GmbH



Dr. Fischer, with digitalization and climate protection, society and business are currently trying to find quick answers to two megatrends that are "sustainable" in both senses of the word. How are you confronting this challenge at Bosch and how do you see the current situation from the customer side?

Bosch wants to use its competitive advantage from long-standing experience in combining networking (Internet of things, IoT) and artificial intelligence (AI) for its future business and become a leading AIoT company. It is predicted that sales of network-capable devices for the home will double in 2021, from four million to nearly eight million. The networking of things results in knowledge about how these things are used. Bosch would like to evaluate the data about the usage of its products with artificial intelligence and create new functions and services for customers via appropriate software updates.

Digitalization also helps with climate protection. With its more than 400 locations worldwide, Bosch has been climate-neutral since February 2020. This is an achievement that is only possible thanks to the constant improvement of energy efficiency in production, systems, and buildings. For CO₂-neutral production, we use our own IoT solution called "Energy Platform." The platform also focuses on using solar and wind energy optimally – and it uses AI in the process. Today, Bosch shares its experiences with other companies: since the middle of 2020, the consulting company Bosch Climate Solution has been helping other companies reduce their CO₂ footprints.

As part of the Bosch management, you are also responsible for the areas of building technologies and smart homes. What are the approaches to successfully interlock the topics of digitalization and climate protection?

At Bosch, sustainability is defined as a central task; through economically, ecologically, and socially responsible action, we want to improve people's quality of life and secure the basis that current and future generations need to live. Sustainability is not an end in itself here. Today, we generate innovation potential for product development: Bosch records approximately 40% of its sales with products that contribute to sustainable development. For example, CO₂ savings between 20% and 100% per heating system can be realized (with the use of "green" gases) by using heat pumps and modern boilers from Bosch and Buderus. Networked heating thermostats control the heat on the basis of pre-defined rules – this is good for the for both the wallet and the climate. Our smart home system's energy manager also enables significantly greater CO₂ reduction and consequently lower energy costs. It can distribute solar power from the roof intelligently and automatically, whether to the heat pump or battery storage – and in the future also to an electric vehicle. With such digital control, homeowners can save up to 70% on their power costs. Furthermore, Bosch has recently started the first real operation of a stationary fuel cell (SOFC) for climate-friendly power production in an urban setting at the bus station in Bamberg, Germany. As compared to the power mix in Germany, a SOFC system itself saves about 40% of the climate-damaging CO₂ emissions when operated with natural gas – and when operated with hydrogen, the figure is 100%.



400+

Locations
around the
world



100 %

CO₂-neutral



395,000+

Employees



71.5

B € in sales

Energy Platform





ORGANISATION & LEADERSHIP

AI-BASED SOLUTION
for optical error recognition

Starting in 2025, every Bosch product should contain or be produced with artificial intelligence. In which fields do you anticipate the greatest benefit from AI? Where is the German economy overall in the global comparison regarding this topic?

The evaluation and analysis of data with AI methods offers the opportunity to develop new functions and services, which in turn increase the benefits of the things. Data-driven business has thus far been the

domain of IT companies outside of Europe. The highest investments in this future field are being made in China and the USA. Nevertheless, European industry has AI strengths that others do not have. Particularly when combining IoT with industrial processes, Europe has some advantages. These should be encouraged with goal-oriented innovation policies. In the process, our conviction about AI has to be secure, robust and traceable – for all AI decisions, people should retain control. ■



DR. BJÖRN FALK
Principal Mechanical Engineering
STAUFEN.AG



MARCEL RUPPRECHT
Managing Director
Böllhoff GmbH – Service provider
for fasteners

INTERIM MANAGEMENT: EMERGENCY SOLUTION, NO WAY!

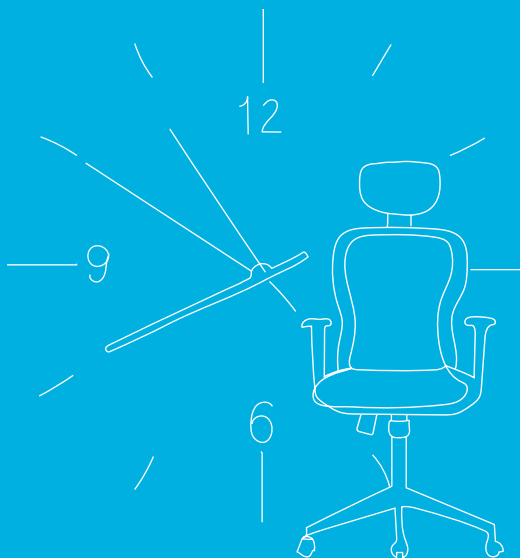
BÖLLHOFF

IS A CONSULTANT ALSO CAPABLE OF INTERIM MANAGEMENT? OF COURSE! IF THE JOB REQUIREMENTS MATCH THE CONSULTANT'S PROFILE, IT IS A GREAT SOLUTION. STAUFEN CONSULTANT DR. BJÖRN FALK DEMONSTRATED HOW WELL THIS WORKS DURING HIS ASSIGNMENT WITH THE EXPERTS FOR JOINING TECHNOLOGY: THE BÖLLHOFF GROUP.

Time was running out when Böllhoff GmbH in Bielefeld began looking for an interim manager at the end of last year. The family-run company needed to fill a senior position in quality management at short notice. They were looking for a successor for the challenging task of ensuring and managing customer quality. But Managing Director Marcel Rupprecht did not want to put himself under pressure in his search for the right person. The requirements profile for the new permanent manager should be well thought out and the position filled without stressing, also to ensure long-lasting leadership and responsibility for the team.

Management experience, hands-on mentality as well as expertise and methodological competence

Marcel Rupprecht came up with the idea of using an interim manager first. "Böllhoff already had good experience with this in other areas, such as sales, purchasing and logistics," says Managing Director Rupprecht. "We always chose this option when urgent and important issues came up." So employing a temporary manager was not unusual. That the position would be filled at short notice by a management consultant, however, was something new. How was this choice made? Marcel Rupprecht: "The demands on an interim manager's flexibility, empathy, ability to cope with stress and specialist knowledge are generally particularly high." Together with Böllhoff's HR team, the managing director developed a requirements profile for the interim manager and spoke with Staufen consultants, who at the time were working in-house to support Böllhoff in a change project. It quickly became apparent that someone from the Staufen AG management team had just the right profile: Dr Björn Falk, Industry Manager for the mechanical engineering sector. His profile impressed the Böllhoff managing director: "He had a mixture of management experience, hands-on mentality as well as expertise and methodological competence in quality management," Marcel Rupprecht remembers.





The Böllhoff Group in figures:

Innovative partner for joining technology with assembly and logistics solutions.



42

Locations



13

Production facilities



24

Countries



3,000+

Employees



545

M € in sales (consolidated)

A valuable sparring partner for management

A meeting was quickly arranged in Bielefeld and Björn Falk took up the post as interim manager in January 2021. "To bridge the vacancy, I was initially given a mandate for three months with the option to extend," said the Staufen consultant. "In addition to complaints, the entire area of customer quality management was part of my job. That is unique. Giving an external person so much responsibility in customer contact requires a great deal of trust, because he or she also represents the company to the outside world."

The managing director of Böllhoff explains the quick decision in favor of Björn Falk and his competencies as follows: "It is a mixture of well-founded expertise and personality that also supports me as a sparring partner. He is a type of manager who integrated very quickly and is digitally savvy." Filling the position on a temporary basis gave him enough leeway to look for a suitable successor and also the opportunity to get to know Böllhoff and make a decision with no rush. "Looking back, I'm glad Staufen proactively approached us and offered us this interim solution."

Onboarding during the pandemic

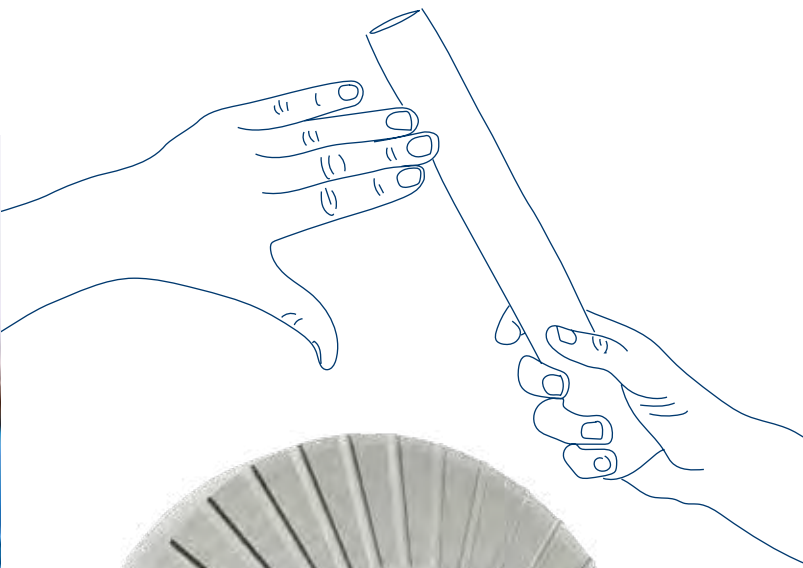
Onboarding the interim manager was complicated by the COVID-19 crisis. With 100 percent of employees working from home, Mr. Falk initially hardly got to know anyone in person, says Rupprecht. Instead, he said, he quickly found digital avenues and built a network through videoconferencing and phone calls. Overall, the in-

terim manager was well received by both managers and employees in the family business. The Böllhoff "passion for successfully joining" not only applies to the products, but also to the corporate culture: "I have received a lot of positive feedback, both from long-standing employees and from those who have not been with us for very long. They all welcomed the solution of an interim manager and continue to appreciate Björn Falk."

But there were also points of friction in the beginning. Marcel Rupprecht: "They are unavoidable." When someone sets out to quickly achieve goals and consistently apply their expertise, they sometimes step into the personal comfort zone of other colleagues. "If done in a respectful manner this also has a positive aspect." The interim manager used new methods and skills to move the team forward and, through constructive criticism and empathy, ensured that no one was left behind. The managing director also likes his ability to think outside the box: "In addition to his primary area of responsibility, Mr. Falk also took care of issues such as employee training and development."

Succession planning without losing knowledge

The interim manager's positive impression and realization that a permanent successor for the quality management executive position would not be quickly found during the COVID-19 crisis led to the mandate being extended into the summer. Björn Falk became more and more involved in the selection of his successor. And that's not all: To prevent losing knowledge during the transition, the Staufen con-



“The demands on an interim manager's **flexibility, empathy, ability to cope with stress and specialist knowledge** are generally particularly high.”

MARCEL RUPPRECHT

Böllhoff GmbH – Service provider for fasteners



RIPP LOCK®

Permanent and secure fastenings

HELICOIL® Smart

The new generation of thread technology

sultant will be tasked with onboarding his successor and assisting him or her during the familiarization process.

Have the requirements for the successor's profile changed as a result of the interim manager's assignment? "Yes," says Marcel Rupprecht. "Mr. Falk's way of working showed us that we didn't just need someone who knew about quality methods." In the area of complaints management, for example, he has brought reporting to the management to a new level. He also consistently assumed responsibility for interface management and the skills of individual team members, he said. "That's why we have placed additional emphasis in the recruiting process on finding a manager with enough empathy to know how to make employees stronger and better."

Entrepreneurial decision instead of focus on costs

Böllhoff Managing Director Rupprecht would rely on an interim manager again in a similar situation, even if this solution incurs additional costs: "In the past, a decision would have been made for other employees and managers to temporarily take over the activities for cost reasons when searching for a successor. But well-applied interim management allows us to acquire new knowledge for the company in the long term, for example with regard to modern working methods, or even different hierarchical thinking. The entire team and I personally have learned a lot from Björn Falk." His conclusion: Employing an interim manager should not be an expensive emergency solution, but always a well-thought-out business decision. ■



“THE RIGHT SENSE FOR INNOVATION”

OR HOW AUTECH BECAME ONE OF THE WORLD'S LEADING MANUFACTURERS OF RADIO REMOTE CONTROLS.



ANTONIO SILVESTRI
Managing Director
AUTECH S.r.l.

Producer of
radio remote controls



1986

Founding year



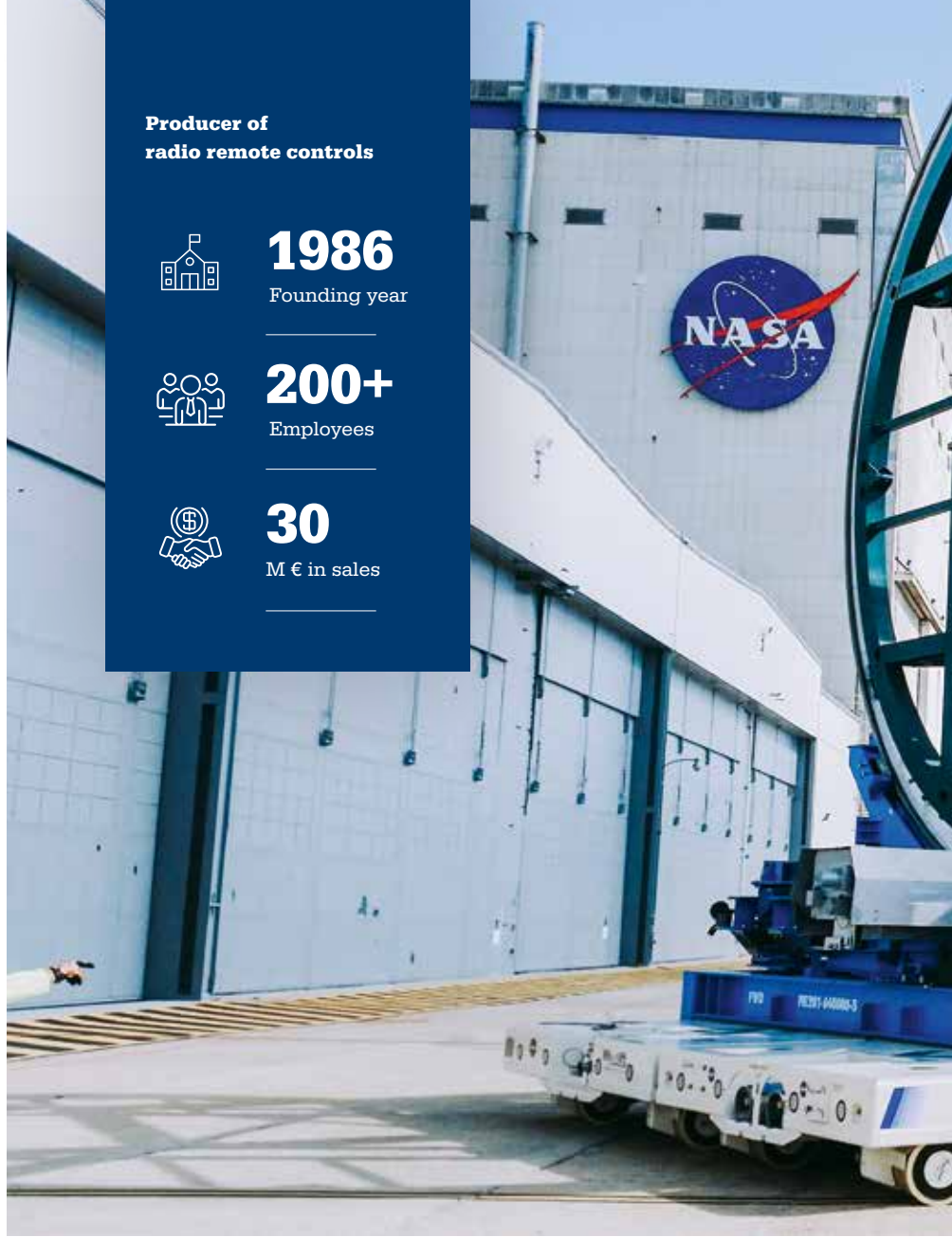
200+

Employees



30

M € in sales



SPECIAL TRANSPORTATION

AGV radio controlled by Autec Dynamic systems

The Italian company AUTECH, based in Caldogno (Vicenza), has gradually strengthened its global market leadership in the technically challenging sector of radio remote controls with safety functions. Since its foundation in 1986, AUTECH, together with the Ministry of Labor and the Ministry of Telecommunications, has been a pioneer in the field of standardization of long-distance radio systems. Specifically, the focus was on defining standards for the safe introduction of the first remote radio systems for mobile or stationary machines and obtaining the necessary approvals. The first Italian law on this topic was passed at the end of the 1980s and was the first of its kind in this field throughout Europe. It defined the technical requirements and specified the use and handling of industrial radio remote controls. "We were the forerunners in a business sector that until then was not subject to any regulatory framework, and we contributed to its recognition and regulation," says Antonio Silvestri, CEO of AUTECH. "Thanks to this innovation, numerous work applications have greatly benefited in terms of safety and productivity through the use of remote control devices."

To this day, the company relies on a dual approach: the pursuit to comply with legal standards and the development of products that are becoming more and more technically advanced.



“With the support of Staufen consultants, we initiated a Lean Transformation. We paid great attention to the optimal management of communication between various functional areas and the different hierarchical levels (...).”

OPERATIONAL MANAGEMENT

"AUTEC," confirms engineer Silvestri, "has always actively participated in defining the sector's legal standards."

The radio remote controls are characterized by a wide range of applications in construction, industry, material handling and intralogistics. The use of these technologies became necessary in the 1980s to more efficiently coordinate the activities of different people and eliminate accidents. "From the very beginning, radio remote controls," Antonio Silvestri points out, "have provided various advantages, both in terms of productivity, since a single device covered all functions that were previously performed by several people, and in terms of safety, as it was possible to work from a less dangerous position. Over the years, radio remote controls have evolved and taken on many new functions: Today, for example, we are working on a very wide range of applications – from simple devices for small tracked vehicles for vegetation pruning to systems for controlling machines for exceptional transports such as NASA's launchers. Our radio remote controls

must be able to move vehicles in risky conditions on land, in the air and in the water, or those carrying dangerous loads or materials such as explosives or highly flammable materials."

AUTEC's success is based on product quality, employee competence, and the services it offers. "One of the aspects we have perfected," explains Antonio Silvestri, "is product development and delivery speed. With the support of Staufen consultants, we initiated a Lean Transformation. We paid great attention to optimizing management of communication between the various functional areas and the different hierarchical levels, giving greater responsibility to all employees. With the help of Shop Floor Management, we changed communication in production. Our short-cycle regular communication allows deviations to be resolved more quickly. Employees are encouraged to constructively solve problems that arise, fostering their sense of responsibility and participation."



Furthermore, AUTECH became active in the area of Lean Product Development (LPD) and was able to optimize the allocation of resources to the various steps of product planning. Shop Floor Management visualizes performance indicators, progress of activities, allocation of resources, priorities, action plans, etc. on display panels. "One of our strengths," emphasizes Antonio Silvestri, "is that we fully plan our products, which allows us to be fully autonomous and to satisfy the exact requirements of customers without having to resort to other tools dedicated to other functionalities. By doing so, we gain full control over the development of various processes: from order receipt and the production of individual components to delivery and after-sales service. We continue to invest in our global facilities to provide customers with immediate solutions and ensure the availability of products and components manufactured in our plant."

Today, in addition to "simple" wireless controls, AUTECH manufactures more complex devices that allow operators not only to control machines remotely, but also to control and monitor everything that happens around the machine. The new generation of radio remote controls, soon to be launched, will provide users with a video control panel that will allow them to evaluate graphics and presentations or monitor cameras connected to the machines in a safe environment.

AUTECH therefore looks to the future with great optimism. "In our sector," says Antonio Silvestri, "technological progress is vital. That is why we are working on both the simultaneous management of multiple signal types and improved integration of radio remote controls into the data processing network, sensor technology and machine diagnostics. Our systems are increasingly developing into complete "cockpits" for overall machine control, offering the advantage compared to stationary devices that optimum and safe remote control is always possible even under the most adverse working conditions. By working with machine manufacturers, we can guarantee ever-increasing levels of productivity and safety." ■



“Employees are encouraged to constructively solve problems that arise, **fostering their sense of responsibility and participation.**”

FOR NEW DIMENSIONS

THE MAXIMUM SLIDING DOOR CERO

Up to 6 m high · barrier free · discreet profile

Glass panels up to 15 m² · optimal thermal insulation

Flexible system design · security standard RC3



CEE REGION BENEFITS FROM SUPPLY CHAIN REORGANIZATION

SUPPLY CHAIN NETWORK MANAGEMENT

The nearshoring debate has gained significant momentum in the wake of the COVID-19 pandemic, as did the blockade of the Suez Canal by the container ship "Ever Given" that lasted for days. The need to reduce CO₂ emissions in global supply chains also drives this discussion. More and more companies are therefore reviewing their supply chains and global production processes, playing out alternative scenarios and planning to increase capacity in Europe. Central and Eastern European countries (CEE) in particular benefit from this.

Staufen AG has been active in Poland, Hungary, the Czech Republic, Slovakia, and Romania for many years, drawing on an experienced team of local and international experts. Alexander Wagner, Head of CEE at Staufen, knows the local conditions: "We help our customers directly on site. Our expertise in this area goes well beyond company-wide operational excellence. We also support our customers in the development of efficient and resilient value chains and digitalization, for example by using process mining technology, establishing smart factories or implementing manufactu-

ring analytics. In general, the need for leadership excellence, organizational development or (predictive) restructuring has risen sharply as a result of ongoing change.

"The expertise of Staufen AG also goes well beyond operational excellence in the CEE region."

ALEXANDER WAGNER
STAUFEN.AG

As Sebastian Metz, Managing Board Member of AHK Romania, describes in an interview with "Staufen Magazine" (see p. 25), Romania, for example, is in an excellent position to benefit from a reorganization of global supply chains in the long term. Árpád Boros, Country Manager Romania at Staufen agrees: "Since the opening of the economy, Romania has been one of the fastest growing economies in Europe and was also able to overcome the COVID-19 crisis without any major upheavals. In recent years, the country has progressively matured from an industrial workbench to an R&D location. More and more companies – especially from the automotive sector – not only have production sites in the country, but they also take advantage of the engineering opportunities." ■



ALEXANDER WAGNER
Head of CEE
STAUFEN.AG



RÓBERT VELENCZEI
Country Manager Hungary
STAUFEN.AG



ÁRPÁD BOROS
Country Manager Romania
STAUFEN.AG



"ROMANIA HAS THE CHANCE OF A LIFETIME"



SUPPLY CHAIN NETWORK MANAGEMENT

SINCE THE OPENING OF THE ECONOMY, ROMANIA HAS BEEN ONE OF THE FASTEST GROWING ECONOMIES IN EUROPE. GIVEN THE NEARSHORING DISCUSSIONS IN THE CONTEXT OF THE COVID-19 PANDEMIC, THE COUNTRY COULD EVEN BECOME MORE IMPORTANT FOR GERMAN INDUSTRY. SEBASTIAN METZ, MANAGING DIRECTOR OF AHK ROMANIA, SPEAKS IN AN INTERVIEW ABOUT LOCATION ADVANTAGES, CHALLENGES AND POTENTIALS FOR COMPANIES.

SEBASTIAN METZ

Executive Member
of the Board of
Management
AHK Romania





Mr. Metz, what particular location advantages does Romania offer?

Romania is firmly anchored in the European Union. The framework for direct investment is in place, and companies also benefit from the large number of well-qualified workers available. This is also due to Romania's long industrial history. One major advantage of the location is, of course, the cost factor: In European comparison, the country is one of the most favorable production locations. This is attracting increased interest from Germany. Major German automotive suppliers such as Bosch, Schaeffler, Continental and Dräxlmaier are represented here, as are numerous smaller, second-tier companies.

Is Romania often seen as a "workbench" or also as a location for more complex tasks?

The area of research and development is becoming increasingly important. The automotive supplier Continental alone employs around 20,000 people here; almost 40 percent are engineers, most of whom perform development tasks. In addition to manufacturing, the tech industry is also gaining in importance: Chip manufacturer Infineon operates a development center here, and Deutsche Bank maintains a technology hub for software.

Romania continues to be burdened with many preconceived notions. What is the situation like for companies locally?

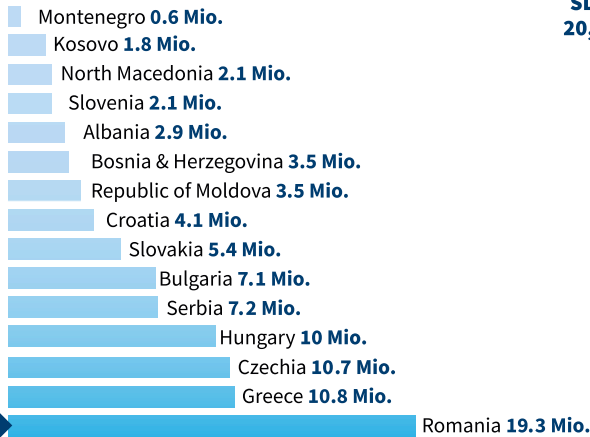
As an EU member, Romania offers investors legal certainty. There are no problems at the macro level. One stigma that still clings to the countryside, but in my opinion is no longer justified, involves corruption. Romania has made enormous progress in this area and is also cited by the EU as a role model in the fight against corruption. Of course, there is still work to be done, but Romania is now considered a role model in Eastern Europe and has achieved important milestones in the fight against corruption. Those who only dwell on old stereotypes miss opportunities and overlook progress.

Are there also disadvantages regarding the location? In which areas does Romania still need to catch up?

Transportation infrastructure remains its Achilles' heel. For the size of the country, the highway network is insufficient. A second disadvantage is administration. While it mostly works well at the local level, central administration urgently needs reform in terms of improved efficiency and professionalism. On a positive note, the government has recognized this shortcoming and is undertaking major reform to modernize the administrative system. It has to do so, because the COVID-19 "Recovery and Resilience" package now

Population and area

19.3 Mio. 238,391 km²



Source: (INS) National Institute for Statistics, AHKS



provides enormous sums for investment: a total of 32 billion euros. This money must be invested quickly and in a targeted manner, not only in infrastructure but also in areas such as education, health and energy.

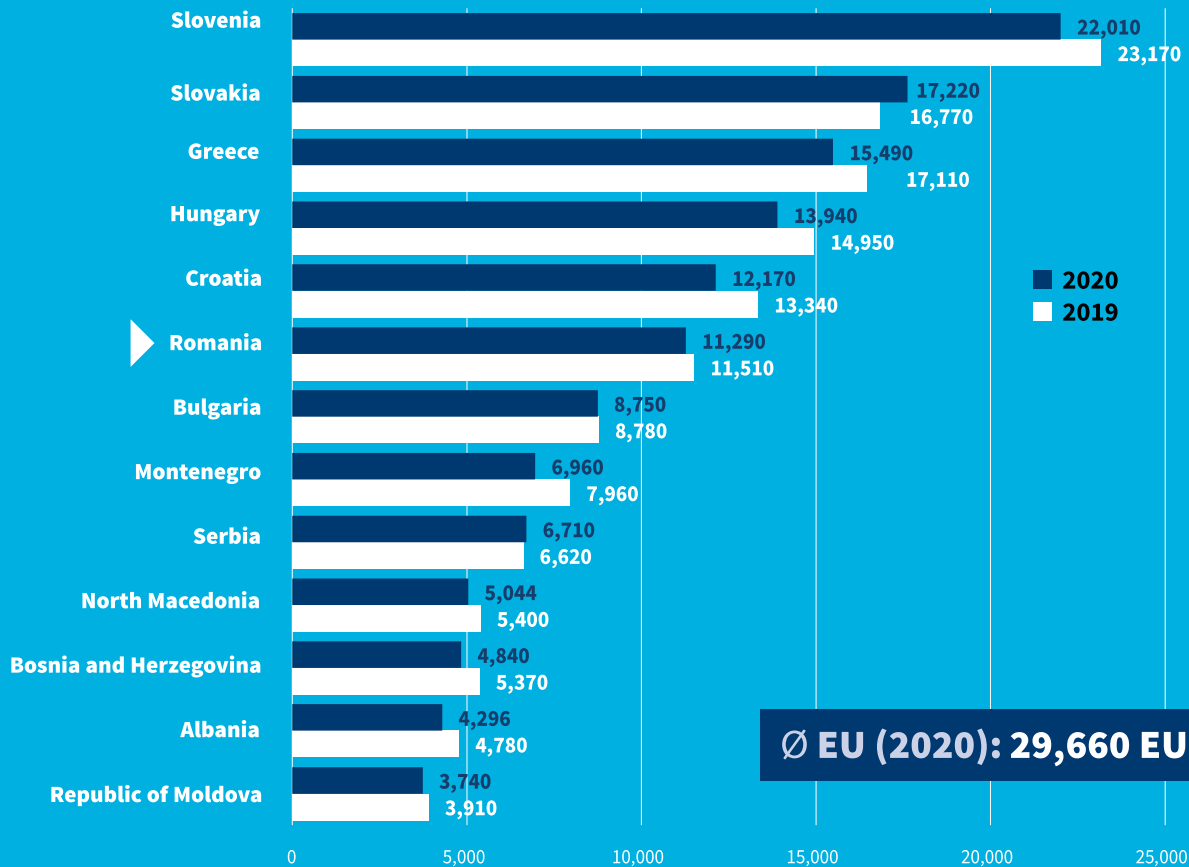
How do you assess Romania's future prospects in the medium term?

The Corona crisis did not hit Romania particularly hard. The country now has the opportunity of a lifetime. Because in addition to the "Recovery and Resilience" stimulus package,

there are still funds from the old financial framework. If these EU funds are now invested properly - and above all quickly - Romania can make enormous progress. We already benefit from relatively stable framework conditions and a good skilled labor market. In combination with reorganizing the supply chain, German companies will increasingly appreciate these advantages. This is because Romania is extremely well positioned, especially with regard to the nearshoring discussions in the wake of the COVID-19 pandemic. For me, therefore, there is only one conclusion: I am very positive about Romania's future. ■

GDP per capita (EUR)

2019: 11,510 € 2020: 11,290 €



SUPPLY CHAIN NETWORK MANAGEMENT

Source: Eurostat, Statista, AHKs

AHK Romania regularly produces comprehensive brochures with important economic key figures and information about Romania. You can download the latest location brochure "Romania. Economic development" here: <https://www.ahkrumaenien.ro/infothek>

Read the whole interview here: www.en.staufen.ag/romania



STAUFEN BestPractice NETWORK

LEARNING FROM AND WITH THE BEST



JANICE KÖSER
Manager Academy
STAUFEN.AG



WERNER LAUB
Partner
STAUFEN.AG

THROUGH OUR INTERNATIONAL PARTNER NETWORK, CUSTOMERS WORLDWIDE CAN EXPERIENCE "BESTPRACTICE LIVE" WITHIN THE FRAMEWORK OF PLANT VISITS AND SEMINARS. AND THE HOST PARTNERS, WHO HAVE ALL ALREADY ACHIEVED A TOP-LEVEL IN THEIR LEAN TRANSFORMATION, ALSO BENEFIT: THE CLOSE EXCHANGE WITH OTHER COMPANIES HELPS THEM KEEP MOTIVATION HIGH AND DEVELOP THEMSELVES FURTHER

The circle of companies that have initiated exemplary improvement processes within their organization and share the knowledge they have gained with other companies is growing. One of our latest network partners, the world market leader for folding glass walls Solarlux (see page 30), has also successfully established Lean Management and is now helping to make the effectiveness of this transformation transparent to external parties.

This kind of BestPractice partnership has an internal and external effect: The company improves continuously, has motivated and proud employees, becomes more appealing as an employer, and the newfound excellence, which is actively communicated to the outside world, also radiates to business partners.

The BestPractice principle is as simple as it is ingenious: Staufen AG enables companies undergoing a holistic transformation process to take a sneak peek behind the scenes of a similar BestPractice partner. There, they can explore certain areas of the company and

experience the company philosophy first-hand. We actively promote exchanges between visitors and hosts so that both sides can learn from and with one another.

In addition, companies in our network offer seminars. With pioneers in specialist areas such as logistics, manufacturing or assembly, customers can undergo very specific training directly on site with the support of our consultants. BestPractice at Staufen is therefore not just a seal of approval but is actively put into practice through partnership that helps you move forward. ■



FABIO ARAI
Continuous Improvement Supervisor
AGCO, Brazil

“The BestPractice Partner network provides an open channel with different companies, industries and activities, with a multitude of knowledge, forming a positive network of support and mutual growth. **Being able to exchange ideas with international partners in the process exponentially multiplies access to the experiences of other professionals.**”

INSIDE



ESTHER SMART
Head of Lean Enterprise
RECARO Aircraft Seating
GmbH & Co. KG, Germany

“I remember the first time I visited a BestPractice Partner very well. I was impressed by how tangible and hands-on the abstract topic of Shop Floor Management became. Today, when we host BestPractice ourselves, the opportunity to present our own knowledge to external visitors is a great motivating factor for our employees every time.”

Learn more about our BestPractice Network on:
www.en.staufen.ag/bestpractice-live



BEST PRACTICE PARTNER SOLARLUX

"IT'S A PATH WORTH TAKING."

THE STAUFEN AG BEST PRACTICE NETWORK CONSISTS OF EXCELLENT COMPANIES THAT PLAY A LEADING ROLE IN THEIR MARKETS. SOLARLUX GMBH, ALSO THE WORLD MARKET LEADER FOR FOLDING GLASS WALLS, BECAME A BEST PRACTICE PARTNER OF STAUFEN AG THIS YEAR. TO-

GETHER WITH HIS TEAM, MANAGING PARTNER STEFAN HOLTGREIFE HAS INITIATED A COMPANY-WIDE TRANSFORMATION PROCESS THAT IS ALREADY IMPACTING MANY AREAS. NOT ONLY HAVE KEY FIGURES IMPROVED, BUT A NEW CORPORATE CULTURE HAS BEEN ESTABLISHED.



When Solarlux has visits from other companies, the day usually starts at 8:30 a.m. directly on the shop floor. "Our production manager explains to participants in a practice-oriented manner the path we followed during this transformation," reports Raphael Placke, Head of Process and Quality Management at Solarlux and one of the minds behind the topic of Lean Management in the company.

The Lean Transformation, which began about five years ago with the support of Staufen AG, has been so successful so far that the company in Melle, Lower Saxony, was accepted into the BestPractice Network. This is where companies can exchange with each other. Staufen customers can experience "BestPractice live" during visits

to Solarlux. "We primarily report on the success factors of Lean Transformation, but we don't focus so much on individual tools; instead, we show the path towards holistic change," says Lean expert Placke.

The participants of a BestPractice Visit learn about the positive effects achieved in terms of quality, productivity, process optimization and adherence to delivery dates. "Some people immediately recognize a methodology that they want to apply themselves, while others are initially excited about how openly we communicate," Placke says. This always reflects the corporate culture that has been in place at Solarlux for many years: "Because during a BestPractice Visit, we also talk about the difficulties we had to overcome. That's always very well received."

"It's important to not only voice what's going well, but also what's not going well."

STEFAN HOLTGREIFE
SOLARLUX GmbH



STEFAN HOLTGREIFE
Managing Shareholder
SOLARLUX GmbH



RAPHAEL PLACKE
Area Manager Process and
Quality Management
SOLARLUX GmbH

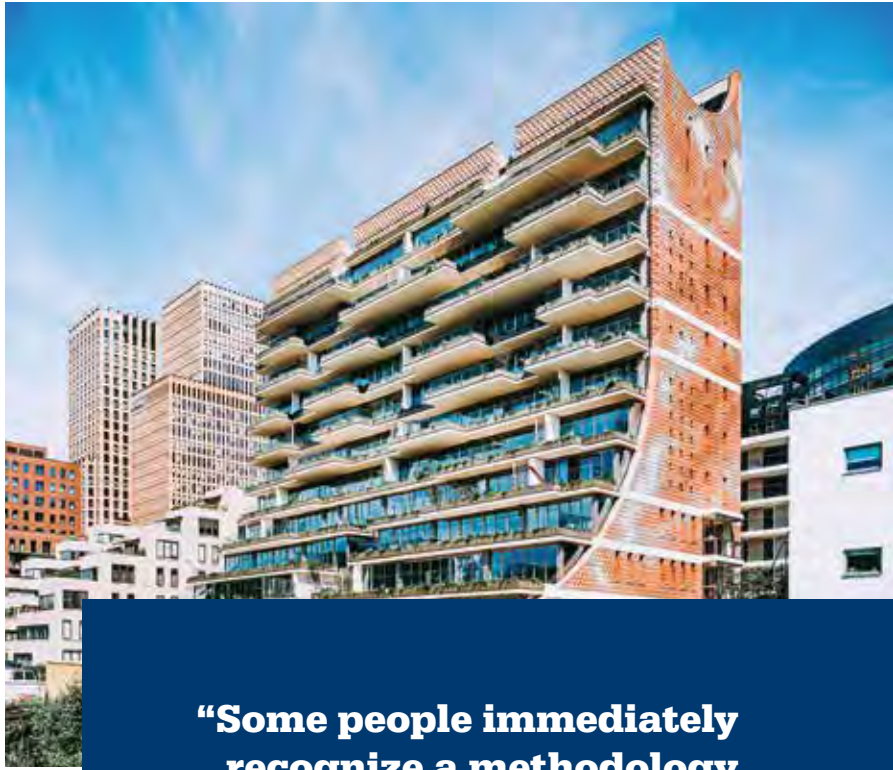
This transparency is one of the secrets of Solarlux's success, in addition to its sought-after products – each order is manufactured individually for customers with a lot size of 1. "As the person ultimately responsible, I am actively committed to an open corporate culture and working with each other in a meaningful and appreciative manner," says Managing Partner Stefan Holtgreife. "It's important to not only voice what's going well, but also what's not going well."





In addition, everything should be allowed to be said, regardless of hierarchical level, and every professional group should be given the same appreciation. "Of course, you sometimes receive unpleasant criticism, but you have to put up with that," Holtgreife is convinced. "The bottom line is that it makes us much more agile and we're continually improving. It's a path worth taking."

The results of Lean Transformation at Solarlux quickly became most visible in manufacturing, where transparency was the greatest beforehand. "It was important to us to transfer the idea of lean to indirect areas as well, such as administration. Here, too, the effects were quickly noticeable," reports Solarlux Manager Holtgreife. He notes the handling of the COVID-19 pandemic as a positive example: "Particularly in technical design, many employees had to start working from home. Thanks to the lean methods that were already introduced, regular communication was also ensured online. Key figures, deviations and activities were visualized and discussed. This transparency was seen as an advantage by both employees and managers. Because when critical problems arose, we could act quickly and in a solution-oriented manner."



"Some people immediately recognize a methodology that they want to apply themselves, while others are initially excited about how openly we communicate."

RAPHAEL PLACKE
SOLARLUX GmbH

OPERATIONAL MANAGEMENT





OPERATIONAL MANAGEMENT

**World market leader
for folding glass walls**



1983

Founding year



150

M €
in sales



1,000+

Employees



60

Countries

Lean Management at Solarlux not only ensures quality and efficiency improvements, but also greater motivation and a sense of responsibility among employees. "If employees notice a positive development, it drives them even more," Holtgreife observed, "and that brings about incredible effects."

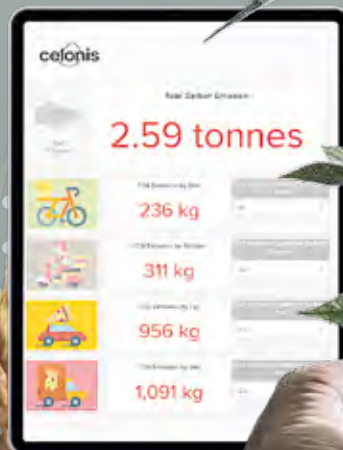
Solarlux is now happy to pass on this experience to other companies. However, it is not only the visitors who benefit from the BestPractice exchange. Managing Director Holtgreife knows:

"With every visit, a mirror is held up to our company and we receive valuable feedback from outsiders as to where and how we can improve. Through this interaction we set new stimuli and raise our awareness with all participants. After all, without the will to keep learning even after reaching a certain maturity level, inertia may set in." ■



RESOLVING THE GOAL CONFLICT BETWEEN ECONOMY AND ECOLOGY

PROCESS MINING INVOLVES PROSPECTING WITHIN DATA STREAMS OF COMPANY NETWORKS. THE GOAL IS TO EXPLOIT UNUSED POTENTIAL OR TO PREVENT WASTE. THE SOFTWARE COMPANY CELONIS ALSO USES THIS METHOD TO BRING THE TOPIC OF SUSTAINABILITY TO ANOTHER LEVEL. WITH ITS EXECUTION MANAGEMENT SYSTEM (EMS), GERMANY'S ONLY DEACORN HAS DEVELOPED "AN X-RAY MACHINE FOR COMPANIES," ONE THAT IDENTIFIES PROBLEMS, AND THANKS TO AI, ALSO CREATES PROPOSED SOLUTIONS AND RECOMMENDATIONS FOR ACTION.





ALEXANDER RINKE
 Founder and Co-CEO
 Celonis



Sustainability is becoming ever more important to companies. But how can this significance be determined and also communicated truthfully? In order to get a precise overview, numerous KPIs have to be collected and evaluated. These KPIs include the areas economy, social, and ecology.

The KPIs most needed are already saved in the companies' IT systems, but they are not linked in a way that makes sense. This is where Celonis' EMS begins: it creates the appropriate data references and contextualizes the data. By tracing and analyzing the digital tracks in the IT systems, the EMS can then map the processes.

Take the example of a purchasing system: for a purchase order, the whole process is traced and a process graphic created from the audit logs. This makes it clear who purchased what when and why – and who processed the order further after that. Depending on the case, more than just the classic economic factors are examined. On request, sustainability factors can also be filtered out: risk mapping, emissions, social standards, etc. Once all the data is pulled together, the sustainability of the supply chain can be determined.

Data evaluation is easier for companies with a high degree of digital maturity. For the more information that has to be combined manually or combined from different sources, the more difficult this task is.

“Humanity has made great progress. Now we have to ensure that this progress is sustainable and that society can survive in the long run. **Three core problems are threatening our world: first, we're destroying our planet; second, social unrest is lurking; third, more has to be invested in education. These challenges inspire us.** The whole team is working, for "Earth is our Future." With Celonis, we can use our platform to encourage and support a more sustainable model for society. **We can make a contribution to solving the greatest challenge of humanity.**”



MAKING THE SUPPLY CHAIN MORE EFFICIENT AND SUSTAINABLE

Celonis' EMS uses the existing data and can map the production process digitally. Inefficient or non-sustainable factors can therefore be identified, and improvement measures initiated as quickly as possible. Even the smallest deviations from the planned process are detected early.

In contrast to classic transaction systems, Celonis links the processes and offers a complete view, from raw materials to logistics, and production to delivery. On request, the EMS also provides intelligent recommendations for action; that is, it offers helpful solutions. For example, it can notify a supplier independently and proactively and make recommendations so that the supply chain will be more efficient and sustainable.

The EMS offers a uniform user interface across the entire system environment. Frequently, several legacy systems are used in purchasing, something that confuses users. Instead of jumping between different applications, the Celonis EMS accesses the data stored in different systems and enables the use of this data by a single program.

For the companies, sustainability is becoming more important because customers and investors are increasingly making their purchasing and investment decisions dependent on sustainability aspects. Social issues and environmental aspects reflect the whole spectrum of sustainability; currently the focus is on the reduction of CO₂. However the more complex the production and the subsequent supply chain are, the more difficult the calculation of CO₂ emissions becomes.

DIGITALIZATION AND INDUSTRY X.0



JANINA NAKLADAL
Global Director of Sustainability
Celonis

“Companies have defined clear sustainability goals. Economic and ecological factors therefore do not need to be conflicting. If we focus on reducing waste and handling resources conscientiously, then we accommodate the basic sustainability concept, and at the same time, we achieve cost reductions and increased efficiency. **With the Celonis EMS, we help make successes more measurable and visible.”**



FINJA BUTTERON
Ecosystem Sustainability Lead
Celonis

“In many cases, the individual economic decision is also the more sustainable variant. This is clear when it comes to avoiding waste and ideal transport routes. In many cases, though, the benefit is only visible if the entire process chain is illuminated, because CO₂ certificates are spared, for example. Sustainability may not be reduced to ecological aspects alone. **The social questions also have to be clarified, such as diversity and governance.”**

CELONIS IS WORKING WITH GLOBAL COMPANIES TO PRIORITIZE SUSTAINABILITY IN EVERY STEP OF EVERY PROCESS **SO THAT THEY CAN MEASURE, KNOW, AND ACT TO BE MORE EQUITABLE, ACCOUNTABLE, AND SUCCESSFUL.**



ACHIEVE SUSTAINABILITY GOALS TOGETHER WITH THE CUSTOMER

A supply chain set up according to sustainability criteria is challenging in other ways beyond emissions. Together with the suppliers, a decision is needed on how the sustainability goals can be achieved and how much transparency is required for this. Too much control can overtax sensitive company relationships. That's why it's important to encourage a trusting and supportive relationship, so that other goals, such as diversity, can be achieved as well.

Lacking standards or unclear definition of required KPIs can make work more difficult and put the brakes on companies' motivation. The possible consequence of this is that sustainability is anchored in the strategy but is neglected in operative daily business. And this is precisely what has to be prevented. For generally the entrepreneurial focus on sustainability also has a positive economic effect.

If aspects such as customer or employee satisfaction are incorporated into the business strategy and a conscious handling of resources is implemented, this not only accommodates the sustainability concept, it can also result in cost reductions and efficiency increases. What possibilities arise only become clear if the whole process chain can be analyzed. With its software, Celonis aims to show that the goals of economic and ecological factors do not need to be conflicting.



OUR VISION

At Celonis we see the Earth as our common stakeholder. We believe processes have a unique potential to cut waste and inefficiencies, and mitigate risks to give back time, money and effort to the Earth and society. Celonis is working with its community of global business leaders to manage the sustainable execution needed to advance their most ambitious Environmental, Social & Governance (ESG) goals. By prioritizing sustainability in every step of every process, companies can measure, know, and act to be

more equitable, accountable, and successful. Earth is our Future is a Celonis core value. This means not only minimizing our ecological footprint, but committing to a more equitable society. We do this by building a diverse team of innovators and offering free access to education, training and our product to foster the next generation of leaders with world changing ideas. We're activating, motivating, and building a company and an ecosystem that shares this vision.

CELONIS + STAUFEN

This year, the software company Celonis has become a close cooperation partner of Staufen AG. Frank Krüger, Senior Partner at Staufen, believes that this symbiotic cooperation is forward-looking. "Thanks to the use of our consulting expertise, combined with the technologies of the market leader Celonis, we are now in a position to formulate solutions to problems more quickly and control processes proactively. We are using the Celonis technologies in the analysis and we implement the solutions for our customers to achieve sustainable process improvement." ■





GEMBA MEETS SAMBA 20 YEARS OF EXPERIENCE IN BRAZIL



OUR BRAZILIAN SUBSIDIARY STAUFEN TAKTICA, NOW KNOWN AS STAUFEN BRAZIL, WAS FOUNDED 20 YEARS AGO. WE SPOKE WITH DARIO SPINOLA, GENERAL MANAGER OF STAUFEN BRAZIL, ABOUT THE MAIN CHALLENGES OVER THIS PAST 20 YEARS AND THE UPCOMING PLANS FOR THE NEAR FUTURE.

Dario Spinola, what was the market like in Brazil 20 years ago?

20 years ago, the market was booming after a recession, and many international companies were investing in Brazil. My partner Paulo Lima and I believed that many companies needed to establish the right processes. The topic of Lean was also new. It was associated more with the application of Japanese principles and methods to production sites.

What about today?

There is still a lot of potential, for the most part in the automotive or machinery sector, which is promising for the years to come. Yet, the main issue will be: what can we do to efficiently grow? Currently, the agro and food industry are very strong, given that Brazil is a large country. Consumer goods in particular are being grown to keep up with the global demand. Brazil is a very rich country in terms of commodities. We have many mining reserves, especially for ores: steel and iron.

Where do you see the greatest potential for optimization in Brazil?

As Brazil is a very large country – we have land equivalent to ten times or more than Germany – the greatest potential can be found in transportation and logistics, i.e. on how products can be moved around. In many companies, logistics account for around 8 to 12 percent of the total cost of a product. Transport is an expensive waste.

Looking towards the future, what are your expectations for Brazil over the coming years?

As is the case everywhere in the world, companies in Brazil are pursuing digitalization. I expect greater adoption of collaborative tools, how we use data science, process mining, automation, mobile devices. As transformation consultants, we believe that it is important to create stability first, no matter what kind of process you are working with. Remove waste, standardize the process and then you can add digitalization to that. ■



DÁRIO SPINOLA
Managing Director
STAUFEN.Táctica

LISTEN IN:

Podcast with
Dário Spinola
[www.en.staufen.ag/
podcast-brazil](http://www.en.staufen.ag/podcast-brazil)





NO TRANSFORMATION WITHOUT QUALIFICATION



DB FERNVERKEHR WANTED TO ENSURE THE QUALITY OF ITS OWN LEAN TRANSFORMATION AND MAKE IT SUCCESSFUL IN THE LONG TERM. THIS IS ACHIEVED THROUGH BROAD QUALIFICATION OF LEAN EXPERTS AND TRAINERS AS WELL AS TARGET-ORIENTED TRAINING OF MANAGERS. TO THIS END, DB FERNVERKEHR LAUNCHED A PROJECT CALLED "LEAN ABC - APPLICATION, TRAINING, COACHING" - TOGETHER WITH STAUFEN AG.



DB Fernverkehr AG –

a subsidiary of Deutsche Bahn. It is responsible for long-distance rail traffic and operates ICE, IC, ECE and EC train types nationally and throughout Europe.



Every day

1,300

Trains
in service



18,000+

Employees



5

B €*
in sales

* Reference: O1 2020



01 INITIAL SITUATION

In 2016, DB Fernverkehr initiated a corporate program in the Production division to achieve operational excellence (OPEX) with the aim of enhancing the quality and efficiency of operational and administrative business processes. In essence, various external consultants carried out transformation projects together with internal resources. In some cases, remarkable results were achieved. At the same time, there was a growing realization that there was insufficient evidence to support the effectiveness of the results across the board and in the long term.

So, management of DB Fernverkehr AG decided to develop a long-term, implementation-oriented qualification concept. Staufen AG was selected as a partner for this, primarily due to its vast expertise in Lean Management/OPEX as well as in the design and implementation of customized in-house training programs. Together, they initiated the "Lean ABC – Application, Training, Coaching" program.

A TRAINING CONCEPT FOCUSING ON "HELPING PEOPLE TO HELP THEMSELVES"

The 1st phase focused on qualifying up to 100 managers – 50 lean multipliers, 30 lean experts and 20 lean trainers. The project had three main goals:

- To create a common understanding of Lean/OPEX as well as a standard valid for DB Fernverkehr. And this across all hierarchies, functions and departments.
- Based on a triad of qualification, implementation of what was learned between the training blocks and needs-oriented coaching, managers and improvement experts were to be trained and prepared to ensure effective implementation of OPEX in day-to-day business.
- Experienced lean experts from DB Fernverkehr were to be enabled as part of the project to then later train and pass on Lean ABC on their own.

02 APPROACH

In a joint target picture and concept workshop, learning objectives, didactic concept and initial training modules were defined and Lean ABC was aligned with DB Fernverkehr's strategy and production system.

Once scripts, agendas, and training materials were finalized, each training module was piloted. Feedback from the pilot groups, which consisted of real participants and representatives from HR and OPEX, was gathered and incorporated accordingly.

In the subsequent roll-out, training courses were held in several maintenance plants nationwide. Involving the plants was important because practical or group exercises on the shop floor were integrated into each training module. The leadership training was designed as a mix across the entire leadership cascade as well as across sites and departments. The level of prior lean knowledge varied greatly, from "my first lean training" to "been on my personal lean journey for 15 years." While such heterogeneous groups of participants are highly challenging from a teaching perspective, it was very important to the DB Fernverkehr management team to bring together a diverse group of people with different daily challenges to create a shared learning and exchange experience.

Deutsche Bahn AG in figures*



4.8 B

Travelers
per year



98 B

Passenger-km
traffic performance
per year



232 M t

Transported
freight per year

*Source: Deutsche Bahn, Integrierter Bericht 2020, Statistics for 2019



Lean ABC was designed as a "learning journey" with various learning formats to ensure that what was learned is transferred into everyday business in the best possible manner:

A

APPLICATION

Application of what has been learned in day-to-day operations, consolidation of knowledge and of new skills and abilities.

B

TRAINING

(B = Befähigung/German term for training)

Qualification of participants during the training courses (3 modules for managers/1-3 modules for employees trained as lean multipliers/experts/trainers).

C

COACHING

Selective coaching of managers between trainings to work through specific challenges and for joint reflection. Feedback is enormously important, especially for establishing new behaviors, since "old routines" become ingrained over years or even decades.



"With its expertise in custom design and implementation of training programs for lean experts and managers, Staufen has completely convinced us.

This allowed us to transport the shop floor to the training room, and to simulate and optimize processes in a practical manner."



MATTHIAS GRAMER

COO DB Konzern
Deutsche Bahn AG





Read the entire interview with Matthias Gramer, COO DB Konzern, Deutsche Bahn AG:



EFFECTIVE TRAINING WITH HIGH PRACTICAL FOCUS

To increase the practical relevance, the training courses were held on site at various maintenance plants. As a result, it was possible to work on real processes in practical and group exercises and directly solve "real" problems.

Directly putting theory into practice significantly increases teaching performance as well as the learning quality and result. In order to achieve this in the training room as well, Staufen relies, among other things, on simulations to "experience and grasp specific content and facts in a playful manner."

SIMULATION OF ICE MAINTENANCE

For this, the project team developed custom training materials and a completely new simulation that depicts the customer-specific maintenance process in the production cycle.

The ICE simulation was made available to all training sites. The full-scale model with a removable roof, complete interior and selected vehicle components was used to demonstrate the processes involved in maintenance and simulate important maintenance steps. The goal was to identify disruptions and inefficiencies. In a subsequent feedback discussion, participants were able to reflect on processes and consider improvements, which they implemented in the follow-up rounds.

03 RESULTS

- A common lean understanding and a common "lean language" were established through Lean ABC.
- Furthermore, the program helped change the mindset and behavior in the organization in addition to the targeted development of know-how and do-how. Uncertainty and resistance were widely reduced. In addition, managers were trained to establish a culture of change and learning in their own areas of responsibility.
- Since the launch of Lean ABC, around 400 managers and more than 2,000 employees from lean/ OPEX transformation projects have been trained at DB Fernverkehr. After initial training sessions conducted by Staufen consultants, further training series were held internally by the approximately 40 newly trained lean trainers. In doing so, sustainability was ensured and the continuous improvement process was driven forward within the company.
- Maintenance processes were also sustainably optimized and the OPEX implementation quality significantly increased.
- Lean ABC has now established itself as a Group standard at Deutsche Bahn and is also successfully being used in other business areas (adapted to specific framework conditions and requirements). ■

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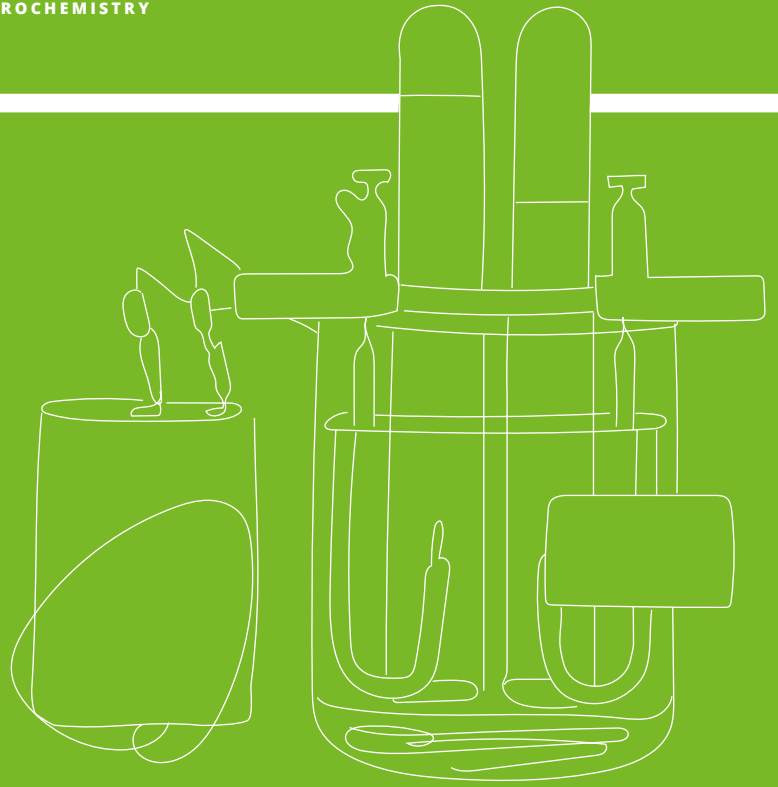
A competitive edge through innovation in production and logistics.

MAXOLUTION® System Solutions from SEW-EURODRIVE for end-to-end factory automation turn your vision of a smart factory into reality. In recent years, we have been able to gain extensive experience in our own factories and are already supporting numerous customers on their way to their own flexible factory of the future.

Just contact us – our intelligent factory automation solutions and our Smart Services will get you and your production ready for Industry 4.0.



THE ENERGY OF THE FUTURE IS ELECTROCHEMISTRY



MILAN-BASED DE NORA INDUSTRIES IS A GLOBAL SUPPLIER OF SUSTAINABLE TECHNOLOGIES AND HAS BEEN A PREFERRED PARTNER IN SOME OF THE MOST IMPORTANT ELECTROCHEMICAL AND INDUSTRIAL PROCESSES SINCE 1923. DRIVEN BY A PHILOSOPHY OF CONTINUOUS IMPROVEMENT, DE NORA MARKETS HIGHLY INNOVATIVE ELECTRODES, ELECTROCHEMICAL SYSTEMS AND ADVANCED FILTERING AND DISINFECTANT TECHNOLOGIES TO RESOLVE ISSUES RELATED TO THE TREATMENT OF PUBLIC WATER/MUNICIPAL, MARINE AND INDUSTRIAL WASTE.

WE MET WITH CHIEF OPERATIONS OFFICER ALBERTO COMINELLI.

01

How would you summarize your “core business” in layman’s terms?

Our corporate activity is focused on two fronts: the production of electrodes for electrochemistry and the construction of water treatment plants. With regard to the former, I'd start with the fact that there are certain natural chemical reactions that are activated as a result of the supply of electrochemical energy. We construct the electrodes which are used, at an industrial level, to provide the energy that is capable of triggering chemical processes. One example of the application of electrochemistry is the refining of metals, such as copper and zinc, which are normally present in minerals. Another electrochemical process that has been spoken of lately of is water electrolysis, which is used to separate oxygen from hydrogen in order for the latter to become “green” energy.

02

Who are your main clients and target markets?

For the chloride/sodium part, which represents 50% of our business, our clients are the world's leading chemical corporations, who use reactions that start with chloride to create elements which are at the base of almost every product. Furthermore, our electrodes are used to create circuits for computers and cell phones, or to produce copper sheets. Another sector that we are active in is swimming pools, especially in the US. In this case, electrodes are used to produce sodium hypochlorite, which is useful for disinfecting water.



03

In terms of Corporate Social Responsibility (CSR), how have you managed to marry innovation in chemistry with a vision aimed at minimizing environmental impact?

Our research is constantly focused on optimizing the energy resources that are necessary to produce these electrochemical transformations. The development projects that we are working on are all heading in the direction of the use of clean energy (fuel cells or hydrogen).

04

Yours is a “family company” that originated from the brilliant intuition of Oronzio De Nora, but over the years it has grown to become an international leader in many markets. What was the pivotal moment that brought about this change in approach?

The quantum leap for the company occurred when Oronzio De Nora decided to acquire the patent for DSA, dimensionally stable anodes. In practice, the positive part of the electrode, which previously was graphite and therefore subject to wear, became titanium, a material that does not wear. At the end of their life, the electrodes regenerate and go on working. Another significant watershed moment was the 2010 acquisition of two Japanese companies, an operation which took our sales volume from €150 M to €400 M, and the number of employees from 900 to 1600. A few years later we also embraced the water business, which resulted in a further increase in sales by €100 M, definitively moving the company into a more multinational rather than local dimension.

05

What were the next steps in this ongoing evolution?

With the growth of the business, we had to constantly refine corporate governance, and the main tool that we entrusted this to was SAP (Systems Applications and Products in Data Processing), which we gradually introduced into all fields. At the same time, we are continuing a significant transformation in “supply chain” management aimed at improving performance, both in terms of efficacy, reducing delivery times, and efficiency, by optimizing the products in the warehouses: a total reorganization of order fulfilment process, from its arrival to the company until the product is shipped to the client. For the manufacturing part, on the other hand, thanks to Staufen Consulting, we are pursuing “Lean Transformation” measures in all of our manufacturing sites which, thanks to a gradual, but radical, change in approach, are aimed at achieving improved results and productivity. The processes applied, from the “water” area to the “front end”, to the “quotation” part, relating to the drafting of tenders, will be shortly be extended worldwide with the objective of achieving efficiency at a global level.

OPERATIONAL MANAGEMENT



19

Offices worldwide



12

Production plants



3

R&D centers in Italy, U.S.A. & Japan



500

M € in sales



1,600

Employees

“The development projects that we are working on **are all heading in the direction of utilizing clean energy (fuel cells or hydrogen).**”



ING. ALBERTO COMINELLI
Chief Operations Officer
Industrie De Nora S.p.A.



06

Your products have a very high technological content. How do you manage the processes linked to innovation?

Innovation, on the one hand, and research and development, on the other, are two very distinct aspects on which De Nora has invested a lot of resources. There are two pillars that we have based our efforts on to increase our capacity for innovation: for one, internally, we are trying to locate and grow talented people who master the necessary, also pioneering, skills and technology. To date we have identified around fifty innovation champions in the group's various sites, with the objective of facilitating the generation and harvesting of ideas. Plus, externally, we are focused on open innovation, or innovation generated by operating beneficial relationships with a network of parties outside of De Nora, such as universities, research centers, competence centers, startups, etc., with specific and diversified knowledge who, together, allow us to develop new ideas, new products, and new technologies. A widespread organization open to both external and internal stimuli, enabling us to be the leaders in the sector and which, in recent years alone, allowed us to achieve savings of several million euros on the pipeline.

07

Remaining on the topic of innovation, what fields are you currently concentrating your work on?

At the moment, if we look at the Research and Development sector, we are focused on several objectives: improving the efficiency of "fuel cells", as well as perfecting the extraction of hydrogen from water and "CO₂ sequestration". As far as internal innovation is concerned, on the other hand, we are working towards the digitalization of processes, but also consistently improving the "customer experience" and health and safety in the workplace.



“For the manufacturing part, thanks to Staufen Consulting, we are pursuing “Lean Transformation” measures in all of our manufacturing sites which, **thanks to a gradual, but radical, change in approach, are aimed at achieving improved results and productivity.**”

OPERATIONAL MANAGEMENT

08

How has the pandemic affected the company?

The emergence of COVID-19 has not led to any losses for us. On the contrary, we have continued to work at the same rate. At this time, we have learned some valuable lessons: we have used “smart working”, held remote meetings, sometimes with other international teams, demonstrating that we can redesign even critical and important processes remotely, as we have often done with our partners at Staufen. We have also learned how to be an increasingly united and cohesive team, with a group of managers who often meet online to discuss how to proceed, without the need to necessarily be on site. Years ago, before COVID, this would have been difficult to imagine.

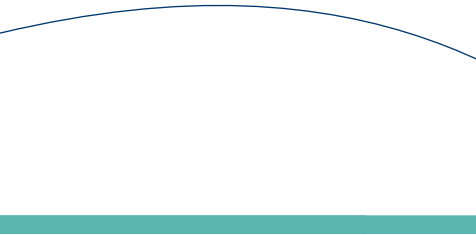
09

What professional successes are you most proud of?

I started in Research and Development, while I was involved in Operations for the last two years. In my former role, I contributed to the creation of a multinational research organization capable of producing two/three new products per year. In the Operations division, a nice climate of trust was created, which was satisfying. Also, the Hoshin Kanri process that we developed with Staufen is going very well, in spite of the complexity of applying a new method of strategic planning in all plants. We have succeeded in creating a professional community that is working well, demonstrating flexibility and receptiveness, in order to aim for excellence. ■



"FOOD CHAIN³"



TOYOTA AS A ROLE MODEL FOR THE FOOD SECTOR

THE FOOD SECTOR CAN ONLY MEET FUTURE DEMANDS BY FUNDAMENTALLY CHANGING PRODUCTION AND MINDSET.

The practice of transporting food as a cheap bulk commodity in truck convoys thousands of kilometers is subject to increased scrutiny. This is because customer demand for locally produced, yet affordable goods is continually growing. A fundamental change in the food industry is necessary to meet the goal of better, albeit inexpensive products. This can only succeed if the disjointed value streams ("global sourcing") are integrated – making them less prone to disruption and the overall "farm to fork process" leaner.

The example of Toyota as the "inventor" of Lean Management shows that this can be achieved. Accordingly, for modern collaboration to serve customers, the relationship between growers, producers and retailers must change from one of power to one of partnership: Food Chain³. All processes from raw material generation to production to trade must form a value stream for each variant family and work as closely as possible alongside of customers. Process chains must remain short and are highly integrated. Interfaces are to be avoided if

possible. This is because the freedom from disturbances must be guaranteed in the value streams in order to produce sustainably and prevent waste.

Is this just an ideal state? Not at all! Initial examples show that companies have started to rethink their approach: Rügenwalder Mühle, for example, relies on soy from Germany; Kühne advises farmers on the selection of seeds and accompanies their work in the field; Aldi Süd is working with regional bakeries. Positive approaches, but the courage to implement "Lean Thinking" across the board – has yet to come. ■

“Is this just an ideal state? Not at all! Initial examples show that companies have started to rethink.”

AXEL DAVILA LAGE
Principal
Food & Beverage
STAUFGEN.AG



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Trend and Future Researcher
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Principal / Industry Manager for Food & Beverage
STAUFEN.AG

SHORT PATHS IN THE FOOD SECTOR: SOMETHING HAS TO CHANGE

FH | JOANNEUM
University of Applied Sciences

 **Fraunhofer**
ISI

NEW EATING HABITS, FOOD WASTE, RISING CO₂ EMISSIONS, INTERNATIONAL TRADE AND HIGHER COMMODITY PRICES MEAN THAT THE FOOD SECTOR NEEDS TO CHANGE COURSE. BUT WHERE IS THIS DEVELOPMENT HEADING? DR. BJÖRN P. MOLLER FROM THE FRAUNHOFER INSTITUTE FOR SYSTEMS AND INNOVATION RESEARCH ISI, DR. SIMON BERNER, PROFESSOR AT THE FH JOANNEUM IN GRAZ, AND AXEL DAVILA LAGE, INDUSTRY MANAGER FOR FOOD & BEVERAGE STAUFEN AG, SAT DOWN AT A VIRTUAL ROUND TABLE TO DISCUSS ...



1 kg of beans from Kenya

CO₂ emissions:

5841 g

1 kg of beans from Germany

CO₂ emissions:

113 g*



“But as a consumer, you naturally wonder **why products that grow on your doorstep are transported 5,000 km around the world.**”

DR. BJÖRN MOLLER
Fraunhofer ISI

... sustainable future scenarios

As part of the EU-funded Fox project, the Fraunhofer Institute for Systems and Innovation Research ISI in Karlsruhe has published "Three Scenarios for Europe's Food Sector in 2035." What will the future of the food sector look like after that?

Moller: Based on trends that will continue to grow, we have come up with three different pictures of the future. They differ in who is driving the change toward greater sustainability. In the first scenario, it is politics. It provides regulations that are accepted by all. In the second scenario, society drives development with its motivation for a healthy, green lifestyle. In the third scenario, it is production and trade. Agricultural production is economic and successful, data is exchanged between those involved, with retailers having data power and control the food sector. The truth will probably lie somewhere between these scenarios.

... shorter food chains

How important will decentralized production and shorter transport routes be in the food sector in the future?

Berner: The food system as it exists today will eventually reach its limits. Shortened food chains will provide resilience and can bring economic benefits to those involved. But the trend toward more regionality develops differently from country to country. In Austria, regional food was more important than organic in previous years because customers demanded regional products. In Germany, organic has always been more important, but now that could change.

Moller: In the food sector, you can't say across the board that all food needs to be traded locally. It depends on the product; one example of this is wine. But as a consumer, you naturally wonder why products that grow on your doorstep are transported 5,000 kilometers around the world.



Globally 21-37% of all greenhouse gas emissions are attributable to the area of food. (Verbraucherzentrale.de)



Study: Three scenarios for Europe's food sector in 2035 Fraunhofer ISI



Davila Lage: Decentralization will play an even greater role in the future. The sheer number of variants means that large-scale plants are already reaching their limits. Initial examples of decentralization can also be seen in Germany. By listing local bakers in retail stores or soy from Germany for meat-free products, production is being brought closer to the customer.

... the prices for food

What do local food cycles offer customers?

Berner: If we shorten food chains, many small, decentralized production providers would be integrated into the system. From growers to customers, many have the opportunity to benefit. But it also means that the food system would undergo restructuring. Food retailers would have to be organized to list regional products and small producers. This often means higher prices. If the price ends up being passed on to the customer through a unique selling point, such as regionality, that would be ideal, and everyone would win.

Moller: In this discussion, of course, there is always the question of who pays the prices and who is willing to invest more. Retailers can always say that they will offer organic or regional or sustainably produced products, but if the consumer does not value and pay for that, the industry is forced to produce cheaply again. But that is, of course, greatly simplified. Other projects we are conducting on these topics also discuss the question of where Germans should actually decide what they eat: at the store counter or in parliament? If you just leave it up to the consumer, it is

always easy to end the discussion and say if there is no demand, then it is too expensive.

Davila Lage: When we talk about price, we still have a great deal of efficiency leverage in the system. A good example here is from the automotive industry. Toyota has managed to drastically reduce value stream losses such as transportation and overproduction, and thus significantly increase its value-added share. This makes it possible to increase customer benefits while maintaining the same price. If waste were also taken out of the "farm to fork" process, this would provide significant cost savings. This would also cushion the customer's price sensitivity.

... a CO₂ tax

What would a CO₂ tax on sausage and meat mean?

Davila Lage: There would be an uproar. If pig farming were subject to CO₂ certificates, it would no longer be profitable.

Moller: Then animal husbandry would largely move away from Germany and Europe. There would be no more fattening farms. The consumer could then choose between imported meat from China or to abstaining from meat consumption altogether.

Berner: You could price in the entire footprint, but if we make meat as expensive as it should be, then barbecue as we know it is over. When many people are no longer able afford it, we reach a system limit and this also has a strong social component.



“You could price in the entire footprint, **but if we make meat as expensive as it should be, then barbecue as we know it is over.**”

DR. SIMON BERNER
FH JOANNEUM

... new research projects

FH JOANNEUM Graz and Fraunhofer ISI are some of the organizations participating in the EU project Fairchain. What is this project centered around?

Berner: It is a complex research project with quite a few partners in Europe trying to establish shortened food chains and support those involved in making it work. In the case study in Austria, we are working with farms from the fruit and vegetable growing sector. New products, processes and business opportunities are to be developed in a so-called food innovation incubator with the aim of establishing a local food supply system within a 30-kilometer radius by 2030.

Moller: Fraunhofer ISI accompanies the individual case studies and develops workshops for them on how to involve future users at an early stage. The topics, but also the maturity levels of the individual case studies, vary greatly. In Greece, for example, key information from a local cheese and yogurt production facility will be stored in a blockchain infrastructure to provide access to interested parties in a trustworthy manner.





“The sheer number of variants means that large-scale plants are already reaching their limits. **Initial examples of decentralization can also be seen in Germany.**”

AXEL DAVILA LAGE
STAUFEN.AG

... a sense of optimism in the food sector

How do you get stakeholders in the food sector to take the plunge and take part in the change?

Berner: Startup support for agriculture, as in the Fairchain project, is often an initial spark to optimize the process. If they are also offered a business model, such as an app that allows them to sell their products directly, the risk for them becomes even smaller.

Davila Lage: There are young farmers who dare to do something new, which are great startups, but the majority of the food industry is still very conservative. We can only achieve this transformation if those involved are willing to take a look at other industries and see how they have managed it. There are several examples of how this can be done well. Jan Bredack was a Manager at Daimler before he founded Veganz (see interview on page 57).



Moller: That's the big challenge in the food sector. All players must move at the same time: Policymakers must improve labeling, for example. Retailers need to enter the conversation. But customers must also change and be willing to pay more, then production and retail will follow suit. ■



"SIMPLY ROMANTICIZING FARMS WILL GET YOU NOWHERE"

VEGANZ FOUNDER JAN BREDACK PRODUCES CLIMATE-FRIENDLY FOOD WITH HIS COMPANY. IN AN INTERVIEW, THE FORMER DAIMLER MANAGER EXPLAINS HOW IMPORTANT TRANSPARENCY IS FOR BETTER PRODUCTION AND WHY CUSTOMERS NEED TO ASK QUESTIONS.



Mr. Bredack, you opened your first vegan supermarket in Berlin while you were still a Daimler manager. From your time in the automotive industry, what was particularly helpful for you in building Veganz?

Certainly dealing with large numbers and being responsible for complex company structures. I also had to fight for my budgets with the board. That helped me enormously when approaching banks and investors to make sure everything could be funded.

Veganz started as a supermarket and has since transformed into a branded company as Veganz Group AG. What has this change in strategy meant for your company?

The more we headed in this direction, the more I could take from my previous life. I was responsible for all sales at Daimler Commercial Vehicles. And no matter whether the product is spare parts or food: In the end, it is all about brand, price and quality. As a brand owner, you need to offer retail partners arguments as to why the products are desirable and why they belong on the shelf.



JAN BREDACK
Founder and CEO
Veganz Group AG



And why does Veganz belong on every supermarket shelf?

We positioned Veganz as a brand for climate and environmental protection. If a retailer wants to offer climate-friendly products today, they have to have our products on the shelf. They know that this is the only way to get a piece of the cake.

Are Veganz products manufactured or do you also produce them yourself?

This is another stage of transformation. As a full-range supplier, however, we cannot and do not want to produce everything ourselves. We have therefore selected segments in which we firstly have a high level of competence, secondly see great potential and thirdly in which we believe the recipe and production are worth protecting.

Which product does that include?

We currently produce plant-based Camembert and other soft cheeses on a small scale following old traditions. But we are also deve-

loping fish alternatives, such as an algae-based salmon. We also produce dry meat substitutes. A 4,500 square meter production hall, the largest of its kind in Europe, is being built for production in Berlin-Schönefeld.

You already mentioned climate protection: How do you determine the climate impact of your products?

At Veganz, we measure the entire value chain, from cultivation and transport to the product on the shelf. We calculate CO₂, animal welfare, transport and water consumption. Cultivation accounts for the majority of resource consumption, so sustainable, regenerative forms of cultivation should be chosen.

How do you make this transparent for the customer?

Our sustainability score was developed together with the Swiss Eaternity Institute. Veganz compares each of its products with 110,000 others in a database. We put the score on each package, so that it is immediately visible to the customer on the shelf. Companies such as Rewe and Hochland now also use this score.

“Our sustainability score was developed together with the Swiss Eaternity Institute. (...) **We put the score on each package, so that it is immediately visible to the customer on the shelf.**”





Plant-based food brand

120

Vegan products

18,000

Sales outlets in

28

Countries

105

Employees



So is transparency the key to achieving the transition towards better food production?

Absolutely! Let me illustrate it again using the automotive industry as an example: Since cars have been labeled in terms of their CO₂ footprint, this figure has become the benchmark for the production of new models. We would like to achieve exactly the same with food. With Eaternity, we have managed to create a scientifically comprehensible, common denominator for sustainability and to communicate the whole thing in simple terms: Three stars in the sustainability score mean very good for the climate, two stars are also good, and one star means worse than average.

100%
plant-based products
since 2015



How realistic is it that sustainability will also play a role in conventional products in the future?

In the food sector, value chains are stretched to the limit and there is massive competition between retail partners. It is hardly possible to incorporate sustainability aspects here, as it would simply be too expensive. It must therefore all start from the grass roots, i.e. the consumers.

What might that look like? What would need to change?

When value chains are transparent, questions are asked and comparisons are made. Then the food industry comes under pressure and has to do something. If demand behavior is oriented toward climate and environmental protection, then the road to legal regulation is not far off. Exactly which sustainability score is used plays less of a role. The main thing is that there is a guideline that companies must follow when growing, because 24% of our total greenhouse emissions are associated with food production. Therefore, a paradigm shift in consumer behavior is necessary as well as rethinking towards a circular and regenerative economy. Plant-based foods are the only way to ensure that everyone is fed 20 years from now.

But that also means that you have to bid farewell to some ideas regarding "organic" and "vegan," right?

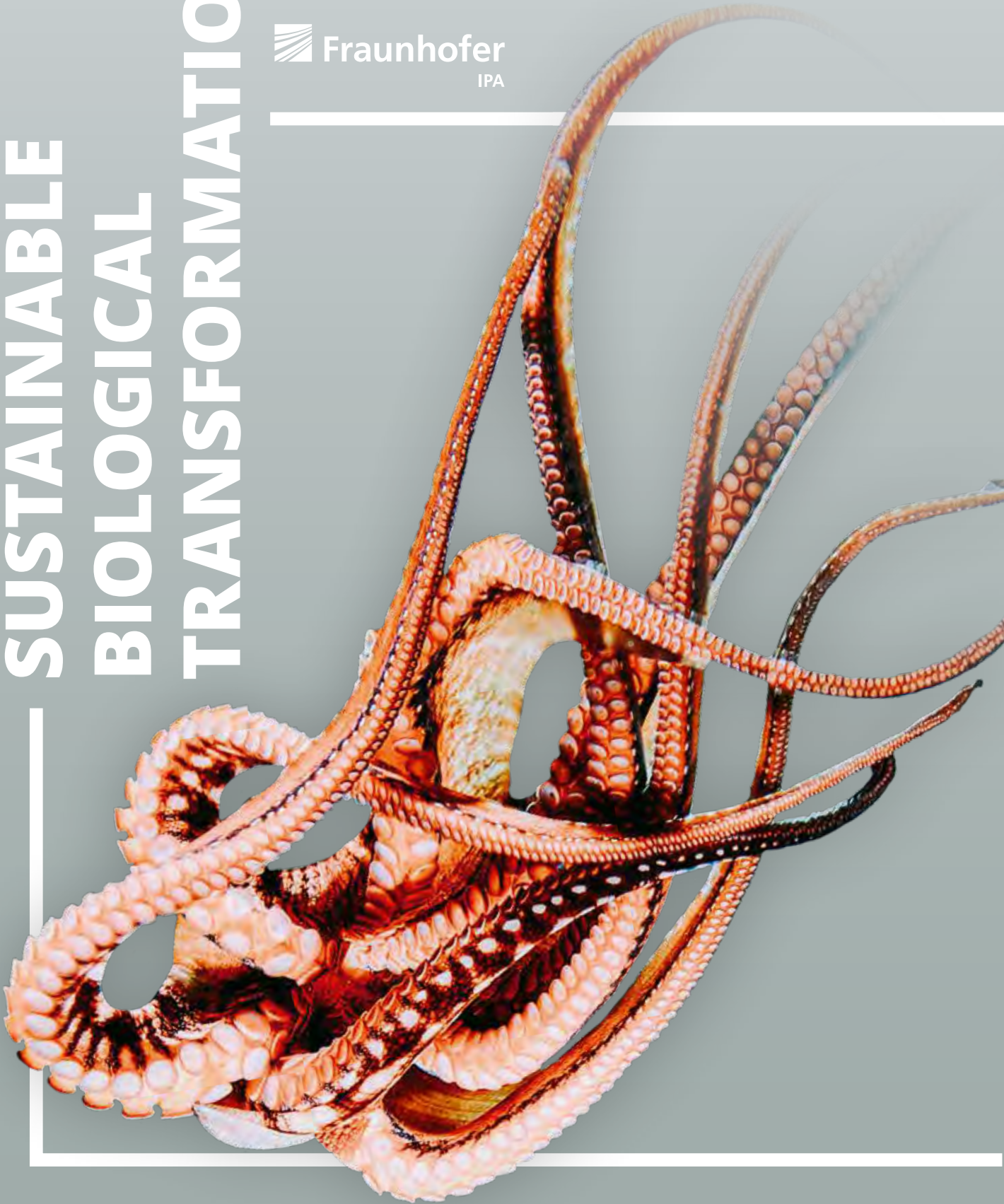
I was one of the pioneers who looked at the necessary change from a business perspective. But if you do something different than what everyone is used to, not everyone wants to be your friend. Some organic chains see me as their enemy. But simply romanticizing farms will get you nowhere. ■



SUSTAINABLE BIOLOGICAL TRANSFORMATION



Fraunhofer
IPA





PROF. DR. THOMAS BAUERNHANSL

Director of the Fraunhofer Institute for Manufacturing Engineering and Automation IPA

RESEARCH AREAS: production technologies, automation, biointelligence

FOCUS AREAS: Industry 4.0, factories of the future

Progressive digitalization is massively changing established value creation systems in industrial production. However, it is also becoming increasingly apparent that the introduction of cyber-physical systems for networking and optimizing industrial production resources is not sufficient to meet essential challenges facing society. Resource scarcity, climate change, the changing role of humans in society and the workplace, and also complexity in companies with agile business models require complementary systematic application of knowledge about natural systems. Nature can be the inspiration for optimizing industrial performance.

The so-called biological transformation of industrial value creation, a new paradigm designed to complement digital transformation within the framework of Industry 4.0, will require biointelligent systems. According to McKinsey, biological transformation will generate 35% economic growth worldwide by 2040 compared to today in the health sector alone, or \$0.5 to \$1.3 trillion, and as much as 36% or \$0.8 to \$1.2 trillion in the agriculture, fisheries and food sectors.

The biological transformation of industrial value creation systematically applies knowledge about nature and biology to technology. The increasing technical use of materials, structures and processes from nature makes sustainable production methods with innovative

technologies possible. Products, industrial manufacturing processes and organizations and, related to this, the way people live their lives will change profoundly as a result.

The right tools needed to develop this are provided by the research disciplines of biotechnology, automation, and materials science, as well as information and communications technology. Artificial intelligence methods (especially machine learning) are just as important for this as additive manufacturing or biotechnological production processes. Combining these and intelligent networking are the key to a biointelligent economy. Here, a new dimension is emerging in the innovation space with above-average growth that can compensate for some failures in the automotive industry, for example.

ADDITIVE PRODUCTION:

When building a silent propulsion system for boats and water sports equipment, octopuses served as a model for research. The system can be produced cost-effectively in a single operation using a 3D printer. © Fraunhofer IPA



JELLYFISH-INSPIRED BIOINTELLIGENT CONICORE SENSOR:

Can sniff out/recognize special substances, e.g., volatile hydrocarbons in the breath of patients or explosives in a suitcase of someone passing by. Here, neurons are kept alive for two years in a carrier for specific tasks (such as a fluorescent reaction upon contact with specific molecules, e.g., in explosives) and integrated into a sensor that detects the glow and evaluates it using machine learning. © KonikuTM





NATURE AND TECHNOLOGY – FROM INSPIRATION TO INTERACTION

The biological transformation process can be divided into three modes of development: inspiration, integration and interaction. Firstly, inspiration allows us to apply biological phenomena that have evolved over millions of years to value creation systems. Companies are using this approach to develop novel materials and structures (e.g., lightweight construction), functionalities (e.g., biomechanics), and organizational and collaborative solutions (e.g., swarm intelligence, neural networks, evolutionary algorithms). This approach is already widely known and tested under the term bio-nics, but is growing massively with the use of digital technologies. Today, for example, the human genome can be decoded within a few hours for less than 100 euros. We therefore understand complex biological systems and phenomena more clearly and comprehensively than ever before and can incorporate this knowledge into designing completely new or optimized solutions.

In the second mode, knowledge of nature and biology is applied in the actual integration of biological systems into production systems, for example by substituting chemical processes with biological ones. Examples of this second mode include the use of microorganisms to recover rare earths from magnets, the functionalization of polymers, and the microbial recovery of bioplastics from CO₂ waste streams. All forms of traditional biotechnology are also included in this approach.

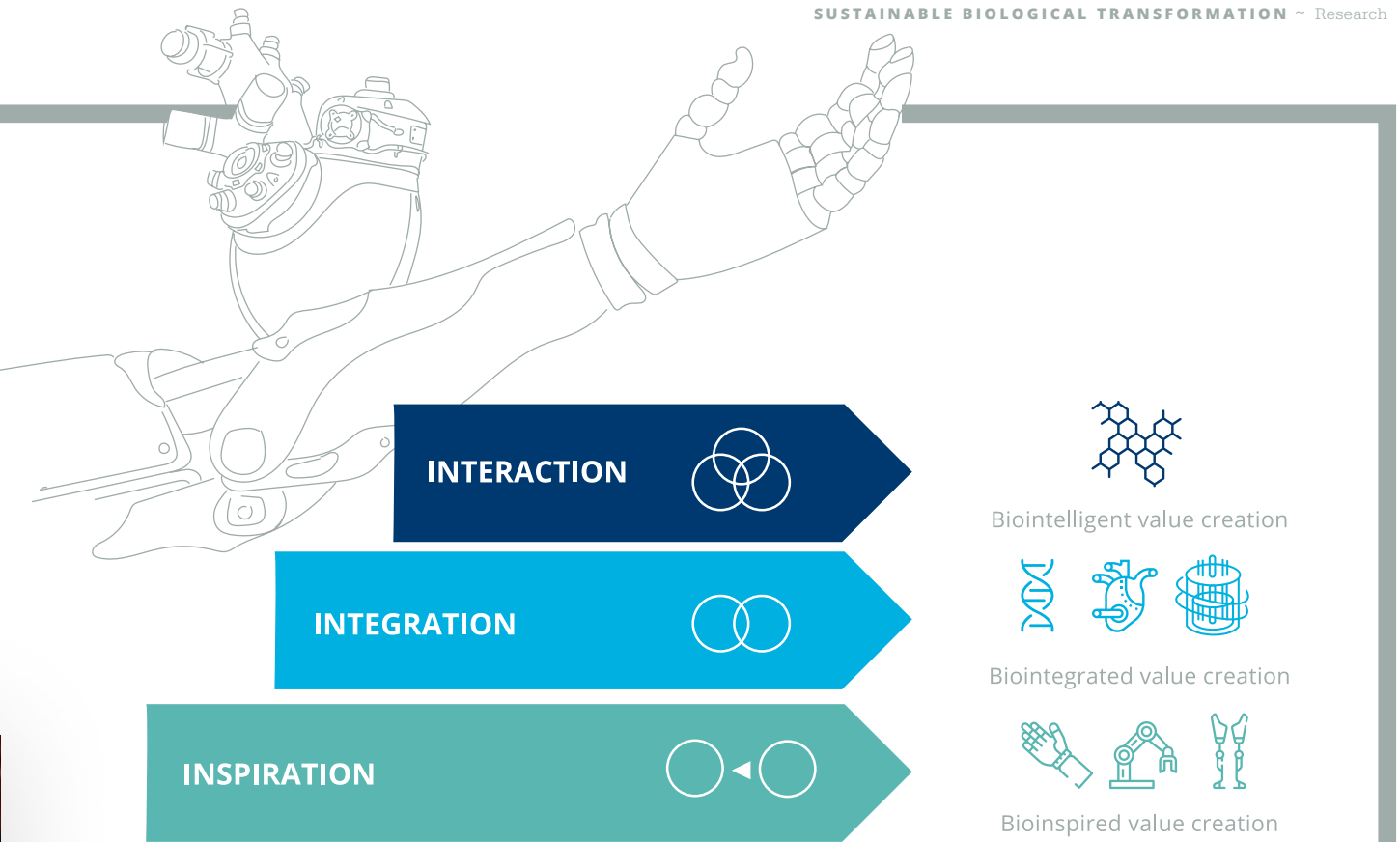


ANIMAL-FREE BURGERS:

Production uses a fraction of the resources of meat production (96% less agricultural land, 87% less water use, and 89% less greenhouse gas emissions). The meat flavor of the Impossible Burger is achieved with vegetable hemoglobin through the fermentation of genetically modified yeast. (Source: www.foodaktuell.ch/2021/02/09/das-riesige-potenzial-der-fermentation/)

Thirdly, the comprehensive interaction between technical, informational and biological systems, or merging these three levels of integration leads to completely new, self-sufficient production technologies and structures, so-called biointelligent value creation systems. In the coming years and decades, systems that merge software, hardware, and bioware into real-time capable architectures will gain massive importance for industrial value creation. The three developmental modes play a crucial role in

the course of biological transformation and are to be understood as interconnected processes. However, the interaction and the biointelligent systems that emerge as a result of this mode of development will gain the most momentum. One reason for this is the leap in recent years of groundbreaking advances in biotechnology, such as the genome-editing technology CRISPR/Cas, and in information technology, such as deep neural networks, the coupling of which will lead to radical innovations.



Levels of integration and modes of development in the biological transformation of industrial value creation.

© Kompetenzzentrum Biointelligenz / Robert Mieke

THE VISION: TECHNOLOGY-BASED DEMAND ECONOMY

Biology is making its way into industrial value creation as part of biological transformation with the inspiring, integrating and interacting modes of development, enabling people to satisfy their needs in an ecologically balanced manner. Novel, biointelligent value creation enables personalized healthcare, intelligent traffic and production organization, plus decentralized production of consumer goods and food from renewable regional raw materials and recycled materials.

The aspired technology-based demand economy is emerging with the convergence of essential key technologies from the disciplines of biology, production engineering and data processing. Here, an advanced form of economy is developing that takes into account the physical limits of our planet.

In biointelligent value creation, the nature of consumption and the materials used are also undergoing fundamental change.

Decentralized, highly flexible, and adaptive smart biomanufacturing devices (SBMDs) are revolutionizing many consumer products. These production units are coupled with self-learning algorithms to process regionally available biobased materials (including bioreactors, biorefineries) or directly into products with novel functionalities. Additive manufacturing is used in this process. Household and agricultural waste, highly efficient urban gardening systems, horizontal gardens or microalgae reactors on building facades, but also discarded products themselves, are sources of raw materials and energy. Industrial companies provide the technologies for these SBMDs. They provide communal manufacturing centers for more complex products and develop the digital blueprints for new products in close and direct exchange with consumers.

Companies now urgently need to increase biological expertise in addition to informatics knowledge in order to incorporate balanced software, hardware and bioware into the design of sustainable solutions in the future. ■



Kurtz-Ersa Group:
Machinery & equipment along with automation solutions for electronics production, particle foam processing, light metal casting and 3D metal printing.



1779

Founding year



14

Subsidiaries



1,200

Employees worldwide



230

M € in sales (2020)



RALPH KNECHT

Managing Director
Ersa GmbH



CHRISTOPH WOLPERT

Manager of Application Development
Ersa GmbH



JOACHIM BRÖNNER

Director of Production
Ersa GmbH



ANDREAS SPIESS

Director of Inside Sales
Ersa GmbH



RAINER KRAUSS

Sales Manager
Ersa GmbH



NEW CONSTRUCTION²



EVEN AT A HIDDEN CHAMPION AND WORLD MARKET LEADER, THERE IS OFTEN POTENTIAL LYING IDLE. THE SOLDERING MACHINE MANUFACTURER ERSA, OF WERTHEIM NEAR STUTTGART, GERMANY, SHOWS HOW QUICKLY AND PURPOSEFULLY THIS POTENTIAL CAN BE EXPLOITED. THIS ELECTRONICS SYSTEM SUPPLIER USED THE NEW CONSTRUCTION OF ITS PRODUCTION HALL TO SUCCESSFULLY OPTIMIZE PRODUCTION AND ORDER FULFILLMENT PROCESSES.

The decisive role that the time factor plays was something that the whole world had to learn painfully, especially at the beginning of the COVID-19 pandemic – the keyword was exponential growth. In response, capacities for manufacturing respirators were increased around the world. A customer of the soldering machine manufacturer Ersa also needed new systems on short notice last year, in order to be able to scale up its output of respirators. This was no problem for Ersa: just four weeks after the order was placed, the machines were delivered as promised.

Not every order relates to life and death in the truest sense. However, reliable delivery is critical even in non-pandemic times; it presents a clear competitive advantage. In order to achieve this degree of delivery reliability, Ersa had undergone a very clearly structured process, which began in mid 2018.

“Ersa has grown consistently in recent years. In the process, we determined that the larger the company, the more difficult it is to maintain communication and speed. That's why we needed to make a break and we brought in some external help. Linking the project to the schedule for the new construction of our production hall was a particular challenge. **The ‘first shot’ had to hit the target – and Staufen AG did not disappoint us. Working with the Ersa teams, they helped us develop and adapt the new system. That's why we were able to establish a system that the employees willingly adopt and put into practice.** For me, that was the greatest success from this project. Now we're at the point where our organization is broadcasting to other subsidiaries of Kurtz Holding and many of our suppliers. We are being perceived as an example.”

RALPH KNECHT
Managing Director Ersa GmbH



At the time, the initial situation in Wertheim was good at first glance: with approximately 500 employees, Ersa, based in the northernmost city in Baden Württemberg, successfully manufactured soldering machines for electronics production. Thanks to its innovative products, excellent customer loyalty, and a global sales and service network, the company had developed an outstanding reputation in many industries and it had been a technology and world market leader for many years. But it was clear to the Ersa team that something would have to change in order to maintain the company's stable growth course in the future and achieve its ambitious sustainability goals. For Ersa's Managing Director Ralph Knecht, the focus was on three points:

- Shorter delivery times
- On-time delivery
- Optimization of costs

Working with Staufen AG as its external partner, a road map was created to re-orient production according to lean principles and slim down processes. The time frame for the transformation organized in four sub-projects was determined by the construction of a new production hall, which was already underway. From this arose a tightly-scheduled series of projects: the first project, "order fulfillment," was started in September 2018. Just a few weeks later, at the end of 2018/early 2019, the projects "final assembly" and "component assembly" were started. In the first quarter of 2019, Ersa started up the new production hall – of course organized according to the previously formulated lean principles and an organizational structure oriented toward the value stream. In mid-2019, the fourth project, "leadership development" started up.



OPERATIONAL MANAGEMENT

SUB-PROJECT 1: OPTIMAL CONTROL OF ORDER FULFILLMENT

Before the implementation, the project participants analyzed the actual situation: from order receipt to picking in the logistics center to shipping of the systems; the whole order fulfillment process was put under the microscope. After that, the tasks, competencies, and responsibilities of all process participants were defined, the process and communication flows were redesigned, and the data and systems in order fulfillment were optimized to ensure smooth processes. Important here was especially the visualization of the new concept for all levels, with defined quality gates and the introduction of value stream-oriented, effective regular communication. In the end, all order fulfillment was integrated into a SFM (Shop Floor Management) cascade. Short daily meetings inform everyone about plan deviations and they offer space for an active and committed cooperation of all participants in order to solve problems.

“The hurdles between the departments were eliminated. Previously, uncoordinated agreements and a flood of email that could not be managed were slowing us down. **Thanks to regular communication, we've got everything in hand now – even without the participation of the Executive Board – and on an operative level, we can detect and solve problems.** We make decisions and maintain a factual yet friendly tone even in challenging daily business instead of establishing a task force or provoking an escalation.”

CHRISTOPH WOLPERT

Manager of Application Development and responsible at Ersa for the order fulfillment project



“Today, employees have a different mindset. With the SFM board, they can communicate differently and participate better in the whole process. **They are heard, they're involved, and they're more motivated. The SFM board was one of the biggest levers for optimizing assembly.** By high noon everybody knows: how is the company doing, what do we have to do better today?”

JOACHIM BRÖNNER

Director of Production and responsible at Ersa for the assembly projects



The daily meetings quickly established themselves in the department as a central organ of control. Combined with up-to-date informative SFM boards, the clearly structured flow ensures quick but also very coordinated agreement. And there's a positive side-effect: friction points are identified as early as possible, in order to de-escalate things and formulate an effective solution. One of the main goals of the whole project has therefore been achieved successfully: delivery reliability has reached an absolute peak level; there are only delays – if at all – in isolated instances. Especially with regard to the many cases of supply chains interrupted because of the consequences of the COVID-19 pandemic, this is an outstanding result and a significant prerequisite for the planned growth.

SUB-PROJECT 2 AND 3: SIGNIFICANTLY REDUCE ASSEMBLY TIMES

As part of the "final assembly" and "component assembly" projects, the lines were designed and timed according to lean principles. This includes a daily capacity check. Consistent separation of value creation and logistics helps keep work on the line much more efficient. In particular, the segmentation of the product portfolio into three independent production lines has proven helpful – now, one of the lines is always used flexibly in order to deal with sudden fluctuations due to priority orders. Material and tool provision was implemented optimally to increase productivity.

Another critical point is the new communication with SFM boards in the production hall. Regular communication does more than just inform people about daily tasks and current states of production. The boards also serve as an interface for problem-solving and clarification of breakdowns. Because all the actors participating in the production process are always informed and there is a lively exchange of information, possible problems are uncovered early on and corrective measures can be taken. In particular, the number of missing parts was reduced greatly.



SUB-PROJECT 4: INTRODUCTION OF SHOP FLOOR MANAGEMENT AND COACHING OF LEADERS

In the fourth sub-project, the focus was on the leaders. In order to achieve continuous improvement and have the will to cast off traditional ideas and dare to do new things, the corporate culture and people behind it have to be ready to accept change. This was achieved with the introduction of SFM.

When performing leadership tasks (e.g. regular communication, process confirmation, and the continuous improvement process, etc.), the leaders were accompanied and developed accordingly. In addition to one-on-one coachings, training was also offered on operational excellence, value creation on the line, and waste. The success

The SFM boards proved especially useful during the COVID-19 lockdowns. The employees were divided up into teams, which worked in assembly at different times. This way, smooth operation was ensured even during the lockdown – which would not have been the case with the previous setup.

The goals set by the management with regard to increased delivery reliability, shorter delivery times, and an optimized cost basis were fulfilled; and at the same time, flow production is much more flexible, and oriented according to a zero-defect philosophy and continuous improvement. For the future, this means that in Ersa's production, the topics of Industry 4.0 and digitalization are now being approached more vigorously.

“We're setting new goals each year, and we're managing to meet them together. **Once a goal has been achieved, we already know what's next on the agenda.**”

ANDREAS SPIESS
Director of Inside Sales

of the coachings and the improved leadership performance can be measured and is reflected in the KPIs.

Dynamics and quality may not be neglected despite the continuous growth trend. For Ersa management, the reorientation of the organization according to lean principles includes not just changing processes in assembly, but also approaching challenges differently and maintaining a consistent solution-oriented attitude.



“Our cooperation with Staufen AG was one of equals. That suits our corporate philosophy very well. Ersa GmbH is a reliable partner that works unusually closely with customers and cooperates very well. We exemplify ‘We are family.’ **And if the customer has his 'aha' experience when picking up his machine from the new production hall, then the whole arrangement is right and he knows: yes, Ersa was the right company for me.**”

RAINER KRAUSS
Sales Manager

A DOWN-TO-EARTH WORLD MARKET LEADER

During the project period, Ersa became an example in the region and among customers. With a visit on-site, many companies have become convinced of the benefits of lean organization and the smoothly interlocked processes.

Werner Laub, Partner at Staufen AG and project manager on the consulting side draws a positive conclusion: "Ersa has developed very well in a very short time and should be proud of what it has achieved. Why was the project so successful? Leadership stood as one behind the project and demonstrated an absolute will to devote the necessary energy and attention to these future-oriented projects." Staufen Consultant Lukas Förschner was especially impressed by Ersa; not only by the project team, but by the way the whole organization was working together: "The acceptance of the changes striven for was encouraged quite purposefully by the early incorporation of as many areas of the company as possible."

Plus, the new organization was also greeted by Ersa's customers. Directly adjacent to the assembly lines, there is now a separate, 600 square meter-large delivery room. This is where customers are informed about how to set up and work with their new systems. People like to take the opportunity in order to experience the modern, clean production of the Ersa soldering machines "live." This way, the customer gets a harmonious picture: from initial contact to ordering to delivery, Ersa presents itself as a world market leader is expected to do.

For the company, this completes the circle of external presentation, quality awareness, and its down-to-earth Swabian nature and self-image. With the lean organization, now the responsibility is distributed rather than having it rest on individuals' shoulders. Thanks to clearer structures and processes, this system works efficiently, securely, and in goal-oriented fashion. And this is also noticeable in the employees' mood; they not only accept this way, they really exemplify it. ■





GAME, SET AND MATCH



Global system provider for industrial enclosures, power distribution, climate control and IT infrastructure, software and services.



Headquarters in
Herborn, Germany



1961

Founding year



MICHAEL GALLER
 Director of Sales Operations,
 Vice President Operations,
 Rittal Electro-Mechanical
 Technology (Shanghai) Co., Ltd



BEHIND EVERY SUCCESSFUL LEAN TRANSFORMATION IS A TEAM AND A GOOD COACH. MICHAEL GALLER, MANAGING DIRECTOR OF THE RITTAL SUBSIDIARY IN CHINA, LIKENS THIS TO TENNIS: "TO BECOME A TOP PLAYER, YOU NEED A GOOD COACH. TOGETHER WITH STAUFEN CHINA AS AN EXPERT IN LEAN MANAGEMENT, THE COMPANY INITIATED A FAR-REACHING CHANGE PROCESS. SUCCESSFULLY: RITTAL ACHIEVED A CULTURAL CHANGE AND IMPROVED ALL IMPORTANT KPIS.

In the worldwide network of the Rittal Group, standardized audits identify deviations or anomalies in the production process. At the Chinese subsidiary, it became apparent in the mid-2010s that there was unused potential in production. Michael Galler, who had already taken over de facto management of the plant in 2016, initiated the early stages of Lean Transformation. This included a Lean Management training program at Staufen China in 2016/17. The first independently initiated measures brought about positive change, but not yet to the desired extent. As of 2018, Staufen China has therefore been commissioned to provide support. The decisive factor to bring in external consultants was a company visit from the headquarters in Germany. Carsten Röttcher, Managing Director of Production at Rittal, pointed out the tennis coach analogy in a conversation with Michael Galler. Staufen was chosen because "we did not want consultants who would not assume responsibility and were only strong in theory. We wanted a partner who would stand by our side during the practical implementation," says Rittal Manager Galler.

Together with the Staufen team led by Jacee Cai, Senior Expert at Staufen China, the Lean project managers developed a concept and divided the project into two blocks: Rittal was responsible for the implementation of the sub-projects in the first block, while the other block was carried out under the direction of Staufen: Shop Floor Management (SFM) and Hancho, qualification of the team leader level. The most urgent need for action was in the area of Shop Floor Management. Mid-2019, the SFM pilot officially launched with the goal of strengthening the perception of leadership tasks by implementing SFM and, in particular, focusing on leadership behaviors. At the same time, it was important to develop internal resources for sustainability and continuous improvement. During the eight-month pilot phase, a total of ten SFM information centers were established with three cascades and eleven managers were trained and coached in the following areas: regular communication, process confirmation, problem solving, and employee qualification.

Excellence is not a skill, it is an attitude

The changes initiated by Michael Galler back in 2016 proved to be ideal in the course of project implementation. They included internally defined guiding principles, which were jointly developed by the entire workforce and today act as the company's compass. These guiding principles strengthen cooperative and binding collaboration and are emblematic of the self-imposed obligation to continuously optimize one's own work:

1. Think like a business owner!
2. Excellence is not a skill, it is an attitude
3. Great entrepreneurial achievements are not accomplished by a single person, but by a team
4. Communication strengthens us
5. You do not need superpowers – focused thinking will lead you to success!
6. Not just ideas matter but rather how the ideas are implemented
7. Continuous improvement is a continuous journey
8. Investing in your own development and growth is not selfish, it is self-care

Openly communicate the reasons for necessary changes

According to production expert Galler, the newfound cultural orientation and workforce's willingness to embrace change are largely responsible for successful project implementation: "During a transformation, you have to leave your comfort zone. And the more people can do that and feel comfortable in their new role, the more will be willing to follow along. We benefited from an affirmative atmosphere right from the start."

The positive initial momentum stemmed not only from the guiding principles, but also from a very open and transparent communication policy between consultants, managers and staff. As a result, the reasons for the necessary change and a positive transformation were identified together with Staufen. A conscious decision was made not to look for people to blame. So the focus was not on whether someone was doing something wrong, but on improving a process or action. Especially when reorganizing the shop floor, a defensive attitude can quickly develop within the workforce if the success, goals and reasons for change are not openly communicated.



Success in China is spreading throughout the Rittal Group

At Rittal, there was a clear, common approach that was supported by the entire group of managers and thus also carried through each department into the entire company. At the same time, the project managers were careful not to push for too much at once. Instead, an iterative process with smaller and more manageable projects was chosen. The time frame was also deliberately flexible to prevent too rigid constraints.

At the headquarters in Germany, the progress of the project was closely monitored. As the Project Manager, Michael Galler regularly communicated the progress and was met with a high degree of approval for the far-reaching changes: "We received broad support and were not put under any pressure. I never had a budgeting problem either. At the same time, a great deal of explaining took place

and we had to orient ourselves to the specifications of the global Rittal system so that the overall system would not implode." Word quickly spread at Rittal about the work in China - and it became a leading example. Before the COVID-19 pandemic restricted people's movement, Michael Galler was on the road at least once a month and presented the changes at the Chinese subsidiary to the Group around the world. Over the course of the pandemic, communication shifted to digital channels, and exchange between the individual subsidiaries has even increased as a result.

All key performance indicators have improved

Key figures prove how successful SFM changes and the underlying Lean Transformation have been. In the global Rittal system, there are 13 KPI target markers, of which the Chinese subsidiary achieved significant improvements in twelve and at least slight improvements in one. For example, lead time improved by 10 percent, old

ORGANISATION & LEADERSHIP





RITTAL CHINA



1996

Entering of the Chinese market

The plant in Songjiang Shanghai was put into production in

2004



870+

Employees



5

Regional distribution centers



1

Central warehouse



13

Sales offices



inventory was reduced by 50 percent, and customer complaints dropped by 15 percent. Delivery reliability was at an excellent level before, but has now been increased to well over 99 percent. The fact that the transformation has been very well received and supported by the workforce is also reflected in the number of sick days, which have fallen by 30 percent and occupational safety (number of serious and minor accidents or close calls) has improved significantly.

Despite these excellent results, the Lean Transformation project is not yet complete for Michael Galler. On the contrary: "It is a continuous process that has to be anchored in the company so that even without input from me or other senior executives, Lean Management stays alive." It is a bit like tennis, where the coach is not allowed to verbally coach from off the court during a match. A successful match plan must be developed before the first serve. ■



LEMKEN AND THE FUTURE

A CONVERSATION WITH NICOLA LEMKEN

ORGANISATION & LEADERSHIP



NICOLA LEMKEN
Managing Partner
LEMKEN GmbH & Co. KG



**Supplier of professional
agriculture technology**



1780

Founding year



1,600 +

Employees



29

Locations
around the
world



380

M €
in sales



“We encourage our employees to play an active role in shaping processes and reward suggestions for improvement.”

Ms. Lemken, what characterizes your personal management style and that of the LEMKEN management team in this traditional family business?

We maintain a distinctly appreciative employee culture and open communication. We place great importance on long-term experience and promoting employees. That is why many of our employees spend their entire working lives at LEMKEN – we celebrate many 25th or 35th company anniversaries every year. The cooperation between me as managing partner and Anthony van der Ley as managing director is based on an equal footing. We encourage our employees to play an active role in shaping processes and reward suggestions for improvement. We also see ourselves as a diverse and tolerant company in which gender roles or cultural backgrounds are not relevant. This is what we live by and what we expect from all our employees.

Agriculture plays a key role in issues such as nutrition and sustainability. How do you position LEMKEN for a successful future in this context?

Sustainable management is in the very best interest of agriculture. After all, farmers must protect and care for their soil to ensure good harvests in the long term. But of course, agriculture must also take into account the realities of climate change and increasingly scarce resources. As a manufacturer, we support this, for example, with machines that minimize impacting the soil and reduce evaporation. Eliminating chemical pesticides also plays an important role, for which we offer hoeing technology for mechanical weed control. However, we must not lose sight of securing food for the world's growing population. This can only be guaranteed in the long term through efficient management and a high degree of mechanization in cultivation. Our development department therefore continuously focuses on these topics.

How important will the use of artificial intelligence and robotics be in this development? And how strongly do you rely on your subsidiary Steketee to achieve this?

The use of artificial intelligence and robotics is certainly the future of agriculture. However, a vast amount of research is still needed for safe, autonomous control. Therefore, it will take a while before it becomes the standard. Even more interesting applications arise from the use of sensor technology to not only automate soil cultivation but also qualitatively optimize the process and thereby yields. Steketee's hoeing technology already includes very specific machine concepts with camera and software-controlled intelligent processing methods. Automated small units will also be available in the future. Because with around-the-clock availability, economic efficiency and thereby the optimal size changes.

What ideas do you pursue to ensure that your company remains innovative and can hold its own in global competition without losing its regional roots?

We are a family business and want to stay that way. We are also one of the largest employers in our region and have been based here from the very beginning. However, this does not prevent us from gaining experience in all regions of the world and developing products for the respective markets. We are adaptable and flexible and also have sufficient reserves to pursue groundbreaking projects with staying power. Specializing in a range of equipment and specific arable farming methods is a great advantage for us, because the expertise we have acquired through specialization drives us and spurs the development of forward-looking technologies. ■

Read the whole interview here:

www.en.staufen.ag/interview-lemken





LEAN TRANSFORMATION AT LEMKEN THE SEED HAS SPROUTED



FROM DEVELOPMENT TO SALES - AGRICULTURAL TECHNOLOGY SPECIALIST LEMKEN IS FACING THE CHALLENGES OF LEAN MANAGEMENT IN TERMS OF QUALITY, DELIVERY RELIABILITY AND COSTS AS WELL AS INCREASING COMPLEXITY IN PROCESSES AND PRODUCTS. THE "LEMKEN EXCELLENCE" INITIATIVE IS THE KEY TO UNLOCKING POTENTIAL AND EMPOWERING EMPLOYEES FOR THIS LONG-ESTABLISHED COMPANY FROM ALPEN ON THE LOWER RHINE RIVER, GERMANY. THE CLOSE AND EARLY INVOLVEMENT OF CONTROLLING IN THE PROJECT ENSURES COMPANY-WIDE ACCEPTANCE, TARGET ORIENTATION, AND QUANTIFIABILITY.

For 240 years, LEMKEN has been supporting farmers around the world with innovative technology (see interview with Shareholder Nicola Lemken on p. 74). Innovative agricultural technologies are necessary to survive in an industry that must increasingly respond



to societal challenges. "In order to be best positioned internally for the future here as well, we decided in 2019 to implement Lean Management in our company as part of the 'LEMKEN Excellence' project together with Staufen," says Anthony van der Ley, Managing Director of LEMKEN GmbH & Co. KG.

At the beginning of 2020, the holistic Lean Transformation project was launched in various modules and sub-projects. Mark Verhülsdonk, who had been with LEMKEN for 14 years, became the Project Manager: "I found this challenge very exciting as we quickly placed lean projects in a wide variety of operational areas and noticed how 'LEMKEN Excellence' brought a breath of fresh air into the company."

For him, consistent support from management is just as much a factor for success as is methodological knowledge from Staufen consultants. "They always work with our employees in the various projects on an equal footing," says Verhülsdonk, "which meant that after expected initial uncertainty, a high level of acceptance was quickly achieved and we were able to work effectively in the various modules." Transparent and constant communication also created a sense of commitment, ensuring all employees that no effort would remain fruitless.



ANTHONY VAN DER LEY
Managing Director/Spokesman
of the Executive Board
LEMKEN GmbH & Co. KG



THILO GANDHI
Head of Operational Controlling
LEMKEN GmbH & Co. KG



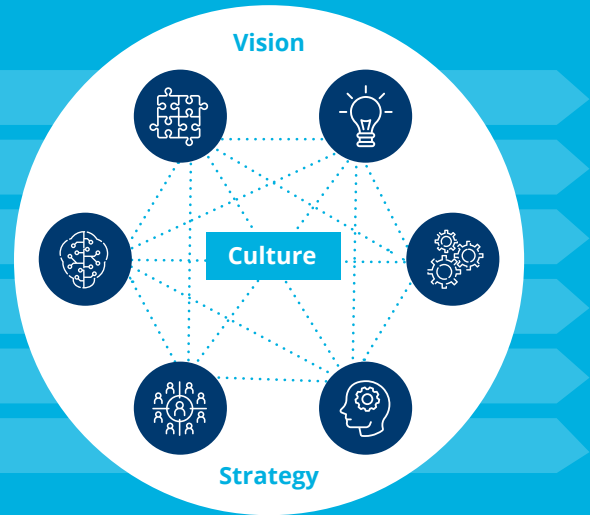
MARK VERHÜLSDONK
Design and Development
Project Manager "LEMKEN Excellence"
LEMKEN GmbH & Co. KG



“INTEGRATED CUSTOMER DEVELOPMENT”

Intervention & measures regarding organizational development

- Business models and markets
- Products and solutions
- Technology and IT
- Processes and structures
- Leadership
- Competencies and expertise



Project Management/PMO

OPERATIONAL MANAGEMENT

VALUE³

Achieving significant success as a result of sustainable and cross-functional optimization.

In order to be effective down to the core of the company, i.e. where change processes encounter defense mechanisms of the status quo, an interdisciplinary consulting concept is required that closely interlinks lean philosophy, technology development, profitability and organizational development (change management).

According to Staufen, integrated customer development begins with a shared understanding of the current situation and the causes of structural and cultural problems induced by competition, economic and social framework conditions, etc. for the current and especially future business model. Stringent, business-oriented project controlling and constant self-reflection through critical examination of the organization's change dynamics are indispensable enablers on the path towards transformation.





Clashing interests and clarifying prioritizations is certainly part of such a project. However, the vast majority of subprojects could be well differentiated from one another, regardless of whether they focused on optimization in an assembly line or in the paint shop. "This has worked very well, even though we had few established continuous improvement processes before," says Project Manager Verhülsdonk.

"Everything up to and including Shop Floor Management also worked digitally"

Many topics with a more overarching structure, such as product development processes, were initially very development-intensive, but when it came to pre-series or procurement issues, the production and purchasing areas also got involved. "These are often issues that are tough to implement because it is usually difficult to find a common vision of goals," Verhülsdonk says. Not all decision-makers were always immediately in agreement, so decisions sometimes had to be made in the steering committee.

Due to the COVID-19 pandemic, which broke out almost simultaneously with the start of "LEMKEN Excellence," it was not possible to carry out nearly as much in person as was once planned. "But everything up to and including Shop Floor Management also worked digitally," says the project manager. It also helped that digital solutions in some target images were available before COVID-19. Clear rules, which are common for lean projects, also provided the necessary level of discipline.

Quantifying success

Involving the controlling department early on was important and is not always a matter of course in projects of this kind. "Our approach was to make potentials and successes quantifiable. After a quick check together with the consultants from Staufen, we were able to continuously monitor the degree of target achievement for each project," says Thilo Gandhi, Head of Controlling at LEMKEN. "Involving the controlling department was clearly a success factor, because it always showed us whether our proposals could be mapped with the company's figures," agrees Staufen consultant Rainer Völker.

And even on the Lower Rhine River, a prophet has no honor in his own country. "For some subprojects, you actually had to wonder why we hadn't done this before," Gandhi reports. "It was helpful that the Staufen colleagues were able to back up all of the approaches with figures, so that the lean concept could quickly manifest itself in the minds of the employees."

The project's major impact was also evident in the portfolio review that was carried out. "We even parted with an entire product line," Gandhi says. "This area had long been criticized by many, and

Staufen encouraged us to take the decisive step of ending the field spraying product and make a clean cut here."

In addition, LEMKEN now also reveals and specifically allocates hidden costs that were previously distributed to all products as overhead surcharges using the watering can principle. To achieve this, an interdisciplinary team led by Staufen developed an assessment tool to record complexity efforts. Now it is possible to realistically evaluate savings achieved through targeted variant management in financial terms.

Read the article
"Variant management
at LEMKEN":
[www.en.staufen.ag/
variant-management-lemken](http://www.en.staufen.ag/variant-management-lemken)



"We discovered potential that we didn't expect at this level"

In addition, process standards were introduced, which now enables better coordination and has had a positive impact on the development of the company as a whole. And "LEMKEN Excellence" has also created significantly more transparency in the area of logistics. "We discovered potential that we didn't expect at this level," Gandhi said.

In addition, expenses are now communicated more openly, making employees more aware of what costs are really being incurred. "The relevant specialists from Staufen have shown us many great ideas for this. Ultimately, the degree of target achievement was 110 percent, which we are very satisfied with," says the controller.

Project Manager Verhülsdonk is also satisfied after a year and a half of "LEMKEN Excellence." However, he does not want to highlight any particular individual success. "That would be unfair," he says, "because a lot of hard work has been achieved in all areas." Improving processes, better managing complexity, preventing waste, and establishing new and clearer lines of communication ultimately benefit the entire company, he adds. This also applies to the expansion of partnerships with suppliers. "We pushed all of that forward, making LEMKEN much better in just a short period of time," Verhülsdonk says.

For Managing Director van der Ley, "LEMKEN Excellence" therefore remains a never-ending topic: "Lean Management will be established in our company on a sustainable basis. Therefore, we will intensively pursue qualifying our employees – also with the support of Staufen – and thereby be even better positioned for the future." ■



TEAM LEADERSHIP AND PERFORMANCE — THE BEST OF BOTH WORLDS

LEAN PROCESSES, SHOP FLOOR MANAGEMENT AND A FOCUS ON VALUE CREATION USING THE PROCESS FACILITATOR CONCEPT TO OPTIMIZE PRODUCTION, INCREASE EFFICIENCY AND REDUCE WASTE.

MOREOVER, EMPLOYEES ARE MORE SATISFIED BECAUSE THEY ARE SUPPORTED IN THEIR DAY-TO-DAY WORK BY A PROCESS FACILITATOR (TEAM LEADER) AND CAN THEREBY BETTER CONCENTRATE ON THEIR WORK AND VALUE CREATION. SOUTH AMERICA'S LEADING KITCHEN APPLIANCE MANUFACTURER MABE EXPERIENCED THIS IN ITS LARGE MEXICAN PLANTS.





COMPANY PROFILE

Mexican manufacturer of home appliances (refrigerators, gas stoves, washing machines, dryers and air conditioners)



1946

Founding year



70%

Market share in South America



Products are sold in

70+

countries



21,000+

Employees



400

B US \$ in sales

ORGANISATION & LEADERSHIP

INITIAL SITUATION

For some time now, mabe has been facing a new situation: Competition is becoming tougher and customer demands for product quality and customization are increasing. The company's management quickly realized that lean processes are one way of greatly increasing productivity and flexibility. Since the initially isolated

lean projects did not achieve the expected long-term results, the company turned to the lean experts at Staufen Americas. The focus was on the two most important Latin American plants: the Saltillo factory, which produces washing machines and dryers, and the Celaya plant, which specializes in refrigerators.



EDGARDO MORENO
Plant General Manager Celaya,
Mabe S.A. de C.V.

“The general purpose of this initiative is to improve our production processes in such a way that it helps us reduce our transformation costs. **We are looking to have capable processes and capable people.**”



APPROACH AND SOLUTION

Staufen developed a holistic approach for the two plants optimizing the value chain and preparing the two factories for smart solutions. As a result, problems such as long lead times due to high inventories or unused capacities were quickly resolved.

An important success factor is the Staufen approach to jointly developing processes and employees in order to achieve sustainable changes. The transformation was mainly to be implemented by mabe's internal team supported by Staufen consultants. The aim was to implement change from the inside out, so that employees were heavily involved right from the start. In order to anchor what was learned during the project, multipliers were exempt from their work for the project. They could then roll out the concept as internal consultants in other mabe plants. Hand in hand with Lean Transformation, all processes were prepared for digitalization.

Digital

- Automation
- New Technologies
- Autonomy



Shop Floor Management

- Process Facilitator
- Leadership on site
- Sustainability

Lean

- Operational Efficiency
- Redesign of Operation and Processes

SHOP FLOOR MANAGEMENT + PROCESS FACILITATOR CONCEPT

The first step during the Lean Transformation was to implement various Process Facilitators who are responsible for 5-10 workers. The Process Facilitator is 100% free from operative tasks and focuses on the conservation and improvements in his area. At the same time, the Process Facilitator tracks the main KPIs in his sector hour by hour. Based on this, the necessary data can be detected to resolve any upcoming disturbances in the value chain.

Staufen trained a total of approximately 200 employees to become Process Facilitators. For this, mabe primarily trained personnel who had been given the freedom to perform other tasks due to

the increased process efficiency. The Process Facilitator, being the key figure in this system, must pass through a six-step training program which provides the necessary tools, including problem solving, conflict resolution, and standardization, to prepare them for their future role. Lean coaches then accompanied the new Process Facilitators in parts of their daily tasks. The main supporting areas, maintenance, and logistics, were prepared in shorter sessions for their role in the Shop Floor Management (SFM) cascade. An SFM cascade with six layers was implemented in parallel to the trainings to provide the transparency necessary to work on problem-solving and process confirmation.



LAURA HERNANDEZ
Process Facilitator, Plant Celaya,
Mabe S.A. de C.V.

“We now provide support to the team so that when any problem arises in terms of safety or quality, they have the confidence to approach us. **I have seen a great improvement since we started with the project. We used to work with a different system. Nowadays, people know about all the processes we have in the factory right from the start.**”

MULTIPLIERS

Multipliers internally promote and coordinate Lean Transformation. They have the task of firmly anchoring the knowledge and experience gained from the project in the company. They coach and accompany the Process Facilitators in their new role and professionally support leaders with their lean competence in optimizing processes. The multipliers are also completely released from work to focus on the project. Afterwards, they are responsible for the roll-out in other company areas and plants.

LEAN AND SMART

Once the SFM and Process Facilitator concept have been implemented, the Lean Transformation of the processes and the implementation of the smart use cases can start. Along the whole process chain, 4 different 12-Week Kaizen Projects, such as Process Connections between different areas or Balancing of Assembly Lines, were carried out, to improve the performance of the value chain, which was the basis for the Smart use cases such as “Smart Workstations, Energy Management, and Quality Event Visualization”, just to name 3 of 12 use cases to be implemented. This process of first introducing Process Facilitators and SFM, followed by Lean and Smart interventions, is the key factor for success, sustainability, and Top Performance. By introducing Process Facilitators and Leaders of different areas to Lean Transformation, the ownership of each individual role is set, preserving the achieved results. The Process Facilitator also has to act as the guardian of the new developed processes.

The Staufen team optimized a variety of different value streams: from manufacturing of individual parts to the final assembly in the entire process chain. There were also targeted improvement projects along the entire value stream to increase capacity for the additional Process Facilitators and improve process efficiency.

RESULTS

At both Mexican locations, all process-relevant KPIs drastically improved during the first year. This improvement proved to be sustainable thanks to Shop Floor Management. Anomalies in production are now clearly visible for all employees, problems can be more easily prioritized and immediately resolved. Overall, efficiency rose significantly in both plants and costs caused by scrap also dropped dramatically.

In addition, employee satisfaction in both plants has risen sharply. The Process Facilitator system offers employees direct support and attention from management and the supporting areas. The Process Facilitators have also developed professionally and personally through their increased responsibility and targeted training. In general, the visibility of individual employees to corporate management has increased. They regularly propose improvements and contribute many ideas for further optimizing production. The greatly increased willingness of employees to make suggestions for improvement in their plants is a clear sign: The path of Lean Transformation will continue. ■



THOMAS EPPLE
Automotive Director Program
Management Europe
Marquardt GmbH



REACH THE GOAL FASTER WITH FRONTLOADING

IT'S FORBIDDEN IN SPORTS, BUT IT HELPS IN PRODUCT DEVELOPMENT: THE EARLY START. IN LEAN DEVELOPMENT, THIS IS CALLED FRONTLOADING AND IT HELPS SHORTEN DEVELOPMENT TIME.

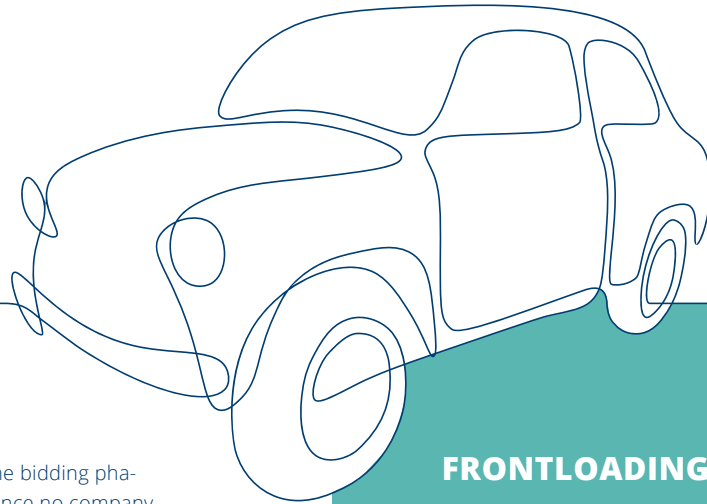
Electronic vehicle access systems – today's car keys – are highly complex high-tech products. They are usually only carried in jackets, pants or in a handbag. The driver moves toward the car and can open it. Then he takes a seat, presses the start button, and drives off. This feature is part of the current generation of Mercedes-Benz locking systems, for example, manufactured by the mechatronics company Marquardt, which is headquartered in Rietheim-Weilheim, Germany.

Risky bidding phase

Such an access system consists of numerous components, including a control unit, the key itself, and the locking systems for the doors. These components have to work together precisely and

perfectly. In total, such a "key" has to be easy to operate and offer protection against theft. Furthermore, it has to adjust flexibly to an OEM's entire portfolio.

As in every development project, the basic rule applies: if something is changed in a late phase of development, it affects other components of the hardware and software. Parts of the development cycle have to be repeated – this is an expensive proposition that all companies want to avoid. In practice, the bidding phase is especially risky, for this is when the framework for product development and the construction of the ordered device are specified. Later on, they cannot be changed or only with difficulty. Working with Staufen AG, in a pilot project, Marquardt GmbH developed a frontloading (see box) in order to be able to provide better, thus more reliable, bids in the future.



Development begins even during the bidding phase. This comes with a certain risk, since no company can win every call for bids. However, the project was very well-suited in this case. "Starting with a certain probability of the order being granted, frontloading is absolutely the right approach in the bidding process," emphasizes Thomas Epple, Automotive Director Program Management Europe at Marquardt.

Efficient work in the project space

In addition, with the frontloading project, Marquardt was not only able to optimize its bidding; in addition, thanks to its experiences, it was able to improve the product development process as a whole. Lean Development doesn't just mean starting as quickly as possible. It also means providing the teams with the best framework conditions possible. That's why Marquardt assembled a small but powerful team of cross-functional engineers and other experts from the company even during the first planning phase for the Mercedes-Benz project commissioned by Daimler AG.

This team moved into its own project space, which it occupied exclusively for the term of the project, and which enabled undisturbed work. There was also a temporal specification: the team members worked together in the team room on the development project every workday from nine to eleven in the morning. "This encourages concentrated, efficient work," says Dino Munk, Senior Partner at Staufen AG. „In addition, the people working on the project didn't have to keep reserving work hours.“

In practice, this spatial and temporal separation provided great benefits as compared to other ways of working, as employees are also frequently working on other projects and they also have everyday tasks they have to perform. Thanks to the strict temporal specification, it was easier to justify perservering on the project to supervisors and colleagues and to take care of other tasks only later on.

FRONTLOADING

In Lean Development, frontloading is part of a holistic-development approach that we recommend to our customers. Here, a manufacturer gathers as much data and information about the product as possible during the planning phase and links it to experiential knowledge from the specialized departments. In addition, a lean consultant integrates themselves into the manufacturer's team and provides the benefit of expertise. The team members work closely together for a certain period and develop solutions for wide-ranging tasks, for example for a new product design or marketing, sales or production concepts. The frontloading concept is especially well-suited for these tasks.



Manufacturer of mechatronic switching and operating systems



1925

Founding year



11.000+

Employees



20

Sites



4

Continents



1,2

B €
in sales (2020)



„Starting with a certain probability of an order being granted, **frontloading is absolutely the right approach in the bidding process.**“

The project space that could be locked and was only accessible to the team members increased efficiency, for the employees could always continue their work here. And of course, the project space also exists virtually. Thanks to the clear temporal specification, digital tools could be used very well in the project space – for example during the COVID-19 pandemic.

Customers will also profit from the faster development tempo

"In Lean Development, even simple changes to the way people work have a big effect," explains Staufen consultant Munk. "They eliminate waste; in this case the employees' time and effort." And this is precisely the concern with frontloading. The bidding and planning phases require more work than usual. But simply avoiding late and thus inefficient changes frequently

more than recoups the work in later project phases. Marquardt's customers also know how to appreciate these benefits. "Daimler told us that the process was very well-structured, and the product was very mature, also from the customer's perspective," says Thomas Epple. "Thanks to frontloading, the team was always in control of the situation and avoided unnecessary clarification loops."

The benefits of frontloading also became clear very quickly in everyday operation. The interdisciplinary cooperation speeds up projects and ensures that sales employees are able to communicate on an equal level with customers. "Thanks to frontloading, we can create more precise bids and complete acquired development projects more quickly," says Marquardt manager Epple, "and this benefits not just us, but also our customers." ■



LEAN & LEAD



AS OPERATIONS STARTED TO NO LONGER RUN SMOOTHLY IN HARMONIC DRIVE SE'S SALES DEPARTMENT, THE CONSULTANTS OF STAUFEN AG HELPED THE LEADING MANUFACTURER OF PRECISION GEARS AND SOPHISTICATED DRIVE

SOLUTIONS REALIGN WITH A LEAN APPROACH. THIS SUCCESS RADIATED ACROSS THE ENTIRE COMPANY AND HAS ONCE AGAIN LED TO SUSTAINED GROWTH IN SALES AND EARNINGS.



For years, Harmonic Drive SE in Limburg/Lahn had a steady stream of orders. Customers from the fields of mechanical engineering, robotics, medical technology, special environments, and aerospace ordered partially customized drive solutions. Business for shaft gear units and actuators was literally running smoothly. But after the worldwide boom in robotics, other players are trying to take over the market.

"At that time, we realized that the sales department had to be optimized and we had to react," explains Daniel Liedke, Head of Overall Sales, Design & Development at Harmonic Drive SE. The company management decided to bring in outside expertise. The consultants from Staufen AG were to help Harmonic Drive SE analyze new growth markets. The goal was to optimize and define new sales processes to bring customer acquisition back to previous levels.

From standard to customized – every sales process is different

First, the sales team and consultants took a close look at the sales processes. The sales department was divided into three levels and processes were reorganized. Today, Harmonic Drive SE distinguishes between a standard process, "semi-customized" process with

minor modifications to existing products and "customized" process with special customer requirements for which completely new innovations have to be developed.

"This separation has helped us move forward beyond sales, because within the three processes, customers' requirements and wishes differ very clearly," explains Dominik Kaiser, Sales Manager Germany. In the standard process, speed is crucial, he said. Harmonic Drive SE now ensures more speed here by streamlining the release processes as well as other measures. "Customized orders, on the other hand, involve developing and manufacturing products that only we can offer the customer. Here, the focus is on finding a solution," says Sales Manager Kaiser. In the customized process, therefore, industry experts are brought in at the customer acquisition stage right through to preparing the quotation, providing additional specialist knowledge at the start of the process. Subsequently, project management takes over.

Lead management ensures more orders

In the semi-customized segment, the company decided to approach customers even more actively to sell its drive technology solutions. "That was the catalyst for establishing lead management,"



“The probability for a series order is at 80 percent.”

DOMINIK KAISER
Harmonic Drive SE



Manufacturer of precision gearboxes and mechatronic drives



1970

Founding year



400

Employees



7

Locations around the world



100

M € in sales



“Small quantities and high variance, **that is where we are the undisputed market leader.**”

DANIEL LIEDKE
Harmonic Drive SE



DANIEL LIEDKE
Head of Overall Sales, Design & Development
Harmonic Drive SE



DOMINIK KAISER
Sales Manager Germany
Harmonic Drive SE

says Liedke, Head of Sales and D+D. To achieve this, clear task competencies were assigned to individual employees. Today, lead managers generate promising customer contacts and hand them over to field sales representatives, who plan on-site customer visits and thus form the spearhead of the sales force. There is still work to be done: "But what belongs together, grows together," says Dominik Kaiser. "Communication among employees is the key to success." For this reason, regular communication has been strengthened. Once a week, the lead managers coordinate with the sales representatives responsible for the sales regions and the technical office staff in a very structured manner.

In generating leads, the team initially focused on winning back customers who had once backed out because delivery times were too long at the time. The current focus is on acquiring new customers. Leads are also generated with technical support. Software tracks company visits to the Harmonic Drive website, where they can find out about products and download information, for example. If a company downloads CAD data, an email address must also be provided. Lead managers use these contacts to actively approach prospective customers. In addition, lead management in the future will look more closely at so-called "parallel applications" for semi-customized products.

"With the help of key performance indicators, we have given the topic greater commitment," adds Dominik Kaiser. "This is how we now control sales by means of key figures. And that gives us confidence."

Approximately 35 percent increase in order intake in the first half of 2021

The current business figures prove that Harmonic Drive SE is once again on the right track: Order intake increased by approximately 35 percent compared to the same period of the previous year. The company intends to grow further in the future, particularly in the area of special products. "Small quantities and high variance, that is where we are the undisputed market leader," says Daniel Liedke proudly.

In 2019, Harmonic Drive SE delivered around 30 prototypes; a year later, the Staufen project saw 123 prototypes, and by the end of May 2021, the number had risen to 125 prototypes, with the goal of cracking the 200 mark in 2021. "The probability of a series order is up to 80 percent," says Dominik Kaiser.

But this is not the end of Harmonic Drive SE's transformation. Lean management, which got off to a successful start in sales, is now being extended to other areas of the company with the help of Staufen consultants. ■

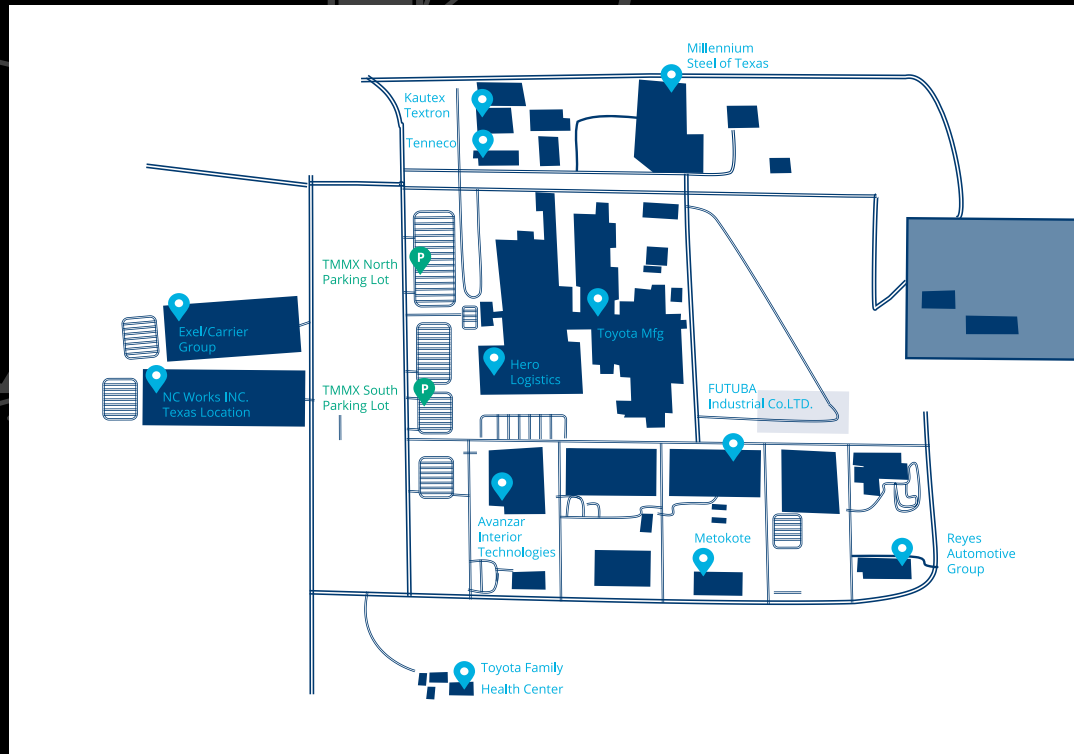


SUPPLY CHAIN NETWORK MANAGEMENT

WHO WOULD HAVE THOUGHT?

WE ARE IN DANGER OF NOT LEARNING FROM THE CRISIS: FROM SELF-DECEPTION AFTER INSUFFICIENT IMPLEMENTATION

FRANK KRAUSE
Senior Partner
STAUFEN.AG



Toyota Manufacturing and onsite suppliers, San Antonio, Texas

Flashback: You were advised more than 20 years ago to adopt a solution that would improve the process landscape. The solution consisted of an effect cycle involving three reinforcing measures. The goal? To reduce everything that the customer is not willing to pay for and thereby shorten the lead time. You called this form of potential "waste".

The first measure was to secure processes, the second was to link them together - or at least get them operating as closely as possible to each other. The third measure was to balance process times. All three measures should allow you to reduce waste because it would no longer be necessary if processes were "immune" to disturbance.

Increasing interlinking should increase implementation pressure to stabilize freedom from disturbances. The result would ideally be a disturbance-free and fully interlinked customer-customer process. J. P. Womack and D. T. Jones gave this process landscape a name in 1996: the "lean" enterprise and called for an end to the industrial "cold war" along the value chain.¹⁾

Back to the present: Much has changed since then. Numerous processes became more stable. Many processes were linked, but many - too many - forms of transport remained. Especially in global networks, the concept of "parts tourism" remained. Coordination between "customers" and "suppliers" improved. We are still a long way from an initiative to streamline the value stream that encompasses the participants in the value stream, as the two authors called for in their bestseller. Nevertheless, waste has been eliminated. Now, during the crisis, supply chains collapsed in

many places and the cause was quickly identified. The number of "safeties" should not have been reduced. Others said that the idea of "just-in-time (JIT)" was leading in the wrong direction. Processes are "always" unstable and reducing safety (stocks) is a dangerous path. That is what the crisis would have proven.

But is that true? This question will be answered in this article. To do so, it is necessary to look at the lean enterprise's maturity level regarding implementation. What was the maturity level of implementing lean principles before the crisis? How far had the two elements "disturbance free" and "flow" progressed?

A look at our "25 Years of Lean Management" study from 2016 shows: Only 7% of all companies had implemented elements of a lean enterprise. This was particularly evident in indirect areas. 20% of all companies surveyed admitted to having achieved only 20% here.

The current criticism of the JIT concept runs the risk of self-deception. It is not the idea of JIT that needs to be discarded - it is more urgent than ever. JIT is not the cause of poor delivery performance; rather, insufficient implementation of the principles has put us in this predicament. One could compare this with stopping an antibiotic treatment. A patient believes he already overcame an "illness," so he reduces the dose and the symptoms return.

So let's be honest and remember what we (should) have known for more than 25 years: JIT not only introduces freedom from disturbance in our processes (in direct and indirect areas), but it also interlinks individual processes so that waste can no longer



occur between them. This requires guiding principles that have been around for a long time: for example, insisting on working with suppliers that are "near-by," instead of "global parts tourism." The crisis has clearly shown the risks that arise when value chains are "spread" across the globe. Organizing interfaces requires hard work and fatal dependencies arise if they are torn apart.

Does this mean that we must abandon globalization or "roll it back"? No, but we should strive for what we learned in the mid-1990s with regard to value stream design: creating uninterrupted value streams. The idea of "local for local" has been around for a long time. It should be the guiding principle in the future. Let's do ourselves and the environment a favor and reduce transportation of information and materials to a minimum by creating complete and self-contained systems near to our customers. To achieve this, our valuation and cost accounting systems must be further developed - a "cost per unit" strategy no longer be the measure of all things. It must be worth something to us to transport as little as possible. The focus is on the lowest waste level operation of the value stream, not on the suboptimization of a part of the company, be it controlling, logistics or production. There are traditional examples, such as Ford's "River Rouge" plant from 1928, as well as many modern Toyota sites in the USA²⁾. Let's hear from James P. Womack, Founder and Director of the Lean Enterprise Institute:

“The ideal industrial future, of course, would be each of us producing our own goods in our basement. Right? Then everyone would have exactly what they need, at exactly the time they need it. Of course, this will not happen in this extreme form, but I believe that in the future we will see more and more production in relatively small, financially independent, operationally integrated units within individual sales regions. These factories will look like...well, like smaller versions of Toyota City.

Toyota is highly de-integrated according to a traditional understanding, which means that it produces virtually no parts itself. From a process point of view, on the other hand, the company works in an extremely integrative manner, engaging in brilliant joint process management with its first, second and third-tier suppliers. This is the future.”

JAMES P. WOMACK

Source: www.brandeins.de, article "Womacks Weisheiten"

¹⁾ James P. Womack, Daniel T. Jones: Lean Thinking: Banish Waste and Create Wealth In Your Corporation, 1996, page 351.

²⁾ See graphic: Toyota Manufacturing and onsite suppliers, San Antonio, Texas



DÜRR BRASIL COMMITS TO LEAN PRINCIPLES TO TRANSFORM ITS CULTURE AND GAIN CLIENT TRUST



Open training programs - international training groups

AS ONE OF THE WORLD'S LEADING COMPANIES IN MECHANICAL ENGINEERING AND PLANT CONSTRUCTION WITH SIGNIFICANT EXPERIENCE IN THE FIELDS OF AUTOMATION AND DIGITALIZATION, DÜRR NOW LEADS THE MARKET IN THE PROVISION OF HIGH-TECH MACHINES AND ROBOTIC TECHNOLOGY FOR THE AUTOMOTIVE INDUSTRY.

WITH FACILITIES STRATEGICALLY LOCATED IN SÃO PAULO, THE UNIT SERVES THE ENTIRE SOUTH AMERICAN MARKET, AND SINCE IT BEGAN ITS LEAN TRANSFORMATION JOURNEY, IT HAS DISCOVERED THAT NOT ONLY IS ITS TECHNOLOGY A MAJOR ADVANTAGE TO ITS SUCCESS. ITS PEOPLE ARE AS WELL.



“I decided to make a **commitment in people.**”

ROBERTO TKATCHUK

President
Dürr Brasil Ltda.

WE SPOKE WITH ROBERTO TKATCHUK, WHO HAS BEEN PRESIDENT OF DÜRR BRASIL FOR MORE THAN 10 YEARS. WITH A DEGREE IN ENGINEERING, HE RECALLS THAT HE RESISTED CHANGE IN THE CULTURE AT THE BRAZILIAN SUBSIDIARY FOR MANY YEARS. HOWEVER, FOUR YEARS AGO, HE MADE THE DECISION TO BRING THE CHANGES THAT HAD BEEN IMPLEMENTED IN GERMANY TO BRAZIL, AND TODAY HE IS ONE OF THE GREATEST ADVOCATES FOR LEAN TRANSFORMATION IN BRAZILIAN INDUSTRY AS A WHOLE.



BIETIGHEIM-BISSINGEN TECHNOLOGY CENTER

In Bietigheim-Bissingen, Dürr operates the world's largest technology center for paint application systems in the automotive industry. This is where new products are developed and painting processes are tested prior to large-scale use.

Mechanical engineering and plant construction



1896

Founding year
DÜRR



1964

Founding year
DÜRR Brasil



120

Locations



33

Countries



17.000+

Employees



Roberto Tkatchuk, how was the transformation experience at Dürr and, above all, what was it like to lead this transformation? Did you always have confidence that it would work?

I spent many years of my life taking management courses. And the big problem in the corporate world is that you listen, but you don't experience it, you don't really feel it firsthand. I am a typical example of this. As an engineer, I realize that the flaw in my thinking was always to think that we can solve everything with procedures and rules, machines, devices and computer programs. Simply by telling people what to do. This was my mistake.

After more than 30 years working in this area, and incidentally I got hit hard for not being able to find a magic formula on how to increase my team's efficiency, I finally made my latest commitment four years ago. If I could go back in time, it should have been my first. I decided to commit to people. I came back from a meeting at headquarters very excited about what I had seen. They were starting to apply Lean Principles there. I thought to myself: This is easy, I can do this myself. I'll just hang some posters on the wall. Obviously, that didn't work. That's when we met Staufen. We started working together, focused on management teams. To be honest, at this stage I was already convinced by the Lean Principles, but it needed a lot of patience from the entire Brazilian team to make this change. It's a long process, it doesn't happen overnight. It is something that is never finished.

We are always reviewing concepts and improving our processes. Over time, we were able to convince people. We had a reasonable initial take-up by senior management. Then, little by little, at operational level – particularly the engineers – the staff started to see the results and were willing to commit. It was a very natural process, but, no doubt, it has to be a top-down process.



7-AXIS

The new generation of 7-axis robots EcoRP E043i



In what ways has the implementation of Lean Principles had an impact at Dürr so far?

When we talk about Lean Principles, we always quote numbers, right? Today, here at Dürr, that days of “creating indicators that keep the boss happy” are over. The indicators now serve a useful purpose, and each person understands what they are doing and how they are doing.

In the past, indicator management focused on pleasing me. Now each manager works based on their own indicators, focusing on the real needs of their area.

The idea of how to bring about improvement was also something that came from the top. Now I don't have to do that anymore. It has

become ingrained in the culture. Each employee prepares their own improvement projections and takes responsibility for them.

We have been having positive results for several years. Yet there were a few Lean Principles that improved our results even more and created stability. We have been acquiring exclusive contracts in a highly competitive environment. We have created a transparent relationship with our clients based on Lean Principles, which has enabled us to have this trust and partnership. Now we bring our clients inside Dürr, so that they can become acquainted with our processes. In fact, we even ended up making this a marketing strategy for us. When they come here and experience how transparently we deal with information, handle mistakes and raise and resolve issues, their trust in us grows stronger.

OPERATIONAL MANAGEMENT



MADE IN GERMANY FOR THE WHOLE WORLD

All of Dürr's painting robots are assembled and programmed at the Bietigheim-Bissingen competence center. They then start their journey to automotive plants around the world.

“Beyond indicators, Lean Principles have become a marketing strategy that demonstrates our transparency and bring us closer to our client, **creating a relationship of trust and partnership.**”



What are the expectations for post-crisis?

In relation to the Lean journey, our thinking today is to solidify and consolidate everything we have constructed up to now, and to work on what is coming up.

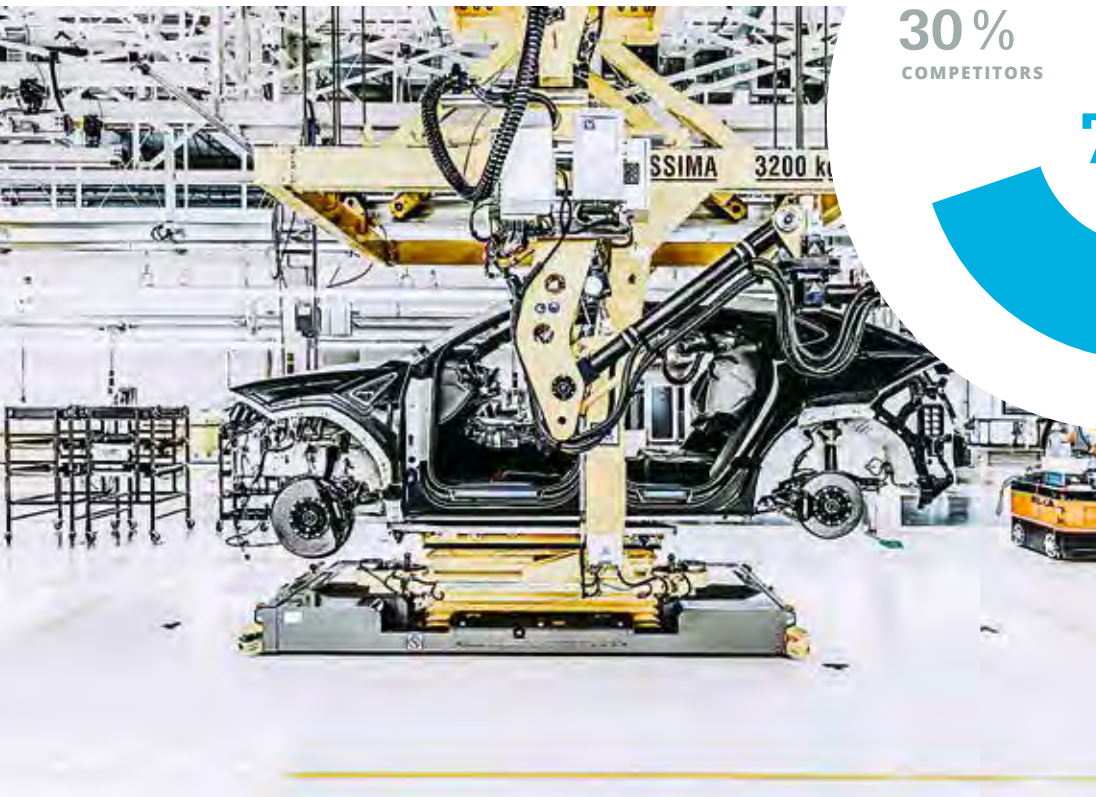
We have our feet on the ground when it comes to current economy. The automotive industry is still undergoing a huge transformation, dealing not only with the issue of electric cars, but the crisis as well. In fact, this has been talked about for many years, but automakers

and oil company lobby have taken steps to delay this process. Due to the pressure from global markets, this issue is now gaining momentum. Currently, no one anywhere around the globe is investing a single penny in the conventional auto industry.

“Market Share
Factory
Construction”

30%
COMPETITORS

70% **DÜRR**



FINAL ASSEMBLY

Dürr offers worldwide turnkey solutions for new plants and modifications for automotive final assembly.

Dürr is the world leader in factory construction. We currently have 70% of the market. In the United States, 80% of our current portfolio represents electric car startups – around 20 companies. In addition, 50% of our net sales come from China, where we have something like 50 clients that are electric car startups. It is a new market, and it will consolidate. What we do know is that the rules of the game have changed.

In global terms, Dürr currently invests from 5 to 8% in research and development, such as for example testing self-driving cars, battery manufacturing, etc. Nonetheless, Brazil is still a problem in this regard. We are falling further and further behind. Industries outside Brazil first have to amortize their current investments through exports and not until then, after around 10 years, can they start investing here.

With a little bit of forward-looking thinking, I can see that our conventional automotive industry is going to slowly die over the next 10 to 15 years. Our big advantage here at Dürr is that we are familiar with the new technologies outside the country. I teach my clients in Brazil everything they need to know about technology. My competitors are either broke or they are in very bad shape. Even though the market has declined considerably, the situation we currently face is one of reduced competition. Yet, I am not so arrogant as to think that now these clients will have no choice but to accept me. On the contrary, we set out to create win-win partnerships. And, thanks to Lean Principles, this has been strengthened a lot. ■



HOW ADAPTABLE IS MY COMPANY?





DR. BAYAS-LINKE
Principal
STAUFEN.AG

LISTEN IN:

Podcast with Dr. Dirk Bayas-Linke
www.en.staufen.ag/podcast-change



THE "SELF-CHECK FOR CHANGE READINESS" IS INTENDED TO HELP COMPANIES AND MANAGERS MAKE AN INITIAL ASSESSMENT, ACCORDING TO DR. BAYAS-LINKE, PRINCIPAL AT STAUFEN AG:

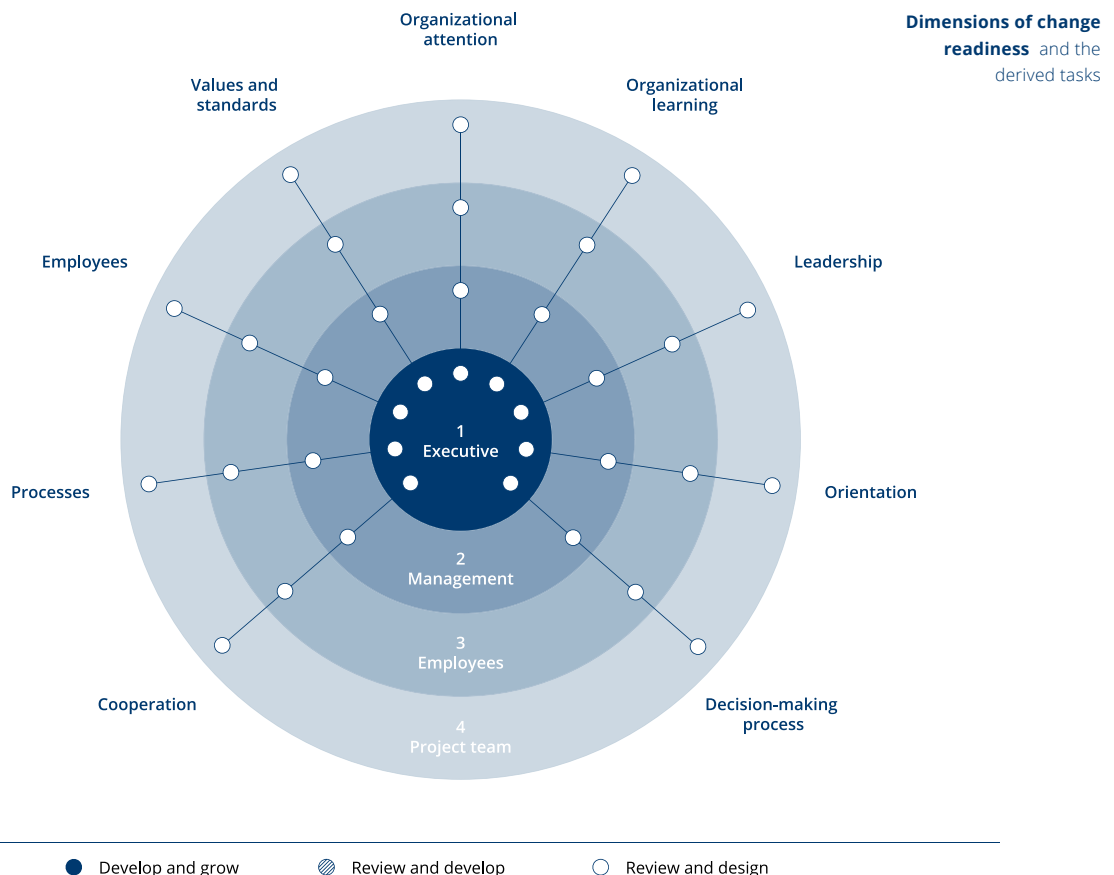
Dr. Bayas-Linke, what does adaptability actually mean to you and why is it clearly important for companies to be so?

The world is constantly undergoing change. That is nothing new. The novelty lies more in the speed of change and the increase in complexity. New competitors, individual customer needs, crises, social currents, disruptions, fragile supply chains, a wide range of business models or hybrid organizations - all these are possible responses we receive from our customers. Adaptability has been a highly relevant topic for companies not only since Corona, and a lacking of it can sometimes threaten a company's very existence.

If adaptability is so important, how can I determine where we are as a company and whether we are also able to meet these changed challenges?

The first step is for companies or executives to address this issue. And this question troubles some, explicitly or by causing inner insecurity. We have noticed this more and more in customer projects. We have therefore turned greater attention to this topic and developed the "Self-Check for Change Readiness," which provides an initial assessment of your own ability to change.

ORGANISATION & LEADERSHIP





How does this initial self-assessment work?

The "Self-Check for Change Readiness" is based on an open and honest self-assessment. A relevant theoretical basis and models were used as a guide. Based on this, Staufen designed a heuristic that takes into account nine key dimensions of adaptability, e.g., organizational mindfulness, the design of decision-making processes or an organization's ability to learn as a whole.

In the first step, the company classifies the relevance of the dimension for its own business. Not all dimensions are equally important for all industries, market, and environmental conditions. This gives each company the opportunity to define its own relevance network. In the second step, the dimensions are reviewed again, each with four sub-questions, and the current proficiency is estimated - and as honestly as possible, since it is initially only for the company itself.

What is the result and what can I do with it?

As a result, you will have two spider web graphs: a benchmark and your self-assessment. You will also receive three recommended measures for each dimension, depending on your score. And then it is your turn. Take a closer look at the dimensions and their characteristics. Are the instructions for action coherent and can be carried out? If relevant issues arise there, one option is to broaden perspectives and approach possible sparring partners in the company to compare further results. Another option is to discuss and reflect on the results with management.

Does that mean I can use this as a recommendation to stimulate an internal discussion and get on the right path?

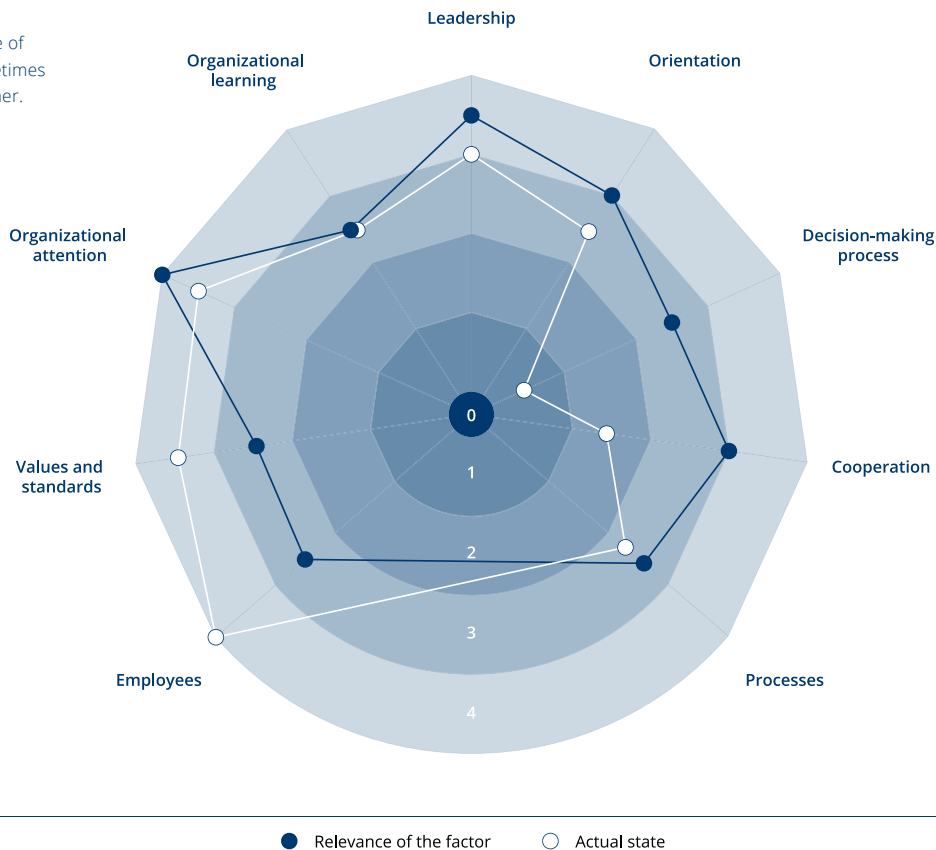
Exactly. The recommendation can also be used to start an internal dialog and take a closer look at where you need to become more adaptable in order to remain responsive. It is always exciting to see how different the self-assessments are within the same company. But that is also a good thing, because you get to talk about differences, which can be helpful. ■

HOW ADAPTABLE IS YOUR COMPANY?

Take the
free self-check:

www.en.staufen.ag/change-readiness-check

Gap in knowledge:
Relevance and degree of implementation sometimes deviate from each other.





SUPPLY CHAIN NETWORK MANAGEMENT

ROBUST SUPPLY NETWORKS: REQUIRED TRANSPARENCY IS STILL MISSING



PROF. DR. THOMAS FRIEDLI
Director of the Institute of Technology Management and Professor of Production Management
University of St. Gallen



THOMAS SPIESS
Member of the Executive Board
Staufen.Inova AG



TRADE BARRIERS, ENVIRONMENTAL CONCERNS AND, NOT LEAST, THE COVID-19 PANDEMIC HAVE HIGHLIGHTED THE IMPORTANCE OF ROBUST SUPPLY CHAINS IN RECENT MONTHS. YET THE MANAGEMENT OF WORLDWIDE SUPPLY NETWORKS IS STILL BEING NEGLECTED BY MANY GLOBALLY OPERATING COMPANIES. DR. THOMAS FRIEDLI, PROFESSOR OF PRODUCTION MANAGEMENT AT THE UNIVERSITY OF ST. GALLEN, AND THOMAS SPIESS, MEMBER OF THE EXECUTIVE BOARD AT STAUFEN.INOVA AG, SHOW HOW IMPORTANT REDUCING COMPLEXITY IN VALUE NETWORKS WILL BE FOR THE SUCCESS OF COMPANIES IN THE FUTURE.

Professor Friedli, what is the biggest challenge for industry and globally active companies with regard to robust supply networks?

Friedli: For years, the biggest challenge has been the question of how to make the complexity of a network so transparent that good and well-founded decisions can be made. The pandemic has not changed this. Up to now, a large part of optimizing the production areas of many companies has always been related to a single location. In the Industry 4.0 hype, this approach led to digital showcase factories, but the digitization driven in this regard offers absolutely no perspective for networks.



How does the University of St. Gallen support companies in developing such a network perspective?

Friedli: By developing models that help them create transparency. Because that is the basis for having the right discussions and making the right decisions. After all, we already see the goals slowly changing. Before the pandemic, the focus was almost exclusively on traditional 'competitive priorities,' such as costs, time, flexibility, quality and innovation. Now, robustness and resilience are at the top of the list.

Staufen.Inova AG has also been advising customers on supply chain network management for years. Mr. Spiess, what has changed in companies over the past five years?

Spiess: Instead of just making individual factories transparent, some customers have now started to look beyond the factory grounds. Bosch, for example, is in the process of making its own factory network transparent, with no less than 240 plants worldwide.

What do customers need to focus on in the next few years as they transform to a glass network?

Spiess: Companies have to identify major levers. You cannot just look at the company's own networks, you have to look at the supplier network and the distribution network all the way to the end customer. And they must learn to manage these complex value networks. The pandemic turned the focus onto the

topics of robustness and collaboration, as supply chains suddenly began to falter or even break down completely.

The complexity of supply networks is often only apparent when cross-site and cross-process projects are implemented. What do you recommend in such situations?

Spiess: One approach to reducing complexity is to segment and structure the network. Corporations need to look at where there are similar processes that they can treat and manage the same way. Another topic is shortening the supply chain and finding interfaces to other areas. This is where modeling can yield interesting results. And ultimately, someone in top management must manage the topic of networks.

The University of St. Gallen and Staufen.Inova, together with the Swiss Innovation Agency Innosuisse, are launching a research program on the topic of robust production networks. What is the main focus?

Friedli: We know that a network is often reduced to typical footprint decisions. When it comes to production, this can lead to relocations, reassignments or site closures. Of course, you can always produce somewhere cheaper. But there is another lever for robustness and resilience: overall coordination within the network. We want to look at why overall coordination has been poorly addressed or not addressed at all so far, and most importantly, how it can be



SUPPLY CHAIN NETWORK MANAGEMENT



“Before the pandemic, the goals were almost exclusively focused on traditional "competitive priorities" - costs, time, flexibility, quality, and innovation. **Now, robustness and resilience are at the top of the list.**”

PROF. DR. THOMAS FRIEDLI
University of St. Gallen





“Instead of just making individual factories transparent, some customers have now started to **look beyond the factory grounds.**”

THOMAS SPIESS

Staufen.Inova AG

improved. Because if a company can reach decisions there today, it can implement them tomorrow. A site closure, on the other hand, usually drags on for years.

What role does Staufen.Inova play in this research program?

Spiess: Staufen.Inova forms the bridge to the practical world, i.e. between universities and companies participating in the project. We contribute an end-to-end way of thinking. My role in particular is also to recruit additional companies from our customer base and network that are interested in robust production networks as project participants.

Professor Friedli, one final question: Cost pressure and global specialization in individual steps of the value chain have become challenges for corporations and SMEs in recent years. How can companies meet these challenges in the short and medium term?

Friedli: Many industrial companies have taken production for granted in recent years, sometimes completely losing sight of it. This has led to some serious missteps. Because operational excellence continues to play a crucial role. The motivation to also keep improving production must be maintained. And importantly, digitization must not become an end in itself. But it can help improve overall coordination and thus the robustness of their networks. Companies must not hesitate to use leverage to establish transparent supply chains. ■



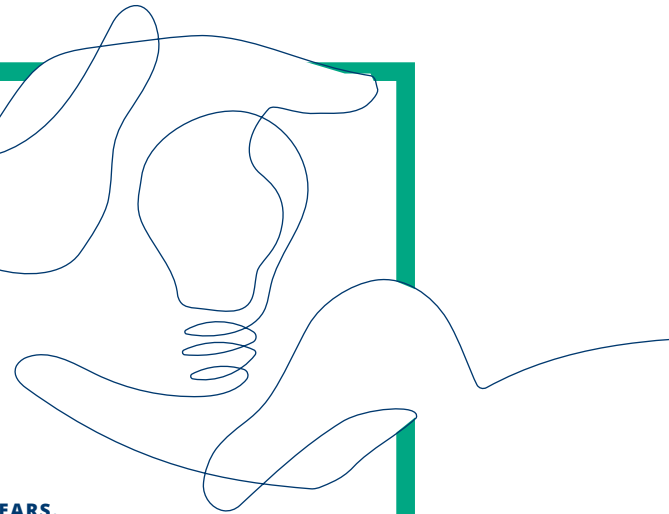


"THESE DAYS BEING ON TIME AND WORKING HARD IS JUST NOT ENOUGH!"





ANNA KOPP
Director IT Germany
Microsoft Deutschland GmbH



ANNA KOPP HAS BEEN WORKING AT MICROSOFT FOR MORE THAN 16 YEARS. HEAD OF IT SINCE 2015, SHE IS IN CHARGE OF THE TECHNOLOGY COMPANY'S OFFICE IN MUNICH. A POWER WOMAN WHO LIKE NO OTHER EXECUTIVE HAS LIVED AND BREATHED NEW WORK FOR YEARS.

What kind of impact has the digital transformation already had on the world of work?

To quote our CEO, Satya Nadella: "During the pandemic, we experienced two years of digitalization in the space of two months." Many companies took the first step on the "new work journey" and suddenly realized: It does work. We can work from home and still manage people and trust them. Still, many companies have not reached the point at which they can be truly efficient, because the culture is just not right yet.

Can you be a bit more specific?

Over the past few months, we have received quite a few inquiries from customers wanting to know how we do things at Microsoft. Since 2014, trust-based working hours and the trusted place of work have been an integral part of a company agreement and the corporate culture. That is critical to the success of the transformation. Because companies can digitalize as much as they want, but if the culture does not match, all the tools in the world won't bring about the desired results.

And so, the first step is for managers to learn to trust. Many managers have a hard time with that. What can companies do to be supportive here?

Middle managers must learn new ways to lead their team. These days, being on time and working hard is just not enough. What counts is that they are self-motivated and results-driven. That's why managers need to have conversations about goals and the quality of work, and keep reviewing both. That's a big change. Every company should develop its own conversation guide and give some thought on how it will reward its employees in the future.

Will companies of the future still have middle management levels?

That depends on the team. Today, companies still have many homogeneous teams that all bring the same knowledge to the table. The more diverse teams are, the more efficient they are. They have more ideas, complement each other, have more fun. Each individual might have to bear more responsibility and the team can work well together without a manager. The more competencies are brought to the fore, the flatter hierarchies become.

What will the workplace look like 10 years from now?

People want to work alone and be focused, but they also have a basic need to work with others. That's why the office will become a place where employees will meet, exchange ideas and work together creatively.

Which companies will ultimately come out ahead in the digital transformation?

It will be those companies that are able to develop digital business models before anyone else does. They are the ones that consistently question themselves, constantly reinvent themselves, and have the courage to completely replace and retool themselves if necessary. Companies that work according to the motto: Uber yourself before you get kodaked. So, the companies that apply digital business models, ensuring that they don't repeat the same failures that Kodak experienced. ■



COOPERATION AS THE KEY TO SUCCESS

Excerpts from the "Collaboration 2021" study

Even before COVID-19, the topic of collaboration was in need of improvement. Because of the pandemic and especially in the period after COVID-19, the topic will be existential.

When the wind shifts, the team must know how to act. During the COVID-19 lockdown, collaboration has changed dramatically in many companies. Working from home, modified shift schedules, and

distance and hygiene regulations have turned once busy factory halls and office floors into non-communication zones in many places.

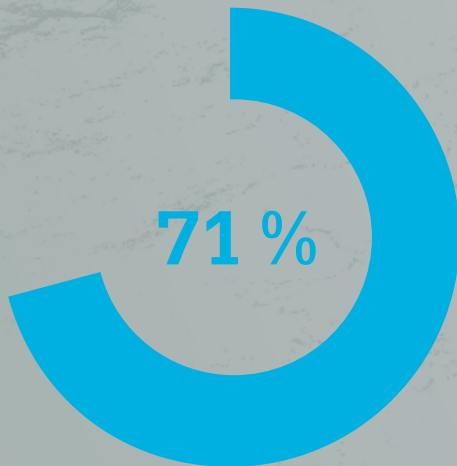
The truth is, however, that even before that, not everything worked well in terms of collaboration. In our study "Collaboration 2021," we took a closer look at "collaboration as a factor for success."

ORGANISATION & LEADERSHIP

COVID-19 Stress Test

Megatrends such as digitalization, flexibilization and internationalization, as well as increased cost pressure have significantly changed the requirements for collaboration in companies. The crisis acts like a magnifying glass here.

THE COVID-19 PANDEMIC PUTS THE COLLABORATION AMONG COMPANIES TO THE TEST



... of all companies state that their collaboration is suffering specifically as a result of the COVID-19 pandemic.

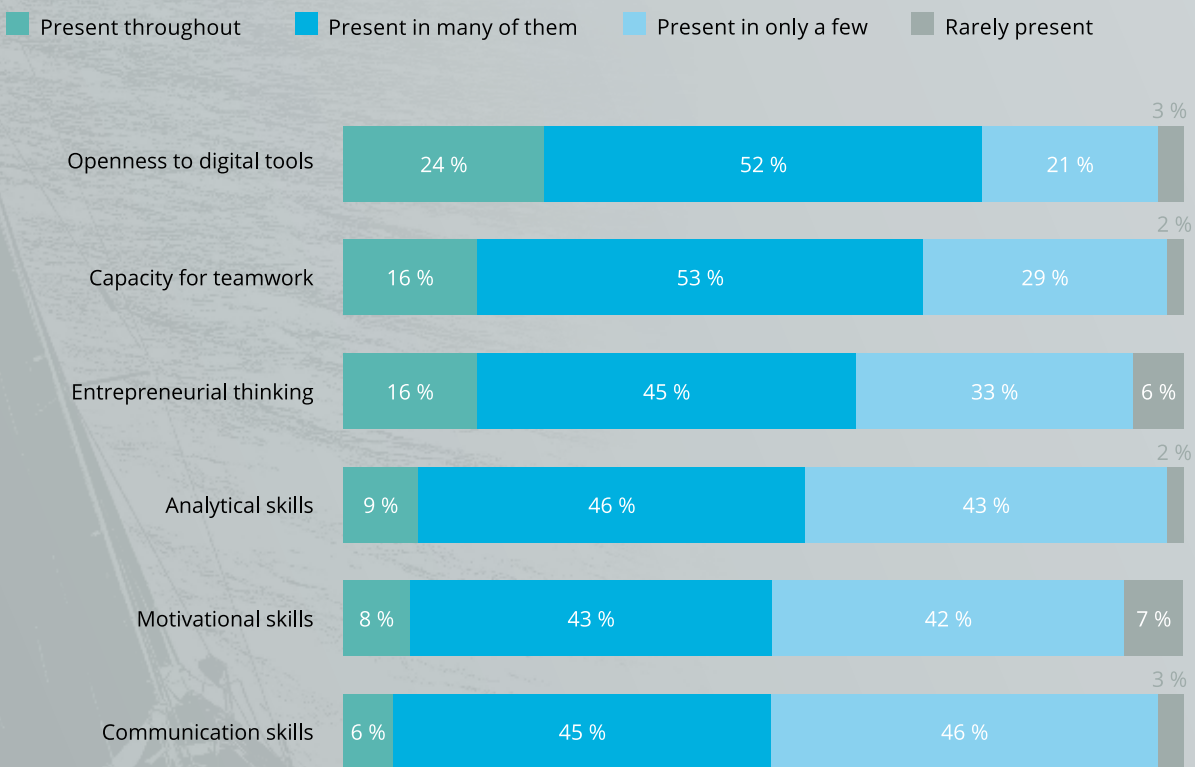
In three out of four companies, collaboration is currently noticeably suffering from the effects of the COVID-19 pandemic. Only one in five companies can at least come close to maintaining the pre-crisis level. In one in four companies, on the other hand, collaboration as in the past is only possible to a maximum of 50 percent at the moment. The most important reason: lack of informal exchange. Cafeterias and kitchens are no longer used as communication centers; short discussions with a colleague or a spontaneous trip to the office next door are obviously difficult to replace virtually.



Key Factor: Leaders

Leaders play a central role when it comes to collaboration. How would you rate the following skills of your leaders?

MANY LEADERS NEED TO UP THEIR GAME WHEN IT COMES TO SKILLS



Recognizing and remedying such deficiencies are clear management tasks. However, most companies do not give their managers a good report card when it comes to collaboration. Only in around one in two companies do the majority of managers excel in their communication skills. There is still great room for improvement when it comes to teamwork. On the

positive side, supervisors in three out of four companies are open to digital tools. In order to leverage this potential, however, a cultural shift is needed in many companies. Because every second manager fears losing their sense of authority due to working from home and other similar measures. ■



Find here more information about the study „Collaboration 2021“:
www.en.staufen.ag/study-collaboration



DIGITAL SHOP FLOOR MANAGEMENT: WORK TOGETHER ON-SITE AND AROUND THE WORLD

Archimedes, Leonardo, Galileo, Liebig, Bell, Benz, Edison – in the West, people like to tell the history of technological progress as the story of individual geniuses and their brilliant inventions. However, anyone who reads deeper into the history of humanity soon realizes that this isn't the way things work. Cooperation is the mother of progress. People are made to work together. Even the construction of Noah's ark required teamwork, as the safe landing of the rover Perseverance on Mars in February 2021 certainly did. As does everyday work in production.

The history of productive cooperation is also the history of technologies that people use to successfully organize collaboration. The people who built the Tower of Babel were successful as long as they had a common language. So, it's no wonder that not just the construction of towers was invented in ancient Mesopotamia, but also writing and numbers. For people who record experiences and procedures and can pass these along have a clear advantage when it comes to planning and executing complex processes.

Fast forward to the 21st century

Clay tablets have been "out" as a process management tool for more than 2,000 years; instead, Shop Floor Management, whether for the construction of Cologne Cathedral or the assembly of electric vehicles, has been done using paper. And this has been extremely successful. But currently things are changing a lot in the environment in which Shop Floor Management systems operate; on the one hand, the individual shop floors are incorporated much more closely into cross-functional and globally operative organizational structures. For somewhere in the Swabian Alb, Germany, a

chipping machine has broken down, and this has direct effects on the final production of a car in Slovakia. On the other hand, today many processes at a company are digital – from process planning to controlling and accounting. The interface between paper-based Shop Floor Management systems and digital management systems such as ERP and MES is usually the email account of the person responsible for the process, and perhaps also a confusing Excel file. For comprehensive planning, control, and management processes at companies, the valuable data and information that has already been produced is thus as good as lost.



Collaborate worldwide: cross-functional and problem-oriented

Or people try to use one of the numerous planning and collaboration tools on the market to cobble together a Shop Floor Management system. Usually there, you're fighting with a similar problem as with email: disorganized, difficult-to-search floods of data that are stored in countless app accounts and on end user devices so that they are not universally accessible. You can't really blame the tools used: classic paper-based Shop Floor Management systems are optimized for planning and controlling flows and processes in production and registering deviations from planned flows and transferring these into structured problem-solving. All of this with a high degree of agility and spontaneity that arises from the team-oriented leadership philosophy of this management approach. Mapping this in "normal" digital collaboration or visualization solutions isn't that easy.

Identify and solve problems more quickly

This is where ValueStreamer's digital Shop Floor Management begins: everything that has previously been recorded and documented in analog fashion is recorded digitally – and can therefore be searched and analyzed. But this web-based software solution can do still more: thanks to digitalization, the individual shop floors can be networked with one another, even across different locations, and incorporated into the usual global ERP and management systems. This way, the data and information that they need to control the productivity and quality of their processes is available directly to the people responsible for the line. The software also represents the single point of truth for all participants. Globally distributed teams and teams working across disciplines can also collaborate in real time without a loss of information and without unstructured floods of emails and messages. The training phase for digital Shop Floor Management is short, even for newbies. The user interfaces are optimized for intuitive use. Depending on their defined role, each team member has access to precisely the processes and data that they need in order to perform tasks independently.



DIGITAL SHOP FLOOR MANAGEMENT

enables the availability of data from all boards of the entire, global corporate cascade



ValueStreamer lifts classic Shop Floor Management to an entirely new level of collaboration: global, across teams and and business sectors, always up-to-date, and without friction losses. ■

PERSEVERANCE

Marslanding





TRANSFORMATION IN THE BRAZILIAN CONSTRUCTION INDUSTRY

RODRIGO OSMO
CEO
Construtora Tenda S.A.

HOW TENDA, BETTING ON HIGH PERFORMANCE, EXPECTS TO GROW IN THE COMING YEARS

Tenda is one of the main construction companies in Brazil, providing affordable housing to an increasing number of families investing in first-time home ownership. All projects are launched within the 'Casa Verde e Amarela' Government Program, aimed at families with a gross monthly income of up to R\$4,000.

The construction company recently invested in the purchase of a wood frame factory — wooden components that are joined together to assemble houses. The goal is to produce around 10,000 units per year by 2026.



Tenda's new vision came after a great amount of internal reflection. It debated on whether to continue to be a great cash generator, stable, but with limited development, or to take advantage of external expertise to start a new business cycle and eventually chose the second option.

We talked to Tenda's CEO Rodrigo Osmo about the Transformation Journey that the company has been undergoing and its plans for the near future.



Tenda is currently one of the largest construction companies and property developers in Brazil, with a focus on the affordable housing segment. With the support of Staufen, the company has spent seven years investing in becoming more efficient and productive to ensure that it is able to meet its completion dates – optimizing resources, on time, and with quality. How do you assess Tenda's transformation in recent years?

The company has an “industrial approach” as a strategic differential within its business model. With our continuous improvement and gains of scale, we were able to create a virtuous cycle, allowing us to reduce our costs by more than 30% during this period, and thus making us the player with the lowest execution costs in the market. Our next step will be to migrate production from an on-site to an off-site system, further leveraging our industrial approach.

Civil construction, despite being one of the largest economic sectors in the world, is also considered to be one of the most inefficient. There is a lot of waste and losses in the segment (with materials, equipment, labor, etc.). How does Tenda combat this waste?

We calculated that 60-70% of the labor component of each apartment constructed was wasted. The number seems huge, but those who are familiar with construction sites can see this waste everywhere: in high wait times between activities, in periods during which contractor employees have to stop to wait for a project to start, in materials not available for immediate use.

We decided to tackle this waste with an industrial approach, by accepting help from Staufen. We structure our production so that it has continuity and rhythm, that is, the same execution team produces the same number of apartments every day, non-stop, on different plots of land, like a production line. In doing so, we apply several Lean Manufacturing concepts to this long production line, eliminating waste and improving processes with each unit that is produced.

Tenda has announced a major investment in research & development over the past two years. What are the biggest lessons learned in terms of productivity and efficiency gains, which are going to be essential for these current times?

The greatest motivator was addressing a limitation in our capacity to continue growing. Current construction methods require a high minimum local scale of 1,000 units/year in each city. There are only 13 cities that support this scale of operation, and we already operate in 9 of those. On the other hand, off-site construction, producing the houses in a factory environment and only assembling at the construction site, would allow us to substantially increase target markets and reach small and medium-sized cities across the country.

Largest construction company in Brazil with focus on affordable housing for families with a gross monthly wage of up to € 670



1969

Founding year



4.551

Employees



2,28

B R\$ turnover (2020)

Tenda recently delivered the first construction projects using timber frame technology. What are the expectations going forward?

We expect to operate on a pilot scale at this learning stage through 2021 and 2022, then accelerate production in 2023. The challenge is significant: We aim to reach the production capacity of 10,000 units/year at the first factory in 2026. We want to grow on-site activity by 10% to 15% per year, launching close to 30,000 units in 2026. It is an ambitious plan. We launched 18,000 units in 2020.

There has been a lot of talk lately about committing to ESG. Is the investment in timber also linked to sustainability issues?

For a company like Tenda the ESG theme is in our soul. We have been collaborating in efforts to reduce the housing deficit in the country by building decent, quality homes for a public that cannot find alternatives in the market.

Another aspect where ESG principles are being applied is in off-site design. We chose to go forward with timber frame technology, which uses reforested timber as its main component. This construction component has significant environmental impact, “sequestering” CO₂ from the environment, unlike traditional construction methods.



Talking a little bit about the context of the Covid-19 pandemic. What were the main impacts on Tenda's business and what decisions have been taken to reduce those impacts?

This year, the pandemic situation placed us in a natural remote working experience.

On the one hand, we found more efficient ways to manage our daily routine. Online meetings started and ended on time. We no longer wasted time on setting up rooms and projectors that don't work properly. Full days of travel have been replaced by meetings lasting 2 hours.

The downside of the excessive efficiency of remote work is the de-personification of employees. Informal ties are compromised, we stop noticing the subtleties of facial expressions, we no longer have relaxed lunches, in which we can strengthen relationships and reflect on topics that are important, but are not so urgent that they are added to the agenda of a structured meeting. In addition, we also miss out on collective interaction as an element that helps us spice up innovation and creativity.

I don't believe we have yet found an ideal balance between the efficiency of remote working and the importance of contact on a personal level. We have been testing many new working concepts, but we still have a lot to learn.

As company CEO, how do you assess your role in leading this company in the face of all these challenges? And what do you personally expect from the next few years?

The company's accelerated growth, the need to undergo a cultural transformation and the stress in personal relationships arising from this new form of remote working (which is here to stay) demand that we make changes in how we lead.

I will have no choice but to move away from the more operational topics, because they have become unmanageable, and instead focus on providing the proper context for the company, both in terms of strategic vision and in culture. Now I have the important role in ensuring that our talent density continuously grows on par with the business. ■



OPERATIONAL MANAGEMENT

“We have been collaborating in efforts to reduce the housing deficit in the country by building decent, quality homes **for a public that cannot find alternatives in the market.**”





LiGENIUM

LiGenium GmbH from Chemnitz is a manufacturer of wooden load carriers in logistics. The start-up is developing modern wood-based materials for use in internal logistics.

WECONOMY

Die Gründerinitiative

WECONOMY brings together innovative, technology-oriented start-ups and established companies. The start-up initiative offers access to valuable contacts and many opportunities to exchange ideas with experienced professionals and managers.

The competition is organized annually by Wissensfabrik – Unternehmen für Deutschland e.V. in cooperation with Unternehmer-TUM, Europe's leading center for innovation and start-ups, and Handelsblatt. **Here we present three current award winners:**



BOTFRIENDS

BOTfriends GmbH specializes in chat and voice bots. The start-up from Würzburg has developed a platform with which chat and voice bots can be created, customized and controlled without any programming knowledge.



Pipe Predict

PipePredict GmbH issues warnings about pipe bursts. To achieve this, the start-up from Darmstadt creates a digital twin that digitally maps supply networks and their condition using supplied sensor data.



WELLNESS IN THE WORKSHOP

THE FUTURE IS TRADED ON THE STOCK MARKET, BUT THE FUTURE IS DEVELOPED IN START-UPS. AND IT LOOKS GOOD. TO FIND OUT HOW THE WECONOMY WINNERS PRESENTED HERE WILL CHANGE PRODUCTION PROCESSES IN GERMAN INDUSTRY, LET US TAKE A LOOK BEHIND THE FACTORY GATES OF A FICTIONAL COMPANY IN 2025.

Mario L. works in the warehouse, and is responsible for picking. In his office adjacent to the hall, there is a lift truck - more for sentimental reasons than out of necessity. It reminds him of the noisy, sweaty days before digital warehousing was introduced.

DIGITALIZATION AND INDUSTRY X.0



LIGENIUM

“As a material, wood is very light and yet strong, you just have to know how to handle it. Wooden load carriers are ideal for transporting sensitive goods, because the goods are not electrostatically charged and the soft structure of the wood ideally absorbs shocks. **Unlike other lightweight materials, such as carbon, wood is also sustainable. In production, we save up to 95 percent of CO₂ compared to traditional warehouse logistics manufacturers.**”

DIGITALIZATION AND INDUSTRY X.0



ANGELA GRIMMER AND DR. RONNY ECKARDT
founded LiGenium together with Dr. Sven Eichhorn and Christoph Alt.

The business economist and the three engineers met at the Chemnitz University of Technology in a research group focusing on wood.



Thanks to comprehensive digitization and reorganization, ideas previously discarded as "future dreams" can now be implemented: recording and processing real-time inventories, intelligent and process-supporting automation, predictive AI analyses, and helpful, voice-bot-based interaction with the inventory management system. The result: more efficiency, safety, sustainability and even job satisfaction.

Because converting the old building - as a positive side effect, so to speak - also greatly improved the general mood and comfort in the company. Where heavy steel trolleys once rumbled through the hall with deafening sound, LiGenium's lightweight, wooden transport trolleys and trailers now glide on specially manufactured roller conveyors with an innovative plug-in system.

Originally, the wooden transport containers were chosen because their modular design allows them to keep up with the flexibility of the new merchandise system and can be quickly adapted to new needs. Moreover, unlike the old steel containers, the wooden containers do not act like Faraday cages. This was crucial in the group-wide conversion to Industry 4.0 because it made it possible to track goods labeled with RFID chips in the warehouse.



BOTFRIENDS

MICHELLE SKODOWSKI
is COO at BOTfriends.

Together with Kevin Dees, Daniel Rösch and Tobias Gansler, she founded the company. All four studied at the Faculty of Computer Science at the University of Applied Sciences in Würzburg.



“Automated and AI-supported dialog systems are the future. Our platform can be used in many different areas, not only in customer service. Our special feature: We provide the product as a SaaS solution in the cloud and are also available as consultants. However, the company carries out continuous training or customization to the respective application itself - and it doesn't need a deep understanding of IT to do so.”



For Mario L., the underlying technology, which ensures smooth back and forth, remains a mystery. All he knows is that the heavy workload of the past, which involved moving several tons per worker every day in order picking, is now largely automated, flexible and, above all, quiet. Physical and psychological strain has decreased significantly.

At the same time, the ability to quickly take corrective action in an emergency has increased. The warehouse logistics software can be accessed using various control modules and even the tablet. In stressful situations or when using your hands to type on a machine's control panel, the voice bot installed by BOTfriends is particularly helpful. For example, if a machine needs to be serviced and Mario L. has a question regarding certain setting values,

all he has to do is ask the voice bot. And thanks to an interface to the merchandise management system, the voice bot can also answer questions about the production process and take orders.

Within a short time, the voice bot established itself as a new "favorite colleague" in the plant as collaboration became easier and more natural than typing on a tablet. Especially in fleet management, there were many unanswered questions that disrupted the process: Which vehicle is due for service? Where are the loading containers currently being used? Does the new employee even have a license for the device he or she is working with? Questions are now answered not only available at the push of a button but also when spoken. You can leave your reading glasses on the table.



CHRISTOPHER DÖRNER

is responsible for business development at PipePredict.

He founded the company together with Valerie Fehst (product development) and Tri-Duc Nghiem (product engineering).

“In Germany, up to 10 percent of fresh water simply seeps out piping systems into the environment. Something has to be done. Our software helps to inspect pipe systems and identify damage. To do this, the first step is to create a digital twin that is supplied with sensor data. If there are any abnormalities, an alarm is triggered immediately. In the next step, we are working on predictive maintenance. This allows us to predict leaks before they occur.”



DIGITALIZATION AND INDUSTRY X.0

Working in three shifts requires a smooth process without disruptions. When it came to converting the hall, however, the plant management could not implement a greenfield solution, but rather had to adapt the plans to the existing brick walls, which were 100 years old. At the same time, the adjacent production was not to be endangered. One challenge here is to ensure the reliable supply of fresh water for the manufacturing processes and safe discharge of wastewater into the company's own wastewater treatment plant.

Before the rebuild, the old pipe system was considered to be one of the greatest weak points because, due to the structural conditions, the pipelines were in the immediate vicinity of the transport roller conveyors controlled by Mario L. Leakages from the pressurized service water system repeatedly disrupted order picking, and the Group's management also wanted to consistently curb water wastage. This was no longer acceptable for economic reasons and the condition was also not sustainable. The company had finally committed itself to production in accordance with ESG guidelines and, among other measures, introduced wood storage logistics for this reason.

To solve pipe problems once and for all, the company has therefore switched to forecasts from PipePredict. With the new analysis tool, the "ticking time bombs" are identified because the system can detect possible leaks in advance. Mario L. first heard

the keyword predictive maintenance in connection with the new CNC machines in the production hall. Here, however, there was now a solution in which an old, existing system could be proactively controlled using artificial intelligence.

The data that feeds the AI comes from various pressure, feed, and flow sensors, all of which were installed at some point in the past 20 years. In the past, however, the data was not intelligently linked, which is why an independent factory team was always busy gathering individual pieces of data, making manual inspection rounds, and stopping production to locate possible leaks using electroacoustic tools.

With predictive AI, time-consuming maintenance tasks remain at a minimum, and instead there is 24/7, real-time monitoring that reports problems early on. And if service on the pipe is really necessary, it can be quickly located. In most cases, the software can narrow down the critical point to within a few meters. Mario L. is happy that he can once again finish work on time and head home with peace of mind knowing that order picking will continue without a hitch. ■

STAUFEN.

INSIDE EVERY COMPANY THERE IS AN EVEN BETTER ONE.

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"IT'S NOT STARTING THAT'S DIFFICULT, IT'S PERSERVERING."

STAUFEN AG SPOKE TO THE SPEAKER AND BOOK AUTHOR MARC GASSERT.

Mr. Gassert, exactly what do you mean with this headline? And in this context, how do you advise an entrepreneur with an entrepreneurial urge?

To start something new and untested, you usually need a kind of conquest energy, a motivation injection, sufficient pressure or an insight about necessity. If the outcome of an entrepreneurial venture is uncertain, the reward comes only at the end. That's why I like to say that starting is not rewarded, but rather perseverance. Only someone who is prepared to go the whole distance will experience the success in the end. Frequently, the big hurdles, obstacles and problems only become clear along the way; they were not visible at all in the planning phase - that's why things are often more complex and difficult than they seemed at the start. Entrepreneurs who are in a position to radiate their goals make it easier for all participants to keep motivating themselves along the unknown and perhaps rocky path and to look forward to the goal.

Another statement for which you are known is "The world belongs to the courageous." Are there too few courageous decision-makers in our economy?

Of course, yes. We are living in a society of hesitation, dithering and squeamishness. We are afraid to make decisions and we don't like to create facts. We prefer reacting to acting proactively. Here, courage would be just what's required. According to Aristotle, courage is the virtue of the average; that is, precisely between extreme arrogance and fearful hesitation. In a complex environment, decision-making and action with forward-looking daring is often associated with great risk from a business perspective, that's why people don't like to act. On the psychological and social level, things are precisely the opposite. Courageous people feel better and a community of courageous people develops an unbelievable motivation. So let's let ourselves be more courageous as a team!

What drives us on? And what should companies take to heart when it comes to motivating their employees?

With "intrinsic motivation," the concern is primarily our values. The concern is the WHY. Anyone who discovers this finds a source of strength and a way. The rule of thumb for entrepreneurs is therefore that anyone who wants performance has to have a sense of purpose. In addition, I like to quote Nietzsche: he who has a why to live for can bear almost any how. ■



MARC GASSERT

Marc Gassert spent a large part of his life in different cultures on different continents and learned the Asian martial arts from renowned grandmasters. This "blond Shaolin" speaks six languages and is a master of Karate, Taekwondo and Shaolin Kung Fu. He studied Communication Science and Intercultural Communication in Munich and Japanese Studies in Tokyo. In his speeches, he offers the transfer of knowledge between Far Eastern and Western culture.

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Marc Gassert in interview

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