

Edition 4 | June 2019

HELLER

The Magazine



1894
2019
5

partnership visions
 knowledge
 trends
 family innovation
 success system
 tradition global
 stories



Dear customers, partners and colleagues

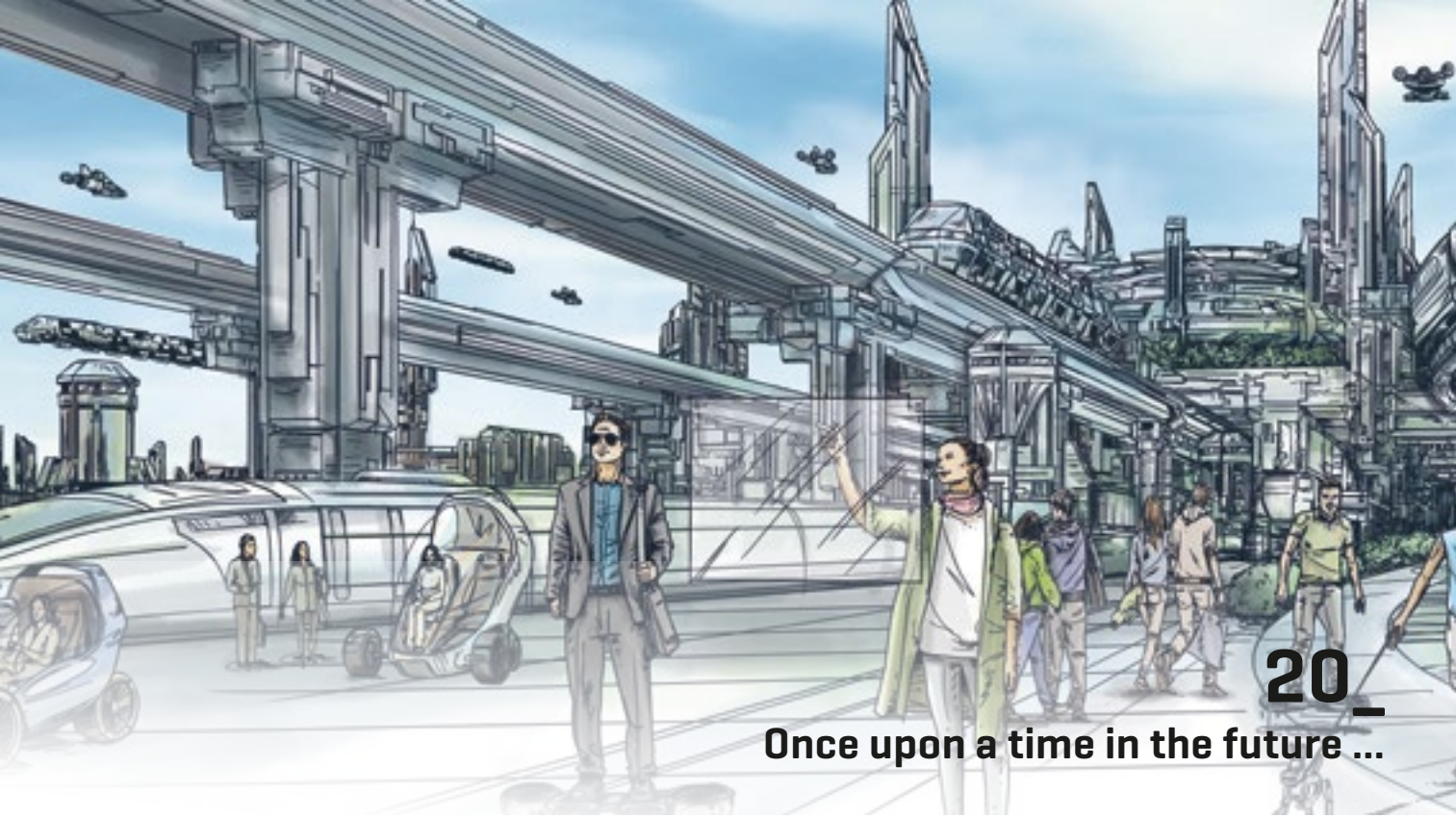
The year 2019 is a very special one for the HELLER Group. 125 years ago, Hermann Heller – only 25 at the time – founded the company 'Hermann Heller Handelsgeschäft und Fabrikation in geschützten Artikeln und Uhrmacherwerkzeugen', specialising in the trade and manufacture of patented products and watchmaker's tools. Only a short while later, his brother Ernst, a trained tradesman, joined the company. This marked the birth of 'Gebrüder Heller Werkzeug- und Maschinenfabrik' in Nürtingen.

The visionary thinking of the founders provided the foundation for HELLER's long success story. Already in 1900, Hermann Heller anticipated the technical development which was to become a reality decades later. "In my opinion, the future will be determined by machines and apparatuses. As to the future, I foresee large machines producing all kinds of goods in a fully automatic manner." This is what the company's founder replied when asked about where he saw his company in 120 years' time. In this pioneering spirit, this anniversary issue of *HELLER the Magazine* focuses on 'visions' as a main topic.

And today? Companies seeking to compete successfully in the market not only have to think about tomorrow, but also about the day after tomorrow. Artificial intelligence, Industry 4.0 and the future of mobility are the challenges we need to meet with the same visionary entrepreneurial spirit our founders taught us. Particularly in politically and economically challenging times, forward thinking and anticipatory action are the key to sustainable success. As a long-term oriented family business, we have the capabilities to develop and realise visions together.

I hope you will enjoy reading this issue and look forward to receiving your feedback!

Sincerely, Klaus Winkler
 CEO of the HELLER Group



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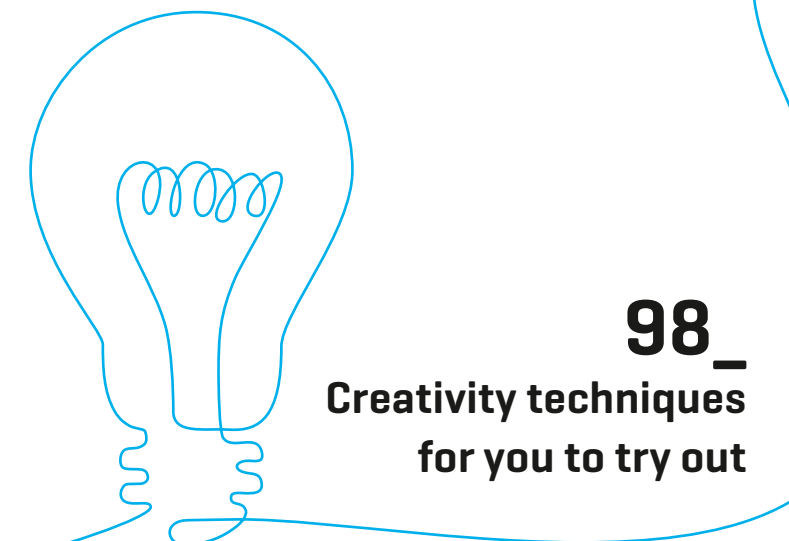
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Vision

[ˈvɪʒ(ə)n]

Word meaning/definition:

1. An experience of seeing someone or something in a dream or trance, or as a supernatural apparition

Example:
_ ‘the idea came to him in a vision’

2. The faculty or state of being able to see

Example:
_ ‘she had defective vision’

3. The ability to think about or plan the future with imagination or wisdom or, a mental image of what the future will or could be like

Examples:
_ ‘the organization had lost its vision and direction’
_ ‘a utopian vision of society’
_ ‘a vision for the 21st century’

3.1 For a company or an organisation, a vision statement is a declaration of objectives, intended to guide its internal decision-making and serving as a foundation for a broader strategic plan.

When the vision is formulated or set down in writing, it becomes a mission statement, providing the foundation for the company’s strategic orientation. Pursuing a vision in a consistent manner helps a company to differentiate itself from others. Within the company, a shared vision increases people’s willingness and will to implement change.

Etymology

From Middle English *visioun*, from Anglo-Norman *visioun*, from Old French *vision*, from Latin *vīsiō* [“vision, seeing”), noun of action from the perfect passive participle *visus* [“that which is seen”), from the verb *videō* [“I see”) + action noun suffix *-iō*.

Source: [oxforddictionaries.com](https://www.oxforddictionaries.com/) / [wiktionary.org](https://www.wiktionary.org/)



TEXT Franziska Hapke
PHOTOS Amanda Dalbjörn / Gorodenkoff / Jens Gelowicz

“People with visions should go see a doctor” – or shouldn’t they?

Leonardo da Vinci, Michelangelo, Galileo Galilei, Thomas Edison, Robert Bosch, Marie Curie, Albert Einstein, Steve Jobs, Bill Gates, Jeff Bezos, Elon Musk, Marc Zuckerberg: without the courage of visionary thinkers – of which only a few prime examples are listed here – many things in the world would not have been changed or even been possible. All these people have one thing in common: they look into our future and actively help to shape it.

The meaning of the word ‘vision’ as a ‘supernatural apparition’ or as ‘seeing something in a trance’ is also what the former German Chancellor Helmut Schmidt was referring to when he said in 1980: “People with visions should go see a doctor.” Since then, the word has been widely re-interpreted and now has a much more positive connotation, subsequently moving into the focus of entrepreneurs and us citizens.

Ever since, a vision is understood as something that drives us. Each and every day, it motivates us to get up and to go out, to leave our comfort zone and to work on turning our vision into a reality.

Similar aspirations can be found on almost all corporate websites. The mission statement, providing the foundation for communication and actions, and which also has an impact on services and products, consists of the values, the mission and – you have guessed it – the vision. In this context, vision refers to a future status the company seeks to achieve whilst also serving as a fundamental orientation for staff.



Visions in mechanical engineering and machining: focal topics of HELLER and the industry

Future mechanical engineering is characterised by various trends and technologies. Being aware of these trends and the resulting changes, HELLER is continuously working on solutions responding to the permanently changing challenges of its customers.

An essential requirement on companies from the industry is to ensure maximum availability of their machines. According to HELLER, automation significantly contributes to achieving this. The technical possibilities range from simple pallet changers, linear and rotary pallet magazines or flexible loading robots through to combinations with rack systems, also for tool storage. The question of automation becomes really interesting when a manufacturing system comprises several machine tools within the process chain. For this, there is a wide spectrum of solutions – from simple linkage using conveyors and grippers or flexible solutions based on a centralised workpiece handling system through to a synchronised transferline. All these automation solutions increase the absolute availability and flexibility of the production solution in the long term.

The potentials offered by conventional means used to increase the productivity of machine tools are believed to have almost been fully exploited in recent years. Therefore, many machine tool manufacturers now take the approach of combining information and production technologies using Industry 4.0 solutions. The objective of all considerations, possibilities and solutions for digitisation must remain the reduction of the customer's cycle times, and thus workpiece costs, by providing a high level of productivity. Already today, HELLER is generating sustainable added values for customers through greater ease of use of the machine, optimal integration

into networks and expanded functionalities and service possibilities. Despite this, the focus remains on machining. However, Industry 4.0 provides many possibilities for optimising machining processes. With Industry 4.0, HELLER aims to enhance the transparency of the current machine status and to evaluate the information gained in combination with existing data to allow purposeful diagnostics. With the holistic 'HELLER4Industry' concept, the company contributes to increased machine productivity and supports consistent engineering chains – a genuine added value for the future. From page 62 onwards, you can read more about HELLER's development as a company up to the Fourth Industrial Revolution.

Increasingly smaller batch sizes, short lead times and growing component complexity require optimisation and streamlining of the manufacturing process. HELLER takes a clear stance in this regard: machining centres must not only meet today's requirements, they need to have the capability to be used efficiently throughout their entire life cycle. With highly productive, universal machining centres and the required application engineering expertise, the machine tool manufacturer lays the foundations for visionary expansions in terms of an 'intelligent mix of technologies'. By adding technology and process know-how, a standard machining centre is transformed into an effective tool for efficient complete machining. Additionally, the integration of a diverse range of technological processes helps to expand the application portfolio of the products and to strengthen the partnership with customers. Strong partnerships again are important because any challenges in terms of production technology using non-standard solutions can only be met in cooperation with the customers. From page 82 onwards, we are presenting two great examples of how expertise can be efficiently combined as part of a collaboration.

Already in 2012, a survey conducted by VDMA among its members revealed that, among other things, the increasing complexity is a major trend in mechanical engineering. In this issue of *HELLER the Magazine*, the association is again looking into the future of machinery and plant engineering [from p. 78]. Despite political uncertainties, the forecasts for the global economic situation in 2019 remain cautiously optimistic and the global consumption in machine tools is expected to remain at a high level. HELLER expects this development to be reflected in the major submarkets. Such trends as well as shorter innovation cycles, growing material and component variety and complexity and constant cost pressure pose challenges to enterprises within the industry if they want to remain competitive. To achieve this, quick and easy-to-understand, modular and flexible products and services can provide a competitive advantage, with a distinct service orientation becoming increasingly important for companies in the industry. In the last issue of our magazine, we presented the 'HELLER4Use' usage model as a response to the challenges of modern production and as a solution providing a new level of flexibility. In this issue, a project example from Poland illustrates how HELLER's other services help to meet unusually complex requirements [p. 74].

Sensorisation is another trend topic, referring to the increasing acquisition of data about the machine's environmental conditions using technical systems and sensors. As it is increasingly in demand in the context of Industry 4.0, HELLER promotes the evaluation of existing machine sensors and supports the networking of machines using services on network computers. The company Balluff based in the Stuttgart region specialises in intelligent sensor solutions. The featured articles in this issue of *HELLER the Magazine* include a report on 'sending measurement values without contact' by the supplier of high-quality sensor, identification and network solutions [p. 56].

Artificial intelligence [AI] is a much discussed topic, offering significant opportunities, which are increasingly recognised and seized in production. Already today, AI is increasingly applied in real production environments where it is used to identify patterns in the machine data captured by a range of sensors, helping, for example, to prevent damage to the systems. AI provides the foundation for self-configuring and self-optimising machines, thus enabling a whole new kind of collaboration between man and machine. The use of AI helps to make the so-called smart factory or self-controlling factory a reality. In the report on page 68, you can read how the German Academic Association for Production Technology [WGP] is helping to promote this megatrend. Augmented Reality [AR] and Virtual Reality [VR] are further technologies increasingly used throughout the manufacturing industry. For example, relevant applications make it possible to already check in a project's planning phase whether the machine's position in the manufacturing line is correct and safety standards are adhered to. Users are able to see their entire manufacturing 'landscape' even before it physically exists. In terms of service, AR and VR, for example, help to make training easier to understand and more interactive and also help to optimise maintenance through the use of visualisation. Since 2017, HELLER has been using virtual reality to convey users a hands-on experience of its machines at major trade shows with the so-called HELLER Cube.

125 years of HELLER

This year, the company from Nürtingen celebrates an anniversary. Even after 125 years, its people are looking to the future full of energy, believing in the power of visions, further developing the company and its processes as has recently been the case with the innovative CBC [CylinderBoreCoating] technology used in crankcase manufacturing. This is also the reason why HELLER wanted to focus this issue of *HELLER the Magazine* on the topic of 'visions'.

From page 34 onwards, you can read what happened throughout the 125 years and how HELLER became the company it is today. In celebration of the major company anniversary, the brothers Hubert and Berndt Heller, who were involved in the leadership of the company for more than four decades, took the opportunity to reflect on the past and to take a look into the future [p. 38]. *HELLER the Magazine* also conducted an interview with Klaus Winkler and Manfred Maier, the current Managing Directors of the HELLER Group – overleaf you can learn more about the company's past and current objectives regarding various trends.

Tradition
future

&

**IN
TER
VIEW**

This year, Gebr. Heller Maschinenfabrik GmbH celebrates its 125-year company anniversary. For the two Managing Directors of the HELLER Group, Klaus Winkler and Manfred Maier, this is a good moment to reflect on the past years and to take a look at the challenges ahead.

TEXT **Helmut Angeli** PHOTOS **Tina Trumpp**



If one were to describe HELLER as a ‘manufacturer of machine tools mainly for the automotive industry’, would you be satisfied with this description?

Winkler: No, not at all. For many years, HELLER has been synonymous with the efficient production of complex components. The fact that the majority of them still comes from the automotive sector is not entirely wrong. However, we do not see this as a drawback. Indeed we are proud to be able to work with such a discerning clientele. At the same time, we are a supplier to many other users from outside of this industry.

Would you agree with that, Mr Maier?

Maier: I can only support that. What is important to me is that it means that HELLER is, above all, synonymous with productive manufacturing. This also explains our focus on the automotive sector. In this particular environment, cost-effective production of series parts is a key requirement. By ‘automotive industry’ we are not only referring to car manufacturers, or OEMs, but also to the supplier industry as well as job shops. I would also like to emphasise what Mr Winkler said about it only being a part of what HELLER does. Our strength is the development and production of manufacturing solutions, enabling high-volume production, regardless of the industry the customer belongs to. At the same time, we strive to reduce the share of automotive business by expanding our activities to other industries and fields of business ...

... successfully?

Winkler: Absolutely. Since the start of the new millennium, the automotive share has decreased from more than 75 percent to currently two thirds of business.

Speaking about the turn of the millennium: the Winkler/Maier managing duo has been at the helm at HELLER virtually since then. What were your objectives when you took over leadership?

Maier: Mr Winkler and I have been members of the Management Board since 2003. At the time, Berndt Heller had already planned to retire from the operational management of the company in 2006, so when we took over, our goal was to ensure the continuous development of the company whilst promoting the internationalisation of business, with the focus directed towards growing our business in Asia.

... to what success?

Winkler: Since 1950, the company has exported its products to China. With a total of four sales and service locations in China, and further locations in India, Singapore and Thailand, we are underlining our commitment to the Asian market. In 2013, we began with the planning, assembly and delivery of machining centres at our production facilities in Changzhou. Basically, the internationalisation process initiated by the third generation of the Heller family provided the foundation for the company’s economic success of today. It is indispensable for us to offer our customers worldwide locations in their proximity. If we had tried to continue to service the world market from Nürtingen, we might not be around today. At the time, it also became increasingly clear that the demand for transfer lines would continue to decline and that our customers had a rising demand for flexible solutions. Therefore, we responded to our customers’ requirements with a newly developed portfolio of standardised machining centres.



Catch phrases like ‘success through internationalisation’ and ‘greater customer proximity’ could lead to the assumption that the Nürtingen headquarters had lost significance. Is this conclusion correct?

Maier: No, it is not. Proof of this are a number of forward-looking investments aimed at promoting further development of the location. We deliberately scheduled the expansion for our anniversary year. At Plant 2 here in Nürtingen, we are going to build an additional hall, moving the assembly of our machines to a more advanced basis. Moreover, we are going to create additional office facilities here at Plant 1.

Although none of the family members are involved in the management of the company anymore, the status as a family business will absolutely continue to have a substantial impact on our corporate philosophy. Why is that?

Winkler: First of all, it enables us to give the company long-term orientation without becoming too focused on quarterly results. Yet, above all, a family business creates a deeper bond between the company and its staff. The identification of employees with ‘their’ company is often underestimated. By all means, we are happy with the shareholder structure and the resulting engagement and commitment of HELLER staff.

Does this happiness also reflect in business results?

Winkler: In 2018, we recorded an order intake of approx. EUR 700m. In 2019, we will generate well above EUR 600m in turnover. To anticipate your question about the result: with the exception of 2009, which was dominated by recession, HELLER’s operational business has been in the black since 2003, recording approx. 5 percent growth every year.

What conclusions did HELLER draw from the recession in 2008/2009?

Winkler: One major lesson for us was to make ourselves even more independent from banks and financiers, which meant raising our equity ratio whilst striving to minimise indebtedness. The second realisation was that it was important to diversify our portfolio in order to reduce dependency

on a single market. Today, I can say that we have largely achieved these goals. The third lesson we have learned is that we need to make ourselves independent from political decisions as far as possible. This means we need to prepare ourselves for the fact that globalisation may not be a goal for all countries and that we should also aim to create a local presence in order to avoid trade restrictions and tariffs. We will also need to respond to the fact that populist politicians will try to make business more difficult for us.

In the past, the so-called pork cycle was a catchword often used in the machine tool business, referring to the relatively cyclical fluctuations of ups and downs in the industry. Does that still apply?

Maier: These fluctuations still exist in some regions, of course. Today, however, the supply chains are globally distributed so that these deflections are more or less evened out. On the other hand, there are many barriers and insecurities in terms of trade policies at the moment which, in principle, could lead to the development of a crisis. Moreover, we know that the automotive industry has made large investments in new manufacturing equipment in recent years whilst entering a phase characterised by uncertainty as far as the future of powertrains is concerned.

What do you think is going to happen in the future?

Maier: As much as we all wish and work to reduce global CO₂ emissions, there is still no genuinely satisfactory solution. Reading the relevant publications might lead one to believe that electric drives were an unrivalled technology. However, that is not the case. There are quite a few interesting research approaches – from fuel cells and hydrogen propulsion through to synthetic fuels – that may be developed to marketability in the near future. Serious studies project that the number of cars will see a 30 million rise in the next ten years, with a ten percent share of electric cars.

And still: for me it is hard to believe that a company like HELLER only observes the overall development as a bystander without having taken measures to be prepared for all eventualities ...

Winkler: Of course. Not only have we discussed various scenarios, but we have also prepared for possible changes ...

... for example?

Winkler: We have continued to diversify our market presence. In this context, Asia plays a significant role. In recent years, we optimised our sales operations by re-aligning not only our key account managers but also our regional sales team working in our back office and in the field, expanding our teams in Europe, but also in China, in a targeted manner. HELLER offers flexibly configurable machine concepts that can be used for a wide range of different applications. The goal is clearly to broaden our customer base. And we have been doing this quite successfully, as last year’s order intake shows. However, we want to and must continue to work on this.



At the same time, machine tools and also staff need to adapt to changing requirements in terms of Industry 4.0. How does HELLER respond to this development?

Maier: The boundaries between mechanics and electrics continue to dissolve. One result, for example, was the creation of the education and study programme in mechatronics. Today, a profound understanding of both areas is indispensable. At the same time, that does not make specialism redundant. After all, mechatronics engineers will sooner or later have to decide which area to focus on. What is important is to communicate with each other.

Winkler: Computer science is the third field that comes into play. However, the crucial factor for success is the team performance. And it is our task to promote exchange and team spirit.

Will all this have an impact on future machine concepts?

Maier: The mechanical design of machine tools – provided that a high chip removal rate and maximum precision are requirements – is subject to physical conditions which are not going to be fundamentally different from today's standards in the future. Changes are to be expected in terms of the integrated sensors and actuators. As a result, the machine tool will increasingly develop into an integral part of superordinate systems.

How important is the Nürtingen location to the company?

Winkler: To this day, it remains very important. Nürtingen is still the largest individual location of the company. An enormous amount of knowledge is concentrated here. Nürtingen is a development site, but most importantly, it supports the global market units. At the same time, I am confident that the emphasis within the HELLER Group will shift in the medium term ...

... in which direction?

Winkler: We will increasingly expand our workforce in those regions where our customers are located. Today, we generate 30 percent of our business in Germany, but 70 percent of our staff work here. I assume that it will be difficult in the long term to even achieve this 30 percent revenue share in Germany. Therefore, I believe that we need to expand our staff at other locations in the future. However, this is not going to have a negative effect on the Nürtingen location at all. Rather it will strengthen it. Past experience has shown that this is possible. Despite the increasing degree of internationalisation and the installation of production facilities in various regions around the world, staff numbers at Nürtingen have remained at the same level.

How high is the vertical range of manufacture at HELLER?

Maier: The electrical components through to the control are purchased parts, as are structural elements, such as bearings or guideways. For all other components, the following applies: "HELLER has the ability to manufacture everything in-house, but we do not have the capacities to do so." It means that we also purchase specific manufacturing parts. However, we produce all components and assemblies affecting quality, such as the rotary tables and spindle units, ourselves. I would also like to mention that we have returned to producing specific parts in-house we used to purchase in the past.

By now, many competitors have incorporated additive processes into their machines. What about HELLER?

Maier: In principle, the coating of cylinder bores is an additive manufacturing process. This included, HELLER is by far the largest integrator of additive processes in the machine tool sector. This means that CBC has made us the global market leader in terms of additive manufacturing. Moreover, we will be able to use the experience gained with the CBC processes in other applications. To us, additive manufacturing is a supplement to our portfolio, nothing more. As said, HELLER's core business is production. As a rule, it is impossible to manufacture high volumes using additive processes. Neither do they offer the precision we expect.

In what direction will HELLER develop in the coming years?

Winkler: Our objective is clearly to achieve further growth – on a global scale. To support this goal, we need to continue to expand our portfolio, develop new groups of customers whilst continuing to strengthen our relationship with the automotive industry.

Where do you see the markets of the future?

Winkler: Quite clearly in Asia and, despite the latest news, also and above all in China. Although China has meanwhile become the most important market for automobiles, the vehicle density in the country is nowhere near as high as in the US or in Europe. This means there is going to be a massive demand in the future. Moreover, it may be assumed that industrialisation is nowhere near sufficient to increase the standard of living, thus contributing to a stable political environment. This offers the international machine tool industry additional sales opportunities.

Maier: Based on the potential business volume, Asia will remain the absolute number one for many years in terms of machine tool consumption. As far as the US is concerned, I can say that, if we succeed in achieving a share in sectors outside the automotive industry there that is comparable to our share in Europe, then North America will be an important growth market for HELLER, too.

In early summer, HELLER will celebrate its 125th company anniversary. What activities are planned?

Winkler: The main event will be the Anniversary Day taking place at the beginning of July. At the event, we want to celebrate the anniversary with our staff and their families. For the public, a special exhibition is staged from May to October staged in cooperation with the town of Nürtingen at the municipal museum.

01

Leonardo da Vinci [1452–1519] was what we would call a multi-talented man. He was a great artist who created famous paintings like the *Mona Lisa* or *The Last Supper*. However, he was also an engineer and a designer whose inventions include a tank, a diving suit for underwater combat and a parachute.



03

This year sees the 95th anniversary of the electroencephalogram (EEG) which, to this day, helps modern brain research to gain new insights. The analysis of brain activities, for instance, allows to reconstruct and to reproduce a word a person just heard based on the measured brainwave curves.

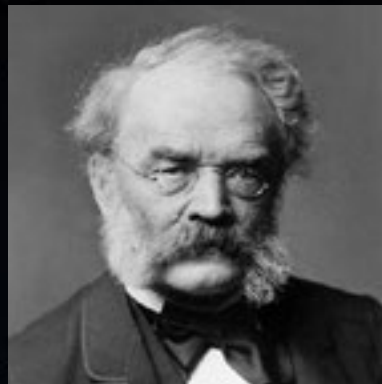
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As the Director of the Software Engineering Division of MIT, Margaret Hamilton was responsible for the development of the on-board flight software for the Apollo space programme. Her software saved the 1969 moon landing.

06

In 1980s/90s, Timothy Berners-Lee invented not only the HTML page description language but also the URL and the first browser called WorldWideWeb.

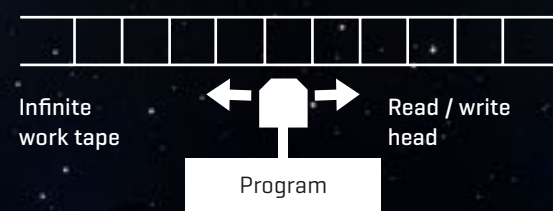
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02

In 1866, Werner von Siemens discovered the dynamo-electric principle on which he based one of the first electric generators. Since then, he has been regarded as the founding father of electrical engineering.

04



In 1937, Alan Turing outlined his idea of a machine able to read and write zeroes and ones from a tape of infinite length according to a table of rules. The model of the universal Turing machine is regarded as the foundation of modern theoretical computer science.

07

Craig Venter is a genetics pioneer who at the turn of the millennium achieved a scientific breakthrough with the sequencing of the human genome. Based on this, his new project, Human Longevity, not only aims to predict the likelihood of developing diseases but also to investigate the nature of our consciousness.

08

In 2004, Mark Zuckerberg launched *Facebook*, thus creating the world of social media. Initially, it was designed as a platform on which Harvard students could rank the attractiveness of their classmates. In the first few hours it was up, the site received 22,000 page views. In May 2018, the platform had 2.2 billion users per month and a market cap of approx. USD 540 billion.



09

In 2016, a fully functional 3D-printed office building, including 3D-printed furniture and interior details, was opened in Dubai. Until 2030, at least 25% of all buildings in the desert state are to be constructed in the same way – allowing to reduce construction costs by up to 70%. Planning for the first 3D-printed skyscraper has already begun.



10

“Making life multiplanetary”: according to Elon Musk and the SpaceX futurists, it is only a matter of time now. The US aerospace manufacturer focuses on the colonisation of Mars and on space tourism. It is planned to send the first Mars tourist on a weeklong trip with a Big Falcon Rocket in 2023.

12

This invention could make the dreams of non-cooks come true: the British company Moley Robotics announced the launch of the world's first robot kitchen – a kitchen with integrated robotic arms trained to prepare a range of different meals. The robot learned its skills from a star cook by means of a motion capture technology.



When visions change the world

TEXT Maïke Held & Franziska Hapke PHOTOS Romolo Tavani

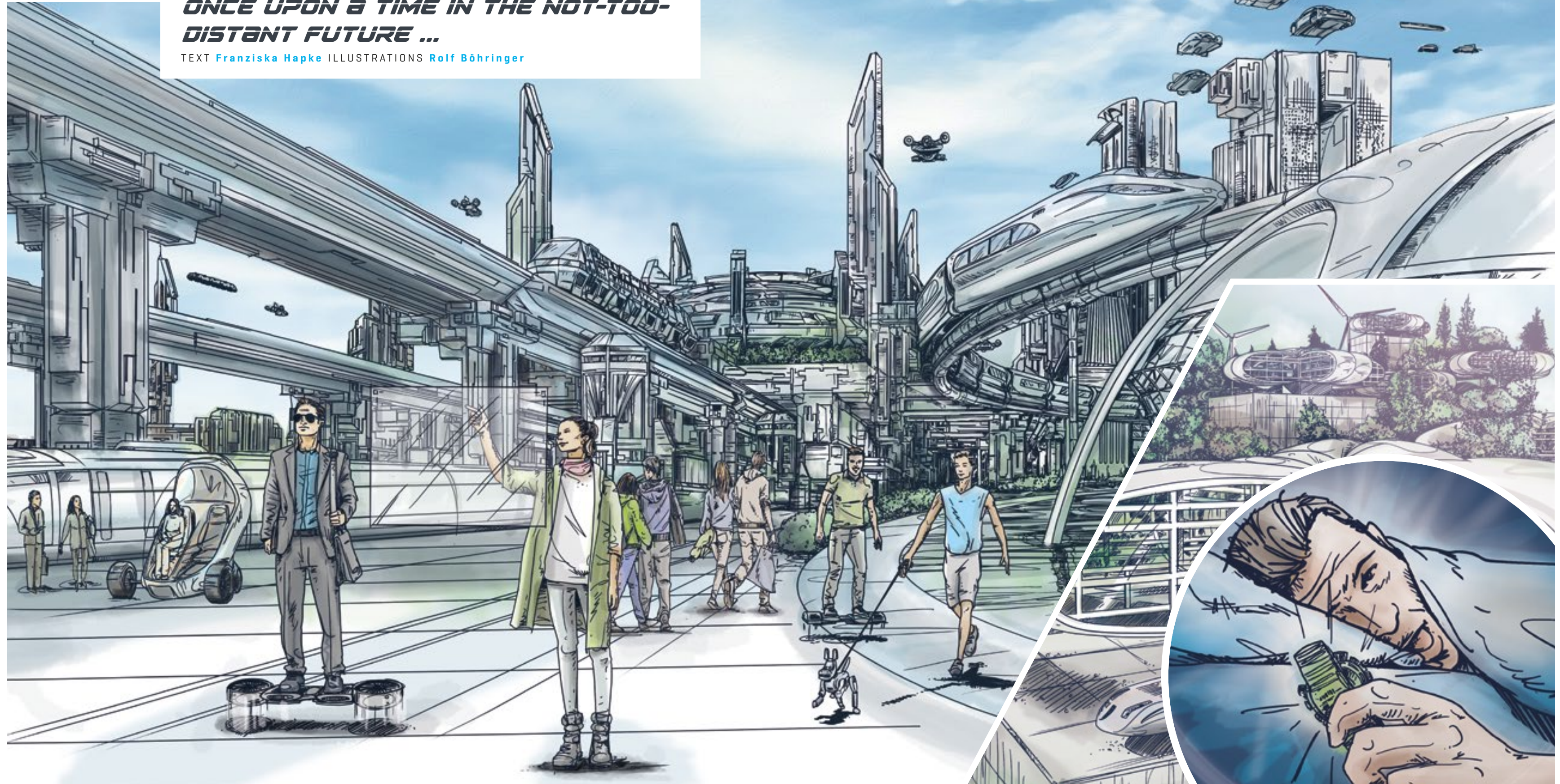
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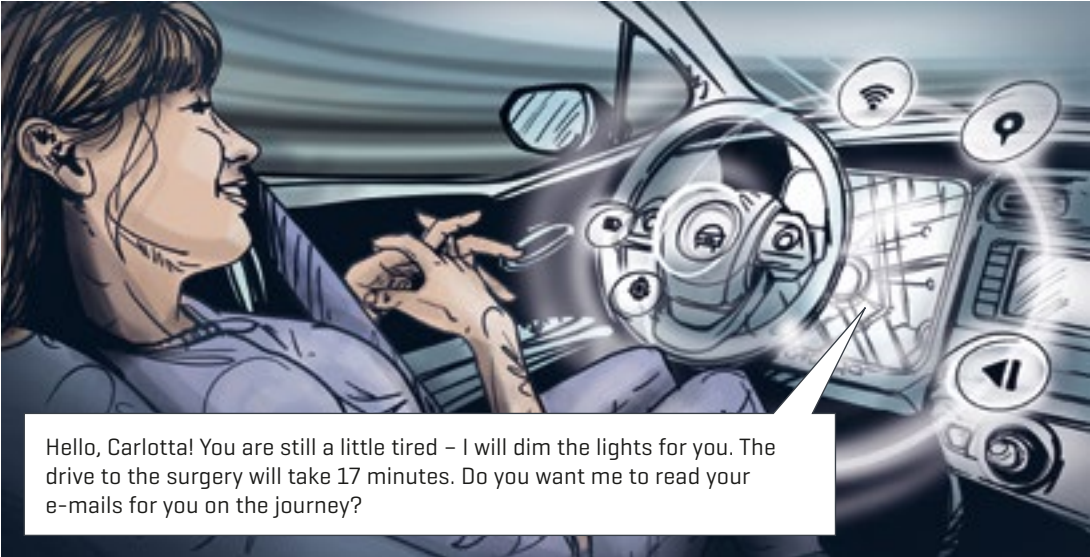
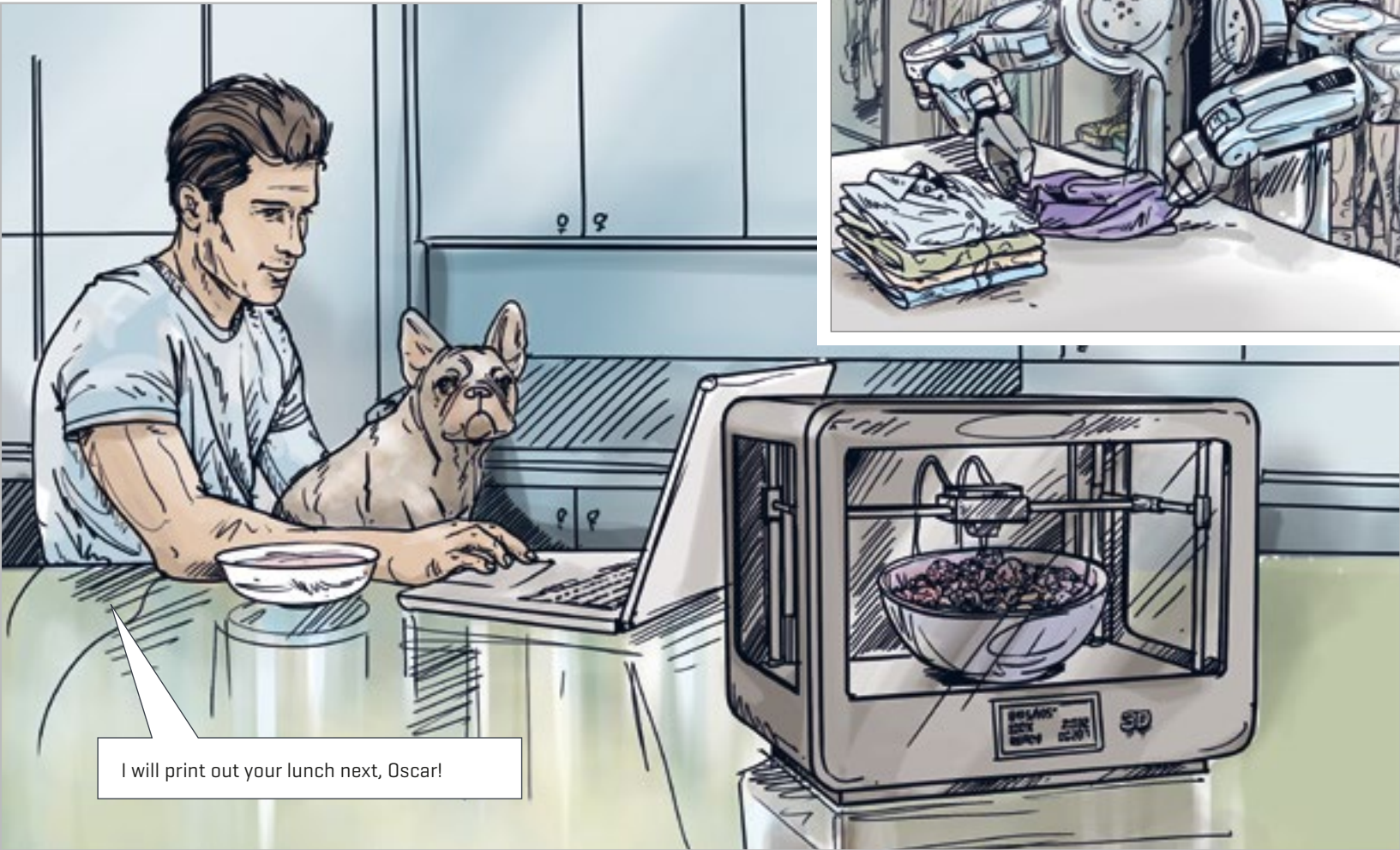
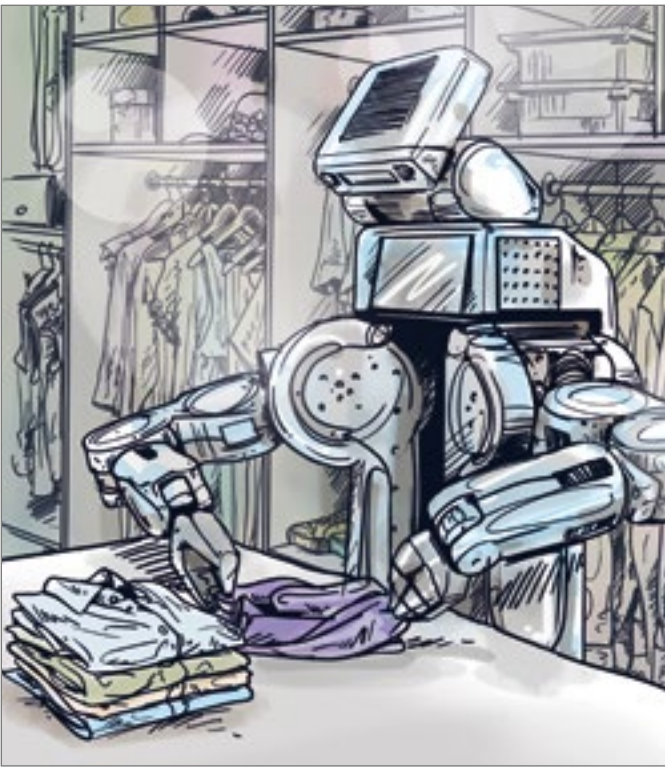
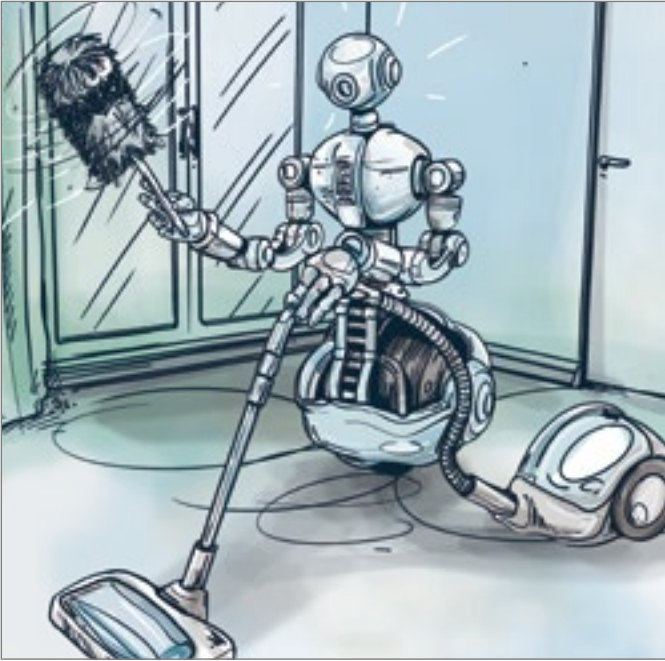
The Munich doctor Franz Pfister has developed an artificial intelligence system able to detect abnormalities in medical data. The aim is to directly alert doctors in case of an emergency, pointing them to the specific region to be examined. This spring, the prototype will be tested for the first time at the Klinikum rechts der Isar in Munich.

How will we live in the future? How will we work and learn? How will travelling to other countries change? What will we do in our spare time? Which innovations will there be in terms of materials? And in terms of the food we eat? In line with this issue's 'visions' theme of HELLER the Magazine, we asked ourselves these questions and on the following pages have illustrated some of the possibilities of what our life could be like in the future.

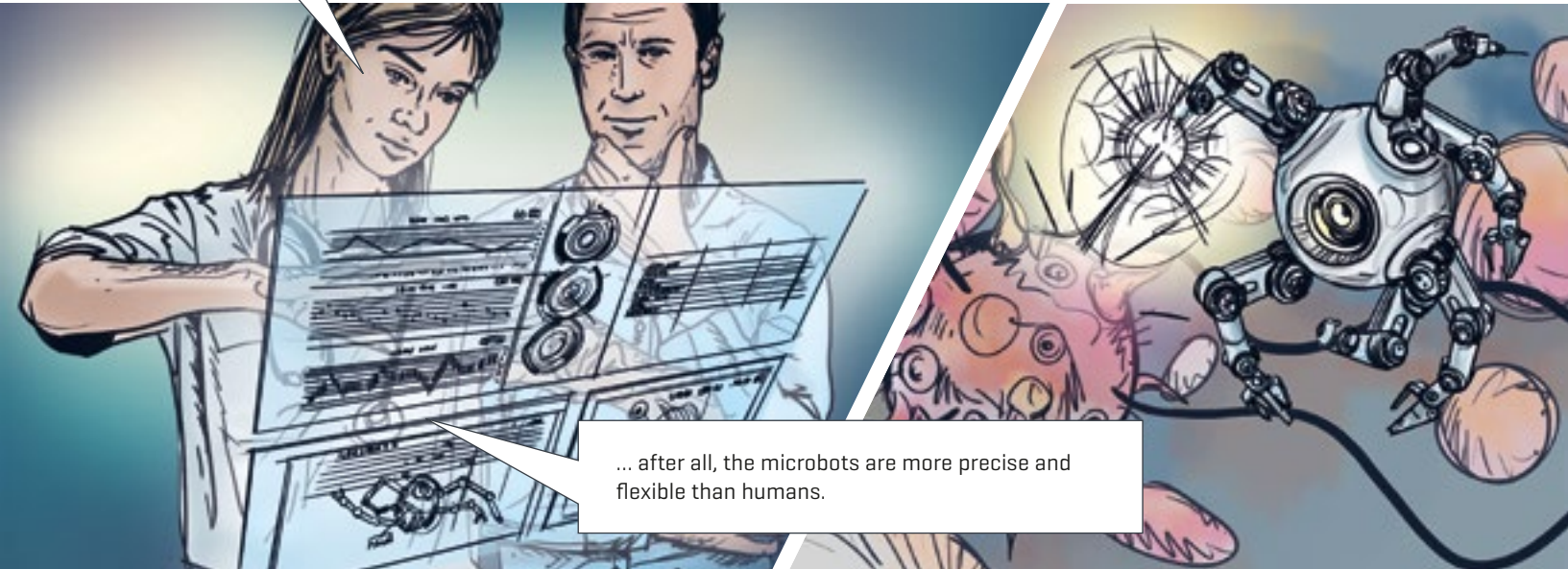
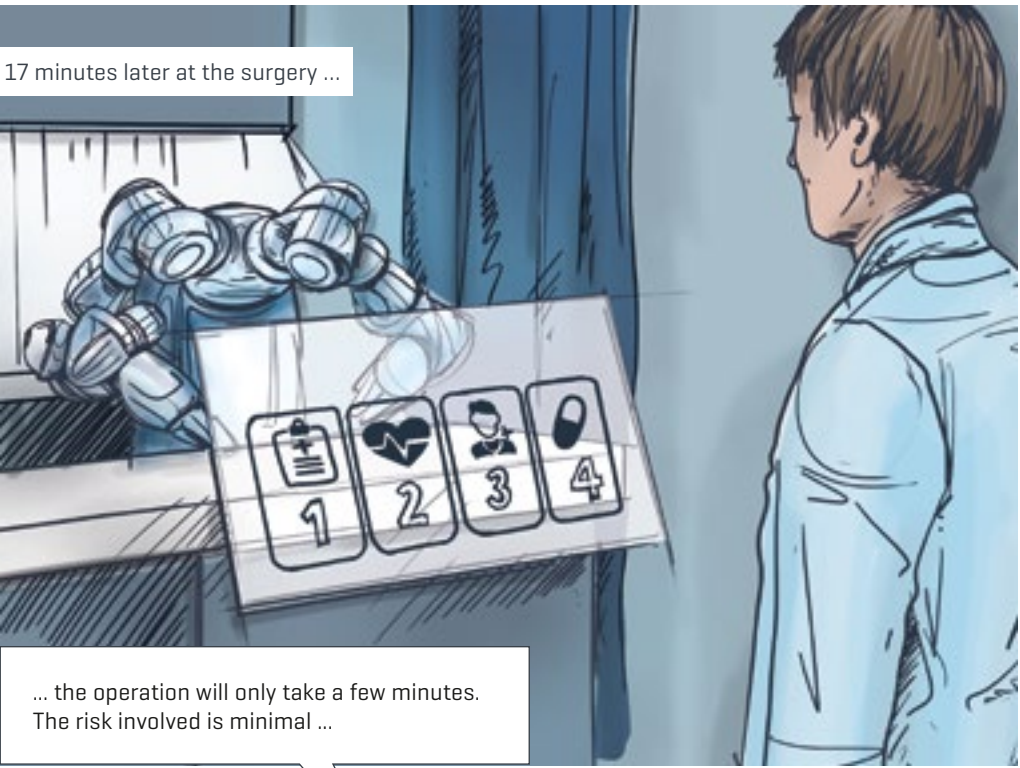
ONCE UPON A TIME IN THE NOT-TOO-DISTANT FUTURE ...

TEXT **Franziska Hapke** ILLUSTRATIONS **Rolf Böhringer**



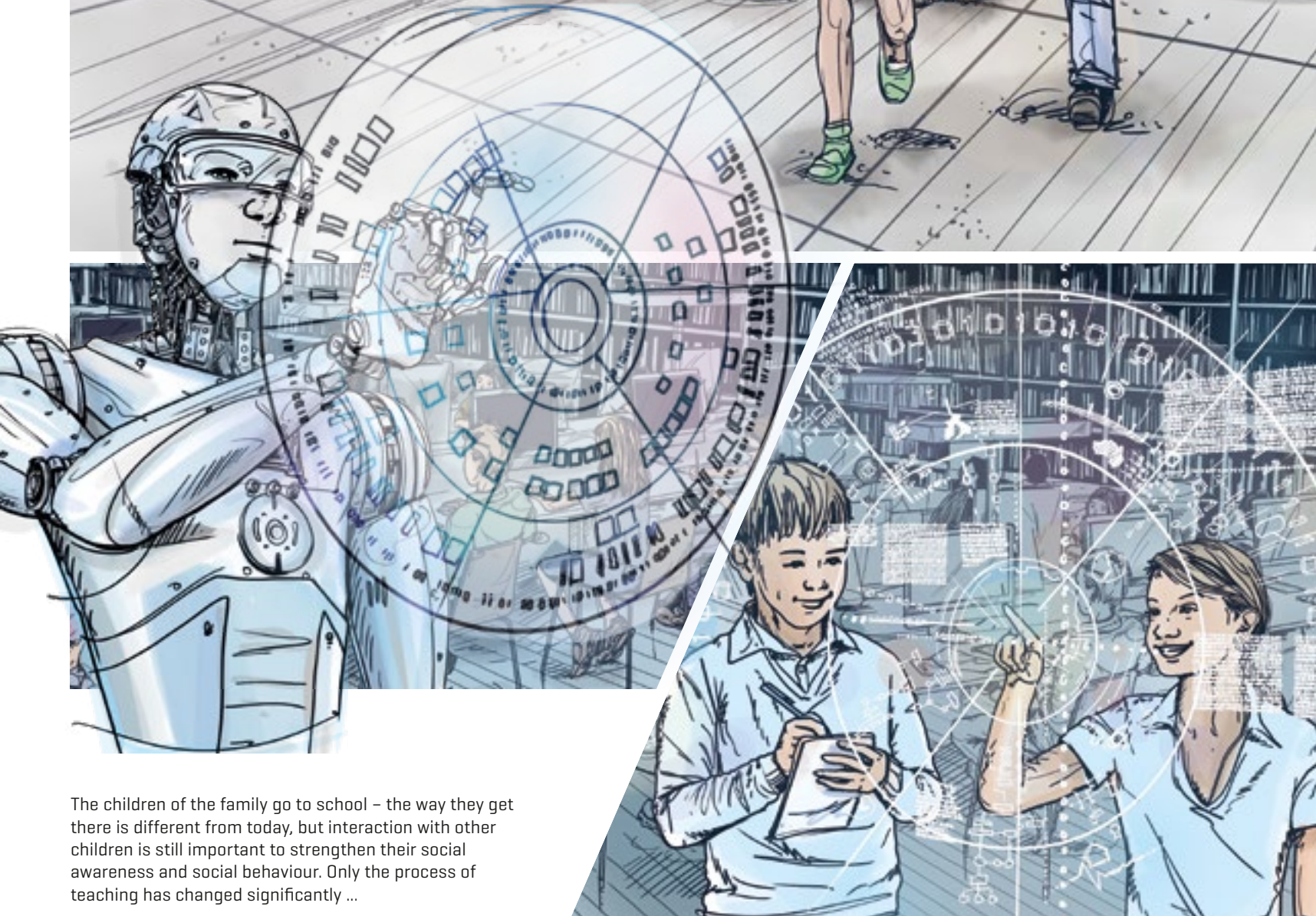


Carlotta still goes to her medical practice every day – personal contact with people is very important in her job. After all, that is why she became a doctor. Her husband, a project manager, regularly works from home, but not every day. He [still] needs to go to the office now and then – spending too much time at home makes him feel cooped up anyway.





At the same time ...



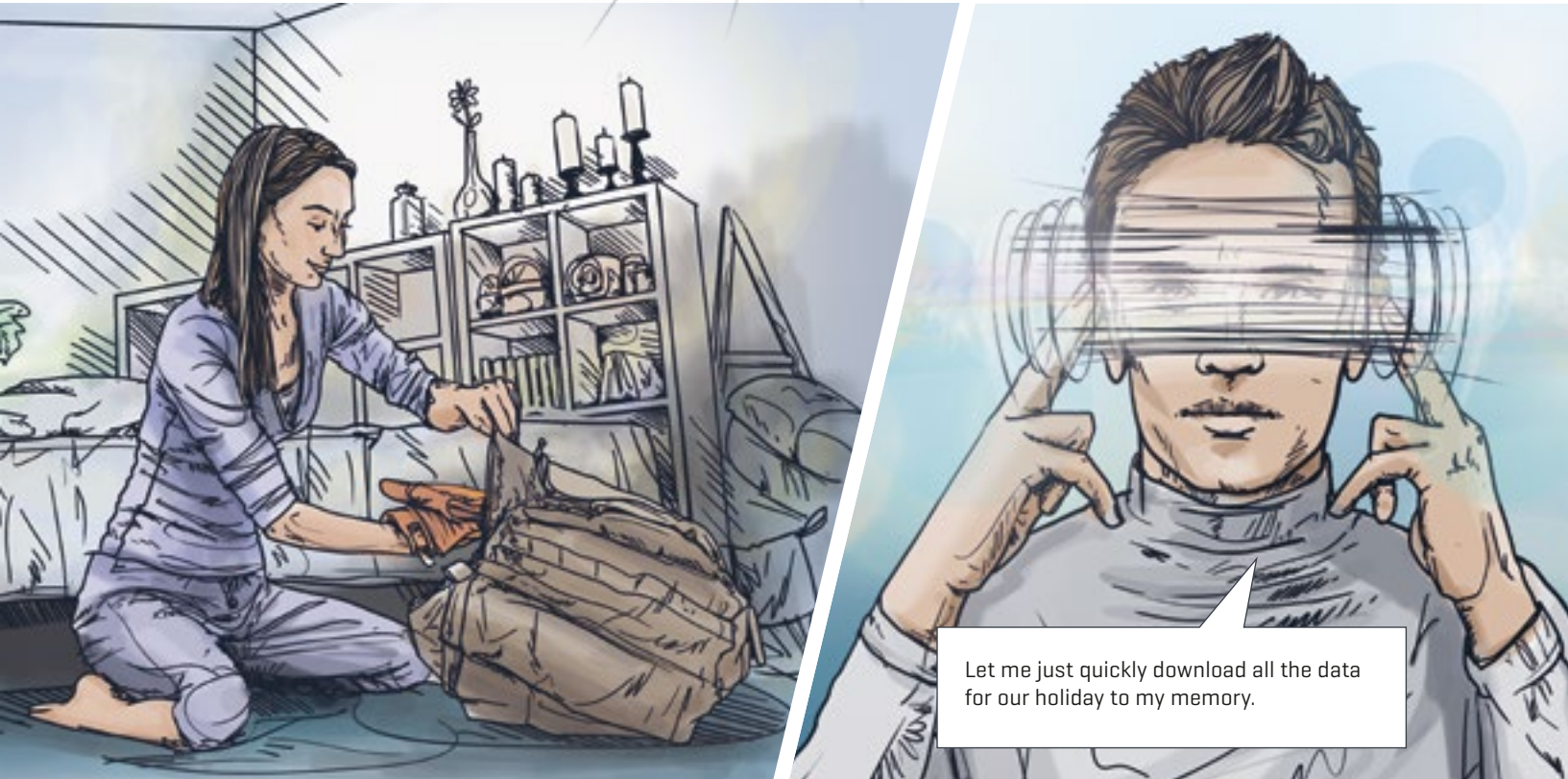
The children of the family go to school – the way they get there is different from today, but interaction with other children is still important to strengthen their social awareness and social behaviour. Only the process of teaching has changed significantly ...

In the future, we will still enjoy going to the cinema. Because it has become an impressive multi-dimensional experience.



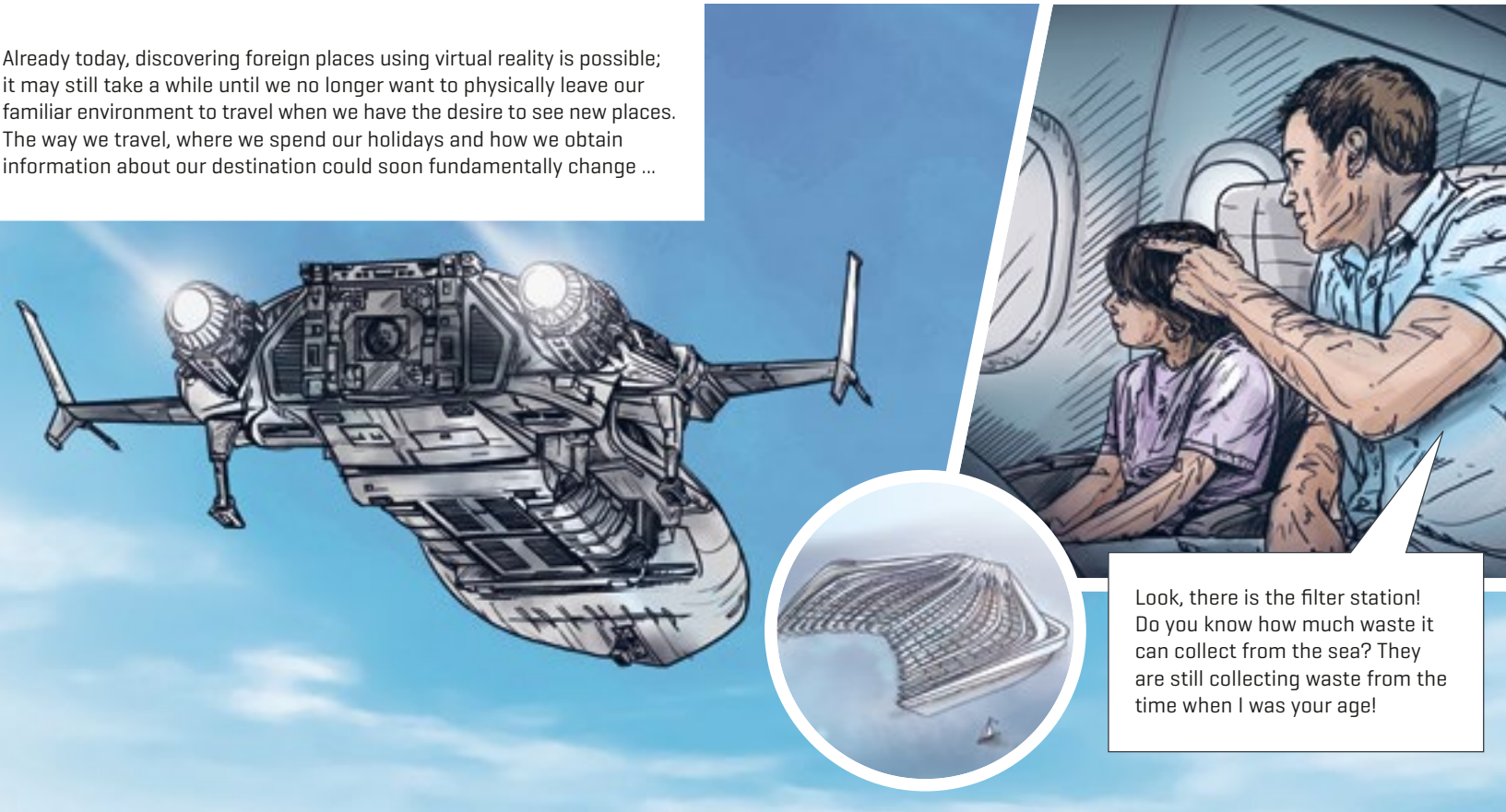


Already today, more sustainable and more functional materials are being developed. If this development continues at this pace, costly art objects could possibly become unbreakable in the future, and when we go on a journey, we will only pack a few pieces of clothing as garments will be able to adapt to different temperatures and weather conditions ...



Let me just quickly download all the data for our holiday to my memory.

Already today, discovering foreign places using virtual reality is possible; it may still take a while until we no longer want to physically leave our familiar environment to travel when we have the desire to see new places. The way we travel, where we spend our holidays and how we obtain information about our destination could soon fundamentally change ...

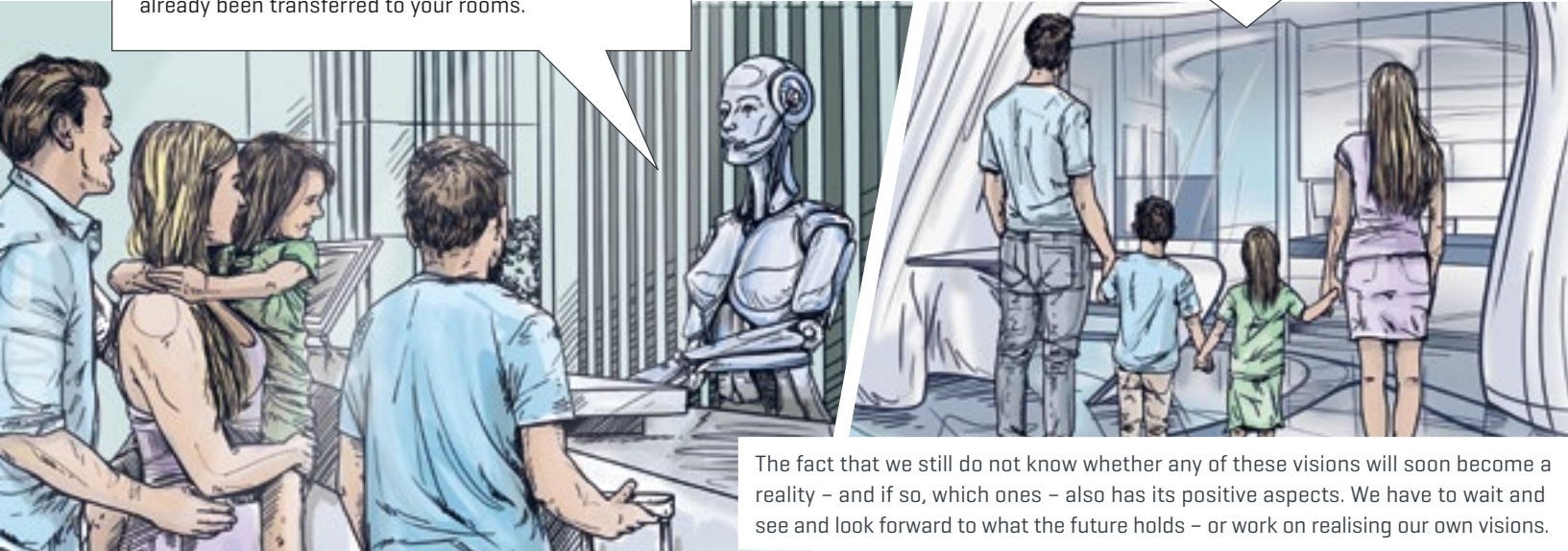


Look, there is the filter station! Do you know how much waste it can collect from the sea? They are still collecting waste from the time when I was your age!



Welcome to the Floating Resort! Your luggage has already been transferred to your rooms.

Hello, Jacob, Carlotta, Mia and Tim! My name is Jetta, I am your personal assistant. I hope you like your room. It was fully 3D-printed from recycled materials. In half an hour, there will be an interactive tour of the resort for all newly arrived guests. If you need anything, simply say my name! I wish you a pleasant stay!



The fact that we still do not know whether any of these visions will soon become a reality – and if so, which ones – also has its positive aspects. We have to wait and see and look forward to what the future holds – or work on realising our own visions.

The future is when vision becomes reality

TEXT **Michael Carl** PHOTOS **2b AHEAD ThinkTank / Joshua Sortino**

The vision is in bad repute. It is regarded as secondary to hard facts, clear analysis and reliable figures. A vision is difficult to grasp and hard to verify with the precision and sober-mindedness of an accountant. Rather, it conveys a feeling of vagueness. It cannot be tested in laboratories or stamped with a seal of approval. Yet, from the futurologist's point of view, visions play a pivotal role. They, in particular, are the key to understanding the living and working environments of the coming years. Active entrepreneurs will realise their visions, thus creating reality. People who do not have visions are unlikely to develop the next iPhone. More importantly, people who do not develop, discuss and evaluate visions will be caught by the arrival of the iPhone unprepared. Then you might as well go back to producing wellingtons – or close down your business altogether. Any questions? Ask Nokia or the Siemens mobile division.



“The supreme discipline of digitisation: the adaptivity of products.”

Futurologist Michael Carl

What can we expect? Artificial intelligence systems unfold their potential leap by leap. Increasing amounts of data provide the fodder for more and more powerful algorithms. What is new is that we will encounter these systems everywhere we go in our daily lives. For example, a personal finance assistant that has learned how I want my finances to be managed and has long taken control in the background. Or the mobility assistant that contacts all 450 hotels in Munich to plan my weekend trip, in detail negotiating and renegotiating the offers and conditions until everything is perfect. Eventually, I will find the hotel of ‘my choice’ in my calendar and will know in advance why I will like it. Like all travel portals from the 2010s, Booking.com will long have vanished from the market as a result. We have every reason to believe that the first quantum computers will be available for commercial applications in the coming decade. They are not just faster computers but a quantum leap in the true sense of the word. We will have to regard every password as already cracked. Moreover, we will have to develop a new understanding of security. At the same time, this will change our understanding of data. The relevance of today’s static real-time data will be replaced by the forecast and analysis of future emotional data. Behind this is an obvious but also common misunderstanding: digitisation does not start with the purchase of new IT equipment. Companies providing their field service staff with iPads have not taken a single step towards digitisation of the sales team. If you distribute laptops to a school class, you have not provided any digital education, just as a computerised POS system alone does not make payment transactions digital. Digitisation starts where effects are measurable: emotion, enthusiasm, but also with the practical benefit to an individual customer. Or put in a non-technical way: digitisation allows providers to know in real time what a customer requires and how he uses the provider’s product.

That is where it all starts. The second step builds on this: if you are able to identify the requirements and the behaviour of individual customers in real time, you will also learn to forecast them. Being faster than real time is the challenge that providers from the most diverse industries have to rise to in the coming years.

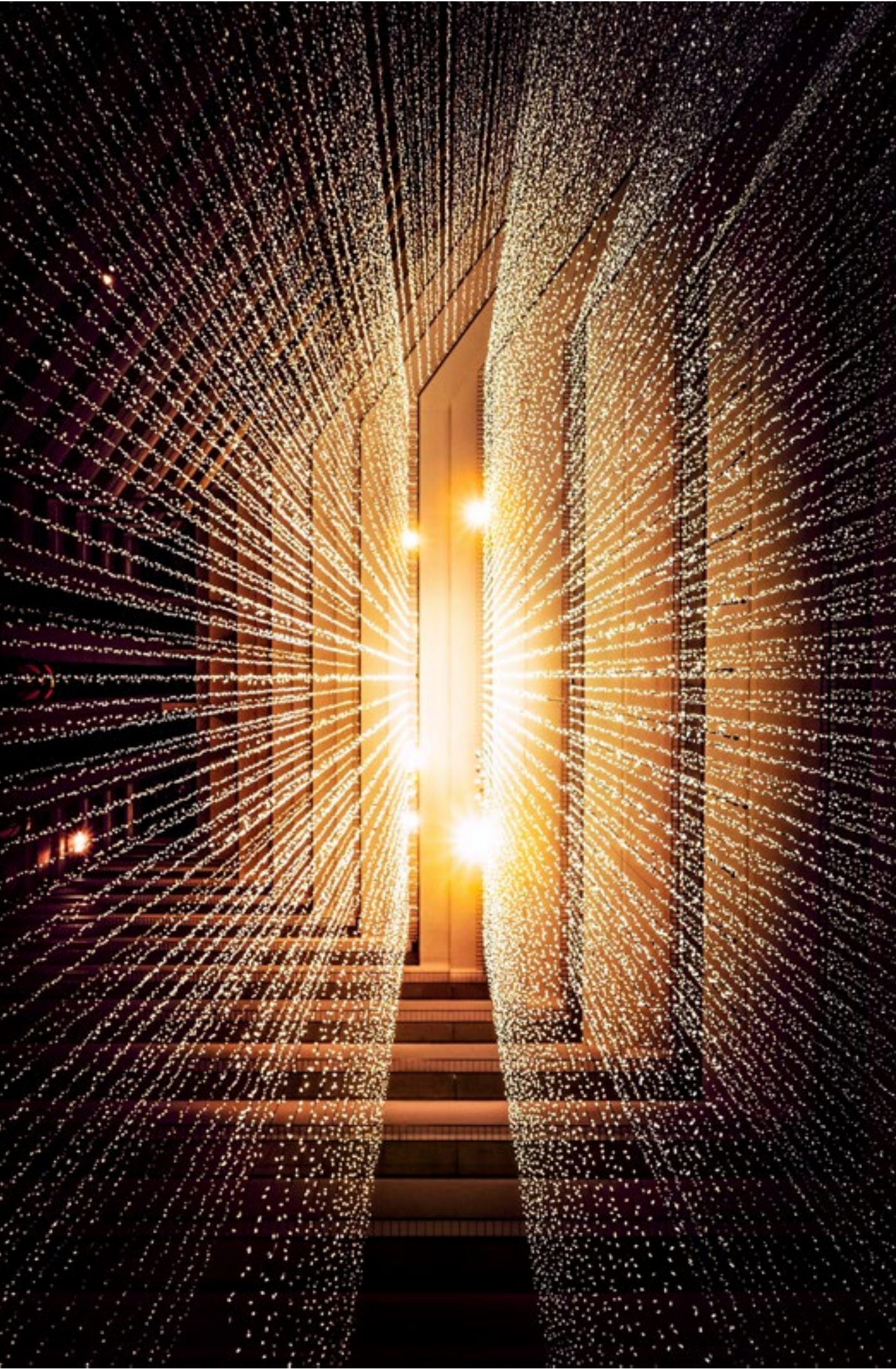
However, it is still only a preparatory step leading to the supreme discipline of digitisation: the adaptivity of products.

“Digitisation starts where effects are measurable.”

Which company would want to sell a customer an off-the-peg product if it already knew the customer’s precise present-day needs and was already able to describe his probable future needs? Or to put it in even stronger terms: which company would seriously assume it would still be competitive selling average products when its competitor is able to address the customers’ future requirements in a precise manner?

This change towards a predictive enterprise will become the real challenge for companies from almost any industry during the course of the digital transformation. Making product development flexible in a way that the products and services cater to the forecasted requirements of mass-individualised customers. A development we will eventually be able to observe in every industry throughout the 2020s. The food producer learning to adapt his products to the genetic code of individual people. The pharmaceutical manufacturer whose products are able to adapt their effect to the changing health condition of individual patients. The machine manufacturer whose products are not only highly customised but also able to measure the level of attention of the skilled workers operating them. In the coming years, standards will see a shift in this regard. The more customers see that individual providers are able to identify and take account of their requirements, the more likely will they expect the same from the next provider. Initially, only from the competitor, but then also in other sectors of business and industry. As a result, communication with customers moves to the beginning of the product development process. The traditional sequence of development – production – marketing – sales – after sales is reversed.

Therefore, you should not only expect the launch of faster smartphones, which is likely to happen. The really profound change will take place in terms of communication. People will



treat each other differently. They will expect that their counterparts – whether fellow humans, colleagues or companies – treat them differently. A practical example: already today, a free-of-charge app uses speech analysis to provide me with an evaluation of the current emotional state of my counterpart. Using the app without my partner’s knowledge to find out how big this year’s Valentine’s Day bouquet will have to be is considered inappropriate and offensive according to conventional standards. Done on a large scale, it would lead to a surveillance state. However, our analyses draw a different picture: as soon as the emotional analysis provided by artificial intelligence is regularly found to be better than that of humans, people will learn to trust the technology. They will demand the use of such technologies so that their needs and requirements can be identified as closely as possible. From this perspective, artificial intelligence makes our communication even more human.

A short interjection addressed to today’s and tomorrow’s data security officers: in the coming decade, data protection will refer to something completely different from what it is today. The recently implemented European standard will probably be the last conventional form of data protection. In the future, data protection will not prevent data and data exchange but will, in the first place, enable the targeted release even of largest amounts of data. As a result, data protection will finally become a transparency requirement. Only those able to explain their counterparts how they plan to capture the data of their potential customers will be able to create trustful communication. Moreover, only those able to demonstrate they can create tangible added value for the individual customer based on the data provided will be granted access to the future users’ data. With access being reversible and restricted in terms of space and time.

During every presentation and workshop I gave in recent weeks, people kept asking me about China, referring to the Citizen Score and the state’s attempt to monitor citizens’ good conduct in a comprehensive and automated manner. The most frequent question I have to answer is: isn’t that something that should be absolutely prevented? Doubtless an important question, but not one for futurology. The questions futurologists ask themselves are rather: what will be the next-but-one step this technology

enables? With our world becoming so much more intelligent in the coming 10 years and this kind of intelligence leaving the laboratories and development centres, taking effect in everyday life in society, what will be the impact on people’s communication? What will be the effects on customer dialogue, on business models and product developments, on qualification, organisation and personal development? What will drive us forward when that happens?

People hasty to make a moral judgement, saying this must be prevented, disable themselves from taking a differentiated approach to the opportunities offered by a technology. Ultimately, we would rob ourselves of the opportunity to have a share in shaping our own future. We should allow ourselves to have more vision in order to shape our future in an active and confident way.



Michael Carl (50) is a futurologist. In his lectures and numerous publications, he inspires people and companies to engage in the future. As ‘futurologist in residence’, he works with the team of the 2b AHEAD think tank, Europe’s largest independent foresight institute based in Leipzig. His forecast: the technological leaps forward in the coming years will result in an entirely new image of what it means to be human: as an employee or manager, as a customer or provider, in families and in society. With his work, Michael Carl aims to motivate people to get involved in shaping the future.

POR TRAIT



34_ Black on White

36_ Tradition meets innovation /
125 years of HELLER

38_ “We sell production.”

46_ 45 years of HELLER Brazil

50_ 125 years working hand in hand
with our customers

Black

Facts and figures about business development

According to the IMF, the global economic output saw a real growth of 3.6 % in 2018, following a 3.8 % increase in the previous year. This means that the development remained below the original expectations and was therefore adjusted in the course of the year. The 2019 forecasts for the global economic situation continue to be cautiously optimistic for international markets as well as for Germany. For the current year, the IMF still expects a worldwide growth of 3.3 %. It has lowered its last forecast made at the beginning of the year by 0.2 percentage points. The reasons for the global economic slowdown remain local crises, political uncertainties and disputes about mutual trade barriers, especially between the US and China, but also uncertainties about the further development of the automotive industry, particularly in Europe, the implementation of Brexit and the downward trend in consumer confidence within the Eurozone.

The global consumption in machine tools will see moderate growth in 2019 with an upward tendency in the growth rate expected for the coming years. We expect this growth to be reflected in the most important submarkets in which HELLER is present. The HELLER Group's order backlog as of 31 December 2018 was at a record level. Together with further orders to be expected in 2019 we anticipate a high utilisation of the HELLER Group in 2019. Based on this, we expect growing sales revenues in 2019 and again a good annual result. We remain convinced that the HELLER Group is very well-positioned in the market with a range of state-of-the-art products. Internal procedures and structures have been improved in the previous periods and are continually optimised. Therefore, we are expecting a gratifying development of business throughout 2019, also in terms of turnover and earnings.

Continuity on shareholder level and in terms of management

Heller GmbH		Gebr. Heller Maschinenfabrik GmbH	
Supervisory board: Berndt Heller [Chairman] Christian Hald Harald Völker	Managing Director: Klaus Winkler [Chairman] Manfred Maier	Supervisory board: Berndt Heller [Chairman] Joachim Beyer Wolfgang Seitz	
HELLER Support Germany		HELLER North America (NAFTA)	HELLER Europe (EMEA)
Managing Director: Manfred Maier [Chairman] Dieter Drechsler Patrick Rimlinger Dr Jürgen Walz Peter Weber		Managing Director: Kenneth M. Goodin _ HELLER Mexico _ HELLER USA	Managing Director: Andreas Müßigmann Peter Weber _ HELLER Germany _ HELLER France _ HELLER Italy _ HELLER Poland _ HELLER Russia _ HELLER Slovakia _ HELLER Spain _ HELLER Sweden _ HELLER Switzerland _ HELLER UK [Sales & Services]
HELLER Support UK		HELLER South America (LATAM)	HELLER Asia (APAC)
Managing Director: Matthias Meyer		Managing Director: Alfredo Griesinger _ HELLER Brazil	Managing Director: Andrew Parkin _ HELLER China _ HELLER India _ HELLER Singapore _ HELLER Thailand
GSN (Germany) Paatz (Germany) STS (Germany) Wenzler (Germany)			

on White

Order intake

EUR 695.2m

Europe: 71 %
North and South America: 12 %
Asia: 17 %

Turnover

EUR 558.3m

Total operating revenue

EUR 590.4m

Equity capital:

EUR 124.7m

Ratio: 34.8 %

Employees

2,930

HELLER Group worldwide

Tradition

125

Innovation

meets

TEXT **Franziska Hapke**

“We have set our sights on the future, but without losing sight of our heritage. The values established by the Heller brothers still guide our actions. We respect what was already indispensable to them: listening closely, taking note of our customers’ requirements and turning them into innovative solutions.” These were the first words in the first issue of *HELLER the Magazine*. In our anniversary year 2019, they are more relevant to us than ever. After all, everything at HELLER in the past 125 years has been about solutions that support our customers in achieving their goals, offering a quality level that has been synonymous with the name Heller since the company’s beginnings. We do not sell machines, we sell production – this was already Hermann Heller jr.’s vision and it remains a goal to this day. We achieve it with all the experience gained throughout 125 years of company history. Throughout these years, we have gained knowledge from thousands of machines developed and produced and projects and processes implemented for a wide variety of industries throughout many regions of the world.

A piece of the region’s industrial history – and much more

From the small Nürtingen trade business to a global enterprise: HELLER’s history is inextricably linked to the development of the region and the town of Nürtingen, where it still has its headquarters. The company founded in 1894 quickly expanded and began manufacturing machines in 1898 and eventually was renamed in 1900 into ‘Gebr. Heller Werkzeug- und Maschinenfabrik’ – Bros. Heller tool and machine factory. Seeing a strong increase in demand, the company moved to newly-erected premises in the so-called Nürtinger Vorstadt at the turn of the century. Soon, the factory became known among industry experts beyond the borders of Swabia. Before long, the company received enquiries from overseas. Company founder Hermann Heller sen. was an exceptionally gifted engineer, but most of all, he was also an ingenious businessman who succeeded time and again to impress customers with his machine tools on his travels.

Not just a place to work

The average staff membership of almost 20 years at HELLER speaks for itself. It bears testament to mutual trust and joint growth. Employees who have worked at HELLER for a long time call HELLER ‘the employee’s company’. Something they already heard their parents say, who also worked at HELLER. HELLER is a family business – in every sense: the founder’s great-grandchildren became shareholders of the company in preparation of the generation change, whilst in terms of staff, often several generations of a family worked at the company, successively or at the same time.

125 years of HELLER

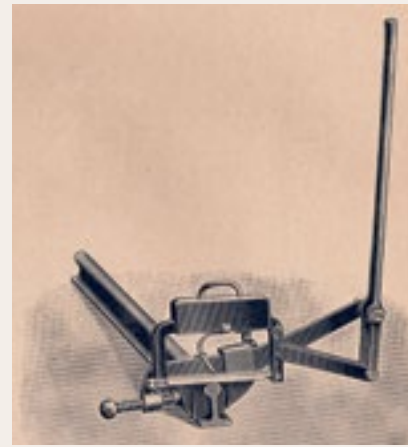
Today, the HELLER Group employs 2,900 people worldwide and develops and produces machining centres and manufacturing systems for metal-cutting applications for numerous customers from many different industries. What began 125 years ago with seven journeymen and three apprentices has developed into a globally active group of companies operating a global competence network. Today, the excellent reputation of the ‘Made in Germany’ seal of approval is complemented by all locations around the globe by the unique ‘Made by HELLER’ brand and quality promise. On our 125th anniversary, we proudly look back on an eventful company history and, despite all political uncertainties, look towards the future with optimism.



1894

Hermann Heller [1869–1931] establishes the company 'Hermann Heller Handelsgeschäft und Fabrikation in geschützten Artikeln und Uhrmacherwerkzeugen' in Nürtingen, trading and manufacturing patented products and watchmaker's tools.

At the beginning, HELLER produces chimney heads, spiral stairs, parallel jaw vices and other tools.



1899

The product portfolio is expanded with a portable oscillating saw with a manual sharpening device used in track construction.

1913

The first apprentice workshop opens in Nürtingen.



1950s

During the time of the so-called Economic Miracle or 'Wirtschaftswunder', HELLER produces an increasing number of special-purpose machines and transfer lines to meet the growing demand for manufacturing capacities.



1952

With the FH 140, the company lays the foundation for its corporate DNA which remains to this day. The horizontal production milling machine in knee-type design, later developed into the bed-type model PF, is already characterised by the typical HELLER genes of stability, productivity and reliability, making it a precursor of the machining centres of the 1960s.

1960s

With Hubert and Berndt Heller, the third generation of the Heller family takes over leadership of the machine factory.



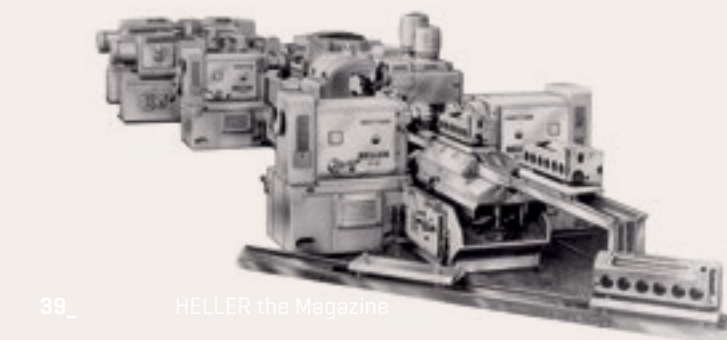
1962

At the time, HELLER builds numerically controlled (NC) milling machines and machining centres, featuring automatic tool change.



1942

The company starts to equip HELLER machine tools with hydraulic controls and expands the portfolio with crank-shaft milling machines.



39_ HELLER the Magazine



1974

The company expands its network with production plants in Redditch/UK and Sorocaba/Brazil.



1982

With a sales and service subsidiary in Chicago, HELLER establishes a first presence in the US market. In 1995 a production plant in Troy/Michigan is founded (photo).

That year, the company starts series production of the BEA machining centres equipped with the latest CNC technology and an in-house built control (HELLER uniPro NC 80).



TEXT **Lukas Schult** PHOTOS **HELLER**



manufacturing processes.

2007

HELLER introduces the new H series, comprising flexibly configurable 4-axis horizontal machining centres for a wide range of materials and components for the machining of individual parts through to high-volume production.

2009

Shortly after, the new F series is launched, comprising 5-axis production machines with or without pallet changer for a broad range of applications in different industries.



2013

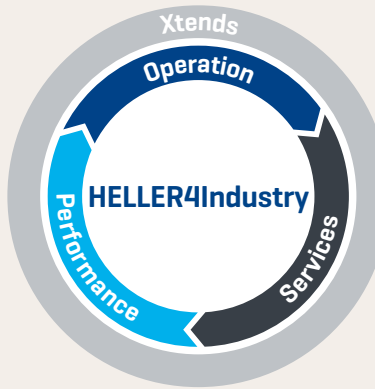
HELLER opens a production plant in Changzhou/China.

Moreover, the company receives an innovation award for its CBC coating technology, reducing fuel consumption and friction losses of combustion engines.

2016

HELLER introduces the 'HELLER4Industry' concept, comprising supplementary machine functionalities and additional on-demand machine services and enhanced service options.

The company also launches the new HF series of horizontal 5-axis machining centres, providing highly productive and flexible machining combined with ease of operation and maintenance.



2012

The first CBC modules for the coating of cylinder bores of crankcases are supplied to customers.

That same year and in the following years, HELLER receives the largest contract in the company's history for this technology: approx. 200 machines for the highly productive and flexible manufacturing of crankcases.



2019

HELLER celebrates its 125th company anniversary and employs more than 2,900 staff worldwide.

1894 2019 125

We sell production.

”



**IN
TER
VIEW**

For more than 40 years, the brothers Hubert and Berndt Heller managed Gebr. Heller Maschinenfabrik GmbH, initiating the company's internationalisation and numerous product developments. On the occasion of the company's 125th anniversary, they look back at the past and also venture a look into the future development of the company.

TEXT **Helmut Angeli** PHOTOS **Tina Trumpp**



Mr Hubert Heller, you took on leadership of the company following the death of your father when you were barely over 20. How well were you prepared for this task at the time?

H. Heller: Our father suffered from a serious heart condition and knew he would not live much longer. Therefore, he prepared me for what was to come as well as he could, teaching me everything he thought was important. He discussed all the technical development goals with me, but most of all, he pointed out the significance of our staff to me. Following his death, I first completed my studies and spent a few months in England to improve my language skills. Subsequently, I joined the company and did my duty.

You say ‘duty’. As a young man, wouldn’t you have liked to see more of the world first, discovering new horizons or foreign cultures?

H. Heller: It simply wasn’t an option. And I saw plenty of the world later on throughout my professional life ...

... but only in the context of your work ...

H. Heller: ... that doesn’t mean that I didn’t take the time to take in all the beautiful things on my travels. I can quite rightly say that I haven’t missed anything in this regard.

You, Mr Berndt Heller, still went to grammar school at the time and surely could have pursued other professional goals. Did you really want to study engineering?

B. Heller: Yes, absolutely. From my earliest youth, I wanted to be like my father. I never had any desire to become anything else.

So being a fireman or a train driver was never your wish?

B. Heller: No, never. My dream job was to be an engineer and I was lucky to be able to go to university in Aachen after graduating from school. After obtaining my degree, I joined the company, working in various departments for a year before being appointed to the management.

How would you describe the company HELLER at that time?

B. Heller: It was a medium-sized company employing approx. 1,600 staff, with transferlines being the mainstay of sales. In terms of products, we still manufactured electro-hydraulic controlled longitudinal and production milling machines at the time, but also one machining centre model. Without a question, HELLER was the absolute technology leader in terms of electro-hydraulic controls at the time. Much of the experience gained in this field was later incorporated into the development of our own CNC.

H. Heller: At the time, our father had already realised that electro-hydraulics was a useful control technology and had therefore promoted its development. He also coined the phrase: “The nervous system is electric, the muscle hydraulic.”

However, this changed very much in the following years.

B. Heller: Not immediately, but we soon directed our development efforts towards series machines. With the PF series, an entirely new kind of travelling column machine, we partly achieved this goal. The BEA 1 was the first real series machine we launched into the market. We sold more than 100 machines of that type per year. Despite this, transferlines were still the number one revenue contributors.

H. Heller: The development of the BEA 1 coincided with the customers’ demands for increased flexibility. At the time, we made the first steps towards increasing the flexibility of the transferlines by using standardised interfaces and then also began offering flexible manufacturing lines consisting of linked machining centres.

Would you say that the development of machining centres was also part of your efforts to reduce the company’s dependency on the automotive industry?

H. Heller: Of course. However, this point is often misinterpreted. We have very good relationships with our customers from the automotive industry and it was not about cutting our ties with the ‘overly powerful’ car industry. Rather, our goal was to become more independent of the investment cycles in these sectors and to expand our customer base.

Was this the period when HELLER developed the uniPro CNC control?

B. Heller: Not only did we have the CNC, but also our own in-house developed programmable logic controller (PLC) and drives. The uniPro control ranked among the top controls of the time as far as performance was concerned. At the same time, we were able to adapt the control algorithms to our machine concept, making the machine and the control work in perfect harmony.

Despite this, the development of the uniPro control was discontinued.

B. Heller: It was only logical. Our customers wanted to focus on as few control suppliers as possible and, at the same time, internationalisation of our business made the use of controls known throughout the world inevitable.

So there were no technical reasons for abandoning in-house development of controls.

B. Heller: By no means. Until today, I would say that the uniPro control ranked among the top CNC controls available at the time as far as performance is concerned. This can also be seen from the fact that Siemens was keen to integrate some of our features and software developments into their own CNC.

You mentioned internationalisation. Was this development also pushed ahead by your customers?

H. Heller: Yes, absolutely. Let’s take Brazil, for example: many German automotive manufacturers had established production facilities in the country and encouraged their suppliers to do the same. Among other factors were the import duties on machine tools of more than 30 percent. The crucial factor for us, however, was service quality and having a local presence. Another example is the UK: at the time, the automotive industry in the country was strong. So we decided to establish an efficient service location there as a first step and then to also build production facilities going forward.



Berndt was the interior minister, and I was the foreign minister.



The Nürtingen headquarters is and will remain the centre of all activities of HELLER.



It's a known fact that the machine tool sector relies on qualified professionals. Probably these were not so easy to come by in Brazil. Where did you find skilled staff?

H. Heller: At the beginning, we mainly looked for people of German origin, also to help with the language barrier. We provided them with in-depth training here in Nürtingen before they returned to Brazil to provide training for other staff. Today, we have a highly skilled team of staff there doing an excellent job.

B. Heller: Although we should not forget to mention that we had an interesting constellation in Brazil in the early years with three sales and assembly companies – namely HELLER, Index and Pfauter – sharing the mechanical manufacturing facilities. None of us would have been able to afford such a well-equipped manufacturing plant. Unfortunately, it was disbanded in the further course, but we used the mechanical manufacturing as a nucleus for our plant in Brazil which we expanded later. At its peak, up to 120 machines were produced there every year.

A volume that is probably far from today's production numbers ...

B. Heller: ... not necessarily. Currently, the production volume should be at around 100 centres.

Basically, the cooperation of three German machine tool manufacturers was a fascinating idea. Why didn't it work out?

H. Heller: The reason was the limited capacity of mechanical manufacturing. When there was an economic boom, we did not have the capacities to meet the demand, and when the demand situation differed from company to company, one was keen to expand the facilities, whilst the others were not. Therefore, the three of us mutually agreed that we would take over the joint manufacturing facilities, operating them alone.

Are the machines produced in Brazil only intended for the South American market?

H. Heller: At HELLER, we have a motto: "Not made in Germany or made in Brazil, but made by HELLER." The centres manufactured at the site are produced for the world market.

In HELLER quality?

B. Heller: These machines are subject to and meet the same quality standards as machines produced in Nürtingen. Here and there, the components are machined in an air-conditioned environment on advanced large machining centres. There is no difference. This is also reflected in the fact that the columns and beds for specific machine sizes used throughout the entire HELLER Group are supplied from Brazil. A company like ours simply cannot afford to produce different qualities. This applies without limitation for all our plants, whether in Brazil, the UK, the US, China or Germany.

Talking about the UK. Will the forthcoming Brexit have an influence on the business activities of the HELLER location in the UK?

B. Heller: This question cannot be reliably answered in detail at this point. Basically, we see no major drawbacks for us. Our facilities in Redditch are a pure assembly plant, importing all major components and exporting a large part of the finished machines. Based on this roll-back procedure, we do not consider potential tariffs the decisive factor and as a machine tool manufacturer can therefore take a fairly relaxed view on the impact of Brexit.

Are you similarly confident about potential obstructions resulting from the US trade policies suggested by President Trump?

H. Heller: With our local presence we are well set up in the US, yet what is important is not to underestimate the influence of the American industry.

The majority of the relevant supplier companies are located in Mexico. So, complicating the delivery situation through tariffs and restrictions cannot be in the interest of the North American automotive industry. Moreover, this is not a situation we can influence in any way.

The company's commitment in China with local production facilities must have been based on similar considerations.

H. Heller: That's correct. With the difference that all equipment providers in the country are encouraged to procure many of the required accessories, such as conveyors, on the local market.

What are the effects of this internationalisation on the Nürtingen location? Will the parent company lose in significance as a result?

B. Heller: The Nürtingen headquarters is and will remain the centre of all activities of HELLER. This is where our central development unit is located and where all relevant decisions are made in the end. The entire group operates like a network with one location helping the other. Nürtingen continues to play a special role in this.

So far, we only spoke about management decisions taken by the brothers Hubert and Berndt which had a positive impact on the company. Were there any decisions that proved to be a misjudgement later?

B. Heller: We were both involved in the leadership of the company for several decades. Therefore, it would be presumptuous to assume that all the decisions we made were right. Misjudging a situation is human. What is crucial is to correct a mistake as quickly as possible and in a sustainable manner.

Can you give us an example?

B. Heller: It was incomprehensible to me that we were successfully building horizontal machining centres but had no vertical machining centres in our portfolio. So we began developing a vertical machining centre in HELLER quality. Although we approached this task with verve and, in my opinion, much know-how, we found that the given budget wouldn't be sufficient by far. Therefore, we stopped the development and didn't even build a prototype.

The question that arises is how did you make such significant decisions? With two Managing Directors, there is no majority vote. Consequently, everything has to be agreed by consensus.

B. Heller: That's correct and it's a good thing. Principally, we discussed all important decisions in detail, always looking for and finding solutions that would advance the company's goals. At the same time, we both focused on different key areas. Whilst my brother concentrated on customer relations and association activities, I focused on development, design and production.

H. Heller: We used to put it this way: Berndt is the interior minister, and I am the foreign minister.

With the exception of the example in Brazil, cooperations with other manufacturers have never really been a goal of HELLER. Is there any particular reason for that?

H. Heller: What advantages would that have given us? Growth makes good sense when it is based on your own efforts. Buying other companies is not really a solution in this regard. And solely increasing the company's size was never our goal.



The customer decides what he wants – no one else.

The machine tool as the final product is only one side of the coin. As a manufacturer you also have to ensure that they run without interruption ...

H. Heller: HELLER is the right place for this. Efficient service is indispensable. Our father used to say: "We do not sell machines, we well production." In other words: once sold, the machines have to keep running and be productive.

B. Heller: ... and I believe that we can unreservedly say that HELLER is among the very best in the industry as far as service is concerned.

How do you determine this?

B. Heller: We have always attached great importance to providing our service staff with the best possible training and also placed a great emphasis on the serviceability of all components when designing the machines, as for example with the HELLER zero-spindle system. With most of our competitors, the replacement of a motor spindle takes between four to eight hours, whereas on the HELLER machine, the same task can be completed in less than 30 minutes.

You both withdrew from operative business relatively early. Especially in family businesses that is not always the case. Were there any specific reasons for this?

H. Heller: I wouldn't say that we withdrew 'early'. In the partnership agreement we both determined that each of us would withdraw from the operational management level at the age of 63. The goal was to prevent the possibility of new ideas and concepts being blocked over an extended period.

When Mr Winkler and Mr Maier took over management, the company was not managed by any members of the family for the first time in its history. Why actually?

B. Heller: The next generation of the family pursues different goals. It was simply a fact we had to account for.

H. Heller: With the two gentlemen we are lucky to have two personalities who think and act the same way as family members. It couldn't have turned out any better.

However, that doesn't mean that there will never be another Heller family member at the head of the company again ...

B. Heller: ... of course not. At the moment, it's not on the agenda, simply because the potential candidates are still too young.

Do you, as an associate or chairman, still have an influence on the company's day-to-day business?

H. Heller: No.

B. Heller: Only within the scope of my supervisory board mandate.

And this takes us to the present time. There is a lot of talk at the moment about a radical change in the machine tool sector in connection with Industry 4.0. Do you share this view?

B. Heller: Let me just say a few words about Industry 4.0. There is no truly generally accepted explanation or even definition of this term and what it means exactly. Everyone seems to have a different idea about it. In terms of the machine tool, I do not see these drastic changes. I rather see it as a continuous development towards complete machining centres, a trend that has already been around for quite a while, of course. Today, customers want the machine to produce finished parts and it is our task to ensure this is possible with our systems.

H. Heller: After all, the fact that it will be possible to acquire an increasing amount of data in the future has no impact on the concept of the machine. And, allow me to raise the question: what are we going to do with the masses of data? Who will process them and who will draw the right conclusions? What we should ask ourselves is how great will be the effort involved and how great the resulting benefit. Above all, every future machine concept will be tailored to our customers' needs. The customer decides what he wants – no one else.

How do you feel about the integration of additive processes into modern machine tools?

B. Heller: HELLER is synonymous with highly productive machine technology. Therefore, I doubt if it makes sense to integrate such time-consuming machining options. To me, it seems much more logic to incorporate these machining systems into superordinate systems as we did with our CBC machine.

As a company working mainly with the automotive industry, you would expect HELLER to keep an eagle eye on the advance of e-mobility. Do you see dark clouds gathering on the horizon?

B. Heller: Again, we should take a more differentiated look at the situation. Combustion engines will continue to be the predominant drive concept for many years to come. Should hybrid vehicles establish themselves successfully in the market, not much is going to change for us as an equipment supplier. Before electric cars can become established on a large scale, the relevant infrastructure has to be in place. We still have a long way to go to achieve this. Moreover, the overall ecobalance of electric cars is by far not as positive as often publicised.

Would you like to have operational responsibility today?

H. Heller: Yes – but with the restriction that I would have to be younger and healthier.

B. Heller: Not really. I was responsible for the employees and the company for almost 40 years and that should be enough.

IN
TER
VIEW

45 years of HELLER Brazil

This year, HELLER has every reason to celebrate. In addition to celebrating the major 125-year anniversary in Nürtingen, the Brazilian plant in Sorocaba is looking back on a 45-year success story in 2019. Since 1974, HELLER has been present on the South American continent with a subsidiary. We take you on a journey through the decades characterised by plenty of work and an unprecedented level of commitment from the people working at HELLER.

TEXT **Roberto Manzo** PHOTOS **HELLER**

Major events 1974 – 1984

- _ manufacture of bed-type milling machines from the PF and Duplex series
- _ manufacture of cold circular saws
- _ manufacture of BEA-1V vertical machining centres
- _ initial production volume: 220 machines



1974

1974 marks the birth of HELLER's Brazilian subsidiary in Sorocaba. The city is located in the southeast of South America's largest country, approx. 100 kilometres from the metropolis of São Paulo.

1976

With the industrial bed-type milling machines from the PF series, the first HELLER machines are produced in Brazil.

1979

In this year, the first machines are exported. The Duplex SFD special-purpose machine for the manufacture of engine blocks is delivered to Mexico.

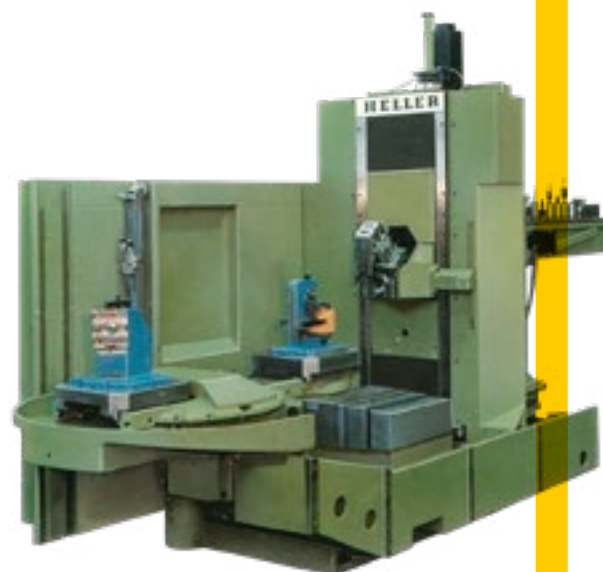


1982

The first BEA-1V machining centre in the sizes 1,000 and 1,800 is manufactured in Sorocaba.

1984

The company receives the first orders for horizontal machining centres. Moreover, a new machine series is produced: the machining centres from the BEA range.



Major events 1985 – 1994

- _ expansion of market shares in Brazil
- _ start of production of the HELLER uniPro 80C numerical control
- _ total production volume in this decade: 400 units
- _ total production volume since the founding of the facilities: 620 machines

1989

The Sorocaba plant starts with the production of additional new machine series, including the PFH, PFV and PFU milling machines as well as the machining centres from the new BZH, BZV and BZU series.

1994

The machining centres from the MCA and MCP series and a new generation of the uniPro 90 control are launched.



Major events 1995 – 2004

- _ first series export programme within the HELLER Group
- _ first projects comprising flexible manufacturing lines for Ford and MWM
- _ total production volume in this decade: 660 units
- _ total production volume since the founding of the facilities: 1,280 machines

1999

The new MC 16 and MC 25 machining centres are launched.

2001

The 1,000th HELLER machine is produced at the Brazilian location: a model MCP-H250 machining centre.

2004

The new MC, MCi and MCH series are launched and HELLER consolidates its market share in Brazil.



1995 – 2004

2015 – today

2015

The open-house event gives customers and suppliers unique insights into the Brazilian facilities.

2017

With the machine models HF 3500 and HF 5500, more 5-axis machining centres are produced and launched.

2019 – HELLER Brazil celebrates its 45-year anniversary.

Apart from the parent company's major anniversary, HELLER Brazil also has every reason to celebrate in 2019. Almost half a century ago, the Brazilian subsidiary was founded, successfully surviving economic crises and cyclical upheavals. Staff have been a critical success factor over the past decades.



1894 2019 45



Major events 2005 – 2014

- _ The MCi 16 becomes HELLER's best-selling machine in Brazil: 358 units
- _ expansion/modernisation of the plant
- _ total production volume in this decade: 830 units
- _ total production volume since the founding of the facilities: 2,100 machines



2011

With the HMC series, another new machining centre is launched.

2012

The 2,000th machine is supplied from the plant in Sorocaba.

2013

With models MC 20 and FP 4000, the first 5-axis machines are launched. Moreover, the entire HELLER Group benefits from the large export volume, e.g. machine components produced in Brazil.

2005 – 2014

"I am proud to have been with HELLER Brazil ever since it was founded 45 years ago. For nearly 12 years, I have been employed with HELLER. I was also involved in the company's beginnings in Brazil. 46 years ago, I was an intern in the law firm of Dr Francisco Florenz. At the time, I was asked to draw up a partnership agreement. With this draft began HELLER's history in Brazil. I am very happy to be part of the HELLER Management in Brazil and South America today. And I am proud to work in a company that has existed for 125 years that stands out for its tradition, values and technical know-how."

Alfredo Griesinger, Managing Director of HELLER Brazil

"2019 is an important anniversary for the HELLER Group. 125 years of company history in Germany and 45 years in Brazil. I can proudly say that I have been a part of this history for 36 years now. We owe this ongoing success to our powerful, innovative products and our skilled staff."

Sandro Baltar, Assembly

"The fact that I have been a part of the company HELLER for 33 years and that HELLER is part of my life makes me proud, because a part of my history is incorporated in the machines we produce. I feel honoured to contribute to the technological development, thus creating solutions for our customers."

Marco Antônio Mendes, Mechanical Machining



125 years working hand in hand with our customers

Customer statements from Europe

What is special about working with HELLER for me is that projects run smoothly.

I would work with HELLER again in the future because I am really impressed with the quality and availability of the machines.

Jürgen Fleckenstein, Production Manager at **KMF Kemptener Maschinenfabrik GmbH** [Germany]



What is special about working with HELLER for us is the close partnership we have formed over the past years. It has resulted in mutual trust, providing a solid foundation for new projects.

I would work with HELLER again in the future because we have really come to know and appreciate the proven technology and staff over the years. Furthermore, we benefit from short response times due the close proximity of the locations.

Carina Katz, Managing Director at **POWER-HYDRAULIK GmbH** [Germany]



What is special about working with HELLER for me is the cooperative and open approach to projects. HELLER is a partner providing genuine 'handshake quality'.

I would work with HELLER again in the future because not only do we invest in systems incorporating high-quality technology, but we also attach great importance to good service – and in this regard we have only had positive experiences with HELLER as far as expertise and rapid response are concerned.

Guenter Muhr, Head of Business Unit Wafer at **FHW Franz Haas Waffelmaschinen GmbH** [Austria]



What is special about working with HELLER for us is the reliability, the quality and the service provided by HELLER.

We would work with HELLER again because the quality of the machines is reflected in the parts we manufacture.

Lothar Weber, Operations Manager at **H. P. Kaysser GmbH + Co. KG** [Germany]

What is special about working with HELLER for me is that they actually deliver what has been promised or agreed by contract.

I would work with HELLER again in the future because adherence to deadlines is a very important aspect for us.

Gerhard Aigner, Production Manager at **ENGEL AUSTRIA GmbH** [Austria]



For me, the special thing about the cooperation with HELLER is the partnership we have created as a result of our cooperation, which gives us a very positive feeling. Originally, we had not intended to cooperate with HELLER. However, we had been looking for the right partner for several years unsuccessfully when we visited the HELLER factory. It had taken us a long time to find a partner offering the perfect capabilities (the right equipment and well-skilled engineers are equally important to us). Our ambitious goal is to be the specialist in vacuum chambers production. The cooperation with HELLER has developed into a close partnership due to the proactive approach of HELLER staff and the great support we received in achieving our goal, resulting in a genuine success story!

I would also choose HELLER in the future because our challenging long-term plans require a perfect partner who is ready to support us at any time.

Miroslav Mičík, Operations Director at **NTS Prometal Machining, s.r.o.** [Czech Republic]



For me, the special thing about the cooperation with HELLER is that I get the chance to see new technologies and thus continue to learn and educate myself.

I would opt for HELLER again in the future because their machines are very good and they also provide very good customer support.

Esmir Mehanović, Project Manager at **Wagner Automotiv d.o.o.** [Bosnia-Herzegovina]



TECH NO LOGY



54_ The HELLER DNA in five axes

56_ Sending measurement values
without contact

58_ Innovative CAM technologies for
manufacturing excellence

The HELLER DNA in five axes

TEXT **Lukas Schult** PHOTOS **HELLER**

Sturdy machine engineering, profound process experience, comprehensive milling expertise – these are the basic characteristics of HELLER machine tools. Since the 1980s, HELLER has expanded its machine portfolio of proven 4-axis machining centres with 5-axis machines. The current F, C and HF series and the MC 20 machining centres are synonymous with highest productivity and flexibility in 5-axis machining. Despite their varied and versatile applications, all machines share the typical HELLER genes of highest quality, perfect productivity and absolute reliability in day-to-day production. What sounds like a well-worn cliché has been a promise for HELLER for 125 years.

With the introduction of the **F series** in 2009, HELLER opened a new chapter in terms of the process-secure 5-sided and simultaneous 5-axis machining. The fifth axis of the F series is provided by the tool and the machines can either be equipped with swivel-head or fork-head kinematics. The series has been designed especially with those users in mind who need to accomplish a wide range of tasks on a single machine. For series production, the F series provides a pallet changer. If smaller batch sizes are manufactured in a workshop-oriented manner, HELLER also offers the machining centres with table loading.

The premise with the **C series of machining centres** is Combined Processing, since these machines do not only provide powerful milling but also turning capabilities. This highly productive machine provides economically efficient cutting data with workpiece rotations of up to 1,000 RPM for performance-oriented pre-machining and finishing true to the final contour. The swivel head or fork head and the high-speed rotary table enable hassle-free horizontal and vertical turning operations of outer and inner contours.

The modular **MC 20** machining centres are ideally suited for integration into flexible manufacturing systems and for highly productive series production of light-duty automotive components and are also available with direct loading. In standard design, they feature 4 axes, but they can also be equipped with a fifth axis provided by the workpiece as an option. The compact machines in modular design are scalable and can be linked to an automated manufacturing system at any time.

The latest machine development, the **HF series**, is the logical expansion of HELLER’s product portfolio in the 5-axis range of machines. These highly productive and flexibly applicable

machines provide great ease of use and are available with pallet changer or in table design. Contrary to the C and F series, the fifth axis of the HF series is provided by the workpiece. Rigidity is guaranteed due to the robust cast machine bed combined with a weight-optimised steel machine column. At the core of the dynamic drive concept are the ball-screw driven linear axes equipped with anti-friction guideways. The NC swivel rotary table equipped with two direct driven rotary axes maintains its rigidity even under high loads due to a counter bearing combined with a YRT bearing. In short, the HF is optimally equipped for the exacting requirements of modern production processes and therefore

the ideal machining centre for the manufacture of complex components.

In addition to the specific light-duty applications of the 4-axis and 5-axis MC 20 machining centres and the possibility of integrating them into flexible manufacturing systems, the three series – F, C and HF – can be combined with workpiece or pallet automation without any problem, offering a wide range of options in terms of workpiece and tool management. As a result, all HELLER 5-axis machining centres can be perfectly integrated into any specific manufacturing environment, thus offering the necessary flexibility indispensable to customers today.



5-axis machining centres

HF

- _ horizontal 5-axis machining centres with 5th axis provided by the workpiece
- _ NC swivel rotary table with counter bearing and AB kinematics as standard
- _ short chip-to-chip times due to quick tool changer and high axis dynamics
- _ spindle units optionally equipped with HSK-A 63 or HSK-A 100
- _ good accessibility for ease of operation and maintenance
- _ machines with pallet changer optimally suited for series production
- _ machines with table loading for workshop-oriented manufacturing and small batch sizes



5-axis machining centres

F

- _ universal 5-axis machining centres with 5th axis provided by the tool
- _ spindle units with swivel-head or fork-head kinematics
- _ powerful 5-sided and simultaneous 5-axis machining
- _ robust machine design, combined with powerful, high-torque spindle technology
- _ optimised per-piece costs due to reduced number of clamping positions and machining in a single setup



5-axis milling/turning machining centres

C

- _ universal 5-axis mill/turning centres with 5th axis provided by the tool and a rotary table
- _ powerful combination of milling and turning operations on a single machine for highest flexibility [Combined Processing]
- _ 5-sided and simultaneous 5-axis machining and turning with tilted rotary axes
- _ machine with pallet changer optimally suited for series production
- _ machines with table loading for workshop-oriented manufacturing and small batch sizes



5-axis machining centres

MC 20

- _ modular 4-axis or 5-axis machining centres for direct loading
- _ designed for optimal integration into flexibly linked manufacturing systems and 24/7 series production of light-duty automotive components
- _ 5-axis variant with NC swivel rotary table [AB combination with 5th axis provided by the workpiece]
- _ horizontal spindle for optimal chip fall
- _ short chip-to-chip times due to fast tool changer and high axis dynamics
- _ small footprint with overhead tool magazine
- _ automatic workpiece loading from the top [or from the front] directly into the work area [Direct Load]
- _ spindle units optionally with HSK-A 63 or HSK-A 100 tool shank

Inductive IO-Link couplers from Balluff transfer measurement results in the micrometer range reliably and loss-free.

Sending measurement values without contact

Wherever workpiece carriers are constantly moving and where as in machining centres there is up to 360 degrees of rotation, transferring data from mobile to fixed parts of the system always presents challenges to electronic designers and builders. Inductive coupling systems (BIC) from Balluff are the remedy, transmitting digitized data, signals and even power for the sensors and actuators over a narrow air gap.

TEXT **Dr Detlef Zienert (Balluff)** PHOTOS **Balluff**



A well-known Scandinavian automobile manufacturer relies on the expertise of HELLER for their truck engine manufacturing. HELLER machining centres run almost fully automatically in a highly modern production line to produce ready to assemble engine blocks from raw castings.

Here is how it works: an automated loading system brings the raw part from above to a 360 degrees rotating index table and secured to the contact area using hydraulic clamping. Since raw block castings usually differ slightly in size due to manufacturing tolerances, as part of the clamping process the relative location of the workpiece on the rotary table is determined and sent to the controller. A bolt located on the base plate detects an index hole drilled in the underside of the engine block, after which four massive swing clamps pull the workpiece back and 16 inductive sensors from Balluff then confirm exact seating. While the casting is moved to its machining position, an inductive sensor registers the distance the bolt has travelled in the indexing hole along with the workpiece. Once the casting is finally in its machining position, the location and dimension data have already been detected and sent to the controller. Machining of the engine block can now begin.

A displacement transducer is used to precisely determine the measurement value as part of the machining and quality control. It compensates for the unavoidable fluctuations in the dimensions of the cast parts to ensure exact and identical machining results.

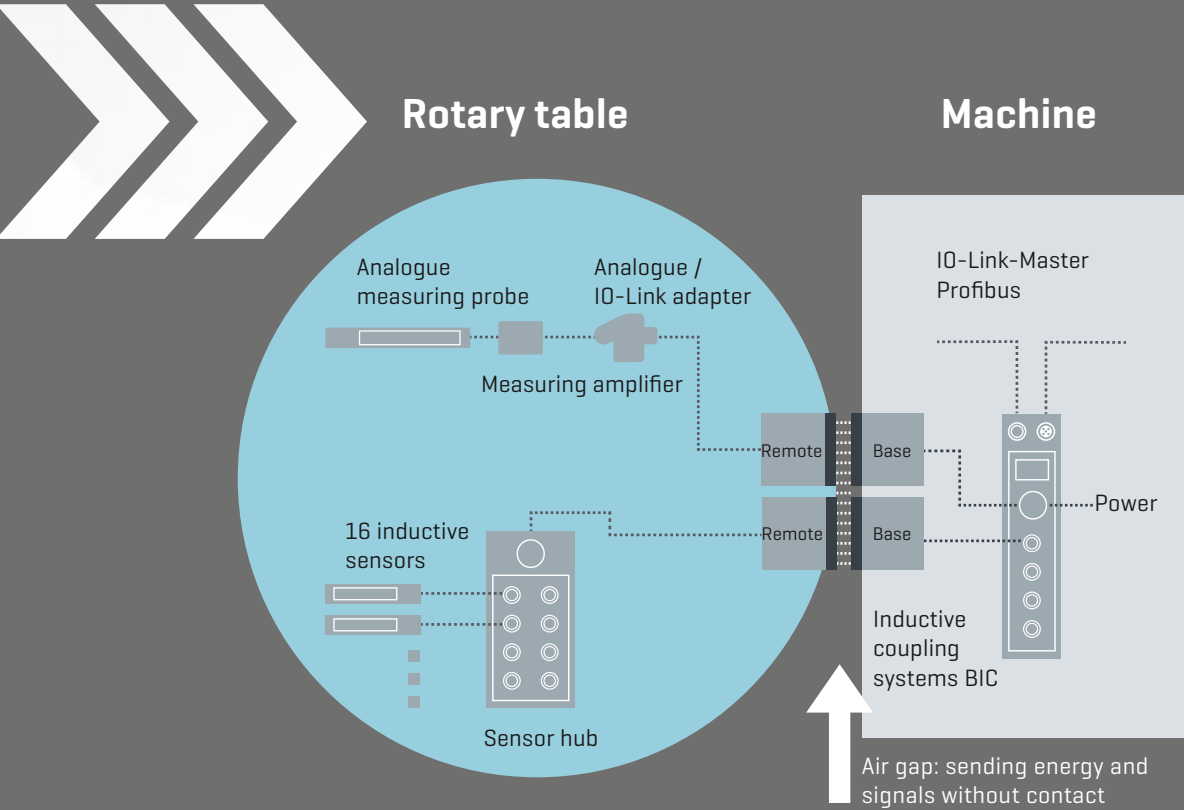
As early as the plant's design phase the question arises as to how the signals and data should get from the movable and rotatable table to the machine base and thereby to the control level. In line with the contractor's high productivity and reliability requirements, conventional wiring solutions were out of the question as were slip ring systems: too cumbersome, sensitive, wear-prone and therefore unreliable. HELLER decided on the inductive coupler systems (BIC) from Balluff with IO-Link interface. This transmits signals and power without contact over an air gap of up to 5 mm. The HELLER machining centres have the sender (Remote) and receiver (Base) facing each other and ready for use in the loading and unloading position. In the present case, the system is redundant: one coupler set is responsible for transmitting the length information, the other for transferring the position data to 1/1000 mm accuracy. An analog adapter (A-D converter) takes the analog signal from the Balluff stance transducer and generates an IO-Link signal, which arrives at the Remote sender via standard cable. No shielded cable is required. A sensor

With over 4,000 employees worldwide, **Balluff** stands for innovative technology, quality and cross-sector experience in industrial automation. As a leading sensor and automation specialist, the family-owned company in its fourth generation offers a comprehensive range of high-quality sensor, identification, networking and software solutions.

BALLUFF

hub collects the signals from 16 inductive sensors and the bundled IO-Link signal is transmitted to the second Remote coupler.

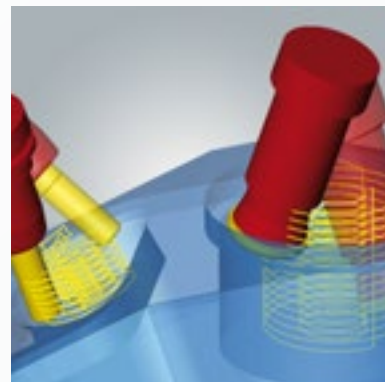
The IP 67 non-contacting couplers work reliably and wear-free even in extreme conditions, with transmission unaffected by chips or coolants. With its quick-disconnect units, this intelligent transmission system offers maximum flexibility when it comes to format changes. And in combination with an IO-Link master, virtually any common fieldbus system can be used.



Innovative CAM technologies for manufacturing excellence

Manufacturing excellence is always a result of several components such as the CAM system, the machine tool and the tool interacting perfectly. The *hyperMILL*® MAXX Machining performance package provides just that. The three modules for roughing, finishing and drilling comprise innovative machining strategies, enabling users to get the most out of the machine tool.

TEXT **Carolyn Lang (OPEN MIND)** ILLUSTRATIONS **OPEN MIND**



5-axis helical drilling: remove material from circular pockets in a highly efficient and tool-friendly manner

The roughing module uses helical and trochoidal tool motions to enable milling and turning operations that go easy on the cutting tool. This method is also significantly faster than conventional roughing processes. The finishing module comprises the machining of planes and any constant-curvature surfaces and fillets using various barrel cutters. In terms of finishing, significant time savings can be achieved whilst producing the same or even better surface qualities as with spherical milling cutters. The drilling module allows efficient removal of material from circular pockets whilst reducing tool wear.

Fast roughing in milling and turning

The roughing module provides numerous strategies for milling and turning operations using trochoidal tool paths to ensure reliable HPC machining. Dynamic feed adjustment according to the existing cutting conditions ensures the use of the highest possible feed rate during milling. Turning operations can be performed with optimal use of round form inserts. Both technologies provide optimal tool paths and maximum chip removal rates whilst guaranteeing the shortest possible machining times. The roughing module, for instance, provides the perfect solution for high-performance turning and milling operations. In terms of milling, not only prismatic component surfaces can be machined but also curved surfaces.

Finishing in record time – 90 % time savings

Many industries demand ever higher surface qualities in machining. To achieve this, *hyperMILL*® provides highly efficient finishing strategies, allowing to make optimal use of the capabilities offered by the machines and the tools in terms of surface finish and speed. For a long time, the finishing of planes was considered a mature process and the often very long machining times required to achieve high-quality surfaces using

spherical milling cutters and multipass milling were accepted by users. OPEN MIND developed a completely new technology based on two factors: innovative 5-axis strategies for tangential machining of planes and sculptured surfaces and the conical barrel cutter. The tool can be used as a barrel cutter and as a spherical cutter at the same time. For the conical barrel cutter, the shape of the finishing tool was modified in a way to provide very large radii – ranging from 250 to 1,500 mm. The cutter's larger radii allow to machine much larger step-over distances between paths of 6 to 8 mm. This enables machining operations using high feed rates whilst the ball tip of the barrel cutter ensures effective machining of corner radii. As a result, no change of milling cutter is required for the finishing of adjacent areas such as rounded inner corners. Companies using the innovative strategies and the conical barrel cutter can achieve significant time savings of up to 90 %.

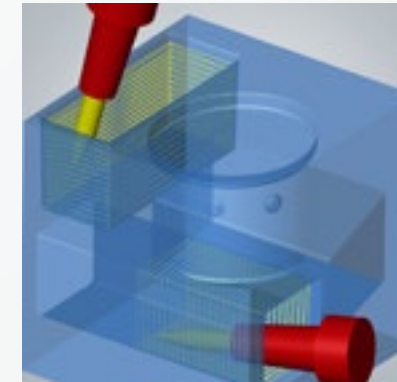
Superior surface finish

These extremely high-quality surface finishes would be impossible to achieve in a conventional multipass milling operation using a spherical cutter. *hyperMILL*® MAXX Machining allows to achieve optimal surfaces through skilful consideration of the contact situation. Automatic tool positioning ensures that the tool always has the optimal tilt towards the surface to be machined. The 5-axis multi-surface machining operation using conical barrel cutters allows to produce entire surface groups in a single operation. This results in ultra-smooth sculptured surfaces and planes. Even hard-to-reach areas can be machined reliably and in a highly efficient manner.

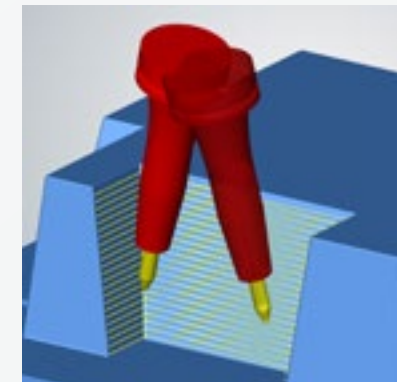
Simple programming

Programming in *hyperMILL*® is easy and user-friendly. Clicking on the surfaces to be machined is enough; the tilt of the milling cutter is then generated automatically. Automatic collision avoidance is provided for the complete machining process. Companies using the innovative strategies provided by the *hyperMILL*® MAXX Machining performance package have numerous benefits: short machining times, extended tool life, small number of tools, maximum process reliability and optimal surface quality.

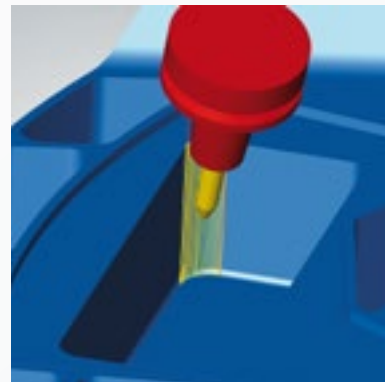
hyperMILL®
MAXX Machining



The strategy
5-axis tangential plane
machining allows high
efficient finishing with
conical barrel cutters



Short machining time:
high step-down with
conical barrel cutter
accompanied by a high
surface quality



Conical barrel cutter: machining a fillet between two surfaces very efficiently

The **OPEN MIND Technologies AG** is one of the world's leading developers of CAM solutions for programming independent of the machine and control type used. The company develops perfectly tailored CAM solutions incorporating numerous unique innovations, delivering a significant increase in performance. Strategies like 2.5D, 3D, 5-axis milling and mill-turning and operations like HSC and HPC are integrated into the *hyperMILL*® CAM system. The CAD/CAM solutions provided by OPEN MIND meet the highest standards of tool and mould makers, machine builders, the automotive and aerospace industry or medical engineering.



MAXXimum efficiency with *hyperMILL*® MAXX Machining

With its three highly efficient modules for roughing, finishing and drilling, the *hyperMILL*® MAXX Machining performance package provides a real boost in efficiency. Manufacturing companies using these innovative CAM strategies achieve times saving of up to 90 % in their finishing and up to 75 % in their roughing operations.

OPEN MIND
THE CAM FORCE

PRO DUC TION

An abstract graphic featuring a large gear shape. The gear is composed of many thin, concentric, wavy lines that create a sense of depth and movement. The lines are yellow and set against a solid yellow background. The gear is positioned in the lower-left quadrant of the page, with its teeth pointing towards the bottom-left corner.

62_ Full steam into the digital future

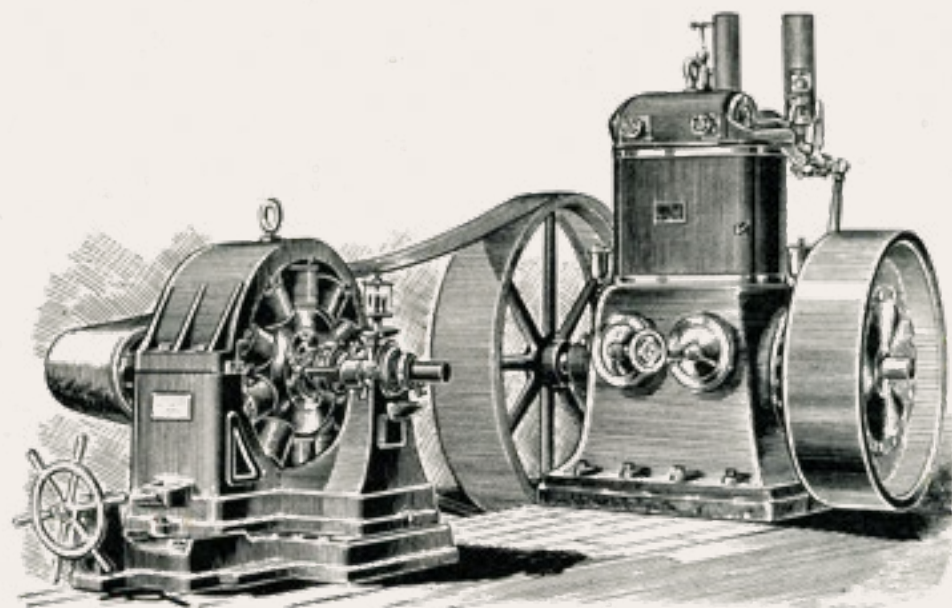
68_ Harnessing artificial intelligence
for production

In my opinion, the future will be determined by machines and apparatuses. In the future, an increasing part of human labour will be performed by machines, especially in manufacturing. As to the future, I foresee large machines producing all kinds of goods in a fully automatic manner. They will make work a lot easier for humans as they require less physical effort. As a result, it will be possible to produce goods faster, cheaper and in higher volumes. ”

Around 1900, Hermann Heller replied to the question
“Where do you see your company in 120 years’ time?”

Industry 1.0 – the arrival of the steam engine paved the way to industrialisation

The industrial age is said to have begun around 1800 with Joseph-Marie Jacquard's invention of the first automatic loom, heralding the arrival of the Industrial Revolution. In Germany, the transformation of the labour and social systems, i.e. the first Industrial Revolution, only started after the year 1830 in smaller industrial centres, e.g. the Ruhr region. Hand-operated looms, mechanical production systems and water and steam power characterise the period. Water power was considered the primary energy and steam engines were the first engines to be widely used in factories, becoming vital drivers of industrialisation. The main areas of industrialisation were steam navigation, the railway industry, coal mining, textile factories and the heavy industry. Railways in particular quickly gained importance as new means of transportation and created a strong demand in many other sectors. These new types of machines resulted in a massive increase in labour force. At the same time, humans turned into machine operators having to conform to organisational constraints.



Industry 2.0 – mass production using electricity

Industry 2.0 – mass production using electricity

The second Industrial Revolution began with the introduction of electricity and is characterised by mass production. In 1913, Henry Ford installed a continuous conveyor belt system, the first moving assembly line. It allowed to increase the production volume eightfold. Other success factors at the time included the first steps towards globalisation. For the first time, traffic became intercontinental with the start of aviation and ships crossing the oceans.

Industry 2.0

Beginnings and development into a global business

HELLER was founded in Nürtingen in 1894 during the second Industrial Revolution by Hermann Heller under the name 'Hermann Heller Handelsgeschäft und Fabrikation in geschützten Artikeln und Uhrmacherwerkzeugen', specialising in the trade and manufacture of patented products and watchmaker's tools, and from then on was a permanent fixture in production throughout the industrial world. Already in 1898, the company began developing cold circular metal sawing machines, saw blade skiving and thread cutting machines. In the 1920s, the company started to export its products to other European countries and even overseas for the first time. At the beginning of the 1940s, HELLER enjoyed an excellent reputation for its crankshaft milling machines and special-purpose milling machines equipped with hydraulic controls. In the following years, machine technology was systematically enhanced, enabling the construction of manufacturing lines in modular design. In 1962, HELLER started to build numerically controlled milling machines and machining centres with automatic tool change, allowing to perform complex operations on a single machine. Interestingly enough, these machines were also used in the company's own production.





Industry 3.0 – introduction of computers and automation

The third Industrial Revolution began in the 1970s. More and more machines performed the work of humans. Personal computers for office and private use opened up a new branch of industry. In mechanical engineering, NC controls superseded punch tapes. Settings and adjustments were no longer made by hand but by the programs. Machine data and production data acquisition, CAD/CAM, networking and digitisation were born during this evolutionary phase. The goal was to capture the entire data, to compress it and make it available to all parties involved. Consequently, the transformation from knowledge stored in the brain to digital knowledge already began during the Industry 3.0 phase.

Pioneer in terms of CNC/NC controls

During this phase, HELLER set new standards in metal-cutting technology with newly developed and refined customer-specific solutions and innovations in the company's own production. Numerically controlled processes superseded mechanical controls, resulting in a first stage of automation. With the in-house developed uniPro control, HELLER became a pioneer and trailblazer in this area. With NC technology, and the subsequent CNC technology, HELLER achieved significantly faster and more precise tool and workpiece motions. At the time, programming, machining programs and unmanned production reached a peak, marking the beginning of the age of Industry 4.0. In terms of machines, HELLER introduced

multiheads, enabling the use of several different tools at the same time. From the 1970s, numerous HELLER horizontal 4-spindle CNC milling machines were used in the production of aerospace components. In 1982, HELLER started with the series production of BEA machining centres equipped with the new HELLER uniPro NC 80 CNC control technology. With the opening of plants in England and Brazil in 1974 and the USA in 1982, HELLER underlined the company's global orientation.

Industry 3.0

Industry 4.0



Industry 4.0 – the digital revolution

Initially, Industry 4.0 was a vision initiated by the German Federal Government. It is based on Industry 3.0 developments and regarded as a systematic evolution. It describes the industrial development of additional technologies, but also the changing production and working environment. Social networks and the internet connect the world. By 2020, approx. three million robots will be in use in the industry. In terms of metal-cutting technology, production is regarded as a cohesive unit today, for which all data required and generated are provided in digital, i.e. paperless form. This transparency, including cloud solutions, is today regarded as a part of Industry 4.0, but its beginnings date back to a time two decades ago.

Real-time, transparent and needs-based – added value for the future

With the new industry standards for data exchange, HELLER focuses on achieving a further increase in productivity and on the implementation of consistent engineering chains. With supplementary machine functionalities, real-time and needs-based services and expanded service possibilities, HELLER directs the focus of applications not only towards the life cycle but rather towards all key areas of a machine tool. In addition to services ensuring high availability, this includes the optimisation of the operation and performance of the machine tool. HELLER also regards Industry 4.0 as an approach to enhance transparency of the current machine status, evaluating the information gained in combination with existing data to allow purposeful diagnostics. HELLER recognised these potentials at an early stage, creating added-value for customers.



A **revolution** is regarded as a fundamental, lasting and often relatively sudden structural change of one or several systems, whereas the term evolution is the opposite, referring to slower developments or changes that do not involve a radical change. Looking at the changes that took place in industrial manufacturing, the correct term to use would not be revolution, but rather evolution. After all, it took almost 100 years to get from Industry 1.0 to Industry 2.0. Moreover, important cornerstones for future development phases were already laid throughout the individual ages in a seamless transition.

Artificial intelligence

Harnessing AI for production

Object



Human

Human



Object



TEXT **Gerda Kniefel (WGP)**
PHOTOS **Daniel Ingold / IWF Berlin / IFW Hannover / IPK Berlin**

Artificial intelligence (AI) is on everyone’s lips at the moment. As part of its *Artificial Intelligence Strategy*, the German government has promised to spend three billion Euros until 2025 to develop the brand *AI – made in Germany*, establishing the country as the world leader in this technology. Considering the investments and progress made in the US and increasingly also in China, this will not be an easy task. Yet, Germany has one crucial advantage: researchers working in close cooperation with manufacturing. “Artificial intelligence offers significant opportunities also in terms of production technology,” stresses Prof. Berend Denkena, President of WGP [German Academic Association for Production Technology] and Head of the Institute of Production Engineering and Machine Tools (IFW) at Leibniz University Hannover. “As a research community we can and will promote this megatrend.”

Various WGP institutes, e.g. in Aachen, Berlin, Erlangen, Karlsruhe and Stuttgart, are already conducting specific AI research in manufacturing. “With approximately 40 research institutes, WGP has a unique domain knowledge of production technology. With the knowledge gained from AI research, we now aim to create a basis for the strategic development of existing experiences, allowing to systematically harness the value creation potentials offered by AI in manufacturing that until now have only been exploited sporadically,” emphasises Prof. Jörg Krüger, Head of the Department of Industrial Automation Technology at the Institute for Machine Tools and Factory Management (IWF) at TU Berlin and Head of the Automation Technology division at the Fraunhofer Institute for Production Systems and Design Technology (IPK) in Berlin.



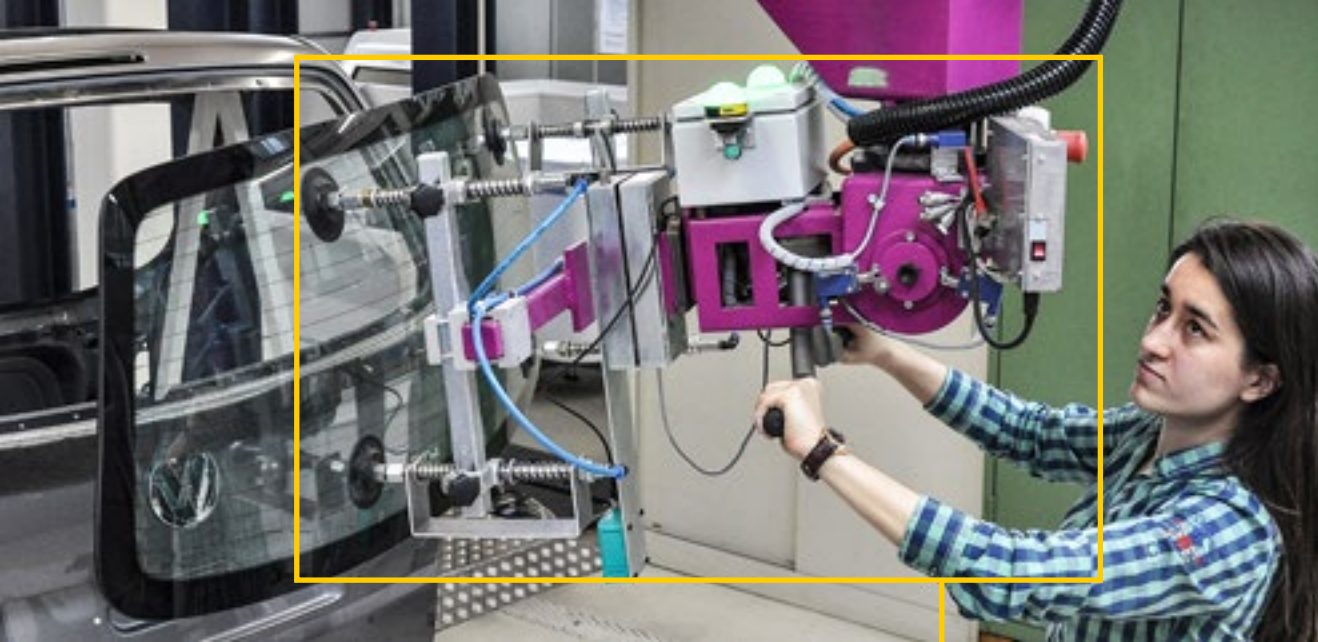
By early summer, the professors plan to draft a position paper which will, for the first time, outline the key questions and answers in relation to AI in production. “It will allow the German industry to increase the application of the new technology in the future and help them to generate an economic benefit from AI,” Krüger, who initiated the position paper, is convinced. Moreover, it is meant as a wake-up call to companies, prompting them to engage in the practical application of AI. Practical recommendations for action regarding the introduction of the technology aim to speed up the knowledge transfer. In Germany, it often takes years before research findings are implemented in business practice. With a rapidly developing technology like AI, the solutions implemented by companies would long be outdated by then.

“In order to find AI-based approaches to production technology-related problems, we first need to define and formulate the requirements on the AI systems,” Krüger describes the approach taken by WGP. “After all, an AI system does not know which data need to be captured at which point of the process chain to enable it to learn what has to be produced in which ways.” The WGP position paper’s task is to establish these requirements.

A 32 billion Euro sales increase thanks to AI

Already about 30 years ago, papers on production planning and machine diagnostics using artificial neural networks were published. Today, the volume of data available and the possibilities of data processing and storage are sufficient to tap into a number of new value creation potentials in production. “And the volume of data available will increase further in the future,” says Denkena.

Therefore, the WGP experts believe that AI will result in numerous innovations in production technology in the foreseeable future. The billions promised by the Federal Government and the universities’ investments into additional professorships show how great the potential of artificial intelligence is estimated to be. Moreover, the conclusion of the so-called PAiCE study commissioned by the Federal Ministry for Economic Affairs and Energy published in 2018 is that the technologies could be of major significance for the manufacturing sector. The Institute for Innovation and Technology (iit) in Berlin has calculated that the additional AI-induced growth in the coming four years will reach a volume of approx. 32 billion Euros. This corresponds to about a third of the overall growth of the sector within this period. The authors of the



study recommend policy makers to promote AI technologies like machine learning and computer vision in a targeted manner. It will only be possible to achieve the massive growth projected when AI is used in a systematic manner. “Increasing added value through AI is not only possible with fully automated systems,” Krüger adds. “A significant increase in added value can also be achieved in partially automated systems or operator assistance systems. It offers distinct competitive advantages to the entire German industry.”

Perfecting production

AI applications could be used for monitoring and maintenance of production systems, optimised resource and knowledge management, quality control, robotics and not least intelligent assistance systems. Experts believe that deep learning, a subfield of machine learning, holds exceptional potential for production technology. Already structured machine data from a range of different sensors, for example, could be linked to unstructured data such as images, videos or sound. Subsequently, machine learning algorithms could be used to identify specific patterns or correlations in the data. This again could help to detect anomalies at an early stage, preventing damage to the machine or even the overall system. The learning system, i.e. a self-monitoring plant, prevents production errors or even losses, reduces the maintenance or inspection effort and improves product quality and manufacturing efficiency.

AI also allows to achieve a significant increase in the precision and efficiency of individual machines. “An example from research shows that artificial intelligence can lead us to a better understanding of the foundations of cutting forces,” explains Krüger. “It helps us to further improve the long accepted and established cutting models. Metal-cutting machines will become more precise and more effective, because we know more about the counterforces involved in machining and are able to improve regulation of positioning accuracy,” Krüger says about a research project of his WGP colleague Prof. Christian Brecher of the WZL Laboratory for Machine Tools and Production Engineering of RWTH Aachen.

Moreover, production planning and control are important fields where AI systems could be used. In times of individual customer requirements and shorter lead times for order processing, automated determination of, for instance, processing sequences in flow production can provide higher added value. Prediction of material requirements or tools reduces waiting times whilst real-time decision support in case of unforeseen events increases production agility and reliability.

As companies are often short on personnel, AI-based services can be a lucrative new business model. The Israeli start-up 3D Signals, for instance, specialises in using microphones to monitor machines in order to identify unusual noise in real time. According to the German magazine WirtschaftsWoche, this helped a steel tube manufacturer to reduce downtimes, achieving savings of USD 180,000 within a two-month period. This shows that AI results in a win-win situation.



WGP – German Academic Association for Production Technology

The German Academic Association for Production Technology is a consortium of leading German professors of production technology. The WGP stands for approximately 2,000 scientists of production technology and represents the interests of research and teaching in production technology vis à vis politicians, the public and representatives of economy. The aim is to raise the awareness of the significance of production and production science for society and Germany as a location and to take a stand concerning socially relevant future topics such as Industry 4.0, energy efficiency or 3D printing. Find out more about the WGP at <https://wgp.de/en/>.

SER VICES



74_ Retooling in unusual dimensions

RETOOLING IN UNUSUAL DIMENSIONS

Model and development cycles in the automotive industry have become shorter and shorter in recent years. This applies in particular to new engine generations with the requirements on fuel consumption and emissions forcing the industry to continually drive new developments. An example of the enormous effort involved in the production changeover to new engine models is the manufacturing system at the Fiat Chrysler Automobiles N.V. (FCA) plant in Bielsko-Biala in Poland. The production line for the proven TwinAir engines was to be split up in order to integrate the new GSE (Global Small Engine) engine family. A project that presented the people in charge at HELLER with a significant challenge.

TEXT **Manfred Lerch** PHOTO **Jens Gelowicz**

43 tonnes
of material

53 machining
centres

What was particularly interesting with this project, aside from the know-how and the massive logistics effort required, was the schedule. At the beginning of 2017, FCA increased the production volume in order to stock up on the relevant components required as a buffer. As a first step, HELLER then began with the retooling of the seven machining centres for the TwinAir engines and further machines for the machining of the cylinder head and block. At times, 12 staff from HELLER Services had to be present on site, working on a total of 30 machining centres*. At the same time, several HELLER technologists were on location to run in the processes. Only four months later, the production was up and running six days/week in three shifts. In the second phase of the retooling project, the GSE manufacturing line is currently being duplicated in order to double the output volume.

A successful joint project

Everyone involved is aware that, all in all, a project like this would not have been possible without a cooperation based on partnership. Project Manager Ralf Lenuzza, and Holger Class, Project Manager Application Assembly at HELLER, believe that the successful implementation of the project was mainly due to the close interaction between all relevant departments and the well organised exchange of materials between FCA and HELLER. To Oliver Herrmann, Technical Support Europe at HELLER, it was very helpful that he has had a very open and honest relationship with the Head of Maintenance at FCA for years. Obviously, FCA shares this view. In addition to thank-you letters and numerous follow-up orders, e.g. for the integration of host computers and the installation of new interfaces and software, HELLER also received the company's Supplier Award.

* Moreover, the company Comau, an Italian machine tool manufacturer and member of the FCA Group, received nine additional HELLER machining centres.

Initial situation and goal of the project

In 2011, Fiat Powertrain Technologies' TwinAir engine received the International Engine of the Year award and won the 'Best Sub 1-litre' category. The engine is produced on a total of 53 HELLER machining centres. In 2016, the people in charge at FCA planned to split the existing system into three new production lines. In addition to the TwinAir engines, they also wanted to use the existing machining centres for the production of the new 1L 3-cylinder and the 1.3L 4-cylinder gasoline engines fitted in the Jeep Renegade among other models. Moreover, it was planned to continue operating a reduced version of the existing TwinAir engine line at a different location. At the time, the HELLER machining centres had been in operation for ten years so that extensive retooling was mandatory.

Prior to start of production

As part of this major project, the HELLER project management began planning a secondary line comprising seven machining centres including loading equipment for the TwinAir engines. In parallel, the processes for the new GSE engines were designed and a manufacturing line comprising 32 machining centres was configured. At virtually the same time, HELLER Services began examining and modifying the machines. As part of the

required retooling, the machines were overhauled and the tool changers and B axes replaced. Some were modified from B to AB axis or updated. Additionally, the X, Y and Z guideways were replaced and new fixtures implemented. In addition, three new HELLER MC 20 machining centres were installed at Bielsko-Biala.

Considering the masses of spare parts required, the project was already an enormous challenge as far as logistics and service were concerned. In total, 43 tonnes of material had to be supplied before completion of the project. In many cases, detailed know-how and commitment were required. Regarding the machines for the TwinAir engines, it had to be taken into account that due to the reduced number of machines different workpiece positions were required. Despite this, the cycle times achieved until then had to be maintained. Another aspect was the instant response required from HELLER since process conditions changed during the running-in of the GSE workpiece type. As a result, the fixtures had to be modified and the tools adapted to the new status. These short-term changes were important because the start of production in Bielsko-Biala had been stipulated in advance, determining the date by which the gamma parts for the first test engines had to be completed in the field.



MARKET



78_ Investigating the future of machine and plant engineering

82_ HELLER – Customer-oriented. Innovative. Efficient.

84_ HELLER at China International Import Expo / A sign of goodwill amidst the trade dispute

86_ 125 years working hand in hand with our customers

Investigating the future of machine and plant engineering

Climate change, migration, urbanisation, mobility, artificial intelligence – the world is changing. Trends and disruptions open up new business opportunities to many industries or challenge traditional ways of thinking. Machine and plant engineering is right at the centre of it: an industry driven by innovation that has always picked up the trends of the time in order to enhance products and their production and to create new things. How can companies recognise changes and shape change? What role does digitisation play? Insights into trends, trend scouting and foresight as corporate strategies.

TEXT **Dr Eric Maiser** [VDMA] PHOTOS **HELLER / VDMA**

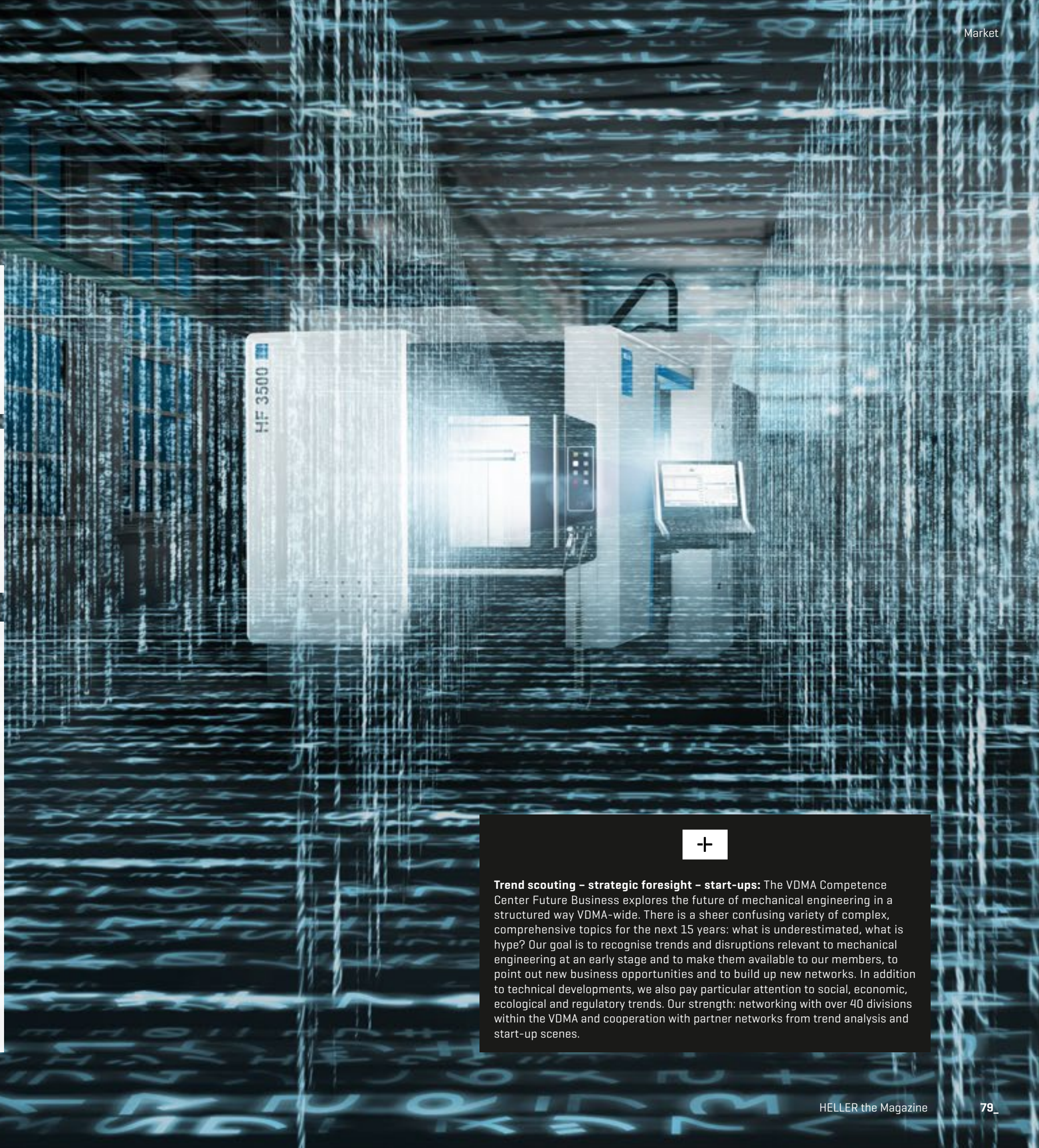
Machine manufacturers 'produce' the future

Tools, machines and equipment are drivers of technological and social change – not only since the Industrial Revolution or the first flight to the moon. At the same time, the mechanical engineering sector itself is in a constant state of change: following the perfection of mechanics, it became clear in the 1970s that the use of electronics would open up new horizons to mechanical engineering. Today, comprehensive, even revolutionary impulses come from the areas of computer sciences and from start-ups from outside the machine building industry. As a result, the mechanical engineering industry itself has become a trendsetter. This is highlighted by the following examples of trends connected to digitisation.

Digitisation: five complex future-oriented fields

The 1980s saw the emergence of Computer Integrated Manufacturing (CIM) followed by a rapid increase in computing power and the introduction of networked microsensors. This resulted in the invention of *self-organising* production 10 years ago, today known as 'Industry 4.0'. Today, OPC-UA helps to create 'plug-and-play' solutions for manufacturing. In 2016, machine learning, a sub-field of **artificial intelligence (AI)**, added another dimension, allowing to design *self-learning* machines. The benefit to the industry: since then, production and logistics have become even more flexible and customisable. But what is really revolutionary about it is that machine learning does not only support automatic evaluation of large amounts of data but also allows to establish previously unknown correlations, to draw unusual conclusions and to generate new knowledge – all in real time. All this results in attractive, completely new business models, from predictive maintenance, as-a-service solutions and data marketing through to human-machine-interfaces. As a result, mechanical engineering companies are able to tap into new markets, offering two-digit growth potentials for hardware and software solutions. Moreover, AI creates entirely new professions and makes companies attractive for digital natives.

Digitisation and networking are also powerful drivers for the future of supply chains. Today, versatile global value-creation networks are in demand allowing to respond to ever more rapidly changing production requirements of increasingly demanding customers in ever shorter periods of time. When order processes and finance flows are not only digitised and automated but run autonomously, making order forms, printed packing lists and invoices obsolete; when the last mile of delivery is organised in a reliable and customer-oriented way, also using drones, then Industry 4.0 reaches far beyond the production halls and is transformed into an **autonomised supply chain**.



Trend scouting – strategic foresight – start-ups: The VDMA Competence Center Future Business explores the future of mechanical engineering in a structured way VDMA-wide. There is a sheer confusing variety of complex, comprehensive topics for the next 15 years: what is underestimated, what is hype? Our goal is to recognise trends and disruptions relevant to mechanical engineering at an early stage and to make them available to our members, to point out new business opportunities and to build up new networks. In addition to technical developments, we also pay particular attention to social, economic, ecological and regulatory trends. Our strength: networking with over 40 divisions within the VDMA and cooperation with partner networks from trend analysis and start-up scenes.

Materials of the future enable entirely new approaches in terms of products, production processes and machines and have always been drivers of innovation. There are countless examples: laser crystals, semiconductor chips, application-specific alloys, customisable plastics, technical ceramics or carbon fibres. Faster and faster, laboratories are developing materials and material combinations with entirely new characteristics. Lightweight hybrid design, multi-material design, additive manufacturing, bionic design methods or smart materials are recent fields providing various potentials for mechanical engineering companies – as a supplier or user. How does digitisation come into play? Materials must become Industry 4.0- compatible. Not only in terms of production but also in view of the end of the product lifecycle. The term **Circular Economy 4.0** refers to the holistic approach discussed at the moment, taking the recyclability of products into account during the design phase in order to extend their usage period and to ensure extensive recycling. Industry 4.0 approaches – as yet unimplemented – provide a huge potential in terms of waste prevention, conservation of resources, security of supply and greenhouse gas abatement and also provide a perfect playground for mechanical engineering.

Speaking of CO₂: machine and plant engineering companies provide many industries with efficiency-enhancing and emission-reducing technologies, making it a key industry for **climate protection**. Renewable energies and direct use of electricity are increasingly coming into the focus, especially in terms of mobility. Additionally, **Power-to-X**, i.e. indirect electrification through transformation into other forms of energy, provides a promising flexibility option, with 'X' referring to e.g. gases, liquids, heat or base chemicals. This also includes synthetic fuels used in air and marine traffic. In terms of the renewable energies required for this, digitisation plays a significant role regarding the international organisation of networks and supply reliability.

Start-ups: breaking new ground

A wealth of topics to be explored. Speed is the key in global competition. Start-ups are a good example of how quickly trend topics can be transformed into new technologies and products which also play a role in mechanical engineering. Contrary to established companies, start-ups can be more creative and are able to try out new things, taking a more playful approach. Digitisation is a prominent driver in this area but not the only one by far. Start-ups also contribute new ways of working that can be extremely useful to the industry – from makerspaces through to agile teams and userX. At the same time, mechanical engineering is a major user industry for start-ups. Both parties can benefit and learn from each other.

Corporate foresight as corporate strategy

In short, the technologies and markets for machinery and equipment manufacturers are extremely varied, the business is global. This means that almost every trend is of interest to machine building companies and the spectrum is vast. On the other hand, capital goods need to have a significantly longer life cycle than consumer goods and also customers are more discerning and the investment risk involved is higher. Accordingly, the business models in the industry need to be adequately robust, leaving little room to 'experiment'. The bottom line is: not only will companies need the flexibility to respond, they also need strategic foresight to proactively shape their business and to be prepared for disruptive changes, no matter what will happen or when it will happen. In the past, key performance indicators used to be the most important instrument in corporate development. Today, corporate foresight is beginning to establish itself with integrative approaches and networked thinking, offering companies strategic instruments to look ahead and to implement innovation processes within companies. Medium-sized companies in particular usually lack the departments enabling them to quickly and systematically assess trends, to recognise euphoria or doom-mongering and to develop and implement genuine foresight strategies. The same applies to cooperations with start-ups.

Our solution: VDMA Future Business. A 'think tank for machine and plant engineering' supporting companies with a trend radar, scenario workshops and strategic foresight to approach their future in a systematic and well-structured way. With a start-up radar, new formats and methods of cooperation, the VDMA Start-up Machine connects start-ups and their culture with medium-sized mechanical engineering companies. Being open to new ideas, shaping change instead of adopting a 'wait and see' attitude – with that we are supporting a strength of machinery and plant engineering.



About the author

Dr Eric Mäuser (born 1967) is a physicist and head of the VDMA Competence Center Future Business, a think tank for mechanical engineering that aims to identify and harness relevant trends. The trend scout and expert in technology roadmaps joined the VDMA in 2000 and established several spin-offs from the electronics production segment, including those for flat-panel displays, photovoltaics and battery production.

125 years of HELLER and ...

TEXT **Roberto Manzo** PHOTOS **Schulz / Mercedes-Benz**

The company celebrates these two anniversaries at a time when the local Brazilian market sees an economic recovery.

Close customer support has always been a top priority for HELLER. The machine tool manufacturer offers complete service from the planning phase to the obtaining of permissions and the development of manufacturing strategies through to after-sales service with comprehensive technical support. In its anniversary year, the company will be focusing on partnership with customers. On occasion of the anniversary year, we spoke to representatives of the two longstanding partner companies Schulz S.A. and Mercedes-Benz Brazil about their experience with HELLER.

Schulz

“Combined expertise makes us fit for the future”

Schulz S.A. enjoys an excellent reputation on the international stage. The company operates two business divisions: Schulz Automotiva and Schulz Compressores. The company's headquarters are located in Joinville in the Brazilian state of Santa Catarina. The location also houses the R&D department responsible for numerous products, including reciprocating and screw-type compressors. Moreover, the company operates numerous locations around the globe, including subsidiaries in the US, in China and three distribution centres for automotive parts in Europe and the US. Among the company's customers are all major global automotive manufacturers, as CEO Dr Ovandi Rosenstock explains. The technical requirements on the products are extremely high in the automotive sector. Strict standards apply to the more than three million prefabricated parts that must be strictly complied with. Every year, dozens of new projects with ever tighter tolerance ranges are added. Therefore, Schulz has always placed high demands on the HELLER machining centres in terms of quality and productivity.

According to Dr Rosenstock, the crucial factors for Schulz S.A. when procuring new capital goods for their own manufacturing operations are spare parts availability and competent technical support, referring to a current joint project of both companies – the testing of machines from the HF 3500 range equipped with five programmable axes. The CEO explains why the company has opted for HELLER machines time and again: “HELLER is a respectable enterprise with a technically and economically attractive portfolio. Furthermore, the company operates a subsidiary in Brazil and



Dr Ovandi Rosenstock, CEO of Schulz S.A.

offers German technology. Benefits to Schulz are the favourable financing conditions and the full implementation of the technical requirements.”

However, tradition is always closely linked to innovation in mechanical engineering. Therefore, Dr Rosenstock also mentions new trends in the machine tool industry. Automation, for example, is constantly moving forward. More and more frequently, automatic loading and measuring systems are integrated into machining centres today – an area just as important as the handling of the data generated by the machining centres and compliance with productivity requirements as part of Industry 4.0 concepts.

According to Dr Rosenstock, HELLER's 125-year company history shows that the company holds a firm place in the development history of machine tools. Schulz builds on a long-term cooperation with companies offering lasting business relationships. The 45-year presence of HELLER in Brazil is proof of the company's outstanding technical expertise. Without it, the company would not have been able to persist in a country faced with several periods

HELLER

**Customer-oriented.
Innovative.
Efficient.**

of economic instability. “This is true for Schulz as well as HELLER. Technically competent companies are successful even under the most adverse conditions.”

Today, Schulz operates a broad range of HELLER machines. In total, 130 machines, including milling machines and horizontal machining centres, were or are in operation at the company. Whenever, due to the introduction of new products or due to specific requirements, a new solution is required, the engineers of both companies cooperatively define the goals in terms of quality, precision and productivity and develop solutions for the medium and long term based on this foundation. The good relationship of the two companies and numerous shared successes make Schulz an important business partner of HELLER in Brazil, Latin America and around the globe.

Factory of Schulz S.A.



... 45 years of HELLER Brazil

Mercedes-Benz

The company's production capacity has seen a 60 percent increase from investments in high-performance machining centres and the replacement of outdated production lines.

Throughout its 60-year presence in Brazil, Mercedes-Benz has developed into the largest manufacturer and exporter of trucks and buses in Latin America, becoming the technology leader in terms of vehicles for freight and passenger transportation. Currently, it employs 10,000 staff in Brazil and is the only manufacturer covering all vehicle segments in Latin America: from cars and light commercial vehicles through to trucks and buses.

Starting in 1976, the vehicle manufacturer has operated various HELLER machines, including milling machines and horizontal machining centres for the manufacture of axles and engines.

For Claudio Herbst, Head of Purchasing Machinery & Equipment at Mercedes-Benz do Brasil, HELLER is an important partner within the region. As part of the expansion of the company's production capacity for commercial vehicles at the São Bernardo do Campo location, HELLER supplied four machining centres for the manufacturing of differential housings. “Based on this partnership, we have been able to raise productivity by more than 60 percent whilst achieving a significant increase in the quality standards of the manufacturing process,” explains Herbst.

HELLER was also involved in the replacement of an axle housing transferline by a flexible cell comprising four machining centres. This measure provided a 50 percent plus in productivity and a significantly higher quality standard in manufacturing. According to Herbst, the modifications also included two additional machining centres for the manufacture of truck axle housings and a machining centre for the differential gear bearings, also contributing to an increase in production capacity. “All these projects were a huge success for our company, both financially and as far as the optimisation of the production processes was concerned,” the Head of Purchasing concludes. “The HELLER portfolio comprises outstanding technical solutions.”



Photo left: Claudio Herbst (right), Head of Purchasing Machinery & Equipment at Mercedes-Benz do Brasil, and Danilo Menezes (left), Head of Production Planning Engine Components & Gearbox Assembly at Mercedes-Benz do Brasil
Photo right: The Mercedes-Benz do Brasil plant



Herbst congratulates HELLER on 125 years of company history and on its 45-year presence in Brazil. Furthermore, he emphasises the significant achievements of the machine tool manufacturer in connection with the modernisation and the increase in production capacity the Brazilian industry has seen. He is convinced that HELLER will continue to develop world-class solutions at the highest technological level in the future to actively support its customers. “With in-house developed cutting-edge technology, HELLER is an important link between the industry in Germany and in Brazil,” he stresses.

Danilo Menezes, Head of Production Planning Engine Components & Gearbox Assembly, explains that the purchasing decision for investments of this scale always involves several departments. These decision-making teams are usually formed when new products are introduced, outdated machines replaced, or quality standards and production capacities raised.

Well-conceived and detailed planning provides the basis for the process. The requirements differ from case to case. Several months, or sometimes more than a year, can pass between requirements planning, request for tenders, detail specification, delivery, try-out phase and start of production.

Several innovative projects have already been implemented with HELLER. Due to the smooth cooperation, the experience and the great dedication and commitment of the engineers from both companies, we were able to overcome all challenges in the implementation phase of each project.

HELLER at China International Import Expo

TEXT **Lukas Schult** PHOTOS **HELLER**

Around 400,000 visitors and 3,600 companies from 172 countries followed the invitation of Chinese President Xi Jinping to participate in a cross-sectoral exchange at the first China International Import Expo (CIIE) in Shanghai. The trade show held at the National Exhibition and Convention Center from 5 to 10 November 2018 did not focus on any specific industry and attracted experts from a wide range of sectors – from mechanical engineering through to consumer goods.

Together with other major German machine tool manufacturers, HELLER presented its products and services to trade experts in the 'Intelligent Manufacturing' hall. Despite the current trade dispute with the US, the Chinese government had wanted to stage a trade show as a sign of openness. CIIE is a crucial step for the Chinese government towards trade liberalisation and the further opening of the Chinese market to the world. Accordingly, Chinese President Xi Jinping emphasised the significance

of the event for international trade in his opening speech. The People's Republic expects an import volume of approx. 10 trillion dollars in the coming five years. This offers enormous potential, especially for German companies, to establish in the Chinese market. HELLER recognised this potential at an early stage, opening its own production facilities in Changzhou near Shanghai as early as 2013.

2018 – a good year for the machine tool industry

Looking back at the 2018 financial year, German machine tool manufacturers can be satisfied. In 2018, exports to China rose by six percent. A look at the quarterly development, however, shows a significant decline in order intake. According to VDW forecasts, this development will exacerbate with investment rates declining. Therefore, participation in events such as CIIE is of crucial importance in order to solidify the industry's market position.

The first China International Import Expo attracted experts from a wide range of sectors.



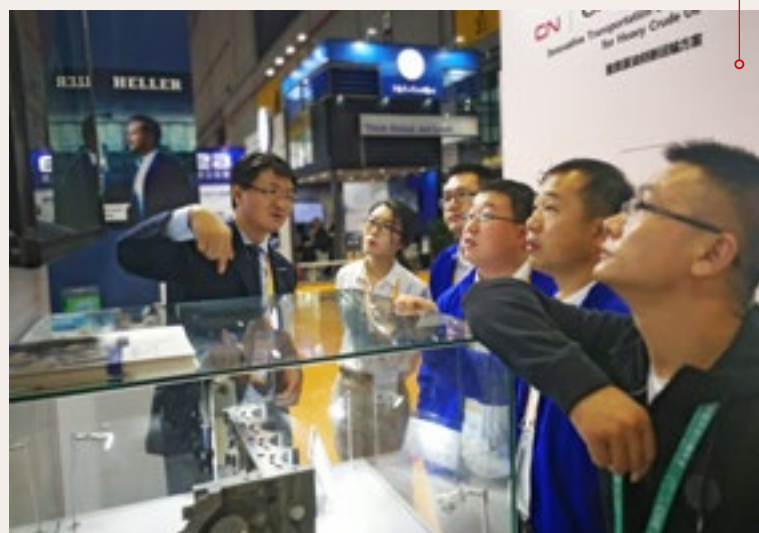
400,000
visitors

3,600
companies

172
countries

It was important to be represented at CIIE.

HELLER presented its products and services to trade experts in the 'Intelligent Manufacturing' hall.



China International Import Expo

A sign of goodwill amidst the trade dispute

TEXT **Christoph Hoene** PHOTO **Hoene Consult**

The idea came from the highest governmental level: in May 2017, China's President Xi Jinping himself announced the China International Import Expo exhibition. In the emerging trade dispute with the US, the intention behind CIIE, focusing exclusively on import, was to provide a sign of goodwill and to contribute to reducing the People's Republic trade surplus of recently 450 billion dollars.

Initially, the German companies only cautiously accepted the invitation. After all, China already has quite a number of trade shows! Moreover, CIIE has no specific industry focus but covers a very wide field, e.g. machines or consumer goods, as well as general country pavilions. In the end, however, they all attended the event: 3,600 companies from 172 countries presented their products. The 'Intelligent Manufacturing' hall was well filled. Practically all major German machine tool manufacturers were represented with at least a small stand. Despite the fact that no great throng of industry visitors was to be expected: for security reasons, they had to register months in advance via the exhibitors. Despite this, CIIE was able to attract a total of 400,000 visitors at its premiere.

President Xi Jinping praised CIIE as a 'pioneering undertaking in the history of global trade'. Already in the run-up to the event, the provincial governments throughout the country had been instructed to send delegations of potential buyers from state-owned enterprises to Shanghai to place orders to the best of their efforts. Numerous signing ceremonies were meant as proof of the trade fair's success. Volkswagen and its local joint-venture partners, for example, declared their intention to import components worth nearly nine billion dollars. In the end, the actual volume of contracts concluded at CIIE was probably at a moderate level.

So was participation worthwhile for the exhibitors? It was not to be expected that the direct results would justify the effort involved. Yet, it was important to be represented at CIIE. The state's influence on the Chinese economy remains high. In industries such as aerospace engineering, for example, there is no way around the state-owned companies. In the automotive industry and in mechanical engineering, the state uses the five-year plans to set the direction and direct funds to key sectors, specifically to promote innovations. So when the next China International Import Expo will open its doors on 5 November 2019, halls are expected to be fully booked again.



Christoph Hoene is the Managing Partner of HOENE CONSULT GmbH in Stuttgart and supports German enterprises from the capital goods sector in building and expanding their Chinese business. Before the founding of HOENE CONSULT in 2014, Hoene accumulated a quarter of a century's worth of experiences in sales and management positions, primarily focussing on Asia. Among other things he was responsible for establishing and managing business in China for a major German machine tool manufacturer. Christoph Hoene was born in 1960 and is a graduate economist from Freiburg University.



Customer statements from Europe

What is special about working with HELLER for me is the support from the sales person and the professional, fast and efficient customer service.

I would work with HELLER again in the future because of the robust design of the machines and the precision of the machining process, which is also faster than with the machines of other first-class manufacturers in the market.

Alfonso Álvarez, Managing Director at **U.H. ÁLVAREZ, S.L. Industria mecánica de precisión** [Spain]



For me, the special thing about the cooperation with HELLER is that we were able to achieve a significant improvement in the productivity and machining quality of our products with the purchase of the new HELLER H 6000 machining centre.

I would also choose HELLER in the future because the collaboration with HELLER was very satisfactory – the machine is powerful, precise and reliable.

Gerard Terman, Production Manager at **Comexi Group S.L.** [Spain]

Customer statements from Africa

For me, the special thing about the cooperation with HELLER is that I know both HELLER brothers and the local agents provide reliable and timely responses to our questions and issues.

I would opt for HELLER again in the future because the equipment and the process designs that we purchased from HELLER in the past served us well.

Steve Gatenby, Snr Manager Quality Management at **Atlantis Foundries (Pty) Ltd.** [South Africa]



For me, the special thing about the cooperation with HELLER is the fact that with all new machine projects, I know that I will receive one of the best quality CNC machines equipped with the latest innovative technology to machine my parts consistently achieving the high quality and tolerance specifications.

I would opt for HELLER again in the future because from past experience since 1991, when we bought our first 16 off BEA 02 and 07 machines, as a company we experienced accuracy, reliability and a family relationship with HELLER. These machines ran 24 hours, 5-day weeks production up to 20 years. Starting new projects with the later HELLER MC 25 and 16 range, it was clear with the improved productivity how much HELLER put into research and development to stay ahead of technology. These reliable machines are still running very productive in our company. Autocast South Africa is machining high tolerance cylinder heads for Volkswagen.

Frans Myburgh, Technical Manager at **Autocast South Africa (Pty) Ltd.** [South Africa]

Customer statements from Asia



At the moment, there are about 50 HELLER machine tools in use in Weichai, providing crucial support in terms of equipment for the company's rapid development. At the Weichai factory, the HELLER machines can play to their strengths as far as reliability and high efficiency are concerned. HELLER's reliable technology and after-sales service team gives Weichai peace of mind. In accordance with the new development strategy, Weichai increased its investments in 2018, purchasing more than 40 machines from HELLER, including a multi-pallet flexible manufacturing system. In order to keep up with Weichai's development, HELLER will establish a service location in Shandong in early 2019 to provide the customer with high-quality and timely services. We will be glad to continue our cooperation with HELLER in the future!

Qiujie Chen, Senior Engineer, Technology Institute of **Weichai Group**, [China]

As the key equipment, the CBC machine plays a vital role in terms of project schedule, investment, efficiency, quality, etc. The smooth test coating on the CBC machine is the first step to success. The HELLER team provides strong support, frequently taking the long journey to the company, and provides clear clarification and even reduced the delivery period. HELLER provides quick response times and continuous support from a professional team. We are happy to work with HELLER and are confident to continue our cooperation.

Jiahao Zhan, Processing Technology Department, **Dongfeng Nissan Passenger Vehicle Co.** [China]



The HELLER machine provides high machining stability and production efficiency. Due to the close proximity to our company, the local service team can respond in a timely and rapid fashion. HELLER is a renowned machine tool manufacturer, providing a quick service response. Normally, the service engineers arrive at our workshop within half a day. We are very satisfied with our smooth cooperation with HELLER. We are glad to have HELLER as our neighbour in Wujin and I think we will continue our cooperation with HELLER.

Wenjie Yun, Production supervisor at **Bosch Rexroth (Changzhou) Co. Ltd.** [China]

Since the cooperation with HELLER in 2010, our general impressions of HELLER are that on the one hand side the spindle system of the HELLER machine provides a high degree of rigidity and precision and is very well suited for heavy-duty cutting. On the other hand, the HELLER managers and field engineers are able to view things from the customers' perspective, actively solving a number of problems and providing support to customers. The relationship between the two parties has always been harmonious. If there is an opportunity in the future, I hope to continue to cooperate with HELLER on new projects.

Biao Wang, Vice Chief Engineer at **Anhui Hualing Automobile Co., Ltd.** [China]



More customer statements in our digital magazine: www.heller.biz/magazin/en

PEOPLE



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Planning, installation and commissioning of new manufacturing lines or the so-called retooling of existing lines are projects that HELLER has handled for decades in a flexible, timely manner in accordance with the relevant quality requirements. However, without the cross-functional commitment of the individual departments, such projects would not be feasible. Reason enough to take a look behind the scenes of a retooling project at Fiat Chrysler Automobiles N.V. (FCA) in Bielsko-Biala in Poland, introducing the departments and staff involved in the project.

TEXT **Manfred Lerch** PHOTO **HELLER**

SOE:

Service

HELLER employs approx. 600 service staff at 30 service locations around the globe. With the FCA project, SEO Market Support Europe was among the first departments to take action on site. The machining centres had to be inspected, repaired and then re-positioned. The team of Uwe Eisinger, Head of Support Europe SOE, and Oliver Herrmann, Project Manager Support SOET, was responsible for all the work from condition assessment through to the repair and re-installation of the manufacturing lines. Based on the inspection results, the required repair measures were structured in cooperation with FCA according to an agreed scheme. Each measure was aimed at three optimisation goals: ensuring workpiece quality whilst enhancing machine availability and reliability. To achieve this, staff from all over Europe was taken onboard. A particularly close working relationship existed with the local engineers from HELLER Slovakia. SOE independently and autonomously handled the overhaul measures of the machines, integrating them into the project in close cooperation with the overall project management. Overhauls of this scope require thorough planning and competent execution, providing the prerequisites for the colleagues from Applications to achieve an uncompromising level of machine precision for the manufacturing of the new engine. In retrospect, the cooperation with the customer and the internal departments was a very positive experience for the service department. Moreover, receiving FCA's Supplier Award was a particularly pleasing outcome of the project for HELLER.

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APMP:

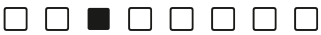
Project Management

The APMP Project Management team consisting of four engineers focuses on prismatic automotive workpieces such as cylinder block and head. For almost all projects, the APMP project managers have to deal with new requirements and conditions. The FCA retooling project was no exception in this respect. An existing manufacturing line comprising 53 machining centres was to be split into three production lines. Project Manager Ralf Lenuzza was responsible for the planning and coordination of the project with the customer as well as for internal coordination. However, this project represented an exceptional challenge. New processes, continual workpiece modifications and the production of the trial engines ahead of the start of production went far beyond the scope of previous projects. Despite this balancing act, the Project Manager is extremely satisfied with the outcome: "Short-term modifications are nothing unusual with projects this complex. You need to respond to them in a flexible manner."

AHFE:

Fluid Technology

Almost from the start, AHFE Fluid Technology was involved in the project. Even though the team was ‘only’ responsible for designing the fluid technology for the two new machines planned, they had to get involved early on in the project on account of the five months lead time required. A substantial amount of work went into the ten new hydraulic fixture types with new clamping sequences. Additional know-how was required for the partly very specific customer requirements regarding the design of the coolant and chip disposal systems. Although the department employs 13 staff, only three of them were involved in the FCA project. An effort that Team Leader Andreas Waldinger considered manageable in any case. In his opinion, the project in Bielsko-Biala did not so much require strength in manpower but rather intelligent coordination: “Despite the tight timeline, this was the kind of project we are expected to handle. The FCA project ran without any problems for us. And whenever I receive no calls following the conclusion of a project, this means that all went as planned.”



AHP5:

Control Technology

The solutions provided by Control Technology involved a more complex effort. The combination of old and new machines posed new challenges to the staff responsible, especially Team Manager Jochen Blank. The assessment of the old machines required extensive data research. Additionally, a new host computer connection for three different machine types had to be created. The requirement specification provided the integration of IO technology. To Marcel Bauknecht, also a member of the AHP5 team, most of these standards are part of his everyday work. However, due to the tight deadlines, integrating IO link into old machines for the first time posed a challenge after all. The AHP5 department has two team members focusing on hardware and six staff working on software. Three of them were involved in this retooling project.



APM4:

Fixtures, tooling and processes in practical application

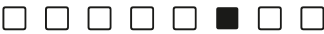
The team headed by Stefan Plankenhorn was responsible for the implementation of the fixture, tooling and process design. They came into the project when the pre-production parts were machined. The fixtures are equipped with a quick-change system and had to be integrated into the existing machines. The challenge was having to machine the pre-production parts on the original equipment and to make sure it was possible to machine the vast type variety of series parts later on. Generally, short-term workpiece modifications or tight timelines are nothing unusual according to team members Richard Reich and Andrej Berngardt: “This was an exciting project, because any problems had to be identified and solved within a short amount of time. However, when you adapt to these situations right from the beginning, you are able to respond without delay.”



AAE:

Planning and implementation

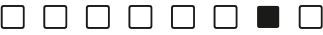
Of course, the designs created in the minds of staff and in CAD also need to be implemented in practice. At HELLER, this is the job of AAE. Holger Class was responsible for coordination, observing deadlines and responding to unforeseen events. Usually, the customer sets the date of the start of production. When dealing with new machines and empty production halls, it is not that much of a challenge. However, with the FCA project, the old machines needed to be separated from the manufacturing line first and then reinstalled. Moreover, a new production line had to be taken into operation. In total, 53 machines were involved. As a result, around six to eight HELLER staff needed to be on site for the duration of almost a year. They inspected, overhauled and relocated the machines, removed any obstacles in the way and responded to ongoing process changes during the running-in process. Class still regards the project as a real challenge, but one they were able to handle practically without a hitch.



AHNC:

Implementation on the machine and the workpiece

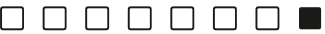
AHNC was responsible for implementing the planned machining processes determined by the colleagues in Process Planning into executable NC programs. The challenge for Erhard Hummel and his team throughout the FCA project was that processes seem to develop a life of their own throughout the product life cycle. Especially in Bielsko-Biala, numerous modifications had been made throughout the years and many workpieces added. Moreover, different machine and control generations had to be considered and the existing linkage equipment had to be connected to form a new manufacturing line. Additionally, the process modifications in the gamma series increased time pressure. To Hummel, all this is part of his work, as the department’s deadlines for the gamma parts or pilot series are usually quite ambitious.



AAS5:

Commissioning

AAS5 is responsible for the running-in of the programs, including tooling and compliance with the specified tolerances and cycle times. It is a particularly difficult task, since most of the time it is not possible to modify the cutting parameters defined by the customer. Quality specifications were another challenge in case of the FCA project. To Reiner Hummel and his team, this is basically not a problem. Still, meeting the requirements with machines that were over ten years old was a challenging task. However, the team is used to dealing with similar requirements almost every day. Therefore, Hummel believes that the successful completion of the project was not only the result of his department’s work, but of the joint effort of all the departments involved. “We can only work in such a smooth and efficient manner because the cross-functional tasks were completed without a hitch. On a range of projects completed in recent years we have been able to demonstrate our excellent communication.”





The HELLER sales and service location for Spain and Portugal

Beginnings:
HELLER Spain has been present in Barcelona and in Santander since 2005.

- Tasks:**
- _ marketing of HELLER products and services
 - _ expansion of sales
 - _ technical support/service activities
 - _ order and project management

Head of the subsidiary:
Hermann Twiehaus

Building floorspace:
approx. 700 sqm in Santander

Office floorspace:
approx. 98 sqm in Barcelona

- Building facilities:**
- _ L’Ametlla del Vallès (Barcelona): Management and Sales
 - _ Santander: service and technical office

Number of employees:
19

Customers within the support area:
Our major customers come from the automotive industry. Most of them are suppliers or contract manufacturers producing small to medium batch sizes. We also support aerospace manufacturers and companies from the general engineering industry. Our customers are located throughout the whole of Spain and Portugal. HELLER Spain sells machines and services. In terms of service we offer the complete range: from typical repairs and commissioning, hotline, retoolings and applications through to training and retrofits for used machines.

Objectives:
We aim to consolidate and expand our market shares. Our goal is to achieve sustainable growth in Spain and Portugal. In terms of after-sales service, our customers expect rapid response times and short travel times of our service engineers. The distances to be covered within our region are enormous and a great challenge to which we respond with continuous qualification and decentralisation of our engineers.



Spain

**Everything from a single source:
cordiality, sun, art and much more**

TEXT **Tania Campillejo, Pilar González & Ana Maria Regales**
PHOTOS **Florencia Potter / Claudio Testa / Takashi Images / RomanBabakin**

The first HELLER machine in Spain was installed in Madrid in 1924. Ever since, HELLER has been present in the Spanish market. In 2005, Heller Ibérica Machine Tools S.L. began with the marketing of machines from L’Ametlla del Vallès (Barcelona) and providing after-sales service from Santander (Cantabria). The main activities of HELLER Spain include sales of machines and spare parts and after-sales service (repairs, retrofits and maintenance). Pilar González in Barcelona is responsible for spare parts, Lucía Galán in Santander for the hotline and the deployment of service engineers. Moreover, HELLER Spain also supports the Portuguese market. Currently, HELLER services more than 220 active machines in the field in Spain and Portugal.

Places to visit near the location and throughout the region

Barcelona
Barcelona is the capital of Catalonia and known for its Modernism [art nouveau]. At the turn of the 19th century, the burgeoning textile industry brought substantial wealth to Catalonia and during the period, many impressive buildings were erected. The best known architect of Modernisme is Antoni Gaudí, who also designed La Sagrada Família Cathedral and Park Güell. Today, the La Sagrada Família Cathedral is the most famous landmark of Barcelona. The building was designed to be seen from any point in the entire city. The cathedral has been consecrated since but is still unfinished and construction works continue. Completion of La Sagrada Família is planned for 2026.

Barcelona is a modern and busy city but also offers beaches and mountains nearby. The Catalan capital has two local mountains: at the summit of Mount Tibidabo visitors can enjoy a theme park, whilst the extensive parks on famous Mount Montjuïc invites visitors to linger. With a height of 173 metres, visitors enjoy a magnificent view over the city, the Mediterranean and Barcelona's hinterland. If you want, you can also go on a trip with the funicular. Further highlights not to be missed include the Olympic Stadiums and the numerous museums.

Approx. 1.65 million people live within the municipal area of Barcelona, whilst the metropolitan region has about five million inhabitants.



Cadaqués
The fishing village Cadaqués is on the Costa Brava and was once the home of Salvador Dalí. The eccentric artist is regarded as the master of surrealism and was inspired by the quiet and peaceful life in the village of Cadaqués. Today, his house in Portlligat is an important museum. Its maze-like structure seems to take visitors into another dimension.

Another highlight is Cadaqués International Music Festival which takes place every August, attracting numerous visitors.



Sitges
Apart from the marvellous beach with a palm tree-lined promenade, the seaside town of Sitges offers numerous opportunities for sports, including sailing, surfing, water skiing, tennis or golf.

Further highlights are the flower carpets decorating the streets in the week before Corpus Christi and the International Film Festival held every year in October in Sitges, focusing on horror and fantasy films.



Santander
Santander is a popular seaside resort in northern Spain. The climate is rougher and more unpredictable than on the Mediterranean coast, but the landscape is also greener. The main attractions of Santander include the famous beach El Sardinero, the beach promenade and the La Magdalena peninsular. The cultural highlights of Cantabria's capital include the coastal route of the Camino de Santiago that passes Santander and the nearby Altamira Caves, both World Cultural Heritage Sites.

Those who have been to visit can confirm: "The food is excellent in Santander." Not only at the seaside but also in the mountains of the hinterland. Cantabria's capital offers a great variety of gastronomic specialities with fresh seafood being among the culinary delights.

L'Ametlla del Vallès
The small Catalan village of L'Ametlla del Vallès has a rural character and approx. 7,000 inhabitants. At the beginning of the 20th century, the wealthy city residents started building summer residences in L'Ametlla, located at about 30 kilometres from Barcelona. Looking for nature and tranquillity, an increasing number of families moved from the capital to the village in recent decades.

L'Ametlla lies at the foot of Mount Puiggraciós. At its summit is a small convent which to this day is inhabited by three Benedictine nuns. The attractions at the centre of the village include the beautiful town hall, a typical Catalan plane-tree alley and several buildings in the Modernism style. Many were designed by the well-known architect Joaquin Raspall.

After an extensive hike or a bicycle tour through the magnificent landscape around L'Ametlla make sure to enjoy the excellent Catalan cuisine served in the numerous restaurants within the region.

Creativity techniques for you to try out, or:

How to create new ideas

TEXT **Maike Held & Franziska Hapke** ILLUSTRATION **Thomas Steigerwald**

Developing new thoughts and ideas can be difficult at times. Especially when you are looking for a solution to a specific problem. A known method is to abandon old thought processes and patterns of thinking. However, the question often is: how do we do that?

“The best way to have a good idea is to have lots of ideas”

Linus Pauling (Nobel Prize winner in Chemistry)

The first step is to generate as many ideas as possible. The so-called intuitive creativity methods were designed for this particular purpose. They can help to overcome mental blocks, encourage people to think out of the box and stimulate the flow of ideas. Intuitive methods using associative techniques directly aim at the subconscious and thus activate knowledge hidden to the mind. We have compiled some of these methods for you to try out.

General ‘rules of the game’

In advance, the task or the problem should be described in a way to create a general understanding about the topic. Ideas will only be criticised, evaluated or discarded at the end of the process.

Creativity killers

- _ the fear to express one’s own ideas
- _ taboos based on prevailing views and conventions
- _ discouragement resulting in waning confidence in one’s own ideas
- _ doggedness and the ambition to find a single perfect idea
- _ time pressure resulting in stress

Creativity boosters

- _ exercise to stimulate blood flow, strengthen circulation and clear the mind
- _ curiosity and the courage to challenge conventions
- _ communication, leading to new patterns of thinking and strengthening one’s own motivation
- _ change of location and redirecting the focus of one’s thoughts towards the new environment
- _ sleep to improve general well-being and cognitive performance



Intuitive vs. discursive creativity techniques

Intuitive approaches support us in leaving the usual patterns of thinking and help to create a large number of ideas within a short time. Subsequently, the preferred solutions can be followed up on using discursive methods. They continue the idea-finding process in a systematic way and describe an idea in greater detail. Due to the expertise and expert knowledge required and the restricted subject area, these techniques are much more demanding than intuitive methods and should therefore be conducted by trained facilitators.

The ABC method: a ‘silent’ method

Benefit:

Writing down the ideas motivates more introvert characters to participate in the idea-finding process. This approach is also ideal as a feedback method during the evaluation phase of an idea.

Participants:

Groups of 2–10 people working individually

Materials:

Facilitator tools (paper, flip chart, projector or similar), pen

1. Note down the letters of the alphabet consecutively one below the other. Leave sufficient space next to each letter to note down comments.
2. The participants write their comments in the column next to the initial letter, e.g. comments on an existing idea that was presented beforehand. They can note as many ideas as they like and can also leave out letters. Neither do they have to adhere to the order of the letters. The time to complete this task should be limited to ten minutes.
3. After collecting all the comments, they are discussed, evaluated and accepted or discarded.

The gallery method: a ‘mobile’ method

Benefit:

The method is particularly well-suited for groups comprising people with different horizons of experience. It is an effective approach to creative problems because the solutions are presented in an illustrative and sensibly arranged way.

Participants:

Groups of 4–12 people

Materials:

Pin cards, pens, pins, a room large enough to ensure that the individual participants can work undisturbed, free walls or partitions.

1. The problem is presented and explained to the group. For example: the risk of injury from a system is to be minimised without reducing the efficiency of the production process. The subgroups with different horizons of experience include the workers concerned about their health and the technicians and management experts evaluating the technical and financial feasibility.
2. First of all, each participant works out an individual, impartial solution, outlining it on a pin card.
3. The individual suggestions are collected and put up in form of a gallery to discuss them in the group, with the participants inspiring each other to think of additional ideas. Some first ideas are discarded or combined with each other.
4. The approaches are individually re-evaluated, refined and then the most practical solution is selected. However, no definitive decision is made at this point, as the solution still has to be approved by further parties responsible. In our example, occupational health and safety and security officers will also be involved in the process. Initially, the goal is only to collect creative solutions.

The flip-flop technique: a ‘loud’ method

Benefit:

By turning the problem upside down, no established patterns of thinking can hinder the brainstorming process, resulting in unexpected insights into the subject area. The flip-flop technique works immediately, especially with untrained teams.

Participants:

Groups of 2–10 people working individually

Materials:

Facilitator tools (paper, flip chart, projector or similar), pen

1. The problem to be solved is turned around and written down. This can be done within the group or be prepared in advance. For example, if the goal is to increase turnover, you try to think of ways to reduce it. Paradoxically, we know very well what does not work and why it does not work. We see faults, obstacles and problems much clearer than solutions.
2. The team members then individually note down their ideas – ‘How can we decrease our turnover?’. They are allowed approx. 10 minutes to do this.
3. The ‘negative’ ideas are then collected and the facilitator reads them aloud to discuss and order them systematically. The sorted ideas are then presented in a way that all participants can see them.
4. The approaches suggested are then flipped around again so that they can be applied and transferred to the original problem.

Realising visions:

four phases you have to go through!

The former German Chancellor Helmut Schmidt once said: "People with visions should go see a doctor." This statement proves that even intelligent people talk nonsense sometimes. It also shows life is not easy for people with visions. Whoever wants to fulfil their full potential and achieve high goals in life needs to overcome a number of obstacles along the way. People who talk about their personal dream or great goal in life and then try to make it real first have to go through these four phases before they can turn their vision into reality.

Phase 1: people ignore you

At the beginning, nobody might pay any attention to you and your idea. You talk about your plan, but people will not listen to you. They may even consider you a nerd. They think that your idea is just a flight of fancy. It sounds hard, but it is true. Humans are primarily only interested in themselves. And this has nothing to do with bad character at all. Humans are egoistic by nature. Just like our ancestors, we are programmed to self-preservation. Otherwise we would long be extinct. So be aware that only few people are interested in you and your visions. Because they are your visions, not those of other people. There is no reason to doubt your ideas when you get no support from outside. Instead, regard it as an incentive to make it to Phase 2.

Phase 2: people laugh at you

The people around you have now realised that your 'flight of fancy' was serious and has some substance after all. People may be buried at the age of 75 although they already died at 35. Only a few still have dreams. Most live off the visions of others. Result: they feel small. The only thing to deal with it is community. So when they are down for the count, they try to pull down others in order not to be alone where they are. Therefore, classic Phase 2 reactions are scorn and ridicule, laughter and derision. However, remember: when they laugh at you, you can be sure to be on the right track. And do not let others make you look small. Their

mockery has little to do with you as a person or your visions, but more with the feeling of inferiority and the missing perspectives of others.

Phase 3: people criticise and antagonise you

Now it is time to get to the nitty-gritty. The people around you notice your progress and successes. They see your new skills and experiences and really take you seriously now. People focus more on you, your plans and your activities. Most of them have now realised: you are about to create something great. Laughing at you was not enough to bring you back down to earth. So now they criticise, lecture and reject you. They argue with you, try to put you under pressure to talk you out of this 'nonsense'. One or the other will even try to antagonise you and your plans. This shows: you are getting close to your goal. Now your heart and passion are put to the test. You should see all the criticism and resistance as a confirmation of the route you have chosen. Now you are being taken seriously. Others are paying attention to your vision which seems interesting after all.

Phase 4: people admire you

At this point, your vision does not have to be fully realised yet. Nevertheless you have generated positive dynamics, achieved significant successes and you are making visible progress. The critical voices start to fall silent, since the facts speak for themselves. The number of fans and supporters increases and you are admired for your success, your personal strength and your development. You did not let them get you down but live your dream. Once considered a nerd, you have now developed into a role model.

A prominent example

Most of you may know Jürgen Klinsmann. He only earned the job as national football coach during the World Cup in Germany due to his perseverance and his visions. Although the German Football Association DFB only gave him the job after 'Der Kaiser' Franz Beckenbauer

had given him his 'blessing' in an interview with Bild newspaper. Before that, nobody had thought that he might be the man for the job [ignorance phase]. However, Klinsmann was a man with visions and rather an inspirer than a coach. He introduced an entirely new playing culture and philosophy and always pursued a playing vision for the national team.

At first, Germany laughed about his methods and measures [ridicule phase]. When the first results of the DFB team were far from convincing, he was about to lose his job following a 1:4 defeat against Italy. His critics were full of anger and scorn [criticism phase]. Moreover, Klinsmann made some unpopular personnel decisions like the dismissal of Sepp Maier and the replacement of goalkeeper Oliver Kahn by Jens Lehmann. However, Klinsmann and his legendary team succeeded in finishing third in the World Cup. Euphorically, the tournament was celebrated as a 'summer fairy-tale' and ever since Klinsmann enjoys the status of an icon among coaches [admiration phase].

So here is my advice: do what Jürgen Klinsmann did: stay true to your visions and follow your own path. It is not about victory or defeat, but about the fantastic development your personality will experience on the way. *For that* you will be admired in the end.



Steffen Kirchner: motivational coach and conference speaker for excellence

Steffen Kirchner is one of the leading motivational coaches and conference speakers in the German-speaking countries, focusing on motivation, team leadership and change management. Today, the former top athlete and manager works as a performance coach and consults international top sportsmen, executives and stars from show business. With his motivational speeches in companies, the best-selling author has inspired more than 150,000 people. He is a frequent guest on TV and radio shows and esteemed for his pointed analyses, expertise and entertaining language. *FOCUS* magazine named him the best motivational expert.

For more information about the work of Steffen Kirchner, his seminars, e.g. *Erfolgsoffensive* or *POWER sucht FRAU* and free-of-charge contents of the coach go to his website: www.steffenkirchner.de

TEXT **Steffen Kirchner** PHOTO **Reimo Schaaf**

Today's apprentices are the next generation of skilled employees.
With service assignments abroad, HELLER offers them the
opportunity to set their goals for the future.



China



Moritz Armbruster, 19, third year mechatronics apprentice

"I have been abroad before, travelling to the US several times on private vacations. The culture there is completely different from Chinese culture. When I learned about the 'Sommermontage im Ausland' (summer service assignment abroad), I was quite taken with the idea and applied for a place in China. The only thing I was a little sceptic about was the food in China. I was not sure whether I would like it. In the end, my concerns were unfounded. I liked all of it.

From 13 to 31 August 2018, I worked with the colleagues at a customer in Zhangjiakou, a city approximately 200 kilometres north-west of Beijing. I was actively involved in the commissioning and had various tasks to complete. For instance, I helped with the installation and setup of the machines. It was great fun and I learned a lot.

The three weeks I spent in China greatly helped my personal development and I can well imagine spending four or five weeks abroad. When I have completed my professional education, I would like to work in service and assembly. In my opinion, the tasks of a service engineer are very varied and provide exciting challenges and an opportunity to gain many positive experiences."

Juntao Fu, 25, third year mechatronics apprentice

"I was born in China and came to Germany when I was twelve. So my service assignment for HELLER at Sinotruk, one of China's leading manufacturers of heavy trucks, was something of a back-to-the-roots experience for me. The country, culture and the people were all familiar to me. And of course, I speak the language. Therefore, I also helped out as an interpreter on location.

When I have completed my professional education, my goal is to support the transfer between HELLER Germany and HELLER China. But I don't think I will go to China right after my apprenticeship. I think it will be better to continue working for HELLER in Germany for two more years. Having gained sufficient practical experience and a profound know-how it will be easier for me to deal with the complex tasks on location in China."



Max Walker, 19, third year mechatronics apprentice

"I am glad that I did not go to China alone but went there together with Juntao to work at our customer Sinotruk. Juntao did a great job as an interpreter, which was really super. We spent the last three weeks of the 2018 summer holidays in China and it was a really great experience. My time in China has encouraged me to stick with my plan to become a service engineer. I have always been interested in this job and now I know that I would really enjoy the work.

At the beginning, it was difficult to understand all of the correlations of course. We performed work for Applications Assembly (AA) on site and our job was to find ways to enhance the engine manufacturing processes. It was very challenging work and initially we only watched our supervising tutor and the other experts. Then, gradually, we also contributed our own suggestions. Changing the program and then seeing the improvements achieved in the μ range provided me with a great sense of achievement."





Mexico

Lukas Reutter, 20, industrial mechanic, department ACA

"I recently completed my apprenticeship at HELLER and had an opportunity to participate in a foreign assignment in the summer of 2018. I was able to choose between Mexico and China. Based on intuition, I decided to go to Mexico. For three weeks, I was able to look over the shoulders of the experts working at our customer General Motors in Ramos Arizpe, near Monterrey, and helped with the machine installation.

The city of Ramos is not very attractive and nothing special. My parents had some concerns due to the armed conflicts existing in Mexico. However, I never saw anybody with a gun and felt very safe at the company. I very much liked the 'Sommermontage' and I am happy that I found employment with the department ACA following the completion of my apprenticeship. I am keen to see more of the world and enjoy travelling to different countries. And HELLER is giving me the opportunity to do this."

Marc Lorenz, 20, third year industrial mechanic apprentice

"Working in Mexico I noticed what a privilege it is to live in Germany where quality standards are high and everything is rather modern. Nevertheless, I really liked working at General Motors in Mexico. I had a chance to get a taste of the 'real' life of a service engineer during the last three weeks of the 2018 summer holidays and I really enjoyed the job. The work is very wide-ranging and varied. My experiences were positive and I learned a lot of useful things.

The focus, of course, was on the practical application of my skills. I learned a lot of useful stuff and a few tricks of the trade for best practice when commissioning a machining centre. Of course, it takes quite some time to link a series of machines to a manufacturing line. Therefore, I would like to spend 4 months abroad in order to support the work as long as possible. I have a clear goal now: after I have completed my apprenticeship, I would like to work in final application installation."

Spain

Samuel Kleinschmidt, 25, mechatronics engineer working in International Service

"During my apprenticeship at HELLER to become a mechatronics engineer I participated in the 'Sommermontage' scheme four times. I was really keen to go on an assignment and always wanted to be among the participants. I went abroad three times, working in Italy, France and finally in Spain. I always enjoyed my assignments, including working for MAN in Nuremberg.

If one of HELLER's apprentices asked me if I would recommend the scheme, I would definitely answer yes. Especially those apprentices thinking about working in service later on should seize the opportunity offered by HELLER in my opinion. There is no better way to find out whether the work of a service engineer is the right job for you.



For me personally, working on assignments abroad is exactly what I want. I like to travel and have always got on very well with the colleagues, no matter which country I worked in. They really supported me in my work and taught me a lot so that I gained valuable experience. It is absolutely great of HELLER to offer this scheme."

Maximilian Breuning, 23, third year mechatronics engineer apprentice

"My parents are German and emigrated to Spain when I was one year old. I grew up bilingually, which, of course, is a huge advantage. Language is crucial in working life and I would like to benefit from the advantage of being fluent in German and Spanish.

My grandparents live in Bempflingen. I was looking to find an apprenticeship near to where they live, so I applied with HELLER. I am very happy to work here. The professional education here is excellent and I think that HELLER offers apprentices a very special opportunity with the 'Sommermontage' scheme.

I took part in the scheme four times and gained a lot of experience during one assignment in Germany and three in Spain. The last time I participated was in summer 2018. We worked on the retrofit of a 20-year-old machine that was to be made fit for the future. My supervisor explained everything very well and I was allowed to do many jobs on my own. No matter what assignment I was on, participating in the work on site was very instructive. My long-term goal is to work for HELLER in Spain and Portugal."



"With our 'Sommermontage' scheme we want to give the apprentices some unusual insights and the opportunity to get a first-hand experience of life as a service engineer. They get the chance to apply what they have learned on customer site and are able to find out whether the job would be right for them. Our success proves us right. In recent years, we succeeded in inspiring the enthusiasm of many young people, employing them in service and commissioning following the completion of their apprenticeship."

Michael Holl, Head of the HELLER training department

"It is crucial for the apprentices to get a first-hand experience of the requirements on each individual employee on customer site. During the 'Sommermontage', the young people are able to get an idea of the professional life of a service engineer and a chance to experience how important each and every one of them is in order to complete the task at hand in a joint effort. A win-win situation for both parties: the apprentices can find out whether the job as a service engineer is right for them and we are able to learn how and if the apprentices can deal with the pressure when working on customer location."

Dieter Pfänder, Team Manager Application & Assembly

HELLER

"I think the 'Sommermontage' scheme for apprentices is a very good idea for several reasons. The young people have the chance to get to know the work outside of the headquarters and can use the experience as a foundation for their professional development at HELLER. At the same time, they are given the opportunity to take a broader view, to work with colleagues from foreign subsidiaries and to get to know different countries, people, customs and traditions, supporting them in dealing with different cultures. Another benefit is that the apprentices get a chance to experience the dialogue with customers and suppliers during the 'Sommermontage'. There is a lot to learn in this respect, too."

Andreas Queck, Project Engineer Application and Subproject Manager

"I very much welcome the fact that HELLER provides the apprentices with an opportunity to get to know the life of a service engineer in all its facets. I also work in technical service support today and once completed my apprenticeship at HELLER. At the time, the 'Sommermontage' scheme did not yet exist. I would have loved to have this opportunity and see it as a unique chance to find out if working in field service is the right kind of job for you."

Ralf Clauß, Technical office service

News & events



TEXT **Tanja Liebmann-Décombe**
PHOTOS **HELLER**

**TRAIN
ING**

Young talents start their apprenticeship

The training department welcomed 30 new additions: in autumn 2018, a new generation of apprentices began their professional education at HELLER in Nürtingen. They train to become industrial mechanics, cutting machine operators, mechatronics engineers, electronics engineers for automation technology and technical production designers. The young talents also include several students, e.g. of mechanical engineering, participating in the 'Reutlinger Modell' degree course or 'MechatronikPlus', the mechatronics degree programme of Esslingen University. Both types of training offer the unique combination of a skilled worker qualification and an engineering degree. Students of mechanical engineering and

computer science from the Baden-Württemberg Cooperative State University Stuttgart also joined the HELLER family last autumn.

Moreover, HELLER offers educational support for 13 guest apprentices from the companies STS Maschinendienstleistung GmbH, hofer mechatronik GmbH, PDT Präzisionsteile GmbH, Kuhn Werkzeug- und Vorrichtungsbau GmbH, GEA Bock GmbH and Lasercomb GmbH. During the first 1.5 years, they will receive fundamental training and parts of their technical education at HELLER.

Automotive Days at HELLER China

At the beginning of December 2018, the HELLER plant in Changzhou/China organised the Automotive Days, an innovative three-day exhibition, to which the HELLER experts welcomed numerous customers and suppliers from the automotive industry.

Which manufacturing solutions offer a particularly high degree of flexibility? How can the production requirements of tomorrow be met in the best possible way? What innovative and comprehensive manufacturing solutions for the production of powertrain, driveline and chassis components is HELLER offering? These and other questions were answered during the HELLER Automotive Days.

**TREND
ING**

"Approximately 300 visitors from the automotive industry and their suppliers from all over China accepted the invitation – a pleasingly positive response," said Narendra Kumar Yadav, who organised the event. Especially the CBC machines for the coating of cylinder bores of 4-cylinder engines met with great interest. Not least the use case of a representative of Dongfeng Nissan underlined "that the process is outstanding", Yadav said.

The event's programme also featured technical seminars. The HELLER engineering and technology experts presented HELLER's response to Industry 4.0 and successfully implemented automotive projects – especially in terms of crankshaft and camshaft machining. Visitors were quite impressed and interested to learn more about the services, the warehouse and the sales strategy of HELLER in China. "The Automotive Days received a very positive response and demonstrated that we belong to the global players," Yadav summarised the event.



SPECIAL EXHIBITION

11 May to 13 October 2019

**"Apprenticeship
at Heller –
125 years of Heller
machine factory
in Nürtingen"**

Experiencing company history up close

With a special exhibition, Nürtingen municipal museum commemorates the fact that HELLER has been part of the town's history for 125 years. How did it all start? Which products did company founder Hermann Heller produce in Nürtingen at the time at the age of only 25? What happened at the company throughout the years, what were the challenges the company had to rise to, which machines were and are produced at the company today? Visitors of the exhibition will find answers to all these questions at the museum. According to the director of the museum, Angela Wagner-Gnan, the intention was to show the many different facets of the company's history. To her, it was important that the focus was not only on technology but also on the people: women and men who apprenticed and worked at HELLER.

The special exhibition at Nürtingen municipal museum runs from 11 May to 13 October. It is titled 'Beim Heller g'lernt – 125 Jahre Maschinenfabrik in Nürtingen' [apprenticeship at Heller – 125 years of Heller machine factory in Nürtingen].

**CELE
BRAT
ING**



HONOURING

Long serving staff honoured

Long-term employees who have worked at the company for 25, 40 or even 50 years are honoured every year at the Employment Anniversary Celebration. This forms an integral part of corporate culture and takes place at the end of November each year.

The event is staged at the HELLER company restaurant. Last year, the HELLER big band under the direction of Helmut Gröbel again accompanied the speeches and words of gratitude the partners and representatives of the management and the works council addressed to the 40 jubilarians. During a tour of the company, they had an opportunity to show their partners where they work.

Again, last year's highlight was the evening's entertainment: in addition to the culinary delights served, the musical cabaret artist Silvester Kuhar, the Knoba Sörwiss comedy waiter duo and the 'fresh'n funky' dance group contributed to a successful event. Other attractions included caricaturist Stefan Theurer who made humorous drawings of the guests, whilst solo entertainer Willy Wondra enticed them to hit the dance floor.

PLAYING

Motivated football team

Last year, the football team of HELLER China, founded approx. three years ago, won two championships: the Chengxi Challenge Cup and the Lunar New Year Cup. Currently, the team has 25 players. They come from Germany, the UK, the US, Mexico, Spain, Turkey, Morocco, Yemen, Sudan, Brazil, Ghana and Tajikistan.

The HELLER football team intends to continue this success in 2019. Currently, for example, the 8VS8 league is played in which 24 teams participate. In the past season, the HELLER team ranked 7th in this league which also includes teams who play in the highest-level amateur league in Changzhou. From May 2019, the HELLER China football team will also be able to compete in the 11VS11 leagues in Changzhou.



TOURING

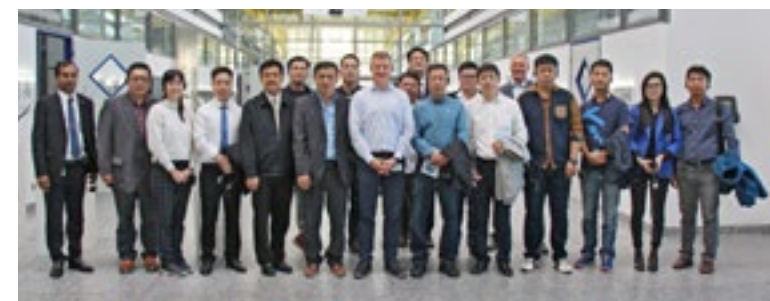
A visit from Asian customers

Last year, HELLER China invited existing and potential customers from various Asian countries to visit the Nürtingen headquarters. 20 people participated in the so-called HELLER VIP Tour which took place from 15 to 19 October 2018. Other items on the itinerary included a visit to castle Hohenzollern, to the Mercedes-Benz Museum in Stuttgart and to the companies Index in Deizisau and Zeller Gmelin in Eislingen as well as a tour of the HELLER plants, including a presentation of the machine manufacturer's latest innovations.



People

The guests were very impressed by the corporate culture, the long tradition of the company and the well organised production and assembly halls. According to Andrew Parkin, Chief Representative Asia, the tour provided an excellent opportunity "to grow our network across Asia". According to the Head of HELLER China, the trip also provided a platform for interesting discussions with the guests, contributing valuable suggestions and feedback. Parkin comments: "This input will help us to shape our business to best fit our customers' standards."



MOVING



HELLER Tech-Day

About 80 customers and prospects participated in the HELLER Tech-Day held on 6 March in Piacenza/Italy under the motto 'mobility today and in the future' to discuss the opportunities and developments of today's and tomorrow's driveline technology. At the beginning of the varied programme, Thomas Lüdiger of development service provider FEV provided an outlook for 2030, presenting a study on the subject conducted in cooperation with VDMA.

Together with the technology partner Mapal, the HELLER experts provided insights into current machining options in the automotive sector. Subsequently, a presentation on the innovative CBC coating technology offered participants a glance into the future. Going forward, HELLER machines will also be ensuring optimal support in the production of electric motors. Before providing the participants with an opportunity for in-depth discussions following the official presentations, Wolfgang Wenzler provided some compelling insights to round off the successful day. The Managing Director of HELLER's affiliated company Wenzler identified ideal ways for the machining of lightweight parts such as chassis components.

"With the main topic and the projects already implemented, HELLER, Mapal and Wenzler were able to demonstrate the audience that there is no need to fear the future if you adapt and respond to changes in good time," Fabian Mattes, Head of HELLER Italy, summed up the event on a positive note.



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Imprint
HELLER the Magazine
Edition 4 | Circulation 11,283 copies

Published by
Gebr. Heller Maschinenfabrik GmbH

Project management
Marcus Kurringer [HELLER, V. i. S. d. P.]
Ute Naumann [echolot.GROUP]

Concept, editing and production
echolot Werbeagentur GmbH

Creative direction text and editing
Franziska Hapke [echolot.GROUP] / Jenny Schnizler [HELLER]

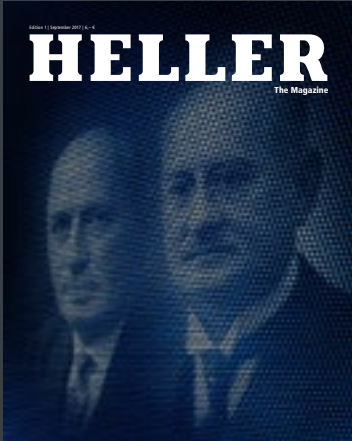
Creative direction Art & Art direction
Helge P. Ulrich / Thomas Steigerwald [echolot.GROUP]

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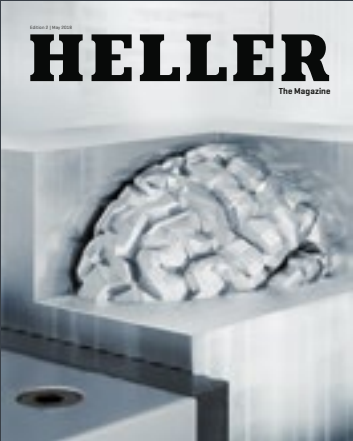
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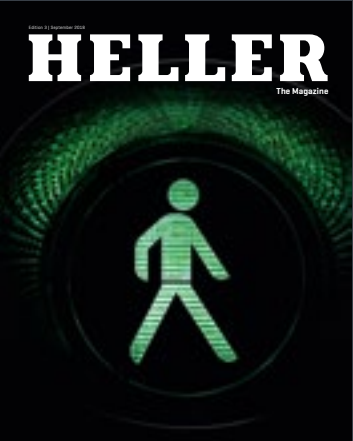
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