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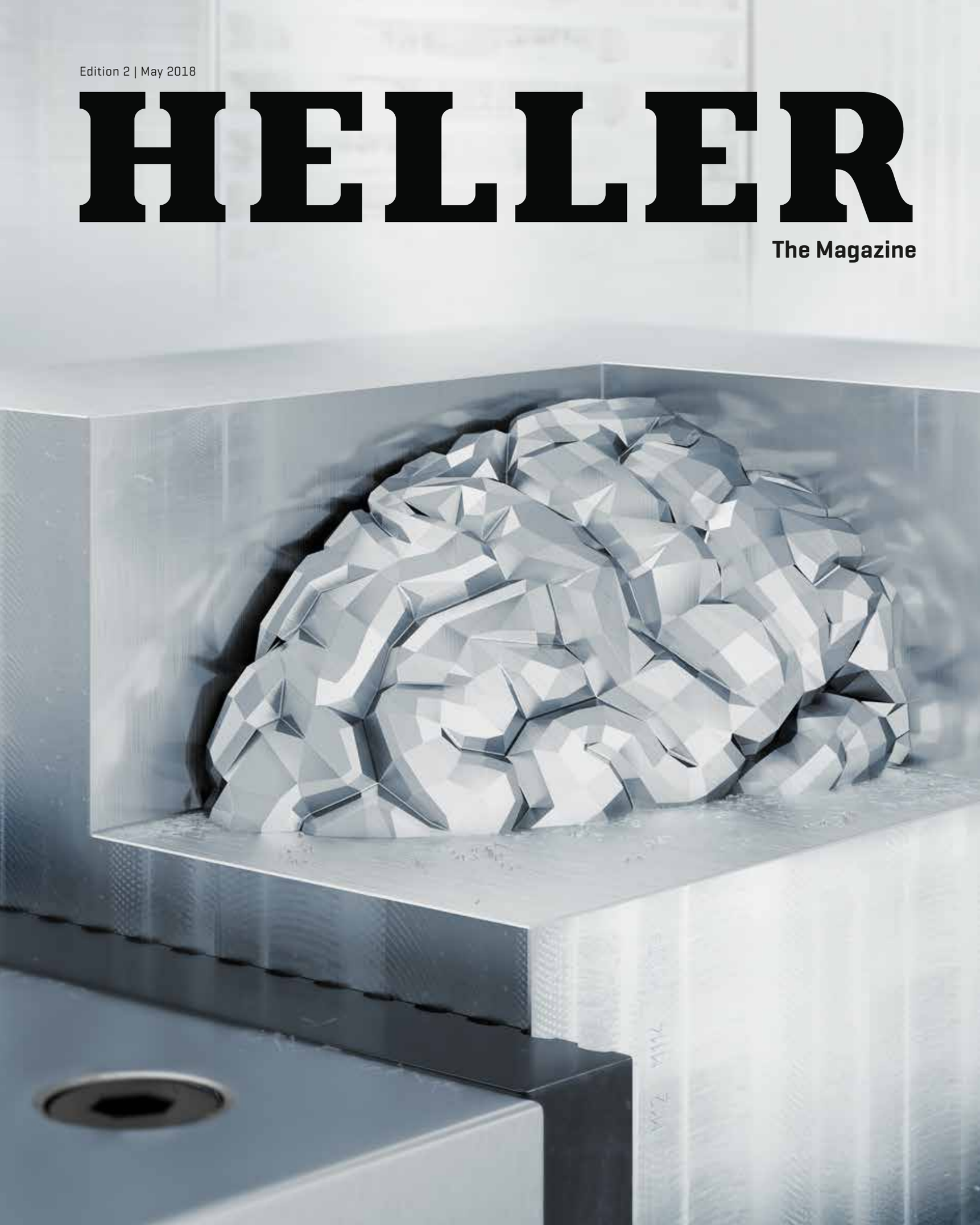
HELLER

The Magazine



In the digital age, knowledge is indeed power. To gain a competitive edge, a company needs to be able to transform the overwhelming amount of data collected every day into crucial knowledge. We have recognised this fact. That is why we are placing knowledge at the centre of our daily work at HELLER – and in the focus of this magazine. But read for yourself!

Dear customers, partners and colleagues,

Following its successful introduction last year, I am proud to present you the second issue of *HELLER the Magazine*. We have decided to focus on a topic that is high on the agenda of ourselves and everybody connected to us: knowledge.

Knowledge moves us forward, especially in today's digital age. This is true for us as a company, but also for us as individuals. The more efficient our access to knowledge is and the more successful we are able to manage it within our company or even within ourselves, i.e. in our memory, and the more often and expedient we are able to share it with others, the better. We have set ourselves the task to be more than a machine manufacturer; we also want to be a solution provider. The crucial added value results from the combination of our know-how gained throughout more than 120 years with the knowledge we acquire every day in our growing network.

I hope you will enjoy this second issue of *HELLER the Magazine*, offering you useful, interesting and insightful information.

Klaus Winkler
CEO HELLER Group

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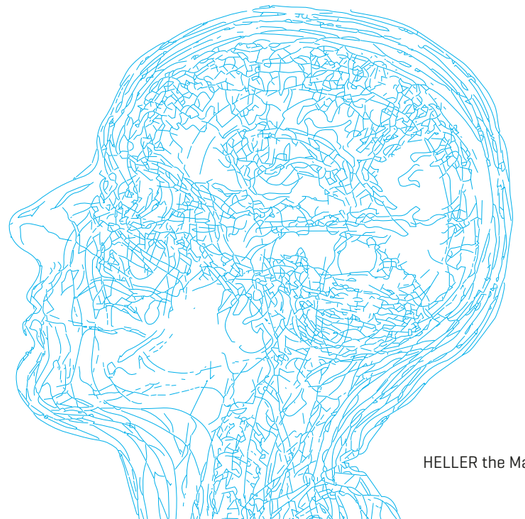


Know|ledge
[ˈnɒlɪdʒ]

Word meaning/definition:

1. **the facts, feelings, or experiences known by a person or group of people**
2. **the state of knowing**
3. **awareness, consciousness, or familiarity gained by experience or learning**
4. **erudition or informed learning**
5. **specific information about a subject**

Origin:
ME knoweleche, acknowledgment, confession < Late OE cnawlæc < cnawan + -læc < lācan, to play, give, move about

Source: *Collins Dictionary*

Since 1999, a German television quiz modelled after a British game show has offered a maximum cash prize of one million Euros for contestants who know the answer to any question. Since 1964, whoever finds the correct questions for the answers presented wins in the television game show *Jeopardy*! The English philosopher Francis Bacon once said that knowledge is power, whilst already Socrates knew that wisdom is in knowing you know nothing. The German *NEON* magazine regularly publishes useless knowledge enjoyed by masses of readers. German children's TV shows like *Die Sendung mit der Maus* and *Löwenzahn* offer comprehensive knowledge to a very young viewership, whilst also regularly attracting a grown-up audience. _

KNOW

Focus on knowledge
Allegedly, Albert Einstein once said: 'Imagination is more important than knowledge. For knowledge is limited.' You could argue about whether the first part of what he said is true or not. However, we all understand that knowledge is limited. And this is exactly what bothers us: we can never have enough of it and strive to know more and more, or preferably everything, about everything (and everybody). The reason could be that we are living in a knowledge society. In social sciences, this term describes the theory that the role of knowledge in society and the economy has undergone a fundamental change in the 20th century. Social scientist and publisher Meinhard Miegel, for example, describes the transition of the industrial society to the knowledge society as a new paradigm shift following the development of the agricultural into the industrial society. Sigrid Nolda, professor for adult education at Dortmund University, underlines the fact that transformations of this kind are first noticeable in the economic and working world: she describes that the concept of the knowledge society was generally based on a growing significance of knowledge as a resource and as the foundation of social interaction. Already since the 1970s, work has been strongly characterised by its cognitive value, i.e. knowledge.

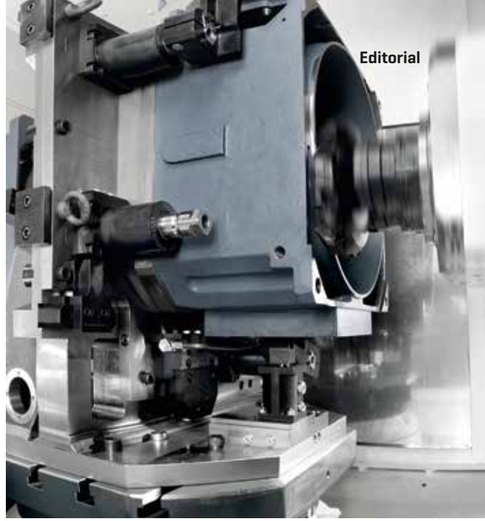
Knowledge in companies: knowledge management as a factor of success
Already many years ago, an article about knowledge management appearing in the German paper *Handelsblatt* put forward the theory that in the knowledge society, the maxim "What I don't know won't hurt me" develops into the credo "What I don't know won't make me rich". In other words, already at that time, the authors recognised the value of knowledge for today's society of the digital age. With all due respect to Albert Einstein's 'imagination' – today it is knowledge that becomes the decisive competitive factor. To gain a competitive edge, you have to be able to transform all the data and information collected every day into knowledge that makes a difference and to share it with all people involved when necessary.

In today's complex corporate structures, internal knowledge is available in many different forms, from documents and databases to the knowledge stored in each employee's brain. But how can we tap into the existing knowledge, utilise and share it? This is exactly what knowledge management is for: it ensures that the knowledge generated on an individual basis is shared with others involved. In the ideal case, this will result in a smooth flow of information between people, technology and project organisation and in long-term access to the knowledge gained. To achieve this, knowledge management, for example, specifies in which ways knowledge is shared. It makes the expertise of individual employees transparent, documents the results of projects and supports the exchange of knowledge, e.g. through training. _

LEDGE

“In the past, larger companies prevailed over smaller ones. Today, the quick companies will prevail over the slow ones,” explained Ulrik Nehammer, Executive Vice President of Salesforce Strategic Customer Advisory of Coca-Cola Erfrischungsgetränke GmbH, in an interview with Salesforce Germany. Based on their knowledge, companies need to make the right decisions promptly and then act accordingly. To Nehammer, the key to achieve this goal is networked collaboration, which always needs to be seen in a mobile context today. According to him, this requires a high degree of flexibility as knowledge management always needs to fit the situations in which the knowledge is needed. Additionally, it has to keep up to date with the constantly changing requirements. Companies wishing to remain competitive in the long term therefore need a modern and adaptable form of knowledge management.

Knowledge management is not restricted to the purposeful preparation, analysis, selection and storage of company information and the distribution to the relevant functions within the company. Even more important is the ability to motivate staff to participate in this process. Success depends on how they share and make their knowledge available to others whilst fully seizing the knowledge of others. Unfortunately, many employees still act on the maxim ‘knowledge is power’, withholding their own knowledge from others in an attempt to make themselves irreplaceable. Unfortunately, it is still considered a disgrace in many areas of our lives when you have to ask about something you do not know.



HELLER solutions: Knowing how it's done

We have realised that knowledge can indeed mean power – especially for companies – and that it is important to ask questions to increase your knowledge. That is why we are placing knowledge in the focus of our interaction. As a partner for modern production and a solution provider able to respond to all questions and challenges of our customers, our aim is to not only provide machines but also customised, tailor-made product and service solutions that will advance our customers' business. To achieve this, we build on the knowledge and experience acquired over more than 120 years of company history. Over these years, we have gained knowledge from thousands of installed machines, projects and processes implemented for a wide variety of industries throughout many regions of the world. Combined with the knowledge we acquire every day in our growing network, this know-how provides crucial added value to support our customers with their challenges. Within the HELLER Group, we are also continually exchanging knowledge which we apply in our own company, for example, in personnel exchange programmes or interdisciplinary project groups. The demands we place on ourselves are also expressed in our corporate claim: HELLER Solutions: Knowing how it's done. In the same way that knowledge is the centre of our daily work, it is also the main topic of this second issue of *HELLER the Magazine*. /

HELLER and knowledge

"An investment in knowledge pays the best interest."

This aphorism by Benjamin Franklin holds true to this day. After all, the success of a company does not only depend on its products and services but also on the capabilities and ingenuity of its qualified employees.

“Knowledge is extremely important to us. In my opinion, the HELLER Academy plays a pivotal role at HELLER in terms of knowledge.”

Andreas Diez
HELLER Academy

Andreas Diez and Melanie Luz of the HELLER Academy and Martina Zimmermann of HELLER Personnel Development explain what makes the task of expanding, maintaining and managing the knowledge of employees worthwhile.

Mrs Zimmermann, it is often said that ‘knowledge is power’. What is your view on this?
Zimmermann: Knowledge is important, no doubt. Today, knowledge is widely and easily available. However, knowledge alone is not enough. In other words, **it takes more than knowledge to make a difference.**

The question is: how can we use our knowledge effectively?
Zimmermann: Mere theoretical knowledge has to be transferred into applied knowledge. In Personnel Development, this transfer process is structured into the following stages: knowing – knowledge – skills – application. The final stage is the crucial one: being able to apply what I know.

What significance does knowledge have for HELLER in this sense?
Zimmermann: Knowledge provides a firm foundation for successful action. It is important for us to impart knowledge and to empower the HELLER employees to practically and effectively implement what they know.

How can this be achieved?
Zimmermann: The prerequisites are an individual’s willingness to learn and being motivated. The learning topics have ‘to get under your skin’, which means they need to be relevant to your daily work.

Could you explain that?
Zimmermann: Sure. Take our talent scheme for example. It consists of three blocks. The first one is a traditional theoretical part. For example, participants learn what leadership of employees, business orientation and project management are. The second block is a practical part during which the knowledge elements from the first block are applied to a realistic project from the working environment.

And what happens in block three?
Zimmermann: After the participants have extensively reflected their own actions with structured support, block three takes a look at their personality structure: what do I want, who am I and who could I be? Answering these questions has a lot to do with self-reflection. People who know a lot about themselves are able to think out of the box and can be instigators of change.

What has been the response to the talent scheme?
Zimmermann: It has been very well received and our experience has been excellent. The scheme runs for three and a half years. Once they have completed the scheme, our talents are ready to take on new challenges. In some cases we also provide them with mentorship.

Mentors are very experienced experts in their field. They are highly qualified. What are the benefits of having an ‘old stager’ at your side?
Zimmermann: These people are invaluable because they can built on a wealth of experience as far as knowledge and implementation are concerned and are enthusiastic about sharing it with others. The mentor also learns a lot from his or her mentee. Unfortunately, approximately thirty percent of these experienced people at HELLER will be retiring within the coming five to ten years. In other words, a treasure trove of experience and tacit knowledge will be lost.

What do you mean by ‘tacit knowledge’?
Zimmermann: Silent or tacit knowledge refers to implicit knowledge. Simply put, it means someone having tacit knowledge is able to do things often without being able to say how they are done. Their knowledge is embedded in their know-how.

How can Personnel Development help to prevent the impending knowledge gap?
Zimmermann: Our training scheme ensures that our employees have access to theoretical and practical knowledge. In other words, we are also committed to building tacit knowledge from which we benefit greatly. _

What do you consider the benefit of HELLER Personnel Development?
Zimmermann: Our Personnel Development can rightly say that it supports HELLER in a time of transition. The fact is: technology leaps are happening at shorter and shorter intervals, we are in the midst of digitisation and facing demographic change. To keep up with developments and to ensure highest standards when serving customers, companies need highly qualified employees. Personnel Development is a guarantor of the continued high quality of employee qualification.

Mr Diez, whilst Human Resources at HELLER is predominantly responsible for interdisciplinary topcis and occupational safety, the HELLER Academy is in charge of the technical aspects of further training. How significant is knowledge for you?
Diez: Knowledge is extremely important to us. In my opinion, the HELLER Academy plays a pivotal role at HELLER in terms of knowledge. We are the central hub for technical questions, keeping the HELLER employees' knowledge up to date.

Ms Luz, what do you consider the key task of the HELLER Academy and its instructors?
Luz: Of course, knowledge transfer is our top priority. Additionally, the instructors have to channel the increasing flood of information and to understand and be able to explain the complex mechanisms behind a HELLER machine. It is important to stay on top of the growing complexity and to promote interfacing. In other words, contacts between instructors and the departments are absolutely vital.

How is knowledge conveyed at the HELLER Academy?
Luz: The process is similar to what Ms Zimmerman has just described. Our instructors convey a mixture of theory and practice. Additionally, they consider it their task to fire the participants' enthusiasm for the HELLER machines. The motto is 'Knowing how it's done and having fun.'

Contrary to the training courses organised by the Personnel Development team, the HELLER Academy does not only train HELLER employees but also customers …
Luz: Yes, that is correct. In fact, so far, we have trained more customers than employees. Due to the increasing complexity of our machines, we will be focusing more on our own staff around the globe in the future. Our long-term goal is to move from decentralised to centralised training management from our location in Nürtingen. Local implementation at the subsidiaries will be organised by the training coordinators on site.

"To keep up with developments and to ensure highest standards when serving customers, companies need highly qualified employees."

Martina Zimmermann
HELLER Personnel Development

Why is that?
Luz: We aim to standardise our portfolio. Customers or staff members receiving training at the HELLER Academy should know: no matter where the training takes place, the standards and contents are the same everywhere – conveyed by professional, certified and local instructors.

What will be your challenges in the future?
Diez: Ms Zimmermann has already pointed it out: the world is changing and the problem is that the knowledge of the older generations gained from experience could be lost over time. We are working on a number of solutions to address this issue.

For example?
Diez: We created a reference book for control technology matters and also our CNC Hotline is making very good progress. Additionally, we have made numerous Academy documents available to users on the intranet. I share Ms Zimmermann's point of view: we are committed to bridging the impending knowledge gap by building knowledge that can be transformed into skills, actions and success in the ideal case.
Luz: Moreover, we are currently developing a service platform for our employees. The first trial version will be implemented by mid-2018. The idea is to provide the service engineers with a range of scenarios with proposed solutions and step-by-step instructions that can be accessed via tablet. /

Did you know …
_ that on average, every HELLER employee participates in a two to three-day qualification measure every year?
_ that HELLER organises 35 language courses for its staff every year?
_ that as of this year, HELLER staff has access to web-based e-learning courses that can be taken anywhere and at any time?
_ that the HELLER Academy trained approx. 1,800 people in 2017, including approx. 800 internal staff and 1,000 customer staff?
_ that approx. 30 instructors work for the HELLER Academy around the globe?
_ that since recently, a placement at the HELLER Academy forms part of apprenticeships at HELLER?

Swarm intelligence

Together we are smart(er). Or not?

The term swarm intelligence refers to the theory that communication and specific interaction between individual agents can lead to the emergence of ‘intelligent’ global behaviour. As a result, the individuals’ skills and the power of the crowd can be used purposefully to solve problems and to master challenges.

Ants, bees, locusts, bats, fish, birds – swarm animals have always used their collective power successfully for their purposes.

The idea of intelligent swarms modelled after examples from the animal world soon prompted scientists to look for the same type of intelligence in humans

An early expression of the basic idea of collective intelligence is Aristotle's Summation Theory set out in his principal work of political philosophy called *Politics*. He suggested that a decision taken by a larger group of people could be better than the judgement of a few individuals or experts. In this context, 'intelligence' is not understood in the usual sense as the capacity to understand facts and interrelationships, to acquire new knowledge which is then used to solve a problem. Rather, intelligence has to be seen as the ability to establish a collective memory and to solve problems as a group, with each individual member contributing to the solution. In order to reach a goal, cooperation is crucial.

What we can learn from the animal world
Animals teach us that we can achieve things together that are beyond our reach as individuals. Ants, bees, locusts, bats, fish, birds – swarm animals have always used their collective power successfully for their purposes, whether in search of food, to save energy or as a protection against predators. According to scientists, animal swarms need to work together to master their daily challenges – on its own, neither a bee, nor an ant or any other swarm animal would know what to do. Swarms do not have an alpha animal to lead the others.

Ants are a popular and instructive example of swarm intelligence. The individual animals receive no orders from 'superiors' and do not follow any specific plan when they leave odour trails of pheromones on their way to a source of food. Yet, other ants follow their trail and so are able to find the food. If there is a shorter and a longer route to the food source, the shorter is the quicker one and becomes more frequented by the ants. As a result, the scent on the shorter route is reinforced. This will attract further ants to the route and so on. This 'non-intelligent' interaction of the individual ants helps to mark the shortest path between the colony and the food source.

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The Italian mathematician Marco Dorigo adopted this behaviour as a model when developing the first ant algorithm, the so-called Ant System (AS). He applied AS to solve the 'travelling salesman problem' in informatics – an equally obvious and ingenious solution. The problem deals with the question of finding the shortest round-trip to link a series of cities. Suppose the salesman has ten different cities to visit, this potentially already results in 181,400 different round-trips. Numerous improved variants followed Dorigo's algorithm.

Swarm intelligence and the golden mean, or: when is a swarm intelligent and when is it not?
The idea of intelligent swarms modelled after examples from the animal world soon prompted scientists to look for the same type of intelligence in humans. A frequently cited example is the experiment conducted by the scientist Francis Galton during a fat stock exhibition in 1907. It is generally regarded as the first experiment to prove human swarm intelligence. During the exhibition, Galton had visitors judge the weight of an ox. When he evaluated the competition entries, he was flabbergasted: on average, voters estimated the ox to have a weight of 1,207 pounds. It actually weighed 1,198 pounds, only 9 pounds less than the average estimate. Coincidence? Not at all, according to the advocators of swarm intelligence, a group of laymen is often able to answer these questions more precisely than experts. How can this be? In an article on swarm intelligence published on the news website Spiegel Online, sociologist Marc Keuschnigg from Linköping University in Sweden explained that the averaging was the decisive factor. The weight-judging example explains what he means: the estimations of most of the voters in the competition were wrong – some too low, others too high. The average value, however, corresponded to almost exactly the correct weight. So does swarm intelligence only work in experiments allowing results to be averaged? It has been proven that the wisdom of the crowd fails whenever questions have to be answered with either 'Yes' or 'No' and with other multiple-choice questions. According to Keuschnigg, the experts provide more precise answers than laymen in these cases. In order to use crowd intelligence nevertheless, teams of scientists have come up with a range of different approaches. What is probably the best known approach was suggested by a team of US scientists. They proposed to use a predictive question in addition to the Yes/No questions as an additional safety. Their theory: only if the proportion of actual Yes votes at least equals the predicted Yes votes, Yes is the correct answer. Otherwise, No is correct and vice versa. However, this approach is controversial, mostly because it seems unbeatable in theory, but is fallible in practical application. So, apparently the golden mean also plays a role in swarm intelligence and even is vitally important.

Animals teach us that we can achieve things together that are beyond our reach as individuals.

What if swarms are not that intelligent at all?
It almost seems as if every event attributable to crowd intelligence was followed by a case questioning its existence. In June 2016, 51.98% of the electorate in the United Kingdom voted in favour of Brexit and, apparently, nobody had seen it coming. Shortly after the polling stations had closed, the odds in favour of 'Leave' were still at only 10%. A gross error – although election stock markets supposedly perform as reliably as stock exchanges. It seemed safe to assume that the forecasts they produce are more reliable than others – at least until then. After all, we have seen other incorrect prognoses. For instance, would you have believed that Donald Trump would become the Republican presidential candidate in the US – and eventually even win the election? No? Neither did the broad mass of people – and was wrong (again).

So what if a swarm is not as intelligent as believed? That would be a problem for those relying on crowd intelligence. Just think of the financial markets or strategists in corporate sales departments. Obviously, the financial and industry sectors have confidence in the concept that a large amount of swarm data provides great insights. BMW, for example, believes that only companies able to use the collective intelligence of their environment in a meaningful way will be able to maintain their competitive edge in the long term. To achieve this, the automotive manufacturer has founded the Co-Création Lab, inviting all automotive enthusiasts to contribute their knowledge and ideas. Among other topics, BMW asked for assessments and suggestions of what mobility could look like in the future and how it could be improved. Today, hardly any company is prepared to launch new products without Big Data. Often, the motto is: 'good' is what the swarm likes. _

Did you know …? Application examples of the Ant Algorithm
Ant algorithms are particularly useful for combinatory optimisation tasks such as IP routing, project planning and logistics problems:
_ bus routes, garbage collection and delivery routes
_ minimisation of transport time in case of large distances between individual production facilities
_ optimisation of routes for replenishing manufacturing lines with supplies with minimisation of the required transport equipment
_ telephone networks and internet: finding free lines during operation
_ staff planning at airlines with consideration of resting phases etc.

Often, people also are influenced by their hopes and desires when making forecasts. Even when wagers are involved, they do not always behave in a rational way [...]

Prone to manipulation and difficult to interpret: why the (alleged) swarm intelligence needs to be handled with care
For a long time, behavioural economists have pointed out that humans tend to follow the herd and are prone to change their mind once they learn that others have a different opinion about a problem. Recently, this was proven by scientists of ETH Zurich in an experiment, cited in many specialist articles since, to demonstrate the fallibility of swarm intelligence: they asked 144 students to answer six estimation questions everyone has heard before but probably cannot answer precisely, e.g. estimating the population density of Switzerland or the length of the border between Switzerland and Italy. Following the first estimate, the scientists told some of the subjects the average value of the participants who answered the same question, whilst other subjects were given the estimations of all other participants. On average, the most precise answers to nearly all questions were given in the first estimation. The more the subjects knew about the estimations of the other participants, the less swarm intelligence was noted: although the estimated values converged more and more, the average value did not approximate the correct value. So, when making a decision, it is better for the individual not to know the decisions of others in order to get to the (correct) result or to use swarm intelligence in an expedient way.

Often, people also are influenced by their hopes and desires when making forecasts. Even when wagers are involved, they do not always behave in a rational way but allow their individual preferences to influence the bet, as can be observed with football bets, for example.

The internet, especially social media, plays a significant role in this context: users are constantly confronted with new, allegedly intelligent opinions and news with the potential to influence the users' own opinions spread like a wildfire. Often, the influence from social media makes public sentiment so erratic that is becomes difficult to capture or determine.

Another problem: people tend to regard things less important in their forecasts and therefore consider things they are unable to imagine less probable. This is also true for the forecasts of Brexit or Donald Trump's clean sweep in the US primary elections. In Germany, similar things happened: contrary to forecasts, political parties like Die Piraten and AfD were elected into parliament shortly after their emergence.

The critics of swarm intelligence believe this confirms their theory, particularly in the case of Brexit. According to an article published in the online edition of the German newspaper Die Welt, the swarm (too) often misses a very crucial part of reality and, being dominated by elites, ignores the voice of the people. According to the theory, it was the cosmopolitan attitude of Londoners that influenced public perception in the case of the Brexit forecasts. In fact, two out of three Londoners voted to remain in the EU. However, their sentiment quite obviously did not match that in the rest of the country. In the same article, Emile Servan-Schreiber, head of a prediction markets company, explicitly states that in cases such as the Brexit forecast, the crowd can only predict probabilities – nothing more, nothing less. If the probability of an event occurring is relatively low, this does by no means mean that it will not occur. According to Servan-Schreiber, the reason for a misinterpretation of the results could have been observations made about who placed how much money in the election stock markets. The majority of traders placed their money on Brexit, but those who did not believe Brexit to happen placed significantly higher amounts. Dirk Helbing of ETH Zurich concludes that politicians should not have interpreted the average value to be the opinion of the people.

However, in case of Brexit swarm intelligence failed. Yet, this is no reason to dismiss the idea of a superorganism made up of many independent individuals. However, anyone utilising crowd intelligence as well as the individuals contributing their own opinion should be aware that the statements, forecasts and results of the crowd or of others should not be blindly relied upon, even if they seem logical or desirable. Then crowd intelligence can be helpful and even extremely useful. /

However, anyone utilising crowd intelligence as well as the individuals contributing their own opinion should be aware that the statements, forecasts and results of the crowd or of others should not be blindly relied upon [...]

Did you know ...

16,000 rpm

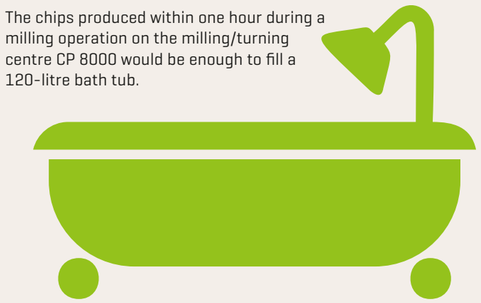
The machining spindle of an H series machine operates at 16,000 revolutions per minute – ten times more than a commercial washing machine.

If the linear axis of a machining centre model H 2000 were a car, it would accelerate to 100km/h in 2.8 seconds. A Formula One car accelerates only three milli-seconds faster.

The pallet of an H 2000 can be loaded with workpieces weighing 800kg. This roughly corresponds to the weight of a Formula One car. Model H 16000 even enables workpiece weights of up to 8,000kg. This equals the weight of a truck.

The linear axis of the H 6000 provides a feed force of 20,000N. This corresponds to the average pulling force of 10 horses.

The chips produced within one hour during a milling operation on the milling/turning centre CP 8000 would be enough to fill a 120-litre bath tub.



The SC63 SpeedCutting machining spindle on the HF series reaches speeds of up to 18,000 revolutions per minute – twice the rpm of a Porsche 911 GT3.

If you wanted to send all 2,611 HELLER employees on holiday by plane, you would need three Airbus A380 aircrafts.

If the staff of all HELLER locations were to form a team, its members would comprise 17 different nations. Only one nation short of the Eintracht Frankfurt football team which holds the record in this regard in the German Bundesliga.

2.4'

The chip-to-chip time during tool change – the 'pit stop of a machining centre' – achieved on an HF 3500 equipped with the Speed Package amounts to only 2.4 seconds. In 2012, Jenson Button, driving for the McLaren team, did the fastest pit stop in Formula One, stopping for only 2.31 seconds.

The company HELLER was founded in 1894 by Hermann Heller. In the same year, the French baron Pierre de Coubertin founded the International Olympic Committee to revive the Olympic Games.

HELLER through the ages

1386
Elector Ruprecht I. establishes **Germany's first university** in Heidelberg.

1775
Samuel Johnson's *A Dictionary of the English Language* is the **first definitive English Dictionary.**

1913
HELLER is among the first industrial enterprises in Germany to establish its **own apprentice workshop**.

1950s
The knowledge HELLER gained in the development of the **relay control and hydraulic system** results in the successful development of transfer machines.

1974
Whilst the HELLER Academy (formerly known as: HELLER Training) is still in its infancy, the **first (internal) staff training** in hydraulics is held.

1966 – 1976
HELLER introduces **semiconductor technology** – a genuine leap in innovation.

1960s – 1990
In the mid-1960s, the technical **foundations of the internet** are laid and the technology is demonstrated and developed to application readiness. The decommissioning of the Arpanet* in 1990 marks the beginning of the **internet's commercial phase.**

*Advanced Research Projects Agency Network: an early computer network commissioned by the US Air Force that was developed from 1968 onwards by a small group of researchers under the leadership of MIT and the US Ministry of Defence.

Beginning of the 1980s
HELLER produces **machining centres in series**. As a result, knowledge, also in terms of production philosophy, becomes a crucial factor for the company's success.

1984
On 3 August, the **first internet e-mail is received in Germany:** Michael Rotert, a research fellow at the University of Karlsruhe, receives a message via the US platform CSNET used for electronic communication of scientists which has been sent the day before.

1985
The **first training centre** of the HELLER Academy opens in Unterensingen.

1990
Archie, the **world's first search engine**, is born. It was developed at McGill University in Montreal and used to search files and folders in FTP archives, but provided no full-text search.

1994
On 1 October, HELLER introduces the **Employee Suggestions Scheme** (today called: HELLER Ideen-Transfer – HELLER transfer of ideas). On 16 December, the first **suggestion for improvement** is submitted.

Mid-1990s
Webmasters are beginning to **optimise websites for search engines.** The website owners soon realise the benefits of preferential listing in the search results and within a short time, companies specialising in this technology start to emerge.

Knowledge that moves us, the industry and the world

1997
HELLER introduces the **UniPro 80 family of controls:** the UniPro NC 80-M is the **first microprocessor-based product**. It is presented in combination with a bed-milling machine at EMO in Milan. From 1983 onwards, all HELLER machine tools are equipped with this control generation.

2001
Wikipedia, a non-profit project aimed to create a multilingual encyclopaedia based on the Wiki* principle, is founded.

* Users can not only read the contents of a website but also edit them directly in the web browser.

2010
HELLER introduces the claim **'HELLER solutions: Knowing how it's done.'** It positions the company as a solution provider, not only a machine manufacturer.

2011
The **term 'Industry 4.0'** is brought to public attention for the first time at Hannover Messe trade show. In October 2012, the corresponding recommendations for implementation are submitted to the Federal Government.

1974, 1982, 2013
The United Kingdom, Brazil, USA and China: with each **new subsidiary that is founded**, the HELLER Group expands its knowledge network further.

2013
In the HELLER Management, knowledge is also transferred from one generation to the next: to prepare for the generation change, **four great-grandchildren of the company founder become shareholders** in the company. In the same year, HELLER receives the German Innovation Award for Climate and Environment for the marketable arc spraying technology called **CylinderBoreCoating (CBC).**

2016
HELLER presents the **new HF series** for dynamic and productive 5-axis machining.

2017
In accordance with its corporate claim, HELLER is making knowledge the centrepiece of its portfolio with the **HELLO_** campaign, offering its customers not only product and service solutions but answers to all questions and challenges. In the same year, the machine manufacturer presents its **customer magazine** as the new central medium of information. From now on, the company will use HELLER the Magazine to regularly share knowledge about machining technology and news about HELLER and other topics.

In black

and white

2017 facts and figures and 2018 outlook

Turnover and total operating revenue developed encouragingly in 2017, being more than 7% above the previous year's figures. Due to the increase in business volume and the favourable sales mix, the consolidated net income has improved further. The order book as at 31 December 2017 amounted to EUR 409.7m. Accordingly, the order balance was above the previous year and above plan and will result in a good basic utilisation together with further orders to be expected. Based on this, the current year's sales revenue and total operating revenue are assumed to reach a level comparable to 2017.

The forecasts for the global economic situation in 2018 continue to be optimistic for the international markets as well as for Germany. The same is true for the economic situation in our industry. The global machine tool market will continue to grow in the medium and long term. We expect this growth to be reflected in the most important submarkets in which HELLER is present. We remain convinced that the HELLER Group is very well-positioned in the market with a range of cutting-edge products. Internal procedures and structures have been sustainably improved in the previous periods and are continually optimised. /

Order intake

€ 612.8m

Europe: 64%
North and South America: 13%
Asia: 23%

Total output

€ 568.9m

Sales revenues

€ 577.6m

Equity capital

€ 108.9m

Ratio: 30.7%

Employees

2,611

HELLER Group worldwide

Continuity on shareholder level and in terms of management

Associates of Heller GmbH:
Heller family

Supervisory Board of Heller GmbH:
Berndt Heller (Chairman)
Christian Hald
Harald Völker

Managing Directors of Heller GmbH:
Klaus Winkler, CEO
Manfred Maier, COO

Managing Directors, Production locations:

Germany (Nürtingen)
Dieter Drechsler
Patrick Rimlinger
Dr. Jürgen Walz

United Kingdom (Redditch)
Matthias Meyer

USA (Troy/Michigan)
Keith Vandenkieboom

Brazil (Sorocaba)
Alfredo Griesinger

China (Changzhou)
Andrew Parkin

Managing Directors, Sales/Service locations:

Europe
Peter Weber
Andreas Müßigmann

_ Germany (Hattingen, Salem, Goslar, Saarbrücken, Nuremberg, Nürtingen)
_ Italy (Verona)
_ France (Paris)
_ Poland (Posen)
_ Spain (Barcelona)
_ Sweden (Värnamo)
_ Switzerland (Appenzell)
_ Slovakia (Vráble)
_ Russia (Moscow)

North America
Keith Vandenkieboom

_ USA (Troy/Michigan)
_ Mexico (Querétaro)

South America
Alfredo Griesinger

_ Brazil (Sorocaba, Belo Horizonte, Porto Alegre)

Asia
Andrew Parkin

_ China (Changzhou, Beijing, Chongqing, Shanghai)
_ India (Pune)
_ Thailand (Bangkok)
_ Singapore (Singapore)

Customer success stories from around the globe

The global support of its customers is the primary goal of HELLER

For our customers from the industrial+, heavy-duty and light-duty vehicles sector we produce premium metal-cutting machines worldwide and support them with customised applications and services. We operate a versatile global production and procurement network with manufacturing facilities in Germany, the UK, Brazil, the US and China which is continually expanded and optimised. Additionally, we support our customers from more than 30 local sales and service bases in the individual markets. A high real net output ratio and strict adherence to delivery dates in supplying the assembly plants with pre-fabricated components are indispensable preconditions for us. It is the only way to meet the needs and requirements of our customers around the world in all aspects. /

Americas

Nordamerika

_ numerous production solutions for crankshaft manufacturing at locations in South Korea, Mexico and the US for a US OEM
_ Retrofit of a total of 49 transfer modules and machining centres from an existing production line for the machining of diesel engines for a US automotive customer
_ Flexible Manufacturing Systems comprising 4-axis and 5-axis machining centres for the manufacturing of automotive powertrain components for a US automotive supplier
_ horizontal machining centres with heavy-duty machining unit and out-facing head technology for the flexible machining of pumps/valves used for power generation for a US full-range supplier

Südamerika

_ Flexible Manufacturing System comprising horizontal machining centres models H 2000 and H 4500 for the machining of engine components at the Brazilian location of an automotive OEM
_ automotive manufacturing solutions comprising horizontal machining centres, including automation, for an international heavy-duty OEM in Brazil

Europe

_ machining of light-duty and heavy-duty powertrain components on 4-axis and 5-axis machining centres and modules for an automotive die-casting supplier at locations in Germany, Austria and Switzerland
_ two large machining centres model H 10000 for the machining of jib components at high process stability at a Finnish forestry machine manufacturer
_ 4-axis and 5-axis machining centres for the machining of aluminium die-cast components for a Swedish supplier
_ expansion of an existing Flexible Manufacturing System comprising HELLER machining centres with a stand-alone horizontal machining centre model H 2000 equipped with 4-position pallet magazine for the machining of prismatic valve components for premium brake systems at a British rail vehicles supplier
_ highly productive manufacturing lines and stand-alone machining centres for 5-axis machining of light-metal components for a machinery and equipment company group
_ eight horizontal machining centres model H 4000 for the manufacturing of clamping technology components for a German gripper system manufacturer
_ mould component production on a highly productive 5-axis machining centre model FP 6000 equipped with automation for a German supplier to the construction industry
_ Flexible Manufacturing System consisting of six machining centres model H 4000 and workpiece automation for the machining of heavy-duty clutch housings at the German location of an international transmission tier supplier
_ 5-axis machining centre model FP 6000 equipped with rack-type magazine with 425 storage places for the precision manufacturing of die tables for a German pharmaceutical plants manufacturer

Asia

_ 4-axis machining centre model H 5000 equipped with out-facing head technology for the machining of nickel-based-alloy aerospace components for a Chinese aerospace supplier
_ 4-axis machining centre model H 4000 for the highly productive manufacturing of compressor components at the Chinese location of a global producer of power engineering system solutions
_ integrated turnkey manufacturing solution consisting of more than 40 MC 20 manufacturing modules, automation and third-party machinery for the manufacturing of light-duty engines of a Chinese OEM

How the German machine tool industry is tackling Industry 4.0 in a joint effort

The German Machine Tool Builders Association (Verein Deutscher Werkzeugmaschinenfabriken e. V. – VDW)
The VDW is the mouthpiece of the German machine tool industry. Its members include machine tool manufacturers producing in Germany. It was founded in Hanover in 1891 and today has its seat in Frankfurt am Main. Most association members are located in Baden-Württemberg, North Rhine-Westphalia and Bavaria. The majority of their customers are automotive manufacturers and their suppliers as well as mechanical engineering companies. The association operates various committees working on aspects such as economy, technology, communication as well as legislation and taxes. In the field of technology, it organises work groups dealing with a range of topics, including control technology, machine tool design, grinding technology etc. The VDW is financed through fees of its members and proceeds from their trade show activities.

Without a general standard it will be difficult for Industry 4.0 solutions to gain market acceptance and thus wider distribution.

Last year at EMO in Hanover, the German Machine Tool Builders Association (Verein Deutscher Werkzeugmaschinenfabriken, VDW) presented its industry initiative focusing on connectivity for Industry 4.0. Until now, the machine tool industry had been lacking a standardised and consistent solution, allowing to read and process data from different machines. However, without a general standard it will be difficult for Industry 4.0 solutions to gain market acceptance and thus wider distribution. Moreover, different types of controllers, proprietary interfaces and isolated software ecosystems are making it hard for machine manufacturers and users to find appropriate solutions, having to focus on time-consuming and cost-intensive infrastructure matters. That is why the VDW started the 'Connectivity for Industry 4.0' industry initiative – with the goal to develop a standard and to implement it by way of software, enabling to connect different types of machine controls with a common interface to higher-level IT systems. At METAV in March this year, the association presented the progress the initiative has made.

'Connectivity for Industry 4.0': a good plan
Already at EMO Hanover in September 2017, the VDW announced first aspects to be implemented as part of the initiative:
_ joint development of an interface specification
_ implementation of a so-called connector stack, translating the signals from different control interfaces into OPC UA (Open Platform Communications Unified Architecture; according to the VDW becoming more and more widely used at the moment, enabling to specify parameters using a pre-defined structure and providing numerous verified implementation samples on OPC servers)
_ implementation of a gateway, enabling the secure connection to various IT systems and clouds, using a standard protocol on the basis of the OPC UA data structure

Why is the machine tool industry tackling this topic in a joint effort?
Manufacturers will have to respond to the digital revolution sooner or later. According to a VDMA study about the platform economy, digital platforms will be playing an increasingly important role in new business models. They provide machine manufacturers with an opportunity to help shape the platform economy through clever business ideas. An interface standard will greatly simplify digitisation and also reduce the costs involved, making it easier for medium-sized companies to tap into the potential of such platforms. "Clearly enterprises cannot ignore this trend if they want to stay competitive in the future," explains Dr. Heinz-Jürgen Prokop, Chairman of the VDW. The association members are already cooperating across different companies on numerous topics. In case of Industry 4.0, however, many have been working on proprietary solutions in parallel. Prokop summarises what quickly became apparent: networking in terms of Industry 4.0 will not succeed when enterprises have to fend for themselves. Lone fighters are quickly reaching their limits. The VDW believes that enterprises should overcome their concerns and share their knowledge, benefit from it and work on a joint solution.

Since publishing the VDW industry initiative, specialists from Chiron, DMG Mori, EMAG, Grob, HELLER, Liebherr-Verzahntechnik, Trumpf and the United Grinding Group have joined the core team.

March 2018: the VDW takes stock
"Without a doubt, the biggest success of our industry initiative until now has been to establish cooperation between renowned machine tool manufacturers, with all of them pulling together. Now, also all of the important control manufacturers from Beckhoff, Bosch Rexroth, Fanuc and Heidenhain through to Siemens have committed their support," Prokop explained at the METAV press conference in February this year. According to the VDW Chairman, the strategic partnership with the suppliers of CNC controls also ensures that the interface will be integrated in future control versions and will be readily available on the market. As a result, nothing stands in the way of its comprehensive use, mainly benefiting the small and medium-sized enterprises. Since publishing the VDW industry initiative, specialists from Chiron, DMG Mori, EMAG, Grob, HELLER, Liebherr-Verzahntechnik, Trumpf and the United Grinding Group have joined the core team. They are contributing resources in form of manpower and testing systems. The team covers a representative cross-section of the metal-cutting and sheet-metal forming industry. In mid-November 2017, the Institute for Control Engineering of Machine Tools and Manufacturing Systems (Institut für Steuerungstechnik der Werkzeugmaschinen und Fertigungseinrichtungen, ISW) of Stuttgart University joined the VDW initiative as a cooperation partner. However, the VDW's executive board is aware that the companies participating only represent a fraction of the overall VDW membership. That is why the board will closely follow the development by setting up a steering committee. Additionally, the VDW will be in regular dialogue with its other members, enabling them to prepare themselves for the implementation of the specification.

To encourage broad acceptance, networking within the initiative is not limited to cross-sectoral cooperation, e.g. with the manufacturers of robotics equipment and rubber and plastic machines, but also expanded on an international level to the USA, Japan and shortly also China. All three countries are interested in a common standard. The USA has already developed MTConnect for status monitoring of production equipment. According to Prokop, the VDW can or even should look for useful applications and basic approaches. Moreover, the VDW initiative will establish a joint working group with the OPC Foundation standardisation organisation. In July 2017, the VDW published a specially developed Companion Specification as an internationally recognised standard for the planned interface and the initiative is now intensely working on expanding it further.

Prokop draws a promising conclusion: "We have created all the prerequisites needed for a broad application of the planned interface standard." According to him, it was now necessary to rapidly develop it further and to produce specific modules. Before long, ISW of Stuttgart University will present a first sample implementation. In autumn, the control manufacturers will introduce the first implementations for the data exchange on machine tools. /

"[…] without a doubt, the biggest success of our industry initiative until now has been to establish cooperation between renowned machine tool manufacturers, with all of them pulling together."

Dr. Heinz-Jürgen Prokop
Chairman of the VDW

"Clearly enterprises cannot ignore this trend if they want to stay competitive in the future."

Dr. Heinz-Jürgen Prokop
Chairman of the VDW

Apropos initiative
In collaboration with 18 partner companies, including HELLER, Siemens AG in January 2018 founded the MindSphere World as a global user organisation for the cloud-based open IoT platform MindSphere. The goal of these companies is the global expansion of the MindSphere ecosystem. Additionally, the partnership will support the individual members in developing and optimising IoT solutions on MindSphere, helping them to tap into new markets in the digital economy. Moreover, the partnership promotes science, research and teaching of MindSphere. In the committees, the partners discuss topics such as the industry's requirements on MindSphere, ideas for data governance and public relations activities of the partnership. With the founding of the MindSphere World, they are positioning themselves as the joint innovation leaders for industrial cloud solutions.

Sorocaba (BRA)

HELLER provides financing to support training facilities for disadvantaged young people

Professional education plays an important role at HELLER. Every day, we ensure that our employees receive high-quality training and never stop learning.

20 years free-of-charge training
Social commitment is not an empty buzzword for HELLER Brazil. For 29 years, the company has been supporting the professional education of disadvantaged children at its location in Sorocaba. At the DETEC – Departamento de Esino Técnico Pestalozzi, the Pestalozzi centre for technical training and professional education – disadvantaged young people have been receiving free training since 1988. The goal of DETEC is to train students in turning, milling, drilling and other techniques to qualify them for a profession in the metalworking or electrical sector. For this purpose the specially-furnished training workshop is equipped with high-quality, mostly in-house built equipment: in 2017, students were able to use four drill presses, one milling machine and four turning machines. Every year, three exams are taken during the two to three-year training course. At the end of their training, the graduates receive a certificate that meets with the guidelines of the national vocational schools in Brazil.

Voluntary teachers and committed HELLER employees
The former vocational school teacher José Alberto Bacci is the director and spiritus rector of the institute. He supervises the students together with four other, mostly voluntary teachers.

The initiative is financed by hundreds of HELLER employees. On average, they donate between one to ten Euros each month. Additional funding comes from one-off donations and the proceeds from a wide range of charitable events and activities. Until today, more than 3,100 graduates of DETEC have benefited from these contributions, enabling them to complete their training free of charge. /

+

The project at a glance
_ free-of-charge training for students aged 14 to 80
_ currently, 50 students are participating in the programme
_ preparation for metalworking or electrical professions
_ training period: two to three years
_ mostly voluntary employees
_ predominantly in-house equipped workshops
_ mainly financed by HELLER employees

HELLER Brazil
_ worldwide reference for the manufacture of horizontal machining centres
_ active in the Brazilian market since 1974

The HELLER location in Sorocaba
_ city in the south-east of the state of São Paulo
_ important and highly developed industrial centre of the country
_ population approx. 659,871 (retrieved: 2017)

"Through its partnership HELLER is encouraging us to continue our work, helping students to realise their professional goals."

José Alberto Bacci
Project Manager

“If there is only one among our students who finds a good job, enabling him to leave life on the streets behind, it has all been worthwhile.”

Janete
Voluntary employee

The project manager

78-year-old José Alberto Bacci has been involved with DETEC from the beginning and is full of passion for the project: “Mechanics are close to my heart and I love to pass on my knowledge.” Bacci has been leading the project with great satisfaction despite difficulties along the way. Deeply moved he says: “Every volunteer finds the necessary strength and enthusiasm to continue his work, leaving a legacy to the new generations.”

Janete, who has been helping at the school for more than 19 years now, explains: “If there is only one among our students who finds a good job, enabling him to leave life on the streets behind, it has all been worthwhile.”

The sponsor

Alfredo Griesinger, Managing Director of HELLER Brazil, considers the programme a kind of payback to the local community. “Supporting this project has been a pleasure and in some ways a recognition of the fact we have been received so well in Brazil during the last 40 years!” Social responsibility is very much in the focus today, but it takes more than good ideas: to create a better world, you have to lead by example. “Apart from developing new talent, any organisation should also strive to improve the life circumstances of people by giving them opportunities for advancement.”

The student

Following his successful graduation from DETEC, Bruno Ferro, 21, has found work as a knife maker: “Everything I learned here, not just the technical skills but also the knowledge about business and project management, I apply every day. I can’t imagine myself in any other field and would like to thank everyone who contributed to my education.” Bruno also proposed his younger brother Guilherme, 15, as a participant in the DETEC course. The adolescent is enthusiastic: “It has always been my dream to become an engineer!”

The teacher

According to Meire Crem de Andrade, 41, businesswoman and voluntary teacher at DETEC, most adolescents come to the school without any perspective. Many of them are unhappy with their lives. However, during classes they realise that the future is in their own hands. The training gives them the opportunity to find themselves. It gives their confidence a boost and helps them to mature. “It is like a personal or professional awakening,” the teacher says. /

The goal is productivity

HELLER4Industry the solution

Apart from translating the absolute performance characteristics of a machine tool into convincing results in the harsh conditions of daily manufacturing, smooth operation is a key prerequisite for achieving a low TCO* and a high OEE**. To approach the ideal level of 100% machine availability, service intervals must be scheduled in a way to ensure that the maintenance-related downtime will have the least effect on the production output. Therefore, maintenance should be performed during company closings, weekends or times of low utilisation. This is the only way to ensure that as few as possible of the valuable production hours are lost, resulting in an increased OEE.

* Total Cost of Ownership
** Overall Equipment Effectiveness

But what is the difference between the existing maintenance and service models and the 'smart' service concepts including the HELLER Services Interface module HELLER has developed in the context of the HELLER4Industry strategy? Bernd Zapf, Head of Development New Business & Technology, summarises the benefits: **"In the future, it will be possible to significantly reduce idle times caused by unscheduled machine downtime due to technical faults."** The consequences of a machine failure – missed deadlines, customer complaints and overtime or emergency actions by service engineers – can quickly destroy a positive order balance. "The goal of achieving maximum machine availability has to be implemented without the need for excessive servicing, as this would have a negative effect on availability," Zapf describes the contradictory situation.

HELLER Services Interface: wear analysis at a whole new level

Existing service models usually involve in-depth inspections of the machine performed by service engineers at fixed intervals (usually semi-annually) during which faulty parts are identified and replaced. Before the inspection, neither the operating company nor the service engineers are able to tell exactly what measures and specific spare parts will be required. By nature, the reasons for the wear of guideways, bearings and ball screws correlate with the machine's intensity of use – cast iron machining causes higher wear of components than the cutting of aluminium workpieces. Apart from the varying machining applications, the process parameters chosen by the operating company can contribute to wear under full-load conditions.

The idea behind the HELLER service module was to automate the methods of the service engineers and to integrate them into a web application. For this purpose, the condition data are regularly retrieved, stored and analysed during the machining process. The results are highly individual trend prognoses, taking the life cycle of the machine tool in question into account. **Users are able to gain an overview of the wear situation and upcoming maintenance tasks, whilst the manufacturer generates crucial knowledge about the scope and the type of maintenance required.** _

However, the Industry 4.0 approach taken by HELLER goes even further than that: "We want to communicate with our customers at eye level. After all, the user needs transparency to be able to decide freely and to comprehend our maintenance suggestions. **Apart from the machine's current condition, the acquired data and machine loads also allow us to provide him with a very precise forecast about when wear will start to affect the machining quality.** Meanwhile our forecasts have reached a prediction accuracy of a week," Zapf describes the progress made. However, the user is not reduced to a mere spectator, unable to do anything but watch the progressively declining 'health' of the machine tool over its life cycle with a worrying look on his face. The HELLER Services Interface module for production data evaluation reveals to him the correlation between the load the machining tasks performed impose on the machine and the resulting wear. Therefore, the user is able to see what effects the machining operations performed have on his machines. When he requires maximum utilisation of the machine tool due to deadline pressure, the maintenance intervals become shorter. When the machine is operated below the limits, the user is able to gain availability and the intervals become longer again. **"The decision always rests with the operating company,"** explains Zapf. **"We only provide them with the tools to evaluate and predict the availability in a reliable manner."**

Working at the limits – in a safe way

The insight into the machine condition is technically supported by a web service using equability axis tests. The evaluation of the data enables a rigidity analysis of the machine tool. If backlash in the motion axes increases (i.e. in case of a loss of pre-load), the relevant bearings and ball screws are worn, resulting in a decline in machining quality and process reliability. To perform these analyses, HELLER does not incorporate any additional sensors in the machine – that would mean introducing additional error sources and components in need of maintenance – but instead evaluates the electrical signals of the drive units. "The users' technology carriers, such as NC programs or tool data, remain unaffected by the data analysis," explains Zapf, adding: "The user remains in control of his process- and application-critical parameters at all times. The manufacturing know-how remains on site. We offer him the opportunity to operate his machine in an ideal window in which wear, quality and safety are balanced. According to the situation, the user can choose the machining strategy which is optimal for him, and that can be different every time." **The benefit is in the optimised operation of the machine, enabling the user to balance availability, quality and machining speed at any time according to his needs and at the same time to monitor the effects on the life cycle of his machine.** Use cases from the HELLER4Performance portfolio, such as increased dynamics of the feed axes when workpiece weights are far below the maximum table load, are always implemented with regard to the specific wear situation of the machine. As a result, the limits can be pushed further without jeopardising the safety and availability of the machine. It means working at the limits, but in a safe way, without actually exceeding them.

"We want to communicate with our customers at eye level."

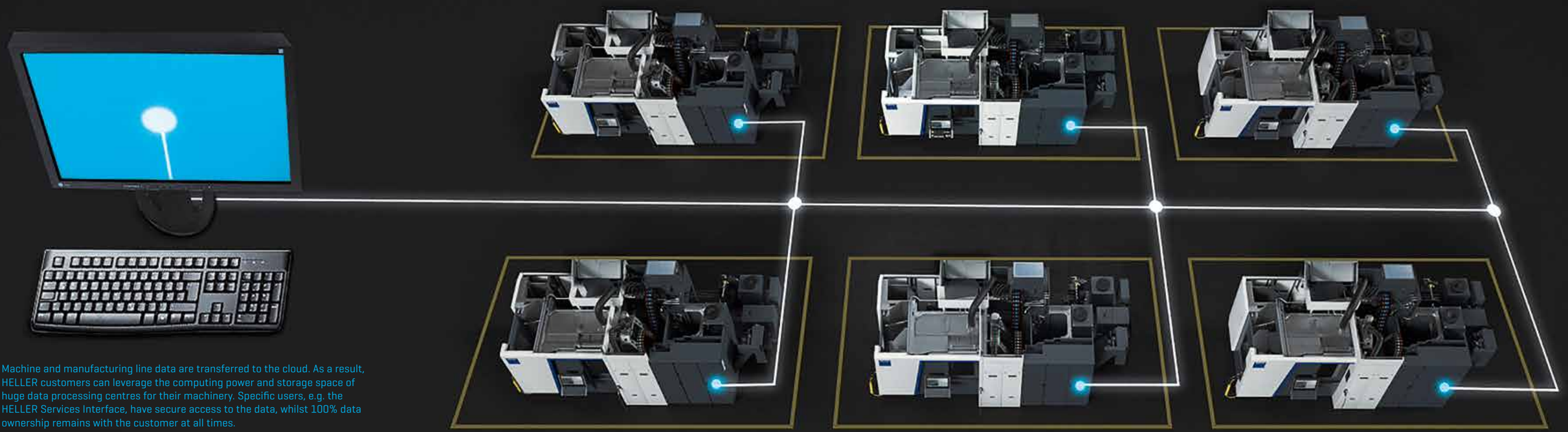
Bernd Zapf,
Head of Development
New Business & Technology

New business models based on HELLER4Industry

The perfectly documented life cycle of machine tools, including capturing and evaluating the actual machine utilisation, also provides the basis for a newly developed operator model for the use of HELLER machining centres. **The HELLER4Use operator model is a new option developed by HELLER, enabling users to drastically reduce their entry costs into HELLER manufacturing solutions.** HELLER provides the desired machine and takes over the inspection, servicing and maintenance to guarantee a high level of availability on a permanent basis. The HELLER Services Interface provides the basis for the model, perfectly reflecting the life cycle of the machine. The machine data required to determine the costs are collected, evaluated and transferred to a digital billing system using the existing functionality. As a result, the customer only pays when he is producing parts.

Additionally, the user has access to the latest machine models at any time, enabling him to adapt his production equipment to the actual requirements. The rental contract includes an installation fee, a basic monthly rent and an initial usage time of 150 hours. Extensions of further 100 hours usage time can be purchased on a prepaid basis in an automatic procedure. The user has the peace of mind that he is able to process his orders without the high capital commitment involved in buying a machine. If he requires additional production time on top, the package can be extended in an uncomplicated manner. Due to the transparency of the comprehensively documented life cycle status, returning the machine or changeover to another HELLER machine model is risk-free and possible after a minimum term of six months.

The methods of the HELLER Services Interface applied in the HELLER4Use usage model also benefit buyers of HELLER used machines: whilst often the only information enabling the assessment of a machine's condition are its year of construction and knowledge about possible repairs performed, HELLER customers receive a full and dedicated evaluation of their used machine. This creates security for productive operating hours – throughout the entire life of a machine tool. /



Machine and manufacturing line data are transferred to the cloud. As a result, HELLER customers can leverage the computing power and storage space of huge data processing centres for their machinery. Specific users, e.g. the HELLER Services Interface, have secure access to the data, whilst 100% data ownership remains with the customer at all times.

Advanced coordinate measuring technology from Renishaw

Today, 5-axis machining centres are the standard when it comes to workpiece machining. The reason is that 5-axis machining allows the component to be machined from any given angle. Complete machining of workpieces on a 5-axis machining centre results in increased precision and improved positioning since the workpiece does not have to be moved from one set-up to the next as was the case in 3-axis machining. Aside from improved precision, this also results in time savings since unnecessary idle times during reclamping are eliminated.

In terms of the new 5-axis technology, the coordinate measuring technology used in many companies still lags behind the state of the art, with many of them still using 3-axis measuring machines. In analogy to the milling technology, the disadvantages are clear to see. Frequently, the workpiece needs to be reclamped in order to perform a full measurement. In this case, the reclamping also involves changing the probe configurations that need to be adapted to the measuring task at hand with considerable effort. This results in significant downtimes and a lower measuring throughput. With the new 5-axis technology, the workpieces can be measured in 5 axes on a coordinate measuring machine. The 5-axis technology is based on the REVO measuring head, providing the fast and demanding measuring motions, whilst the heavy axis in the coordinate measuring machine only moves in linear direction at low speeds. The REVO system uses synchronised motions and 5-axis measurement technology to minimise the dynamic effects of the CMM motion at ultra-high measurement speeds. The removable probe system used in conjunction with a low-cost changer provides added system flexibility. The 5-axis technology in the coordinate measuring machine provides a significant increase in measuring throughput. A 70% reduction in measuring time is realistic. The special procedure for scanning the surface geometry produces more measuring data and therefore a more precise representation of the geometric situation. As with the milling machine, the 5-axis technology improves accessibility to the individual features, resulting in a drastic reduction of probe configurations needed and significantly – and sustainably – lowers the costs of the probing equipment. Another important aspect in favour of the 5-axis technology is the significant reduction of idle times while preparing the measurement. In many cases, the changeover from one component to the next is possible without having to change the existing probe configuration; no elaborate adaptation of the probes is required. For companies operating state-of-the-art milling machines, the use of advanced measuring technology is indispensable. /

Renishaw is one of the world's leading engineering and scientific technology companies with outstanding expertise in precision measurement as well as additive manufacturing (3D printing) and healthcare. The Renishaw Group currently has more than 70 offices in 35 countries with more than 4,500 employees worldwide. At its location in the UK, the company carries out the majority of its research and development and its manufacturing. By June 2017, Renishaw recorded sales of £536m, 95% from exports. The company invests 17% of sales in R&D. Its largest markets are China, the US, Germany and Japan. The German subsidiary employs 150 staff.

RENISHAW
apply innovation™

STARK provides concentrated know-how in

clamping technology

STARK Spannsysteme GmbH is considered a pioneer in the development and manufacture of zero-point clamping systems and the first company in the market that has specialised in this particular technology for decades. STARK offers the most comprehensive portfolio of highly productive workpiece-clamping solutions in the market with products characterised by highest quality and precision.

Going strong for 40 years
As a pioneer of zero-point clamping systems, STARK celebrated its 40-year company anniversary in 2017. The high-tech company STARK Spannsysteme based in Rankweil/Austria was founded in 1977 and became a member of the ROEMHELD Group in 2000. It sees itself as a trend setter in zero-point clamping technology. "With batch sizes getting smaller and smaller and part range and part variety growing, the set-up times and resulting set-up costs have become an increasing cost factor. The use of a zero-point clamping system helps to achieve a significant boost in production," explains Robert Hartmann, Sales Manager at STARK. Today, the company exclusively focuses on the development, design and production of zero-point clamping systems. "With a zero-point clamping system, customers are not only buying a clamping system meeting highest requirements on quality and precision, but also benefit from the know-how our company has gained over 40 years," Hartmann continues. Therefore, it is hardly surprising that STARK's reference list reflects the who-is-who of the industry with customers from the automotive industry, aerospace or mechanical engineering.

Systems for modern production
Today, cost savings in production are increasingly only achievable in terms of the machine set-up or by cutting process times (idle times). The advantages zero-point clamping systems provide in production on a sustainable basis include bottleneck-oriented planning, cycle time reduction, solutions for reduced batch sizes and reduced inventory levels. STARK offers a very wide range of configurations from simple designs through to complex clamping solutions suitable for automation.

hydratec – used on machine tools for more than 10 years
The double action clamping system SPEEDY hydratec is robust in use and designed for the fastest possible changing processes. Due to its compact design, the SPEEDY hydratec only requires little space for installation. As a result, very small spacings can be realised easily. Due to the special retractable nipple contour and the matched radii, the bore is not damaged on insertion in the SPEEDY. No swarf can be jammed in the cylindrical bore and due to the optimal application of force – the retractable nipples are fixed positively and highly accurately by the clamping mechanism – bending or lifting is not possible and as a result high positioning accuracy is guaranteed. Positioning, clamping, releasing – SPEEDY hydratec integrates everything in an intelligent hydraulic zero-point clamping system. /

STARK Spannsysteme is a member of the ROEMHELD Group and for 40 years has specialised exclusively in zero-point clamping technology. The company is a supplier to the aerospace, automotive and metal industry and to mechanical engineering: STARK has sold more than 100,000 zero-clamping systems and exports its products to renowned companies around the globe with the help of the joint sales and service companies of ROEMHELD in more than 50 countries.

ROEMHELD
HILMA ▪ STARK

3 questions _ 3 answers

What does knowledge management mean to STARK Spannsysteme?
In our context, knowledge means knowing the status of the clamping system. For this purpose, we use a direct piston position query: retractable nipple positively fixed as a security query, clamping system fully opened for the removal of the pallet and, if needed, incorrect clamping when the retractable nipple is not properly clamped. Additionally, we provide a clamping check to verify precision.

How does STARK see the future of clamping technology?
STARK has a tradition of breaking new ground. With the SPEEDY etec clamping system, we have developed a fully electrically powered system which also provides all the information electrically. This clamping system is setting new standards for hydraulic-free machines and machining centres and other applications. It is the perfect addition to our extensive product range.

What are the current challenges in terms of the electrification?
Generally, the electrification of machine tables has not developed as quickly as originally anticipated. There is still some catching up to do as far as signal transfer, energy density, design etc. are concerned. From STARK's point of view, an electrical zero-clamping system makes little sense as long as neither electricity nor a bus system is available on the machine table.

We believe that the energy supply will continue to be hydraulic or pneumatic whilst queries will be performed electrically in the future – for this purpose we have developed a new product family which will be presented at AMB.

New organisational structure supports transfer of knowledge

HELLER Germany

Systems are entities consisting of several interrelated elements with multi-layered structures. So, when you link different systems, you will obviously end up with something quite complex. Keeping track of the overall structure and leveraging the benefits of the individual systems to support the company's success is important, but not that easy. How is HELLER meeting this challenge and why does the restructuring of its production operations place the machine tool manufacturer one step ahead of other companies? Christian Kurtenbach, Head of HELLER Mechanical Manufacturing and responsible for the implementation of the HELLER Group's global production strategy, gives us an insight.

Christian Kurtenbach until recently headed the FOCUS HELLER initiative, supporting various investment and organisational restructuring projects in OM. In January 2018, he took over as Head of Mechanical Manufacturing.

HELLER has completely restructured Mechanical Manufacturing at its German production facilities and is currently working on implementing the new organisation at its Brazilian location in Sorocaba. What is new about it is that the company now uses a range of different systems communicating with each other. With an investment of approx. EUR 1.5m, HELLER has succeeded in creating highly developed and highly functional interfaces between the different systems. In addition to eliminating errors, it also enables multi-level planning. The advantages of HELLER's integrated network at a glance:

_ transparent processes
_ improved quality assurance
_ reduced cycle times
_ cost reduction
_ collection and transfer of knowledge

According to Kurtenbach, especially the latter provides a major benefit. He explains that approx. 50 employees working in HELLER Manufacturing will be retiring in the next 5 years. This corresponds to about a quarter of staff. "The systems enable a transfer of knowledge," says Kurtenbach, adding that the following generations of employees will benefit greatly from the knowledge stored in the systems. So what are those systems interacting in HELLER Manufacturing and communicating by means of intelligent interface connections?

1 ERP system

Enterprise Resource Planning system
ERP is the centralised corporate management system used to handle all cross-functional information. All business processes taking place within a company are mapped in this system. It is used for planning, control and monitoring of orders and resources such as capital, personnel, manufacturing equipment, materials and IT systems. The ERP system provides a uniform data base for all business divisions. Other advantages the system provides include transparency, process optimisation, time savings and cost reductions.

2 MDA/PDA system

Machine Data/Production Data Acquisition system
Already in November 2016, a so-called ERP-integrated machine data and production data acquisition system was implemented in Mechanical Manufacturing. It is currently being introduced at the Brazil location as well. The system enables acquisition of machine data (MDA), production data (PDA), process data, material movements, quality data and staff work time logging with real-time storage in the ERP system. In other words, the system captures what is currently happening, i.e. actual data. _

3 APS system

Advanced Planning and Scheduling system
APS system is a detailed planning system, retrieving any data relevant for production from the ERP system. Contrary to the ERP system, limited capacities can be taken into account in the planning. In other words, APS retrieves the actual data from the MDA/PDA system and synchronises them with the planned load from orders and the available capacities. Subsequently, it calculates the delivery date and the optimal processing order at each workstation, taking all influencing factors into account. The goal of APS is to achieve one hundred percent adherence to schedules whilst ensuring optimal utilisation of machines and personnel. Or, in other words: the goal is to ensure the optimal organisation of all processes.

Casually speaking, APS helps to conquer the complexity. On a given day, for example, 8,750 pending jobs had to be processed in Mechanical Manufacturing. Each operation requires materials, capacities, programs, tools and fixtures to be available at a different time. Simultaneously, each operation requires to be completed at a different time. For example, according to the actual data, machine A is in need of repair at the moment and employee B is on holiday. The question is, when, where and in which sequence will the materials, tools etc. have to be supplied to machine H to ensure that everything runs smoothly?

The example shows that a range of different circumstances and influencing factors need to be taken into consideration to be able to answer this question and, for example, helping to decide if it would be advisable to switch over from two-shift to three-shift operation. A so-called input/output diagram provides a visual overview of the order-related capacity requirements and the available capacity. In the ideal case, both lines are at the same level. A major benefit of the system: APS is able to provide a reliable simulation for the future. In other words: what will be the situation tomorrow, within a week's time or within a month?

4 3D CAM system

Computer Aided Manufacturing system
CAM refers to the computer-aided manufacturing of workpieces. The goal is to identify the most efficient method of machining with the help of this system. The 3D CAM system incorporates the measuring functions used for quality control during the machining process. A three-dimensional representation of the manufactured parts makes the work of programmers and specialists easier. Job setup and processing in production can be accomplished faster. Additionally, the system enables optimisations and provides increased precision. HELLER uses a customised version of the 3D CAM system. It is capable of exchanging information with the Equipment Management System (EMS).

5 EMS

Equipment Management System
EMS is a resource management system. Or, in other words: EMS is a centralised database of all production resources and tools and provides the entire manufacturing communication between the systems. Its purpose is to optimise the planning and provisioning of tooling and fixtures and it will replace all databases previously used for resource management in HELLER Manufacturing. Additionally, the goal is to make the transfer of knowledge on the shopfloors easier. For example, the programmer will be automatically notified when the machine operator has made changes to the machining program. The fixture designer will also be able to see any changes made to the workpiece setups. Irrespective if these changes will become the standard in the end or not: the goal is to manufacture a workpiece under optimal conditions. During this process, it is important that knowledge is used effectively and not lost.

The fact is: with EMS, extensive information about tooling, fixtures and other production resources and tools in Manufacturing becomes transparent for different people at HELLER. How long has tool X been in storage or at the machine, when will X have to be replaced, re-sharpened or modified in any other way? EMS provides answers to these questions and helps to optimise stock quantities, resulting in cost reductions. Since EMS communicates with the ERP system, Purchasing, for example, will automatically be notified when materials need to be re-ordered. According to Kurtenbach, this data transfer and the broad access to data is of major importance: "It allows to transfer knowledge independent of individuals to a wide range of people."

6 Quality Assurance System

In this context, the focus is directed on digital data acquisition. The plan is to progressively implement this process at HELLER by the year 2020. For this purpose, it is planned to establish a quality control plan for all core-competence components. To assure quality, the components are measured and the measured values of each component are stored at a central location as part of MDA/PDA in the ERP system. The advantages of digital data acquisition: elimination of duplicate inspections and reduced cycle time. Additionally, input errors can be eliminated since staff on site are able to select the value to be measured which will then be digitally transmitted into the ERP system via the MDA/PDA system.

Facts and figures
Mechanical Manufacturing at HELLER Nürtingen
_ employs 215 staff
_ operates 40 key machines
_ comprises 100 different job roles
_ performs between 5 and 15 operations per workpiece
_ produces 5,000 different workpieces
_ processes 19,000 jobs per year with an average batch size of 5
_ uses 15,000 tool combinations and more than 4,000 fixtures

The bottom line is: with all these systems, HELLER is creating optimal manufacturing conditions with series production characteristics. Currently, Mechanical Manufacturing is investing in a spindle line, comprising spindle manufacturing and assembly equipment. As a first step, spindle production in Mechanical Manufacturing will be established and then ramped up by the end of 2018. In 2019, spindle assembly will be added. In this context, numerous positive modifications will be implemented in manufacturing. HELLER is investing in new machining equipment, a dedicated climate-controlled area for spindle production and in the building infrastructure. All these measures aim to achieve a reduction in cycle time, increased quality and reduced component costs. More information about this can be found in our next issue.

According to Kurtenbach, only few companies are capable of enabling multi-level planning in their manufacturing operations, interlinking several systems in an intelligent manner. In his view, HELLER's approach to Mechanical Manufacturing is absolutely innovative. Kurtenbach: "With this project, HELLER is leading in innovation." /

HELLER China

Coating technology receives positive response

The new CylinderBoreCoating technology, or CBC, has been extremely well received in the Asian market, Hongbin Chen, Head of Production at the Changzhou production facilities in China, recently announced. According to him, HELLER can rely on a young production team that has been able to adopt the quality standards and requirements of the HELLER Group's production processes within a very short time. In January 2018, already the 6th CBC machine was delivered, although the facilities only started with the assembly of these machines little more than two years ago.

The positive response received from customers is indicative of the HELLER Group's success in Asia. Already in the 1950s, the company exported the first machines to China. The new production facilities in Changzhou are a perfect addition to the existing plant and equipment, including the Application Engineering and Technology Centre established in 2009. To this day, more than 1,500 machines and equipment have been commissioned at customer site. Chen: "The goal is to strengthen and expand our market position and regional presence." /

HELLER UK

Increased production capacity

The HELLER production facilities in Redditch in the UK are growing step by step. According to Matthias Meyer, Managing Director of HELLER UK, the administrative and Applications Engineering departments have benefited from a 'comprehensive makeover'. Additionally, a new customer area for machine demonstrations was created. "We have also expanded the entire production plant to create room for a new flowline assembly comprising 11 stations for the assembly of machining centres," says Meyer. According to him, this has "significantly increased" HELLER UK's production capacities.

Operations Manager David Evans is also enthusiastic. He explains that additional floorspace was created for the new logistics system for the complete manufacture of horizontal machining centres. "Originally, our machine assembly was purely a mechanical process on an adjacent flow line," says Evans. He says that when they first moved from block assembly of machines in one location to the old flow line, there was an immediate twenty percent increase in productivity. Evans: "The new Strothmann flowline assembly has resulted in a further reduction of at least twenty percent in overall assembly time." The goal is to make the process at HELLER UK even leaner. /

Knowledge management

A challenge for every production operation

I have many questions regarding the future of my production. The key issue for me is the topic of knowledge and ways to use it in a purposeful manner in production.

We know the challenges you are facing and will not leave you to tackle them on your own. We spoke to Professor Eberhard Abele (TU Darmstadt) about important questions focusing on knowledge management in production.

Knowledge management: why will this be a topic of vital importance for production companies in the future?
Abele: Today, the world of production technology is experiencing a rapid transformation. Digitisation, 3D printing but also the enormous progress made in terms of new materials such as CFK and titanium need to be considered every time a new production process is planned. In the future, production planners will have to think of new possibilities of digitisation and a substantially wider range of manufacturing processes and means of production. The rapid growth in production technologies in the area of additive manufacturing and 3D printing makes us aware that the knowledge in production will grow exponentially in the coming years.

Going forward, every company will have to ask itself the following questions:
How can we access the knowledge outside of our hemisphere (customers, external service providers, suppliers, research institutes and also competitors)? How do we document our knowledge? How do we exchange our knowledge within the company? How can we create a redundancy in terms of knowledge carriers, also in view of demographic change?

What possibilities are there for a machine building company to structure our knowledge?
Abele: Experts differentiate between implicit and explicit knowledge. Implicit knowledge refers to what is stored in our brain, our knowledge from experience. It is difficult to transfer and often only available to the knowledge carrier, whereas explicit knowledge is identifiable and accessible by others and easy to transfer in the form of documents. Networking the implicit and explicit knowledge creates a type of learning spiral with new technological and organisational knowledge at its end. The goal is to establish a 'learning organisation' that handles the resources knowledge and experience in a responsible and efficient manner.

How successful are the knowledge management campaigns started by the various companies in your view?
Abele: Presumably, many campaigns are not as successful as planned and fail due to lack in organisational continuity. Instead of implementing a systematic knowledge management based on the actual requirements of the business processes, many seem to follow the principle of contingency. Any knowledge components critical to success should be captured with reasonable effort by central knowledge carriers as part of the usual value-added processes, whilst ensuring a structured documentation and transfer to other individuals or to the corporate documentation department. However, this is no trivial matter, especially considering the fact that expert knowledge from various fields such as mechanics, electronics and information processing is much more closely interlinked today in the machine building industry.

What new technologies are there to support knowledge management within a company?
Abele: In the factories of tomorrow, we will be able to capture, control and optimise the condition of machines and manufacturing processes using increasingly cost-effective sensors. We will also be able to get deeper insights into processes. However, this poses the problem that we have to be able to tell what is important among the mass of data produced. Big Data Analytics could be a useful technology helping us to achieve this.

In how far can Big Data Analytics already by applied in machine building?
Abele: New methods and technologies for the acquisition, storage, processing, analysis and mapping of large amounts of poly-structured data are already on the market. The available software solutions are just as varied as the problems posed by Big Data itself. They enable parallel processing of poly-structured data. A solution able to process Big Data within seconds, for example, is in-memory computing as provided by SAP HANA offered by SAP: it uses the RAM of a computer as data storage. Compared to data stored on a hard disc, this results in much higher data access speeds. Other solutions are based on analytical databases. These are mostly column-based databases that move away from the traditional concept of conventional line-oriented databases. They filter out all areas that are not required, providing flexible and, above all, fast access. All these technologies allow to process huge amounts of data at speeds appropriate for real-time analysis. In terms of the machining processes, it is imaginable to increase workpiece precision by continually capturing the cutting forces, displacement and angle measuring systems and also temperatures and correcting them online in order to reduce the number of rejects or to optimise processes.

How are graduates prepared for the topic of knowledge management in production at the university?
Abele: In addition to extensive knowledge in their technical fields of specialisation, we need to provide engineering graduates with an overview of the process landscape. The processes of innovation, order processing, quality assurance and continuous improvement are always directly linked to the question of knowledge management. At our technical university, we have made very positive experiences with so-called learning factories, since they illustrate the complexity of knowledge in a production operation in the context of a university education or continued education. At the same time, our students learn that today's dynamic growth in knowledge makes collaboration and team work indispensable on all levels of a company. /

"Today, the world of production technology is experiencing a rapid transformation."

Prof. Dr.-Ing. Eberhard Abele,
born in 1953, studied Mechanical Engineering at Technische Hochschule Stuttgart.
He then worked as a research associate and head of department at the Fraunhofer Institute for Production Technology and Automation (IPA) in Stuttgart. Later, he held executive positions in the automotive industry, e.g. in Spain and France.
In 1999, he was appointed as professor for Production Technology at Technische Universität Darmstadt. As the head of the Institute for Production Management and Technology and Machine Tools (PTW), he and his team work on innovative topics in the field of production technology, with more than 200 publications in the field of manufacturing organisation, machine tool and manufacturing technologies. The learning factories for Lean Processes/Industry 4.0 and Energy Efficiency initiated by him have paved the way for new ways of sustained qualification in education and further education, but also in the fields of production technology and lean management.

Read more
You can read more about this topic in *Zukunft der Produktion. Herausforderungen, Forschungsfelder, Chancen* by Prof. Eberhard Abele and Prof. Gunther Reinhart. Based on the current megatrends, the book illustrates which fields of action production research needs to explore in the coming years in order to help Germany maintain and expand its leading position. Be it demographic change, new technologies, climate change, scarcity of resources or mobility: each one of these influencing factors requires purposeful adaptations in production and within the company. The book describes what they could look like: new products and markets, a paradigm change in terms of organisation and production management, new production technology and stronger knowledge orientation. For each challenge, answers and recommendations for action are given. An indispensable book for executives and scientists, shaping the future.

Transparent and clearly structured services
_ **Hotline:** the right contact person for any requirement
_ **Spare parts:** original spare parts immediately available
_ **Customer service:** services covering every aspect of your machine
_ **Upgrades:** develop yourself!
_ **Financing:** financing solutions tailored to your individual needs and requirements
_ **Insurance:** Insurance coverage – just in case
_ **Service agreements:** Opt for continuous productivity
_ **Training:** transform your staff into experts!
_ **Rebuilds:** expect more than the standard!
_ **Component repair:** count on performance made to measure!
_ **Retrofit:** keep up with the best!
_ **Used machines:** a safe choice in any case

For more Information visit: www.heller.biz/en/services

HELLER Services – Lifetime Partnership

Simply well taken care of – throughout the entire lifetime (of the machine)

Partnership-based support, outstanding expertise, short response times and customer proximity: that's what HELLER Services stand for, offering a comprehensive range of transparent and clearly structured services. Speed is one of our strengths – from parts ordering, repair requests, technical queries through to rectification of machine faults. Our machines and services are perfectly matched to each other in order to provide maximum performance and productivity in manufacturing. We are here for you with more than 500 staff working at 30 service locations worldwide and more than 40,000 spare parts available from stock. /

HELLER Total Productive Services

Opt for continuous productivity
Your goal is to increase your productivity – our goal is to provide you with the optimal support to help you achieve this. For this purpose, we have developed our modular service range with Total Productive Services (TPS). Made for you: choose between **three service packages** matching your individual maintenance philosophy or create your own personalised service package based on our **individually available TPS modules.**

TPS

The packages at a glance

No matter whether we provide support to your own maintenance department or act as a reliable outsourcing partner – our service agreements guarantee you maximum availability throughout the entire life cycle of your machines and equipment.

Performance Package

With the Performance Package, we support your own maintenance department with an annual manufacturer inspection. Our dependable inspection report gives you peace of mind. The regular inspection keeps you informed about the current condition and performance of your machine.

- extended telephone support
- rapid and location-independent fault rectification with HELLER Remote Remote Diagnostic Services (RDS)
- optional expansion of the RDS remote diagnostics access by a wide range of diagnostic functions by means of condition monitoring
- response time: 2 hours
- spare part delivery on the following workday*
- arrival of service staff on the following workday*
- annual inspection of main assemblies
- geometry check including measuring protocol
- condition report and repair recommendations
- HELLER upgrade recommendations as part of the HELLER product maintenance programme

* specific requirements are set out in the TPS terms and conditions

Maintenance Package

Our Maintenance Package guarantees the high availability of your machines at predictable costs – no matter whether you operate your own maintenance department or not.

- annual or biannual manufacturer maintenance depending on operating hours
- including the required wear parts packages 'Filters/media' and 'Wipers' at a special price
- additional wear parts can be replaced during the course of the manufacturer maintenance (extra price; installation included)
- including one-off condition assessment of up to five further existing machines

Full-Service Package

You expect maximum availability? Then our Full-Service Package is the right choice for you – even if you do not operate your own maintenance department – offering you budget certainty beyond the warranty period.

- execution of unscheduled repairs including supply of the required spare parts
- implementation of recommended preventative maintenance actions noted during the annual manufacturer inspection including the required spare parts
- dedicated TPS Coordinator to respond to any of your maintenance queries

TPS

The modules at a glance

You are looking for customised service tailored to your specific needs? Our TPS modules are individually available, enabling you to create your own personalised service package. Benefit from fixed prices and predictable costs. The following modules are available: Inspection, Maintenance or Data Backup. We create your customised fixed-price quotation, inclusive of all freight and packaging costs as well as travel and incidental expenses. Made for you: the TPS Modules are available as a one-off service without any contractual obligation or at customised contract terms in accordance with your individual requirements. /

Inspection by the Manufacturer

- annual inspection according to HELLER's checklist for the 'Manufacturer Inspection'

Annual maintenance by the Manufacturer

- annual maintenance according to HELLER's checklist for the 'Annual Maintenance by the Manufacturer'
- 'Filters/media' maintenance package, comprising filters for pneumatics, hydraulics, lubrication and air-to-water cooling
- 'Wipers' maintenance package, comprising wipers for machining, positioning and auxiliary axes

Semi-annual Maintenance by the Manufacturer

- maintenance according to HELLER's checklist for the 'Semi-annual Maintenance by the Manufacturer'
- 'Filters/media' maintenance package, comprising filters for pneumatics, hydraulics, lubrication and air-to-water cooling

Annual Maintenance of the Rack-Type Magazine by the Manufacturer

- annual maintenance of the rack-type magazine according to HELLER's checklist for the 'Annual Maintenance of the Rack-Type Magazine by the Manufacturer' – in conjunction with the Annual Manufacturer Maintenance of HELLER machining centres
- maintenance package 'Rack-type Magazine' consisting of compression springs, cleaning elements (optional) and the required auxiliary materials and consumables
- inspection of the loader reference points and the required setting and adjustment procedures

Data backup

- annual backup of the operating system of HELLER machining centres and backup of all active NC and PLC data onto an external data carrier, including handover of the data carrier to the customer

Advanced data backup

- annual backup of the complete hard disc contents of the industrial PC of HELLER machining centres in the form of an image file on an external data carrier, including handover of the data carrier to the customer
- recommended for machines from the HF, H, MC, F and C series equipped with an additional industrial PC

CDS* in practical application: **foundation for predictive maintenance**

Transparency of manufacturing processes helps to protect against workpiece damage, lack of precision or productivity losses. That is why MAN Truck & Bus AG opted for the HELLER CDS. Meanwhile, 22 machines in Munich have been equipped with these systems. The aim was to introduce preventive maintenance, opting for a middle course between the longevity of the machining centres, component precision and productivity.

A number of years ago, MAN Truck & Bus in Munich had already started monitoring the HELLER machining centres used for axle manufacturing with their own measuring equipment in order to enable predictive maintenance. In the context of the MAN Dynamics project, ball bars and vibration sensors were used to determine the machining centres' current condition at regular intervals. This allowed to predict the estimated life expectancy of individual machine components and to initiate preventive maintenance actions. After HELLER had developed the digital services HELLER RDS (Remote Diagnostic Services) and HELLER CDS some years ago, MAN Truck & Bus and HELLER started a pilot project with the aim to provide the necessary transparency of the manufacturing and maintenance processes that would allow to determine wear conditions and to initiate preventive measures whilst eliminating unscheduled downtimes. Since then, test runs have been performed in Munich every four weeks in the context of the HELLER Condition Dependent Services. In this process, the feed axes are traversed in both directions at a constant speed in order to determine overall rigidity. On top of that, the main spindle, incorporating an additional vibration sensor (CDS plus), is subjected to various accelerations. The results of this measurement are transferred to a web portal via the network. From there they can be retrieved by HELLER for evaluation. According to Dr. Felix Brungs, Head of Casing and Component Manufacturing at MAN Truck & Bus, the sole purpose of the so-called 'Monday measurement' is preventive maintenance. "The system replaces our MAN Dynamics system. That is also why meanwhile 22 HELLER machining centres have been connected to the CDS system. It allows us to schedule and perform maintenance measures within a time buffer without causing any significant effect on the production processes."

Data is evaluated and reports are created

The vibration sensor continually performs measurements during the process. At the same time, the system captures temperatures, and once a day and records the traverse paths in normal feed and rapid traverse or the number of positioning motions of the individual axes. The data is evaluated by HELLER and reports are created every three months. In case limits are exceeded, specific measures are agreed with MAN. Due to the sheer abundance of data it would be difficult for MAN to evaluate them. That is why HELLER has developed a 'traffic light system' to signal when thresholds are reached so that the necessary actions can be taken. The thresholds are defined based on a fingerprint (delivery condition) of the machine. Whereas until now, the insight into the evaluations and statistics was restricted to HELLER, this will soon change. Bernd Nill, HELLER Services, explains: "After all, the system is evolving. Previously, the tests were only generated via the server, whereas now the user can also initiate them manually. As a completely new feature, the HELLER Services Interface, as a module for the visualisation of maintenance and manufacturing processes, will give the user real-time insights into the data recorded." MAN Truck & Bus opted for the analysis using the traffic light system because the company has its own maintenance department in place. To Dr. Brungs this makes sense: "In contrast to conventional remote maintenance systems, the HELLER solution provides real-time condition analysis. Only this can prevent potential damage to the machine components before it affects the workpiece. In the future, we will be able to access the system online, with the advantage that we will be able to have issues fixed by our own maintenance department." /

MAN Truck & Bus AG
The company based in Munich is one of the leading international suppliers of utility vehicles and transportation solutions. The Munich plant produces trucks in the heavy series with a permissible gross vehicle weight of 18 to 41 tons. Munich furthermore produces cabs and driven axles, transfer cases and drive shafts for the entire plant network. In total, the company produces more than 73,000 trucks, 6,100 buses and 6,300 integral engines every year.

* Condition Dependent Services

Aerospace vs. automotive

Tailor-made manufacturing solutions for contrary manufacturing strategies

Around the globe, the automotive industry and the aerospace sector are regarded as the leading innovators and are both strongly export-oriented. However, there the parallels end, because their individual product and manufacturing strategies could not be more different. On closer examination, however, there are indeed similarities between the two.

Maximum flexibility takes precedence over maximum productivity whilst investment costs must be kept to a minimum. In the automotive industry, these requirements currently result from the wide type variety and increasingly shorter product life cycles. That is why, for decades, the industry has relied on Flexible Manufacturing Systems from HELLER, providing maximum productivity and a significant reduction in unproductive idle times – for increased competitiveness. Drawing on its extensive know-how, HELLER is able to offer innovative and comprehensive production solutions for powertrain, driveline and chassis components, whilst ensuring minimal per-piece costs. Approx. 75% of the HELLER Group's business comes from the automotive industry. This includes passenger cars and trucks as well as agricultural and construction machinery. The company supplies equipment for a range of different automotive segments, e.g. 'Heavy Duty Powertrain', 'Crankshaft Machining' and 'Light Duty Powertrain'. Among our customers are also companies from general mechanical engineering, power engineering, contract manufacturers and numerous other industries. Another important target group are aerospace companies.

Contrary to the automotive industry, the life cycles in aerospace range between 25 and 30 years. The annual growth rates in global aircraft production are at approx. 7%. Just like the automotive industry, aerospace companies are working on cost and weight savings and forward-looking trends in terms of products, technologies and production. An example is Boeing's Dreamliner 787. The aircraft is designed in a way to enable an assembly line-like production. The supplying industries will have to adapt to this concept. This widebody aircraft in particular will not only revolutionise air traffic but also aircraft production. As a result, however, it becomes more difficult to look at the production in its entirety. Today, Boeing sees itself as a system integrator. Fuselage and wing components or landing gear and engines as well their mounts are mainly produced by prime, super tier and tier suppliers. This type of manufacturing presents new kinds of challenges. One is the use of fibre composites and titanium alloys. Other challenges include technological developments of a broad range of products that require seamless tracking. Continuous process control and traceability are the reasons why the company is promoting digitisation and welcomes the introduction of Industry 4.0. It also expects a modular range of services with digital functions to support customers throughout the entire life cycle of the machines or production equipment.

Introduction of first-class standardised technologies

As far as the machine tools are concerned, customers from the automotive industry expect powerful machining centres providing a high degree of availability and absolute reliability. Batch sizes are increasing, but in the past, efficiency was a problem on account of process control. Due to cost pressure, the demands for availability, quality and efficiency are now coming to the fore. If productivity is to be understood as a high chip removal rate, then it is a requirement as the components are becoming larger in size. Additionally, their alloying changes. With a correspondingly high chip removal rate, the need for a second machining operation could be eliminated. At the same time, technologies like 5-axis machining are becoming commonplace, especially in engine manufacturing (e.g. turbine blades). The prerequisite, however, are standardised manufacturing solutions, because process reliability and availability remain integral parts of the manufacturing strategies.

Support for the entire production despite certification

In terms of flexibility, there are limits in aircraft manufacturing. Although every industry continually has to adapt to new challenges, the certification processes are very laborious, complex and time-consuming. That is why aerospace companies rely on long-lived machining centres also suitable for the machining of part families, whereas in the automotive industry the focus is on developing and optimising production processes on a project basis, using comprehensive product and process know-how in order to create maximum added value. To achieve this, HELLER development engineers contribute their extensive product and process know-how, whilst the customer provides his experience from manufacturing to the project. Approx. 70–75% of components that HELLER Application Engineering deals with are used in combustion-engine based powertrains. Contrary to that, aircraft manufacturers expect support with the entire production and only advice and consultation in terms of technology development.

On an equal footing due to the HELLER DNA

In recent years, the supply chain in aerospace has become more globalised. The increasing relocation of production, also to Asia, requires organisations to be able to guarantee an optimal exchange of information throughout the international supply chain. Due to its global footprint with 5 production locations and more than 30 sales and service bases worldwide, HELLER is optimally positioned for this.

The overall conclusion is that the requirements on product and manufacturing strategies may be contrary in the automotive and the aerospace industry, yet there are parallels with a value-adding effect. With regard to the machining centres, the HELLER DNA, including qualities like availability, performance, reliability, longevity and also productivity, is what makes the difference. /

Productivity and a stable process guarantee continued cooperation

One of the most challenging tasks is the machining of fibre composites and a wide range of difficult-to-machine alloys used in aerospace to achieve the required weight savings. Additionally, availability, quality and efficiency of machining centres have increasingly come to the fore. These particular requirements laid the foundations for the partnership-based collaboration between HELLER and a global supplier to the aircraft industry based in China. The project in question initially focused on the machining of an engine hoisting component, specifically, an inner sphere in a moulded workpiece made from a nickel-based material. Due to its high hardness and toughness, the company had faced issues with rejects and tool wear in the past, resulting in extended machining times. Additionally, the machining of the inner sphere required a manual intervention, leading to an unstable process. Already during the first discussions with HELLER, it became clear that materials this difficult to machine required machining centres providing not only a high level of efficiency, but also combining high rigidity, stability and precision with high torque. The aircraft company's manufacturing experts soon realised that the HELLER 4-axis machining centre model H 5000 was able to meet all of these prerequisites. HELLER has developed a high-performance spindle providing up to 2,290Nm torque, tailored to the specific requirements of difficult-to-machine materials such as titanium and nickel-based alloys. HELLER also presented the technology experts with the HELLER out-facing head along with a number of optimisations they had developed for the machining of the inner sphere (±0.01mm shape tolerance). The out-facing head is an additional axis provided by the tool, enabling a radial feed movement of the cutting edge. Compared to conventional systems, this solution only uses a single drive and helps to reduce machining and idle times, whilst offering high process dependability.

Consistently positive experience results in continued cooperation

As a result of the collaborative exchange of experiences, the manufacturer invested in the first HELLER machining centre. Since then, the company has had a consistently positive experience with the highly productive and extremely robust 4-axis machining centre model H 5000 equipped with out-facing head technology. Combined, the machining centre and the HELLER process know-how have helped the company to achieve maximum productivity and very specific savings. The roughing and finishing operations are performed with a single cutting-edge and there are no more rejects or tool breakages. Additionally, the use of the out-facing head has eliminated the formerly required manual intervention, ensuring the necessary process stability. The original machining time of eight hours has been reduced by 70% to only two hours. That is why aircraft production in general has come to rely on powerful, long-lived machining centres that are also suitable for the machining of whole families of parts. However, machine tool manufacturers are also expected to provide support and consultation with the entire production process and to contribute to the development of the technology. Apart from the highly productive H 5000 4-axis machining centre, it was the product and process know-how of the HELLER engineers that contributed to the success of the partnership-based collaboration. And as a result of this success, the cooperation continues. Recently, the manufacturer decided to invest in further HELLER machining centres. /

Manufacturing processes in the aerospace industry are characterized by forward-looking trends. Especially in terms of the machining processes, the machine tool manufacturers have to respond to numerous new challenges.

Production system combines core competency with complementary technologies

Whilst to this day the automotive industry has mainly focused on maximum productivity in order to achieve a significant reduction of unproductive idles times, agile processes are now increasingly coming to the fore.

The goal is to be able to respond flexibly to changing customer requirements. A recent example is a specific production system that illustrates the practical implementation of such as project. It concerns the manufacturing of crankcases for combustion engines with different workpiece variants to be produced on a flexible manufacturing line. Starting in 2013, the manufacturing system for an OEM was successively implemented and commissioned by HELLER. In 2017, a new tender was issued in which HELLER again beat out the competition, partly due to the high quality achieved with the existing manufacturing solution: one of the future manufacturing systems was planned to be erected in the same plant, whilst three others were to be installed at a new engine plant. Since the workpiece types were largely identical, the people in charge initially assumed that the machining processes would be more or less the same. However, the automotive manufacturer in question follows the production concept of 'reference plants' in which specific boundary conditions exist that need to be adhered to. Whilst the existing systems comprised up to eight HELLER machining centres using one gantry for loading, the reference plant only provides four machining centres per gantry in the future. The goal of these redundant systems is to enable continued production in case one of the gantry loaders is out of operation. Another difference to the existing systems is that the machines used so far were designed for direct loading. In the future, an adapter changer is to be positioned in front of each machine to enable the decoupling of the automation and the machining centre. To increase the system efficiency, the adapter changer performs the workpiece change largely independent of the gantry loader. Only for two specific operations, machines with direct loading will continue to be used in the future.

Numerous disciplines require peripheral know-how

Specifically for the new engine plant, the system layout also includes numerous complementary technologies. In addition to the machining centres it also incorporates machines for assembly tasks, honing, washing and brushing operations or measuring and testing technology required as turnkey solutions. As the general contractor, HELLER therefore has to master numerous different disciplines. A key technology, for example, is the coating of the crankcases, using the new HELLER CylinderBoreCoating process technology (CBC). As with the existing system, the automotive manufacturer relies on a HELLER CBC 200 coating machine for its new systems. Whilst the new engine plant now exclusively focuses on the production of 4-cylinder engines (petrol and diesel), one of the new lines is used for the production of crankcases for 4- and 6-cylinder inline engines. It comprises 163 machining centres model MC 20, 13 vertical machining centres type MC 20 V and 17 CBC 200 coating machines from HELLER. With requirements comprising component-related equipment, intensive Application Engineering and extensive automation solutions, the project is about much more than machines. In addition to the core competencies, the projects also require comprehensive know-how regarding the peripheral applications. That is why project scheduling was a particularly interesting aspect in this context. At the end of November 2017, orders for the additional systems were awarded. Delivery of the machines is planned for November 2018, whilst the SOP is scheduled for January 2020. /

Proven technology helps to double the output in the heavy-duty sector

One of China's leading heavy truck manufacturers produces established engines and knows the market demand and thus the required volumes. That is why the company also uses five transfer lines for specific operations as well as 45 highly flexible machining centres. This example shows that the use of transfer lines is far from 'old-fashioned' but depends on the production volume and the cycle times. In 2011, the first HELLER manufacturing line was taken into operation. The company produces the cylinder blocks and heads for an engine series under licence. The cooperation with HELLER started on the basis of a recommendation by a German truck manufacturer. The target was to achieve an annual production output of 80,000 parts with a cycle time of four minutes, using 50 machines. At the beginning of 2017, a new tender was issued due to a required increase in output and the widespread introduction of the Euro 5 standard in China. The Chinese truck manufacturer was extremely satisfied with the existing manufacturing line, but based on the experience gained believed there was still potential for improvement. Both the new and the existing line each achieve an annual output of 80,000 parts, resulting in a total production of 160,000 parts. Further changes to the future systems were down to the fact that the HELLER MCH series had meanwhile been replaced by the H series. Therefore, it was not possible to duplicate the existing line. A whole new system had to be implemented. One of the particular challenges was the customer's wish to incorporate a total of five transfer lines.

A challenge in terms of know-how and organisation

The first thing to be taken into account was the experience gained in China with the existing manufacturing line. Additionally, HELLER considered the customer's optimisation requests as far as the tool/process layouts were concerned. Another aspect was the introduction of a new 5-cylinder engine. In the end, the complete manufacturing solution now comprises seven machining centres model H 10000 with A-axis, four H 10000 machines with pallet changer and three H 10000 with direct loading as well as 29 direct loading machines model H 8000 and two special-purpose centres model MP 10000 and five transfer lines. For HELLER, the production of the machining centres was the least problem. The five transfer lines with three to six stations each mainly posed an organisational issue for the people responsible. Whilst one system was already in the process of installation on customer site, four further systems are installed at three assembly halls at HELLER. Aside from the large space required, the procurement of castings and various other machine components and the corresponding quantities of manufacturing parts needed pose a challenge. However, the fundamental basis for the efficient and reliable implementation of such transferlines is to have the right experts. Experienced HELLER experts working on the project were recruited from the various departments and are currently sharing their knowledge and experience with the younger staff members. /

The manufacturing strategy for heavy-duty engines with significantly longer product life cycles can divert greatly from the concept of agile flexible production systems.

It takes more than the right machine to create the optimal manufacturing solution

If you can't play the violin, a Stradivarius won't be of any use to you.

To solve complex manufacturing tasks, Production Planning, Manufacturing Engineering or however else you want to call it, has the task of combining the right machines with the right process sequence and the right flow of materials. In a figurative sense, you could say: "If you can't play the violin, a Stradivarius won't be of any use to you." Many customers expect HELLER to take on the task of manufacturing engineering. For decades, HELLER has been doing this successfully. Today, this functional area at HELLER is called **Application Engineering (AE)**.

Currently, approx. 75% of the HELLER Group's business comes from the automotive industry. This includes passenger cars and trucks as well agricultural and construction machinery. The share of the HELLER Group's project business makes up approx. 60%. Along with the automotive applications, project business with other industry sectors such as engineering, fluidics, oil and gas or the aerospace industry is continually growing. Although the requirements of the various industries differ greatly in some respects, they all have one thing in common: numerous customers draw on the HELLER project and process know-how. Primarily, the goal is to produce workpieces within a specific cycle time at optimal per-piece costs and in the required quality. The task of HELLER Application Engineering is to implement these requirements with a tailor-made configuration of machinery and equipment.

In terms of AE, HELLER differentiates between the different workpiece families and functional tasks: **AP** (Application Prismatic Powertrain & Chassis Components) develops manufacturing solutions for the machining of cylinder blocks and heads as well as transmission and chassis components. **AC** (Application Crankshaft/Camshaft) specialises in the machining of crankshaft and camshafts. The **AI** team (Application Industrial) is dealing with a vast variety of components and industries. The enquiries they receive predominantly concern machines and automation. In terms of project business, AI needs to provide a high degree of flexibility, with requirements ranging from engineering support to interlinked machines with and without process. **AH** (Application HELP_C) (HELP_C stands for Hydraulic, Electric, Lubrication, Pneumatic, Coolant) plays a vital supportive role for all three above-mentioned departments – not only since Industry 4.0!

In nearly all segments of Application Engineering, the focus is on expertise from proposals engineering and application construction to project management during order processing. Accordingly, the department is dealing with a broad spectrum of enquiries. Customers who have already defined their own process, for example, submit enquiries for stand-alone machines, a broad range of upstream or downstream operations or turnkey systems with precisely defined boundary conditions. At HELLER, the entire process-related engineering already starts in the quotation phase. The teams involved, for example, investigate third-party equipment, evaluating and incorporating it into the quotation. This initial configuration of the process before submitting the quotation, including the layout of the machines, tooling, clamping fixtures and automation, is a prerequisite and also the basis for successful project development later on. Once the order has been awarded, the project is coordinated in the relevant departments and the existing technical basis is developed into a viable solution during the implementation phase.

A recent example of what such a project looks like in practical application are crankcase lines for 4-cylinder and 6-cylinder engines of an OEM. HELLER took over the layout of the machining processes, the automation and the tooling and also designed the clamping fixtures. Additionally, HELLER was responsible for the overall technical execution and scheduling through to the commissioning. For decades, HELLER has been handling comparable projects for numerous large automotive manufacturers and their suppliers.

Efficient structures prevent interface losses

The requirements of the various industries are just as varied as the implementation conditions in the international markets HELLER is active in as a global player. HELLER provides basic AE capacities at its various locations across Europe, China, Brazil and the US. These decentralised units receive support from the Nürtingen location as required. In order to meet the varied requirements, AE must have an efficient structure and the appropriate communication channels in order to prevent loss of information and time. That is why enquiries received by Sales (Front Office) are prepared by the regional liaison offices (Middle Office) and then transferred to the relevant AE departments (Back Office).

In summary, HELLER Application Engineering provides comprehensive know-how and experience for successfully developing production processes and implementing them through to start of production. /

By the way
Already during the quotation phase of a project, the HELLER DNA comes into play. Productivity, guaranteed availability, stability and longevity are just as important to creating the optimal solution as is the ability to provide the necessary services and offering a reasonable cost-benefit ratio.

A HELLER success story: engineer by passion

For more than 30 years now, Thomas Hiemer has been working at HELLER. He still sounds enthusiastic when he talks about his work. Following his love of technology, he completed a work-study program in Mechanical Engineering at HELLER and then started his career as an Application Engineer in Nürtingen. Since 1998, he has worked as the Team Leader of Application Engineering Prismatic Transmission.

The focus of Thomas Hiemer and his colleagues is the design of tooling and fixtures for the various HELLER machine types the automotive industry uses in the production of transmission cases and axle components. Most of the time, Hiemer is busy solving constructive tasks. It all starts with the quotation, for which he needs to develop and draw up creative technical solutions. The engineer also spends time on organisational tasks, including task planning, staff meetings, capacity monitoring and more. In meetings with the customers, he discusses their requirements and expectations and explains the chosen layout of the application.

The team has successfully completed two large orders from China and Mexico for machines for crankcase production. Hiemer feels proud whenever he sees a truck equipped with front axles for which he and his team developed the necessary machine applications for part production. Moreover, his team participated in the development of the third steering knuckle production line for a renowned automotive manufacturer. A particularly gratifying job, because it shows the customer's appreciation of his department's work. /

Introducing:

Our new staff executive

"HELLER is a technology leader with a highly-qualified team."

Stephan Deuchert

_ completed an apprenticeship as an agricultural machinery mechanic
_ has a degree in sociology
_ has been preoccupied with personnel and organisational aspects for 20 years
_ knows the machine tool industry through his previous employments and is also familiar with the IT and energy sector and other industries
_ lives in Kirchheim/Teck and Karlsruhe
_ enjoys riding his racing cycle, narrow trail running and loves nature

Facts, figures and data are crucial to success. To Stephan Deuchert, however, there is one thing even more important: the people behind them. It is in collaboration with them that HELLER's new staff executive wants to shape the future and drive change. To the 50-year-old Deuchert, the people working at the company hold the lion's share in its success. Deuchert: "Today, highly qualified and motivated staff is a vital competitive factor and key to a successful future."

To Deuchert, effective communication is an essential ingredient for shaping and changing a company in a meaningful way. He joined HELLER in August 2017 and is committed to questioning operational procedures, openly addressing critical issues and finding viable solutions through a dialogue at eye level. His focus is mainly directed at consistent and sustainable development of Human Resources (HR). "My goal is to raise HR's level of performance," he explains, adding that optimisation of procedures and processes is very important to him. According to Deuchert, organisational innovations will not only be directed towards increasing efficiency but also to giving his team greater freedom, e.g. for the recruitment of qualified specialists, consulting of executives and promoting young talent and staff.

He also says that vocational education and personnel development will be playing an increasingly important role in the future. As a technology leader, HELLER can rely on a highly-qualified team. However, this does not mean that there is no need for improvement. On the contrary: in order to remain at the forefront of the industry, the company has to be able to adapt to changing framework conditions, e.g. technological innovation, digitisation and changes in values. "We need to develop intelligent HR solutions so that people will continue to perceive us as an attractive employer," Deuchert says, adding that people's expectations from their employer are continually changing. Additionally, he says that demographic change poses an enormous challenge. "Finding qualified and high-performing staff is becoming increasingly difficult," says the staff executive, adding that a healthy, socially-oriented corporate culture is vital to him. To him, teamwork, appreciative relationships with staff and transparency are just as important as challenging tasks and a sound financial foundation.

'How can we help people to be successful?' is the question Deuchert, who sees himself as an instigator of change, is focusing on. He is also thinking about ways on how to make HELLER even more attractive to school graduates and young talent. His vision is to develop HELLER further, fostering a culture that offers every employee room for development and the possibility to grow with the job whilst enjoying the work they are doing.

Due to the increasing significance of internationalisation, Deuchert is not only focusing on the Nürtingen location alone. According to him, his aim is to promote global cooperation and to contribute to helping the foreign locations to adapt to the growth of their markets. To achieve this, the political framework and new regulations have to be taken into account. For Deuchert, the Nürtingen location is of crucial significance to the company: "An enormous wealth of knowledge is concentrated in this location and our intention is to keep it that way." /

"Today, highly qualified and motivated staff is a vital competitive factor and key to a successful future."

HELLER transfer of ideas

Employees' suggestions optimise procedures to the benefit of all

What is HIT and how does it work?
What used to be the Employee Suggestion Scheme is now called HIT or 'HELLER Ideen-Transfer' in German. HIT or the transfer of ideas at HELLER is part of Ideas Management, also comprising the Continuous Improvement Process and Innovation Management.

HELLER staff can contribute suggestions for improvement on paper or using the intranet. All suggestions are recorded in a database, so it will be easily apparent if any of them have been submitted before. The staff members responsible for HIT discuss the suggested solution with the relevant department and, if viable, they implement the suggestion together. The reward for the originator of the idea depends on the calculated savings potential. However, this does not mean that suggestions have to result in financial savings. Any ideas increasing the safety at work are just as welcome. Following evaluation by the reviewer and the HIT representative based on a number of criteria, the person who suggested the idea receives an appropriate reward.

What is the objective of HIT?
The intention of HIT is to leverage our employees' creativity and potential for ideas to progressively improve our processes, eliminate anything unnecessary and enhance our cost-effectiveness. Whilst reaching these goals, the sense of 'we-ness' is always in the foreground. Quite often, people from different departments, areas and levels meet as part of the HIT process to exchange information and to discuss experiences and suggestions.

What are the benefits of HIT to the company and its people?
HIT helps to create and maintain a creative corporate culture. Implementing a suggestion for improvement creates a win-win situation: the company achieves a savings potential, improves its operational procedures or their safety, whilst the person submitting the suggestion receives a reward and recognition – which is often more important to them than the actual reward. What also matters to them is the appreciation of their ideas. Our goal is to give staff members the feeling that their ideas and suggestions can make a difference. If it is not possible or difficult to implement a suggestion in its original form – although it provides potential for improvement – we will look for a different approach and will not immediately reject the idea.

HIT

The HIT initiative does not only focus on products and processes.
The HIT activities question and improve operational procedures, processes and patterns of thinking.

Changes in corporate culture
_ constructive criticism
_ appreciation
_ openness
_ participation
_ quality awareness

Changes in the employees themselves
_ feeling of 'we-ness'
_ motivation and commitment
_ satisfaction
_ communication
_ cooperation between colleagues

Energy scouts to fight compressed air leakage

The suggestion

In May 2014, a service technician submitted a suggestion aimed at decreasing the unwanted energy consumption caused by compressed air leakage.He suggested to train HELLER apprentices in their third year to act as 'energy scouts', detecting leakage using advanced equipment.

The background

Compressed air is used throughout a wide range of processes.
In production, leakages occur over time, causing costs, but mainly unnecessary energy consumption.

The implementation

The energy scouts can locate leakages using an ultra-sound detector: the detector uses a microphone and a special software to filter out any background noise, only transmitting the high-frequency sound of the leakage to the headphones. If the energy scouts cannot repair the leakage themselves, they mark the spot of the leakage and enter the location into a position plan; the relevant departments will then take the necessary action to eliminate the leakage.

The result

Following previous trials with leakage sprays or trying to detect leakages by ear, the energy scouts upon implementation of the suggestions have been able to detect 223 leakages during their first search operation. As even the smallest wholes and gaps can cause additional costs of 50–100 Euros every year, the investment paid off after the first round of inspection. Although the departments conscientiously eliminate any leakages found, new ones keep emerging – that is why this year's apprentices are already training the next generation of energy scouts. The project continuously helps to raise the awareness of leakages and reduces energy costs at HELLER year upon year. /

HELLER Slovakia

Customer proximity is paramount

The HELLER service location in Vráble
Tasks:
_ support of the service regions Slovakia, Hungary, Poland, Czech Republic and Romania; sale of HELLER machines in Eastern Europe
_ component repairs (spindles, tool changers, rotary tables) for the local customers since 2013
_ supplier to HELLER Services GmbH in Nürtingen (tool changers since 2016 and spindles since 2017)

Plant management and responsible manager:
Andreas Fachet

Building floorspace:
600m² (480m² for repairs and storage, 120m² office space and staff facilities)

Number of employees:
12 (3 office workers, 3 staff in component repair, 7 service engineers)

Customers within the support area:
approx. 90 operating about 430 machines

Objective:
Further expansion of the component repair department established in 2013 (with the relocation to a new hall in October 2017)

In the US, in Asia and Europe, HELLER not only operates production facilities but also sales and service locations. The goal is to have a regional market presence, offering the local customers optimal consultation, support and service. The long list of cities in which HELLER is operating subsidiaries also includes the Slovakian town of Vráble. At the location, a dozen employees ensure that the HELLER machines in Eastern Europe not only provide high levels of productivity but also operate reliably. One of them is Radim Swider. As the Deputy Manager of the quickly growing location, every day anew he is delighted to see the "excellent cooperation between the Slovakian locals and the experts from the HELLER headquarters in Nürtingen." Swider himself lived in Vráble for eight years, establishing and expanding the location together with Location Manager Andreas Fachet. The subsidiary has developed from an office space with a single technician into a service location employing 12 people. The qualified, committed and long-term local staff and technicians have strongly contributed to this success. /

Points of interest in and around Vráble

The **Roman Catholic Church of the Blessed Virgin Mar**y (Farský kostol Preblahoslavenej Panny Márie) is considered the town's most beautiful and architecturally most important monument. For a long time, the steeple of the church was said to be diverting from its vertical axis by 150cm. However, the latest measurements have proven the opposite. It is one of the straightest towers in Slovakia.

Along the Hlavná ulica street, there is a whole complex of monuments Vráble has been proud of for decades including **the parsonage building, house No. 8, the Kindergarten, the former vinegar factory building, the County House, the statue of Ján Nepomucký and the bank building.**

A visit to the **National Wine Cellar** is another trip worthwhile: visitors have the opportunity to taste wines from various regions of Slovakia whilst sitting on a terrace in the summer.

In the village of Horný Ohaj, there is the **Požitavské Mill Museum** inside the mill of **Mašekov mlyn.**

Arboretum Mlyňany

Approx. 12km from Vráble is the **Arboretum Mlyňany**, a botanical garden with the largest collection of wood species in Slovakia and one of the most comprehensive collections of plants in Central Europe. The evergreen park with 67ha acreage was established in 1892 by a Hungarian aristocrat.

Kolárovo

At approx. 55km distance located slightly further away from Vráble, but still worth visiting, is the **shipboard watermill in Kolárovo and the watermill museum.** The 86m wooden bridge leading to the mill is considered the longest wood bridge in Central Europe with a roof construction.

Topľčianky

25km north of Vráble lies **Topoľčianky**, a village with a rich history: once it was the seat of the administrative county of Bars (Tekovská župa) and between 1923 and 1952 it was used as the summer residence of the President of the Czechoslovakian Republic. **Topoľčianky Castle** is a National Cultural Monument. The **National Stud Farm** is considered a living national cultural monument and a breeding centre for Lipizzaner, Hucul and Arabian breeds for Slovakia and Europe.

Nitra

At approx. 20km distance lies the city of **Nitra**, one of the oldest towns in Slovakia, built on seven hills. Nitra is a true paradise for archaeologists. Apart from its rich history, the town is also a centre of agriculture and known for being a young city due to its two universities. **Nitra Castle** is one of the most well-known points of interest of the city.

Podhájska

Approx. 22km from Nitra, there is the popular **Thermal Spa of Podhájska**. The thermal water is salty and said to have miraculous health effects.

Vráble at a glance

_ town in the south-east of Slovakia, approx. 100km east of the capital Bratislava
_ area: approx. 38km²
_ population: approx. 8,800
_ first written reference is from 1265 as 'Verebel'
_ divided into three parts: Dyčka, Horný Ohaj and Vráble
_ special characteristics: various architectural styles in the town; region around Vráble is known for winegrowing

Train your brain

Tips and tricks to improve your memory

The brain is probably the most fascinating of organs. Everything we know, feel and remember is stored in the brain. Approx. 100 billion nerve cells, or neurons, are linked to one another in a complex way. These links, called synapses, play a crucial role in the learning process.

What happens in the brain while we acquire knowledge is highly complex. And what is more: due to the vast number of potential links between the neurons in our brain we are capable of processing huge amounts of data. Given the flood of information we need to process every day, it is important to be able to differentiate between what is important and what is not. In other words, it is normal and even good for us to forget certain things in order to protect us from overstimulation.

However, what can we do when we feel something is important and we need to remember it, e.g. the name of a new colleague? Surely this has happened to most of us: shortly after a new colleague has introduced himself, we seem to be unable to remember his complicated name. Due to a lack of functioning synaptic connections the information did not make it from short-term memory to mid-term or long-term memory. That is why it is good to know that memory performance can be trained. You can still learn a foreign language or a musical instrument at an advanced age. When you are older it will take greater effort and more time to learn something new. But everything is possible, especially when the learner is interested in what he is trying to memorise and enjoys the process. On the internet or in seminars, books and magazines you can find numerous tips and tricks for improving your memory performance and thinking skills. In the following, you will find two exercises – one with numbers another one with letters. We also reveal how you can influence your memory in a positive way:

1. Regular exercise improves the brain's ability to maintain existing and to create new synaptic connections. In other words, by exercising regularly you can improve your thinking skills. How about a regular cycling or swimming practice? Vigorous walking two or three times a week is also beneficial.

2. A sufficient amount of sleep increases alertness and the ability to concentrate which is crucial to learning. Additionally, memories are stored whilst unimportant information is wiped out during the slow-wave sleep phase. What is more, scientists have been able to prove that new synapses are formed while we sleep and that what we have learned is consolidated.

3. A balanced and whole food diet including rice, pasta, muesli and wholemeal bread provides a consistent replenishment of glucose. This ensures the energy supply to the brain. Fruit and vegetables protect against the damaging effects of oxygen radicals, whilst omega-3 fatty acids, e.g. found in oily fish, linseed, rape seed and walnut oil, are the building materials for the nerve cell envelopes. /

Good to know
According to scientists, the left half of the brain contains the speech centre. The right hemisphere is believed to be responsible for spatial skills, numerical skills and facial recognition.

Memory training becomes more and more popular. In 1991, the first World Memory Championships took place.

Interesting books
_ Robert Capital: *Power Brain!*
_ Kevin Horsley: *Unlimited Memory*
_ Sharon Begley: *Train Your Mind, Change Your Brain*
_ James Horton: *Accelerated Learning*

Interesting links
_ www.brainfacts.org
_ human-memory.net
_ www.worldmemorychampionships.com

Mental exercise – numbers

Each box contains one four-digit number three times. Which sequence of numbers is it?

2469656224156292 4626562928656241
27393439744359347327439743974327
14764196419381419645764112417645

Mental exercise – letters

At least 20 words can be made with the following nine letters. How many can you make?

E	R	F
E	L	C
I	A	P

Solution: Number puzzle: 1.) 6562; 2.) 7641 3.) 3974
Letter puzzle: The following words can be formed:
Fireplace, pillar, preface, replace, replica, recipe, repeal, April, creep, peace, pearl, peril, piece, place, price, pacer, caper, Capri, parcel, crape etc.

HELLER activities

HELLER UK

Cycling for a good cause: on **24 September 2017,** four employees of HELLER UK – John Crumpton, Joe Smith, Carl Reeves and Alistair McIntosh – took part in the 'Velo 100' in Birmingham. They entry was sponsored by HUK and the team completed the course in good time, raising monies in aid of local charities.

The start of the year saw the office employees of HELLER UK return to their workstations in the newly refurbished offices. They were rewarded with a modern, bright space which is visually very inviting and practical to work in. There are meeting rooms as well as break-out areas, meeting pods and informal seating areas. Two coffee bars and height-adjustable desks have also been introduced.

HELLER China

On **25 April 2017, more than 30 students from various types of schools at the commercial Albert Schäffle college in Nürtingen visited HELLER China.** The young people majoring in Economics were impressed by the range of products and business activities and pleased to hear that HELLER maintains German quality standards in China.

On **9 November 2017, 33 students from Changzhou University visited the HELLER Changzhou plant.** HELLER is looking for young talents and is in close contact with the university. The guests were very impressed by the presentation of the HELLER Group and its corporate culture. Some of the young people could be completing a 2 to 3 year apprenticeship at HELLER. This would enable HELLER China to strengthen its performance in the SEA region. The students come from Thailand, Laos, Vietnam, Indonesia, Malaysia, Turkmenistan, Mauritius and Yemen.

HELLER Germany

The commitment of HELLER as an employer based in Nürtingen also extends to the company's apprentices, who frequently participate in voluntary projects in and around the town. On **1 February** this year, for example, **15 apprentices helped out at the local 'Vesperkirche' and also donated a 500 Euro cheque to the church management.** The money is intended to support the Vesperkirche project, an initiative of the Protestant Church, providing a meeting place for people affected by poverty, loneliness or cultural marginalisation. The proceeds come from various events our apprentices organise every year as part of the **HELLER Apprentices' Initiative (HAI).** The initiative was founded in Nürtingen in 2002.
Another example is last year's **'NTBarrierefrei' project,** focusing on accessibility for the handicapped: on **9 November 2017**, 21 apprentices participated in a professional wheelchair training and then tested accessibility in Nürtingen by going around town in a wheelchair. They had prepared questionnaires for recording any barriers found in shops and restaurants. The goal of the project was to make Nürtingen accessible to people with disabilities.

The 70-strong HELLER Big Band has existed since 2000. Every year, it performs at the Employment Anniversary Celebration and the traditional Christmas concert at the HELLER premises on the last working day before Christmas. The **proceeds of the last Christmas concert** were donated to charity: at the **beginning of February**, two band members visited the Behinderten-Förderung-Linsenhofen e. V., an association supporting people with disabilities, to hand over a cheque. HELLER had doubled the initial proceeds, donating 1,500 Euros in total to BFL e. V. "We have received a fantastic sum from the Big Band and will use the money raised for our summer holiday fund. Unfortunately, not all disabled people at our facilities can afford a holiday. That is why we have created a fund, subsidising summer holidays for people with disabilities," Thomas Fick, manager of the initiative said, warmly thanking the musicians.

At the **beginning of March**, HELLER employees handed over three donation cheques for a total of 2,790 Euros – the **proceeds from beverage sales at the HELLER Family Day 2017.** Staff members from crankshaft and camshaft machine manufacturing were among those who had volunteered to sell beverages at the event. The voluntary group donated half of the total proceeds of 2,040 Euros each to two organisations: the Children and Youth Hospice Services in Kirchheim/Teck and the Friends' Association supporting children suffering from Cancer in Tübingen. Another 750 Euros were raised by a team from HELLER HR, selling homemade wines and musts at the wine bar during the Family Day. The proceeds were donated to the 'Herzenswunsch' project of the German Red Cross Nürtingen-Kirchheim/Teck.

Family Day

HELLER Germany

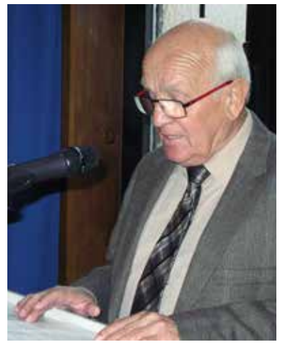
HELLER welcomed around 3,000 guests to the **HELLER Family Day** held on **21 October 2017** at the company's two plants in Nürtingen, offering enticing venues for a whole host of attractions. The varied programme covered a wide range of subjects from mechanical engineering, art, virtual reality, robotics, music and sciences through to sports, crafts, criminalistics and technology. One of the highlights was an appearance by 6-time world champion Marco Hösel who performed breath-taking stunts on his BMX bike. The HELLER Family Day also provided insights into the HELLER training department as well as Manufacturing, Assembly and the HELLER TechnologyCenter. Technical highlights at Plant 2 included the presentation of the functioning principle of a tool magazine and tool changer as well as the presentation of the 5-axis technology incorporated in HELLER machining centres. "Organising the HELLER Family Day was a mammoth task as far as the planning was concerned," HELLER Head of Marketing Marcus Kurringer remembers. However, it was worth the effort: already during the day and also after the event, the company received praise from many quarters.

Anniversary Celebration

As every year, HELLER also hosted an **Employment Anniversary Celebration** in 2017, traditionally held on the last Friday in November. A total of 38 jubilarians and their partners were invited to the event on **24 November** to celebrate their 25th or 40th staff membership together with senior staff and division managers. The event opened with a performance of the HELLER Big Band and an address by HELLER Managing Director Klaus Winkler and Bernd Haußmann, Chair of the HELLER Works Committee. Following a tour of the company, guests enjoyed a varied entertainment programme and a joint dinner at the HELLER company restaurant.

Pensioners' get-together

Around 300 people attended the traditional **HELLER pensioners' get-together** held at the company restaurant in Nürtingen on **10 November 2017.** In his speech, Pensioners President Manfred Bäuerle reported on this year's pensioners excursions into the Old Town of Esslingen and to the funeral chapel on the Rotenberg near Uhlbach. Commercial Director Gerhard Reiner and Bernd Haußmann, Chair of the HELLER Works Committee, also addressed the participants. The event provided an opportunity for an extensive exchange.



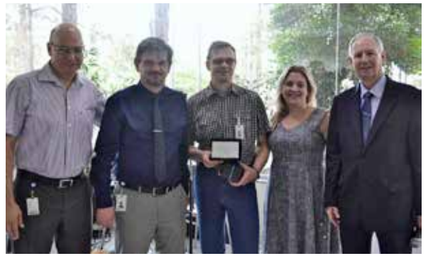
Family Day

HELLER UK

Similar to the event in Nürtingen, HELLER UK also organised a **Family Day** on the **10 July 2017** with numerous visitors to the company, enjoying a varied entertainment programme and culinary highlights.

Every year, HELLER UK participates in the **Jeans for Genes Day** to raise money for both cancer and gene therapy research. On **28 September 2017,** employees paid a small fee to wear their jeans and then brought in their home bakes for all to purchase. The Jeans for Genes Day is a national charity event held in Australia and the United Kingdom where it is organised by the Genetic Disorders UK charity. Every year in September, the charity raises monies for the support of children and families affected by genetic disorders. Since the beginning of the initiative in 1992, it has raised more than 35 million pounds in the UK and HELLER has participated since 2014.

With a **Christmas Jumper Day** on **14 December 2017,** staff at HELLER UK supported 'Save the Children', the world's largest children's rights organisation, by wearing their Christmas jumpers and donating money. Additionally, staff got together for a festive lunch and a raffle with prizes donated by both suppliers and the senior team.



Anniversary Celebration

HELLER Brazil

Just like the parent company in Nürtingen, the HELLER subsidiary in Brazil organised an **Employment Anniversary Celebration** last year. About 170 people attended the event on **7 December**, honouring staff members who have been loyal to HELLER for 10, 20 or 30 years.

In-house event

HELLER China

Xi'an Jiaotong-Liverpool University in Suzhou has its own curriculum for future executives of the China Railway Rolling Stock Corporation Limited (CRRC), a national rolling stock manufacturer. During a **specially staged in-house event** at our subsidiary in Changzhou on **6 April 2017**, around 120 students of the university – all from CRRC – visited the HELLER facilities to learn more about the business and sales strategies of HELLER China.

According to Andrew Parkin, they received only positive feedback from visitors, who also wanted to learn more about Modern Production and Corporate Culture. According to the Managing Director of HELLER China, the students were very impressed by the presentations given at the in-house event, also because CRRC still operates a 30-year old HELLER crankshaft machine and is very satisfied with its availability and quality. /

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