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06#2018 ENTREPRENEURIAL VISION
Burying your head in the sand is never a good idea – and the notion that ostriches do it is just a myth. In reality they just lay their head and neck flat against the ground in the hope that predators won’t spot them. Smart move. Nature has also equipped the flightless bird with a very useful attribute. Thanks to the membrane over their eyes, ostriches can sense whether predators are approaching even when they are asleep. Many entrepreneurs would like to have that kind of vision, at least in a figurative sense, because staying alert at all times is part and parcel of running a good business.
American football is all about points and, of course, having the right strategy. The quarterback has to make split-second decisions on how to act. Who should he pass the ball to? Who has the best chance of shaking off their opponents? How long can he wait? And should he pass the ball or run with it? A single play can determine the outcome of a whole game.

Entrepreneurs are a bit like quarterbacks: they have to weigh up all the options and decide on the most efficient course of action that has the greatest chance of creating long-term success for their staff, their company, and the future.
What happens if a groundbreaking idea comes at the wrong time? Nothing. That’s what Steve Jobs had to accept in 1983 when he released the first personal computer “Apple Lisa”. Nobody was interested in his product, and nobody understood how innovative it was. Now, of course, Apple is one of the biggest and most important companies in the world, and people don’t even remember that setback ever happened. Sometimes people simply need a little more time to understand visionary inventions and decisions – and there are plenty of entrepreneurs who have learned that the hard way.
Is TRUMPF transforming itself from a machine maker into an IT service provider?

In short, no, because machines will continue to form the basis of manufacturing in the future. But we increasingly envisage our machines as part of a system that offers huge potential. And Industry 4.0 is the key to realizing that potential.
Faster, higher, farther: It’s great to power ahead, but sometimes we can achieve more by hitting the brakes. Counter-intuitive? Perhaps, but German engineering company KNOLL is a prime example of how taking a step back can be a smart move.

... in Bad Saulgau

Returning to your homeland to build a successful business requires some careful planning. Croatian company KFK reveals how it became one of the world’s leading facade fabricators – and how German quality played a key role.

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... in Rugvica

... in Konga

Stewes Servicefirma may not be a major corporation on the world stage, but this Swedish family-run company has shown enough entrepreneurial vision to put other companies in the shade. And it all started with a birthday present.

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03

... in Ditzingen

How digital will TRUMPF be ten years from now? And what has the company learned by bringing digital connectivity into its own production facilities? One year into his tenure as Chief Digital Officer, Mathias Kammüller is the perfect person to ask.

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04
The Croatian company KFK has opted to invest in its homeland and help shape Croatia’s future. The company’s founder was confident that Croatia’s economy would eventually pick up – and his investment has certainly paid off. A perfect example of how entrepreneurial vision and confidence go hand in hand.
Mario Papac is young, dynamic and superbly qualified – the textbook example of an ideal manager. Although he was born and raised in Germany, he never forgot his Croatian roots. Eventually, the business administrator decided to give up his career in Germany to join KFK in Croatia. The path taken by company founder Marko Rašić had motivated and inspired him, and Papac was determined to make his own mark in the land of his forefathers. Rašić established KFK in 1997, just two years after the end of the Croatian War of Independence. Prior to founding his company, Rašić had spent ten years working for facade construction companies in Germany and Austria, picking up a wealth of expertise along the way. But he longed to return to his Croatian homeland and help shape the country’s future. With the war not long over, the economy was still in bad shape, and sheet metal fabricators were few and far between. None of that stood in the way of Rašić founding KFK, however, and his combination of hard work, entrepreneurial vision and practical experience soon transformed the small company into a global player. KFK now specializes in modular facades consisting of multiple parts that fit together like Lego bricks. Every project KFK works on is unique because every facade is different. That’s what makes this industry so challenging – and so exciting.

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Mario Papac, Managing Director of KFK International GmbH

“A one-stop service provider: KFK set up its own glass production facility measuring approximately 360 meters long in 2017.”
Facade fabricator by vocation

A lot has happened over the past 20 years. The six employees that were hired by the Zagreb-based facade fabricator when it was founded are still there, but now they have been joined by another 360 colleagues, including Mario Papac, Managing Director of KFK International GmbH. Founded in 2012, this subsidiary mainly handles large-scale projects in German-speaking regions and the UK. Thirty-six-year-old Papac knows exactly how tough things were for KFK founder Rašić when he first started out: “There were no specialists back then; employees would be responsible for a range of different jobs. Rašić still spends every day in the factory giving people useful tips and working on new solutions and products. He’s quite simply passionate about building facades – it’s not just a job for him, it’s his vocation.” You can quickly see that Mario Papac shares this passion. He understands that a facade ultimately determines how we perceive a building. This shared enthusiasm is not the only point Mario Papac and the company’s founder have in common.

Just like Rašić, Papac also saw the potential in this small country of just over four million inhabitants. Papac was born and raised in the German town of Karlsruhe, but he has never doubted his decision to emigrate: “I’m very happy in Zagreb. I’ve loved the city ever since I was a kid, so when the opportunity came up to join KFK I grabbed it with both hands.”

EU propels company into turbo speed

KFK has always re-invested the lion’s share of its profits in new machines and technologies. “A few years ago we decided to take another new approach that would enable us to carry out even bigger projects. That’s what led us to the EU funding programs,” says Mario Papac. The European Union supports cutting-edge ideas, technologies and machine purchases by providing companies with financial support. With the EU’s help, the company has contributed to the creation of a number of impressive buildings in Croatia, including the roof and facade design for Dubrovnik Airport. “Obviously you have to clear a whole set of hurdles to get the funding, but all those strict checks and controls are there for a good reason,” Papac adds. “For example, the EU ensures that we only buy approved machines from outstanding manufacturers. That’s not always easy, but it’s definitely worth it.”

This financial support has always been a kind of bonus for KFK, propelling it into turbo speed and enabling it to grow faster while simultaneously helping to develop its home country: “The great thing is that it enables us to push ahead with projects both in Croatia and worldwide, as well as investing in new machines,” says Papac. A good example is KFK’s laser tube cutting machine from TRUMPF. This is one of the machines that has helped the company create entirely new facade designs based on tubular structures. KFK used to focus predominantly on customers from Croatia, but today the company is involved in projects all over the world. “Right now we’re focusing on the UK, which is currently experiencing a boom in construction. All the world’s big cities are constantly striving to make buildings that are taller, more sophisticated and even better quality, and London is no exception,” says Papac. He is particularly proud of the biggest project KFK is working on at the moment: “It’s a residential building in London, the tallest structure of its kind currently under construction anywhere in Europe. With 76 floors and at 233 meters tall, it’s a project that obviously requires the production of lots and lots of facade modules.” It takes several years to complete projects on this scale – three and a half years in this case.
Croatian products, German quality

KFK is perfectly equipped for these kinds of demanding jobs. A year and a half ago, the Croats began making their own glass products. What makes them really stand out from the competition is their cutting-edge glass production line measuring approximately 360 meters.

“It was a step that we had been considering for some time. Receiving the EU funding made the decision a lot easier, so we were able to put our plans into action,” says Papac. Now they can perform all the facade fabrication processes in-house, including all the glass processing steps. KFK even has its own test laboratory to maintain high quality standards at all times. “Obviously our facades are tested by external inspectors, too, but having a test lab of our own is extremely beneficial,” explains Papac. To stay ahead of the competition, Papac and his colleagues are constantly coming up with new, innovative solutions. Examples include specially designed pallets that can be used to ship oversized facades without the need for special and costly transport arrangements.

Despite its technological advances and farsighted ideas, KFK has always been a company that makes decisions quickly. Papac considers this to be one of the company’s biggest strengths, along with its emphasis on producing perfect products: “Our founder Marko Rašić is a Croat through and through, but he always insists that our facades meet German standards of quality,” says Papac with a wink. This combination of German and Croatian traits definitely seems to work, proving that international understanding can sometimes be a surprisingly simple business.

When it comes to facade assembly, tubular structures play a supporting role – in the most literal sense of the word. That’s why the TruLaser Tube 7000 laser tube cutting machine is so crucial in the production process at the company KFK. On request, TRUMPF can now equip its tube processing machines with new features for thread tapping and forming.
In brief

Two in one: TruLaser Tube

The TruLaser Tube machines have acquired some new skills. Equipped with the thread technology package, they can now tap screw threads as well as cutting tubes. By incorporating this additional process step in its machines, TRUMPF hopes to help customers cut their workloads and reduce throughput times. To achieve this, the machines are provided with a tool changer and a spindle that can produce threads in thin-walled and thick-walled tubes. Since many thin-walled tubes do not have enough material to tap into, the technology package offers the option of flow drilling as well as standard methods of tapping and forming threads. In the first processing step, the flow drill produces a metal lip or “sleeve”. A stable thread is then cut in this sleeve in a second step.

www.trumpf.com/shxqgna
Digitalizing a long-established company from scratch takes a lot of work. The key is to have a plan. KNOLL Maschinenbau understood that right from the start – and the company is now advancing step-by-step toward connected manufacturing. The fact is that putting an entrepreneurial vision into practice sometimes means being prudent, too.
Joachim Riebsamen heads up the Unfinished Structures department at KNOLL, and he smiles when asked whether it really takes several years of incremental progress to create a smart factory: “Personally, I would have liked things to move a bit faster, and that’s doubly true for my boss. But I have to say that, looking back, we managed to accomplish a great deal in just four years. And we did everything right. We were determined to make a thorough job of analyzing the processes in our production facilities and achieve some lasting changes. That was more important to us than rushing things – and that’s how we intend to continue.”

Lean management ushers in new era

Headquartered in the town of Bad Saulgau in southern Germany, KNOLL is a leading supplier of pumps, conveyor systems and filter systems. The company embarked on its journey into the future four years ago, though preparations had been underway since 2005. It began by introducing lean management in its production facilities, laying the foundations for subsequent automation.

But that was only the beginning. KNOLL was founded 48 years ago as a family-owned business, and it has been growing steadily ever since. The company built one production facility after the other, but there was no clearly defined structure to its overall planning process. Riebsamen and his team therefore decided to adopt a completely new style of factory planning from 2007 onwards. Their idea was to relocate their sheet metal processing facility from the middle of the site to the edge of the company’s premises. That would cut the distances that had to be covered and speed up the processes involved.

Turbocharging small batch production

The 2009 financial crisis prompted KNOLL to suspend the project, but it resumed in 2011 with Riebsamen bringing in experts from TRUMPF and Stopa to help plan storage solutions. “For the first time, we took the approach of drawing up detailed specifications for the project and working through them step-by-step with our partners,” says Riebsamen. The fruits of their labor are still clearly visible today. “We planned meticulously for the future, examining the situation from every conceivable angle to make sure that we would have enough storage capacity to meet future requirements, too,” says Riebsamen.

Smart, automated XXL storage system

The fully automated Stopa storage system at KNOLL is 70 meters long. It contains more than 1,200 storage spaces as well as 13 loading/unloading stations. At the heart of the facility is an automated storage and retrieval system (ASRS). Zooming vertically and horizontally from one storage space to the next, the ASRS collects raw materials and transports them to the appropriate machining stations on a just-in-time basis. It then returns the finished parts to storage bins or forwards them to whatever machine they are assigned to next.

KNOLL managed to boost efficiency even further by working with TRUMPF to develop temporary storage stations and quick-change stations. The ASRS uses these stations as stopover points: the production control system identifies which materials will soon be needed by a particular machine and – if they are located some distance away – it takes advantage of ASRS idle times to convey the materials closer to the machine ready for processing. That makes it quicker to get materials where they are needed, reducing the time machines spend idle.
Lights-out manufacturing at night

TruTops Fab is the perfect production control system for this kind of intelligent storage solution. The software controls and monitors the flow of materials, activates the temporary storage of required materials at stopover points for jobs entered in the system, and provides accurate information on inventories and capacity utilization at all times. Machine operators rarely need to intervene during the two daytime shifts. TruTops Monitor collects and analyzes all the machine data and updates factory staff with information on downtime, breaks, idle time, the causes of any errors, and the duration of maintenance work. Night-time and weekend operations run “lights out” with no human presence on-site, says Riebsamen: “The shift supervisor can monitor what’s happening at all times using an app and intervene if necessary.”

KNOLL also uses TruTops Fab in production planning for tasks such as programming and nesting.

Overall, the company’s meticulous planning in the past has certainly paid off. Joachim Riebsamen says they are now at the stage where they can get the best out of the systems they have, safe in the knowledge that they are on track to meet their business objectives.

“Over the past four years we’ve boosted the productivity of our sheet metalworking facilities by an estimated 20 to 25 percent – perhaps even more. We intend to continue down that path.”

Joachim Riebsamen, manager of the Unfinished Structures department, KNOLL Maschinenbau GmbH

TruTops Fab app

KNOLL uses TruTops Fab software to help control its production processes. The accompanying app gives users mobile access to key information.
In brief

A control room in the palm of your hand

Mobile first

Less downtime
Get the latest updates on any malfunctions by email or text message – 24 hours a day.

Save time and effort
Fewer on-site checks – users can keep tabs on production anytime.

Always on hand
The app displays the control screen on a mobile device in real time.

Connect up older machines
TruTops Fab also works with older machines.

Clear and concise overview

The perfect overview

About the customer

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info.itworks@knoll-mb.de
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Machinery

- 3 x TruBend S130
- TruLaser 3030
- TruLaser 3030 Fiber
- TruLaser 3040
- TRB V 8505
- 3 x TruBend S230
- TruBend 7036

The TruTops Fab app turns iOS devices into information hubs. It gives users access to key production data on their mobile device at any time of day or night.
www.trumpf.com/en/tech/46290

TruTops Fab App

The app displays the control screen on a mobile device in real time.

Clear and concise overview of production jobs.

www.knoll-mb.de

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TruTops Fab App

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Clear and concise overview of production jobs.
Småland is a lovely place. The setting for the Emil of Lönneberga series of children’s novels, it features beautiful landscapes dotted with pretty red houses.

But this southern Swedish province is far more than just a rural idyll. It is also home to ambitious sheet metal fabricators such as Stewes Servicefirma – a small company with big machines and even bigger ideas.
Stewes is run by Britt Johansson and Jonas Engberg, a mother- and-son team that share a keen sense of curiosity. Their inquisitive nature drives them to delve ever deeper into issues of technology, progress and the future of sheet metalworking. Although it only employs 16 people, Stewes is one of the region’s most important suppliers. It serves a range of companies, including a local manufacturer of electrical distribution substations. Much of its success stems from a visionary decision that Jonas made nine years ago when he opted to invest in a TruMatic 7000 – the first company to do so in the whole of northern Europe. It quickly became clear that his instincts had led him to make an excellent purchase, and new customers and orders were soon flooding in. The machine was so new at the time that none of its documentation had been translated into Swedish. “But our TRUMPF account manager translated the whole lot for us in just one day!” says Jonas.

The high-end punch laser machine is one of the most expensive – and most productive – machines in TRUMPF’s portfolio. And Jonas and Britt decided to go one step further by choosing the automated version of the TruMatic 7000. Equipped with a SheetMaster and GripMaster, their punch laser system is even faster and more versatile. Stewes also offers bending services to its customers with its three TruBend machines. But it’s the company’s vision that really makes Stewes stand out from the crowd. “TRUMPF machines can do so much. Our job is to exploit those capabilities to the full, ensuring that each of our customers gets a cutting-edge design and the best available product. Essentially, we use our machines to continuously innovate and push ourselves to the next level,” says Jonas.

For this reason, it comes as no surprise to learn that Jonas opted for the TruMatic 7000 even before he had any suitable customer projects in the pipeline: “It’s true that at the start we only had one customer that benefited directly from laser cutting. But I was confident that others would follow in their footsteps.” And he was right. Jonas jokingly refers to the fact that he turned 30 two weeks after buying the machine: “You could say I gave myself the TruMatic as a birthday present! It took me a little while to work up the courage to tell my mother what I had bought.” Britt, who was more inclined to take a purely rational stance to weighing up the benefits of the punch laser machine before buying it, was quickly won over: “Nowadays we only have to work in one shift instead of two. The machine saves us a lot of time and is a great support to our team on the shop floor.”

All this was still to come when Jonas’s father Stewe Engberg founded the company in 1986. But one thing was clear right from the start: the company’s mission was to prioritize its customers and their products, and Stewes quickly gained a reputation for its professional problem-solving skills. “For a long time we didn’t have our own factory building, so we would simply sort out problems and carry out repairs on site, a bit like mobile service engineers,” says Jonas. His father, who founded the company and gave it his name, was always on the road. In the year 2000, the family finally found a suitable production facility. To begin with, they continued to use their customers’ plants to make some parts – not during the day, but at night. “Our customers didn’t use their machines at night, so it gave us the perfect opportunity to build up some expertise and improve our skills,” says Britt. It didn’t take long for this unusual approach to pay off. When Britt and Jonas purchased their first TRUMPF punching machine in 2004, they were able to benefit from their years of experience and shift into top gear almost immediately.

Not many of the world’s sheet metal fabricators are run by a woman, and Britt was initially something of a rarity in Sweden, too. “At first, many of our customers opted to talk to Jonas or another male employee instead of me. But they quickly changed their tune.
when they realized that I was the managing director,” says Britt. “Sometimes she still has that teacher vibe though,” says Jonas with a smile. A mother of three children, Britt instinctively knows how to take care of her staff, because she understands just how important they are to the family-run company. Every morning at nine o’clock, the team sits down together for breakfast at the kitchen table and discusses the current project status before they head back to the automated production facility. The company’s investments in new machinery stem from a mix of pragmatism and entrepreneurial vision – a quality that clearly distinguishes Stewes Servicefirma from the competition.

Having a clear vision for the future doesn’t depend on the size of a job shop, but rather on the progressive men and women who run it. It makes little difference whether you employ 16 or 1,600 people, though arguably small firms have to show even greater entrepreneurial vision, because the competition never sleeps. Clever business people can find a solution to any challenge, much like the resourceful little Emil of Lönneberga, the protagonist of bestselling author Astrid Lindgren’s series of children’s books. He always knew how to get himself out of a fix – and even when he got his head stuck in a soup tureen, he still had a plan. Jonas can’t help grinning when Emil’s name is brought up as a comparison. He certainly put his own acumen to the test by purchasing the TruMatic. Next year Jonas turns 40, and although he hasn’t made any concrete plans for this important milestone yet, perhaps he’ll end up buying himself another top-notch TRUMPF machine.

Stewes Servicefirma demonstrated impressive entrepreneurial vision by adding automated punch laser processing to its portfolio in 2009. Determined not to do things by halves, the family-run company in Sweden opted for a TruMatic 7000. That’s a decision that Managing Director Britt Johansson has never regretted. The TRUMPF punch laser machine is a reliable partner for existing jobs – and for whatever jobs the future may hold.
In brief

Automated punching and laser cutting

The TruMatic 7000 is a high-end machine that offers a combination of punching and laser cutting. Various automation components can be added to make the machine even more efficient. These optional extras boost productivity and capacity, particularly in multi-shift operations.

www.trumpf.com/s/v1l4xh

About the customer

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Machinery

- TruMatic 7000 with SheetMaster
- TruBend 7036
- TruBend S170 (B23)
- TruBend S170 (B23)
- QuickSharp

GripMaster and ShearMaster

The GripMaster automatically removes scrap skeletons and remainder strips and stacks them on a scissor table – all without operator intervention. The ShearMaster shreds scrap skeletons even while the machine is running, facilitating the disposal of scrap material. The TruMatic 7000 pulls the scrap skeleton onto the ShearMaster’s conveyor table, where the shearing unit divides it into more manageable strips.

SortMaster Box

The SortMaster Box automatically sorts small parts into up to four boxes while the machine is in operation. Its four containers are arranged in a circle and can be removed with a pallet jack.

ToolMaster and ToolMaster Linear

Automation components make it faster and easier to switch tools. The classic ToolMaster has a magazine wheel with 40 or 70 tool holders. It uses a swivel arm to bring tools into the right position. The capacity of the ToolMaster Linear can be expanded incrementally to hold up to 90 tool cartridges.

SheetMaster

The SheetMaster loads and unloads the TruMatic 7000. Its suction cups take sheets or blanks from the loading station and transfer them to the machine table. The SheetMaster sorts and stacks finished parts on a platform.

In 2017, TRUMPF became one of the first industrial companies to make the role of Chief Digital Officer a management board function. Mathias Kammlüller took on the task of leading TRUMPF into the digital future. In this interview, he describes his vision for the company, recalls the far-sighted decisions adopted at its headquarters, and emphasizes that digitalization sometimes has to wait.

Mr. Kammüller, how would you define your new role as Chief Digital Officer?

Digitalization offers both us and our customers an opportunity to be faster, more flexible and more competitive. My job is to make sure we embrace that opportunity. That means offering our customers the right solutions to make it work. And it also means looking at how TRUMPF can evolve outside its core business, for example with the AXOOM digital business platform.

Up until a year ago you were still in charge of the Machine Tools division. How has this new role changed your day-to-day work?

I used to spend a lot of my time flying from one place to another, but now my colleagues on the managing board have taken on some of the trips to the US and China. This gives me the necessary freedom to devote myself to our digital strategy, initiate and help shape projects.

That means offering our customers the right solutions to make it work. And it also means looking at how TRUMPF can evolve outside its core business, for example with the AXOOM digital business platform.
What does the strategy look like? How digital will TRUMPF be ten years from now?
Digitalization is evolving in leaps and bounds, so it’s simply not feasible to look ten years into the future. Instead we’ve been focusing on setting goals for the next five years. One of these is to use our digital offerings to reinforce TRUMPF’s technology and market leadership. We’re also aiming to speed up our in-house processes and become 30 percent more productive, as well as motivating our employees to embrace digitalization. That latter point is particularly important to me.

How can you reach that goal?
Above all, by encouraging them to help shape our digitalization strategy. Our employees are busy generating new ideas for multi- ple areas of our business. That’s fantastic, because I think it is essential to get the workforce involved. We already offer a range of training and development programs that give our employees the tools they need to engage with digitalization. Ultimately, successful digitalization will also create positive outcomes for our workforce by securing our competitive edge and safeguarding people’s jobs.

Will your customers benefit, too?
Absolutely! That’s why we offer them digital solutions that can help make their manufacturing processes more transparent, reduce the complexity that many of them are currently struggling with. Whether your goal is to respond faster to customer orders or cut the cost per part in custom manufacturing, introducing digital connectivity into your manufacturing operations is the only realistic way to find long-term solutions to today’s challenges.

What stage has TRUMPF reached in its own process of digital transformation?
We’ve already made a lot of progress in digitalizing our internal processes. I would say we’ve completed twenty percent of that journey – but it could be that I judge TRUMPF by slightly higher standards, because when I compare us to other companies, it’s clear that we’re well ahead of many of them. Our customers really notice that competitive edge when they look at TRUMPF’s digital offerings, which are nothing short of pioneering in many areas. Competition is fiercer in the platform business, though. Not only from major industrial organizations such as Siemens and General Electric, but also from IT companies such as Google, Microsoft and Amazon. But I’m very confident about our AXODM platform solution – customers like it, and it’s already gained a solid footing in the marketplace.

Does digitalization go hand-in-hand with a shift in corporate culture? How do you lay the right foundations to ensure that succeeds?
TRUMPF has an excellent corporate culture that encourages openness and fosters a resourceful approach to tackling changes in our business environment. And there’s no doubt that digitalization involves plenty of changes – it has a huge impact on how we will work in the future. Fortunately, we can draw on the experience we gained from our previous change projects to make our own digital transformation successful. When TRUMPF introduced lean management 20 years ago, we knew how important it was to get all our employees involved. That’s why we decided right from the start to use information platforms and new communication channels such as online chats and videos to explain our digital strategy to our workforce.

You’re also breaking new ground in your in-house production processes. For example, you spent the last few years digitalizing the sheet metal fabrication unit at the Ditzingen site. Looking back, would you say that was a far-sighted decision?
Yes, it was. That production facility used to have two more machines than it does now. We actually managed to make two of the machines redundant by making huge improvements in capacity utilization based on our daily analyses of machine data. That also freed up space and made our production processes more transparent. One of our biggest achievements, in my view, is the green communications zone we’ve created right here. This is where people gather every time a new shift starts. Using the monitors, they can access data on how the machines performed the previous day. I’ve watched that happen, and I was amazed at how quickly this digitalized wealth of information helps people identify and solve problems. And that kind of entrepreneurial vision isn’t limited to our sheet metal processing facilities in Ditzingen. We’ve also seen it at other sites such as Gerlingen, where they’ve introduced fully digitalized order processing systems for punching tools. That was a key step in our efforts to remain competitive and safeguard the site’s future.

What lessons can SMEs learn by visiting the sheet metal processing facility in Ditzingen?
Top of the list are the ideas they pick up on how digitalization makes processes visible and speeds them up. They also see how it makes manufacturing more transparent and efficient. That’s a key challenge facing many of our customers due to ever shorter delivery times and ever smaller batch sizes. But sheet metal processing also shows how feasible it is to digitalize processes without optimizing them beforehand. To maintain a competitive edge over the long term, companies need to make their processes leaner first and then digitalize them afterwards. That’s the rationale we use to put together the teams of consultants that analyze our customers’ production processes on site. They always include a lean management specialist and a digital solutions expert.

What advice would you give to bigger companies?
I would recommend shifting their focus away from their in-house production lines and placing more of an emphasis on upstream and downstream processes such as order placement and delivery. That’s normally where the biggest potential for improvement lies.

You deal with digitalization on a daily basis at work. Would you describe yourself as a fan of all things digital in your personal life, too? Or do you prefer to pick up a book when you get home in the evening?
Both! I definitely like to read a book in the evenings, but I am also an avid user of smartphones and tablets. I use both these devices to read the news and to handle the lion’s share of my communication, both for work purposes and with my family. And when something urgent comes in, my smartwatch helps me respond quickly. Basically, I see digitalization as something that makes my everyday life much easier, not just professionally but also on a personal level.
Hello, Mister President!

TRUMPF apprentices in the town of Bietigheim-Bissingen recently explained the workings of the TruMark 5010 marking laser to German President Frank-Walter Steinmeier. Germany’s head of state paid a visit to the “Lernfabrik 4.0” learning factory at the vocational school center in April. This is where students learn how digitalization makes manufacturing easier – from development, production and assembly to the entire cycle of order processing. The “Lernfabrik 4.0” opened in October 2017 and is one of many flagship projects for digitalization and vocational training in the German state of Baden-Württemberg. TRUMPF supports “Lernfabrik 4.0” by contributing the TruMark 5010 marking laser to German President Steinmeier’s visit. Steinmeier had a chance to see the workings of the TruMark 5010 marking laser at the company premises and within the local area. RWTH Aachen University began developing this electric vehicle back in 2010. TRUMPF supported the design process with its expertise in laser welding and its machines continue to play a role in the vehicle’s production.

TRUMPF celebrates 59th anniversary

This year TRUMPF is celebrating 95 years in business, a path that has seen it evolve from hand shears for sheet metal cutting to a fully fledged international technology company. In 1923, Christian Trumpf acquired the mechanical workshop previously occupied by Julius Geiger GmbH in Stuttgart. In 1992, Trumpf’s godson Berthold Leibinger joined the family-run business as an apprentice. Over the decades to come, he would shape a successful future for TRUMPF and transform the sheet metal and laser industries with his visionary ideas. His daughter Nicola Leibinger-Kammüller has served as Chief Executive Officer since 2005, writing her own chapter in the company’s ongoing success story. A book telling the full story of how the company evolved is due for publication by the end of this year.

In the Middle Kingdom

TRUMPF is investing in China. TRUMPF subsidiary JFY, acquired in 2013, recently opened its new production facility in Yangzhou. At 19,000 square meters, it is the TRUMPF Group’s biggest manufacturing site anywhere in the world. It primarily manufactures laser, punching and bending machines, and its output of well over 1,000 CNC bending machines a year makes JFY the market leader in this sector in China. TRUMPF is also investing directly in its own manufacturing site anywhere in the world. TRUMPF acquired the mechanical workshop previously occupied by Julius Geiger GmbH in Stuttgart. In 1923, Christian Trumpf opened its new production facility in Yangzhou. At 19,000 square meters, it is the TRUMPF Group’s biggest manufacturing site anywhere in the world. One example can be seen at its headquarters in Ditzingen, where its fleet of electric vehicles has recently been enhanced with the addition of a Street-Scooter. This small, agile vehicle is the perfect choice for transporting items on company premises and within the local area. RWTH Aachen University began developing this electric vehicle back in 2010. TRUMPF supported the design process with its expertise in laser welding and its machines continue to play a role in the vehicle’s production.

E for electric

TRUMPF has already sold more than 500 lasers for use in manufacturing electric vehicles batteries. The company is also making use of this alternative drive technology for its own purposes. One example can be seen at its headquarters in Ditzingen, where its fleet of electric vehicles has recently been enhanced with the addition of a Street-Scooter. This small, agile vehicle is the perfect choice for transporting items on company premises and within the local area. RWTH Aachen University began developing this electric vehicle back in 2010. TRUMPF supported the design process with its expertise in laser welding and its machines continue to play a role in the vehicle’s production.

AXOOM at Hanover Messe

AXOOM’s platform is already used by some 40 customers from multiple sectors and components. AXOOM solutions are specifically designed as a vendor-independent systems that can be seamlessly integrated into existing system environments. “That makes it simple, fast and affordable for new customers to get to know us and our products, even if they are already working with existing manufacturers.” That makes it simple, fast and affordable for new customers to get to know us and our products, even if they are already working with existing manufacturers. TRUMPF supported the design process with its expertise in laser welding and its machines continue to play a role in the vehicle’s production.

TRUMPF robot oracle

It’s hard to believe the 2018 FIFA World Cup is already over. This major sporting event was enjoyed by fans at all TRUMPF sites worldwide. Ditzingen even had its own TRUMPF World Cup oracle: perhaps inspired by Paul the Octopus, a robot lawnmower was assigned the task of predicting match results. Two sets of goalposts were set up on a mini soccer pitch, and a goal was predicted for the corresponding team each time the robot turned between them.

TRUMPF posts increased sales

TRUMPF has released preliminary figures for the 2017/18 fiscal year. Sales increased by around 15 percent from 3.1 to 3.6 billion euros. Orders received were also well up, by around 13 percent to 3.8 billion euros. The company’s domestic market, Germany, was the biggest single market, followed by the USA and China. “In many markets, we exceeded our targets, with all our products contributing. We registered a sharp growth in the future technology of additive manufacturing – and in the structural expansion of locations at home and abroad.

In the past fiscal year, TRUMPF continued to invest in digital connectivity and in the structural expansion of locations at home and abroad.
When I design a part, how can I keep production costs as low as possible? And if I start using new production techniques like laser welding, what tricks and tips are available to me? Experts from TRUMPF offer users advice on the most economical way to design sheet metal and tubular parts – in training sessions held at TRUMPF or directly on site at customers’ facilities. Here we explain how this process works and what benefits it offers using an example involving the company group Eirenschmalz from the Bavarian town of Schwabsoien.

Presenting the part

The design engineers bring a workpiece along with them to the workshop that has been welded using conventional methods. They are looking to improve the quality of the visible weld seams using laser welding – a technique they have introduced at their facility in Schwabsoien. TRUMPF sheet metal expert Jörg Heusel helps them analyze the current situation and gives the group valuable tips on design principles for the welding process.

Putting pen to paper

Next, the employees consult with Mr. Heusel about how they can put their idea into practice. They put pen to paper to draw up the initial designs. Using their sketches as a basis, the group then determines which approach is most suitable for the new manufacturing method.

Talking shop

The members of the group put their heads together and come up with some ideas as to how they should design the part to reap the full benefits of the new technology offers. They also consider which steps they could eliminate – reworking, for instance, which often isn’t necessary after laser welding.

Origami and beyond

Working from the drawing, the group makes a model of the component out of paper. It’s a delicate task that takes some initiative, but it is well worth the effort as it gives the design engineers the opportunity to scrutinize their idea from every angle before they transfer the design from paper to sheet metal. This approach allows them to determine which weld seams will be critical later in the process. After all, you can only know if something will work by trying it.

From paper to production

In the final step, the employees manufacture the part from sheet metal and prepare it for full-scale production. Thanks to the workshop, the design engineers were able to build on their laser welding expertise.
GOING WITH THE FLOW!

Christmas comes around once a year – and so too does the task of changing the cooling water in TRUMPF machines and lasers. Annual maintenance of process coolers is essential to keep everything working as it should.

For operators, this is a long, arduous and costly task, but there is an alternative: the Easy Filter which, as the name suggests, makes the job a whole lot easier.

Oelschläger Metalltechnik GmbH, a system supplier based in Hoja just south of Bremen, put the Easy Filter through its paces during the annual maintenance of its machines. “So far we’ve used the Easy Filter to treat the water in nine of our TruLaser Tube machines, and the new system is proving to be extremely beneficial,” says Tjark Zellmann, an electrical engineer who works in the company’s maintenance department. “Previously, it took two people to change the water while the machine stood idle for a few hours. Now, I can do the same job on my own in just ten minutes. We normally work to capacity, so it’s essential to find ways like this of saving time and money.”

The Easy Filter recycles the used water, eliminating the need to replace the entire cooling water reserve every year. In just under three hours, the filter removes all impurities and particles to provide clean, demineralized water ready for another year of production. It takes just an hour for users to fit the reusable pipes and filter valves, with no external support required. The Easy Filter is available for a wide range of TRUMPF machines and lasers.

At each change of shift, the production team gathers and analyzes the previous shifts. This task is facilitated by screens showing evaluations of the machine data. Staff can see at a glance if a specific tool set-up operation took too long, or if a lack of materials led to downtime. The team can then work together to derive solutions. Digital processes and monitors also help to optimize workflows at the five processing stations.

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DIGITAL DITZINGEN

One of the most striking things when you walk into the sheet metal processing facility in Ditzingen is how all the machining stations have screens. These have gradually replaced most of the paper-based documentation used for manufacturing. TRUMPF’s sheet metal processing facility shows how the company is not just a key provider of connected solutions, but also a key user – and it offers a great example of how workers benefit from digital manufacturing.

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1769

In 1769 a "water frame" by the name of Richard Arkwright invented the world's first water-powered spinning frame, subsequently known as the "water frame". Just two decades later, hundreds of thousands of people all over England were using his machine to spin as much as manual workers had managed just a few years earlier. By 1790, over 200 factories had been established in England and Scotland on the basis of Arkwright's invention, and hundreds more would follow. The water frame is considered to be one of the most important steps in the early years of industrialization.

1781

People have worked with wool for millennia. In 1781, the Englishman Henry Cort devised a faster method of removing excess carbon from molten pig iron by stirring it with rods. Cort's steel was markedly superior to the standard steel products common at the time, but it would take another invention by the Englishman Henry Bessemer in 1855 to pave the way for mass production of high-quality steel. His method involved pouring molten pig iron into a pear-shaped vessel. Even in the era of aluminum and carbon fiber, there is still tremendous demand for crude steel: in 2016 the global steel industry produced some 1.62 billion tons, equivalent to the weight of around 162,000 Eiffel towers.

1800

An invention by Italian physics professor Alessandro Volta made him famous worldwide. He developed an apparatus that could not only produce an electric current, but also provide this current to a circuit over a period of time. The "voltaic pile" was the prototype of modern batteries and one of the pioneering inventions that ushered in the electrical era. Electricity had previously been little more than a farground attraction. As well asMme Gombaud, the ultimate in ingenious inventors! That’s fortunate for us, because where would we be without our cars, computers and cell phones? Here, we take a quick look at some key inventions from the mid-1700s onwards that showed real entrepreneurial vision, explaining how each one came about.

1859

The German version of the phrase "The horse does not eat cucumber salad" was the first sentence transmitted over the telephone. The choice of words was said to aid, but they were chosen for their acoustic complexity – and the concept of a device that could transform sounds into electric current and then render them in their original form somewhere else was nothing short of revolutionary. Although the American Graham Bell is widely regarded as the inventor of the telephone, a precursor to his invention was actually developed by German teacher Philipp Reis in 1859. However, it was Bell who first obtained a patent for his more advanced version in 1875.

1889

It may seem bizarre to think of someone inventing the telephone, but for Timothy John Berners-Lee it was just that. He is the founder of the World Wide Web and the inventor of HyperText Markup Language, or HTML. In 1989, he used these tools to solve communication problems faced by CERN scientists in their efforts to share information. Fortunately, he never patented his ideas and technical solutions, which is why the Internet is now freely accessible to everyone.

The first website ever created is still available online: http://info.cern.ch/hypertext/WWW/TheProject.html

1889

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1816

The wheel has been the backdrop for many technical innovations. Modern archaeologists believe that it was first used in ancient China and Greece to move heavy loads. But centuries more would pass before someone came up with the idea of using it for other purposes. In 1654, French mathematician Jacques Ozanam invented the first wheeled vehicle that could be powered by hand and steered using reins. In 1817, German Karl von Drais invented his Laufmaschine, a "running machine" with handlebars, a saddle, and a brake, somewhat similar to the balance bikes small children use today to learn how to ride a bike.

There is some dispute as to who first attached pedals to a bicycle. Frenchman Pierre Lallement was certainly riding a pedal-powered, two-wheeled bike through the streets of Paris sometime around 1863. Today the bicycle has become an integral part of modern life, with estimates in 2018 suggesting there are more than 1.5 billion worldwide.

Just 23 years after the creation of the pedal-driven bicycle, Karl Benz developed the first four-wheeled automobile with an internal combustion engine. He patented his invention in 1886.

1858

Researchers first discovered the electrical system of the heart in the mid-19th century. Natural passerine calls emit electrical impulses that give the heart its regular rhythm of 72 beats a minute. The electrical activity was measured and recorded for the first time in 1857. In 1859, Paul Julius Carus – a cardiologist from Boston, Massachusetts – constructed a device that measures the heart's electrical impulses and emits its own impulses if it detects that no heartbeat is present. His early version of the pacemaker was a bulky machine that had to be raised along next to a patient on a cart. Just six years later, however, two Swedish doctors developed a pacemaker the size of a matchbox and implanted it in their first patient in 1864.

1958

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1959

The German version of the phrase "The horse does not eat cucumber salad" was the first sentence transmitted over the telephone. The choice of words was said to aid, but they were chosen for their acoustic complexity – and the concept of a device that could transform sounds into electric current and then render them in their original form somewhere else was nothing short of revolutionary. Although the American Graham Bell is widely regarded as the inventor of the telephone, a precursor to his invention was actually developed by German teacher Philipp Reis in 1859. However, it was Bell who first obtained a patent for his more advanced version in 1875.
Flying cars used to be the exclusive domain of science fiction films. But soon they might become reality. Alongside Uber Elevate and Lilium, aviation start-up Volocopter from the German city of Bruchsal has been busy working on plans to make air travel accessible to everyone. Volocopter envisions an autonomous air taxi that will take up to two passengers from A to B, relieving pressure on congested roads.
The dream of flying is as old as mankind itself, and airplanes have long since become an everyday mode of transportation. Yet when it comes to getting around in our day-to-day lives, Volocopter may be on the verge of opening up some entirely new possibilities. Anyone who has travelled through a big city during rush hour knows just how revolutionary a new means of transportation could be. Volocopter has already received the backing of big-name companies such as Intel and Daimler for its plans to develop an alternative to conventional vehicles.

**Flying for everyone, on any occasion, anytime**

For the first time in human history, more people live in cities than in rural areas. There is a growing feeling that transportation is reaching the limits of its capacity in the world’s major population centers. Demand is soaring for new and sustainable mobility concepts such as Elon Musk’s Hyperloop maglev train and connected, self-driving vehicles. The hope is that these new modes of transportation could make travel in urban areas less stressful once again.

The air taxi company Volocopter aims to offer a product that will reduce the effects of urbanization on traffic. This ambition has transformed the company into one of mobility experts’ greatest hopes. Volocopter’s self-declared goal is to enable “flying for everyone, on any occasion, anytime”. To achieve this, company founders Stephan Wolf and Alexander Zosel and their team have been working since 2011 on a project to research and design a fully electrical multicopter – in other words an aerial vehicle that uses multiple fixed-pitch rotors to provide lift. In 2013, the company set a European record by raising 1.2 million euros through crowdfunding. In 2016, the air taxi was granted a provisional license for a manned, fully electrical multicopter by the German Ministry of Transport. This cast Germany in a pioneering role as the first country to issue this type of flight permit.

In fall 2017, the company embarked on a five-year test program in Dubai to trial the autonomous air taxi as a means of public transportation. “I expect to see the first commercial demonstration flights in two to three years,” says Alexander Zosel.

**Flying at the touch of a button**

The idea is that people will use an app to book their flight – say from an airport to a trade fair site – and pay for it using their smartphone. The journey will cost slightly more than a standard taxi, but will be significantly quicker. The passenger will be picked up by an autonomous Volocopter 2X, a multicopter with 18 quiet electric rotors that allow for zero emission travel. The company guarantees that the multicopter will offer the highest degree of stability and safety in the air. Even if a rotor fails, the other rotors can easily compensate for it, and the same applies to the propellers, electric motors and battery packs, all of which offer multiple redundancy in the event of failure. The aerial vehicle also features cutting-edge assistance systems and well over 100 microprocessors. In areas in which autonomous flying is not possible, the multicopter can be controlled using a joystick by any occupant who has completed a short training session.

So with Volocopter on the horizon, perhaps flying cars will turn out to be more than just a pipedream after all.
TRUMPF has developed a nibbler that is suitable for a range of industry sectors, including aerospace and automotive manufacturing. The nibbler is designed to be used in hard-to-reach areas. The new nibbler creates clean and precise cuts, releasing dust that can pose a health risk. The TruTool FCN 250 is designed as the first of its kind anywhere in the world. The TruFold FCN 250 is designed to separate a range of fiber composite materials up to 2.5 millimeters thick. Parts made of these kinds of materials are currently processed using traditional methods, including lower manufacturing costs and lower fixture weight. This type of fixture offers some key benefits over fixtures produced by conventional means, including lower manufacturing costs and lower fixture weight. The TruServices team runs various seminars and workshops that offer personalized advice and end-to-end support for all issues relating to tube fixtures. Precise and versatile angle measurements

TRUMPF offers a range of ACB angle measuring systems for bending machines. One of these – the non-contact, optical ACB Laser system – was previously only available for the TruBend Series 5000, but now TRUMPF has released it for the TruBend Series 3000, too. The ACB Laser system uses a laser to project a line on the sheet. A camera then detects the line and determines the angle. To achieve this, two measuring units are automatically moved into position in front of and behind the bending line. The system can then detect the angle in real-time during processing – and even correct it if necessary. To create its ACB Wireless angle measuring system, TRUMPF equipped its bending tools with sensor disks. Small metal sensor disks are mounted on the lower end of the sensor tools. As soon as they come into contact with the metal sheet, they transmit a signal to the machine that allows it to calculate the bending angle. A range of different adapters are now available to use with these tools. They can be positioned between the tool clamp and the bending tools to extend the sensor tool. This makes it possible to process boxes with even longer sides.

Separating fiber composite materials

TRUMPF has developed a nibbler that is the first of its kind anywhere in the world. The TruFold FCN 250 is designed to separate a range of fiber composite materials up to 2.5 millimeters thick. Parts made of these kinds of materials are currently processed using traditional methods, including lower manufacturing costs and lower fixture weight. The new nibbler creates clean and precise cuts, releasing dust that can pose a health risk. The new nibbler is suitable for a range of industry sectors, from aerospace to automotive manufacturing.

Self-made welding fixtures

Laser tube cutting machines are a great boon to the companies that use them, but are these companies aware of the machines’ full potential? TRUMPF Services reveals a wealth of new possibilities in part design. The fact is that tubular structures are not only a good choice for constructing end products and assemblies, they can also be used to make economical versions of the welding fixtures themselves. This type of fixture offers some key benefits over fixtures produced by conventional means, including lower manufacturing costs and lower fixture weight. The TruServices team runs various seminars and workshops that offer personalized advice and end-to-end support for all issues relating to tube fixtures.

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RollBend now offers non-marking bending

The RollBend tool makes it possible to create short side lengths as well as moldings and holes close to the bending line, without causing deformation. It can be combined with standard dies. RollBend has always been designed to minimize any marks, but now it comes with an embedded elastomer layer that reduces friction on the surfaces even more efficiently. That makes RollBend the perfect non-marking bending system for painted, coated, and highly reflective surfaces with variable material thicknesses. The tool excels in particular in cases where specifications call for minimal visible points between tool transitions, or none at all.

Innovations, technologies and future trends

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1,000th tube

There was plenty of cause for celebration recently at TRUMPF in Hertingen as the factory completed its 1,000th laser tube cutting machine. The machine is already earmarked for delivery to an Italian customer in Tuscany. Plant manager Steffen Braun is delighted to have reached this point: “We’ve been producing tube processing machines in Hertingen since 2002, and in 2007 we opened our own design engineering department. We have focused on steadily increasing our production capacity, and we added an extra 6,000 square meters just last year. The 1,000th machine is an important milestone.”

TruLaser Center 7030

Now available with connection to store

Users now have the option of connecting the fully automated TruLaser Center 7030 laser cutting machine to a storage system, specifically to the TruStore 3030 compact store or to large-scale systems from the company SITOPA. Storage solutions can be installed either in front of or to one side of the machine. A cart conveys raw materials to the machine from behind or from the side, so materials can be loaded and unloaded while the machine is in operation. Instead of sending finished parts back to the store, the TruLaser Center 7030 deposits them on a separate unloading cart. The only exception comes when using the SortMaster Speed automated unloading system, which can deposit large parts on a storage pallet and then convey them back into the store on an unloading cart. Since it was launched last year, the TruLaser Center 7030 has proved to be the perfect addition to the TRUMPF portfolio thanks to its hybrid, dynamic manufacturing capabilities. It offers a reliable means of processing sheet metal with minimal operator intervention – the perfect solution for keeping costs down.

www.trumpf.com/s/0dx2gk
The engraving feature provides a flexible means of applying markings to sheet metal parts – but that’s not all. It actually offers more than the name might suggest. Combining four useful applications, it is one of the most versatile functions in the TRUMPF punching repertoire. As well as enabling users to mark sheet metal parts and apply lettering, the engraving function can also be used to deburr cut edges and even slit films by means of ablation. Available for all TRUMPF punching machines and punch laser machines, it offers the following key features:

**Ball deburring**

Punching often leaves behind an unattractive, sharp burr. The ball deburring tool presses down this raised edge to flatten it. By improving the quality of the punched edge, deburring reduces part costs. The tool is equally adept at handling large contours and tiny holes.

**Marking with ink**

The ink marking tool marks metals, non-metals, and film-coated sheets without damaging the metal sheet itself. That makes it the perfect solution for batch numbers, construction lines, and color highlighting. Users can also subsequently remove the ink from the sheet if required.

**Film slitting**

The film slitting tool separates protective films on sheet metal parts without damaging the sheet in the process. As the punch glides over the surface of the film, the ball tip penetrates the film and cuts it along the chosen path.

**Marking without chips**

The engraving tool offers a versatile means of marking sheet metal parts without producing any metal waste. The line produced by the ball tip is so thin that it can even be used for delicate engravings, so users benefit from high marking quality and maximum contour flexibility at the same time.
Who dares, wins

I was in my local hardware store recently and I happened to see an electric chainsaw made by the company Stihl. Seeing a Stihl with a rechargeable battery was a shock – a bit like discovering that Tesla had suddenly started making diesel vehicles. In case you didn’t know, Stihl has been the number one global producer of petrol chainsaws for decades, producing powerful tools that make a lot of noise and can chop up even the thickest oak. Yet here they were offering a saw with a rechargeable battery pack.

I instinctively felt it was a bit of a reckless move on their part, because cordless saws seem to throw into question everything that has made the brand such a big success in the first place. But I also remembered that introducing new things in the hope they will pay off at a later date is a core value of entrepreneurialism – even if those test balloons gobble up time and money to begin with, and even if some of them fail.

“Who really needs this silver disk anyway?” joked the CEO of hi-fi giant Philips in the early 1980s, shortly before the CD took the music industry by storm. Around the same time, a certain Bill Gates supposedly said that “640K ought to be enough for anybody”. The error of that prediction would eventually become clear, and the history of business is replete with similar examples.

Misjudgements are the poor relations of entrepreneurial vision, the unloved cousins that are rarely discussed because the companies that made them were understandably keen to hush them up. Yet failure is an integral part of any business venture. After all, who dares, wins – as the saying goes.

What, then, is entrepreneurial vision? Put simply, it is whatever we define it to be with the benefit of hindsight. “Every idea is logical in hindsight,” says creativity guru Edward de Bono. “The only question is why we didn’t come up with it 200 years earlier.”

In hindsight, his superiors were probably not best pleased with that decision. The band in question was Coldplay. They went on to enjoy phenomenal success, while the record executive was left looking for a new job.

Oskar Simon