

four zero

TRUMPF



ANNUAL REPORT

16-17



TRUMPF Group

Our Company

Taking manufacturing technology to the next level is our mission – and that means making it cost-efficient, accurate, future-proof and connected. We are a market and technology leader in machine tools and lasers for industrial manufacturing. Our innovations play a role in virtually every sector of industry, from software that paves the way for smart factories to solutions for high-tech processes in industrial electronics. Some 12,000 people work at TRUMPF worldwide, helping to promote its positive attitude and achievements as a family-run company.

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ANNUAL REPORT

16–17

At a Glance

TRUMPF Group

Figures

		2014/15	2015/16	2016/17	Change from 2015/16
Sales	in € millions	2,717.0	2,808.5	3,111.3	+10.8 %
Overseas share	in percent	79.1	78.7	80.0	
Orders received	in € millions	2,818.3	2,793.3	3,378.6	+21.0 %
Income before taxes	in € millions	357.1	303.1	337.2	+11.3 %
Net operating margin before taxes	in percent	13.1	10.8	10.8	
Net income for the year	in € millions	270.8	235.1	261.6	+11.3 %
Expenditure on fixed assets	in € millions	129.4	137.6	200.4	+45.6 %
Expenditure on research and development	in € millions	265.1	296.2	318.3	+7.5 %
Balance sheet total	in € millions	2,708.5	2,839.4	3,088.4	+8.8 %
Equity	in € millions	1,383.8	1,476.9	1,582.8	+7.2 %
Equity ratio	in percent	51.1	52.0	51.2	
Economic equity*	in € millions	1,642.1	1,773.9	1,916.3	+8.0 %
Economic equity ratio	in percent	60.6	62.5	62.0	
Employees on June 30	number	10,873	11,181	11,883	+6.3 %
Personnel expenses	in € millions	793.1	817.8	896.5	+9.6 %

* Equity capital plus long-term loans from partners

Business Activities

Figures/Business Activities

MACHINE TOOLS

€ 2.70 billion

SALES

7,566

EMPLOYEES



TruLaser 5030 fiber

MACHINE TOOLS FOR FLEXIBLE SHEET METAL AND TUBE PROCESSING

The largest area of activity at TRUMPF comprises various machine tools for flexible sheet metal and tube processing. Our portfolio includes systems for bending, punching, combined punch and laser processing, laser cutting, and laser welding applications. We offer our customers machines and automation solutions tailored precisely to their requirements, together with consulting, financing and many more services enabling them to manufacture their products economically, reliably and in high quality. With our software solutions we support them in all sheet metal processing tasks, from design to complete production control.

LASER TECHNOLOGY

€ 1.23 billion

SALES

3,392

EMPLOYEES



TruDisk

LASERS FOR PRODUCTION TECHNOLOGY

Cutting, welding, marking and surface treatment: For every industrial application, we have the right laser and the right technology to manufacture products innovatively and cost effectively. Whether on a macro, micro or nano scale, we address our customers' individual needs and accompany them with system solutions, software tools, application expertise, and consulting.

High technology would not be possible without a supply of processing power. Our generators provide our customers with electricity for induction heating, plasma and laser excitation, in the necessary form with regard to frequency and power.

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ANNUAL REPORT

16–17



four zero

EDITORIAL

When we chose the theme for this year's annual report, we hadn't yet decided on a cover design. We were still looking for an image that would perfectly illustrate the all-encompassing nature of digitalization. One that gives center stage to the human aspect.

Digital transformation has long since grown beyond the simple goal of optimizing processes. It has become an issue that affects all of society, and it's vital that we understand its implications. It's no longer a question of for or against, but instead of how we can actively shape the future, as Klaus Kornwachs relates in the essay he wrote for this annual report. It is our firm conviction that it will be possible to find a solution that allows us to progress in this direction – without compromising our values as a family-run business in terms of its work but also its workforce.

We finally found what we were looking for when we came across photos of baseball icon Sandy Koufax and came to appreciate what baseball fans mean when they talk about a no-hitter. The legendary Los Angeles Dodgers pitcher had not one, but rather four no-hitters in his career – which means a single run in those four games. Four times zero. And this happened at a time of many changes, when the large wave of automation was sweeping through mechanical engineering.

This parallels our own story. When TRUMPF launched the TRUMATIC 20 in 1967, it was the first punching and nibbling machine with numerical control. Seen in retrospect, it set off a chain of events that established our reputation as technology leaders. Nobody could have known then that it heralded a digital transformation that would change every aspect of our lives. People at that time were enthralled by the conquest of space and the exploits that culminated in the epic Apollo 11 lunar mission in 1969 – a symbolic event in the race for technological supremacy on Earth.

Looking back over a fiscal year in which worrying political news dominated the headlines, we have a second reason for placing Sandy Koufax's photo on our cover page. We want to send a signal to the United States – confirming our allegiance with our longstanding partner, at a time when free trade and transatlantic relations are sometimes being called into question. For us, the United States still represents one of our most important growth markets – especially in the domain of digital production.

The demonstration plant in Chicago that we opened recently is proof of our commitment. And it's perhaps a positive sign that 2016 proved to be a hugely successful year for the Chicago Cubs, after a seeming eternity during which the team simply could not manage to win it all.

I hope you enjoy reading our latest annual report.



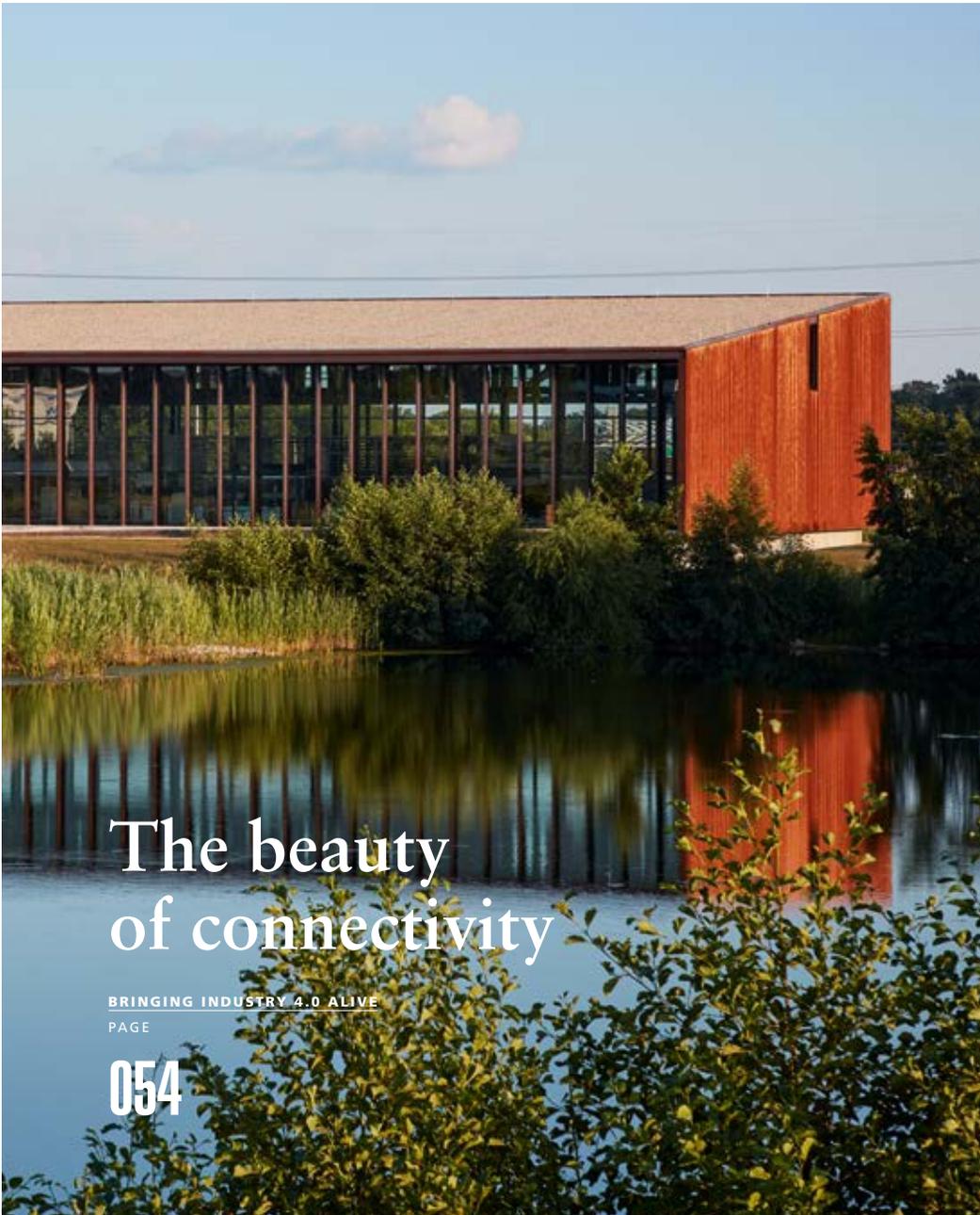
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TRUMPF Annual Report 2016/17

Clever all-around talent

TOOLS 4.0
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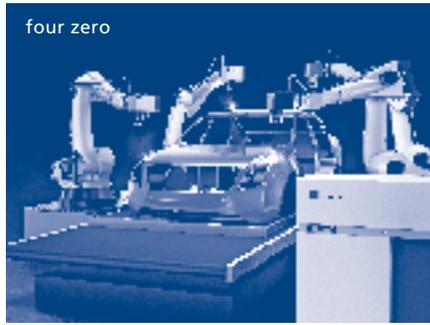
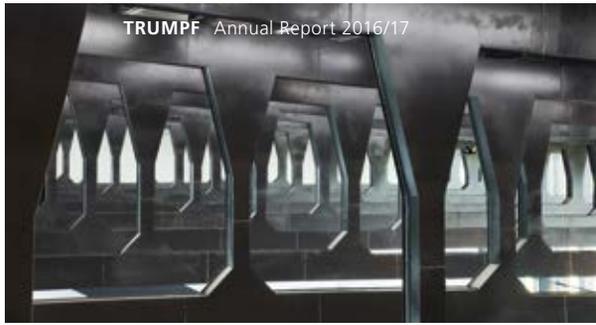


The beauty of connectivity

BRINGING INDUSTRY 4.0 ALIVE
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The universe of scanners

PROCESSES 4.0
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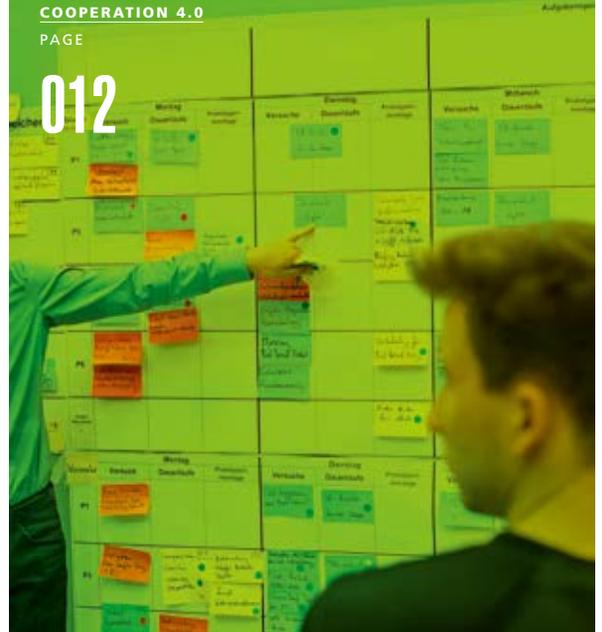
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Collaboration is the magic word

COOPERATION 4.0
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Clever all-around talent

TOOLS 4.0

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The beauty of connectivity

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Being connected in the age of “four zero”

TRUMPF

VISION

ESSAY

TRUMPF Group Management

Being connected is a powerful idea. It implies being close to someone and understanding where they're coming from, but also being loyal and taking their side. In many cases, that feeling of camaraderie, of a common identity, is fostered by sharing experiences or a certain way of life. As the Swiss writer Max Frisch once said: "Words unite us only if we are already on the same wavelength."

At TRUMPF, we've always believed in reaching our customers not just through words, but also through shared experiences and convictions. Back in 1960, we packed our most important machines into a lovingly restored Volkswagen camper van and made the rounds of potential customers. In 1987, we opened our first real showroom at our headquarters in Ditzingen, and since then thousands of customers have passed through its doors. Over the past two decades we have added showrooms all over the world, including the recent unveiling of a fully-fledged Industry 4.0 demonstration factory in Chicago (see page 56) in September. Every last aspect of it is designed to live and breathe Industry 4.0.

And that's only the beginning.

DIGITAL AMBITION: FOR OUR CUSTOMERS AND PARTNERS AS WELL AS OUR EMPLOYEES

We are growing even more connected to our customers through digital connectivity. We exchange more information nowadays than ever before, and that means we know a lot about each other, which can be mutually beneficial. From TRUMPF's perspective, it means we can provide the best support and maintenance services for our customers' machinery – by ensuring that repairs and software updates are implemented on a timely basis, for example. We can also monitor each machine's performance and give useful tips on how it could be improved. Knowing exactly how a machine is being used allows us to draw up highly personalized offers that include everything from support service packages to finance solutions.

Based on our years of experience, we can provide our customers with solid and authoritative advice when it comes to optimizing business processes and fostering digital connectivity. One example of the solutions we offer is our TruConnect range of software services. Another example is our open, digital business platform AXOOM, which we hope will place us firmly among the ranks of the leading providers of business-process software in the manufacturing industry. That's our goal.

The products and services we offer enable our customers to produce their goods far more efficiently, with studies suggesting average productivity gains of 30 percent. What's more, we are responding faster than ever before. We now resolve 75 percent of support incidents remotely, and we can access some 15,000 machines all over the world through our service cloud. We understand that spare parts and consumables are often critical to keeping production running without interruption; they reach our customers quickly thanks to our customer processes 4.0. Every customer has their own personalized service portal to provide the perfect framework for keeping in touch with TRUMPF.

All in all, things run smoother and faster when we facilitate a certain level of transparency on both sides.

TRUMPF recently opened a demo factory 4.0 in the industrial hub of Chicago.

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CAREFUL ANALYSIS IS KEY.**OUR GOAL IS TO ELIMINATE UNSCHEDULED DOWNTIME**

To ensure both sides make the most of this opportunity, we are making significant investments in our products' connectivity. We are equipping our machines and lasers with cutting-edge data interfaces and developing new methods of ultra-secure data transmission. At the same time, we are building user-friendly analysis tools that extract useful information from the huge quantities of data our products generate. This includes status updates on a customer's machinery, upcoming maintenance requirements, imminent shortages of materials, and information on which systems or production units have been working fastest over a defined period of time. All this results in greater transparency.

To avoid unproductive downtime, you need to eliminate the risk of sudden machine stoppages and maintain the right stocks of materials as well as ensure that all systems are working to capacity and can even be operated remotely. By pursuing this approach, we can get closer and closer to the goal of zero unplanned downtime, substantially reduce throughput times, and ensure a more rigorous adherence to customer deadlines. That makes production processes more predictable and reliable than ever before.

We can apply a similar concept to upstream and downstream processes as well as the actual production process. Everyone benefits when an order is placed online: the part is designed automatically, and the machine works autonomously to convert this information into a machining program and then assign the finished parts to the right order. The whole ordering process becomes faster and more transparent while eliminating the risk of errors. Delivery companies are already capable of tracking parcels with tremendous accuracy right up to the point of delivery, and in the future this degree of control will also be available for sheet metal parts. This will make it commercially viable for companies to deal with growing numbers of customer-specific, small-batch orders. And adding a 3D printer such as TruPrint to the production environment will create an almost unlimited capacity for customization.

Every time you order spare parts or consumables, you set off a genuine "process 4.0."

PAGE

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AGILE COLLABORATION – MASTERING COMPLEXITY AND SHAPING NEW WORKING ENVIRONMENTS

Our entire organization is currently confronting huge challenges due to digital transformation, especially with regard to the pace of development and the courage to embrace change. Our development team is proceeding full speed ahead on a broad range of tasks. These include creating innovations in software, providing access to cloud platforms, implementing disruptive business models – both within and beyond the sheet metal and laser sectors – and creating new machine designs for modern production processes.

Our sales and service staff are equally busy keeping their knowledge primed about all of these offerings while communicating it to customers through new channels. Our corporate HR department is currently focused on recruiting additional people for these tasks and achieving consistent implementation of all our HR processes worldwide. The list of these challenges goes on and on, but one way to tackle them is to implement "agile collaboration 4.0," an approach that we have already identified as the best way forward in many areas.

The results are clear: encouraging more and more departments to cooperate with each other using new methods and organizational structures produces tremendous efficiency and is enriching for everyone involved. We firmly believe that this interdisciplinary, iterative form of collaboration is the future. And we're equally confident that digitalization is having a positive effect on TRUMPF employees' daily lives and reinforcing our reputation as a good employer. Our positive recruitment path starts with the system of dual vocational training programs, which is essentially a form of "didactics 4.0." Ultimately, of course, it encompasses education in its broadest sense – in other words, the ability to communicate new learning and bring it to life while breaking down people's reservations and anxieties. By committing to transparency on all sides, we can acquire the kind of digital skills that will reveal new opportunities for development and new career profiles.

**WE WELCOME THE FUTURE WITH OPEN ARMS –
WITH OUR CUSTOMERS RIGHT BY OUR SIDE**

The laser is our favorite tool. It leaves us perfectly positioned to face the future because it is the most suitable machining tool for Industry 4.0 production. It is an important enabler for the production of microchips, and a key customization tool that marks workpieces with unique codes containing process and customer information. It is also a creator of parts that yields the maximum possible range of products through cutting, welding, coating, ablating, roughening, polishing, and a multitude of other machining processes. Whatever upheaval and conceptual leaps we face, and whatever unfamiliar territories we may enter in the realms of collaboration and digital opportunities, we can be confident of one thing – we can always rely on our "tool 4.0" (see page 24).

The laser is the
ultimate tool 4.0 for
the data society.

PAGE

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Cooperation 4.0
means embracing
an interdisciplinary,
iterative form
of collaboration.

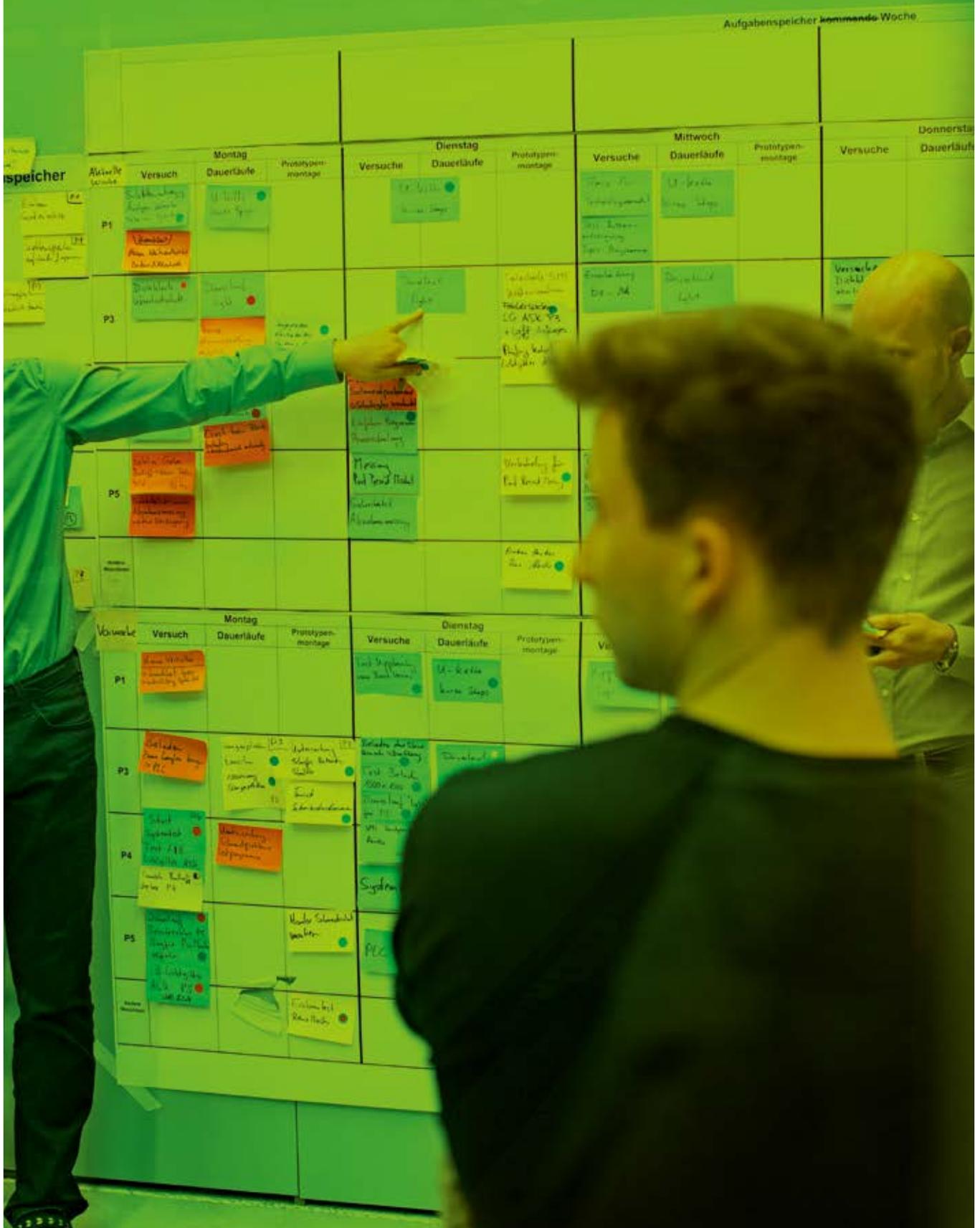
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This is a tool that still has plenty of untapped potential, which is why Peter Leibinger was appointed Chief Technology Officer in July 2017 – placing a major focus on additive manufacturing and opening up new business fields. Meanwhile, Chief Digital Officer Mathias Kammüller – another member of the Group Management team – is now devoting himself to strategic planning and effective implementation of the company's digital transformation. All this will help ensure that TRUMPF takes the fast track into the future. The fact is that connectedness is inextricably linked to a sense of being able to depend on someone. When you work with TRUMPF, you can rely on us to live up to our reputation as a true promoter of innovation and to seize every available opportunity to benefit our customers.

**WE'RE SHAPING THE FUTURE OF THE WORLD
OF MANUFACTURING. AND WE'RE DOING THAT
IN OUR OWN UNIQUE STYLE**

There's one more point we feel is important. You might call it a kind of digital ambition that extends well beyond our company and our industry and that sums up how we do business. We're determined to use our long-established tradition of collaborating with social partners and educational institutions as a basis for constructing our own unique style of digital transformation. We believe the time has come to state with confidence that Silicon Valley found its own particular path and its own values – and now owner-managed, medium-sized companies such as TRUMPF are stepping up and finding theirs.



Aufgabenspeicher

Aufgabenspeicher kommende Woche

Aufgabenspeicher	Montag				Dienstag			Mittwoch			Donnerstag	
	Versuche	Dauerläufe	Prototypenmontage	Versuche	Dauerläufe	Prototypenmontage	Versuche	Dauerläufe	Prototypenmontage	Versuche	Dauerläufe	
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P1	Handwritten notes			Handwritten notes	Handwritten notes		Handwritten notes	Handwritten notes				
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P4	Handwritten notes	Handwritten notes		Handwritten notes	Handwritten notes		Handwritten notes	Handwritten notes				
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Cooperation 4.0

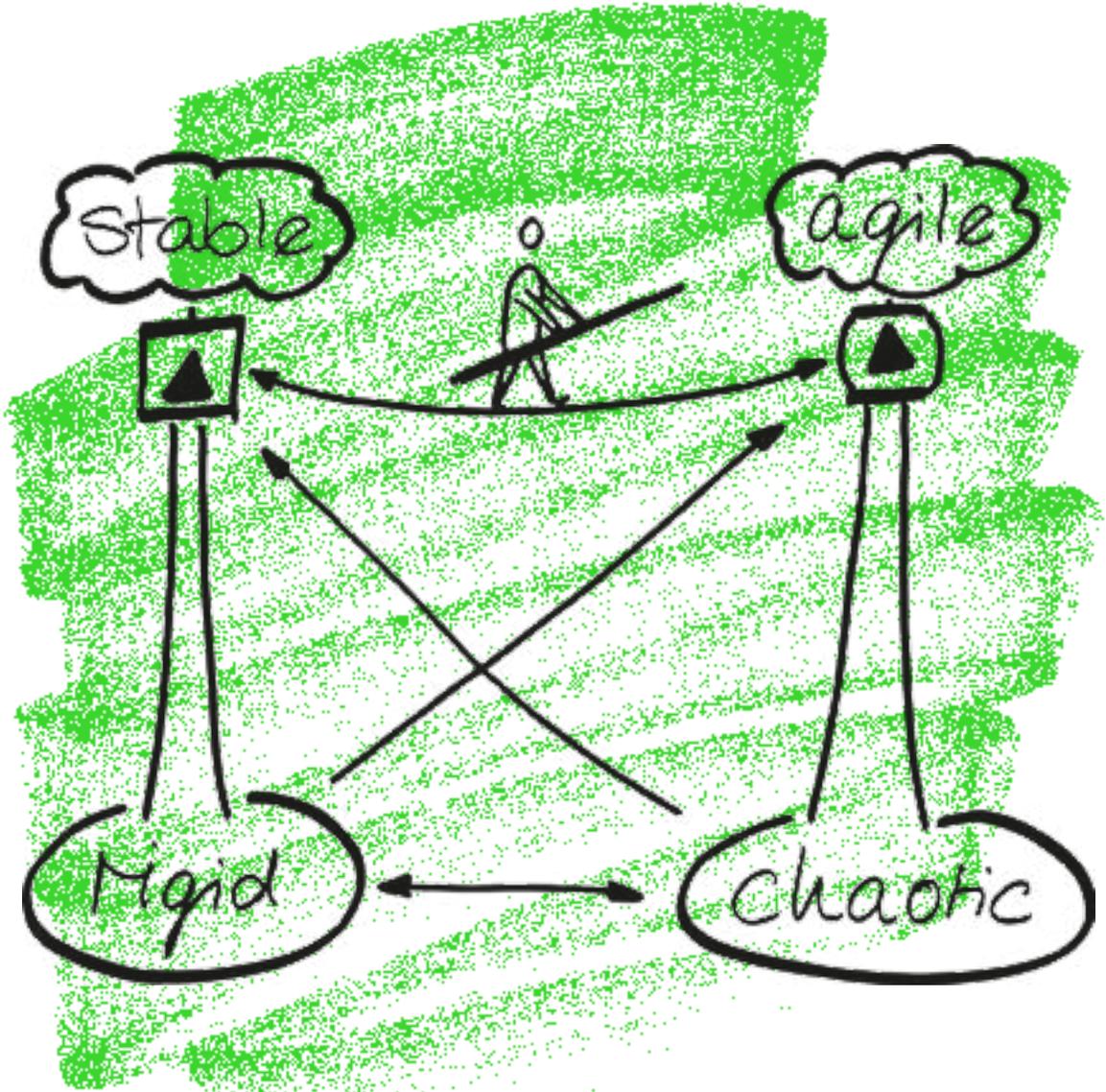
CROSS-FUNCTIONALITY
IS THE KEY TO AGILE.

Collaboration is the magic word

AGILE PROJECT MANAGEMENT AT TRUMPF

A VOYAGE OF DISCOVERY

Industry 4.0 combines business processes, digitalization and mechanical engineering – and that means it brings together different people from different parts of the company. That, in turn, generates complexity, creating an environment where changing just one parameter could have an unexpected impact on the results – especially if that parameter is a human being. That's why it's so important to foster an approach that allows a multitude of experts in their own particular areas to work together successfully as a team. TRUMPF has a name for this approach: agile collaboration. The company has already made great strides in cross-functional collaboration and encouraged the widespread adoption of iterative planning methods. Based on values such as openness, transparency, and the belief that people should work together on an equal footing, TRUMPF is rapidly pushing ahead with the implementation of agile methodologies. Underpinning these efforts is a fundamental understanding, namely that every single person is there to create value for the customer. A very personal journey into the world of agile collaboration at TRUMPF shows how this works in practice.



A WORTHWHILE BALANCING ACT

For a flexible organization, you need both stability and agility.

v

INTRODUCTION

Hi!

→ ANIKA BANK:

I started working here in April 2017 and quickly realized that Industry 4.0 is a top priority. I regularly come across the term "agile working," and it's clearly a very important concept at TRUMPF. When I saw just how many different groups in the company are focused on agile working, I decided to embark on a voyage of discovery through the company to find out more! My aim was to discover what agile collaboration means at TRUMPF and how it is applied in practice.



My name is Anika Bank.
I'm 25 years old.
After finishing school and
earning my Bachelor's degree,
I began working as a trainee
in the Corporate Communications
department at TRUMPF.

v

TRUMPF AND AGILE

Agile



WHY DOES TRUMPF NEED AGILE?

The first question I asked myself was why agile methodologies are necessary in the first place. I decided to talk with Andreas Witt, the head of software development, and this is what I found out.

Over the years, markets have evolved, moving from the manufacturing age (small markets, products tailored to the customer) to the industrial age (broader markets, standardized products) and then onwards to today's knowledge age (global markets, return to customization). Companies in our globalized world are under enormous pressure because they are constantly at risk of being ousted or superseded. This risk doesn't just stem from competitors in their own markets, but also from providers in other sectors whose products influence those markets. The reason behind all this is digitalization: companies that offer physical products are increasingly facing competition from providers of digital services.

Nowadays, many things are faster and simpler than they were in previous decades

And raising capital is no exception. It's no longer only money that is the limiting factor, but also the search for the brightest minds in the global workforce. In the industrial age, companies invested a lot of time in drawing up detailed plans, because it was difficult to raise capital. But nowadays companies are more willing to experiment. Today, the primary competitive factor is speed, and companies that devote too much time to planning now find themselves left behind by their competitors. What matters is being flexible enough to deliver your goods quickly, because otherwise customers will simply turn to the next provider. Businesses today are shifting from zero-defect strategies to zero-time strategies, and that explains why they need to take a new approach to how they work. The industrial age coined the terms "thinkers" and "doers," leading to line structures and hierarchical thinking within organizations. And that's where we're now seeing the biggest transformation of all – the shift towards collaborative methods of thinking and working.

"Right across the company you get the sense that the people who work here want to make TRUMPF successful and keep the company moving forward. The best way to tap into this motivation is to apply the kind of methodologies that are most appropriate in today's world."

ANDREAS WITT – Head of Software Development

NOTE

Agile = constant process of change, continuously reflecting and optimizing. Also important to devote a relatively large amount of capacity to planning + presentations for the project team in order to ensure their work is coordinated and harmonized
→ difference to former, more isolated style of working.

v

WHAT IS AGILE?

Glossary

PRODUCT OWNER

What are the priorities? What do we need to do? Specifies technical requirements and prioritizes product backlog items. Represents the interests of all stakeholders.

→ ANIKA BANK:

Why agile methods are useful is now clear to me. But what exactly do these methods look like, what is behind them, which processes are there? What is different than before? The procedure for the new type of project and product management is called "scrum," which means "hustle." It includes various positions, which would be:

AGILE OR SCRUM MASTER

How efficiently are we working? What is impeding us? Manages the process, removes obstacles, coaches team on how to apply scrum practices, supports product owner in prioritizing backlog items.

DEVELOPMENT TEAM

How do we do it? This interdisciplinary and cross-functional team organizes and manages itself; everyone contributes to its success regardless of their hierarchical position or qualifications.

PRODUCT BACKLOG

Contains a list of requirements and deliverables that are prioritized and subject to change at any time. This list is continuously updated, generally online to ensure it is accessible to everyone.

DAILY SCRUM

The daily scrum is a brief standup meeting in which each person provides a quick report on their work and their plans for the day.

REVIEWS

Have the scheduled tasks actually been completed? Were the specified objectives achieved? Presentation to stakeholders of increments of completed items from the sprint backlog, plus soliciting feedback on the results of the iteration.

RETROSPECTIVE

A meeting or series of discussions held at the end of a sprint. The retrospective enables the team to reflect on what happened in order to pursue continuous improvement.

SPRINT

A period/block of time devoted to a segment of work with concrete objectives. Each sprint follows on directly from the previous one. They generate a fixed rhythm in the development process, and the end of each sprint marks the completion of a self-contained product increment.

SPRINT BACKLOG

Contains the list of tasks that must be completed to meet the agreed objective for the current sprint. The backlog provides the basis for organizing the sprint team.

PLANNING

In this step, the team transfers the high-priority requirements from the product backlog into the sprint backlog, where they are divided into tasks for that particular sprint.

NOTE

Based on Douglas McGregor's division of human motivation into Theory X (people who need to be motivated) and Theory Y (people who are motivated and consider work to be a source of pleasure), it's clear that you can achieve the most by having large numbers of motivated people. The aim is no longer to stipulate how something can be achieved but rather to foster each employee's own sense of motivation, producing a dynamic that yields very good results and making them a Y person.

..... HOW DOES TRUMPF APPLY AGILE METHODOLOGIES?

Sprint

→ ANIKA BANK:

_____ I decided to take a closer look at how this all works in practice at TRUMPF. To do that, I took part in a meeting held at the end of a sprint for a project to develop a modular 2D laser system.

WHAT I EXPECTED

- Meeting (maybe about one or two hours) at the end of a defined period of time, in which each person involved in the project briefly presents how their work is going.
- A fairly small group, around ten people.
 - Held in front of a mobile workshop board or something similar, a stand-up meeting.

WHAT ACTUALLY HAPPENED

- Large numbers of people may take part.
- There are several parts to the sprint changeover – in this case a review, retrospective and planning session.
- It can sometimes last an entire day.

In the project to develop a modular 2D laser system, sprint changeovers take place once every three weeks. I took part in number 40; this sprint cycle has already been running for around two years. The project involves a total of some 70 employees, including colleagues from Neukirch in Germany, Switzerland, China and the United States. That's really a lot of people, far more than I was expecting. On that day, 31 people took part in the sprint changeover, some of them via video conference. They come from a range of different departments – for example people from the mechanics and e-design teams – and they are all working together on various modules in the project, such as materials handling and simulation results. The employees started presenting their modules,

each of them taking 5 to 10 minutes to show what they had achieved over the past three weeks with the tasks assigned to them and what still needed to be done, and announcing the next task they would be tackling. Each presentation was followed by comments, feedback and/or questions from the group. This achieved two things: complete transparency with regard to the current status of people's work, and support and feedback from their colleagues. In the subsequent planning session, part of the team scheduled available capacity until the next sprint changeover in three weeks' time. Clearly, some of the biggest benefits of sprints lie in projects with lots of participants who work at different sites and in different departments and who need to be kept informed.



REPORT ON THE TRAINING DEPARTMENT

Hierarchies?

↳ ANIKA BANK:

What kind of agile approach can be applied to training?

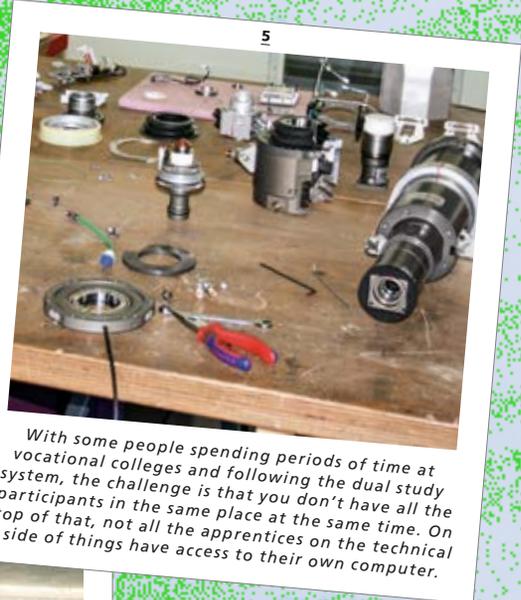
My research into agile collaboration at TRUMPF also led me to the company's training department at headquarters in Ditzingen. The idea is to use agile methods right from the start, just as people are embarking on their careers. I wondered how the concepts of agile and training would fit together, and how they could apply Industry 4.0 to this topic.



The training department designs, builds and operates its own machine for training purposes, running through all the same stages that you would need to develop a "real" machine. Let's see how it works!



Apprentices work with experts from different areas, breaking down rigid hierarchies in the process. So even if the Scrum Master is an apprentice, they are definitely expected to step up and say what the next steps will be.



With some people spending periods of time at vocational colleges and following the dual study system, the challenge is that you don't have all the participants in the same place at the same time. On top of that, not all the apprentices on the technical side of things have access to their own computer.



But by using pinboards and workshop boards, the team keeps all the individual stages and process visible at all times, so everyone is kept up to date on the current status.

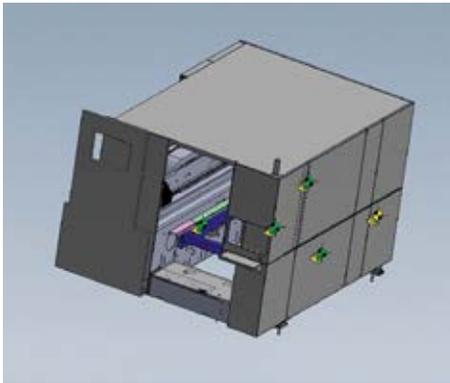
NOTE

Denis Gabriel, Agile Coach at TRUMPF, emphasizes one of the key points to remember: "Think about the customer when you're working on communication! That's the key to agile collaboration: always keeping the focus on what your customers need."



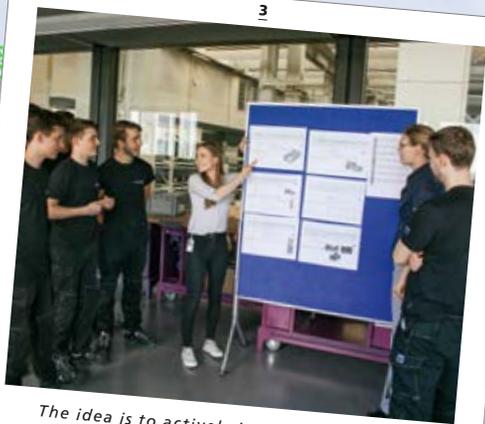
REPORT ON THE TRAINING DEPARTMENT

2



The project is still at an early stage, but it illustrates how agile methodologies are being applied in various parts of the company – and are already a key component of hands-on training.

3



The idea is to actively involve 170 students and apprentices from different departments in the project over the next three years, and to accompany them on that journey.

6



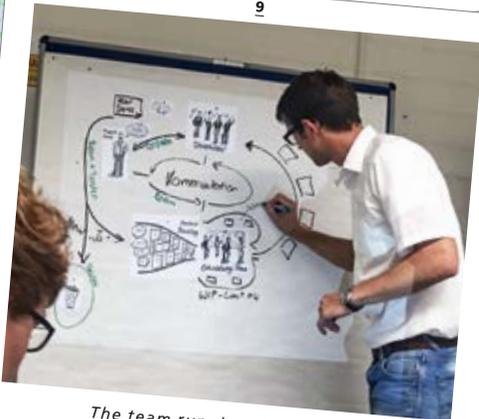
The traditional kinds of project-management methods that require a computer didn't provide proper transparency to each and every individual.

7



That's why the training department wants to move with the times by using the methodologies that currently have priority within the company and are in widespread use.

9



The team running the training project is supported by the Project Competence Center, which provides advice on agile practices and conducts training sessions on agile methodologies.

10



Just like in all projects, there are no fixed formats or rigid methods of agile collaboration. Each project team has to make its own decisions on which methods they will use, and in which format.

EXAMPLE: THE WEBSITE PROJECT

Complexity

ANIKI BANK:

Agile methodologies were also applied to the relaunch of the TRUMPF website (www.trumpf.com). The project began in May 2015, and its number one goal was for the new website to go live by the INTECH in-house exhibition in April 2017.

WHY USE AGILE?

- Requirements and volumes of work change as the project moves forward. For example, the Smart Factory field didn't even exist at the start of the project, so it had to be incorporated later down the line.
- Many different participants; a complex project involving external providers.
- Interfaces with a variety of departments, all of whom are represented on the new website, plus the inclusion of different languages and different countries.
- A fixed deadline by which the project needed to be successfully completed
 - Content creation and content development took place simultaneously.

CHANGE IN APPROACH

- A shift from a linear process with clearly delineated phases and disciplines (such as creation, design, content development) to frequent and regular synchronization and collaboration between different departments in a workshop format.
- A shift from estimated costs and deadlines and a scope that is fixed to fixed costs and deadlines and a scope that is variable.
- Populating the website with content took place in parallel to the design process, not just right at the end.
- Customers involved throughout the process, not just right at the end.
- A shift away from "waterfall thinking" (succession of completed work packages such as requirements definition, design, implementation).

5,769

→ | person days were spent on the project

120

→ | people were involved in the project in total

4,693

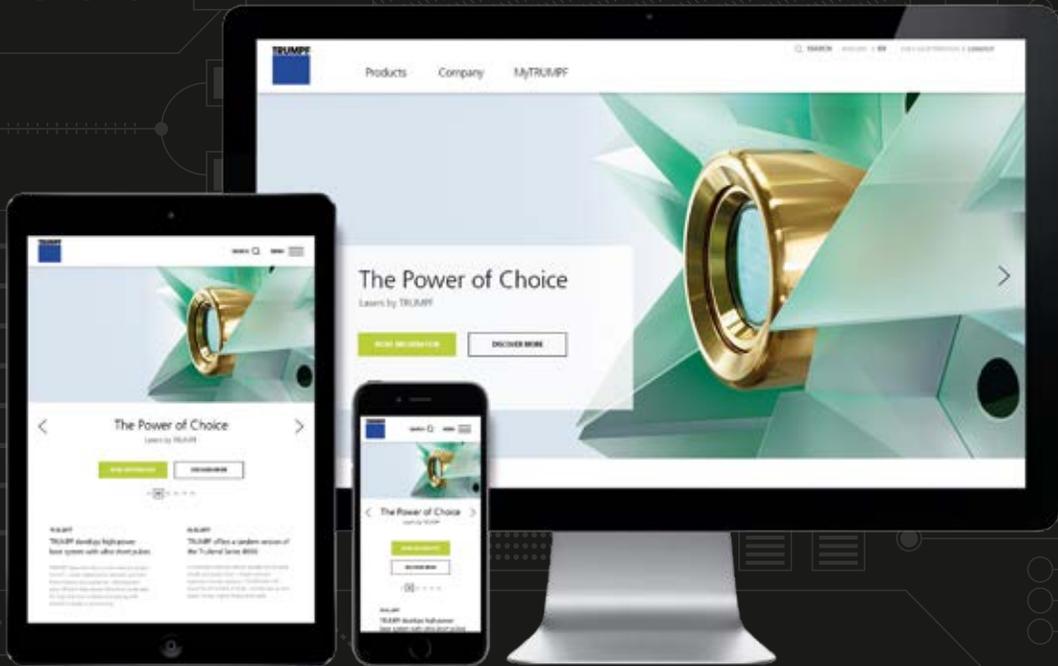
→ | visitors browse the website every day

27

→ | country-specific versions are available in 17 languages

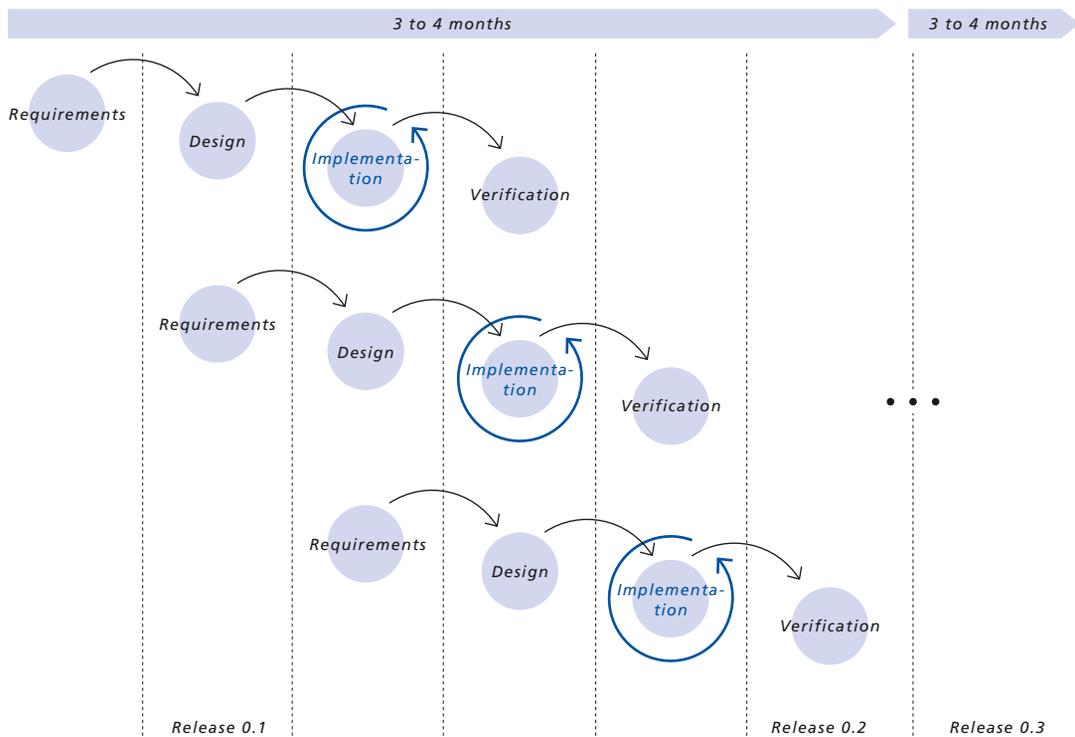


EXAMPLE: THE WEBSITE PROJECT



AN AGILE APPROACH

CONTENT CREATION AND DEVELOPMENT TOOK PLACE SIMULTANEOUSLY







Tools 4.0

**LASERS ARE THE
IDEAL PRODUCTION
TOOL FOR
DATA-DRIVEN
MANUFACTURING.**

Clever all-around talent

LASERS ARE SMART
FOCUS: THE NEW DISK LASER
DOCUMENTATION

Information flows are a frequent topic in discussions about tomorrow's production world: data analysis, self-learning algorithms, intelligent control systems for flexible materials management. But information is not an end in and of itself; after all, the aim of all this intangible data is to create (physical) products that make our lives easier. Ideally, in today's market, that means customized mass production in which numerous parameters can be adjusted to adapt the basic product to each customer's desires. But what tool is capable of interpreting so much information and using it to produce workpieces that meet these demands? Digitalization à la Industry 4.0 needs an instrument just like itself: capable of moving swiftly, flexibly and directly from one line of code to the next. In short, the best tool for data-driven manufacturing is the laser. It converts raw data into physical structures while delivering huge quantities of measurement and empirical data for the smart factory's digital process chain.



LASER PROCESSING

A thin beam of light stands between the data and the physical product. And it can do everything: ablate, coat, drill, cut, join, and anything else imaginable.

**DELICATE STRUCTURES**

Optical elements have to be kept clean. A laser beam source consists of numerous sensitive components such as lenses, diodes and beam guidance.

A laser beam is swift, flexible and direct. There's no material in the world that it can't process.

Laser material processing has digital bits encoded in its DNA. From day one, numerical control was the only option for engineers wishing to gain mastery over light, and they have since gathered 50 years of experience with this incorporeal phenomenon. This is a huge advantage for those tackling the challenges of the modern world in general and data-driven manufacturing in particular. The laser is a fully mature industrial tool that meets all requirements and can be immediately put to work. It is swift, flexible and direct. Ablation, coating, drilling, cutting, joining, metallurgical transformation, tempering glass, and roughening, smoothing or cleaning surfaces: laser light can do it all. There's no material in the world that laser beams can't process: glass, plastics, organic compounds, and every type of metal. If smart factories are in their infancy, lasers are already "grown-up."

LASERS DON'T CARE **WHAT YOU ASK OF THEM**

The trend toward ever more product variants, special editions, personalization and flexible batch sizes has spread to almost every sector of industry. This has driven up the cost of mechanical tools and led to absurdly long retooling times – sometimes longer than the actual production process. Lasers, by contrast, require neither special tools nor retooling. The major automotive companies have long since eliminated all mechanical machining steps downstream from the forming press, such as milling or drilling, and have set up laser

Lasers have
digital bits encoded
in their DNA.

stations instead. When designing car doors, for example, the raw body part is cut in such a way that it can be used in the maximum number of different models. In the subsequent processing stages, it makes no difference to the laser whether the angles have to be flatter for the soft-top version or wider holes have to be drilled for the station wagon version. The data package gives the instructions, and the laser executes them immediately. Intelligent scanner optics require nothing more than the data from the 3D simulation software to direct the laser to the right weld spots – without having to be taught. The tool adapts automatically to the workpiece.

The laser head asks the
workpiece, "What can
I do for you today?"

BATCH SIZE ONE **ON DEMAND**

Connected manufacturing goes a step further by enabling workpieces to determine how they are to be processed. The laser head meets the workpiece and asks, "What can I do for you today?" In tomorrow's smart factories, each workpiece will bear a data matrix

**CLEAN ROOM**

Laser systems are high-tech products that demand special know-how to ensure the smooth interaction between the various components and the correct processing results.



“The latest generation of TruDisk lasers is not only the most advanced and smartest, but also the most compact and energy-efficient generation of disk lasers that we have ever developed.”

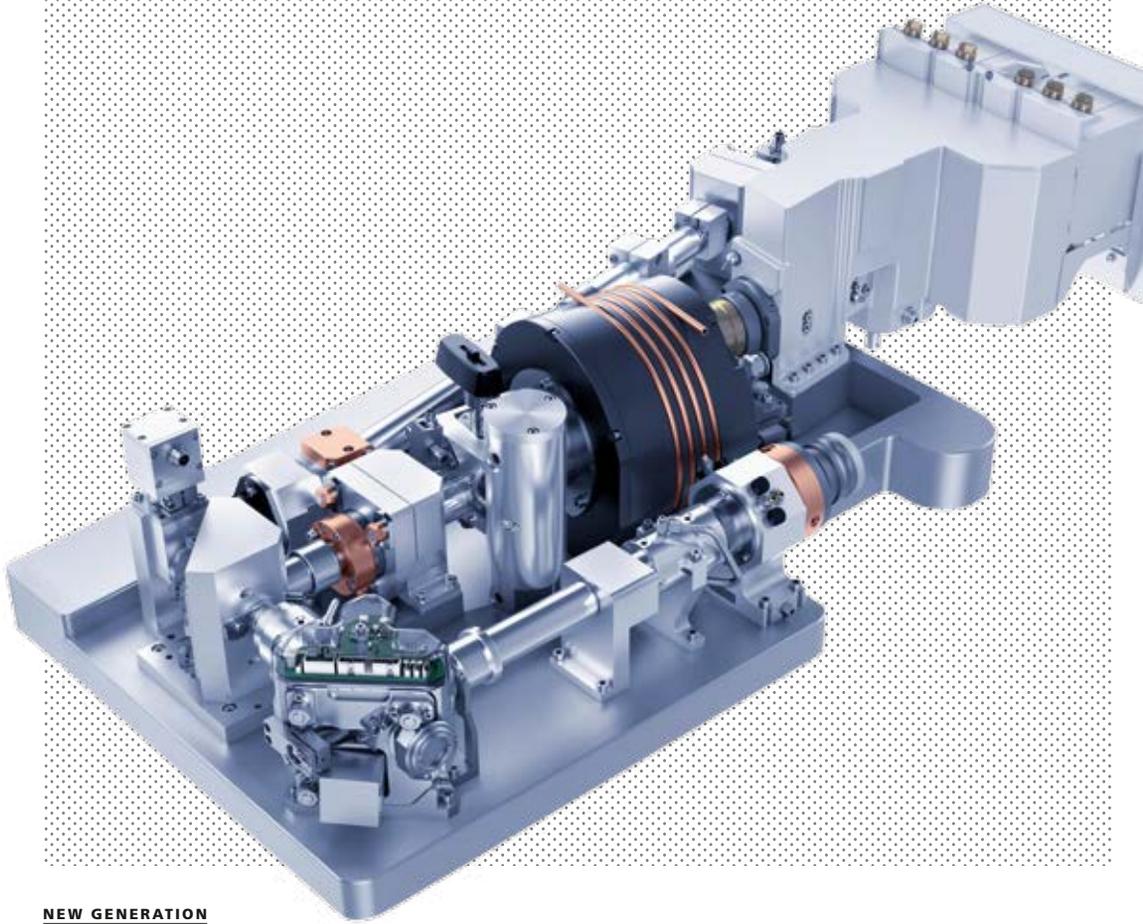
KLAUS LÖFFLER
*Managing Director and
Head of Sales at TRUMPF
Lasertechnik GmbH*

INSIDE THE LASER

*A look at the laser resonator:
The mirrors in the optical
cavity guide the pump beam
emitted by the diodes through
the disk crystal multiple
times in order to concentrate
the laser beam.*







NEW GENERATION

The TruDisk disk laser is recognized as the most advanced high-power solid-state laser on the market.

code enabling the system to retrieve information on its planned route through the production plant and what machining operations are required. Transport systems and machining stations are linked into the process. Integrated production systems like this need highly flexible tools that are easy to control, such as the laser. The data matrix codes are applied by a laser marking system, making them clearly legible on any surface, and checked by cameras during the labeling process. These codes also contain other information permitting full traceability throughout the manufacturing process – the beginning of a real smart factory.

3D PRINTING IS THE CULMINATION

Additive manufacturing based on laser deposition welding or powder-bed 3D printing takes this approach to its ultimate form. As soon as the machine receives a data set, it

produces whatever it is asked to do. The engineers' ideas flow from the design program to the laser machine, where they can be instantly converted into real components: idea -> light -> object. As for part geometry, the engineers have maximum freedom, and can design new lighter, smarter and better parts. These features of laser-based additive manufacturing and 3D printing are the purest expression of data-based manufacturing.

Smart factories are in their infancy; lasers are already "grown-up."

When the laser was invented in the 1960s, it was often decried as a tool in search of an application. Now it looks as though it has found its true vocation as a facilitator of the data-based society.

NEW GENERATION OF TRUDISK DISK LASERS

The new TruDisk lasers are perfectly adapted to smart factory applications. Thirty or so synchronized sensors record various measurement data such as light scattering, laser output, temperature and pressure – the perfect basis for automated data analysis.

advanced
intelligent

THE BEST BEAM QUALITY
at every output

SIMPLE, MODULAR STRUCTURE

ROBUST AND RELIABLE
even under extreme ambient conditions

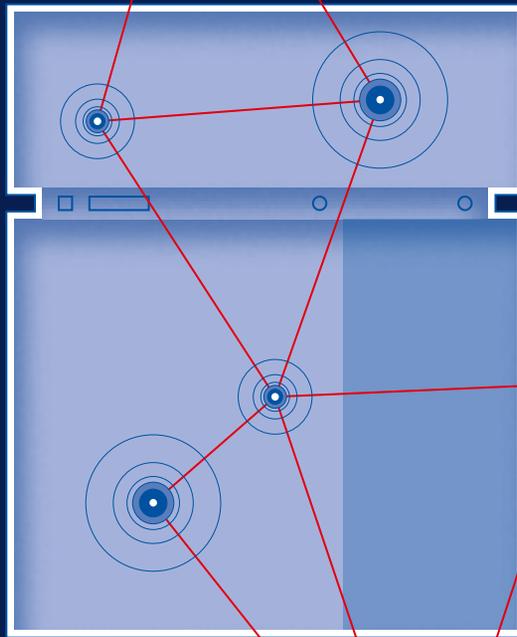
50%

SMALLER FOOTPRINT
compared with its predecessors

FLEXIBLE COOLING SYSTEM
integrated heat exchanger or integrated cooling compressor

DIRECTLY CONNECTED TO DOMESTIC WATER SUPPLY
max. inflow temperature of 28°C or 38°C

EXTERNAL COOLING not required



PROVEN DISK LASER DESIGN
unaffected by back reflections

CONTROLLED LASER OUTPUT
100% constant performance

ENERGY SAVINGS
energy-efficient pulse function in short laser-off times

REDUCED off-axis diode current

THANKS TO **30** SENSORS
monitoring important parameters

SYNCHRONIZED DATA RECORDS
based on Precision Time Protocol

INDUSTRY 4.0
high-quality data for virtual analysis

compact
energy-efficient

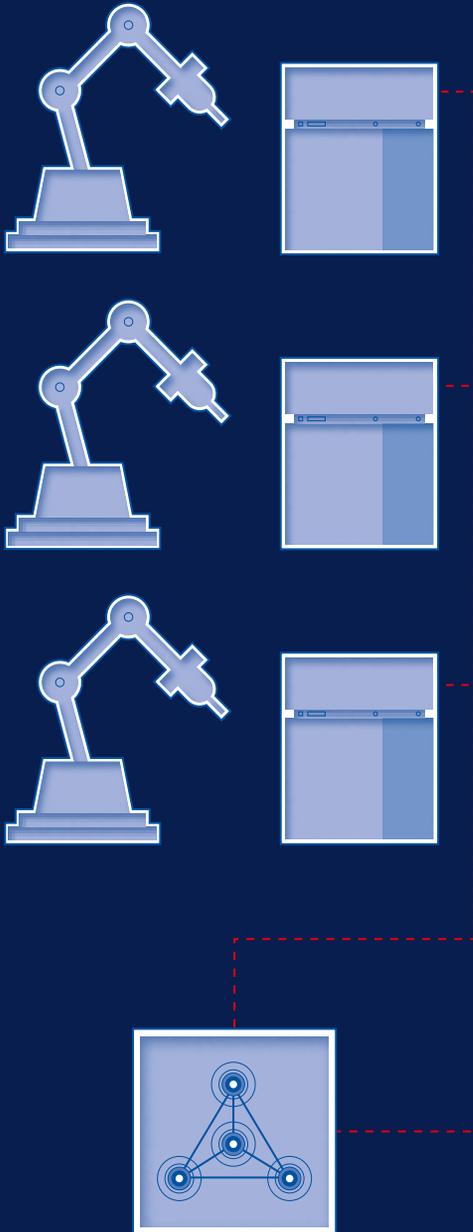
SMART SERVICES FOR LASERS

THE FACTORY GATE

Secure data transmission

Task: Sending selected, IT-secured data from the laser to internal systems and TRUMPF service experts.

1



FACTORY GATE

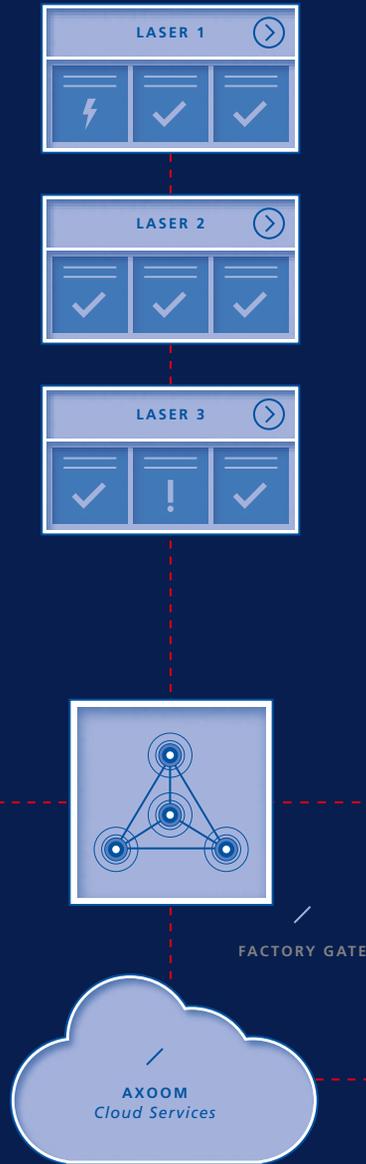
TruConnect

SMART VIEW SERVICES

Dashboards for current status

Application: Providing an up-to-date overview of relevant information such as status, capacity utilization and maintenance work for the entire laser pool.

2



FACTORY GATE

AXOOM
Cloud Services

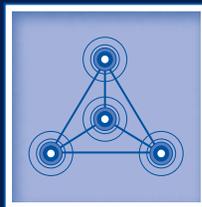
TruConnect

CONDITION MONITORING

Analysis and predictions

Function: Algorithm- and expert-based trend analysis of condition data to determine the risk of laser failure and avoid unplanned downtime.

3



FACTORY GATE

TruConnect

DATA BASED SERVICES

Storage capacity

Use: Storage of process data over a number of years for quality assurance, monitoring and documentation of production quality.

4



TruConnect

Gazing into the future

**CONDITION MONITORING
AT DAIMLER**
SIDE STORY



Industry 4.0 holds great potential for increasing productivity through new forms of collaboration between customers and system suppliers – especially through connected, predictive maintenance services. For example, TRUMPF increased the capacity of its laser welding lines by helping to reduce downtime at Daimler, and optimized its internal operating processes at the same time.

TRUMPF AND AXOOM COLLABORATE WITH DAIMLER

Every laser and optical system used in production processes gives rise to thousands of measurements concerning states and events: actual laser output, delay, average pulse energy, cooling water pressure, and so on. In the past, this data often led a useless existence, as it was not systematically evaluated, depriving operators of a golden opportunity to learn from past experience and predict future developments. Car manufacturers wanting to exploit the potential of this data trove joined forces with TRUMPF in a project to design an architecture for the Internet of Things that benefits both partners and supports their business ambitions. The TRUMPF Condition Monitoring system detects problems before they cause damage.

SYSTEMATIC OBSERVATION AND TREND ANALYSIS

Laser welding is an everyday activity in the Mercedes-Benz plant in Sindelfingen, Germany: groups of robots equipped with I-PFO intelligent scanner optics weld the doors and tailgates of the E-Class vehicles, powered by a network of TruDisk disk lasers. The data derived from the lasers, processing optics and process sensor are sent to other stations on a kind of in-house data highway. Some of the data is uploaded to the AXOOM Cloud via the Internet. Algorithms and real TRUMPF experts then set to work transforming the data into trend analyses. The aim is to avoid failure events and identify ways to improve efficiency.

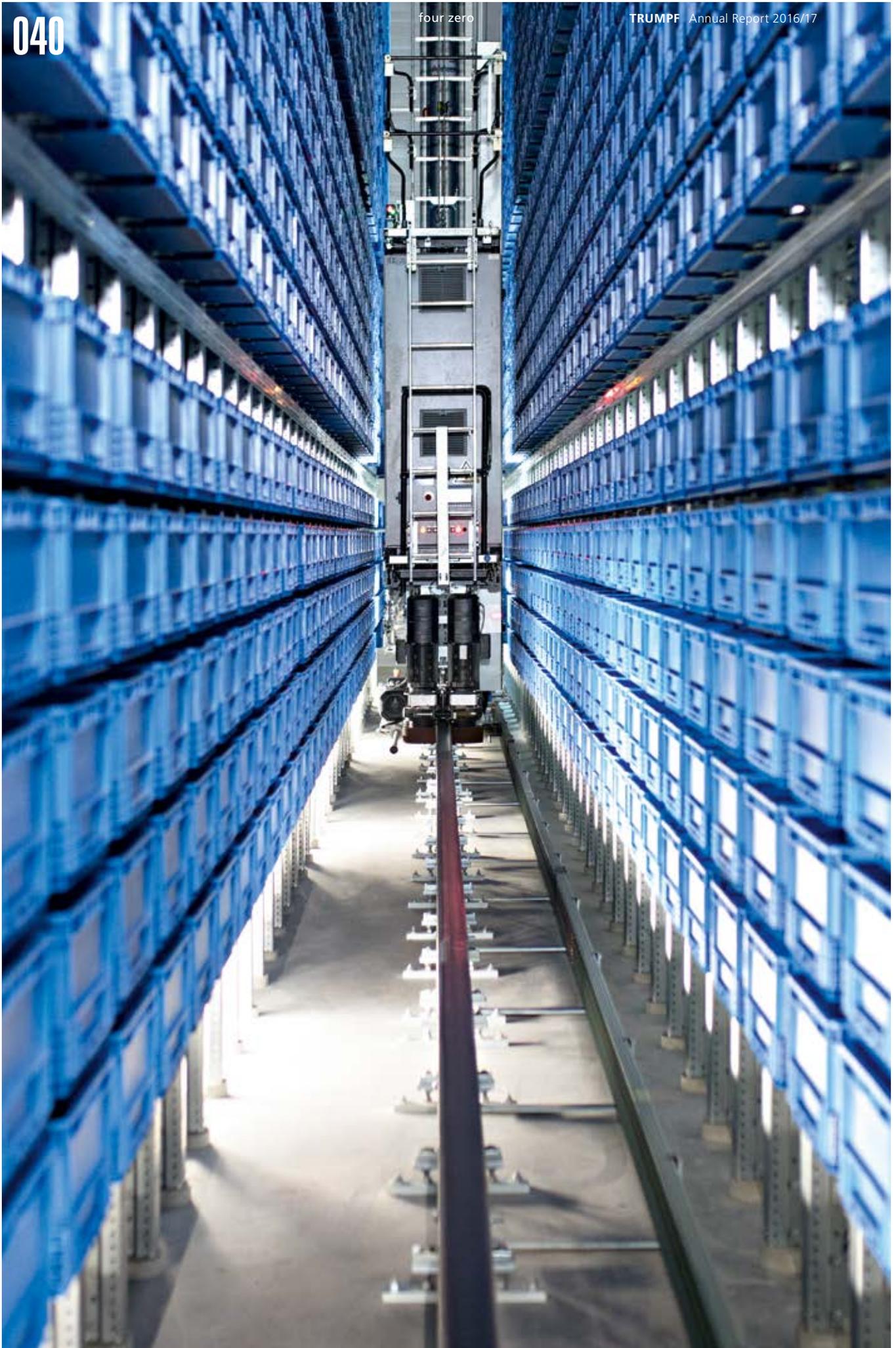
This has had successful results. For example, the team in Sindelfingen noticed that measured values for laser beam reflection were changing as time went by. It wasn't immediately possible to determine what had caused this change, but it was obvious that something wasn't quite right. The TRUMPF service technicians got in touch with the relevant system specialists at Mercedes-Benz, who were able to trace the problem to a focusing angle that had been misadjusted by the self-teaching algorithm. It was immediately corrected, and there have been no further problems.

To supplement the expert knowledge of TRUMPF's employees, Smart View Services have been introduced. These enable Daimler employees to detect and resolve many minor anomalies on their own, thanks to the user-friendly live overviews provided in the central customer portal. Anyone with access to a PC or smartphone can check the status of the plant, at any time and from anywhere in the world. As a result, the availability of the laser welding machines has increased significantly.

TRUST AND IT SECURITY

All data forwarded from the laser systems is reported to Daimler using encrypted data connections. Data logistics and secure IT connections to TRUMPF were designed in a joint process based on mutual trust. Both partners expressed their willingness to learn so that they might profit from the benefits of digitalization. TRUMPF received the 2017 Daimler Supplier Award for this outstanding show of collaboration.







Processes 4.0

WHEN CUSTOMERS
ORDER SPARE
PARTS, IT'S ALMOST
ALL-DIGITAL TODAY.

The universe of scanners

DELIVERY OF SPARE PARTS TO CUSTOMERS

REPORTAGE

Nowadays, orders can be placed from anywhere in the world, and are compiled automatically from stocks in numerous warehouses. Online ordering is standard procedure these days. The customer doesn't care whether the books, electronic goods or clothes they order are sent from one warehouse or several different ones. It's much the same for TRUMPF: when customers order spare parts or consumables for their machines, the most important thing is that they are delivered on time. It's irrelevant where they come from or who delivers them – what counts is that the truck turns up at the factory on schedule. But before the driver gets there, he has to pick up the consignment, and that demands a well-organized logistics process – in keeping with the principles of Industry 4.0. To take a closer look at what this involves, we followed an order placed by company owner Walter Haimerl. To restock his inventory of spare parts and consumables for his TruMatic 1000 combined laser cutting and punching machine, he placed an order for punching tools and laser cutting nozzles – online of course.



**WIDE AND HIGH**

The new TRUMPF logistics center has a surface area of 13,000 square meters, a ceiling height of 18 meters, and delivers more than 60,000 stock items per month.

1:37 P.M.

Order placement

1



Walter Haimerl has a combined laser cutting and punching machine. It is in operation for many hours each day, because his order book is relatively full these days, but this leads to increased wear on the material. To minimize the risk of production downtime, he has ordered new stocks of punching tools and laser cutting nozzles through the

MyTRUMPF online shop. The service portal saves the product information provided when the customer placed the first order, allowing it to be retrieved to simplify and speed up the processing of future orders. As soon as Haimerl has sent off his order, the various TRUMPF stations automatically set to work on its fulfillment.

AREA

– Punching tool production –

“The customers start the machines themselves when they order – it couldn’t be more direct or digital.”

2a

2:14 P.M.

Start of production



The punching tools start their journey in the punching tool factory in Gerlingen, Germany (48° 48' N, 9°4' E). By clicking on the order button, the customer gives the go-ahead for end-to-end, automated processing of this specific order. In the first step, the order is passed from the E-Shop to specially programmed I4.0 software. The software prioritizes the incoming orders, fully autonomously, generates the machining programs, and forwards them to the first machine in the production process. Here the correct die blank and punch are selected for the tools the customer ordered.

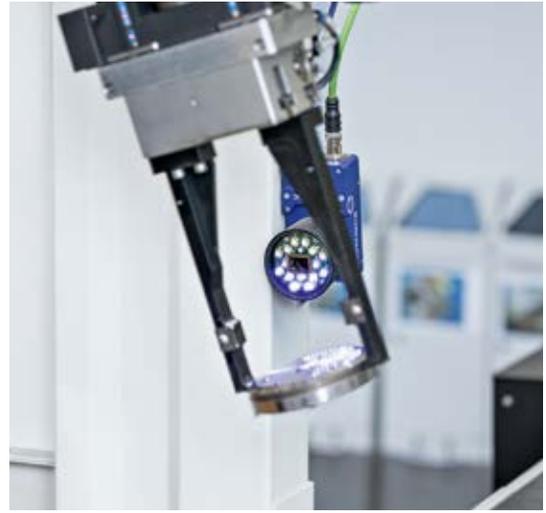
3a



Since 2015, every blank is labeled with what is called a data matrix code. This code, which is non-specific to start with, is linked to the order when processing begins and filled with the customer's data. Each blank is thus uniquely identifiable through its data matrix code, and the information it contains ensures real-time transparency during production – and minimizes errors.

The use of data matrix codes helps standardize processes. This important aspect of Industry 4.0 saves time, money and capacity that can be put to better use elsewhere. For the employees in Gerlingen, this new method of working makes their days calmer, more organized, and easier to plan – stress and hurry are things of the past.

Through measures like this, the punching tool factory has already achieved several of the goals of digitalization: sharing information, avoiding errors, making processes standardized and efficient. This has made the site profitable and fit for the



3:03 P.M.

Customization



future. But there is still a need for people, because there are some things that machines cannot do. Creativity is one of them – for example when designing special-purpose tools. Nor can they replace the human element: customer management.

THEN AND NOW

STATEMENT

What Bernd Hegele missed in the digital world was contact with the machines. Now he contacts customers.



BERND HEGELE
Customer loyalty

“When I suddenly found myself having to operate several machines at once, I thought it would be too much for me. I didn’t feel at home with the idea. I was used to a more hands-on approach, after training as a fitter in the mid-1970s and working for decades on an electrical discharge machine for punching tools, which we programmed the old way, using punched tape. I even developed my own techniques for certain operations. I was personally involved with every tool I made.

Then it was decided that the machines needed to be connected to a database. This couldn’t be done with the old machines, so they were replaced with new ones. From one day to the next, it was no longer my job to deal with incoming orders, or sort through them and assign priorities, or even program the machine. I’d lost contact with the machines – and that caused me to lose my motivation. Luckily, we’re a close-knit team here and I was able to talk openly about my worries. I was given a new set of responsibilities and now I look after suppliers and make special deliveries to customers.”

THEN AND NOW

STATEMENT

Digital networking enables Jens Mayer to supervise an entire fleet of machines.



JENS MAYER
Machine supervision

“I joined TRUMPF ten years ago, as a trainee warehouse operator. After working in the Gerlingen warehouse for four years, I decided to change direction and train to become a manufacturing technician specializing in CNC machining. My goal was to get closer to the machines. I’ve been doing that for nearly three years now, just in time to see the end of the paper age. I was taught the ropes by my predecessor in this post, Bernd Hegele. (see above)

My daily work is extremely varied. I am responsible for the eroding, grinding, and laser labeling systems. I monitor all steps in the production process and transport the tool parts from one machining station to the next. Once I have loaded them and scanned in the data matrix code, everything else runs automatically. Since paperless working was introduced, the processes have become much faster and more reliable. There’s no longer any risk of orders being mixed up. And it’s much easier for us to deal with day-to-day fluctuations in the workload than in the past.”

3:54 P.M.

Laser labeling



4a

The 85 employees in Gerlingen handle orders for a total of 800 to 1000 individual items each day. These include the punching tools ordered by Haimerl, which are now ready to move on to the laser labeling station. The data matrix code is scanned automatically to read out the necessary information. This means that, in the future, this entire step can be automated using a flexible robot cell.

5a

4:25 P.M.

Packing

The labeling helps with the final step, namely order picking and dispatch. Here too, most of the tasks are carried out by automated functions. The person in charge of packaging is notified as soon as an order is complete, i.e. all ordered items are ready for dispatch. Thanks to smart digital networking, orders for standard tools placed before 2 p.m. can be dispatched the same day. An on-time delivery rate of 98 percent confirms the reliability of this process. Once the freight forwarder's truck has collected the consignment of punching tools, it is delivered directly to the customer.

Well, almost: first, a short detour to the logistics center.



AREA

– Logistics center –

3:36 P.M.

Order preparation

2b



Until a year ago, TRUMPF's international logistics center was still housed in a converted spice mill. But the company has grown so much that bigger premises were needed to store spare parts and consumables for its machines. The new logistics center provides plenty of space for both present and future requirements – the 13,000-square-meter warehouse holds well over 30,000 products. As in Gerlingen, the customer is the linchpin of operations: no process is started without an order. And in the logistics center, as in the punching tool factory, all processes are digital and connected.

But unlike in Gerlingen, no products are manufactured in the logistics center. Its sole purpose is to distribute parts of all kinds to customers, including nozzles for laser cutting machines. Since Walter Haimerl ordered these as well, the system sends a request to the automated small parts store (AKL), which keeps such products in 23,000 shelf spots.

The logistics center also contains a four-level, manual shelving system for slow-moving items, i.e. rarely ordered parts, and several pallet racks for outsize and bulky parts.

“The employees use paperless, digital processes to manage all incoming and outgoing material flows.”

3b



One of the blue crates custom-designed for TRUMPF's automated small parts store contains the sought-after stock of laser cutting nozzles. It is automatically selected by the order picking system, placed on a conveyor belt, and sent to the manual order picking station. With the support of a luminous display and a picture of the ordered product on his monitor, an employee takes out the required number of nozzles, clicks on a button to confirm this action, and the crate is sent back to its storage location.

3:49 P.M.

Order picking

THEN AND NOW

STATEMENT

Diana Börkel processes returned goods – often from a home office in her living room.



DIANA BÖRDEL
Returned goods management

“My office at work looks a lot different from the way it used to be. It’s not just that it’s brighter, more ergonomic, and more open-plan. The biggest change is that there is a clear space around my desk, whereas in the past it was surrounded by piles of packages filled with parts returned by customers. Each one represented a complicated case needing further investigation.

I still work on such cases, but I don’t have to examine the actual goods anymore. Since the new logistics center opened, the processes are now digital and I only ever see the evidence in virtual form. This evidence is collected by coworkers on the shop floor and documented by means of scanned shipping documents, photos, and written descriptions. It felt strange to start with, because I couldn’t actually see or touch the parts. But I can work much faster now that I don’t have to unpack the goods and inspect them myself. I can easily keep track of unresolved issues and, what’s more, I don’t have to be in the office every day: I can work from home with my laptop – something I’d never believed possible!”

THEN AND NOW

STATEMENT

Philipp Marschand designed the new logistics process landscape.



PHILIPP MARSCHAND
Logistics process planning

“I was a team leader in the returned goods department when the project to build a new logistics center was launched. I was asked so often to provide advice on how the processes should be organized that I proposed myself as a full-time consultant. That’s how I became a member of the planning team, where I was faced with innumerable exciting challenges. All three aspects of the project – the building, logistics equipment and IT – were dealt with in parallel. The first storage bays were installed before the builders had moved out, and we used emulations to test the software before the physical warehouse configuration had been finalized.

To ensure sustainable IT processes, we started by analyzing the current and projected workload. We then investigated different warehouse management principles before testing the initial concepts to find the appropriate software. We finally decided to use an SAP-based software solution adapted to TRUMPF’s specific needs, because we knew that this would fit in with the systems used in other areas of the company.”

4b

4:20 P.M.

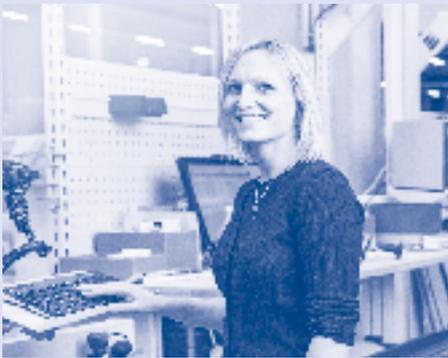
Packing

The blue crate containing the ordered laser nozzles has arrived at the packaging station, after traversing the building on a conveyor belt. The distance traveled depends on the number of other orders being processed at the same time, and which ones have priority. The logistics center is very flexible in this respect: an ingenious combination of automated and manual warehouse management processes makes it possible to respond rapidly to changes such as fluctuating order volumes and still deliver the merchandise as quickly as possible.



THEN AND NOW
STATEMENT

Sabrina Pfeifer's most important tools? Scanner and enter key.



SABRINA PFEIFER
Incoming goods inspection

“My contribution to the new logistics center is master data – loads of it. Each part's data sets, containing information on the weight, size, type of packaging, and in some cases expiry date or hazardous material class, are essential to the smooth functioning of our new warehouse management system. For example, the system uses the weight and size information to calculate the total volume of a consignment, allowing it to be allocated to a suitable storage location. The goods practically store themselves, fully automatically. And priorities are taken into account, too: items that are asked for less frequently are placed in the more remote storage locations.

The check-in system ensures that nothing gets lost. Every crate has a barcode, and so does every compartment of the transport carts. The two items of information are linked when I scan in the codes – and remain so until the product is removed from the cart and put away in its allocated place in the warehouse. This action is confirmed with another swipe of the scanner, and then nobody has to hunt for anything anymore. Transparency like this is a real asset!”

“Some 60,000 items are dispatched each month. That adds up to around 270,000 packages a year.”

5h

5:59 P.M.

Checkout

Once the goods have been neatly packed and labeled, the scanner is used one last time to check out the package. This is the key feature of the new processes: every time a product is moved from place to place, every time it is handled in the warehouse, the action is recorded using the scanner. This makes everything transparent, and above all absolutely reliable.

To expedite the packages without delay, the number of goods receiving and dispatch gates has been increased to fourteen in the new warehouse, as opposed to three in the old one. And this is where the laser cutting nozzles embark on the last leg of their journey.

The freight forwarder's truck that picked up the punching tools in Gerlingen earlier in the day is ready and waiting. And Walter Haimerl will soon receive his order. Industry 4.0 in real life.







Bringing industry 4.0 alive

CONNECTED
PRODUCTION
LIVE AND
HANDS-ON IN
CHICAGO.

The beauty of connectivity

TRUMPF'S SMART FACTORY IN CHICAGO

PHOTO REPORTAGE

When a working factory is set up in a showroom, manufacturing processes come alive. Once again, TRUMPF has gone to extraordinary lengths not only by creating a hands-on experience of connected production but also by framing it in a futuristic vision that offers revolutionary perspectives. A control room equipped with numerous monitors, many of them transparent, looks directly out over the shop floor and all the machinery. And an elevated walkway spanning the entire production hall provides a bird's-eye view of the digitally connected facility. TRUMPF's smart factory in Chicago shows the modern face of sheet metal processing using the latest tools. Unlike other demonstration centers which focus on individual products, here visitors can see the fully orchestrated interaction between elements in the production system. The Chicago demo center enables customers to visualize their entire value chain and even place orders there.





Chicago was consciously chosen as the location for the Smart Factory. The directly adjacent states contain around 40 percent of the country's entire sheet metal working industry.



The building links the history of the Rust Belt as the oldest and largest industrial region in the U.S. with high-tech digitally connected production.



The Industry 4.0 offerings at TRUMPF are all subsumed under the name TruConnect. All the key TruConnect modules are in operation at the Chicago plant, enabling comprehensive demonstration of production according to the principles of Industry 4.0.



The control room – a command center with large display areas – makes various process parameters available in real time.





In a production hall measuring 55 meters in length, there is a connected sheet metal production with a central storage system as the centerpiece, which supplies the machine tools with material.



The focus of the Smart Factory is to advise and train customers on the introduction of digitally connected production solutions.



A bird's-eye view of the factory reveals a catwalk, the so-called skywalk: spanning the full length of the 55-meter-long hall, with its material and information flow, it emphasizes the fact that the production facilities constitute a single, overall system.





The skywalk is part of the cantilevered ceiling structure that was manufactured by a TRUMPF customer in Atlanta.



The production line is designed in such a way that entire real production processes can be carried out.



The construction costs of the 5,500 square meter building estimated at about 13 million euros. It was designed by the Berlin architectural office of Barkow Leibinger.



Digital transformation — Revolution or design challenge?

FUTURE

TECHNOLOGY

ESSAY

Klaus Kornwachs

When Thomas Newcomen invented the first practical steam engine in 1712 and James Watt patented his improved version in 1769, the world was astonished that it was even possible to transform heat into motion. This is understandable, given that there was no precise definition of energy at the time.

The history of technology teaches us that the development of a theory of thermodynamics and hence a common understanding of energy went hand in hand with the increasing use of engines to generate power. It was finally technically possible (and, in due course, theoretically comprehensible) to convert one form of energy into another on a massive scale.

The invention of the steam engine is not the only factor that led to the industrial revolution in England. Other reasons include the increasing accumulation of capital, the availability of plentiful raw materials, and a growing labor force resulting from the mass migration of impoverished farm workers to the new factories. Britain enjoyed special political privileges as a colonial power, enabling it to tap new sales markets overseas through its imperial policies, which increased demand for products such as textiles. The mechanization of agriculture and manufacturing processes, not to mention transport (the motor car), led in turn to the well-known economic, social, cultural, and political consequences of the industrial revolution.

The centrifugal governor in the steam engine could be regarded as the birth of automation.

One small detail that is often overlooked in this historical analysis is that in 1788, James Watt also invented the centrifugal governor, which he integrated into a later version of his steam engine to keep it operating at a constant speed. This could be regarded as the birth of automation, because these mechanical controls enabled the machine to operate regularly. It effectively broke the link between the machine's running time and the human operator's working time, because the need for someone to supervise the machine was replaced, at least to some extent, by a mechanism to keep it running at a preset rate.

Make no mistake about it: this governor was an early example of a small information-processing machine – albeit analog and mechanical.

Over time, governors and other control systems were built using electrical components, and finally using electronic circuits. Analog signal processing merged with digital computing, and programmable machines emerged as the successors to electro-mechanical computers.

These programs are based on specific algorithms, which are in turn based on a mathematical model of the process the program is intended to control. The basic principle of control systems hasn't changed at all since then, but the technology used to implement them has. Another change is that we now use such systems to control organizational and technical processes at the same time, an approach that can be extended to cover entire value chains.

The most complex solutions currently envisioned are smart, model-based, self-regulating systems that control an entire process chain – from product design and manufacture to

end-of-life disposal. They also support communication and service functions and can be used in the power grid to balance supply and demand, especially in connection with volatile renewable energy sources.

AUTONOMOUS SYSTEMS

Today, we use the term “autonomous systems” to refer to all kinds of highly automated structures, robots, industrial plants, self-driving cars, connected household appliances, and even autonomous weapons systems. These are controlled in principle by extremely complex, intermeshed data processing networks; yet strictly speaking, they are all still controls or governors, as they derive their target values from past measurements. They learn from their own experience, i.e. from a mathematical analysis of collected measurement data, or in other words their recorded system history. This development is more than just an evolutionary process in which performance increases with each new generation of technology – it’s more a case of automating automation.

According to Moore’s law, the performance of transistors in integrated circuits can be expected to double every 18 months, and this has proved to be true. But similar “doublings” can be observed in the performance of many other technologies, including steam engines, light sources, turbines, data storage media, communication systems and even agricultural yields. However, these doublings generally mean more of the same.

It’s more a case
of automating
automation.

These past leaps in efficiency are still not enough to meet the proposed climate protection targets, or at least not with the existing energy and mobility technologies and traditional forms of land management. For despite the green revolution, the increase in food production as it stands today will not be sufficient to feed an estimated global population of nine billion people in the year 2050. And current security measures are incapable of genuinely guaranteeing the stability, integrity and data security of the internet. Does this mean we are condemned to “more of the same” unless we make radical changes? Does progress necessarily have to be disruptive and its consequences revolutionary?

In the last decade of the 20th century, there was a sea change in attitudes regarding two main issues. The first is what is commonly known as digitalization (or more accurately, “informatization” of technology). Its spread has forced software engineers to think about the organizational context in which their IT products are embedded, as well as the devices themselves. An evident sign of this new development is the greater attention given to social responsibility in the annual reports published by many companies. The implementation of a problem-solving approach based on a strategy of product and service development has gradually begun to work its way into the mindset of many entrepreneurs, replacing the previous all-powerful yardstick of shareholder value.

Computers have achieved dominance through technology, a dominance that reflects what computers make possible – especially in the realm of organization and even more so in the

working environment. New technologies lead to new organizational structures, but organizational structures themselves are the framework within which technologies are developed, aligned and implemented. For many people today, the Internet has become their (virtual) workplace, and computers and Internet access together shape nearly every aspect of the working world.

The second issue to which the business world is responding is the environment. After environmental activists, the first to appreciate the risks were insurance companies and reinsurers. It took some time before manufacturers and service providers boarded the train. Environmental science has now shifted away from being a sentimental cause and grown into a serious scientific discipline, gaining ground to the point where companies have created new key performance indicators for it and recognized its potential for new, attractive business models.

THE DESIGN CHALLENGE

It would be easy to suppose that the combination of these two factors, digitalization and the environment, might lead to a convergence of energy and environmental technologies on the one hand and communication and information technologies on the other hand. The current debate on infrastructural vulnerabilities indicates that this convergence is already under way. But does this really mean that the digital transformation is a revolution in the conventional sense?

“Revolution” also expresses a sentiment that things are changing faster than people are willing or able to accept.

People often talk of revolution in the sense of an expected upheaval of circumstances that seem to be relevant to themselves. The public perception of technological revolutions is that they are more like road maps for a given sector of industry and, as such, constitute neither performance reports nor predictions but rather declarations of intent.

Seen this way, Moore’s law, mentioned earlier, is neither a law of physics nor a prediction, but the announcement of a deliberately planned timetable for a series of development targets, which just happen to have been realized so far. “Disruptive innovation” is the term of choice for those who want to heighten the sense of drama. But they’re forgetting that, in technology as elsewhere, past, present and future are a continuum. Each new technology grows out of and is contiguous with what went before. James Watt’s centrifugal governor was essentially inspired by an age-old system employed in windmills – his innovation was to incorporate it into his steam engine.

“Revolution” also expresses a sentiment that things are changing faster than people are willing or able to adapt. The acceptable rate of change varies from one individual to another, and from culture to culture. Youth-centric societies tend to make higher demands on their citizens in this respect, and are more resilient in the face of change, whereas societies with an aging population often find it harder to cope. Nobody knows where a revolution might lead, especially if you are in the midst of one. Progress is like a snail: it might seem slow, but if you take your eyes off it for a moment, it’s gone farther than you thought.

Does progress necessarily have to be disruptive and its consequences revolutionary?

The promise of Industry 4.0 has already given rise to other terms, such as Work 4.0 and the like. Whatever you call it, such developments can instill both fear and optimism, precisely because digitalization is spreading faster than ever. This means that more and more functions in technical devices and systems are being controlled by microprocessors and data, and mechanical, electrical and electronic control circuits are increasingly being replaced by algorithms. But we needn't worry that we are about to enter a totally dematerialized world. People will still need physical products and the means to manufacture, transport and dispose of them. And we will still have devices that take up space and generate waste heat, albeit less and less, and more discreetly.

**DIGITALIZATION ISN'T
LIMITED TO TECHNOLOGY**

Technological change affects our organizational structures and the way we manage our resources. On the other hand, our social, legal and economic infrastructures have a certain impact on technological developments.

Involvement and communication on all conceivable levels creates a feeling of being a part of things.

The totally dematerialized world is a myth: we will continue to manufacture, transport and dispose of physical products.

Many aspects of our social lives, political processes, and business activities are already controlled by algorithms. Despite their alleged capacity for learning from experience, and their ability to draw actionable conclusions from an analysis of previously collected data, the fact remains that they are written by humans. Algorithm designers deliberately gave them the ability to learn so they could relieve us of routine chores, while remaining within a set range of parameters.

The designers created models of the processes to be controlled by these algorithms, including business models. These algorithms could even be described as the ultimate incarnation of theories of business management and organization, just as algorithms used in a technical context need to reflect functional theories if they are to be effective. As a result, these theories have a huge impact on the way processes are implemented in the real world and the way we conduct our lives. But theories can go only so far.

This gives rise to two more questions, namely, whether such systematic processes are reversible, and who has the power to shape the outcome. Because it's no longer a question of whether autonomous systems are "doable" in the long or short term. The more important point is whether we really want this, and if so, what types of systems, their degree of autonomy, and how we foresee their functionality and usefulness. This is the design challenge.

Fears of a revolution won't be calmed by facile statements of appeasement. And it doesn't help that Industry 4.0 is described by insiders using warlike terms.

A better approach would be to describe digitalization as a process of social renewal that offers immense scope for positive change. This gives us the liberty to try out many different solutions, in the assurance that nothing is fixed and, as in science, most processes are reversible; the people who write the

algorithms live in the real world and can design functionalities to match almost any situation.

Just as scientific theories are not immutable and last only until they are proven wrong, technology and the algorithms used to control and manage organizational processes are right only until failures prove otherwise. What we need is a well-balanced combination of courage and modesty to attack the hard challenge of implementing a digital transformation that will also transform society.

Reversibility is one thing, but shaping tomorrow's technology also requires a willingness to accept other participants, i.e. co-determination. Too many cooks spoil the broth, as the saying goes, but not if their skills improve the recipe. Obviously, the desired functionality of high-tech systems must be co-determined by the business partners, down to the component level. Such participation is even an indispensable part of the business model.

For some time, attempts have been made to include prospective customers in discussions about the desired functionality of products, using diverse formats such as living labs, participatory design workshops, seminars, platforms, forum discussions, and projects. Whatever the format, the goal is to gain acceptance of certain solutions or provide future users with experience of products requiring sustainable behavior changes, for example. But this can hardly be described as co-development, not least because the skill levels are too disparate.

Nonetheless, these formats – even though they are not as well developed as might be desired – provide an avenue for communicating results, giving advice on behavior change, and communicating experts' and users' views to the manufacturer.

Involvement and communication on all conceivable levels – especially among partners, customers and employees – creates a feeling of being a part of things. This emotional attachment will grow in importance as the technologies that determine the world we live in grow in complexity. And so, from this viewpoint too, there is no alternative to becoming actors in the digital transformation. To answer the original question, it is both a revolution and a design challenge.



Prof. Dr. phil. habil. Dipl. phys. Klaus Kornwachs is a physicist and a philosopher of technology. He taught at the universities of Cottbus and Ulm and has held various guest professorships since then. Klaus Kornwachs is a full member of the German Academy of Engineering (acatech). From 2001 to 2009, he headed the "Society and Technology" section of the Association of German Engineers (VDI). He is the editor and author of numerous books and publications on the subject of technology and society.

Digitalization is a process of social renewal that offers immense scope for positive change.



Employees in the regions

TOTAL

11,883

+6.3%

ABROAD

5,860

+5.5%

GERMANY

6,023

+7.1%

EUROPE WITHOUT GERMANY

2,934

+5.8%

AMERICAS

1,103

+6.0%

WESTERN EUROPE WITHOUT GERMANY

2,191

-1.8%

ASIA-PACIFIC

1,823

+4.7%

EASTERN EUROPE

743

+37.3%



The company

Company Management

／ DR. RER. POL. LARS GRÜNERT
DR.-ING. HEINZ-JÜRGEN PROKOP
DR.-ING. E.H. PETER LEIBINGER
DR. PHIL. NICOLA LEIBINGER-KAMMÜLLER
DR.-ING. MATHIAS KAMMÜLLER
DR.-ING. CHRISTIAN SCHMITZ







Message from the Managing Board

Ladies and Gentlemen,

In fiscal year 2016/2017 – which ended at the TRUMPF Group on June 30, 2017 – the company increased its sales by a considerable 10.8 percent compared with the previous reporting period, to achieve 3.1 billion euros in sales. Orders received increased over the same period to 3.4 billion euros, which is 21.0 percent higher than in fiscal year 2015/16.

For the first time in its history, TRUMPF has surpassed the mark of 3 billion euros in terms of both sales and order intake. The Machine Tools and Laser Technology divisions contributed in equal measure to this success.

The group's earnings increased by 11.3 percent to 337 million euros. Our return on sales reached last year's level of 10.8 percent.

Especially in the second half of the reporting period, we reaped the benefit of strong demand in both German and international markets. Exogenous factors such as the euro exchange rate and low commodity prices had a positive effect, with the result that we were able to exceed our planned targets by a significant margin.

Sales in Germany amounted to 622 million euros. Once again, the second-most important market for TRUMPF was the United States, with sales of 421 million euros, followed by China and South Korea. Business with South Korea has been developing at a particularly high rate, with sales increasing by almost 60 percent in the reporting period. These results have propelled South Korea into fourth place among all sales markets for TRUMPF.

In Europe, Italy and the Netherlands were among the most dynamic markets. Sales in connection with EUV lithography systems for the company ASML were particularly strong.

As regards our operations in Switzerland, production at our location in Baar was shut down this past fiscal year; its activities have been reassigned to other TRUMPF Group plants. The remaining staff at this site now handle sales and service as an annex to our production site in Grüşch.

In this past fiscal year, TRUMPF invested heavily in advanced technologies such as additive manufacturing, and has expanded its physical infrastructure at numerous sites. Completed construction projects include production and sales facilities in Warsaw in Poland and Neukirch in Germany, as well as a new logistics center at the company's headquarters in Ditzingen and a demonstration plant for Industry 4.0 solutions in Chicago in the U.S.

At the same time, we have energetically driven forward the company's digital transformation – with respect to both internal and external processes. In addition to our AXOOM business platform we have also implemented several new modules to the TruConnect range of networking solutions. One of our key product innovations was the TruLaser Center 7030 – the first fully automated laser cutting machine – which we presented to customers at the Euroblech trade show in the fall of 2016. It will play an important role in the fully connected production of tomorrow.

In view of the changing market environment, and so as to better exploit opportunities for growth, TRUMPF has set up a new organizational structure, effective July 1, 2017. Among the new responsibilities assigned to the Group management team, a specific function has been created for a Chief Digital Officer (CDO) to oversee the digital transformation, and new areas of technology have been included in their mandates. As a result, the Managing Board now consists of six members instead of five.

A continuing growth trend is also discernible in the number of TRUMPF employees, which increased by 6 percent to some 12,000. To each and every one of them, whether they work in Germany or at one of our more than 70 subsidiaries around the world, I would like to offer my sincere thanks, on behalf of the entire Managing Board, for rising to the many challenges of fiscal year 2016/2017, and thereby contributing to the company's success.

I would also like to thank our customers and business partners, whose invaluable support has helped TRUMPF to maintain and expand its leading position in our industry. This strengthens our call of duty and motivation to do even better in the coming fiscal year.

Ditzingen, October 2017

DR. PHIL. NICOLA LEIBINGER-KAMMÜLLER
Chief Executive Officer (CEO)





Supervisory Board Report

Ladies and Gentlemen,

the fiscal year 2016/17 was a record year for TRUMPF, once again. Orders received and sales surpassed the mark of 3 billion euros, for the first time. Also income before taxes could be increased significantly. The company is in good shape. The strategy of growth driven by innovation proves to be successful.

The Supervisory Board exercised the responsibilities incumbent on it with due skill, care and diligence, in accordance with statutory regulations. Communication between the Managing Board and the Supervisory Board was constantly close, effective and efficient. The Chairwoman of the Board informed the Supervisory Board regularly and promptly of all events of significance. The Supervisory Board met three times during the period under review, during which it dealt comprehensively with the strategy of the company, the consolidation of the electronics business field, the sales strategy in growth markets, risk and compliance management as well as employee satisfaction and the management structure. Regular points of consultation were the Company's business policy, budget monitoring, and all significant future fields as EUV lithography as well as investment and acquisition projects.

Prof. Dr. Hermut Kormann resigned from the supervisory board in the fiscal year 2016/17. Prof. Dr. Claudia Eckert took his place as the new supervisory board member of the shareholders. We would like to thank Professor Kormann for the constructive and trusting collaboration in the last eight years.

At the end of the fiscal year 2016/17, Dr. Gerhard Rübling left the managing board and retired after 29 years working for TRUMPF. Dr. Heinz-Jürgen Prokop and Dr. Christian Schmitz were appointed new members of the company's managing board. Meanwhile, responsibilities have been reassigned within the board.

The annual balance of accounts, the consolidated financial statements and the group management report were audited by Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, Stuttgart, and each section was issued with a clean audit certificate. After completing its own audits of the annual balance of accounts, the proposed appropriation of earnings, the consolidated financial statement as well as the group management report, the Supervisory Board has accepted without objection the annual balance of accounts and the consolidated financial statement as presented by the Managing Board.

The Supervisory Board thanks the Managing Board and all employees worldwide for their hard work and personal contributions to the success of the company. We also thank the works council representatives for their good cooperation.

Ditzingen, October 2017

DR. RER. NAT. JÜRGEN HAMBRECHT
Chairman of the Supervisory Board



Company Information

Managing and Supervisory Board

GROUP MANAGING BOARD

Dr. phil. Nicola Leibinger-Kammüller

Chief Executive Officer
President of the Managing Board of TRUMPF GmbH + Co. KG
Labor Director
Responsible for strategic development, corporate communication, brand management, corporate real estate management and sustainable business, legal affairs, M&A and personnel

Dr.-Ing. E.h. Peter Leibinger

Chief Technology Officer
Vice Chairman of the Managing Board of TRUMPF GmbH + Co. KG
Responsible for research and development, sales and service, development and expansion of new business sectors

Dr.-Ing. Mathias Kammüller

Chief Digital Officer
Managing Director of TRUMPF GmbH + Co. KG
Responsible for digital transformation, digital business solutions, business information services, production, quality and process management

Dr. rer. pol. Lars Grünert

Chief Financial Officer
Managing Director of TRUMPF GmbH + Co. KG
Responsible for finance, financial services, venture capital, purchasing and information security

Dr.-Ing. Heinz-Jürgen Prokop

Chief Executive Officer Machine Tools
Managing Director of TRUMPF GmbH + Co. KG
Regional responsibility for China

Dr.-Ing. Christian Schmitz

Chief Executive Officer Laser Technology
Managing Director of TRUMPF GmbH + Co. KG
Regional responsibility for North America

PARTNERS

Family Leibinger

95.0 percent

Berthold Leibinger Stiftung GmbH*

5.0 percent

SUPERVISORY BOARD

Dr. rer. nat. Jürgen Hambrecht

Neustadt an der Weinstraße
Chairman of the Supervisory Board of Berthold Leibinger GmbH, Chairman of the Supervisory Board of BASF SE

Renate Luksa **

Vaihingen/Enz
Vice-Chairman of the Supervisory Board of Berthold Leibinger GmbH, Senior Chairman of the Works Council of TRUMPF Werkzeugmaschinen GmbH + Co. KG, Ditzingen

Werner Bruker **

Lauterbach
Chairman of the Works Council of TRUMPF Laser GmbH, Schramberg

Prof. Dr. rer. nat. Claudia Eckert

Garching
Director of the Fraunhofer Institute for Applied and Integrated Security (AISEC), Garching

Dr.-Ing./U.Cal. Markus Flik

Stuttgart
Chief Executive Officer of CHIRON Group SE, Tuttlingen

Stefan Fuchs

Hirschberg
Chairman of the Board of Management of Fuchs Petrolub SE, Mannheim

Prof. Dipl.-Ing./M. Arch.

Regine Leibinger

Berlin
Architect, Barkow Leibinger, Berlin

Monika Lersmacher **

Kornwestheim
Union Secretary of the IG Metall trade union, Stuttgart

Martin Röhl **

Tübingen
Second Authorized Representative of IG Metall Stuttgart, Stuttgart

Jürgen Schäfer **

Weinstadt
Director Corporate Department Real Estate Management and Sustainable Business, TRUMPF Immobilien GmbH + Co. KG, Ditzingen

Joachim E. Schielke

Backnang
Former Chairman of the Board of Management Baden-Württembergische Bank, Stuttgart, former Member of the Board of Management Landesbank Baden-Württemberg, Stuttgart

Harald Wehbrecht-Betz**

Trochtelfingen
Group Leader Production Unit Machine Assembly, TRUMPF Werkzeugmaschinen GmbH + Co. KG, Hettingen



**Corporate social
responsibility**

TRUMPF



TRUMPF is a family company.
Our principles compel us
to think about the long term
and act responsibly.
And we lead by example,
by appreciating
our employees, investing
in education as a
key resource, and playing
an active role in
social and political discourse.

RESPONSIBILITY

We believe that digital transformation is about more than just technology. We see tremendous opportunities for businesses, for connectivity between industrial companies, and for the future of manufacturing locations.

At the same time, we understand that digital transformation raises complex questions about the role of employee training and development as well as interaction within work processes. We take this aspect of four zero just as seriously as the potential it offers. “Responsibility 4.0” obliges us to carefully consider these questions alongside technical developments.

At the same time, we feel just as comfortable promoting the core values of democracy, Europe and a free world as we do campaigning for the social market economy. We need a lively debate on digital transformation precisely because it will have such a major impact on the way in which growth unfolds. We need companies that are willing to publicly promote these core values – and we are more convinced than ever that choosing not to communicate is not a viable option.

TRUMPF
RESPONSIBILITY

Employees

We firmly believe in taking into account people's needs in everything we do. That's why we show our appreciation for our employees, invest in education, and promote projects that touch upon issues relevant to our business. One of these issues is demographic change.



The Fit for Service pilot project at TRUMPF in Ditzingen offers experienced service technicians an opportunity to re-focus their career after years of strenuous work in the field. The goal is to allow them to apply their skills in an age-appropriate way that is just as challenging, but less physically demanding.

As well as traditional back-office roles, this could involve tasks such as production and application consulting, providing training at customer sites, working as an instructor of new service technicians, and providing advice on installation projects. Specially tailored training sessions and seminars are provided to help people prepare for their new role. The German Federal Ministry of Education and Research has agreed to fund the project for the next three years. Fit for Service won the German Education Award in 2017.

TRUMPF won this year's German Education Award in the Innovation category for its Fit for Service project.

TRUMPF
RESPONSIBILITY

Education

Education provides the basis for innovation and a catalyst for socioeconomic advancement. We live and breathe technology, and are determined to get young people involved and committed. This is reflected in our educational projects.

We actively support children and young people, encouraging them to carry out their own research and experimentation and helping them acquire basic business skills, for example as part of our Knowledge Factory initiative.

Teams of students participating in the German young scientists' competition "Jugend forscht" can benefit from our training department in Ditzingen and optimize their project in a hands-on environment, drawing on the know-how of teams of TRUMPF experts from the fields of sheet-metal design and construction, software engineering, and training & development.

The TRU2Future school-vacation academy run by TRUMPF Hüttinger in Freiburg aims to show students just how much fun electronics and programming can be. Under the guidance of TRUMPF apprentices, the students gain their first real experience programming and building electronic components.

TRUMPF apprentices at our Swiss sites recently took part in the VariLeg project. One of the tasks they worked on was producing the mechanical parts required to develop an exoskeleton. The VariLeg was subsequently put through its paces at the Cybathlon in Kloten, Switzerland. Organized by ETH Zurich, this was the first-ever competition of its kind for disabled people using bionic assistive technology. It aims to raise people's awareness of the obstacles that people with physical disabilities face every day.



A team of students from the Leonberg vocational-training school learning about laser safety, sheet-metal part design, and cross-team collaboration in the TRUMPF apprentices' workshop.

TRUMPF
RESPONSIBILITY

Social aspects

Digital transformation can be challenging, especially for people with disabilities. They should be able to participate on an equal footing, both in a personal and professional capacity. We firmly believe in the need to provide people with opportunities, and we are determined to raise awareness among our workforce.



→ As a family company that believes in social responsibility, we offer opportunities to people with disabilities and promote integration within our organization.

The Inclusion Factory is a workshop for people with disabilities in the Chinese city of Taicang. TRUMPF supports this important project, which is proudly flying the flag for inclusion in China. As well as providing work clothing and safety shoes, TRUMPF also provides expert advice on developing their quality-management system to become ISO-certified.

In 2015, we embarked on an inclusion initiative with 15 additional positions for disabled people at our headquarters in Ditzingen. Our cooperation partners support us as multipliers and gateways through which applicants can contact us. In return, we provide assistance to a workshop for people with disabilities, helping them organize their workflows.

TRUMPF is a company that offers specific opportunities for people to come together in order to break down reservations and prejudices. These include preparatory workshops for people with disabilities when they join our company, apprentice projects, sporting and cultural events for employees and their families, wheelchair-basketball games, and a concert by an inclusive band.

TRUMPF
RESPONSIBILITY

Culture

In a world that is becoming increasingly globalized, understanding different cultures is more important than ever. TRUMPF promotes cultural institutions in the regions we work in, reinforcing the attractiveness of our locations. Our commitment to this topic safeguards cultural treasures for future generations.



The painting "Rice Planting in the Rain" by Japanese artist Ono Bakufu depicts an idyllic vision of rural life.



The Linden Museum in Stuttgart recently held a major exhibition about Japan's food and drink culture called "Oishii!". The exhibition was supported by TRUMPF as premium sponsor. Oishii means "it tastes good" and symbolizes how food is tightly interwoven with every sphere of Japanese life. We have long had close ties to Japan. One of our first subsidiaries was founded there in 1978, and our Managing Director Mathias Kam-müller was recently reappointed Honorary Consul of Japan in the German state of Baden-Württemberg for another five years, through to 2021.

TRUMPF
RESPONSIBILITY

Sustainable management

Our company owes its success to its tremendous engineering talents. Making sustainable use of natural resources and minimizing the impact of manufacturing processes is not just good business; it is also a challenge that we embrace eagerly.



The new design of the laser nozzle reduces the use of cutting gas by 70 percent.



Diligently making the most efficient use of energy and resources is a key part of how we operate. We are constantly striving to reduce error rates in our production processes, to reveal new potential for saving natural resources, and to find better ways of measuring, documenting and analyzing the flow of energy.

In fiscal 2016/17, we successfully extended our ISO 50001 certified energy-management system to seven of our subsidiaries. In the next fiscal year, we will be expanding the system to our four remaining European production locations, regardless of whether the certification is a statutory requirement in each country or not. Once that step is completed, our energy-management system will cover 75 percent of the energy consumed at TRUMPF production sites.

We are also very much aware that energy efficiency is a key part of our efforts to drive forward product efficiency. For the first time, our new generation of TruDisk disk lasers makes it possible to ramp the current of the pump diodes down to zero amps even during very short laser-off times between processing steps. And our new HighSpeed Eco cutting process for 2D laser-cutting machines boosts the feed rate by up to 100 percent during fusion cutting with nitrogen – without having to increase the laser power.



The campus at TRUMPF's headquarters in Ditzingen boasts a wealth of architectural styles. It features innovative construction methods and workplace design concepts.



The new TRUMPF sales and service center in Warsaw stems from the conviction that high-quality architecture has a direct impact on the quality of people's work.

We also take a long-term view when it comes to architecture, constructing our facilities in line with the tenets of sustainability. Recent examples of this approach include building projects in Neukirch, Chicago, Warsaw and Taicang in China. Since 1997, the Berlin-based architects' firm Bar-kow Leibinger has been working on a master plan for the TRUMPF campus in Ditzingen. In 2017, the campus was awarded the German Industriebaupreis for sustainable construction in the commercial sector in the urban design category. The underlying planning framework allows us to respond flexibly to the need for future expansion and alterations to existing buildings. Each new building is given its own formal and functional identity, reflecting not only aesthetic clarity and precision, but also harmonious integration in existing infrastructures and landscapes.

TRUMPF
RESPONSIBILITY

Society and public policy

Rather than narrowly focusing on our own business, we have always believed in framing our organization as an active part of wider society. Engaging with issues of public interest is more important than ever in an information society, and we strive to make our voice heard and to give a voice to others.



This picture was taken shortly before the Women 20 summit in Berlin, which was attended by Nicola Leibinger-Kammüller as well as Canadian Minister of Foreign Affairs Chrystia Freeland, Managing Director of the IMF Christine Lagarde, Queen Máxima of the Netherlands, German Chancellor Angela Merkel, and Ivanka Trump. As part of Germany's G20 Presidency, the country's government invited top-ranking female representatives to take part in a panel discussion on how best to support women entrepreneurs and encourage a healthy work-life balance.

The purpose of our dialog with society and policy makers is not to promote our own interests, but to campaign for a good overall framework of conditions for manufacturing companies. We also believe in promoting the positive reputation of industry as a whole at a time of increasing skepticism about growth, globalization, free trade, and even technological advancement.

To achieve these goals, we participate in committees, associations and advisory bodies to help shape policy. We also support foundations and invite policy representatives from Germany and beyond to visit our company.

We take an active stance on issues through our public relations activities, even when those issues affect our business only to a limited degree. We feel it is important to maintain a dialog with the public and give people a voice on a wide range of topics, from the development of working-time models in the digital age to the integration of refugees in the German labor market. At the same time, we exert our influence to encourage improvements such as a more vigorous approach to infrastructure development and increases in research funding.



Locations

GERMANY

13 _____ Ditzingen –Headquarter Gerlingen, Hettingen, Aachen,
Berlin, Freiburg, Karlsruhe, Munich, Neukirch,
Schramberg, Stuttgart, Teningen, Unterföhring

EUROPE

25 _____ Pasching –Austria, Sofia –Bulgaria, Liberec –Czech Republic,
Prague –Czech Republic, Haguenau –France, Paris –France, Luton –Great Britain,
Rugby –Great Britain, Southhampton –Great Britain, Budapest –Hungary,
Milan –Italy, Turin –Italy, Vicenza –Italy, Hengelo –Netherlands, Gdynia –Poland,
Warsaw –Poland, Porto Salvo –Portugal, Bucarest –Romania,
Moscow –Russia, Košice –Slovakia, Madrid –Spain, Alingsås –Sweden,
Baar –Switzerland, Grüsch –Switzerland, Istanbul –Turkey

AMERICAS

10 _____ São Paulo –Brazil, Mississauga –Canada, Apodaca –Mexico,
Chicago –IL, USA, Cranbury –NJ, USA, Detroit –MI, USA, Farmington –CT, USA,
Reno –NV, USA, Santa Clara –CA, USA, Seattle –WA, USA

ASIA-PACIFIC

17 _____ Dongguan –China, Hongkong –China, Shanghai –China, Taicang –China,
Yangzhou –China, Chennai –India, Pune –India, Jakarta –Indonesia,
Sagamihara –Japan, Yokohama –Japan, Kuala Lumpur –Malaysia,
Manila –Philippines, Singapore –Rep. Singapore, Seoul –South Korea,
Gueishan Shiang –Taiwan, Bangkok –Thailand, Ho Chi Minh City –Vietnam



**Group Management
Report**

Group Management Report

for the fiscal year 2016/17

STRUCTURE AND BUSINESS ACTIVITIES

Taking manufacturing technology to the next level is our mission – and that means making it cost-efficient, accurate, future-proof and connected. We are a market and technology leader in machine tools and lasers for industrial manufacturing. Our innovations play a role in virtually every sector of industry, from software that paves the way for smart factories to solutions for high-tech processes in industrial electronics. Some 12,000 people work at TRUMPF worldwide, helping to promote its positive attitude and achievements as a family-run company.

Two divisions – one powerful company

Our Machine Tools and Laser Technology divisions are both combined under the roof of a holding company, TRUMPF GmbH + Co. KG. Our largest area of activity comprises machine tools for flexible sheet metal and tube processing. Our portfolio includes machines for bending, punching, combined punch and laser processing as well as laser cutting and laser welding applications. Diverse automation solutions and a wide range of software for digitally connected production solutions round off our portfolio.

Our product range in laser technology comprises laser systems for the cutting, welding and surface treatment of three-dimensional parts. We provide high-performance CO₂ lasers, disk and fiber lasers, direct diode lasers, ultrashort pulse lasers, marking lasers and marking systems. Our portfolio also includes 3D print systems for metallic components. In addition, the Laser Technology division includes the Electronics business field with direct current, high frequency and medium frequency generators for inductive material heating, surface coating and surface processing via plasma technology as well as for laser excitation.

Global presence – close to our customers

The TRUMPF Group is represented in all major markets worldwide. We have 73 subsidiaries operating in Europe, the Americas and Asia-Pacific. Our production facilities are in Germany, China, France, the United Kingdom, Italy, Japan, Mexico, Austria, Poland, Switzerland, the Czech Republic and the United States.

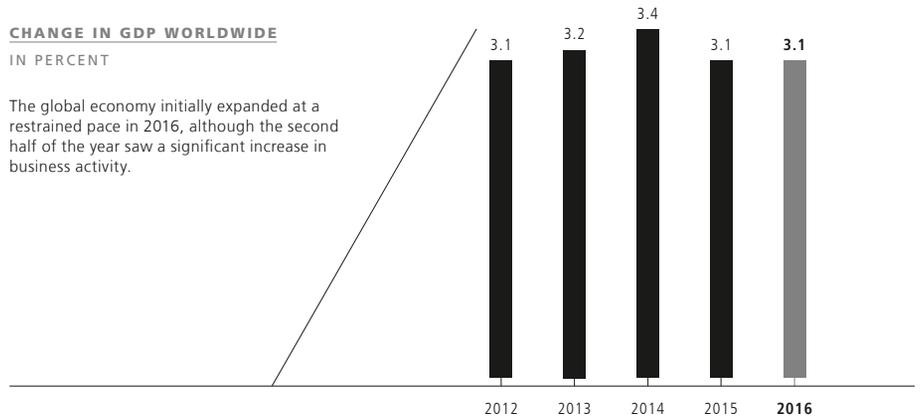
Our headquarters is located in Ditzingen, Germany. The Machine Tools and Laser Technology divisions are run from there. The Electronics business field is managed from Freiburg, Germany.

Graphic

01

CHANGE IN GDP WORLDWIDE
IN PERCENT

The global economy initially expanded at a restrained pace in 2016, although the second half of the year saw a significant increase in business activity.



Source: International Monetary Fund

We support our customers with comprehensive services that cover the entire lifecycle of our products. We offer a full range of services extending from financing, tools and spare parts, technical service, consulting and training through to functional expansions, process optimization concepts, monitoring and analytical tools as well as the pre-owned machinery trade.

ECONOMIC REPORT**Economic situation****Global economy with good second half of 2016**

Graphic 01 | A

This global economy initially expanded at a restrained pace in 2016, although the second half of the year saw a significant increase in business activity. According to the International Monetary Fund (IMF), growth worldwide was 3.1 percent in 2016.

In industrialized countries, the gross domestic product (GDP) increased by 1.7 percent. At 4.1 percent, economic development in emerging countries remained at the same pace of growth as in the previous year.

In Germany, the economy continued to develop positively in 2016, and was up 1.8 percent. This expansion was driven mainly by private and public consumer spending as well as investments in residential construction. There was only a moderate increase in corporate investments.

The economy in the eurozone continued the trend of the previous year. GDP rose by 1.7 percent in 2016. The unexpected outcome of the Brexit referendum in the United Kingdom temporarily caused uncertainty in financial markets but this had a limited impact on the real economy. The economy benefited from private consumer spending in particular.

The U.S. economy got off to a slow start in 2016. Particularly the weak investment activities of companies had a dampening effect. At the end of the year, the economic situation brightened with the growth rate amounting to 1.6 percent overall. In Japan, the economy, up 1.0 percent, expanded more positively than expected in 2016 – with this trend set to continue. Posting growth of 2.8 percent, South Korea showed dynamic performance.

Graphic

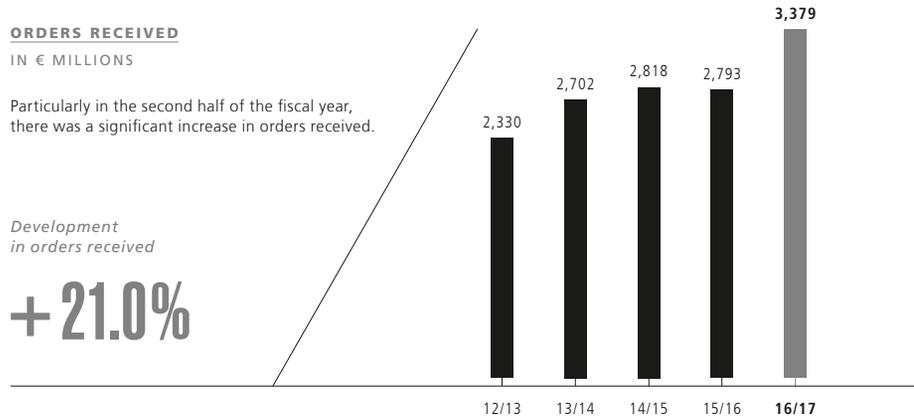
02

ORDERS RECEIVED
IN € MILLIONS

Particularly in the second half of the fiscal year, there was a significant increase in orders received.

Development
in orders received

+21.0%



The economic conditions in emerging countries varied significantly. The Chinese economy remained on course for growth at 6.7 percent. In 2016, Brazil remained mired in a recession with a 3.6 percent decrease in economic output.

Machine tool industry declines slightly

In 2016, German machine production once again stagnated. According to the German Mechanical Engineering Industry Association (VDMA), production achieved zero growth as in the previous year. Sales rose slightly to €219 billion. The orders received in 2016 failed to match the level of the previous year by 2 percent in real terms. Domestic demand fell year-on-year by 1 percent and foreign demand by 3 percent.

Global manufacture of machine tools decreased by 2 percent to €67.6 billion in 2016. China remained the largest manufacturer with a volume of €17.1 billion, followed by Germany and Japan tying for second place with a volume of €11.1 billion each.

Market for laser technology grows significantly

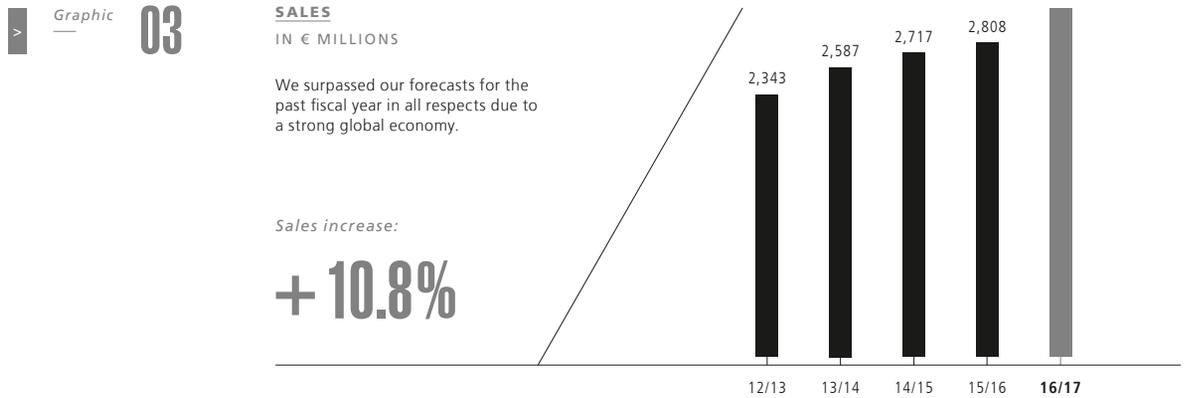
According to an analysis by Optech Consulting, the global market for laser systems for material processing rose by 7.4 percent in 2016, thus achieving a volume of €11.4 billion (previous year: €10.7 billion). This growth is largely attributable to China, where demand increased by almost 20 percent. In Europe and North America, however, the demand for laser systems showed hardly any change in 2016 compared with the previous year.

There was also an increase of 6 percent to €3.0 billion in the global market for laser beam sources in material processing. Laser systems for the macromachining methods of cutting, welding, marking and for additive manufacturing methods account for 75 percent while micromachining makes up 25 percent of the total volume.

Business development**Record figures in orders received and sales**

Graphic 02

In the past fiscal year, TRUMPF managed to increase both orders received and sales to above the €3 billion mark for the first time. With growth of 21.0 percent to €3.38 billion, orders received achieved a record high (previous year: €2.79 billion). We also posted an increase of 10.8 percent in sales, generating €3.11 billion (previous year: €2.81 billion). Income before taxes rose by



Graphic 03 | 11.3 percent to €337 million (previous year: €303 million). The number of people working for the company worldwide rose by 6.3 percent to 11,883 employees (previous year: 11,181 employees).

We have thus surpassed our forecasts for the past fiscal year in all respects. Due to geopolitical crises and uncertainties we expected only single-digit growth rates. Our book-to-bill target ratio is now significantly greater than 1. Our net operating margin came to 10.8 percent as in the previous year.

Very strong orders received overall

Particularly in the second half of the fiscal year, there was a significant increase in orders received, which were up by 21.0 percent to €3.38 billion (previous year: €2.79 billion). Both divisions contributed to this development, although the relative growth in Laser Technology was more apparent than in the Machine Tools division. At the end of the reporting period, orders received came to €1.06 billion (previous year: €789 million). The forward order book thus amounts to 3.7 months.

Machine tools and laser technology on course for growth

Sales development of the divisions was as follows: Sales by our Machine Tools division rose by 7.0 percent to €2.70 billion (previous year: €2.52 billion).

The Laser Technology division generated an increase in sales of 22.0 percent to €1.23 billion (previous year: €1.01 billion). Both business fields, Laser Technology and Electronics, contributed to the company's solid performance. The Laser Technology business field increased its sales by 18.6 percent to €1.11 billion (previous year: €935 million). Thanks to a consistent restructuring concept, the Electronics business field returned to a course of growth. It boosted its sales by 67.9 percent to €156 million (previous year: €93 million). There is a significant supply relationship between these divisions leading to significant sales. Sales are consolidated within the TRUMPF Group.

Sales of laser-related products in fiscal 2016/17 amounted to €2.20 billion or 70.6 percent of total sales.

Markets show largely positive development

In Germany, our strongest individual market, we continued the past fiscal year's growth course and increased sales further. These were up by 4.2 percent to €622 million (previous year: €597 million). The markets in the rest of Europe also developed favorably in most cases. Particular mention should be made of the Netherlands (up 55.4 percent to €204 million) and Italy (up 27.5 percent to €131 million). In Western Europe excluding Germany, our sales rose overall by 17.0 percent to €777 million (previous year: €664 million). By contrast, our sales in Eastern Europe fell slightly by 1.8 percent to €276 million (previous year: €281 million).

In the North American market, we took a big step forward after two years of rather weak growth. Sales in the U.S., our second-largest market, grew by 13.8 percent to €421 million (previous year: €370 million). Other markets in the Americas varied: Sales in Central America fell slightly, whereas in South America we again posted pleasing growth on the back of our sales development in Brazil, although at a low level. All in all, sales in North, Central and South America were up by 11.4 percent to €540 million (previous year: €485 million).

Apart from a few exceptions, Asian markets developed positively. Overall sales rose by 14.8 percent to €873 million (previous year: €760 million). We posted strong growth in South Korea (up 58.3 percent to €212 million) on account of good business in laser technology with companies in the electronics industry. Sales in China, our third-largest market, rose sharply after a weak fiscal year, increasing 10.0 percent to €404 million (previous year: €368 million).

Only slight variation in sales shares

The growth rates in the regions affected the shares in sales only slightly. Compared with the previous year, Germany decreased its share to 20.0 percent (previous year: 21.3 percent). Europe excluding Germany contributed 33.9 percent to our sales (previous year: 33.7 percent). The share of the American markets rose slightly to 17.4 percent (previous year: 17.3 percent). The share in overall sales for Asia increased to 28.1 percent (previous year: 27.1 percent).

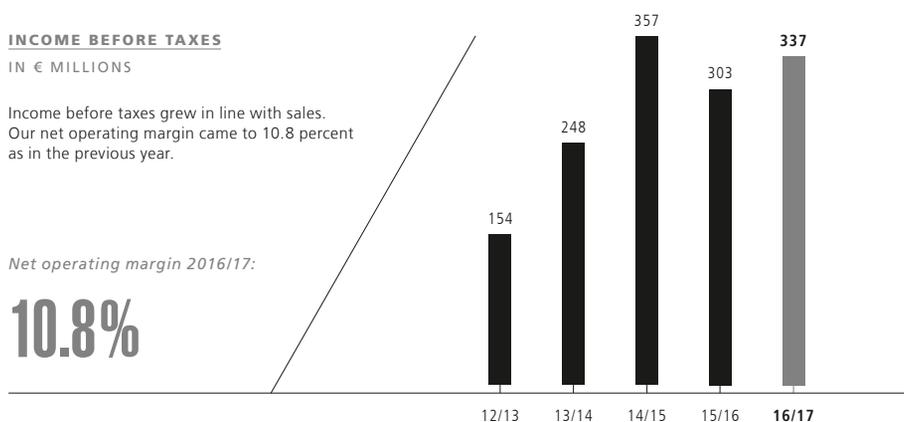
Graphic

04

INCOME BEFORE TAXES
IN € MILLIONS

Income before taxes grew in line with sales. Our net operating margin came to 10.8 percent as in the previous year.

Net operating margin 2016/17:

10.8%**Results of operations, net assets and financial position****Very good result and further good net operating margin**

Graphic 04

In fiscal 2016/17, income before taxes rose by 11.3 percent to €337 million (previous year: €303 million). Our net operating margin remained at the previous year's good level of 10.8 percent.

The positive development in sales was reflected in a corresponding increase in overall performance by 11.2 percent to €3.16 billion (previous year: €2.84 billion). On account of the broader definition of sales in Germany's Accounting Directive Implementation Act (BilRUG), income of €13 million was reclassified to sales from other operating income in the fiscal year. This reclassification has very little impact on sales. Hence, figures can be compared with those of the previous year.

Other operating income fell by 11.5 percent to €94 million (previous year: €106 million). This is primarily attributable to the revised definition of sales revenues by BilRUG and lower exchange rate gains.

The cost of materials rose by 11.0 percent to €1.33 billion (previous year: €1.20 billion), in line with the growth in sales. In terms of overall performance, the cost-of-materials ratio improved negligibly, totaling 42.2 percent (previous year: 42.3 percent).

Personnel expenses expanded in the year under review by 9.6 percent to €897 million (previous year: €818 million). This was due to the creation of new jobs on account of our growth, especially for our future-oriented pursuits of additive manufacturing and digitalization. The personnel expenses ratio fell slightly to 28.4 percent (previous year: 28.8 percent).

Other operating expenses, at €520 million, were 6 percent higher year on year (€491 million). A decrease in realized exchange rate losses was offset by an increase in external performance and higher selling expenses. In addition, the deconsolidation of TRUMPF China (Hong Kong) Limited entailed expenses of €4 million.

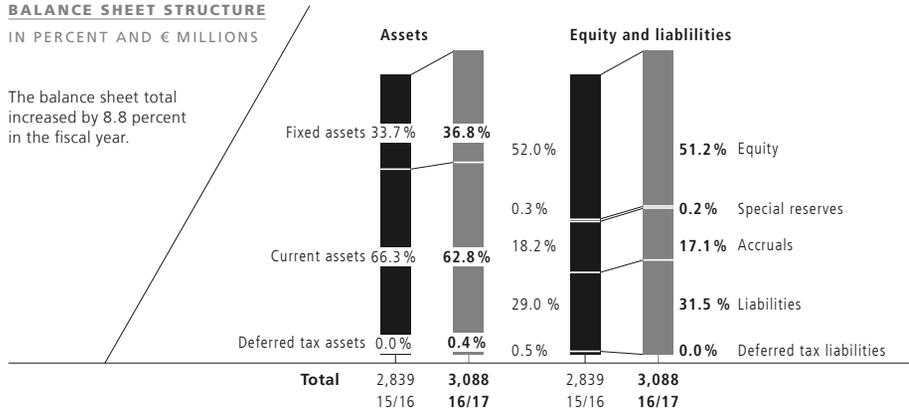
The financial and investment result came to -€29 million (previous year -€16 million). In the previous year, the financial result largely benefited from a change in the commercial interest rate for pension reserves. The financial result is also weighed down by write-downs of €2 million on non-consolidated affiliated companies.

Graphic

05

BALANCE SHEET STRUCTURE
IN PERCENT AND € MILLIONS

The balance sheet total increased by 8.8 percent in the fiscal year.



Tax expenses amounted to €75 million (previous year: €68 million). Taxes on income and earnings totaled €61 million (previous year: €56 million) while other taxes came to €14 million (previous year: €12 million).

Net assets and financial position: Further increase in equity and liquidity

Graphic 05 | The balance sheet total increased by 8.8 percent to €3.09 billion (previous year: €2.84 billion).

Fixed assets rose by 18.7 percent to €1.14 billion (previous year: €958 million).

Additions to tangible assets were mainly due to investments in new buildings and to the reclassification of internally used technical equipment and machines.

In the 2016/17 fiscal year, machinery with a net carrying amount of €111 million was reclassified to fixed assets from current assets. This reclassification included machinery leased to customers as well as machinery used for testing, for training purposes, in showrooms and demonstration machines. Leasing and lease-purchase contracts are now held to a greater extent by the TRUMPF financing companies.

In the past, these contracts were as a rule resold to financing partners. The inventory of other machinery used internally over a longer period has continually increased compared with the previous years and is thus recognized under fixed assets.

Current assets including prepaid expenses and deferred tax assets increased by 3.7 percent to €1.95 billion (previous year: €1.88 billion). This is largely due to the rise in cash and cash equivalents as well as the increase in trade receivables. This was offset by a decrease in inventories in comparison to the previous year.

Inventories were down by 23.0 percent to €471 million (previous year: €612 million). First, this is due to higher payments on accounts received from customers, which are deducted from the inventories. Secondly, it is attributable to the 36.0-percent decrease in finished goods, resulting almost entirely from the reclassification of internally used machinery into fixed assets specified above.

On account of the sharp increase in sales, trade receivables grew by €90 million to €651 million (previous year: €561 million). The days sales outstanding (DSO) rose slightly to 76 days (previous year: 72 days).

Other assets decreased by 4.6 percent to €147 million (previous year: €154 million). They include medium-term financial assets of €60 million with a residual maturity of up to three months. In addition, other assets mainly include receivables from value added taxes and income taxes to the tax authorities.

Cash and cash equivalents as well as marketable securities rose by 19.8 percent to €631 million (previous year: €526 million). Overall, the cash flow statement shows an increase in cash and cash equivalents of €16 million to €624 million (previous year: €608 million) due to the good result. The higher cash inflow from operating activities was offset by the higher cash outflow from investing activities.

Equity rose by 7.2 percent to €1.58 billion (previous year: €1.48 billion). The equity ratio fell a slight 0.8 percentage points to 51.2 percent (previous year: 52.0 percent). The economic equity ratio including long-term shareholder loans was 62.0 percent (previous year: 62.5 percent).

Accruals rose by 1.9 percent to €527 million (previous year: €517 million). The increase is mainly due to higher personnel-related accruals. Pension obligations, in contrast, were slightly lower, as €50 million in liquidity was irrevocably allocated in trust to financing the pension obligations within the framework of a contractual trust agreement in fiscal year 2016/17. This amount was offset against the pension obligations.

Liabilities rose by 17.3 percent to €918 million (previous year: €783 million). Trade payables were up by 62.6 percent to €224 million (previous year: €138 million). Liabilities to managing partners increased by 12.1 percent to €438 million (previous year: €391 million).

Due to the good liquidity situation, financial obligations were further reduced by €9 million to €176 million (previous year: €185 million).

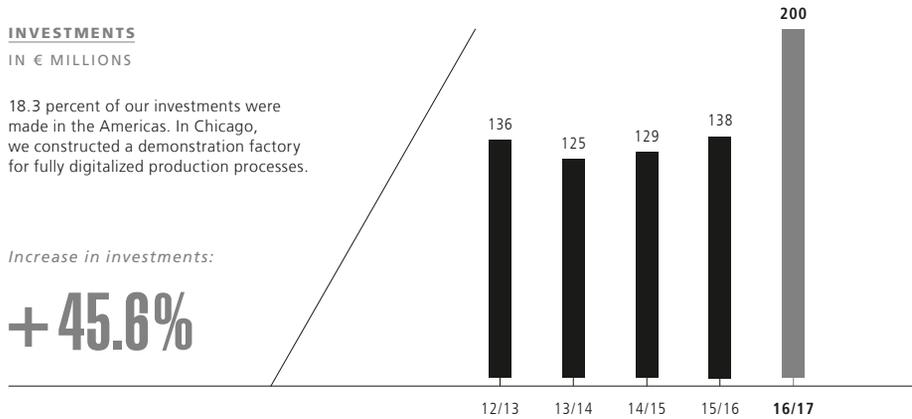
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06

INVESTMENTS
IN € MILLIONS

18.3 percent of our investments were made in the Americas. In Chicago, we constructed a demonstration factory for fully digitalized production processes.

Increase in investments:

+45.6%**Investments and acquisitions****Investments in fast-growing areas**

Graphic 06 | ▲

In the 2016/17 fiscal year the company increased its investments in tangible and intangible assets (excluding the reclassified internally used machinery) by 45.6 percent to €200 million (previous year: €138 million).

Real estate and construction expansion projects accounted for 52.2 percent of the total sum invested, plants and machinery for 17.3 percent, and office and business equipment for 26.5 percent.

A total of 69.4 percent of the investments were made in Germany. Of primary importance here were construction projects at our headquarters in Ditzingen, with a sum invested totaling around €40 million. We are currently constructing a production building with cleanrooms and office space to expand our high-technology production, particularly in order to manufacture the lasers used in EUV lithography for microchips. A state-of-the-art logistics center was also built that we completed and put into operation in the fiscal year. Furthermore, we expanded capacity at our German locations in Hettingen, Neukirch and Schramberg.

5.0 percent of our investments were made elsewhere in Europe and 18.3 percent in the Americas. In Chicago, we constructed a demonstration factory for fully digitalized production processes in the past fiscal year. Asia accounted for 7.4 percent of the investments.

The investment ratio of fixed assets amounted to 6.4 percent (previous year: 4.9 percent).

The amount of €200 million invested in tangible and intangible assets exceeded depreciation and amortization, which stood at €138 million in this fiscal year (previous year: €118 million).

Venture capital activities underway

Our venture capital company TRUMPF Venture GmbH made its first investment only a few months after being founded. The company participated in the A series round of financing in XARION Laser Acoustics GmbH headquartered in Vienna, Austria. XARION has developed and is producing the world's first laser-based optical microphone that measures ultrasonic waves in the air or in liquids. Its use will make a decisive contribution to fields of application such as non-destructive material testing, process control in industrial environments or medical diagnostics.

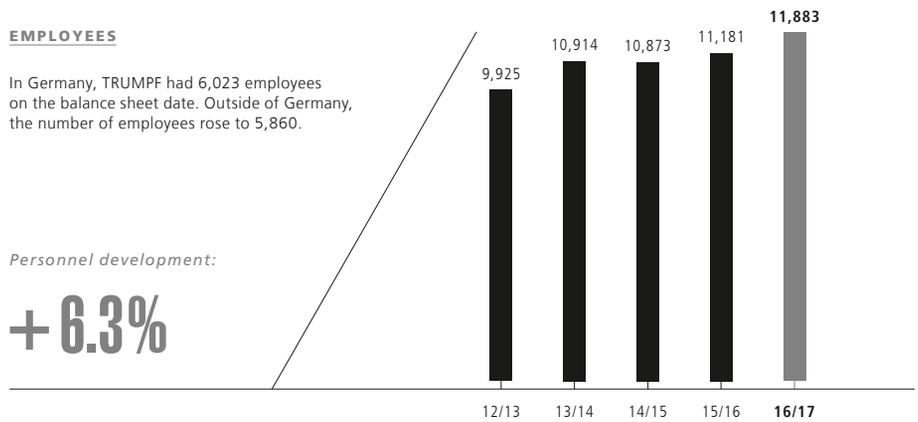
Graphic 07

EMPLOYEES

In Germany, TRUMPF had 6,023 employees on the balance sheet date. Outside of Germany, the number of employees rose to 5,860.

Personnel development:

+ 6.3%



In addition, TRUMPF increased its venture capital activities by joining the company Unternehmertum VC Fonds II GmbH & Co. KG (UVC) headquartered in Garching, Germany. The UVC is an early-stage venture capital company that specifically invests in young companies with innovative technologies and international market potential.

Employees

New hires worldwide

Graphic 07

The number of employees working worldwide for TRUMPF increased in the fiscal year 2016/17 by 6.3 percent to 11,883 employees (previous year: 11,181 employees).

In Germany, TRUMPF had 6,023 employees on the balance sheet date, which is 7.1 percent more than the year before (previous year: 5,626 employees). Outside of Germany, the number of employees rose by 5.5 percent to 5,860 (previous year: 5,555). By increasing our headcount, we have adapted to the higher volume of business. Furthermore, we are pressing ahead with the expansion of our workforce for our future initiatives, such as additive manufacturing, and for our digitalization strategy.

The training of young skilled workers, engineers and business administrators is very important to us. During the year under review, 459 young people completed a training course or a co-op work-study program. The training quota in the Group therefore stood at 3.9 percent (previous year: 4.3 percent).

Different work models are being created due to the higher level of digitalization within the company. Structures which were firmly established to date are loosening in favor of work less dependent on time and place. Teamwork among employees is also changing, so disciplinary leadership and technical leadership are no longer necessarily connected. HR has responded to the introduction of such diverse models and can map these as far as remuneration classification, time recording or performance appraisal systems are concerned.

Graphic

08

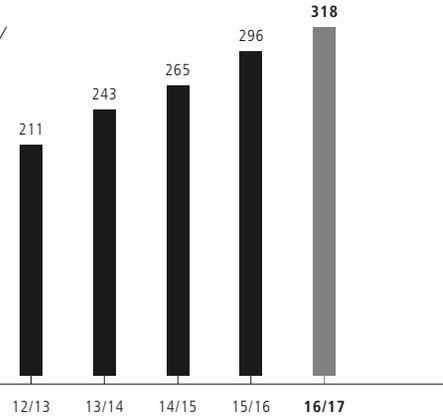
RESEARCH AND DEVELOPMENT

IN € MILLIONS

Our development ratio in relation to sales is once again at a very high level of 10.2 percent.

Increase in R+D expenditure:

+ 7.5%

**RESEARCH AND DEVELOPMENT****High development ratio for unique innovative strength**

Graphic 08 | ▲

Expenditure on research and development was increased anew in the 2016/17 fiscal year, rising by 7.5 percent to €318 million (previous year: €296 million). Our development ratio in relation to sales is thus once again at a very high level of 10.2 percent (previous year: 10.5 percent). The number of employees working on new products for TRUMPF rose by 7.4 percent to 1,843 (previous year: 1,716).

Graphic 09 | ▲

Our central Research and Development department is driving comprehensive and sustainable innovation management beyond the specific operationalization of innovation projects in the development sectors of the business fields. Here, we are specifically seeking close ties with technological centers of excellence worldwide that are relevant to us. This allows us to gain insights very early on into high-tech trends of interest to us.

With our global technology scouting we identify startup companies that have business relevance for TRUMPF. This can lead to M&A projects which supplement the development work or product portfolio of one of our divisions, or which flow into venture capital projects. All of this enables us to sustainably assess trends in the long term and enter high-tech fields of importance to us.

Digital connectivity as a leitmotif of innovation activities in the business divisions

While in the past individual machines or applications were differentiated by technology, our Machine Tools division gears its activities specifically to the digital connectivity of manufacturing processes. We seek to ensure the consistency of data from the sensor to the cloud. This lays the foundation for innovations by digitalization. The benefit is scaled depending on the type of data collection and provision, degree of connectivity, or technological interpretation. Our aim is to completely synchronize the physical and digital realms – an excellent example of which is the TruLaser Center 7030, our 2D laser cutting machine launched in the past fiscal year. It completes most of a fully automated production process on its own.

The Laser Technology business field also develops products for use in digitally connected production. This is illustrated, for example, by the new generation of our TruDisk disk lasers. The data quality of the sensors monitoring all important parameters in the laser has been significantly improved. The new TruDisk lasers are thus ideally prepared for future Industry 4.0 services such as condition monitoring. Thanks to enhanced efficiency, a new energy-efficient pulse function and intelligent energy management, the laser works extremely economically in all states.

v

Graphic

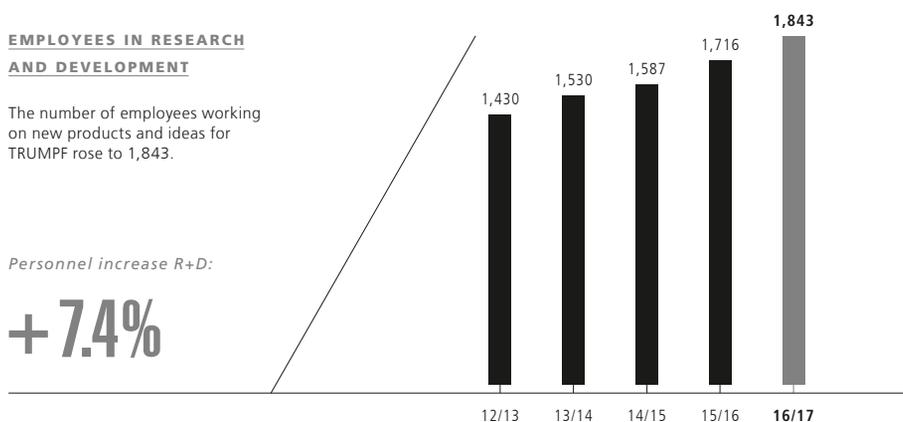
09

**EMPLOYEES IN RESEARCH
AND DEVELOPMENT**

The number of employees working on new products and ideas for TRUMPF rose to 1,843.

Personnel increase R+D:

+7.4%

**OPPORTUNITIES AND RISKS****Risk management**

As a global high-tech company, TRUMPF is exposed to a multitude of risks. To respond appropriately, we have a sophisticated risk management system in place. A central risk manager ensures that risks in all areas are regularly identified, evaluated and monitored on a standard basis throughout the Group, and that any correlations between risks are identified. The results are presented to management on a regular basis. Our Corporate Development department defines strategic development opportunities. Centrally controlled innovation management as well as series and sector managers in the individual business fields help identify entrepreneurial opportunities and risks.

The Group's Managing Board, heads of business divisions and central corporate departments are informed every month of the results of operations, net assets and financial position. The orders received KPI is updated in daily reports. Key financial data and analyses thereof by the controlling department provide the basis upon which the Managing Board identifies and evaluates potential risks, and can decide to take appropriate countermeasures, wherever necessary.

For risk assessment purposes, our company planning includes analyzing alternative scenarios of possible trends within the TRUMPF Group. An interest rate and currency committee meets monthly at Group level to manage and control cash flow, currency and interest rate risks. Risk transparency is further increased by means of market and competitor analyses.

Market opportunities and risks

The prospects for the global economy are generally positive at the present time. The IMF anticipates increasing momentum in global economic output with a 3.5 percent increase in 2017 and 3.6 percent in 2018. Yet risks remain that can jeopardize the currently good development.

Apart from the persistent geopolitical crises, this includes greater political and economic uncertainty due to nationalist and protectionist tendencies and possible turbulence in international financial markets.

Special attention will be paid to political developments in Europe. To date, the outcome of the Brexit referendum in the United Kingdom has not had any serious effects on the real economy. However, a stronger impact on capital expenditures and trade could set in through harsher rhetoric during the exit negotiations between Brussels and London. Risks for the stability of international financial markets are entailed in the hesitant tightening of the monetary policy in the United States and Europe.

Due to our strong market position in the machine tools and laser technology fields, along with our consistent focus on promising growth areas, we expect our group to perform well.

Opportunities offered by consistent digitalization – both internally and externally

TRUMPF offers its customers a comprehensive product portfolio for digitally connected production. In this context, TruConnect solution modules and the AXOOM software platform enable both the vertical and horizontal connectivity of production. We provide in-depth advice to our customers on the introduction of digitally connected processes and repeatedly find that a huge amount of potential for improvement lies particularly in indirect processes. This is why we also consistently digitalize our own added value, proceeding on a cross-divisional basis in the process. Optimizations are intended to have an effect on the complete order-to-cash process.

EUV lithography now on the verge of series production

Manufacturers of microchips are successively changing over their production to EUV lithography systems. We expect several customers to start series production on these systems in 2018 and 2019. Manufacturing microchips with EUV exposure replaces three to four classic exposures. That cuts costs and reduces rejects.

We are prepared for different scales of the business situation – both through the framework agreement concluded with ASML, our strategic partner, and through the creation of new space for our subsidiary TRUMPF Lasersystems for Semiconductor Manufacturing GmbH.

Product portfolio of TRUMPF unique in additive manufacturing market

The market for additive manufacturing methods has been growing at a fast pace for years. We are constantly forging ahead with the transformation from prototyping and small series to highly productive series manufacture by increasing machine productivity. TRUMPF is the only manufacturer to have both methods relevant for industrial metal 3D printing in its portfolio. In addition, our industrial solutions include the entire process chain and are characterized by intelligent digitalization, robust machines and complementary services.

Opportunities offered by the specific expansion of our sales financing solutions

TRUMPF provides quick, time-saving access to investment finance for its customers in the form of credit or leasing offerings. In the past fiscal year, we expanded our offerings to include a digital marketplace with comprehensive financial services. In addition to financing TRUMPF products, it is also possible to finance machinery and vehicles of other manufacturers and, in Germany, even to finance commercial properties. This allows us to tap global markets faster and more efficiently in financial terms. We will gradually add further services to this offering and are also seeking interesting concepts for our customers in the FinTech scene for this very purpose.

Financial opportunities and risks

The TRUMPF Group regularly maintains its liquidity through medium-term and long-term measures. We again increased our liquidity reserves in relation to the previous year. The liquid funds have been invested in the money market over the short term. When investing our liquidity reserves, we spread the risk by allocating our investments between numerous financial institutions and instruments. This has enabled us to avoid negative interest. We work exclusively with banks that have good credit ratings. In addition, we have structured a revolving credit facility with our core banks. This has secured a large part of our credit lines at attractive rates until 2022. To protect pensions, we have concluded a contractual trust agreement (CTA) for €50 million, which will ensure the earmarked use of these funds.

Our liquidity reporting system enables us to generate daily liquidity reports for all of our subsidiaries. Currency and interest rate risks constitute further financial risks for us. Since the eurozone is our main sales market and accounts for 41.6 percent of our sales – and because we are partly able to offset foreign currency payments within the company through our global production alliance and global purchasing – we view our currency risk as limited. We have managed to use the currently weaker euro for medium-term currency hedging.

Derivative financial instruments are used at TRUMPF not for speculative purposes, but instead exclusively for hedging the underlying business transactions. Hedging takes place within the TRUMPF Group companies to cover currency risks resulting from posted, pending and anticipated underlying transactions. In accordance with the internally concluded forward exchange deals, and taking into consideration the net exposures, external hedging activities are transacted with banks with good credit ratings.

We systematically hedge net exposures in the following currencies: U.S. dollar, Japanese yen, Chinese renminbi, British pound, Korean won, Swiss franc, Czech crown and Polish zloty. To this end, we use standardized currency hedging instruments such as forward exchange transactions and currency options. Other currencies are hedged on a project-related basis. There is a risk in the market price fluctuation of forward exchange transactions, which is, however, offset as a rule by the opposite trend in the market value of the underlyings. In the eurozone, we concentrate our liquidity on a daily basis using a cash-pool system that ensures transnational liquidity balancing. We have a comparable system in place at our subsidiaries in China. A multilateral netting of accounts receivable and payable increases transparency and facilitates the processing of internal payments.

We intensively developed and fully documented our internal control system during the year under review. Internal audits create additional transparency on the situation of our subsidiaries. We have emphasized the importance of these audits, and will continue to expand our auditing activities.

Strategic and operational opportunities and risks

Innovations

We respond to trends in technology at an early stage. Our innovation management maintains a technology roadmap that secures the availability of future technologies while identifying disruptive ones and initiates meaningful steps for their industrialization. We also specifically seek to forge close ties with universities, non-university research institutes or relevant startups – also very specifically through our venture capital company. Institutional research in projects with multiple partners plays a key role for us, which means we are always up to date on the trends in our high-technology fields.

Intellectual property

We secure our investments in research and development through close collaboration between our development and patent specialists. Our goal is to develop a patent portfolio that gives TRUMPF advantages in terms of freedom of action, exclusivity and patent exploitation in the market. Patent law officers support the entry of intellectual property into new technologies and contribute toward their targeted generation, evaluation and application. We also register property rights for new developments. In the process, our core markets are always the main focus.

Acquisitions

We improve our position in markets and technology fields through targeted acquisitions. Our decisions in favor of acquisitions are always very carefully considered. An M&A Committee consisting of members from our divisions and central departments reviews any acquisition projects. Due diligence provides us with the greatest possible certainty about the future development potential of an M&A project. We reduce the risk further still through relevant agreements in the purchase contracts.

Procurement

We successfully continued our Purchasing Excellence program during the year under review, focusing on the global harmonization of processes and their professionalization. To this end, we expanded cost engineering in particular. Furthermore, we continuously review the purchasing volume for further optimization potential and implement calls for tenders centrally, especially where procurement of non-production material is concerned.

We keep risks low through comprehensive supplier management. A careful selection and continuous evaluation of our strategic suppliers, combined with a stringent supplier approval process, provide the necessary transparency on possible risks at all times. By continuously monitoring delivery quality and reliability, we derive suitable measures for quality assurance and supplier development. We were able to guarantee our basic supply by third parties at all times. Due to the growth and high volatility of individual projects, there were isolated instances of delivery bottlenecks, the impact of which, however, was of no consequence on account of our active bottleneck management. Effects arising from higher steel prices were limited through suitable measures.

Production

The processes in our production undergo continuous development. The digital connectivity of the entire order-to-cash process also affects many parts of production. Successful projects have already been implemented. Our goal is to have all our production sites fully digitalized by 2020. We are continuing to press ahead with the consistent standardization of our processes, which is a basic condition for digital transformation. Here, our lean production philosophy SYNCHRO is a crucial prerequisite. Last year, we made every effort to achieve consolidation in a European production alliance – which enabled us to design our structures even more efficiently.

We have identified the risks of business interruptions in production and taken protective measures against them. We have examined and assessed critical production processes. Production downtimes can be avoided by increasing the flexibility of our production facilities or through the short-term relocation of production. Measures also include extensive emergency scenarios.

Property damage, fire damage and operating downtimes as well as operational and product liability risks are covered to a sufficient extent by an international insurance policy along with local coverage. We regularly assess and audit our production sites together with our long-standing insurance brokers.

Information technology

We also keep a very close eye on IT risks. We constantly monitor our central IT systems and continuously improve security by ensuring a security-optimized organization of our IT landscape, and by investing in hardware and software on a regular basis. In the past fiscal year, we also launched an internal campaign that raised awareness among employees regarding IT security issues and supported IT security activities.

Employees

Our employee turnover rate is low: 3.7 percent in the Group and 2.3 percent in Germany. By conducting regular employee surveys worldwide, we determine how satisfied our employees are and how strongly they identify with our company. This is how we ensure the refinement of our organization and management culture. Demographic change and the lack of qualified staff in technological professions continue to present challenges. Consequently, recruiting and securing the next generation of skilled workers has high priority for us. This includes long-term measures such as projects and school partnerships, one example being our “Knowledge Factory” initiative. Our flexible worktime model makes us a very attractive employer, especially in Germany.

With a Group-wide occupational safety initiative, we have set ourselves the goal of reducing accidents worldwide to a best-in-class level. To this end, we consistently implement our occupational safety policy and are developing an integrated management system.

Compliance program

TRUMPF has introduced a Group-wide compliance program. The code of conduct describes the expectations of the company and requires that, in their business dealings, all TRUMPF Group employees abide by the law and adhere to ethical standards. It also defines the basic rules that must be followed at TRUMPF. All our employees undergo training in this program on a regular basis.

Assessment of the company's risk situation

There are no identifiable risks that could substantially endanger the continued existence of the corporate group. The risk management system practiced by the company enables risks to be rapidly identified so that adequate countermeasures can be initiated. Activities focus on the management of financial risks and market risks as well as on the identification of entrepreneurial and technological opportunities.

OUTLOOK

Positive outlook despite several risks

The sustained growth path of the global economy since the summer of 2016 is reflected in the outlook. The International Monetary Fund (IMF) expects an increase of 3.5 percent for 2017 and 3.6 percent for 2018. Growth momentum is greatest in the emerging countries, and particularly in the U.S. among industrialized countries. The predicted growth thus rests on a broad base, although existing risks prevent stronger growth.

The IMF expects an expansion of 2.0 percent and 1.9 percent for industrial countries in 2017 and 2018, respectively. The eurozone is anticipated to contribute growth of 1.9 percent in 2017 and 1.7 percent in 2018. According to forecasts, Germany will remain slightly below the EU average. After growth of 1.8 percent in 2017, growth will amount to 1.6 percent in 2018.

The IMF believes the U.S. economy will expand by 2.1 percent in both 2017 and 2018. This assessment is based on the assumption that fiscal policy will ease and confidence will increase after the 2016 elections there.

Growth in the emerging countries is expected to be strong, achieving increases of 4.6 percent in 2017 and 4.8 percent in 2018. Pivotal in this connection is especially stabilization in many commodity export markets. Following the price decline in recent years, structural changes were made which are now having a positive effect. According to the IMF, however, growth in these markets will be weaker than the average figures generated between 2000 and 2015. Here, particularly China's more sustainable path of growth is having an impact. This market will remain below the levels recorded in previous years with growth rates of 6.7 percent and 6.4 percent. With projections of 7.2 percent for 2017 and 7.7 percent for 2018, India will spearhead growth. After years of recession, Brazil is predicted to return to a path of growth with an increase of 0.3 and 1.3 percent.

Machine tool industry expects 2017 to be a good year

Due to the positive development in 2016, the VDW (German Machine Tool Builders' Association) projects a 3.0 percent increase in production in 2017. This assessment is based on international industrial output and the global demand for machine tools which, according to Oxford Economics, is set to develop well. According to the VDW, the German tool machine industry is benefiting especially from the large-volume and automotive project business worldwide.

Laser industry benefits from positive environment

The global laser industry will also boost its sales in 2017. Laser Focus World reports that the market will expand by just under 7 percent to 11.1 billion U.S. dollars in sales. Sources of stimulus for this will come both from the industrialized markets and from emerging countries.

TRUMPF expects further growth under stable economic conditions

In view of the good economic forecasts for all the regions and despite persistent political uncertainties, TRUMPF projects stable growth in fiscal 2017/18. For orders received we expect a further single-digit percentage increase against the backdrop of the exceptionally high growth in the past fiscal year. On account of our high forward order book, we intend to increase our sales to a level similar to the past fiscal year. Underlying this target is growth predicted by us in all regions. This will also result in a further increase in the results and a slight improvement in the return on sales.

Future orientation of the TRUMPF Group

To respond better to changes in the framework – such as the slowdown in growth in emerging countries, new business models and progressive digital connectivity – TRUMPF sharpened its strategic focus and adjusted the management structure of the Group's Managing Board. The board, which has consisted of six members since July 1, 2017, ensures consistent management of the Machine Tools and Laser Technology core divisions, simultaneously creating the freedom required to consistently tackle future topics.

In Machine Tools, which is our largest division, we have higher growth rates than the sector average. Building on this good starting situation, we are continuing our sales initiative, which aims to gain sectoral and regional market shares. Our portfolio for our machine tool customers consisting of machines, software and services is consistently tailored to the customer's benefit. Through the perfect intermeshing of our offerings, we are preparing our customers for the application of digitally connected production.

The laser continues to be the tool that can be used to realize future technologies. For the coming fiscal year, we anticipate further growth which will be generated in all product fields. At the sector level, we see a favorable environment for applications in consumer electronics, electromobility and sensor technology. Our activities with diode lasers are gaining importance. In electronics, we will continue to focus on innovative electronic solutions of medium batch sizes, especially in the semiconductor industry. The consolidation of this field has resulted in a very positive development in orders received and sales. This will continue, albeit not quite as strongly.

In our additive manufacturing product field, we will constantly expand our product portfolio consisting of machines, sensors and periphery to increase our share in the rapidly growing market. Customers in this field especially appreciate our technology and process expertise. In EUV lithography for the coating of microprocessors, we anticipate a further rise in sales. The industrialization of this highly innovative production process – in which TRUMPF is the only provider, along with Zeiss and ASML – is proceeding as planned.

Digitalization is a key strategic field. Our activities are geared to improving and supporting internal processes. But above all, we intend to facilitate the digital connectivity of our customers' production with our comprehensive portfolio. To this end, we are consistently expanding our TruConnect offerings as well as the activities of our subsidiary AXOOM that we intend to establish as one of the leading business platforms for medium-sized customers.

With our strategic refinement, we ideally prepared the TRUMPF Group last year for the future based on a five-year time horizon – in view of our technological expertise, market developments and a good business environment in which our employees can provide top performance for our customers. We therefore look to fiscal 2017/18 with optimism.

Ditzingen, September 19, 2017

TRUMPF GmbH + Co. KG
Berthold Leibinger GmbH
Dr. phil. Nicola Leibinger-Kammüller, President
Dr.-Ing. E.h. Peter Leibinger, Vice President
Dr.-Ing. Mathias Kammüller
Dr. rer. pol. Lars Grünert
Dr.-Ing. Heinz-Jürgen Prokop
Dr.-Ing. Christian Schmitz

Sales in the regions

TOTAL

3,111 – € millions
 +10.8%

ABROAD

2,489 – € millions
 +12.6%

GERMANY

622 – € millions
 +4.2%

EUROPE WITHOUT GERMANY

1,053 – € millions
 +11.4%

AMERICAS

540 – € millions
 +11.4%

WESTERN EUROPE WITHOUT GERMANY

777 – € millions
 +17.0%

ASIA-PACIFIC

882 – € millions
 +14.6%

EASTERN EUROPE

276 – € millions
 –1.8%



**Consolidated
Financial Statements**

Consolidated Balance Sheet

AS OF JUNE 30, 2017

Assets in € '000s	Notes	6/30/2017	6/30/2016
FIXED ASSETS			
Intangible assets	1	83,771	112,328
Tangible assets		1,029,457	828,180
Financial assets		24,062	17,417
		1,137,290	957,925
CURRENT ASSETS			
Inventories	2	471,009	612,017
Receivables	3	656,625	562,816
Other assets	4	146,824	153,841
Cash and cash equivalents, securities	5	631,007	526,549
		1,905,465	1,855,223
PREPAID EXPENSES	6	31,965	26,213
DEFERRED TAX ASSETS	7	13,684	-
		3,088,404	2,839,361

Equity and Liabilities in € '000s	Notes	6/30/2017	6/30/2016
EQUITY	8		
Fixed capital and subscribed capital		98,500	98,500
Retained earnings		1,351,349	1,223,485
Equity difference from foreign currency translation		84,144	109,859
Minority interests		48,795	45,103
		1,582,788	1,476,947
SPECIAL RESERVES	9	7,299	7,924
ACCRUALS			
Accruals for pensions and similar obligations	10	197,157	215,490
Other accruals	11	329,719	301,421
		526,876	516,911
LIABILITIES	12		
Trade payables		224,247	137,938
Financial liabilities		175,553	185,478
Liabilities to partners		438,489	391,277
Other liabilities		79,311	67,826
		917,600	782,519
DEFERRED INCOME	13	53,841	42,159
DEFERRED TAX LIABILITIES		-	12,901
		3,088,404	2,839,361

Consolidated Profit and Loss Statement

FOR FISCAL YEAR 2016/17

in € '000s	Notes	2016/17	2015/16
Sales revenues	14	3,111,336	2,808,465
Change in inventories and own work capitalized	15	47,401	31,338
Operating result		3,158,737	2,839,803
Other operating income	16	93,800	106,048
Cost of materials	17	-1,331,561	-1,199,766
Personnel expenses	18	-896,537	-817,789
Amortization and depreciation on intangible and tangible assets		-137,945	-117,984
Other operating expenses	19	-520,078	-490,837
Financial and investment result	20	-29,180	-16,379
Profit before taxes		337,236	303,096
Taxes on income	21	-61,323	-56,444
Profit after taxes		275,913	246,652
Other taxes		-14,286	-11,596
Consolidated net profit		261,627	235,056
Result attributable to minority interests	8	-10,188	4
Consolidated net profit after minority interests		251,439	235,060
For informational purposes:			
Taxes of partners	21	-52,008	-38,995
Consolidated net profit after minority interests and taxes of partners		199,431	196,065

Statement of Shareholders' Equity

FOR FISCAL YEAR 2016/17

	Parent company				Equity
	Fixed capital and subscribed capital	Equity earned by the Group	Accumulated other comprehensive income		
in € '000s			Exchange rate differences	Other recognized income and expenses	
As of June 30, 2015	98,500	1,152,680	148,470	-62,887	1,336,763
Investments	-	-	-	-	-
Payment of dividends	-	-	-	-	-
Allocations to partners' accounts	-	-103,413	-	-	-103,413
Changes in consolidated group	-	-342	-	-	-342
Consolidated net income	-	235,060	-	-	235,060
Other changes	-	2,387	-38,611	-	-36,224
As of June 30, 2016	98,500	1,286,372	109,859	-62,887	1,431,844
Investments	-	-	-	-	-
Payment of dividends	-	-	-	-	-
Allocations to partners' accounts	-	-123,480	-	-	-123,480
Changes in consolidated group	-	-2,641	499	2,142	-
Consolidated net income	-	251,439	-	-	251,439
Other changes	-	404	-26,214	-	-25,810
As of June 30, 2017	98,500	1,412,094	84,144	-60,745	1,533,993

Minority interests				
	Minority capital	Accumulated other comprehensive income	Equity	Group equity
		Exchange rate differences		
	41,489	5,579	47,068	1,383,831
	4,102	-	4,102	4,102
	-5,394	-	-5,394	-5,394
	-	-	-	-103,413
	1,514	-	1,514	1,172
	-4	-	-4	235,056
	-	-2,183	-2,183	-38,407
	41,707	3,396	45,103	1,476,947
	-	-	-	-
	-5,803	-	-5,803	-5,803
	-	-	-	-123,480
	-128	114	-14	-14
	10,188	-	10,188	261,627
	-	-679	-679	-26,489
	45,964	2,831	48,795	1,582,788

Consolidated Cash Flow Statement

FOR FISCAL YEAR 2016/17

in € '000s	2016/17	2015/16
CONSOLIDATED NET INCOME FOR THE YEAR	261,627	235,056
+/- Elimination of financial and investment result	29,180	16,379
+/- Elimination of income tax expenses	61,323	56,444
Consolidated net income before financial and investment result and income taxes	352,130	307,879
-/+ Income taxes paid/received	-68,209	-51,061
+/- Elimination of write-downs/write-ups of fixed assets	137,945	117,984
-/+ Elimination of gain/loss from the disposal of fixed assets	1,981	-417
-/+ Increase/decrease in inventories and trade receivables	-154,127	-7,242
+/- Increase/decrease in trade payables	88,382	-4,806
+/- Increase/decrease in accruals	20,298	3,490
+/- Change in other assets and liabilities	-1,241	-1,182
+/- Elimination of other non-cash expenses/income	42,227	2,687
= Cash inflow from operating activities	419,386	367,332
- Cash paid for investments in tangible assets	-189,506	-129,805
+ Cash received from the disposal of tangible assets	27,228	7,029
- Cash paid for investments in intangible assets	-8,235	-7,797
+ Cash received from the disposal of intangible assets	252	58
- Cash paid for investments in fixed financial assets	-9,371	-10,307
+ Cash received from the disposal of fixed financial assets	695	62
+/- Cash paid/received from the acquisition of consolidated companies	-3,316	-7
- Cash paid for investments in plan assets (CTA)	-50,000	-
- Cash paid for financial investments > 3 months	-60,000	-
+ Dividends received	189	-
+ Interest received	6,890	5,123
= Cash outflow/inflow from investing activities	-285,174	-135,644
+ Cash received from equity contributions from minority interests	-	4,102
- Cash paid to partners	-84,042	-59,409
- Dividends paid to other partners	-5,803	-5,394
+ Cash received from the issuance of loans and other financial liabilities	7,849	14,715
- Cash repayments of loans and other financial liabilities	-26,113	-75,455
- Interest paid	-3,660	-3,243
+ Cash received from subsidies/grants	-	107
= Cash outflow from financing activities	-111,769	-124,577
CHANGE IN CASH AND CASH EQUIVALENTS	22,443	107,111
+/- Change in cash and cash equivalents due to exchange rate changes	-6,719	-12,491
+/- Change in cash and cash equivalents due to consolidation activities	79	1,536
+ Cash and cash equivalents at the beginning of the fiscal year	608,259	512,103
= Cash and cash equivalents at the end of the fiscal year	624,062	608,259
COMPOSITION OF CASH AND CASH EQUIVALENTS		
+ Cash	630,986	526,014
+ Securities	20	535
+ Debenture bonds	-	83,500
- Liabilities to banks payable on demand	-6,944	-1,790
= Cash and cash equivalents at the end of the fiscal year	624,062	608,259



Notes to the Consolidated Financial Statements

Notes to the Consolidated Financial Statements

FOR FISCAL YEAR 2016/17

Principles and Methods

TRUMPF GmbH + Co. KG and Berthold Leibinger GmbH are listed in the Commercial Register at the District Court Stuttgart under Entry HRA 201460 and HRB 200720. The head offices of both companies are located at Johann-Maus-Straße 2, 71254 Ditzingen, Germany.

The consolidated financial statements for the fiscal year 2016/17 have been prepared in accordance with sec. 264a HGB (German Commercial Code) and in line with sec. 290 et sequentes HGB. The accounting and valuation principles of the HGB for large corporations have been applied while taking into account the regulations for partnerships. In accordance with sec. 298 (1) HGB in conjunction with sec. 244 HGB the consolidated financial statements have been prepared in euros (€). The consolidated income statement follows the total costs method.

To enhance the clarity of the consolidated financial statements, various items of the consolidated balance sheet and the consolidated income statement have been combined and are disclosed separately in the notes to the consolidated financial statements. The balance sheet was supplemented by the position “financial liabilities” in addition to those prescribed by law. Unlike in the prior year this position includes all interest-bearing liabilities against third parties that were entered for financing purposes. The prior year values have been adjusted accordingly.

Accounting and Valuation

The financial statements of the companies included in the consolidated financial statements follow uniform accounting and valuation principles. In case adjustments to local accounts are necessary to ensure uniform accounting within the group, a “Handelsbilanz II” (balance sheet for consolidation purposes) is prepared.

Intangible and tangible assets are stated at acquisition or manufacturing costs, net of regular amortization or depreciation. Tangible assets are depreciated using the straight-line method.

For regular amortization and depreciation the following useful lives are assumed: 3 to 5 years for software, 9 to 12 years for acquired customer bases, 3 to 9 years for technological know-how, 10 years for trademark rights, 25 to 50 years for buildings, 6 to 8 years for technical equipment and machinery, and 3 to 20 years for other equipment, factory and office equipment.

The useful life of goodwill is assumed to be 5 years and is determined based on internal empirical data on the respective product life cycles.

Machines used for testing or training purposes as well as showroom and demo machines are considered to be internally used machines. They are classified as fixed assets and are amortized over an expected useful life of 5 years. Machines that are leased to customers are amortized over the term of the lease contract.

Financial assets are stated at acquisition costs or net realizable values as of the balance sheet date. The accounting and valuation principles of shares in associated enterprises are outlined in the chapter consolidation principles.

Inventories of raw materials, consumables and supplies as well as merchandise are stated at the lower of costs or market values. Finished goods and work in progress are valued at manufacturing costs, which include direct material and production costs, appropriate material and production overhead costs as well as depreciation expenses attributable to the manufacturing process.

In case acquisition or manufacturing costs exceed the market value at the balance sheet date due to lower replacement prices / sales market prices, excess inventories or unsaleability, the book value of inventories is adjusted accordingly.

Payments on account received are deducted from inventories.

Receivables and other assets are stated at the lower of nominal values or net realizable values as of the balance sheet date. If the collectability of receivables is at risk, appropriate allowances are made. Receivables deemed uncollectible are written down to full extent. The general credit risk is covered by lump-sum bad debt allowances on net receivables that are not subject to specific allowances.

Securities are stated at the lower of acquisition costs or net realizable values at the balance sheet date.

Prepaid expenses comprise payments that were made prior to the balance sheet date but that constitute expenses for a certain period after that date. Debt discounts are capitalized and amortized over the scheduled term of the loans.

The **special reserves** include investment subsidies and grants for fixed assets. They are released over the economic life of the subsidized assets.

Accruals for pensions and similar obligations are calculated based on actuarial principles using the projected unit credit method based on Prof. Dr. Klaus Heubeck's 2005 G mortality tables. In accordance with the regulation in sec. 253 (1) HGB, the expected increase in salaries and pensions as well as the predicted employee turnover rate are taken into account in the actuarial calculation of the accruals. Accruals for pensions and similar obligations are discounted with the average market interest rate of the past ten fiscal years, based on an assumed residual term of 15 years. The interest rates are published by Deutsche Bundesbank (German Central Bank). The determination of the discount factor over the longer ten year horizon compared to the seven year horizon leads to a positive difference of k€ 37.611 (prior year k€ 24,984).

In fiscal year 2016/17 the calculation was based on the following parameters:

- Interest rate: 3.85 percent p.a. (prior year 4.17 percent p.a.)
- Increase of salaries and pensions: 3.0 percent p.a. (prior year 3.0 percent p.a.)
- Pension trend: 2.0 percent p.a. (prior year 2.0 percent p.a.)

Other accruals cover all known risks, uncertain liabilities and contingent losses on pending transactions as of the balance sheet date. They are recognized at the settlement value which is derived from prudent commercial judgment. Accruals with a remaining term of more than one year have been discounted in accordance with sec. 253 (2) sentence 1 HGB. Economic hedging relationships between derivative financial instruments and the underlying transactions are accounted for by creating valuation units. Therefore, no provisions for onerous contracts are recorded for financial instruments with a negative fair value.

Accruals for obligations relating to phased retirement programs are calculated according to actuarial principles based on an interest rate of 1.62 percent p.a. (prior year 1.87 percent p.a.).

These accruals were offset against assets which will be used exclusively for the settlement of these obligations and which cannot be accessed by all other remaining creditors. The net realizable value of the plan assets (k€ 4,949, prior year k€ 3,191) is equivalent to their amortized costs. The repayment amount of the accruals for obligations relating to phased retirement programs which were offset against the corresponding assets stands at k€ 5,904 (prior year k€ 4,076). Due to immateriality the offsetting of expenses and income was waived.

Accruals for obligations relating to the “TRUMPF Familien- und Weiterbildungskonto” were offset against assets that will only be used for the fulfillment of these obligations and that cannot be accessed by other creditors. The net realizable value of the plan assets, which corresponds to their amortized costs, is k€ 5,508 (prior year k€ 4,484). The repayment amount of the accruals is also k€ 5,508 (prior year k€ 4,484). Due to immateriality the offsetting of the corresponding expenses and income was waived.

Liabilities are reported at the repayment amount.

Deferred income includes payments that were made prior to the balance sheet date but constitute income for a certain period after that date.

Deferred taxes result from temporary and quasi-permanent differences between the commercial amounts of assets, liabilities, accrued and deferred items and their corresponding tax values, or from tax loss carry forwards. To calculate the deferred tax amount, the respective undiscounted tax burden or relief is valued based on the company-specific tax rate that is expected to prevail when the differences will be settled. Deferred tax assets and liabilities are shown net. If a surplus remains on the assets side as of the balance sheet date, the option for recognition in accordance with sec. 274 (1) sentence 2 HGB is not exercised.

The Bilanzrichtlinienumsetzungsgesetzes (BilRUG) was applied for the first time in fiscal year 2016/17. Yet, the comparability with the prior year figures is not impaired materially.

Ownership of Shares and Companies included in Consolidation

Professor Dr. techn. Dr.-Ing. h. c. Berthold Leibinger, his family and Berthold Leibinger Stiftung GmbH hold all shares, directly and indirectly, in TRUMPF GmbH + Co. KG and Berthold

Leibinger GmbH, Ditzingen (Germany). Together, these two companies exercise joint control over all domestic and foreign subsidiaries of the TRUMPF Group. The consolidation process treats these two companies as joint parent companies.

In addition to the parent companies, the basis of consolidation consists of 27 (prior year 27) German subsidiaries and 57 (prior year 55) subsidiaries outside of Germany. In fiscal year 2016/17 three companies have been included for the first time in the consolidated financial statements according to the principles of full consolidation. One company was deconsolidated. Neither the initial consolidation nor the deconsolidation had a significant impact on the financial position and performance of the group, i.e. the comparability with the previous year is still given.

Two (prior year two) companies are included in the consolidated financial statements as associated enterprises, in accordance with sec. 311 et sequentes HGB.

Fifteen (prior year twelve) subsidiaries as well as one (prior year two) associated enterprises are not included in the consolidated financial statements for reasons of immateriality. Their combined net income and revenues only amount to approximately 1 percent of the consolidated TRUMPF Group net income and revenue, respectively. Consequently, they are considered as irrelevant for the fair presentation of the financial position of the Group.

Consolidation Principles

Until June 30, 2010 capital consolidation was carried out in accordance with the book value method. This involves offsetting acquisition costs against the pro rata owner's equity of the subsidiaries at the time of first-time consolidation, foundation or acquisition. From fiscal year 2010/11 onwards the revaluation method in accordance with sec. 301 (1) HGB has been applied. When using this method the equity of the subsidiaries is stated at an amount that approximates the net realizable value of those assets and liabilities that have to be included in the consolidated financial statement.

Until the fiscal year 2009/10 a residual debit difference was treated as goodwill and offset against the revenue reserves and minority interests without affecting income. From fiscal year 2010/11 onwards a residual debit difference is shown as goodwill on the assets side and is depreciated based on the expected useful life.

Investments in associated enterprises have been consolidated at equity in accordance with sec. 312 (1) no. 1 HGB using the book value method.

The consolidation measures of sec. 300 to 305 HGB may result in differences between the accounting and the tax base of assets, liabilities as well as of accrued or deferred items. In these cases, the prospective tax relief or burden is recognized in the balance sheet as deferred tax asset / liability provided that these differences are expected to reverse in the future. The calculation of deferred taxes is based on the individual tax rate expected for the date of settlement of the differences. The tax rates range from 10 percent to 39 percent. Deferred tax liabilities are disclosed net of deferred tax assets. In case the latter exceed the former, the option to recognize deferred tax assets in the balance sheet provided by sec. 274 HGB is not exercised.

Any intercompany profits arising from intercompany sales or services are eliminated with effect on income. In the course of fiscal year 2016/17 a detailed analysis of each subsidiary's inventories with respect to the intra-group margins was performed. The first-time application of the newly implemented group-wide product profitability analysis led to more precise estimation of those margins. The resulting expense of €34 million was recorded in the consolidated income statement during fiscal year 2016/17.

Accounts receivable and accounts payable between companies included in the consolidation are offset against each other. Any resulting foreign exchange related difference is not included in the profit and loss statement and recognized in the item "equity difference from foreign currency translation" instead. Revenues from intercompany sales and intercompany income are offset against the corresponding expenses or reclassified as changes in inventory or other own work capitalized.

Foreign Currency Translation

In the individual financial statements, foreign currency receivables and liabilities are translated generally at the average spot exchange rate. In case of residual terms of more than one year the realization principle (sec. 298 (1) HGB in conjunction with sec. 252 (1) No. 4 clause 2 HGB) and the historical cost principle (sec. 298 (1) HGB in conjunction with sec. 253 (1) sentence 1 HGB) are taken into account.

Bank balances denoted in foreign currency are translated at the average spot exchange rate prevailing at the balance sheet date. Acquisition costs for shares in foreign subsidiaries or participations – with the exception of other participations – are valued at historical rates. Figures disclosed in the notes to the financial statements are translated at the average spot exchange rate on the balance sheet date.

In the consolidated financial statements, the balance sheet items of subsidiaries that do not use the euro as reporting currency are translated in accordance with sec. 308a HGB with the modified current-rate method. Hence, items on the asset and the liability side of balance sheets that are denominated in foreign currencies are translated at the average spot exchange rate prevailing at the balance sheet date. This practice does not apply to the equity position for which historical rates are used. The items in the profit and loss accounts of subsidiaries that do not use the euro as reporting currency are translated at the average exchange rate for the fiscal year. Any resulting differences are shown within group equity below the reserves as “equity difference from foreign currency translation” in accordance with sec. 308a HGB.

Explanations to the Balance Sheet

The numbers stated in the following paragraphs refer to the corresponding items in the consolidated balance sheet or consolidated profit and loss account.

1. Fixed assets

The development of the consolidated fixed assets is presented separately in the statement of fixed assets changes. Differences resulting from currency translation have been taken into account in the acquisition or manufacturing costs as well as in the cumulated depreciation and amortization.

Internally used machines with a net book value of k€ 148,455 were reclassified from current assets into fixed assets at various points in time during the course of fiscal year 2016/17. Internally used machines comprise of machines used for testing or training purposes, showroom and demo machines as well as machines that are leased to customers. The decline of the economic value of these machines is classified as depreciation (k€ 20,828) once the reclassification was performed. Prior to the reclassification any newly acquired internally used machines were reported as change in inventory and the subsequent decline of their economic value in material costs.

2. Inventories

in € '000s	6/30/2017	6/30/2016
Raw materials, consumables and supplies	187,990	171,153
Unfinished goods	177,026	160,108
Finished goods and merchandise	252,666	384,115
Payments on account	11,035	8,929
	628,717	724,305
Payments on account received	-157,708	-112,288
	471,009	612,017

The prior year value of finished goods and merchandise contains internally used machines that were reclassified as fixed assets in fiscal year 2016/17.

3. Receivables

in € '000s	6/30/2017	6/30/2016
Trade receivables	650,949	561,003
<i>of which with a residual term of more than one year</i>	4,683	3,845
Receivables from affiliated companies that are not fully consolidated	5,676	1,813
<i>of which trade receivables</i>	4,456	1,440
<i>of which with a residual term of more than one year</i>	800	200
	656,625	562,816

4. Other assets

in € '000s	6/30/2017	6/30/2016
Other assets	146,824	153,841
<i>of which with a residual term of more than one year</i>	6,307	2,870
	146,824	153,841

Other assets primarily comprise tax receivables resulting from income taxes and value added taxes as well as medium-term financial investments with a remaining maturity of more than three months (k€ 60,000).

5. Cash and cash equivalents as well as securities

Cash and cash equivalents include checks, cash on hand, bank balances, short-term promissory notes as well as short-term financial investments with a remaining maturity of less than three months. In addition to that investment securities with a book value of k€ 20 (previous year k€ 535) exist.

6. Prepaid expenses

in € '000s	6/30/2017	6/30/2016
Debt discount pursuant to sec. 250 (3) HGB	-	129
Other	31,965	26,084
	31,965	26,213

Other prepaid expenses include vacation allowances, insurance premiums, maintenance agreements, rent, dues and other prepaid costs caused by the divergent fiscal year.

7. Deferred tax assets

Deferred tax assets and deferred tax liabilities are shown net. The deferred tax assets recognized on the balance sheet arise from consolidation activities, in particular from the first-time adoption of the intra-group margins derived from the newly implemented product profitability analysis. The deferred tax liabilities are based on divergent values in the commercial and the tax financial statement and are mainly attributable to intangible assets, tangible assets and provisions.

in € '000s	6/30/2017	6/30/2016	Change
Deferred tax assets	34,774	15,020	+19,754
Deferred tax liabilities	-21,090	-27,921	+6,831
Surplus	13,684	-12,901	

8. Equity

The fixed capital and subscribed capital position corresponds to the compulsory contributions of the limited partners of TRUMPF GmbH + Co. KG and the subscribed capital of the general partner. The compulsory contributions of the limited partners and the risk capital are identical.

The result allocation for the fiscal year 2016/17 was made in accordance with the regulations of the partnership agreements and has been taken into account in the preparation of the consolidated financial statements.

Other revenue reserves consist of profits and losses generated by the general partner, the domestic and foreign subsidiaries. Furthermore, effects of various consolidation measures are recorded in equity. Effects from other consolidation activities are also disclosed in equity.

Minority interests mainly relate to investments in Jiangsu Jinfangyuan CNC Machine Company Limited, TRUMPF-Homberger S.r.l., TRUMPF Sachsen GmbH and TRUMPF Hüttinger GmbH + Co. KG. The result allocable to minority interests comprises profit shares of k€ 10.435 (prior year k€ 3,081) and loss shares of k€ 247 (prior year k€ 3,085). The development of the Group's equity is shown separately in the statement of changes in group equity.

9. Special reserves

in € '000s	6/30/2017	6/30/2016
Investment subsidies and grants	7,299	7,924
	7,299	7,924

10. Accruals for pensions and similar obligations

in € '000s	6/30/2017	6/30/2016
Accruals for pensions and similar obligations (settlement value prior to offsetting)	247,157	215,490
Contractual Trust Agreement (offset amount)	-50,000	-
	197,157	215,490

In fiscal year 2016/17 the accruals for pensions and similar obligations were offset against assets that are beyond the reach of other creditors. The fair value of these assets is equal to the acquisition costs and amounts to k€ 50,000. No offsettable income and expenses arose during the course of fiscal year 2016/17.

11. Other accruals

in € '000s	6/30/2017	6/30/2016
Tax accruals	32,127	15,216
Other accruals	297,592	286,205
	329,719	301,421

Other accruals mainly relate to obligations in the personnel and welfare area, warranty obligations, outstanding purchase invoices and other contingent liabilities.

12. Liabilities

in € '000s	6/30/2017 Total	Remaining Term			6/30/2016 Total	Remaining Term	
		up to 1 year	1 to 5 years	over 5 years		up to 1 year	over 1 year
Trade payables	224,247	219,231	4,700	316	137,938	135,220	2,718
Financial liabilities	175,553	102,152	56,387	17,014	185,478	57,064	128,414
<i>of which against banks</i>	67,158	26,180	24,542	16,436	88,321	26,670	61,651
<i>of which other financial liabilities</i>	108,395	75,972	31,845	578	97,157	30,394	66,763
Liabilities to partners	438,489	104,996	333,493	–	391,277	94,362	296,915
Liabilities to affiliated companies that are not fully consolidated	1,281	1,281	–	–	499	499	–
Other liabilities	78,030	77,165	825	40	67,327	66,821	506
<i>of which taxes</i>	44,344	44,344	–	–	34,087	34,087	–
<i>of which relating to social security</i>	6,864	6,864	–	–	5,462	5,462	–
	917,600	504,825	395,405	17,370	782,519	353,966	428,553

Trade payables are subject to customary retention of title.

Financial liabilities comprise all interest-bearing liabilities against third parties that were entered for financing purposes. These include liabilities to banks (k€ 67,158) and other financial liabilities. The latter consist of deposits, loans and a private placement on the U.S. stock market of k€ 37.657 (prior year k€ 37.657) including accrued interest.

Of the liabilities to banks, a total of k€ 50,173 (prior year k€ 43,650) are secured by mortgage.

Liabilities to partners relate to liabilities of TRUMPF GmbH + Co. KG and their limited partners.

Other liabilities include commission liabilities and positive customer balances.

13. Deferred income

This item includes mainly the deferral of revenues or payments already received for maintenance services, training or leasing contracts.

Explanations to the Profit and Loss Account

14. Sales

20 percent (prior year 21 percent) of total sales were generated in Germany and 80 percent (prior year 79 percent) abroad. In fiscal year 2016/17 the revised definition of sales revenues (sec. 277 German Commercial Code) was applied for the first time. Had the new definition of sales revenues already been applied in fiscal year 2015/16, sales revenue of k€ 2,818,177 would have been reported. The impact on group sales revenues is immaterial such that comparability to prior year figures is given. The reclassified income primarily refers to the sale of food and beverages, income from production licenses and commission payments.

For sales per business division please refer to the group management report.

in € '000s	2016/17	2015/16
National Sales	622,330	597,380
International Sales	2,489,006	2,211,085
	3,111,336	2,808,465

15. Changes in inventories and own work capitalized

in € '000s	2016/17	2015/16
Changes in inventories of finished goods and unfinished goods	12,323	28,185
Own work capitalized	35,078	3,153
	47,401	31,338

16. Other operating income

Other operating income mainly relates to exchange rate gains, income from the release of accruals and the reversal of value adjustments as well as gains on disposal of assets.

Income from foreign currency translation amounts to k€ 58,005 (prior year k€ 66,245). Other operating income totaling k€ 17,271 is allocable to other fiscal years (prior year k€ 10,565) and is mostly related to income regarding the reversal of accruals.

17. Cost of materials

in € '000s	2016/17	2015/16
Cost of raw materials, consumables and supplies and of purchased goods	1,270,536	1,143,607
Cost of purchased services	61,025	56,159
	1,331,561	1,199,766

18. Personnel expenses

in € '000s	2016/17	2015/16
Wages and salaries	749,280	682,054
Social security and other welfare costs	126,543	117,953
Pension costs	20,714	17,782
	896,537	817,789

Personnel expenses also contain the remuneration and pension expenses of our partners as well as extraordinary expenses resulting from restructuring activities (k€ 8,767).

19. Other operating expenses

Other operating expenses mainly contain exchange rate losses, administrative and selling expenses including sales representative commissions, third party services, maintenance costs, training and travel expenses, freight out, advertising expenses, rent and lease expenses as well as additions to provisions.

Expenses from foreign currency translation amount to k€ 61,380 (prior year k€ 71,331). In addition to that, other operating expenses include extraordinary losses due to a deconsolidation (k€ 3,975) and restructuring measures (k€ 6,115).

20. Financial and investment result

in € '000s	2016/17	2015/16
Income from securities and loans	28	38
Income from equity investments	189	–
Other interests and similar income	7,386	8,419
<i>of which from affiliated companies that are not fully consolidated</i>	1	2
Depreciation of financial assets and current securities	–1,670	–22
Interests and similar expenses	–35,113	–24,814
<i>of which from discounting of accruals</i>	–20,924	–9,740
	–29,180	–16,379

The effect of interest rate changes which results from the discounting of pension amounts to k€ 12,315 (prior year k€ 1,072).

21. Taxes on income

Taxes on income include the effective and deferred trade tax and corporate income tax payable by TRUMPF GmbH + Co. KG, the general partner and the domestic and foreign subsidiaries. Effective income taxes amount to k€ 88,075 (prior year k€ 61,725) for the reporting year. Thereof, k€ 4,138 are allocable to prior fiscal years and are attributable to adjustments arising from tax audits as well as adjustments related to prior years.

The deferred tax income of k€ 26,752 recognized in the current fiscal year (prior year k€ 5,280) can be split into two components: income resulting from differences between the commercial and the tax balance sheet (k€ 5,250, prior year k€ -128) as well as income from consolidation measures (k€ 21,502 (prior year k€ 5,408).

Partners' taxes were presented, for information purposes only, after the figure for the consolidated net income for the year according to sec. 264c (3) HGB. They are not included in the calculation of deferred taxes.

Notes to the Cash Flow Statement

22. Cashflow from operating activities

The change of inventories reported in the cash flow statement has been adjusted for the reclassification effect of the internally used machines into fixed assets (k€ 148,455).

23. Composition of cash and cash equivalents

Cash and cash equivalents includes cash (k€ 630,986), highly liquid securities (k€ 20) as well liabilities to banks that are repayable on demand (k€ 6,944). The liabilities to banks that are repayable on demand refer to bank overdrafts.

Other Disclosures

24. Contingent liabilities

in € '000s

6/30/2017

Bills of exchange	14,887
Warranty agreements	55,788
Guarantees	34,962
	105,637

With regard of the sound financial position of the companies, for which guarantees and warranty agreements were provided, the risk that the contingent liabilities will become effective is considered to be low.

25. Derivative financial instruments and valuation units

	Nominal amount	Net realizable value	Book value	Balance sheet item
Foreign exchange related transactions	kEUR 456,374	kEUR 24,900	–	–
	kUSD 3,013	kUSD 24	–	–
	kCNY 60,000	kCNY 202	–	–
Other transactions	kEUR 37,657	kEUR –1,721	–	–

Foreign exchange related transactions constitute foreign exchange forwards and swaps in the currency pairs EUR/JPY, EUR/KRW, EUR/USD, EUR/GBP, EUR/CHF, EUR/PLN, EUR/CNY, EUR/CZK, USD/GBP and CNY/GBP. Other transactions include combined interest and foreign exchange hedging transactions in the currency pair EUR/USD.

Adequate provisions have been made for hedging transactions with a negative net realizable value on the balance sheet date that are not included in a valuation unit. The valuation is conducted in accordance with generally accepted valuation methods, e.g. present value or option pricing models.

The following valuation units have been generated:

Underlying transaction / Hedging instrument	Risk / Type of valuation unit	Included amounts	Hedged amount
Third party sales/Foreign exchange transactions	Foreign exchange risk/Macro hedge	kEUR 202,498	kJPY 23,700,000
Third party sales/Foreign exchange transactions	Foreign exchange risk/Macro hedge	kEUR 101,100	kKRW 126,787,740
Third party sales/Trade payables/ Foreign exchange forwards transactions	Foreign exchange risk/Macro hedge	kEUR 94,285	kUSD 106,500
Third party sales/Trade payables/ Foreign exchange forwards transactions	Foreign exchange risk/Macro hedge	kEUR 21,440	kGBP 18,161
Trade payables/Foreign exchange transactions	Foreign exchange risk/Macro hedge	kEUR 21,006	kCHF 22,800
Trade payables/Foreign exchange transactions	Foreign exchange risk/Macro hedge	kEUR 6,672	kPLN 30,000
Trade payables/Foreign exchange transactions	Foreign exchange risk/Macro hedge	kEUR 5,435	kCZK 145,941
Third party sales/Trade payables/ Foreign exchange forwards transactions	Foreign exchange risk/Macro hedge	kEUR 3,938	kCNY 30,616
Third party sales/Foreign exchange transactions	Foreign exchange risk/Macro hedge	kUSD 3,013	kGBP 3,900
Third party sales/Foreign exchange transactions	Foreign exchange risk/Macro hedge	kCNY 60,000	kGBP 6,704
Financial liabilities/Combined interest and foreign exchange hedges	Interest and foreign exchange risk/Micro hedge	kEUR 37,657	kUSD 45,000

In respect of the existing hedges on the balance sheet date the following applies in accordance with sec. 254 HGB:

Economic hedging relationships between derivative financial instruments and underlying transactions are reflected in the balance sheet by recognizing valuation units. Due to the consistency of all significant value-determining components, the opposite changes in value from the underlying and the hedged item completely offset one another within the hedging period. The effectiveness of the hedges is monitored on a regular basis within the existing risk management. When necessary, the hedging strategy is modified immediately. Therefore, prospective and retrospective effectiveness can be assumed for all hedging relationships.

To hedge foreign exchange risks arising from high-probability forecast transactions, TRUMPF group enters forward contracts that match the expected net cash flow in terms of duration, nominal value and currency (macro hedges). The high-probability future cash flows from sales and sourcing transactions are derived from the corporate planning process. The verification of former planning results has shown that the forecast transactions are indeed highly probable.

26. Off-balance-sheet transactions

At the balance sheet date, off-balance sheet transactions relating to Operate Lease contracts exist. These contracts concern vehicles and office equipment and were concluded for cost-efficiency reasons. The sum of the lease payment during fiscal year 2016/17 amounts to k€ 11.819.

27. Other financial commitments

in € '000s	6/30/2017
Rent, lease and leasing agreements as well as other commitments	67,840
Purchase obligations relating to capital expenditures	60,092
	127,932
The amounts are due as follows:	
within 1 year	81,380
2 to 4 years	32,189
5 years and thereafter	14,363
	127,932

In addition to the financial commitments listed above, obligations from master agreements and regular purchase commitments on a scale customary for the company exist.

28. Audit fees

The total fee charged by the independent auditor for the fiscal year amounts to k€ 1,650 (prior year k€ 1,000) and can be broken down as follows:

in € '000s	2016/17	2015/16
Audit of financial statements	577	526
Tax consulting services	992	368
Other services	81	106

29. Employees

Annual average headcount:

	2016/17	2015/16
Germany Employees	5,543	5,306
Trainees	325	332
Abroad Employees	5,634	5,427
Trainees	134	147
	11,636	11,212

30. Management

The persons stated below are responsible for the management of TRUMPF group. As of June 30, 2017, Dr. rer. soc. Gerhard Rübling is no longer part of the management of the company. Dr.-Ing. Heinz-Jürgen Prokop and Dr.-Ing. Christian Schmitz joined the management of TRUMPF group on July 1, 2017. Their remuneration for managing the parent company and its subsidiaries amounts to k€ 9,707 (prior year k€ 9,499).

Pension commitments of k€ 16,987 (prior year k€ 17,237) were granted to former members of the management. In fiscal year 2016/17, former general managers or their surviving dependents received benefits amounting to k€ 1,376 (prior year k€ 1,291).

31. Exemption in accordance with HGB

The following corporations have made use of the exemption from sec. 264 (3) HGB: AXOOM GmbH, TRUMPF Werkzeugmaschinen Beteiligungs-GmbH, TRUMPF Werkzeugmaschinen Deutschland Vertrieb + Service Beteiligungs-GmbH, TRUMPF Werkzeugmaschinen Teningen GmbH, TRUMPF International Beteiligungs-GmbH, TRUMPF Laser- und Systemtechnik GmbH, TRUMPF Hüttinger Verwaltung GmbH, TRUMPF Laser GmbH, Celtia Verwaltungs-GmbH, TRUMPF Lasertechnik GmbH, TRUMPF Finance GmbH, Berthold Leibinger Immobilien GmbH, TRUMPF Kapitalbeteiligungen GmbH, TRUMPF Sachsen GmbH, TRUMPF Scientific Lasers Verwaltungsgesellschaft mbH, INGENERIC GmbH, TRUMPF Lasersystems for Semiconductor Manufacturing GmbH, Xetics GmbH.

The following commercial partnerships within the meaning of sec. 264a (1) HGB made use of the exemption from the preparation of annual financial statements provided for in sec. 264b HGB in accordance with the commercial law provisions applicable to corporations: TRUMPF GmbH + Co. KG, TRUMPF Werkzeugmaschinen GmbH + Co. KG, TRUMPF Hüttinger GmbH + Co. KG, TRUMPF Immobilien GmbH + Co. KG, TRUMPF Werkzeugmaschinen Deutschland Vertrieb + Service GmbH + Co. KG, TRUMPF Scientific Lasers GmbH + Co. KG, TRUMPF Grundstücksverwaltungsgesellschaft mbH + Co. Vermietungs KG, TRUMPF VSZ Grundstücksverwaltungsgesellschaft mbH + Co. KG, Hüttinger Grundstücks-Vermietungsgesellschaft mbH + Co. Objekt Freiburg KG.

32. Supervisory Board / Administrative Board

Sec. 1 (1) no. 2 of the MitbestG (German Codetermination Law) provides that a company which exceeds a certain size classification must appoint a supervisory board. In accordance with sec. 7 (1) no. 1 MitbestG, Berthold Leibinger GmbH has met this requirement effective since fiscal year 1998/99. The Supervisory Board has twelve members.

The Supervisory Board total remuneration amounts to k€ 131 (prior year k€ 153).

33. Related party transactions

All transactions with affiliated companies and persons were at arm's length.

34. Appropriation of earnings

The management of Berthold Leibinger GmbH proposes that the result of fiscal year 2016/17 be carried forward. The profit of TRUMPF GmbH + Co. KG is appropriated according to the partnership agreements.

35. Supplementary report

No significant events occurred after the end of the fiscal year that had a material effect on the group's financial situation, net assets or operating results.

Ditzingen, September 19, 2017

TRUMPF GmbH + Co. KG

Berthold Leibinger GmbH

Dr. phil. Nicola Leibinger-Kammüller (President)

Dr.-Ing. E.h. Peter Leibinger (Vice President)

Dr.-Ing. Mathias Kammüller

Dr. rer. pol. Lars Grünert

Dr.-Ing. Heinz-Jürgen Prokop

Dr.-Ing. Christian Schmitz

Development of the Consolidated Fixed Assets

FOR FISCAL YEAR 2016/17

Acquisition costs

in € '000s	07/01/2016	Changes attributable to currency exchange effects	Changes in the group of consolidated companies	Additions	Disposals	Transfers	06/30/2017
INTANGIBLE ASSETS							
Acquired concessions, industrial and similar rights, licenses	156,762	-3,289	-	6,539	-4,204	968	156,776
Goodwill	95,572	-3,878	138	120	-	-	91,952
Payments on account	2,061	-	-	1,576	-	-912	2,725
	254,395	-7,167	138	8,235	-4,204	56	251,453
TANGIBLE ASSETS							
Land and buildings	854,606	-6,551	-	60,532	-5,643	25,444	928,388
Technical equipment and machines	321,985	-4,246	-	164,978	-56,988	9,542	435,271
Other equipment, factory and office equipment	366,588	-1,550	518	50,098	-25,800	2,839	392,693
Payments on account and assets under construction	62,663	-102	-	62,353	-1,533	-37,881	85,500
	1,605,842	-12,449	518	337,961	-89,964	-56	1,841,852
FINANCIAL ASSETS							
Shares in affiliated companies	10,765	-41	-72	8,450	-24	2,330	21,408
Shares in associated companies	4,465	-	-	407	-612	-2,330	1,930
Participations	2,304	-	-	-	-	-	2,304
Long-term investments	1,337	-39	-	-	-	-	1,298
Other loans	1,420	-31	-	313	-59	-	1,643
	20,291	-111	-72	9,170	-695	-	28,583
	1,880,528	-19,727	584	355,366	-94,863	-	2,121,888

Accumulated depreciation						Book value		
07/01/2016	Changes attributable to currency exchange effects	Changes in the group of consolidated companies	Additions	Disposals	06/30/2017	6/30/2017	6/30/2016	
-93,056	1,745	-	-15,317	3,952	-102,676	54,100	63,706	
-49,011	2,720	-48	-18,666	-	-65,005	26,947	46,561	
-	-	-	-	-	-	2,725	2,061	
-142,067	4,465	-48	-33,983	3,952	-167,681	83,772	112,328	
-290,618	3,278	-	-25,405	4,365	-308,380	620,008	563,988	
-230,293	3,777	-	-44,670	34,461	-236,725	198,546	91,692	
-256,775	1,462	-39	-33,671	21,930	-267,093	125,600	109,813	
24	-7	-	-215	-	-198	85,302	62,687	
-777,662	8,510	-39	-103,961	60,756	-812,396	1,029,456	828,180	
-	-	-	-1,650	-	-1,650	19,758	10,765	
-	-	-	-	-	-	1,930	4,465	
-2,304	-	-	-	-	-2,304	-	-	
-570	3	-	-	-	-567	731	767	
-	-	-	-	-	-	1,643	1,420	
-2,874	3	-	-1,650	-	-4,521	24,062	17,417	
-922,603	12,978	-87	-139,594	64,708	-984,598	1,137,290	957,925	

List of Shareholdings

AS OF JUNE 30, 2017

Company	Share of ownership TRUMPF GmbH + Co. KG	
	direct	indirect
Fully consolidated subsidiaries		
TRUMPF Werkzeugmaschinen Beteiligungs-GmbH, Ditzingen	100	
TRUMPF Werkzeugmaschinen GmbH + Co. KG, Ditzingen ³	100	
TRUMPF Werkzeugmaschinen Deutschland Vertrieb + Service GmbH + Co. KG, Ditzingen ³		100
TRUMPF International Beteiligungs-GmbH, Ditzingen	100	
TRUMPF Werkzeugmaschinen Deutschland Vertrieb + Service Beteiligungs-GmbH, Ditzingen		100
TRUMPF Laser- und Systemtechnik GmbH, Ditzingen		100
TRUMPF Hüttinger Verwaltung GmbH, Freiburg i. Br.		75
TRUMPF Hüttinger GmbH + Co. KG, Freiburg i. Br. ³		75
TRUMPF Lasersystems for Semiconductor Manufacturing GmbH, Ditzingen		100
TRUMPF Sachsen GmbH, Neukirch		94.4
TRUMPF Laser GmbH, Schramberg		100
TRUMPF Grundstücksverwaltungsgesellschaft mbH + Co. Vermietungs KG, Mainz ²	100	
Celtia Verwaltungs-GmbH, Reutlingen		100
TRUMPF Financial Services GmbH, Ditzingen	100	
TRUMPF Lasertechnik GmbH, Ditzingen	100	
TRUMPF Finance GmbH, Ditzingen	100	
TRUMPF Med Beteiligungen GmbH, Ditzingen ¹	100	
TRUMPF VSZ Grundstücksverwaltungsgesellschaft mbH + Co. KG Mainz ²	94	
Berthold Leibinger Immobilien GmbH, Ditzingen	100	
TRUMPF Immobilien GmbH + Co. KG, Ditzingen ³	100	
Hüttinger Grundstücks-Vermietungsgesellschaft mbH + Co. Objekt Freiburg KG, Pullach i. Isartal ²		70.5
TRUMPF Kapitalbeteiligungen GmbH, Ditzingen		100
TRUMPF Scientific Lasers Verwaltungs-GmbH, Unterföhring		80
TRUMPF Scientific Lasers GmbH + Co. KG, Unterföhring ³		80
INGENERIC GmbH, Aachen		80
TRUMPF Werkzeugmaschinen Teningen GmbH, Teningen		100
AXOOM GmbH, Karlsruhe	100	
TRUMPF Maschinen AG, Baar, Switzerland		100
TRUMPF Grüsich AG, Grüsich, Switzerland		100
TRUMPF Maschinen Grüsich AG, Grüsich, Switzerland		100

Company	Share of ownership TRUMPF GmbH + Co. KG	
	direct	indirect
TRUMPF Laser Marking Systems AG, Grösch, Switzerland		100
TRUMPF Finance (Schweiz) AG, Baar, Switzerland	100	
TRUMPF Inc., Farmington, Connecticut, USA		100
TRUMPF Huettinger Inc., Santa Clara, California, USA		75
Farmington Aviation Inc., Farmington, CT, USA		100
TRUMPF Photonics, Inc., Cranbury, New Jersey, USA		100
SPI Lasers LLC, Santa Clara, California, USA		100
Metamation Inc., Reno, Nevada, USA		51
TRUMPF Limited, Luton, United Kingdom		100
SPI Lasers plc, Southampton, United Kingdom		100
SPI Lasers UK Limited, Southampton, United Kingdom		100
TRUMPF Corporation, Yokohama, Japan		100
TRUMPF Huettinger K.K., Yokohama, Japan		75
FA Service Corporation, Yokohama, Japan		100
TRUMPF S.A.S., Paris, France		100
TRUMPF Machines S.A.R.L., Haguenau, France		100
TRUMPF Máquinas Ind. E. Com. Ltda., São Paulo, Brazil		100
TRUMPF maskin ab, Alingsås, Sweden		100
TRUMPF Maquinaria S.A., Madrid, Spain		100
TPT Máquinas-Ferramentas e Laser, Unipessoal, Lda, Porto Salvo, Portugal		100
TRUMPF Maschinen Austria GmbH, Pasching, Austria		100
TRUMPF Maschinen Austria GmbH & Co. KG, Pasching, Austria ³		100
TRUMPF Homberger S.r.l., Buccinasco (Mailand), Italy		75
TRUMPF Macchine Italia S.r.l., Lonigo (VI), Italy		100
TRUMPF SISMA S.r.l., Piovene Rocchette (VI), Italy		55
TRUMPF Pte Ltd., Singapur, Singapore		100
TRUMPF Korea Co., Ltd., Seoul, South Korea		100
TRUMPF Malaysia Sdn Bhd, Kuala Lumpur, Malaysia		100
SPI Lasers Korea Ltd., Seoul, South Korea		100
TRUMPF (India) Private Limited, Pune, India		100
India Metamation Software Pvt. Ltd, Chennai, India		51
TRUMPF Praha spol. s.r.o., Prague, Czech Republic		100

Company	Share of ownership TRUMPF GmbH + Co. KG	
	direct	indirect
TRUMPF Strojírenská výroba CZ s.r.o., Liberec, Czech Republic		100
TRUMPF Liberec, spol. s.r.o., Liberec, Czech Republic		100
TRUMPF Polska Sp. z o.o. Sp. k., Warsaw, Poland ³		100
TRUMPF Polska Sp. z o.o., Warsaw, Poland		100
TRUMPF Hüttinger Sp. z o.o., Zielonka, Poland		65.625
TRUMPF Hungary Kft, Budapest, Hungary		100
TRUMPF Bulgaria Ltd., Sofia, Bulgaria		100
TRUMPF Laser + Machinery S.R.L., Bucharest, Romania		100
TRUMPF Sheet Metal Products (Taicang) Co., Ltd., Taicang, China		100
TRUMPF (China) Co., Ltd., Taicang, China		100
TRUMPF Metal Products (Dongguan) Co., Ltd., Dongguan, China		100
TRUMPF HÜTTINGER Electronics (Shanghai) Co., Ltd., Shanghai, China		75
SPI Lasers (Shanghai) Co. Ltd., Shanghai, China		100
Jiangsu Jinfangyuan CNC Machine Co., Ltd., Jiangsu Province, China		72.236
TRUMPF Mexico S. de R.L. de C.V., Apodaca, Mexico		100
TRUMPF Mexico Services S. de R.L. de C.V., Apodaca, Mexico		100
TRUMPF Slovakia, s.r.o., Kosice, Slovakia		100
TRUMPF Canada Inc., Mississauga, Ontario, Canada		100
TRUMPF Nederland B.V., Hengelo, Netherlands		100
TRUMPF OOO, Moscow, Russia		100
TRUMPF Taiwan Industries Co., Ltd., Gueishan Shiang, Taoyuan County, Taiwan		100
PT. TRUMPF Indonesia, Jakarta, Indonesia		100
Inclusion according to the equity method		
JT Optical Engine Verwaltungs-GmbH, Jena ¹		50
Toref Technica Co., Ltd., Aichi, Japan		25
Companies not included in the consolidated financial statement		
XETICS GmbH, Stuttgart		85
Findos SC Investor Fund II GmbH & Co. KG, Munich		24.995
AXOOM Solutions GmbH, Karlsruhe		85
TRUMPF Venture GmbH, Ditzingen		100

Company	Share of ownership TRUMPF GmbH + Co. KG	
	direct	indirect
FG4 Beteiligungs-GmbH, Ditzingen		100
Latech KK, Sagamihara, Japan		100
JKL Newco Limited, Rugby, United Kingdom		100
c-labs Corporation, Kent County, Delaware, USA		100
TRUMPF Engineering Services Italy S.r.l., Orbassano/ Turin, Italy		75
TRUMPF China (Hong Kong) Limited, Hong Kong, China		100
TRUMPF Technology (Shanghai) Co., Ltd., Shanghai, China		100
TRUMPF Philippines Inc., Manila, Philippines		100
TRUMPF Ltd., Bangkok, Thailand		100
TRUMPF VIETNAM COMPANY LIMITED, Ho Chi Minh City, Vietnam		100
TRUMPF Makina Sanayii A.Ş., Istanbul, Turkey		88.89
c2go inprocess solutions GmbH, Berlin		100

¹ In liquidation.

² Companies are consolidated as, from an economic standpoint, the opportunities and risks accrue to the parent company.

³ Entities whose unlimited liability partners are the joint parent companies or another entity that is included in the group of consolidated companies.

Audit Opinion

Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, Stuttgart, issued the following audit opinion on the consolidated financial statements and the group management report as published in the “elektronischer Bundesanzeiger” (electronic Federal Gazette):

“We have audited the consolidated financial statements prepared by TRUMPF GmbH + Co. KG, Ditzingen, and Berthold Leibinger GmbH, Ditzingen, comprising the balance sheet, the income statement, the cash flow statement, the statement of changes in equity and the notes to the consolidated financial statements, together with the group management report for the fiscal year from July 1, 2016 to June 30, 2017. The preparation of the consolidated financial statements and the group management report in accordance with German commercial law and supplementary provisions of the partnership agreements of the parent companies is the responsibility of the Group’s management. Our responsibility is to express an opinion on the consolidated financial statements and the group management report based on our audit.

We conducted our audit of the consolidated financial statements in accordance with Sec. 317 HGB [“Handelsgesetzbuch”: German Commercial Code] and German generally accepted standards for the audit of financial statements promulgated by the Institut der Wirtschaftsprüfer [Institute of Public Auditors in Germany] (IDW). Those standards require that we plan and perform the audit such that misstatements materially affecting the presentation of the net assets, financial position and results of operations in the consolidated financial statements in accordance with [German] principles of proper accounting and in the group management report are detected with reasonable assurance. Knowledge of the business activities and the economic and legal environment of the Group and expectations as to possible misstatements are taken into account in the determination of audit procedures. The effectiveness of the accounting-related internal control system and the evidence supporting the disclosures in the consolidated financial statements and the group management report are examined primarily on a test basis within the framework of the audit. The audit includes assessing the annual financial statements of those entities included in consolidation, the determination of entities to be included in consolidation, the accounting and consolidation principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements and the group management report. We believe that our audit provides a reasonable basis for our opinion.

Our audit has not led to any reservations.

In our opinion, based on the findings of our audit, the consolidated financial statements comply with the legal requirements and supplementary provisions of the articles of incorporation and bylaws and give a true and fair view of the net assets, financial position and results of operations of the Group in accordance with [German] principles of proper accounting. The group management report is consistent with the consolidated financial statements and as a whole provides a suitable view of the Group's position and suitably presents the opportunities and risks of future development.”

Stuttgart, September 20, 2017

ERNST & YOUNG GMBH
WIRTSCHAFTSPRÜFUNGSGESELLSCHAFT

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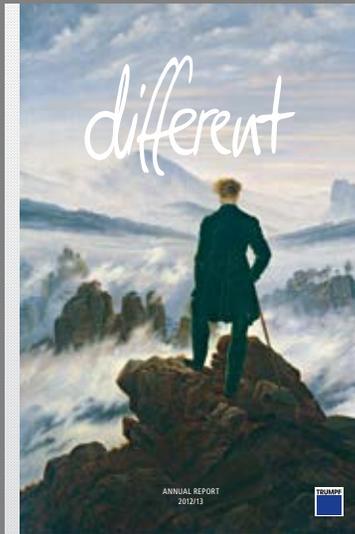
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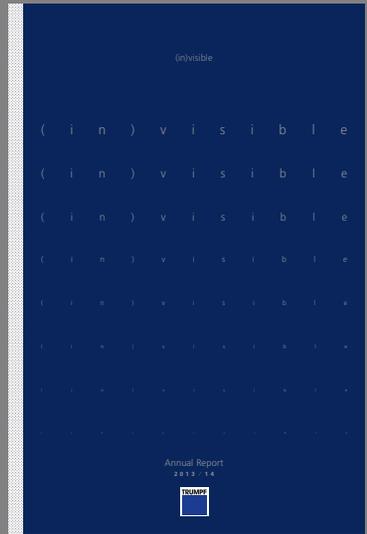
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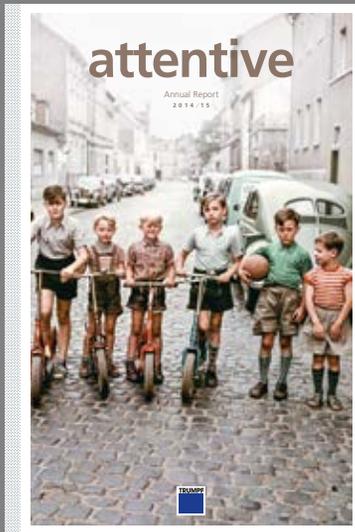
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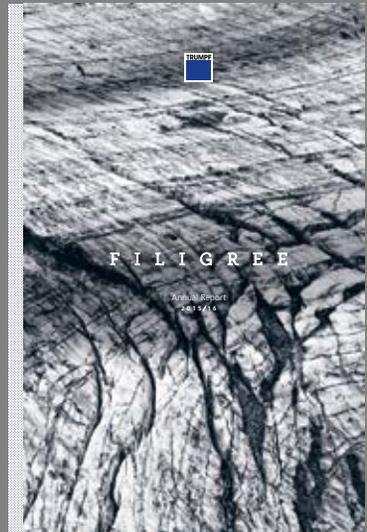
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Technology Highlights

09.2016
— 11.2016



09.2016

TruPunch 1000

A machine that grows with your needs

Many TRUMPF customers want an affordable, high-performance, automation-friendly punching machine that takes up little space and grows as their business evolves. The TruPunch 1000 compact entry-level machine perfectly meets these demanding requirements. It can be retrofitted to convert it into an equally space-saving TruMatic 1000 fiber punch laser machine.

10.2016

TruLaser Center 7030

A revolution in 2D laser cutting

The TruLaser Center 7030 is a high-precision, fully automated cell that takes care of production almost on its own. It offers extremely efficient, synchronized processes, all the way from programming to sorting the workpieces after laser cutting. Based on a completely redesigned machine concept, the



TruLaser Center 7030 offers an unprecedented level of process reliability, intelligent functions, and end-to-end automation. Numerous uniquely innovative features come together in this machine, making it nearly as easy to operate as a desktop printer. You merely have to send it a document containing the relevant job data, and the finished parts are delivered in a neat stack for each specific job order.

11.2016

TruPrint 3000 and 5000

Industrial-scale 3D printing

The new medium-format metal 3D printers TruPrint 3000 and TruPrint 5000 generate complete parts – layer by layer in a powder bed using laser metal fusion (LMF) technology. Their sophisticated tool-change cylinder approach makes them particularly suited to the large-scale production of complex parts. The TruPrint 5000 is especially fast thanks to three powerful, 500-watt TRUMPF lasers that can operate simultaneously

03.2017
— 04.2017



at multiple points in the construction chamber.

03.2017

TruDisk, new generation

The smartest disk lasers yet

The latest-generation TruDisk lasers are reputed to be the most advanced high-power solid-state lasers on the market. As well as being compact and energy-efficient, their secret lies in the smart features hidden inside. Combined with TRUMPF's Condition Based Services for condition monitoring and trend analysis (a.k.a. predictive maintenance), the new TruDisk lasers are the ideal tool for modern, connected production lines.

04.2017

AXOOM IoT

Machines speak, AXOOM translates

AXOOM IoT is the latest addition to the



business platform created and operated by AXOOM GmbH, a subsidiary of the TRUMPF Group, in a bid to expand its product spectrum in the machine and component manufacturing sector. Here, the horizontal integration of all process steps, from order intake through to delivery (known as AXOOM Smart Enterprise) is further enhanced by vertical integration from sensors through to the cloud. AXOOM IoT adds value in four focal areas. The Connection Center facilitates IoT management by enabling machine manufacturers to connect and manage their devices in the field. The Condition Monitoring module monitors the behavior of machines and components and makes their statuses transparent. The Remote Services module enables remote configuration, software updates and troubleshooting. And the fourth module, Analytics, analyzes data collected with a view to identifying potential areas of improvement where productivity could be increased.

Our cover shows the legendary U.S. baseball player Sandy Koufax, born 1935 in Brooklyn, New York, posing for photographers with four balls each of which has a zero drawn on it. The photo was taken in 1965, after Koufax pitched the fourth no-hitter of his career for the Los Angeles Dodgers. A no-hitter means he prevented all opposing players from making a single run. This rare achievement requires the utmost concentration and extraordinary technical precision. The game against the Chicago Cubs in September 1965 was especially memorable for Koufax, because it was also a perfect game. In baseball parlance, this means he prevented all opposing players from reaching base. To honor his moments of glory, no Dodgers player since Sandy Koufax has worn the number 32. And Koufax has long been inducted into the Baseball Hall of Fame.