# Promoting a "Positive Culture of Failure"

**The best way for a university to support entrepreneurs in the digital age is to give them the space and the resources to experiment, as well as the opportunity to learn from failure, agree Information Systems specialist Prof. Helmut Krcmar and Dr. Helmut Schönenberger, co-founder and CEO of UnternehmerTUM, the Center for Innovation and Business Creation at TUM.**

*Klaus Manhart*

# Eine „positive Kultur des Scheiterns" fördern

Die Digitalisierung verändert die Wirtschaftswelt: Unternehmen digitalisieren zunehmend ihre Geschäftsprozesse, Produkte werden individualisiert oder in Dienstleistungen transformiert. Vor dem Hintergrund technologischer Umbrüche wird die innovative Bedeutung von Start-ups besonders deutlich, stellt Dr. Helmut Schönenberger im Interview fest. Er ist Geschäftsführer von UnternehmerTUM, dem Zentrum für Innovation und Gründung an der TUM.

Mit einem umfassenden Angebot begleiten TUM und UnternehmerTUM technologiebasierte und wachstumsorientierte Ausgründungen bei der Entwicklung neuer Produkte und Dienstleistungen – vom erfolgreichen Geschäftsaufbau über den Markteintritt bis in die Wachstumsphase.

Die Gründungsteams aus dem Umfeld der TUM finden laut Schönenberger „einen geschützten Rahmen vor, in dem sie experimentieren und Dinge ausprobieren können". Die Wissenschaftlerinnen und Wissenschaftler an den Lehrstühlen fungieren zudem als „Inspirational Advisors", wie Prof. Helmut Krcmar berichtet: „Wir ermuntern die jungen Leute, gute Ideen zu entwickeln und diese auszubauen", sagt der Wirtschaftsinformatiker und betont: „Wir geben ihnen ein bisschen Mut zur Größe mit".

Wichtig ist beiden Experten, dass Universitäten eine Kultur fördern, in der das Scheitern positiv bewertet wird. „Wenn man an hoch innovativen Produkten arbeitet, wird immer nur ein kleiner Teil Erfolg haben. Wer wirtschaftlich auf die Nase fällt, kann das nächste Projekt angehen – und es vielleicht zu einem weltweiten Markterfolg bringen", fasst Schönenberger zusammen. □

# This is how we foster
# **entrepreneurial talents:**

**Research – Education – Startups**

**TUM**

**The Entrepreneurial University.**

**Talents**

**Technologies**
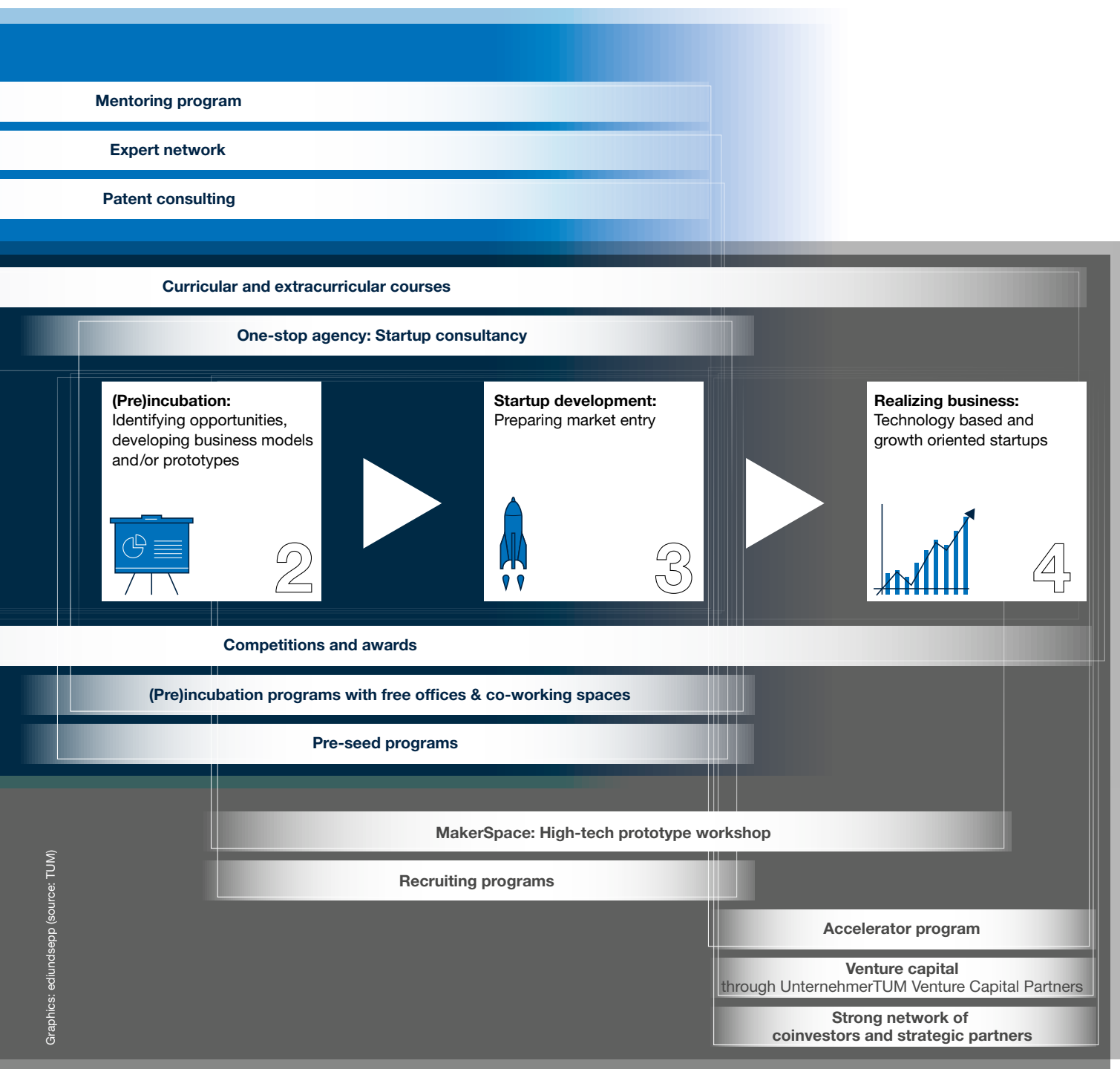
**Entrepreneurial know-how**

**UnternehmerTUM**
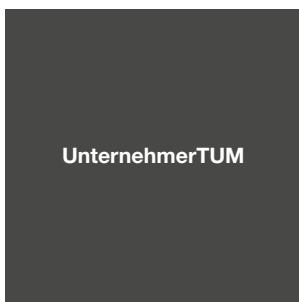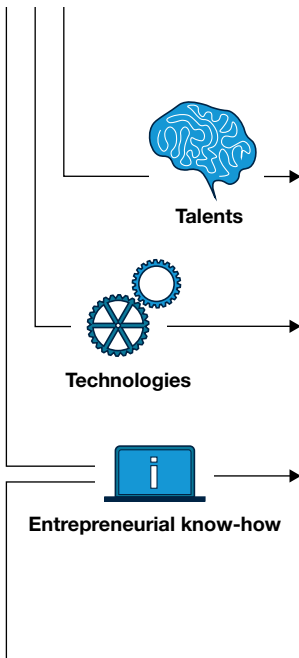
**Center for Innovation and
Business Creation at TUM**

**Talent development:**
TUM students and
academics gain
knowledge and
awareness
around entrepreneurship

1

**Mentoring program**

**Expert network**

**Patent consulting**

**Curricular and extracurricular courses**

**One-stop agency: Startup consultancy**

**(Pre)incubation:**
Identifying opportunities, developing business models and/or prototypes

2

**Startup development:**
Preparing market entry

3

**Realizing business:**
Technology based and growth oriented startups

4

**Competitions and awards**

**(Pre)incubation programs with free offices & co-working spaces**

**Pre-seed programs**

**MakerSpace: High-tech prototype workshop**

**Recruiting programs**

**Accelerator program**

**Venture capital**
through UnternehmerTUM Venture Capital Partners

**Strong network of
coinvestors and strategic partners**

Graphics: ediundsepp (source: TUM)

**F**aszination Forschung: Where do you see the biggest impact of digitalization on the business world?
**Prof. Dr. Helmut Krcmar:** The way I see it, the defining change comes in the form of product and service combinations, the ⤻ "everything as a service" concept. This essentially means viewing "things" as service providers. These days, for instance, very few people are likely to buy a foldable city map. "Everything as a service" means you can now access a map on your smartphone when and where you need it – and for the exact city you are touring. Another example would be a company developing a sensor system. If it analyzes and evaluates the data streams from these sensors, that company can then also provide a high-value offering blending both product and service elements.

Since this brings service providers closer to their customers, they naturally need completely different processes and a lot of knowledge – in other words, data. After all, a rich knowledge base translates into products and services that are both better and more individualized. In my opinion, it is this individualization, enabled by technology, that is really driving ⤻ digital transformation.

The term ⤻ **"disruption"** is often used in this context. What does that mean?
**Krcmar:** Disruption is often confused with destruction. But disruption doesn't automatically mean destroying everything that was previously in place. It simply adds a new contextual layer. So the car is no longer seen as just a material product with its own image, for instance, but also as a provider of mobility services. So disruption means embracing a new value concept, with different service characteristics becoming more important.

**Dr. Helmut Schönenberger:** Disruption in particular shines the spotlight on the crucial role played by ⤻ startups. They power innovation processes and are one of the biggest drivers of change. Digital technologies are comparatively easy and affordable to access, and entry barriers for entrepreneurs are low. That is why there are so many startups in the digitalization arena, all trying to develop new business models and reach as many customers as they can.

**Encouraging young entrepreneurs** is a priority for both of them: Information Systems specialist Prof. Helmut Krcmar (left) is involved in numerous networks, which provide support for business founders as well as being a co-founder of companies himself. Dr. Helmut Schönenberger is co-founder and CEO of UnternehmerTUM, the Center for Innovation and Business Creation at TUM.
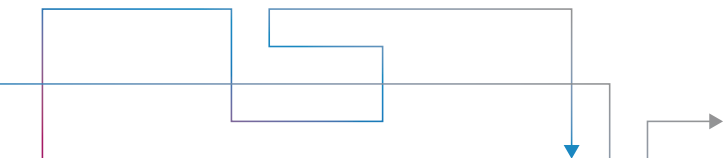
## How do these business models differ from conventional ones?

**Krcmar:** Startup business models operate according to the "deconstruct and recombine" principle. These ventures dismantle a ⤳ value chain and reassemble its links in a new and ingenious way – or they isolate one small piece of it and focus solely on that. Take the finance sector, for instance, with its ⤳ fintech startups. International bank transfers are just one step in the value chain – and not a particularly profitable one you might assume. But if you bundle a whole series of transfers, that then becomes lucrative. As part of the offering of a major established bank, a mini-service such as transfers doesn't count for much. But if a fintech startup concentrates on this and cleverly markets it worldwide, it can "steal" a link in the value chain from the banks – and use it to make good money.

**Schönenberger:** By now, entrepreneurs have learned how to deconstruct value creation systems and extract the exciting parts. This creativity relies on three main skills: Firstly, startup teams quickly master new technologies, since they usually come from a university setting, have access to cutting-edge technologies and are keen to experiment. Secondly, they are extremely fast when it comes to implementation as they are used to agile working methods. And thirdly, compared with established companies, startups can also execute their projects very cost-effectively – particularly because these teams tend to pay themselves comparatively low salaries and hope to increase the value of their company in return.

## A lot of startups are focusing on topics like machine learning and artificial intelligence at the moment. Why is that?

**Schönenberger:** Startups mainly position themselves in areas of technological transformation. And in the ⤳ artificial intelligence (AI) arena, a window is opening right now. Many investors are keen to buy into this market and are putting up significant funds. And the technology for AI is now in place. So this is a highly attractive field for startups at present.
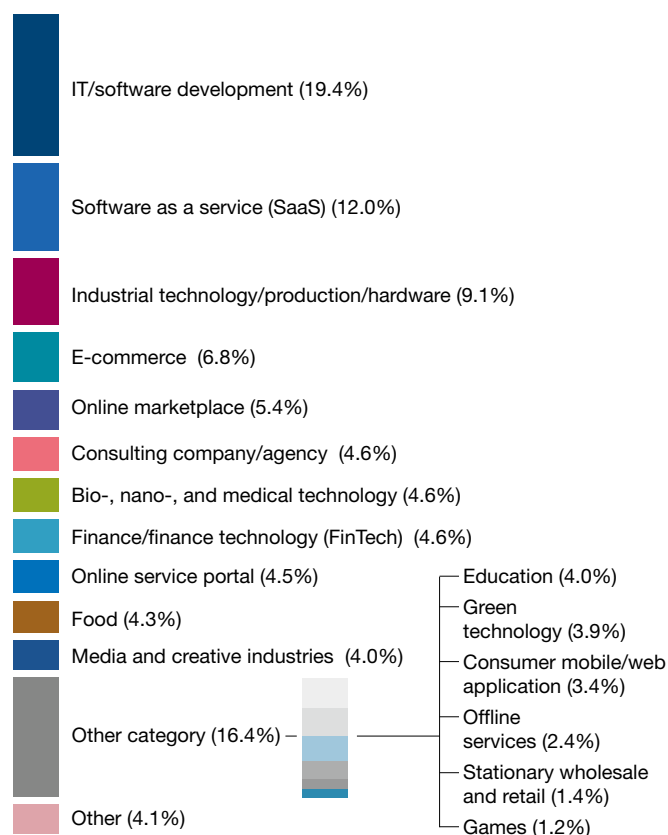
**Krcmar:** We have about 70 startups emerging from TUM each year – many of them with a data-driven business model. Applications range from ⤳ machine learning through pattern recognition to visual detection methods – all branches of AI. The great thing about projects of this type is that the technology can be deployed across a huge number of sectors – from sports to manufacturing. ▷

Graphics: ediundsepp (source: Bundesverband Deutsche Startups: Deutscher Startup Monitor 2017), picture credit: Kurt Bauer/TUM

### appliedAI Initiative

With its mission "We accelerate the adoption of AI", UnternehmerTUM joins forces with leading public sector, industry and tech players in the "appliedAI Initiative". Combining corporate experience, entrepreneurship, the latest research and a creative mindset – the initiative accelerates the adoption of artificial intelligence (AI) in industry as well as society. UnternehmerTUM provides a broad spectrum of products and services, all focused on the understanding, development and implementation of the latest AI.

https://appliedai.de

### Startup sectors and business fields

IT/software development (19.4%)

Software as a service (SaaS) (12.0%)

Industrial technology/production/hardware (9.1%)

E-commerce (6.8%)

Online marketplace (5.4%)

Consulting company/agency (4.6%)

Bio-, nano-, and medical technology (4.6%)

Finance/finance technology (FinTech) (4.6%)

Online service portal (4.5%)

Food (4.3%)

Media and creative industries (4.0%)

Other category (16.4%)
- Education (4.0%)
- Green technology (3.9%)
- Consumer mobile/web application (3.4%)
- Offline services (2.4%)
- Stationary wholesale and retail (1.4%)
- Games (1.2%)

Other (4.1%)

**The results of the German Startup Monitor 2017** show the impact of the digital economy when it comes to new ventures: Around 19 percent of the startups surveyed stated that their venture belongs to the IT/software development sector, followed by software as a service (12%), as well as by several other sectors related to digitalization such as e-commerce and online marketplaces.

**What is the relationship like between established companies and startups?**

**Schönenberger:** Collaboration between the experienced and established on the one hand, and the new and agile on the other, strengthens both domains. The BMW Startup Garage, for instance, selects young companies from around the world focused on innovations in the automotive sector. They then receive three months of support from BMW, engage with their technical departments and can build strategic partnerships.

**Krcmar:** In many cases, I think established companies have forgotten how to embrace new angles and new ideas. That is why partnerships of this kind are also very important for them.

**How are startups from the TUM ecosystem positioned on the international stage?**

**Schönenberger:** Both Munich as a whole and the TUM ecosystem in particular are regarded as major startup hubs. Here at TUM and UnternehmerTUM, we focus on technology-based ventures that are looking to grow. We are particularly strong in this field. With all our specialists in IT and the natural and engineering sciences, we have a strong technical foundation – while our TUM School of Management brings the business development expertise to the table.

| Link |
| --- |
| www.i17.in.tum.de |

**Prof. Dr. Helmut Krcmar**

# Research focus on digital transformation

Helmut Krcmar has been Professor of Information Systems at TUM since 2002. His research focuses include digital transformation, information and knowledge management, and engineering and management of innovative IT-based services. He is particularly interested in the role of digital platforms.

Krcmar studied business management at Saarland University in Saarbrücken, Germany, also receiving his doctorate there. He then began his research career in the US, working as a postdoctoral fellow at the IBM Los Angeles Scientific Center and as Assistant Professor of Information Systems at New York University and the City University of New York. Back in Germany, he held the Chair of Information Systems at the University of Hohenheim, Stuttgart, from 1987 to 2002, before moving to TUM.

Krcmar is involved in numerous research institutions and networks on digitalization, including as a board member of the Center for Digital Technology and Management (CDTM) and as spokesman of the Board of Directors for fortiss, the Bavarian research institute for software-intensive systems and services, affiliated with TUM. He is also Chairman of the Research Committee of the Münchner Kreis, Co-Chairman of Germany's National E-government Competence Center (NEGZ) and founder of the Initiative for Digital Transformation (IDT), as well as a Fellow of the Association for Information Systems (AIS).

*"Academics can act as inspirational advisors – by encouraging young people to come up with good ideas and take them to the next level."*

*Helmut Krcmar*

## UnternehmerTUM – Center for Innovation and Business Creation at TUM

UnternehmerTUM is TUM's center for innovation and business creation. This institute assists startups and established companies in developing new products and services, also helping to build the business, prepare for market entry and drive growth, which includes the securing of venture capital. UnternehmerTUM's high-tech workshop, MakerSpace, offers an extensive range of equipment over 1,500 square meters to enable prototype construction and small-scale production.

UnternehmerTUM GmbH was founded in 2002 by the entrepreneur Susanne Klatten. More than 50 high-growth spin-offs emerge each year from UnternehmerTUM alone, with over 2,000 people taking part in training courses. In 2017, Germany's Federal Economics Ministry designated UnternehmerTUM a "digital hub" to drive digital transformation in the mobility sector.

www.unternehmertum.de

Picture credit: Kurt Bauer/TUM

### What concrete support is available for entrepreneurs at TUM?

**Schönenberger:** TUM students have a protected environment here, allowing them to experiment and try things out. They also have access to resources such as ↦ MakerSpace and can engage with customers.

At the same time, they can benefit from a wide range of funding opportunities. Germany's Federal Economics Ministry has introduced the ↦ EXIST program, for instance, where business founders can apply for a year's startup grant to ensure basic funding. TUM and UnternehmerTUM also help startup teams to regularly secure this type of support.

**Krcmar:** Academics from TUM's departments can also act as inspirational advisors. This means encouraging young people to come up with good ideas and take them to the next level. We encourage them to think big, for instance suggesting that digital transformation means more than just digitizing a manual.

**Schönenberger:** Professors and academic staff who lead by example and inspire students play a very important role. They have an entrepreneurial mindset and some of them have started ventures themselves too. Their experience and – above all – their passion are something they can pass on. This also contributes significantly to the entrepreneurial culture here at TUM.

### Where does a startup begin, and how does it then develop?

**Schönenberger:** The beginnings of a spin-off can be traced back to the teaching and learning process – for instance to the ↦ entrepreneurship training offered by the TUM Entrepreneurship Research Institute (ERI) (see also p. 40) and UnternehmerTUM. The next step is to give students a basic understanding of how to develop a product and how to start a venture. The joint startup coaching provided by TUM and UnternehmerTUM supports prospective company founders in developing their idea and taking the next step. If they then decide to proceed with a startup, office space and advisory services are also available at TUM's ↦ incubator.    ▷

Faszination Forschung 22 / 18    57

> *"It is a major opportunity for universities to promote a positive culture of failure."*
>
> *Helmut Schönenberger*

**Any startup also carries the possibility of failure. How can these ventures stand the test of time?**

**Krcmar:** It's fundamentally important that we support young people who want to start their own business. And that also means helping them work out how much time they want to invest and where to cut back. If a project does go down the tubes, we hold a "wake", emphasizing the fact that we had fun and we learned something, but just because we started implementing an idea three years ago doesn't mean we have to continue pursuing it now.

**Schönenberger:** This is a major opportunity for universities to promote a positive culture of failure. When you're working on highly innovative products, only a few of them will ever be successful. But that is not a problem, since the projects themselves provide a valuable learning experience. And even if you do fall flat on your face from a commercial perspective, you can dust yourself down and get back in the saddle – perhaps even making the next project a global market success.

*Klaus Manhart*

**Dr. Helmut Schönenberger**

## Leading startups to success

Helmut Schönenberger is co-founder and CEO of UnternehmerTUM, the Center for Innovation and Business Creation at TUM. His passions lie in inspiring people in the areas of innovation and entrepreneurship and leading promising startups to success. During his studies in management at TUM, the aerospace engineer already started a consulting business with fellow students and developed a strategic concept for the university's management team to strengthen its startup culture – the origins of UnternehmerTUM. Schönenberger has played a major role in the design and ongoing development of UnternehmerTUM's services for startup teams, scientists and companies.

# Glossary

**Artificial intelligence (AI)**

"Artificial intelligence" is a branch of computer science that seeks to simulate human cognitive functions, such as thinking, problem-solving and reasoning, in computers. Its core focus lies on the development of programs and machines intended to function along similar lines as human intelligence.

**Digitalization**

Whereas "digitization" refers to the conversion of analog processes to digital formats to enable computer processing, "digitalization" has a broader sense, describing the digital transition or shift to a digital business model in which all processes are computerized.

**Digital transformation**

"Digital transformation" is the trend among organizations to use digital technologies throughout their operations and digitalize all business processes, develop new business models and tap into modified value-adding arrangements. Digital transformation is driven by digital infrastructures and applications (e.g. apps).

**Disruption**

In this context, "disruption" means a high-speed shift from the familiar to something new and revolutionary. Examples of disruption include the upheaval in the taxi industry caused by driving service Uber or changes in the entertainment industry in the wake of streaming services such as Amazon and Netflix.

**Entrepreneurship**

"Entrepreneurship" refers to the foundation of companies based on innovative business ideas. Entrepreneurship is characterized by the ability to recognize and seize market opportunities and turn them into profitable undertakings. This entails the coordinated deployment of resources and the willingness to embrace a calculated level of risk.

**Everything as a service**

"Everything as a service" or "anything as a service" (most commonly abbreviated XaaS or EaaS) describes a scenario where everything is provided and consumed as a service. Tangible and intangible assets are no longer bought but rented; either converted into services or flanked by them. Thus the customer no longer owns a product, such as a car, but procures the benefits of the product as a service.

**EXIST program**

Germany's Federal Ministry for Economic Affairs and Energy (BMWi) has been offering support through its EXIST – University-Based Business Start-Ups program since 1998. Targeting students, graduates and scientists, this aims to increase awareness, motivation and skills in the startup field, as well as providing initial funding for the launch phase.

**Fintech**

"Fintech" stands for "financial technology" and is a collective term for technologically advanced financial innovations that result in new financial services. In a narrower sense, the term is often applied to startups offering digital or technological financial innovations.

**Incubator**

In the business context, an "incubator" helps new and startup companies to develop. At TUM, the incubator provides office space and workstations for entrepreneurs, as well as startup coaching. Building on this, UnternehmerTUM also offers a dedicated incubator program, XPRENEURS.

**Machine learning**

"Machine learning" describes the acquisition of new knowledge by a computer system and is thus a branch of AI. Like a human being, the computer generates its own knowledge from experience and can find solutions to new problems autonomously. This is achieved by a computer program analyzing examples and attempting to identify certain patterns and rules in the data with the aid of self-learning algorithms.

**Makerspace**

"Makerspaces" are open spaces where people work creatively on new ideas, projects and physical objects. Spanning 1,500 square meters on the Garching research campus, UnternehmerTUM's MakerSpace offers introductory courses and access to software, machines and tools – from laser cutters to 3D printers.

**Startup**

A "startup" refers to a team preparing to launch a venture or to a recently founded company, bringing its own – ideally highly innovative – business idea to market and striving for rapid growth.

**Value chain**

A "value chain" describes the interlinked activities or steps that combine to enable a company to create value or manufacture products of value. It shows the path of a product or service during its transformation: from input or starting material to output or use case.

# Three questions for
# TUM's Data Protection Official...

**Faszination Forschung: Why is data protection such a hot topic in connection with digitalization?**

**Prof. Uwe Baumgarten:** Large amounts of data are collected in the course of many digital projects. This often includes personal data such as an individual's whereabouts, habits or profiles and even fitness information. This is where data protection comes into play: Whoever gathers such personal data has to take the legal framework into consideration, and above all the right to self-determination in regard to information. This right has been strengthened with the EU's new General Data Protection Regulation. The person whose personal data is processed must have a clear understanding of what happens with their data and give their express consent. A good approach here would be to use consent forms, which provide easy-to-understand information about the purposes of data processing.

**How does research contribute to the topic of data protection?**

An important aspect is the improvement of anonymization techniques. This means changing the data so that no conclusions can be drawn about individuals. Then you have machine learning and artificial intelligence processes, where algorithms are "trained" with large amounts of data – personal data in particular – and learn how to make decisions. Their reason for making a particular decision is often not so easy to understand, however, hence the interest in research aimed at exploring and explaining these processes.

**What advice would you give startups with a data-driven business model?**

The first thing entrepreneurs need to reflect on is whether they really need personal data for their business model. If they do, they must ensure transparency about what and whose data they are collecting. The users' right to ask for information about their stored personal data has been strengthened. They may also request that inaccurate data be corrected, withdraw their consent for future data processing, and even demand the deletion of their data. Companies have to be well prepared for this eventuality: It is relatively easy to accumulate and store data, but not so easy to delete it on a selective basis.

*Undine Ziller*

**Prof. Uwe Baumgarten**

Following his undergraduate and doctoral studies in Informatics at the University of Bonn, Uwe Baumgarten qualified as university professor in Informatics at Carl von Ossietzky University Oldenburg. Baumgarten has been Professor of Informatics at TUM since 1994. The focus of his research lies in the field of mobile distributed systems. He has held the position of Data Protection Official at TUM since 2010. In this position, he takes care of informing and advising people about data protection regulations and the resulting obligations and monitors compliance with these regulations.

**Link**

www.datenschutz.tum.de

Picture credit: Astrid Eckert/TUM