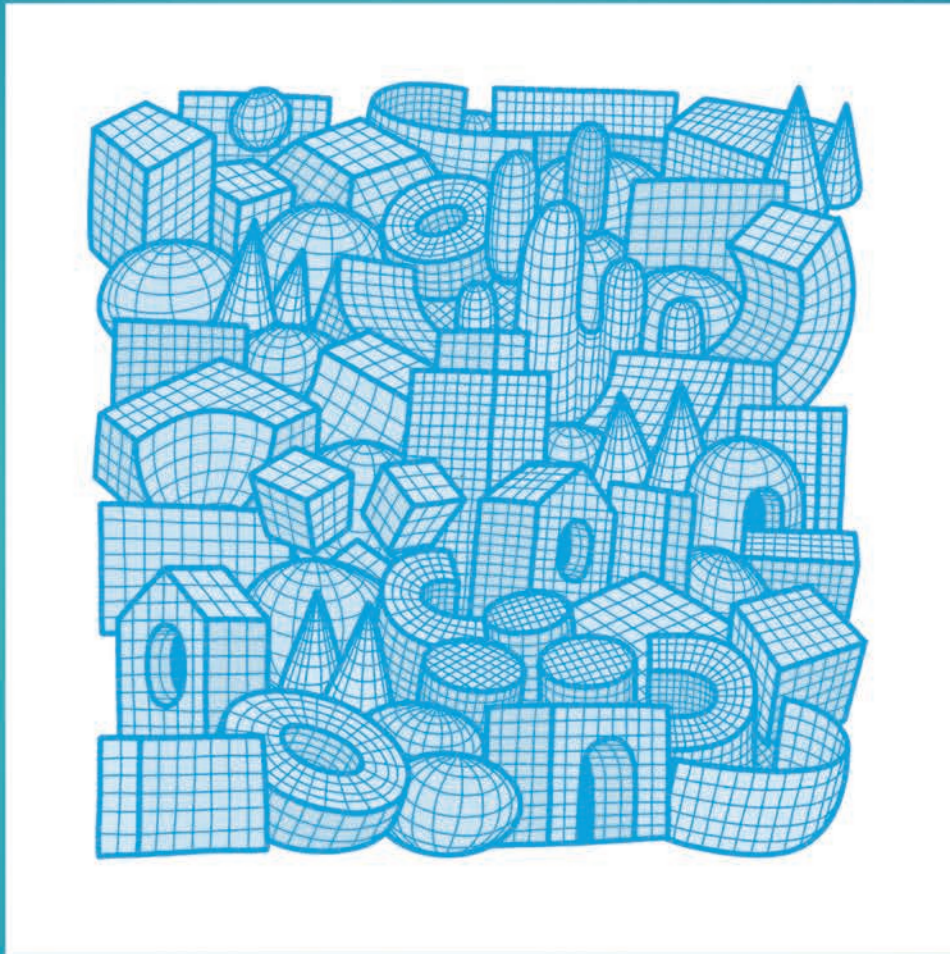


# ti&m special

AI 2020

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and Insurance Trend Study.



## There's no need to be scared of AI!

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**Bringing autonomous systems to engineers: Taking a leap from the digital world of games to the real world**

# Dear readers,



Thomas Wüst, CEO and founder of ti&m AG

*“For me as a computer science engineer, the most exciting thing is the new paradigm created by AI. Deterministic model thinking is out; now it’s all about iterative learning curves and results-driven process control that are at the center of developing AI-based solutions.”*

**AI is once again on our doorsteps, younger, stronger and more vibrant than ever after having gone through two “AI winters” already in the last 50 years. Alexa, Siri and friends are a fixture of many a living room, and we are treated to daily analyses and speculations about when the machines are going to take over the world.**

Away from all the hype and hysteria however, artificial intelligence is in the process of establishing itself as a powerful and indispensable key technology of digitalization. AI methods are used in all kinds of sectors, from industrial network planning, pharmaceutical engineering, portfolio management, fraud detection and health and disease management. It helps to transform the enormous volumes of data we generate today into knowledge and insights. Along with cloud computing and security technologies, AI will have a lasting impact on our world.

Yet, as much as I look forward to solutions to our key challenges, it seems vital to me that we address the ethical challenges proactively and in good time. As a society, we have to develop an “AI code of conduct” that preserves our core values but also protects against the threat of overregulation.

We at ti&m have, of course, also recognized AI’s potential. We have spent the last few years building up considerable expertise so that we as an innovative service provider and partner can help shape the future in this field with and for our clients. We got straight to work on this with our products, too. Our ti&m channel suite already understands users’ voice commands. We have implemented machine learning and natural language processing techniques together with our clients to establish proof of sustainable company management using extensive documentation (p. 20 RobecoSAM) or to review X-ray images for diseases (p. 25 caries detection). ti&m’s Banks Trend Study and Insurance Trend Study examine the effects that technologies such as AI will have on these industries in the future (p. 27).

We have incorporated all this experience into our overall portfolio. This means we can offer the potential of AI as an integral part of our solutions, from initial consultations and training, through design thinking workshops and “garages,” to the development and operation of solutions.

For me as a computer science engineer, the most exciting thing is the new paradigm created by AI. Deterministic model thinking is out; now it's all about iterative learning curves and results-driven process control that are at the center of developing AI-based solutions. This is the final step away from Taylorian process optimization and toward a holistic view of solutions. This way of thinking is a perfect fit for the agile and holistic approaches we already always practice in our garage and development projects with interdisciplinary teams.

I warmly invite you to join us on this journey into a world that enhances our natural intelligence with a portion of artificial intelligence rather than controlling it – for the time being, at least. We have assembled a wide range of high-profile authors from the ranks of our clients and partners to tell us about their experiences and successes on this journey in this ti&m special. They do not shy away from the social and political aspects.

It's a good read, and I hope you will enjoy it.



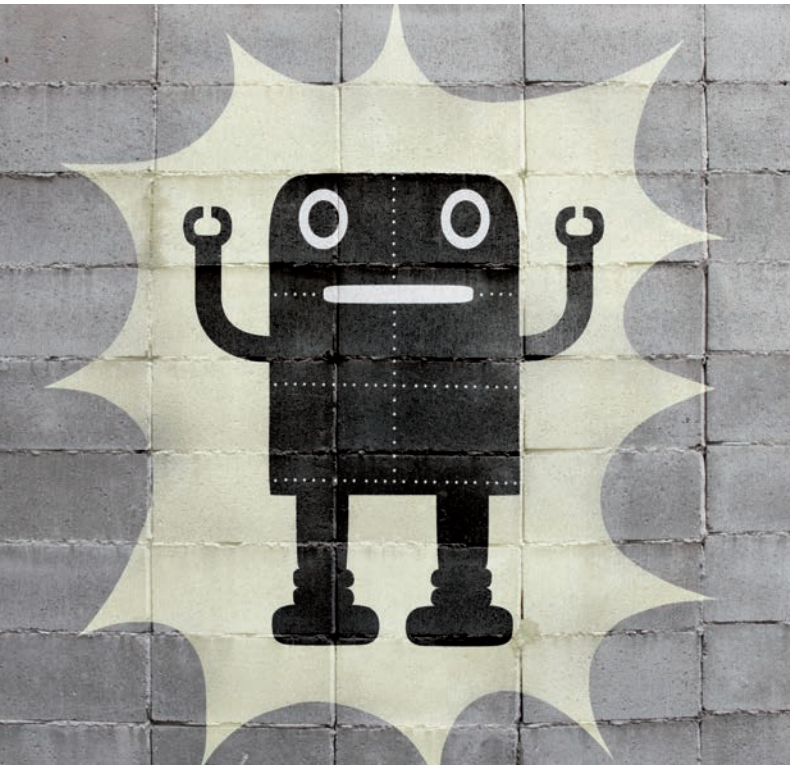
Thomas Wüst

**Publisher:** ti&m AG, Buckhauserstrasse 24, CH-8048 Zurich  
**Cover photo:** [ti&m art@work/Druegg](mailto:ti&m.art@work/Druegg) [ti8m.com/en/special-AI](https://ti8m.com/en/special-AI)  
**Editorial team:** Thomas Wüst, Pascal Wyss  
**Design/Production:** ti&m AG **Circulation:** 9,000 copies  
**Printing and distribution:** Multicolor Print AG



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# AI is here to stay

Pascal Wyss &  
Karsten Burger, ti&m

**Technology //** Ever since the birth of the computer, humans have been developing and perfecting programs. The goal has almost always been to become more efficient and increase quality of life. Since then, IT has branched off into many different specialist areas and recently entered new territory: artificial intelligence, or AI for short.

Today's AI algorithms surpass humans in accuracy and speed when performing tasks that require decisions to be made based on knowledge and experience. Unlike conventional programs in which complicated sets of rules had to be permanently programmed in, machine learning allows AI algorithms to derive rules and convert these automatically into programs. To develop a spam filter for emails, for example, millions of emails would have to be analyzed manually, and the rules derived from this. With machine learning, you can get the machine to do this analysis for you; it will identify emails as spam using statistical methods.

AI is already helping us today to improve the customer experience and make processes more efficient for many different products. On a mere smartphone, it will categorize photos, optimize battery use, identify the owner via the camera and interact with him/her via digital assistants. Tech firms have a gimmicky approach to showing what AI is capable of, designing algorithms that master the most complex of games better than the world's most gifted players.

Despite this, SMEs in particular have difficulty implementing AI productively. This is mainly down to two things: firstly, a lack of ideas for concrete use cases with foreseeable ROIs; and secondly, dispersed, heterogeneous data that is not directly accessible. Or perhaps there is no data at all because historical data was not collected or digitized properly.

## Data and machine learning

So let's start with data and how AI learns from it. Strictly speaking, an artificial intelligence does not "learn" at all, but it's still a good analogy. Machine learning is really all about attempting to find a mathematical function in the data that functions so generally that it can be used to find the right solutions for new and previously unknown input. However, this only works if the input doesn't deviate too much from the data used by the machine to learn. This means that today's AI does not possess any human intelligence – it is more of an idiot savant.

## There are three ways in which a machine "learns":

- 1 The first is supervised learning. This remains by far the most commonly used method to date. It involves the machine learning like a child: You show it two pictures and say: "This is a dog; this a cat." So you present exactly what it is supposed to learn. However, unlike humans, the machine needs a multitude of images.
- 2 The second method is called unsupervised learning. This way, the machine learns like a child that has independently recognized the following connection: This flying creature is small, yellow and black, and buzzes, so it's probably a stinging insect. The child learns independently how to form groups based on features and is able to assign a particular object to a particular group. The machine on the other hand requires a list of innumerable insects and their associated characteristics in order to form these groups.

3 The third learning method – known as reinforcement learning – involves the child learning that they shouldn't touch the wasp as this will have negative consequences. So the machine learns like a child, exploring its surroundings and discovering by means of positive and negative feedback how best to reach its goal. The only thing here is that the machine must get stung many, many times before learning that wasps are better left untouched. This is also how machines learn how to play games and how to annihilate world champions.

Right now, it takes a long time to prepare data that is suitable for training. So the focus must necessarily turn to unsupervised learning as we must and will inevitably need to achieve success using raw data. Nevertheless, there are a number of issues that can already be resolved with current methods.

*“SMEs in particular have difficulty implementing AI productively.”*

#### The concrete use case and added value

AI projects differ from software projects. And the main difference lies in “expectations.” The biggest, most immediate added value of AI projects is that companies can gain a better understanding of their own data and their own business. Equipped with this insight, they can then open up new pathways to improving the customer experience and indeed their business as a whole. This process is experimental and iterative, so it's hard at the outset to estimate the time you'll require and just as hard to envisage the result. To get to your goal of operational AI, you'll need to combine fast prototypes, technical expertise and domain know-how.

#### This data-driven, iterative process requires specialists that can offer you new, specific capabilities:

##### Storage & data ingestion

Data engineers make sure that data from different sources can be combined and processed.

##### Data science

Data scientists analyze data and know which methods are appropriate for which problems. They also build and train AI models.

##### Machine learning engineering

Machine learning engineers automate processes, create data pipelines and define service architectures for AI models.

##### Deployment & serving

Cloud and DevOps engineers transfer models to the productive environment and monitor them.



[ti8m.com/en/special-AI](https://ti8m.com/en/special-AI)

Due to the high requirements and strong degree of specialization involved, companies often shy away from building these kinds of teams. Things often get off the ground by taking a holistic view of the data. The keyword here: data lakes. Data collection is already a familiar topic thanks to data warehouse and BI projects. This approach is certainly the right one for making data accessible throughout the entire organization. But to apply machine learning successfully on top of this, more is needed. You can enhance your internal knowledge by bringing in some external experts.

At ti&m we've also had some great experiences by taking a different, more innovative approach: user-centered thinking with design thinking. We've also developed a specific program that turns the process on its head, whereby we start with the use case rather than the data. After just three days of our AI Kickstart, you'll know how to put AI to use, to rethink how you interact with your customers and optimize your business. ●

#### Pascal Wyss

Head of Artificial Intelligence, ti&m

Pascal Wyss started out as a software developer in the finance industry. After eight years, he became a digitalization consultant, helping companies to adapt their services and products to the needs of digital customers. He has been Head of the ti&m AI Competence Center since 2019.



#### Karsten Burger

Head of Innovation & Cloud Hosting, ti&m

Karsten Burger has been Head of Innovation Hosting at ti&m since 2014. In his career in IT, he has focused primarily on infrastructure, operations and cloud services.



# “Those responsible must disclose the functionalities and mechanisms of AI technologies where they affect privacy”

Adrian Lobsiger, FDPIC

**Law //**  
AI technology raises data protection questions. Federal Data Protection and Information Commissioner Adrian Lobsiger explains in our interview what companies must consider when implementing AI technologies.

## **ti&m: How can data protection and AI's thirst for data be reconciled?**

Adrian Lobsiger: Machines have no needs and don't thirst for data. If machines gather data via Internet interfaces or via acoustic and visual sensors, they do so in accordance with human programming specifications.

If a program aims to gather ever-greater quantities of data in order to improve a specific function, then data protection law does not prevent it. However, if the programmers leave open the functionality and subsequent personal rights-based consequences of automated data processing, they are courting danger. Applications such as these infringe the data protection principles of purpose limitation and proportionality.

## **In the future, AI algorithms could decide whether we get a job or even receive medical treatment. What problems do you anticipate from a data protection perspective?**

“Decisions” are a cultural construct. The only thing that makes the result of a machine's calculation a “decision” is if people determine this to be the case. People unfortunately have a tendency to glorify their decisions. Archaic cultures used the weather or animal behavior patterns to justify decisions about war and peace. In the digital era, people are exposed to the temptation of explaining decisions based on the supposed autonomy of algorithms.

Anyone using automated decisions to process personal data must make this process transparent to the people potentially affected. This is often no small task. Systems designed to take over tasks done by people are usually fed training data shaped by human judgment. For instance, as women were often left out of statistics in the

past, a program learning to sort application forms would continue this pattern. In this context, data protection legislation requires those responsible for such systems to assess and document the risks and to take appropriate countermeasures before deploying the application.

## **What is your advice for companies that want to implement an AI project?**

Firstly, manufacturers and users of “intelligent” technologies have to know and respect the legitimate expectations of customers. In line with the data protection principle of good faith, their applications must make clear any deviations from the patterns expected by the data subjects in good time.

Secondly, they need to be aware that they have a responsibility toward the data subjects for any effects on human privacy and personality. They cannot avoid this responsibility by relying on the supposedly “self”-learning or “self”-developing aspects of these technologies. It's a bit like breeding and rearing dangerous animals such as bees or livestock; the human breeder is always liable for their behavior.

## **What are the three preventable errors in the handling of data in AI projects?**

There are three deadly sins from a data protection perspective: Firstly, unclear responsibilities for the production, operation and development of the applications that are the subject of the project. Secondly, a lack of clarification and documentation of the risks associated with the application. Thirdly, a lack of transparency, accountability and explanation of the functions toward the people potentially affected.



**What are your main concerns about the increasing use of AI algorithms in Switzerland?**

My professional view is limited to data protection legislation. This requires that those responsible disclose the functionalities and mechanisms of their technologies where they work with personal data and affect human privacy and personality. The extent to which it can be inferred from data protection legislation that these applications must meet legal, legitimate or even humane purposes is debatable. In a recent judgment concerning a health insurance app, the Federal Administrative Court responded to my complaint by deciding that it was not my business to ask if processing was compatible with social health insurance law.

But there are, of course, ethical questions related to AI that concern me more as a private individual than in my work as a privacy advocate: To what extent can AI programs discriminate or manipulate? Other areas of the law such as equality or anti-racism legislation may be applicable here. If not, the ball is in the politicians' court.

**How should politicians respond?**

Let's take military software as an example. The programmers would generally limit its "ethics" to ensuring that the system does not process the data supplied to the detriment or even destruction of their own armed forces. If an application such as this works recognizably and predictably for all, no objections can be raised to it from a data protection standpoint. Whether and to what extent AI should be developed and used to perfect the ongoing destruction of people and the environment, is a job for the politicians. ●

*Interview conducted by Christoph Grau*

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**Adrian Lobsiger**

**Federal Data Protection and Information Commissioner (FDPIC)**

Adrian Lobsiger has a doctorate in law. He joined the Federal Office of Justice in 1992. In 1995, he moved to the Federal Office of Police, where he most recently served as Deputy Director. Lobsiger was elected Federal Data Protection and Information Commissioner by the Federal Council in November 2015. He has been in office since June 2016. In April 2019, the Federal Council confirmed his reelection for a second full term, due to conclude at the end of 2023.

# Outsourced intelligence and fallen empires

Nikolai Tsenov, Finnova

**Strategy // “Divide and rule” was the key principle followed by many successful rulers and potentates for centuries. It helped them to conquer continents, bring ancient civilizations to their knees and to accumulate immense wealth. But the mishandling of the resulting diversity and the growing complexity of this new world brought about the fall of many of these empires.**

## Complex and fragmented reality

At some point, many of these rulers could no longer keep up with the increasing complexity and highly fragmented reality without considerably simplifying things and making significant compromises and concessions. The “divide and rule” strategy gave them the short-lived, misleading feeling of having everything under control. But in reality, it increasingly undermined the rulers’ authority, endangered their rule and limited their global influence. They gradually traded in the knowledge they had accumulated without being in a position to take advantage of the fruits of these exchanges. But what has this got to do with the battlefields of the financial industry in the 21<sup>st</sup> century?

Unfortunately, many modern businesses – including banks and financial institutions – do the same thing. They make the same mistakes, simplify or ignore the world’s complexity and segment their customer intelligence by either outsourcing it or trading it away. Yet the benefits of integrative, consistent 360° customer intelligence analyses are more than obvious – in terms of insights gained, completeness, precision, synergies, costs, infrastructure, data and resources.

## Consistent analysis of behavior patterns

A simple, adequate linear regression analysis or a decision tree analysis carried out in isolation in one of these fields can prove to be a valuable source of previously unknown patterns of behavior once other dimensions have been added to it, and it is viewed and analyzed holistically from a multidimensional perspective.

In such cases, fully static, usually irrelevant or even disregarded attributes can suddenly change the situation for a while before disappearing again and reverting to “normality.” But what is “normal”? How stable is “normal” these days? And for how long? Can we really map the complexity of the outside world by running a few R or Python algorithms on a mass of data and thus consider one isolated question or one isolated problem? How subjective is the selection, configuration and parameterization of these

algorithms? Are we really reliant on the skills and availability of an almost unaffordable quantitative analyst for all these tasks?

We talk about sophisticated approaches to data analysis, discuss and philosophize about what machine learning and artificial intelligence are, get carried away by the artificial intelligence wave and are blinded by buzzwords. At the same time, it seems we cannot see the wood for the trees and concentrate on isolated problems and silos instead of addressing complexity with a uniform and consistent approach.

And why? Because it is easier, more convenient and more practical. Because our world and often our way of thinking are highly structured and compartmentalized. When confronted with complexity, we tend to simplify it or even ignore it.

## Networked thinking

Let’s take a step back, view the overall situation and rethink this. Would you offer a customer another bank product simply because it seems advisable based on your CRM analysis on cross-selling and upselling even though you know that their creditworthiness is dubious, that they appear on negative reports and that they are probably involved in money laundering and tax evasion? No, you probably wouldn’t.

Would it interest you to know that this customer is also incredibly careless when it comes to defending themselves against cyber attacks, which leaves them and you both exposed to high levels of integrity risks? Or that you are even about to lose them as a customer for this or several other reasons? Yes, definitely.

Would you want to know how current developments in the financial markets are affecting this particular customer profile and all its portfolios, exposures, risks and opportunities? Probably, yes.

And do you think that your customer would be keen for you to provide them with expert and well-founded advice on what it would mean for them in tax or cross-border terms if they were to emigrate to another country? Yes, absolutely.

The answers seem to be clear and obvious, and yet we always



seem to repeatedly fall into the trap of irrational behavior by applying isolated perspectives and only viewing these problems from a single, simplified point of view.

### Hybrid approaches

It is not difficult to leave these problems behind, however. Dynamic risk & opportunity based profiling is an integral, uniform and consistent method for the contextual and situational application of countless advanced hybrid approaches that combine machine learning and artificial intelligence. Dynamic risk & opportunity based profiling does not focus solely on a particular question or a particular problem in isolation. Instead, it delivers an analytical 360° view of the customer and their entire profile with equal weight on all the risks, threats and opportunities, based on all available static and dynamic customer data as well as internal and external intelligence.

Of course, dynamic risk & opportunity based profiling not only fulfills the requirements of the revised Swiss Anti-Money Laundering Act, but also allows you to tick the compliance box with

peace of mind. And it provides security as well as accuracy and efficiency in your daily decision-making. This reduces risks and threats, avoids or minimizes losses and maximizes profits. ●

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### Nikolai Tsenov

Analytics Product Manager, Finnova

He has been Compliance Product Manager at Finnova since 2015 and has more than 20 years' experience in compliance, risk management and data analysis. He won the Banking IT Innovation Award 2016 at the University of St. Gallen for his analytical framework concept FAF.





## “Zurich offers the ideal breeding ground for developing new AI technologies”

Carmen Walker Späh, Canton of Zurich

**Location //** Players in business, science and politics have joined forces to turn the Greater Zurich area into a leading global hub for AI. Carmen Walker Späh, President of the Government Council and Head of the Department for Economic Affairs of the Canton of Zurich, provides an insight into the goals of the initiative led by the Mindfire Foundation.

**ti&m: How long has artificial intelligence been on your agenda as the Head of the Department for Economic Affairs in the Canton of Zurich?**

Carmen Walker Späh: We've been keeping an eye on global developments for many years in the Office for Economy and Labor that deals with local business development. AI technologies offer huge potential for the life sciences, which are strongly represented in the Canton of Zurich. We became active in the field ourselves about a year ago. We were talking with the Mindfire Foundation when we first came up with the idea of getting renowned representatives from science and business around a table to discuss Zurich's position – and indeed the position of Switzerland as a whole – as a research center and an economic

hub for artificial intelligence. Last November, the Government Council also hosted a dialogue on location, which included a panel discussion on AI.

**So your aim, together the Mindfire Foundation, with this initiative is to turn the Greater Zurich area into an AI hub.**

**What makes Zurich so suitable?**

The participants in the AI Roundtable – who come from all sorts of different specialist fields – share the vision that Switzerland, and Zurich in particular, should take a leading role in the development and promotion of artificial intelligence. And I have no doubt that Zurich has the ideal conditions for blazing a trail in artificial intelligence. We have a unique ecosystem here with leading

universities, an innovative startup and ICT scene, not to mention international companies such as Disney Research, Google and Yahoo. The Zurich region offers virtually the ideal breeding ground for developing new AI technologies.

**Switzerland is very strong in research, but how will it convert this into competitive products?**

As far as publications in neuroscience and artificial intelligence are concerned, Switzerland is already a leader. But the basic research we've done is ultimately being "translated" into market-ready products by American and Chinese corporations much too often. That's a shame because it represents a lot of lost value creation potential for Switzerland and the Canton of Zurich. To change that, we need science, business and politics to stand shoulder to shoulder, and we need all those involved to have the determination to take on a leading role.

*“Zurich offers the ideal conditions for blazing a trail in artificial intelligence.”*

**What shape should collaboration between business, science and politics take?**

If Zurich wants to take a leading position in artificial intelligence, the brightest minds, the most skillful entrepreneurs and the most influential opinion leaders must join forces in the political process and create synergies. When everyone puts their heads together and pools their knowledge, wealth of experience and know-how, you can develop completely new approaches. An intensive exchange between the relevant players can considerably shorten the route from idea to productive usage.

**What role does the Department for Economic Affairs take in the project?**

As President of the Government Council and Head of the Department for Economic Affairs, I support the initiative to build a hub for artificial intelligence in Zurich. My department and I have made a significant contribution to the launch of the initiative by bringing together the relevant actors, and we will also make our network and expertise available in the future. At the end of the day, however, it is a private initiative coordinated by the Mindfire Foundation.

**In your view, what needs to be addressed on the political side, both by the canton and by the Federation, as a matter of priority?**

In essence, the role of politics is to provide a political and legal framework that is appropriate to the current day and fosters a

climate of innovation. Our liberal employment law is also a huge advantage for the location and this must be protected. On the federal level, a new artificial intelligence working group was set up in the Swiss State Secretariat for Education, Research and Innovation in 2018. Its role will be to present reflections on responsible use of AI technologies and to ensure that international bodies understand Switzerland's concerns.

**How can Switzerland as a location compete with giants such as the US or China in the field of AI technology?**

Switzerland's strength lies precisely in its small size. We have a unique and very diverse ecosystem of innovation in a very small space. Compared to other locations, everything is within close proximity. Furthermore, Switzerland has a strategically advantageous position in the heart of Europe; it has a first-class mobility network; and it boasts excellent international flight connections in every direction. Zurich is therefore eminently suitable for setting up a national and international hub. All this combined with a high quality of life makes us very attractive to renowned researchers, not to mention as a location for innovative companies.

**The social discourse on AI is currently rather critical.**

**How do you intend to steer this in a more positive direction?**

The public's perception of AI is still shaped by sinister sci-fi movies. But most people aren't really aware of exactly what science and industry are working on. In the medical sector, for example, AI technologies can be applied for people's well-being. I also see a great deal of potential in the mobility sector: Electrically operated, self-driving systems could help to meet growing demand more efficiently, more safely and in a more environmentally friendly way. We need to have a frank and transparent discussion about how we handle artificial intelligence. But we mustn't talk only about opportunities and potential; we also need to tackle thorny questions such as data protection and ethics. Our education and research institutions certainly still have many areas of inquiry to address. Politics and society are also called on to play their part as well. The key thing for me is not to make technology the central focus, but rather people. ●

*Interview conducted by Christoph Grau*

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**Carmen Walker Späh**

**President of the Government Council and Head of the Department for Economic Affairs of the Canton of Zurich**

Carmen Walter Späh has been a Government Councilor and Head of the Department for Economic Affairs of the Canton of Zurich since 2015. She is serving as President of the Government Council in 2019/2020. From 2000 to 2015 she ran her own law firm, specializing in public and private construction law.

# Banks need to rethink their e-banking

Stefan Rüesch & Samuel Scheidegger, ti&m



**Products // Swiss banks need to turn their e-banking into a fully-fledged sales and marketing channel in order to keep up with competition from neobanks over the long run. ti&m's new e-banking module gives them all the tools they need.**

If banks want to compete successfully against neobanks such as Revolut or N26, or against the banking services offered by the big Internet companies such as Google or Amazon, existing customer contact points with the bank need to be used systematically.

## **A modern e-banking platform is vital in the battle for the customer interface**

Today e-banking is clearly the go-to way for customers to contact their bank, as ti&m's Banks Trend Study also shows (see

page 27 for more): 89 per cent of 1,000 customers surveyed say that they use e-banking, and 66 per cent of respondents use e-banking at least once a week (see figure). These numerous interactions with the bank must be utilized to offer the customer new self-service options or appropriate personalized offers. It's therefore important for e-banking to keep evolving: to move from being a platform used purely for transactions to a touchpoint and a fully-fledged sales and marketing channel. This gives banks an ace up their sleeves in the battle for the customer interface – an "unfair advantage" against all new providers.

## Modularity and transparency are the requirements for modern e-banking

Many e-banking services are developed as monolithic, inflexible platforms: They may cover all the banking services, but they are useless as a platform for interaction. An e-banking service of the future must therefore meet the following criteria:

**Open banking architecture:** A flexible architecture that makes it possible to integrate third-party providers quickly and cost-effectively. Using a mixture of standard services and individual offers, a bank can offer its customers an ecosystem that reflects its strategy.

**Fast, cost-effective integration:** This is the only way for banks to react agilely to new offers from the competition or to changing customer needs.

**Modularity:** The platform must be designed in such a way as to integrate services independently, without affecting the whole platform every time.

**Developer kit:** A development environment enables the bank to develop and integrate its own services.

**User experience:** A user interface that is easy to adapt. This is the only way to optimize usage and adjust it to suit new findings or needs.

**Process engine:** Banks must model and adapt their processes and be able to combine them with the core system. In combination with the integration layer, customer applications for new products, such as mortgage extensions, can be automated.

**Integration layer / API:** The integration layer needs to ensure that all data ends up in the core system – this includes marketing- and sales-relevant data. This is a prerequisite for automating self-services such as address changes and applications for new products.

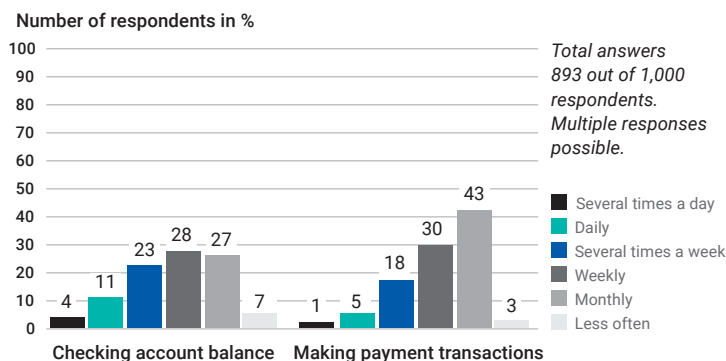
**Personalization:** A modern e-banking service must be able to tailor its interface to customers and their needs, and be able to present individual offers to the customer.

**Analytics:** Analyzing customer behavior is the foundation for developing the platform and monitoring the success of the digital measures taken.

## Cloud capability and AI

As the latest and most state-of-the-art e-banking service in Switzerland, ti&m's new e-banking module meets all these requirements – in fact, it already meets the requirements of open banking. Naturally it can be used on all devices – desktop PC, smartphone and tablet. Numerous innovative features such as multi-banking, bulk scanning deposit slips, a search function for searching all content and all transaction data, and a new kind of payment wizard give banks additional competitive advantages. What's more, the ti&m e-banking ecosystem is formed of over 20 partners, which can be easily integrated. Our partner network is constantly being expanded. In addition, banks can integrate all the modules in the ti&m channel suite.

## Purpose and frequency of use of e-banking



## AI as the key development step

As a next step, the e-banking module will be expanded with AI-based services. It is already fully voice-enabled and can be controlled via Alexa, for instance. Three examples from our current road map:

- 1 Automatic data analysis and lead generation allow it to be used as a 1:1 marketing platform.
- 2 E-banking is fully personalized based on user behavior and customer requirements.
- 3 The automated analysis of account statements for deposits held with third-party banks gives customers an overview of their portfolio, as well as giving the bank valuable information on the customer's total assets.

With its new, fully cloud-enabled e-banking module, ti&m has taken an important step in the evolution of e-banking in Switzerland, helping banks to protect their customer interface against outside competition. ●

## Stefan Ruesch

Head of Digital Banking, ti&m

Stefan Ruesch has been digitalizing various business areas as a manager and strategy consultant for banks and Internet companies for over 18 years. He heads up digital banking at ti&m.



## Samuel Scheidegger

Head of Products, Member of the Executive, ti&m

Over the course of his professional career, Samuel Scheidegger has held a range of IT management positions at various companies, including Julius Baer and Credit Suisse. He studied Computer Science at Bern University of Applied Sciences and holds a dual degree from the Universities of Rochester (MBA) and Bern (Executive MBA).





## “Anyone thinking about AI should immediately think of Switzerland”

Dalith Steiger, SwissCognitive

**Dedication // Dalith Steiger and her co-founder Andy Fitze have put their heart and soul into making Switzerland a global AI hub. She has been working all out for more than three years to make Switzerland a global AI hub. She tells us in this interview where she gets her strength and motivation, and explains why Switzerland does not need to hide its light under a bushel when it comes to AI.**

### **ti&m: What is your vision of a cognitive Switzerland?**

Dalith Steiger: It's our dream for Switzerland to not only advertise banks, chocolate and watches at Zurich, Geneva and Basel Airports, but also cognitive technologies. We believe that Switzerland can become one of the top 5 global competence centers for cognitive technologies. For example, when you think of cyber security today, the first thing to come to mind is Israel. We want to achieve this with Switzerland when it comes to cognitive technologies: Anyone thinking about AI should immediately think of Switzerland. But before we can get there, we need to do our homework – thoroughly and quickly.

### **What is this homework exactly?**

We have excellent research and development facilities. In terms of sheer size, however, we cannot keep step with research and development in the US or China. Our country is home to around 600,000 SMEs. These SMEs already have to make investments with the evolution of digitalization. Now more work is being added

for cognitive technologies. Where digitalization focused more on business efficiency, artificial intelligence principally changes products and services. How this works and how to understand its place in the global race to transform entire industries, that is the challenge facing us.

**In terms of the measurably productive implementation of cognitive technologies, there is still a lack of productive cases, isn't there?**

Yes, we're only at the beginning. But I want to emphasize that there's already plenty going on in Switzerland. And that's exactly why we're shining a light on the existing use cases and carrying out reality checks with SwissCognitive. We want to manage expectations properly and for companies to motivate themselves by addressing the actual possibilities in their businesses and discussing them. Especially since there's so much hype around the word AI that sometimes clouds people's views.

**How does that manifest itself?**

Depending on your perspective, we have already completed 90 percent of the work, whereas others will say that we still have 90 percent yet to do. There are enormous discrepancies in the estimates. Siri can already do a lot, for example. But if I think about all the potential that's still untapped, I come to the conclusion that we're only scratching the surface.

**How far along are Swiss companies?**

Finding out where Swiss companies are at was quite high up on our to-do list when we founded SwissCognitive. Three years ago, Switzerland was still a no-man's land when it came to cognitive technologies. Our first event was attended by 35 companies, but none of them had much of an idea about how, where and why they should use cognitive technologies. Most of them were however aware that they could expect something to happen. All of them thought that the US was much further along. We did a bit of research and found that they put their pants on one leg at a time on the other side of the pond, too. But you do have to give it to the Americans: They are the better salespeople... In any case, three years on, we can see that there are now a lot of practical use cases.

**Why haven't we heard about them?**

Switzerland is still far too modest. Do good and spread the word! The main thing is that we should share our experiences. It helps us if we can learn from each other and reap the benefits. People love to talk about best practices, but companies tend to keep quiet about their worst failures. But these are in fact the most valuable experiences and projects. Failure is a great teacher. It's a fact that all companies struggle with data quality, but nobody wanted to say it loud and clear at the beginning. But why not? Problems don't get solved by keeping them under wraps. Problems are solved by actively addressing them.

**Where do people come into this?**

People are the central element. Without them, the best technology is no use at all. To put it in a nutshell: 10 percent is technology, 90 percent is about people – we should never forget that!

**How justified are the fears in the public debate?**

Technologies are not only changing business processes, but also our society and hence the world of work. This affects all of us. People have a right to know what we can already do with AI today

*“The superintelligence we're all afraid of is currently just a theory with no basis in reality.”*

and how far we've come. Unfortunately, fears are being stirred up with science fiction. I wish the media would contribute more to factual explanations of the technologies. Then the discussions around the kitchen table or in the bar could be more realistic. At the end of the day, we're still talking about algorithms that can be used only in very narrowly defined fields. We are currently taking the first global steps with the use of cognitive technologies. There's still a long time to wait before the first chess-playing, self-driving car comes to market. The superintelligence we're all afraid of is currently just a theory with no basis in reality. I would like to make the debate more objective, and fast. Otherwise, we run the risk of slowing down and being left behind. The debate about the ethical questions concerning AI is somewhere where we Swiss should play an active and incredibly vital responsible role. With our neutrality and globally accepted position as a partner in discussions and negotiations, we are predestined to put forward our values as a framework for dealing with AI. Let's do this together. ●

*Interview conducted by Christoph Grau*

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**Dalith Steiger**

**Co-founder of SwissCognitive**

Dalith Steiger was born in Israel and grew up in Switzerland. She studied Mathematics and Information Systems at the University of Zurich. In 2019, Dalith Steiger was named one of the top 10 pioneering women in AI and machine learning by Enterprise Management 360 London and one of the top 100 digital shapers in Switzerland by Bilanz magazine.

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- High usability
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 [ti8m.com/en/hackanapp](https://ti8m.com/en/hackanapp)



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#### Understand the principles and methods

Training:  
The use of artificial intelligence follows a different set of rules and requires a whole new mindset. We familiarize you with this way of thinking and show you how to put it to good use.

### Locate the gold



#### Identify your potential

Business case:  
We help you make use of the potential in the data you have. We show you how real-world problems can be solved with the help of artificial intelligence.

### Start digging



#### Confirm your hypothesis with workable pilots

MVP: In very little time, we find the right methods and build a functioning prototype. We use your data to train machine-learning and deep-learning models up to product maturity.

### Smelt and cast



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# How AI will change your business

What Swiss decision-makers say.



**Nicolas Bürer**  
Managing Director  
digitalswitzerland

*“In a few years, both AI and blockchain will be an entirely normal part of our everyday lives and professional activities. We will no longer mention them in special terms, as is the case today with once new technologies such as the Internet or email.”*



**Roland Schiess**  
Head of IT, Bank Now

*“We use AI to interact more personally with various target groups by adapting our customer approach to different situations using self-learning. In the future, customer advisers will be able to process applications faster thanks to AI; processes will become more efficient thanks to AI-based automation.”*



**Dr. Thomas Dübendorfer**  
President Swiss ICT  
Investor Club, cybersecurity expert and member of  
ti&m's advisory board

*“The targeted application of AI can shorten tedious customer processes and make them more customer-friendly.”*



**Judith Bellaiche**  
National Council  
member and Managing  
Director of Swico

*“AI will not only change our business; it will change our society. Ethical questions will also become more important. We need to address these together and proactively.”*



**Thomas Wackersreuther**  
CIO, member of the SASIS  
management board

*“Trainable and self-learning AI will take over the analysis of text-based content – regardless of structure, source and language. Intelligent Document Recognition (IDR) can significantly improve the quality and efficiency of content classification and data extraction.”*



**Matthias Kälin**  
Head of Technology &  
Operational Services  
Bank CIC (Switzerland)

*“AI is spurring on the process of replacing people with machines. Monotonous jobs such as revising decision-making criteria are being delegated, and people can use their emotional intelligence to generate real added value compared to machines.”*



**Johannes Hoehener**  
Head of Fintech at  
Swisscom and member of  
ti&m's advisory board

*“People and machines will work together collaboratively, and automation will become visible to everybody. Over the next few years, many hyped applications will undergo a reality check. Invisible AI will evolve faster than robotics – it will be a while before a high-performance robot is cleaning my kitchen.”*

# “With AI projects, you need a long breath”

Manjit Jus, RobecoSAM

**Use Case //** RobecoSAM has been developing sustainability indices for large quoted companies for 20 years. In order to cope with the growing mountains of unstructured data, RobecoSAM implemented an AI solution together with ti&m. Manjit Jus, Executive Director, Head of ESG Ratings at RobecoSAM, talks about how the project went and what the companies learned about themselves during the process.

## **ti&m: What does RobecoSAM do?**

Manjit Jus: Since 1999, RobecoSAM has run its annual Corporate Sustainability Assessment (CSA) which collects sustainability data on 4,700 companies and it will be 7,200 by March 2020. RobecoSAM collects data from some of the world's largest companies directly through an online assessment platform as well as through publicly available information published on company websites, corporate annual reports and financial filings and sustainability reports. The CSA is widely recognized as the leading global assessment framework for sustainability ratings, and our data has been feeding the world-renowned Dow Jones Sustainability Indices since they were created in 1999. As of June 30, 2019, RobecoSAM managed USD 24.3 billion of client assets (including consulting and license agreements).

## **What is the difficulty with the evaluation?**

The amount of sustainability data available has been increasing substantially over the last years, as a result of increasing global demand for transparent sustainability information by investors and other stakeholders. While global sustainability reporting standards exist, the type of reported information is constantly changing, in line with evolving global sustainability challenges. As a result, analysts analyzing this information are confronted with increasing data volumes, sources and sometimes incomparable data sets. Analyzing and processing this information is therefore becoming an increasingly complex and labor-intensive task.



### **How and why did you come up with the idea of using AI?**

The increasing availability of large data sets allows for new technologies to be applied. We now have 20 years of data history – a perfect use case for applying technologies like AI and NLP. Increasing standardization within sustainability reporting has also allowed to apply these kind of technologies. Furthermore, new niche market entrants have helped support the adoption of these technologies in the sustainability space. It is a dynamic, rapidly changing space and traditional research frameworks benefit from leveraging new and flexible tools.

### **Why did you decide to go with ti&m?**

We assessed a number of different partners, but we appreciated ti&m's flexible, innovative and entrepreneurial approach – this fits well with the corporate culture at RobecoSAM. So far, the collaboration has been excellent, as the ti&m team members we have worked with are not only interested in the technologies, but also the content of the work we do. There is a clear passion emerging for sustainability, and this interest and excitement has made the collaboration feel more like a partnership rather than a one way business relationship.

### **How did your employees react to the AI project?**

Everyone in the company who you talk to is excited about this, even if it doesn't directly impact their areas of work. It shows strong management commitment, shows the company is staying innovative and a leader in its space, and sends a strong signal to our clients and corporate stakeholders that we are forward looking. Sustainability is an evolving theme, and being prepared to tackle tomorrow's challenges is a key element. The people directly involved in the project are excited, as they are learning new things every day – regardless if they work in IT or in business.

### **What is your conclusion so far?**

We learned a lot about ourselves and the way we work through this process. Going through a process like this requires a lot of preparation and hard work cleaning and reviewing data. By doing this, you discover a lot of new things about your own work – things that could be optimized or improved, processes that could be automated or replaced. Therefore, the learning experience goes far beyond just how these new technologies can positively impact your business, but it also forces you to make changes in

your internal processes and systems to better prepare for a production-level roll out. Based on learnings we are not adjusting some key internal processes to be able to process data more effectively to feed future iterations of the models we have started building. This not only makes the AI implementation process smoother, but overall will improve the quality and effectiveness of our work.

### **What tips can you give to someone who also wants to try AI?**

Have a clear vision of where you want to be, not tomorrow but in a year, in two years in three years. Find a partner that can support a realistic roll out of this vision. I think many managers believe that with enough money, AI can solve all of their problems in a short period of time. This simply isn't true – while it's about technology, it's still about people and the organizational culture and how to support these. We see technology as an enabler, but in our field of work we also understand that analysts will continue to have a key role to play in interpreting the data we collect and make meaningful decisions based on this data. Therefore, long-term management buy-in is key. If necessary, break the project down into smaller tasks, spread budgets over a few years, but make sure to keep the momentum and excitement up internally. Make sure the project management is set up well, so that failures are turned into learnings and improvements.

### **Were you able to achieve your goals and to what extent?**

This is to be seen. Our first goal is to improve the comprehensiveness and completeness of our assessment, by ensuring that all data is processed efficiently. We are not immediately trying to save time or money – we believe this will be a natural outcome of improving the way we work, freeing up time and resources to do other value-add work. ●

*Interview conducted by Christoph Grau*

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## **Manjit Jus**

### **Executive Director, Head of ESG Ratings at RobecoSAM**

Manjit Jus has worked for RobecoSAM for nine years. He started out as a Sustainability Data Analyst and is currently Executive Director and Head of ESG Ratings at RobecoSAM. He holds a Bachelor's in International Management from the Swiss Business School.

# More mobile with AI?

Andreas Kronawitter, its-ch

**Mobility // Mobility is reaching its limits. Congestion, crowded trains and buses, accidents and environmental damage are the consequences of people's ever-growing need for mobility. The traditional solution – increasing infrastructure capacity – takes too long and is reaching its limits in terms of acceptance and affordability.**

## Andreas Kronawitter

**CEO of its-ch  
and founder of  
Kronawitter Innovation**

Andreas Kronawitter is the CEO of Swiss mobility platform its-ch. He is one of the highest-profile mobility experts in Switzerland thanks to his experience at SBB and BLS.

He joined the ti&m advisory board this year.



"If data is the new oil, AI is the new engine" – was how Eric Sampson, Chief Rapporteur of the ITS World Congress 2018 in Copenhagen, summed up the importance of AI. In a time of growing mobility needs and fast-changing habits, artificial intelligence seems to promise a solution to all major mobility problems. Intelligence instead of concrete and steel. How fitting for organizations bearing the name of "intelligent transportation systems."

A total of 34 of the 188 sessions at the ITS World Congress Singapore 2019 addressed AI applications in mobility, and almost half were related to it in some way, such as legal aspects or acceptance of AI-controlled vehicles and mobility systems. There was also a two-day special program on automated and autonomous driving – AI was the dominant theme there, too.

### Is it all hype, or is it real?

Wherever expectations are high, disappointment is not far behind: In short, adaptation is going slower than the protagonists had anticipated, or at least hoped. A few years ago, the assumption was still that self-driving vehicles

would be driving freely on the roads from 2021 and that half of all vehicles would be driverless by 2030. Meanwhile, reality has demonstrated that the problems of use on public roads with no artificial conditions are in fact greater than expected. But there are applications already being put to good use, such as in specific areas or cases.

What are the difficulties? Artificial intelligence is the product of processing, data and algorithms. Processing in the cloud is not usually a problem anymore – there are many well-connected data centers. But it's a different picture for applications in vehicles: Waymo car sensors produce 1 gigabyte of data per second, which then has to be processed. This amount of data is too large to "send to the cloud" via wireless networks. It has to be processed locally instead. Look in the trunk and you'll see that there isn't much room for bags anymore. Self-driving cars are mobile supercomputers. The solution will lie in finding the ideal balance between the "intelligence" in the vehicle and communication between vehicles and with the infrastructure.

It is imperative that vehicles in use are reliable. Cars, with their large mass and high speeds, represent a huge risk if something isn't working as it should. This is why safeguarding automated or autonomous systems is a crucial issue. Deep learning, one of the most commonly used AI techniques today, needs immense quantities of data for training. According to a statement from Jeff Dean, head of the Google Brain project, you need at least 100,000 examples for deep learning. This is one reason why Waymo is covering millions of miles on the roads and still more in simulators. The Americans have a significant advantage over their competitors here.

### Other applications of AI in mobility

Automated driving is not the only field in which AI is used for mobility, however. Figure 1 shows the other applications in overview: In addition to new or enhanced products, including automated driving, process automation and new

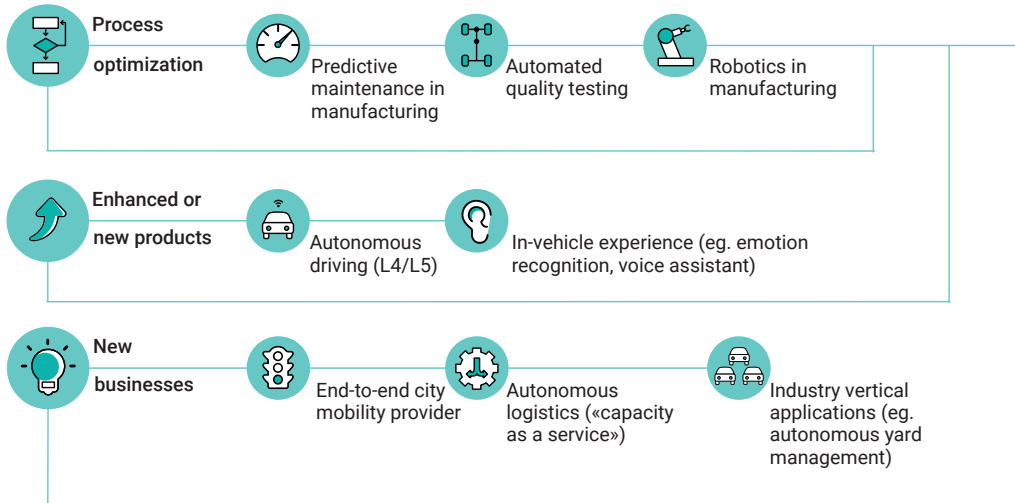


Figure 1: Applications for artificial intelligence in mobility.

business models offer opportunities for applying AI in mobility.

Applications for predictive maintenance can be found in process optimization. This opens up great potential for expensive and complex transportation infrastructure, but also for the vehicles themselves. Commercial vehicle manufacturers can increase the availability of their customers' vehicles – the high mileage of professionally used vehicles is perfect for collecting the necessary data. The "data lake" is large enough since the data from all vehicles reaches the manufacturer regardless of the number of customers. Other applications include quality control and robotics in manufacturing, but also increasingly in vehicle and infrastructure maintenance. Take, for example, the drones used for collecting status data, where every deployment of every single drone can be used for collective learning. This is a sector in which Switzerland is taking a leading role.

### New business models

Automated ticketing systems are a special case. Here, too, Switzerland has the upper hand as it was the first to introduce national automated ticketing systems. With lezzgo, artificial intelligence techniques are being used to calculate distances traveled on public transport based on data measured by smartphones. Extending this to other mobility services, to fraud detection and boarding and alighting could pave the way for an end-to-end platform. Platforms like

these, which offer "mobility as a service," will be increasingly able to better accommodate the needs of mobility users by learning from their behavior.

Pickwings, a kind of ridesharing service for goods and commodities, is one example of autonomous logistics. It links spare transportation capacity with transportation needs. This improves the utilization of trucks, which benefits both bank balances and the environment. Container terminals, ports but also the railways are increasingly controlled by artificial intelligence.

Artificial intelligence has entered the world of mobility. Many applications are specific and still of limited complexity. We may be waiting a while for high-publicity, complex AI applications, but today's applications are solving relevant problems and can be used productively.

Getting on board and taking the first steps is worth it for businesses. Every long journey begins with the first step. ●



*“lezzgo uses artificial intelligence techniques.”*



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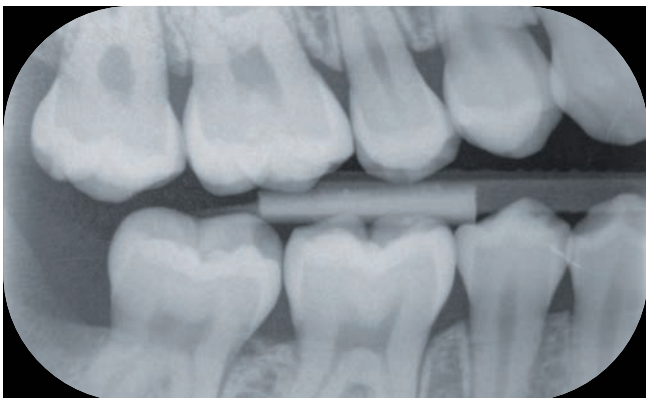
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# How AI can help dentists identify tooth decay

Tobias Minder, Nostic Solutions

**Prototype // Routine work such as identifying caries from X-rays is a time-intensive and challenging business. But AI can help to speed up this process and make it more automated. Nostic Solutions built a prototype in the ti&m garage.**



In my work, I deal with issues and questions surrounding the digitalization and design of customer-oriented business processes. At my last dental appointment, my dentist took some X-rays to check for tooth decay, and I realized that analyzing these images is ripe for optimization. So I worked on a process to modernize X-ray diagnostics and prevent tooth decay alongside my partner, who works in dentistry. Because identifying caries on an X-ray image isn't always particularly straightforward. The image might have errors in it or artifacts that make it difficult to assess.

We were confident that by making areas that were highly likely to be affected by caries graphically visible on X-rays, we would be taking a first step to helping dentists: The dentists would gain a visual indicator as to where they should take a really close look during the clinical diagnosis. We then had this product idea validated by several people working in dentistry and IT. After getting some positive feedback, we decided to develop a functioning prototype. So we turned to the ti&m innovation garage.

## Why did we go for AI?

The experts at ti&m left us in no doubt that, from a technological perspective, AI is the most promising way to achieve success. The large quantities of data to be processed and the complex structures that need to be identified on the images all spoke for using AI. It was also important to us that the technology continues to improve with every image analyzed.

The prototype we jointly developed proves its feasibility. To this end, we trained the algorithm using X-ray images that featured positive caries diagnoses. The algorithm was then fine-tuned. If the algorithm identifies an area on the X-ray that has a high probability of being caries, this area will be highlighted in a particular color. This helps dentists to assess the X-ray, and then they can focus on the suspected areas in the clinical examination.

## Will only dentists benefit?

We'll shortly be launching our first product on the market. It will support dentists and their practices in analyzing X-ray images. This digital "second opinion" will make analyses easier, faster, and more accurate. However, we are not trying to replace dentists. Rather, it's about taking the pressure off them in everyday working life so that they have more time for their patients. This ultimately enhances treatment quality, strengthens the dentist's reputation and lowers costs for both patients and the health system.

We are confident that combining state-of-the-art technology with tried-and-tested diagnostic and analysis procedures will help dentists to better diagnose conditions at an early stage. AI is a key technology that helps us optimize processes in medicine and ultimately automate them as well. We are excited to see what applications will emerge over the next few years. ●

## Tobias Minder

CPO, Nostic Solutions AG



Tobias Minder is a co-founder of Nostic Solutions AG and creates new strategies for product and services out of ideas. As CPO he is responsible for implementing the product strategy. He spent over ten years of his career at leading tech companies, financial institutions and consulting firms that focus on digital solutions and customer experiences.

# Squeezing the middle – How AI will change the world of work and our lives

Holger Rommel, ti&m

**Society // AI technology has great potential, but it is often overestimated. It's time to take a critical look at the possibilities and the impact on society.**

Artificial intelligence and its application in practice are hot topics, especially in technology companies and technology-driven sectors – be that banks, insurers or transport companies. The opportunities AI can offer a business are usually in the foreground. The potential is immense even if much of it is still in the experimental phase and unsuitable for industrial use. Nevertheless, the degree of upheaval caused by AI is often underestimated. However, it is important to take a closer look at these changes as, especially in the field of AI, it is those dreaming of new applications who could be massively affected by its use.

## **A look at current examples of AI application fields makes this clear:**

**Text recognition and processing:** Systems for automated document analysis, e.g. for underwriting, evaluating audit reports or fund prospectuses, identifying customer needs and producing adequate answers to all kinds of questions

**Allocating and processing flows of materials, people and payments:** Fully automated accounting, inventory management systems and supplier management

**Executing and optimizing workflows:** Claims processes in insurance, managing workers in industrial manufacturing, assembly or businesses in the skilled crafts sector

**Image recognition / pattern recognition:** Fully automated customer onboarding

**Complete automation:** Loss assessment, quality assurance processes, inspections

**Communication and interaction:** Expert systems, chatbots, digital assistants

**Intelligent and situational sensor system control:** Self-driving cars, predictive maintenance, smart homes

Wider use of AI entails a massive change in workflows and a huge push toward streamlining, leading to totally new demands on those involved in the work process. This will require much less input from people, and the work will have a new quality. This could result in social problems if these changes affecting people are not addressed at the same time as the reorganization of the world of work.

*“Jobs requiring empathy where interaction with people, social skills and sensitivity are needed will also be of greater importance than they are today.”*

## **AI is not just a threat to low-skilled jobs**

People can see the threat posed by AI systems, but view it as rather abstract. What most of us don't realize is how much AI-based streamlining could affect our own area of work and hence ourselves. All previous industrial revolutions saw the increased mechanization and automation of goods production. This made low-skilled jobs obsolete and created new, higher-skilled ones.

Educational levels increased accordingly and,

with qualifications, so did people's prosperity. If intelligent systems capable of making decisions become established in industry, it is in fact the skilled jobs that will be replaced by machines. The reason for this is that AI systems primarily replicate analytical, procedural thinking and decision-making. In contrast, AI is less suited to reacting intuitively and quickly to sudden changes. Systems like this are also less good at productive creative work than they are at solving algorithmic problems and at making decisions and acting within a specified framework. This will shift the typical clerk's area of work onto the machines. Planning, controlling and optimizing workflows will also be increasingly taken over by machines. The numbers of accountants, insurance clerks and bank back office staff will steadily decrease.

**Creative, situational and people-related work will stay with humans**

AI streamlining starts in the middle of the work processes, expanding from there to the edges that cannot be done by AI systems as quickly or at all. This includes all types of work where intuition and creative thinking are required

in addition to pure analysis. Jobs requiring empathy where interaction with people, social skills and sensitivity are needed will also be of greater importance than they are today. The manipulation of objects that have to be processed situationally and individually is among the kind of work that AI systems will not be ready to do independently for a long time yet. Put in concrete terms, this means installation work, construction or the skilled crafts. It is possible that AI systems will take over more and more of the control here, but the work itself will still need to be carried out by people for a long time.

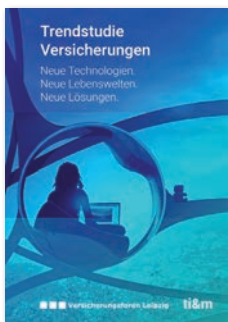
As is so often the case, it is a question of your personal viewpoint as to whether you see the loss of autonomy vis-à-vis controlling machines resulting from the continuing proliferation of AI systems as a growing threat or whether you welcome the obsolescence of repetitive work in favor of greater creative freedom and more challenging tasks. If creative action or personal interaction gains ever more importance in the world of work, and entering numbers in computer input masks becomes less so, who is to mourn the loss of the old – or should we say current – days? ●



**Holger Rommel**  
**Head of Research & Digital Transformation, ti&m**

Dr. Holger Rommel is responsible for consulting as Head of Research & Digital Transformation at ti&m. His work focuses on the changes to specialized processes and organization resulting from technological transformation.

**ti&m trend studies**



**ti&m has teamed up with the Institute of Financial Services at the Lucerne University of Applied Sciences and Arts and Versicherungsforen Leipzig to produce two trend studies on technology development and usage: Banks Trend Study and Insurance Trend Study.**

These studies examine the impact of digitalization, in particular the influence of technological trends such as AI, on working and living environments. The Banks Trend Study examines the specific affinity for, and use of, technology among bank customers in Switzerland and compares it to the actual possibilities, drawing upon expert opinions. It reveals very high potential for using ideas like AI in the Swiss banking sector. Yet the banking world is still in the early phase. The Insurance Trend Study established the potential for change in three spheres of life: mobility, living and health. It served as the basis for B2C surveys and expert discussions. These showed that the insurance industry has huge potential for using the new technologies. The studies assist decision-makers in banks and insurance companies in applying technological trends to their own specific situations.



Download the trend studies here:  
[ti8m.com/en/studies](https://ti8m.com/en/studies)

# AI and UX Design – a challenging new love

Stephanie van Ophuisen & Lisa Müller, ti&m

**Design // Artificial intelligence has been the buzzword on everybody's lips for some time now. Many people are already familiar with the technological possibilities, but what does this term actually mean in the context of UX design?**

A new era has dawned – machines are getting smarter. No longer do they simply follow orders; they sometimes act independently, too. This requires an entirely new way of thinking in the design process. And design is currently in high demand – according to a study by LinkedIn, creativity is the number one soft skill for businesses in 2019. Particularly in UX, empathy and understanding human interaction is essential. Today, users expect perfectly designed customer journeys and specifically tailored products more than ever before.

*“Creativity is the No. 1 soft skill in businesses.”*

While artificial intelligence opens up new horizons in products and applications, designers are faced with a whole host of new challenges in making the interface between man and machine intuitive and understandable, and in assuaging fears and breaking down prejudice about the new technology.

**These are the core challenges confronting designers when working with artificial intelligence:**

## 1 Trust and transparency

Without knowing how a system works, artificial intelligence can seem bewildering and uncanny. When it comes to data protection, many users are skeptical – particularly when it's unclear exactly which data is to be collected and what it will be used for. It is therefore important to explain to the user which system components are “intelligent” – meaning personalized for the user – and which user data was used to create them. For instance, product suggestions on an e-commerce platform can come with information explaining that these are being displayed because of the latest search query performed. Sure, this takes away some of the magic, but it promotes trust and sets the right expectations.

## 2 Expectations of the system

It is absolutely essential to make users aware of what to expect from an intelligent system. If expectations are too high, frustration quickly sets in, and people start questioning the competence of the system as a whole.

AI can generate content or perform actions that are difficult to foresee. Designers of these kinds of system must therefore take into account all the possible scenarios more seriously than otherwise and put in place fallbacks to head off cases that would otherwise condemn the entire system as being unreliable. An intelligent chatbot, for example, should be better equipped with human traits and answer “I'm sorry, I don't know” rather than responding with a wrong answer.

## 3 Autonomy and control

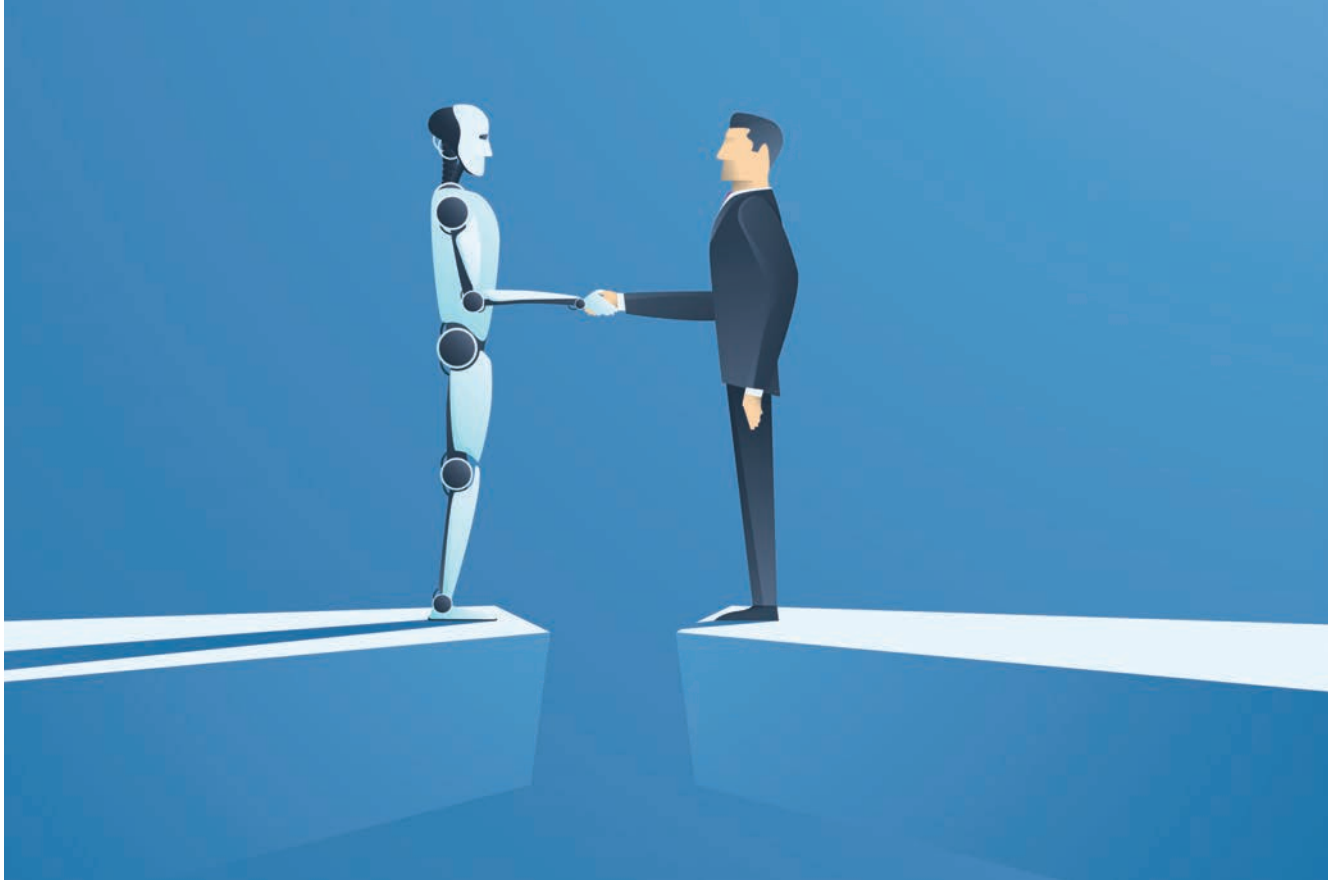
Artificial intelligence is not designed to be controlling, but rather to offer users assistance at just the right moment. This assistance can be accepted or ignored as they choose. It shouldn't do anything without the users' consent; instead, it should ask for permission to perform a task.



**Robert Fritze**  
Head of Design, ti&m

*“Smart enough to implement AI correctly? Let's find out at the AI Kickstart workshop how this technology can generate impact for you.”*

As long as users can decide for themselves when to use the advantages of AI and when to take over manually, artificial intelligence will help users in a new way and offer them a tailored user experience. Even when AI is proactive, users should always make the final decision.



*“AI isn’t designed to control the user; it’s supposed to offer assistance.”*

#### **AI must generate added value**

Design for artificial intelligence presents us user experience designers with totally new challenges that go far beyond the design of graphic user interfaces. Precisely because the system learns and is designed to adapt to the user as closely as possible, many processes are untransparent and difficult to grasp. Values such as empathy – from classic user-centered design – are still essential; however, new approaches, for example in the usability testing of AI interfaces, are indispensable.

And yet: Despite all the precautions, many AI users remain skeptical. It’s very likely that users decide against AI because they do not understand what happens to their data or what it is used for. This is why transparency is so vitally important – just as important, in fact, as showing users that they are not at the mercy of the system, but that they have control at all times.

Above all, AI should be implemented where it really does generate added value: in the error-free implementation of tedious and repetitive work. This reduces the workload for us humans, allowing us to turn our minds to creative things that are fun and which can’t be performed by a machine.

AI has a great deal of potential, particularly in B2B. One of many examples is a 360° view for relationship managers of their customers, combined with Next Best Actions (NBA). At ti&m we have developed the necessary expertise to provide responses to

the challenges posed by AI. A key element in this is our three-day AI Kickstart workshop, where a multidisciplinary team formulates answers to the burning questions surrounding AI and works on a key use case. Employing design sprints, we develop initial prototypes, which we then turn into an MVP in the ti&m garage within just four weeks. We are the contact point for AI projects in Switzerland because we create a user experience that is technically feasible thanks to our holistic approach. ●

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### **Stephanie van Ophuisen**

**Senior Interaction Designer, ti&m**



Stephanie van Ophuisen has worked at ti&m for around five years. She completed her Diploma in Communication Design at the Frankfurt Academy of Visual Arts.

Brainwork has got to hold water – this is Stephanie’s guiding principle in her career and how she achieves the best possible solutions for clients and for ti&m itself.

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### **Lisa Müller**

**Senior Interaction Designer, ti&m**



Lisa Müller completed her Bachelor’s degree in Interaction Design at Zurich University of the Arts in 2013. Since then she has worked as a UX/UI and Digital Product Designer for leading Swiss businesses; she joined the ti&m design team one year ago.

# Bringing autonomous systems to engineers: Taking a leap from the digital world of games to the real world

Harry Shum, Microsoft

**Research // Research in AI has made enormous progress in recent years. But training often still requires millions of trials to develop AI-powered systems and to meet the responsibilities this entails in critical situations.**

Imagine an autonomous vehicle navigating a smoke-filled mine looking for survivors, personal belongings or any other clues to find anyone who might be alive. It identifies objects it sees and decides which paths to take first. As it reaches the limit of where it can explore, a drone sitting on the vehicle flies off to explore the hard-to-reach corners of the mine. All of this is done without any communication with the outside world. Believe it or not, this isn't science fiction! Team Explorer from Carnegie Mellon University and Oregon State University did exactly this to win the first event of the Defense Advanced Research Projects Agency (DARPA) Subterranean Challenge.



<https://bit.ly/2RgMbPU>



Today we live in the age of data-driven artificial intelligence (AI), where machine intelligence systems solve difficult problems by considering hundreds of millions of trials or training episodes. Hard problems in perception and decision making that were considered too tough by the community even in the recent past are today being successfully solved using techniques such as reinforcement learning (RL).

I've often thought about how advances like these in machine perception and automated decision-making could help us do things like build intelligent robots, and in particular tackle the challenges of optimal control of dynamical systems. And since my early days as a graduate student at Carnegie Mellon, I've been fascinated by the tight loop between perception — using computer intelligence to sense surroundings — and action — using this feedback and data to make decisions. Today, our work teaching computers to play games has the ability to fundamentally change the way we will build control systems in the future. The potential applications could impact a wide range of industries with profound impact on safety and productivity.

## Helping engineers build action-perception loops for the real world

Today's engineered devices and systems use rules-based logic to bring together the scientific principles, technology and mathematics which have been painstakingly discovered over time by subject matter experts and engineers. But what if our engineers of the future could build control systems infused with machine intelligence that go beyond rules-based logic, and respond in real-time to changing environments to accomplish their goal? Technologies such as RL that are seeing tremendous success in solving video games will be key to building real-world sequential decision-making mechanisms and will power our next generation of autonomous systems.

*“Translating the success of RL in video games to real-world autonomous systems carries big challenges.”*





Translating the success of RL in video games to real-world autonomous systems carries big challenges — for example, no one loses a life making the wrong move in a video game! AI can't learn from its failures as easily in the real world, where the potential cost of mistakes can be huge. Additionally, newer AI techniques are data hungry. For example, it takes hundreds of millions of tries before a seemingly respectable policy can be trained for many of these gaming tasks. So, operating physical systems like machines or chemical processes for millions of cycles to generate data to train AI can be a very expensive proposition.

### **Machine teaching – a new paradigm to infuse domain knowledge to help improve learning**

Our researchers have been hard at work on developing machine teaching, which infuses expert domain knowledge and harnesses human expertise to break a big problem into easier, smaller tasks. It also can give AI models important clues about how to find a solution faster, dramatically accelerating model training time. There's still AI underneath the hood, but you as the expert provide examples, or lesson plans, to help the learning algorithms solve the task at hand. Since you are the one giving the lessons, describing the goals, desired behavior, and safety boundary conditions, the resulting AI models are also far more explainable and auditable once they are deployed. I know I wouldn't want a "black-box" AI model running the control loop for my systems!

Borrowing a quote from Alfred Aho and Jeffrey Ullman, "Computer Science is the science of abstraction, creating the right model for thinking about a problem and devising the appropriate mechanizable techniques to solve it." I think of machine teaching as the abstraction we are creating, the right model for thinking about applying domain expertise to AI systems. It can help you to bridge between the model-first mindset of engineers and the code-first mindset practiced by software developers.

### **High-fidelity simulations – A critical path to gather experiences at scale**

Similar to machine teaching, simulations offer a way to generate synthetic data that can train machine intelligence systems at scale and without taking unnecessary risks. Simulations are a safe and cost-efficient way to train AI models, if you can model the key elements like the devices, the sensors and the environment interacting with your system. That allows you to simulate all possible scenarios, including edge situations — such as when a certain sensor or actuator fails — to teach the AI how to adapt to those situations.

For example, we built an open source simulator for aerial and other robotic vehicles called Aerial Informatics and Robotics Simulation, or AirSim for short. AirSim allows the simulation of a wide variety of environments, lighting conditions, sensors and fusion of sensor data. AirSim's ability to create near-realistic autonomy pipelines is how Team Explorer secured its win.

### **The possibilities are endless, and the time is now**

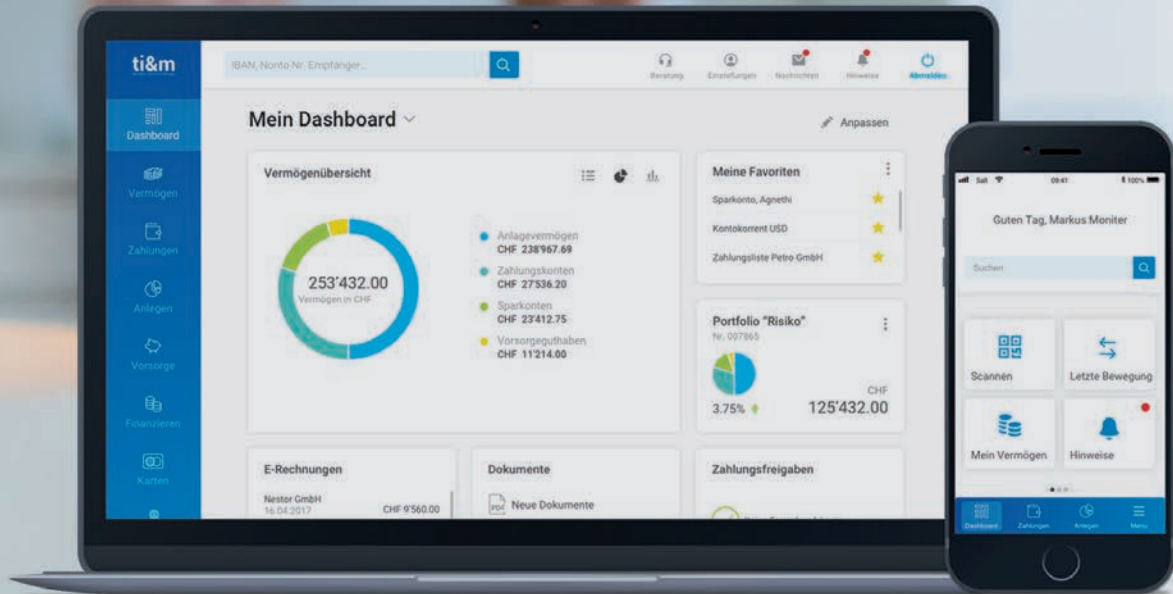
We're continuing to bring AI to engineers and designers that will harness their expertise and trustworthy autonomy as the foundation for accelerated innovation. From industrial applications to search and rescue operations like in the DARPA challenge, the applications of this technology will be endless. We hope you will join us on this journey to start inventing the future! ●

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## **Harry Shum**

**Executive Vice President, Microsoft AI & Research**

Dr. Harry Shum is a computer scientist. He has researched and worked for Microsoft since 1996. His current position is Executive Vice President of Artificial Intelligence and Research. In this role, he is responsible for Microsoft's overall AI strategy and research activities.



# Taking the most cutting-edge e-banking and making it even better with AI

We already have the most advanced e-banking solution in Switzerland with features such as open banking, voice banking and multi-banking. We're making it even better with AI-based services. Benefit from personalization, automated data analysis and lead generation as well as the automated analysis of account statements for deposits held with third-party banks. Have we sparked your interest? Then contact us to learn more about the undreamed-of possibilities. Call Samuel Scheidegger, Head of Products, on: +41 44 497 75 00



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