

How mature is AI adoption in financial services?

A PwC Study across the DACH region



Introduction – Beyond the hyperbole

Few topics generate such hyperbole and hysteria as that of Artificial Intelligence (AI). Whether linked to robots taking over jobs, the convergence of smart cities, or the single solution to society's biggest challenges, few trends have captured the imagination quite like AI.

Such exaggeration is largely down to a lack of understanding about AI's role in modern society and business, versus its potential for longer-term, revolutionary change. Indeed, Google CEO Sundar Pichai famously declared AI to be *"probably the most important thing humanity has ever worked on"*¹, while Stephen Hawking went on public record to announce that *"the development of full AI could spell the end of the human race."*²

While such sensationalist claims are shaping more radical opinions of the technology, beyond the hype, organizations are increasingly investigating how AI can improve their business, increase efficiencies and enhance customer service levels. One of the most obvious and referenced industries for AI adoption is Financial Services (FS). Indeed, businesses in this area have long recognized how technology can improve operations, reduce costs

and enhance customer satisfaction. Many are already reviewing ways to apply AI and advanced analytics to reshape processes and organizational structures from internal operations to customer experience, in an attempt to boost efficiency levels.

But to what extent is FS already deploying AI technologies and is it really leading the way when it comes to AI adoption? To investigate, we have interviewed financial service professionals from across the DACH region, speaking to banks, insurers and FinTech professionals, to provide a market overview of the maturity level of this technology. We have asked businesses to classify their advancement in relation to the market, to build a realistic picture of AI adoption in the FS industry and understand how Europe compares to the rest of the world.

We are very grateful for the excellent collaboration with Hochschule Karlsruhe, which allowed us to scale the study to 151 participants. I would personally like to thank Marcel Germann for his outstanding work and Professor Franz Nees, Dean of the faculty for Business IT, for several highly insightful discussions.

The following first edition of the PwC AI in Financial Services study provides an illuminating picture of the current and potential future impact of AI in financial services.

We hope you will gain some new insights along the way and would be delighted to discuss our findings in further detail should you wish to contact us (details at the end of the study).

Frankfurt, May 2020



Michael Berns
Director, AI & FinTech

¹ <https://www.cnn.com/2018/02/01/google-ceo-sundar-pichai-ai-is-more-important-than-fire-electricity.html>.

² <https://www.bbc.co.uk/news/technology-30290540>.

Table of contents

| | |
|---|-----------|
| Introduction – Beyond the hyperbole | 3 |
| Table of figures..... | 4 |
| The time is now | 6 |
| AI: Important, but not quite there | 7 |
| Talking the talk..... | 8 |
| Blockers | 10 |
| Lack of data | 10 |
| Budget constraints..... | 11 |
| Skills shortage..... | 11 |
| Solutions | 12 |
| Government support..... | 12 |
| Internal support..... | 13 |
| Maturity score | 14 |
| An enterprise-wide project | 15 |
| The future..... | 16 |
| Contacts..... | 17 |

Table of figures

| | | |
|--------|---|----|
| Fig. 1 | Territories..... | 6 |
| Fig. 2 | AI initiatives..... | 8 |
| Fig. 3 | AI Projects: Average distribution of current development stages | 9 |
| Fig. 4 | Readiness | 9 |
| Fig. 5 | Agreement Ratio..... | 10 |
| Fig. 6 | AI Maturity Score..... | 14 |



The time is now

The overwhelming volume of data collected suggests that the financial services industry across the DACH region has considerable catching up to do if it is to compete with the rest of the world.

“If we do not ramp up AI in the coming 12 months, we will not exist any longer in the form we do right now.”

Banking, CDO

“In 10 years, AI in interaction with the Internet of Things (IoT) and other topics, all will be factors that achieve economies of scale. Today, we are still in a world where insurers have hardly any scale advantages.”

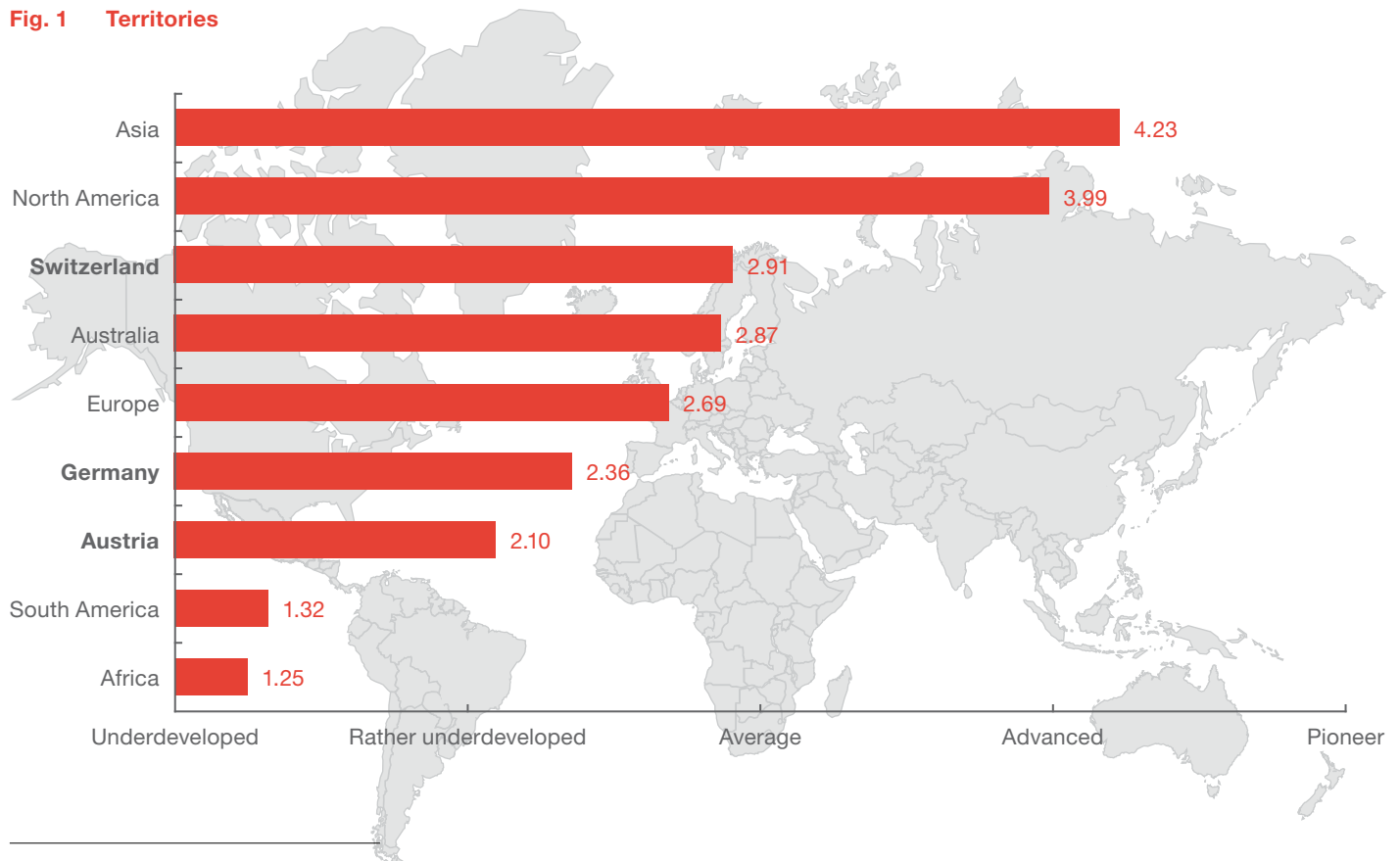
Insurance, AI Lead

In June 2019, a Chartered Financial Analyst (CFA) report³ issued a rallying cry across Asia-Pacific; look out, the robots are coming for your jobs. A report showed that half of Asia-Pacific’s finance professionals feared for their jobs as the region’s adoption of AI technologies reached as-yet unprecedented levels.

Such a view is not reserved strictly for the Asia-Pacific region, since the majority of our survey respondents cited both Asia and North America as the territories leading the way in AI for FS. In comparison, Switzerland is the DACH country most advanced in its

adoption of AI, although the nation’s deployment of AI is considered rather “underdeveloped” compared to North America’s, which is viewed as “advanced”. Holding up the bottom are South America and Africa with “underdeveloped” AI adoption.

Fig. 1 Territories



³ <https://www.scmp.com/business/banking-finance/article/3015094/artificial-intelligence-and-fintech-come-knocking-half>.

Such observations and opinions aren't too far from the truth. In China in particular, insurers own petabytes of data which, combined with government support, is fueling the deployment of AI through distribution, claims and loss adjustment. For example, Ping An Insurance⁴ has a dedicated AI team that handles text-based enquiries through WeChat instead of customer service agents. An AI-bot collates policy holder questions into a central database which is continually iterated upon in real-time for Ping An's 80m policy-holders.

Where does this leave DACH? Technology preferences are more diverse in the region, without a single common platform such as WeChat on which to deploy new technologies. Instead, DACH's AI activities are focused more upon smaller-scale business and customer experience improvements. Just over half of survey respondents (56%) are investigating AI for personalization and chatbot experiences with the overwhelming majority (80%) hoping to utilize AI for smaller efficiency improvements, for example smaller-scale automation and predictive marketing.

AI: Important, but not quite there

In total, 45% of decision-makers consider Artificial Intelligence as important. This indicates that more than one out of every two respondents considers the topic to be of limited priority. However, it is important to consider bias between the perception of importance from those questioned, and the actual practical implementation of AI technologies and processes. As one respondent stated:

“Everyone would like to do something with AI – rescue the world and stop famine – but they do not really know how to start.”

Rather than being an essential project to undertake today, the majority of respondents (62%) stated that AI will

become very important in the next five years, in contrast with less than 20% who believed AI was very important for the financial services industry today. However, to scale up AI resources for the next five years and enable DACH to compete with the likes of Asia and North America by 2025, adoption programs must begin now, with plenty of time for trial, improvement, and refinement.



⁴ https://www.the-digital-insurer.com/china-in-depth-october/#gf_69.

Talking the talk

The financial services sector has a long and distinguished history of using data and algorithms to support decision-making, putting it in a unique position to lead the adoption of AI. The possibilities for FS are limitless; from anomaly detection for identifying fraudulent transactions to complex automation for improved risk assessment and machine learning for enhanced customer service levels; AI will become increasingly important as the industry evolves.

For the time being though, AI adoption across the DACH region is aimed towards smaller gains; efficiency improvements (80%), cost savings (73%), personalization (56%) and compliance (50%).

When questioned further, resultant data demonstrates that a number of AI initiatives has been rolled out with the aim to enable and realize data-driven decision making with a principal focus on the customer journey. For example, several businesses are deploying machine learning technology to streamline the customer journey and deliver more targeted promotional activity, thereby cross and upselling products and services and enhancing customer loyalty, preventing churn.

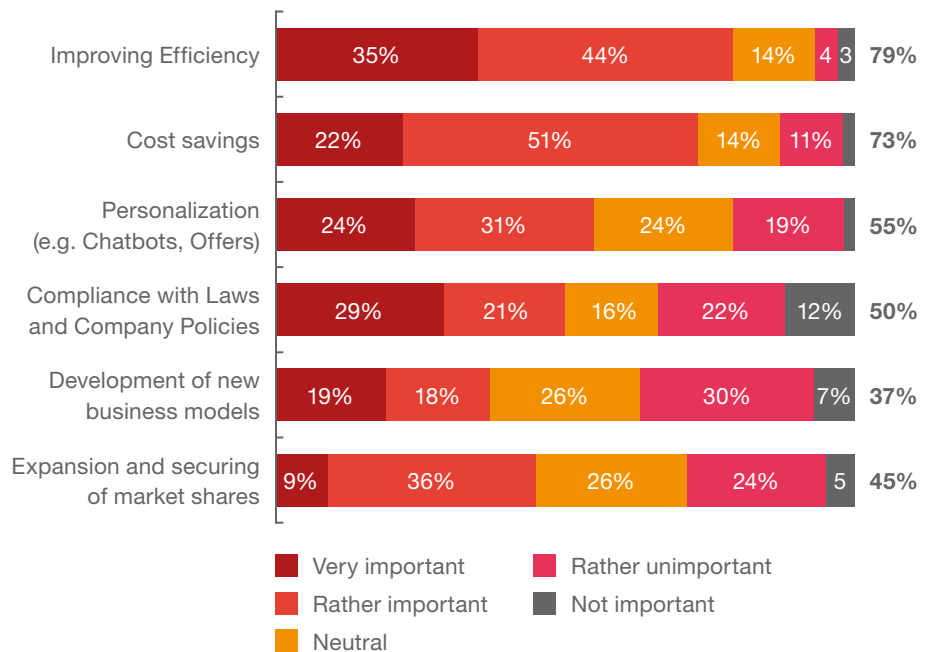
“We are talking the right talk, but we are not walking the right walk.”

Banking, CDO

“Many customers are not interested in ROI, but simply having an AI project running.”

FinTech, CEO

Fig. 2 AI initiatives



However, before the customer journey can be enhanced, the majority of businesses are focusing AI efforts on back-office activities, since demand for an improved customer experience also exists from a regulatory point-of-view. Financial institutions are required by law not only to collect and store information on customers but also to verify data held. Ensuring this information is

correct, lawful and up-to-date, is the first step towards winning customer trust and widespread automation is an effective means to achieve this. Benefits here are twofold: intelligent AI systems built on reliable datasets can detect anomalies in transactions for banks and for insurers, can accelerate the processing of claims with an entirely online experience.

However, while businesses are actively adopting AI technologies, to what extent these programs have progressed varies. To quantify the maturity of AI, we questioned survey participants on the project stages of individual initiatives, to find that only a minority (23%) of existing projects are currently in “live” stage. The overwhelming evidence points instead to an industry that is still early on in its AI journey, with 21% of existing projects operating at a pilot

level and a further 44% at the research and development, or exploratory, stage. As one respondent in the insurance sector commented:

“Control is essential. Otherwise, we will have more pilots than Lufthansa.”

Insurance, Group AI Lead

Fig. 3 AI Projects: Average distribution of current development stages

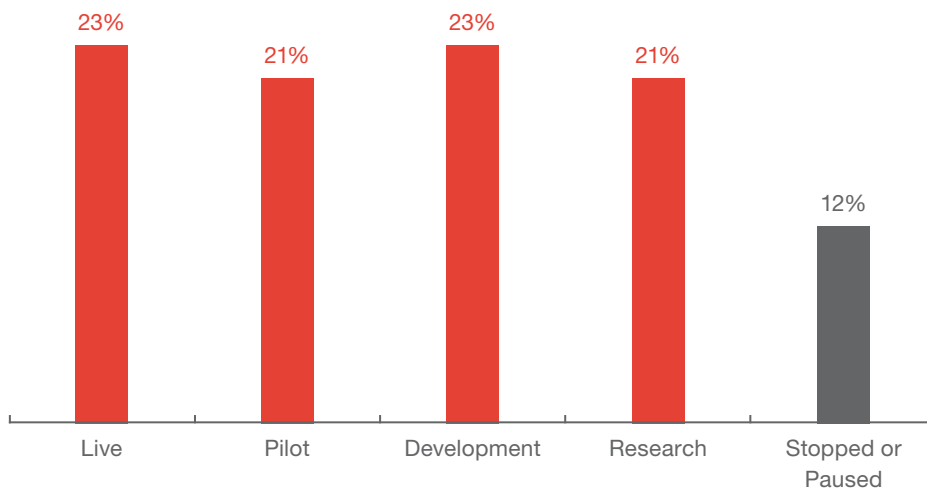
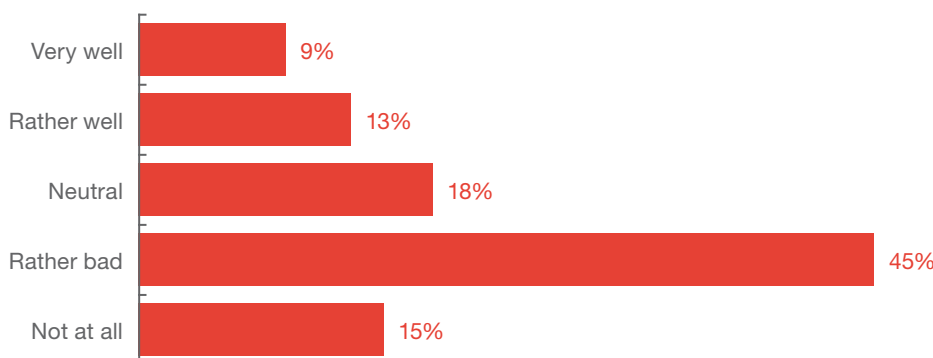


Fig. 4 Readiness



There is an overwhelming feeling from respondents that to effectively harness AI in FS, companies must possess a fundamental technical and organizational infrastructure.

When asked about industry progress, the feedback was not as current hype would suggest. 45% of respondents stated that AI progress is “rather bad,” with just 13% feeling they were “rather well” prepared.

Blockers

“People are not ready for it. It is not the case that the processes are not ready: it is the mindset of the people.”

Banking, CDO

“The main blocker is the mindset of the people. People are not aware of what is feasible and what treasures are in the data.”

Insurance, CIO

It's as the old saying goes: If you change the way you look at things, the things you look at will change. But how do you change a mindset that says “we are not ready for AI”?

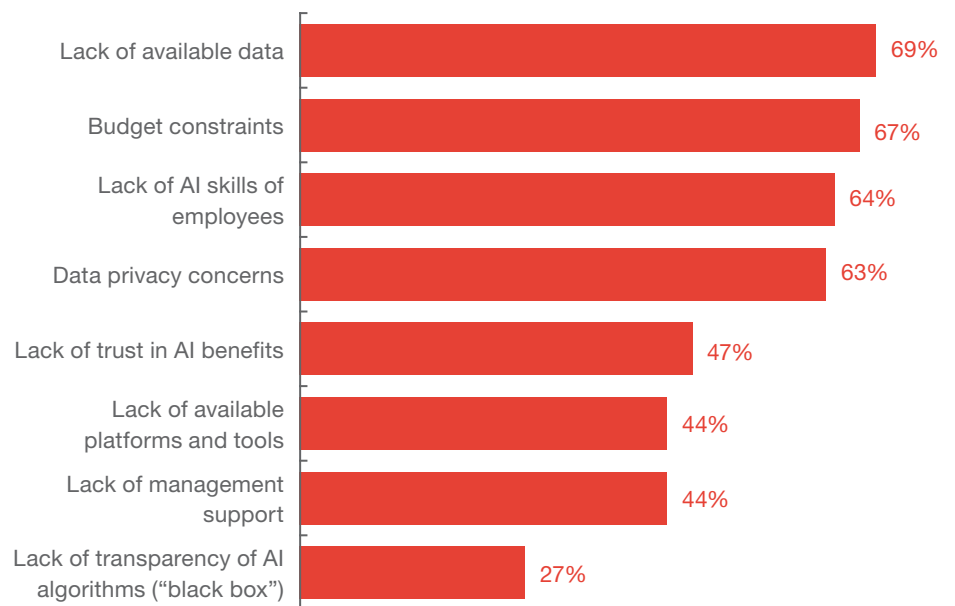
When questioned about blockers to AI adoption in the FS industry, respondents mentioned mindset only after they had focused on more practical struggles; the lack of available data (69%), budget constraints (67%) and the lack of AI-skilled employees (64%).

Lack of data

UK mathematician Clive Humby⁵ famously once stated that “data is the new oil.” If the same is true for the financial sector in DACH, data lakes have yet to be fully explored.

As with any technology solution, the success of an AI project can be dependent on the data used, considering not only the quality of the data itself but the effectiveness of the analysis stage. However, according to our survey respondents, the financial services industry still has a distance to travel before it is effectively making the best use of its data. Only 51%

Fig. 5 Agreement Ratio



of businesses are centrally storing, analyzing and processing data with differences between banks (30%) and insurers (39%). Interestingly, the majority of businesses adopting a centralized approach to data collection and analysis are Swiss-based.

While businesses are aware of the critical role that data analysis plays in an effective AI strategy, the industry

is still attempting to shift from a culture of data hoarding to one of data sharing. The FS industry has collected data for years but this has largely sat alone, untouched, only collated for regulatory purposes. Our survey respondents largely agreed that while data lakes do exist and are accessible, the information they contain is largely unstructured and increasing legislation is hindering in-depth analysis.

⁵ <https://towardsdatascience.com/data-is-not-the-new-oil-bdb31f61bc2d?gi=e58e2ac2eeb9>.

Budget constraints

Technology and change require financial investment and this is often as integral as that of time or resources. Yet within the financial services industry in the DACH region AI investment is staggeringly low. Participants complained about insufficient funding for AI projects with the majority of budgets still being invested in legacy systems as part of early stage digital transformation initiatives.

One of the challenges associated with AI investment is understanding from which department the sum will come from, or in other words, should AI be considered an IT project, a change management project, or an innovation initiative?

The definitive answer is all three, but only a small fraction of overall budgets are dedicated to AI. Of the IT project budget, an average of 7% is assigned to AI, whilst 21% of change and innovation budgets are AI-focused. However, the majority of funds from both pots are largely being spent on upgrading legacy systems as part of digital transformation initiatives, rather than new technologies and processes. The majority feeling from our survey was that IT is seen as the originator of AI project spend, covering establishment of the infrastructure required to run AI, before the change and innovation budget takes over the cost of ongoing projects.

Skills shortage

The third blocker to AI projects in FS is perhaps the most difficult to overcome. According to Bloomberg, the number of job listings for FS stating AI skills as essential to the role increased by 60% globally in the past year⁶ as business increasingly began talking about a war for AI talent. The realization of a successful AI project requires domain competence, previous project experience, analytical capabilities and programming knowledge; skills that are in short supply.

As an interim measure to plug the skills gap, financial services companies are outsourcing a high proportion of projects. Just 29% of banking AI projects are developed in-house, while insurers develop 43% in-house. This correlates with the average experience of AI experts in each sector. For example, AI experts within banking have an average of 5 years' experience, 6.5 years' experience in insurance and unsurprisingly for a sector built upon technology, the average experience of AI experts in FinTech is 7.75 years.

The road to improvement

Despite the blockers highlighted, many interviewees indicated that they have recently started, or plan to embark on, significant improvements in Artificial Intelligence as part of their AI strategy. However, for this to be successful, a deep understanding of AI processes and technologies is required in order to avoid unethical use.

For example, financial institutions are obligated to reveal to regulators and internal auditors, the rationale of processes and decisions. Application of machine-learning algorithms can cause unintentional, but unethical decisions to be made. A credit application may be automatically rejected on the fact that customers with the same surname have a high probability of insolvency. Such scenarios elucidate the need for decision traceability and transparency for customers.

⁶ <https://www.cnbc.com/2019/09/25/finance-jobs-requiring-ai-skills-are-growing-and-here-are-examples.html>.

Solutions

“In Germany, there is too much fear of setting up local funding programs for AI implementation besides pure basic research.”

Banking, Data Analytics
Lead

“AI needs to be as easy to install as a telephone or Outlook. Processes need to be robust.”

Insurance, AI Lead

Two overwhelming facts have so far been ascertained by our research. Firstly, there is a definite understanding that AI is important to the future of financial services – indeed, 45% of decision-makers stated that. However, secondly, the sector only has a small number of live AI projects operational today and the majority of these are in the early stages, intended only to create small marginal gains in wider automation and digitalization strategies. So, what can be done to accelerate the adoption of AI across FS?

Government support

One solution is improved support from central government, an area where the importance of AI is widely understood. Canada, China, Denmark, Finland, France, India, Italy, Japan, Mexico, the Nordic-Baltic region, Singapore, South Korea, Sweden, Taiwan, the UAE and the UK have all unveiled their own individual Government-led strategies to promote the use and development of AI since 2017. However, at the tail-end of this is the EU and Germany, whose AI strategies were only unveiled in the second half of 2018, after every other location in the list above. For FS leaders in the DACH region, the support of the German federal government is retrogressive and hesitant compared to that of other nations.

Shockingly, only an average of 2% of respondents in the DACH region feel their AI development is being supported by the government,

with a similar average for Germany alone. When asked to identify areas where support is forthcoming from government, just over 3% point to subsidies such as research or investment funds with only 2% feeling that clear legal guidelines are in place for AI.

As one banking professional put it:

“They [the German government] are just juggling money from here to there; they already promised subsidies but nothing happened. Do we have a national platform like Singapore? No. A national education policy like Israel? No. Regulation like the United States? No.”

AI policy in Singapore

AI Singapore was established in May 2017 to harness AI throughout the country. As part of the initiative, the national government promised to invest up to \$150m in AI throughout a five-year-period. AI objectives are to address societal and industrial challenges and invest in deep capabilities to drive scientific innovation.

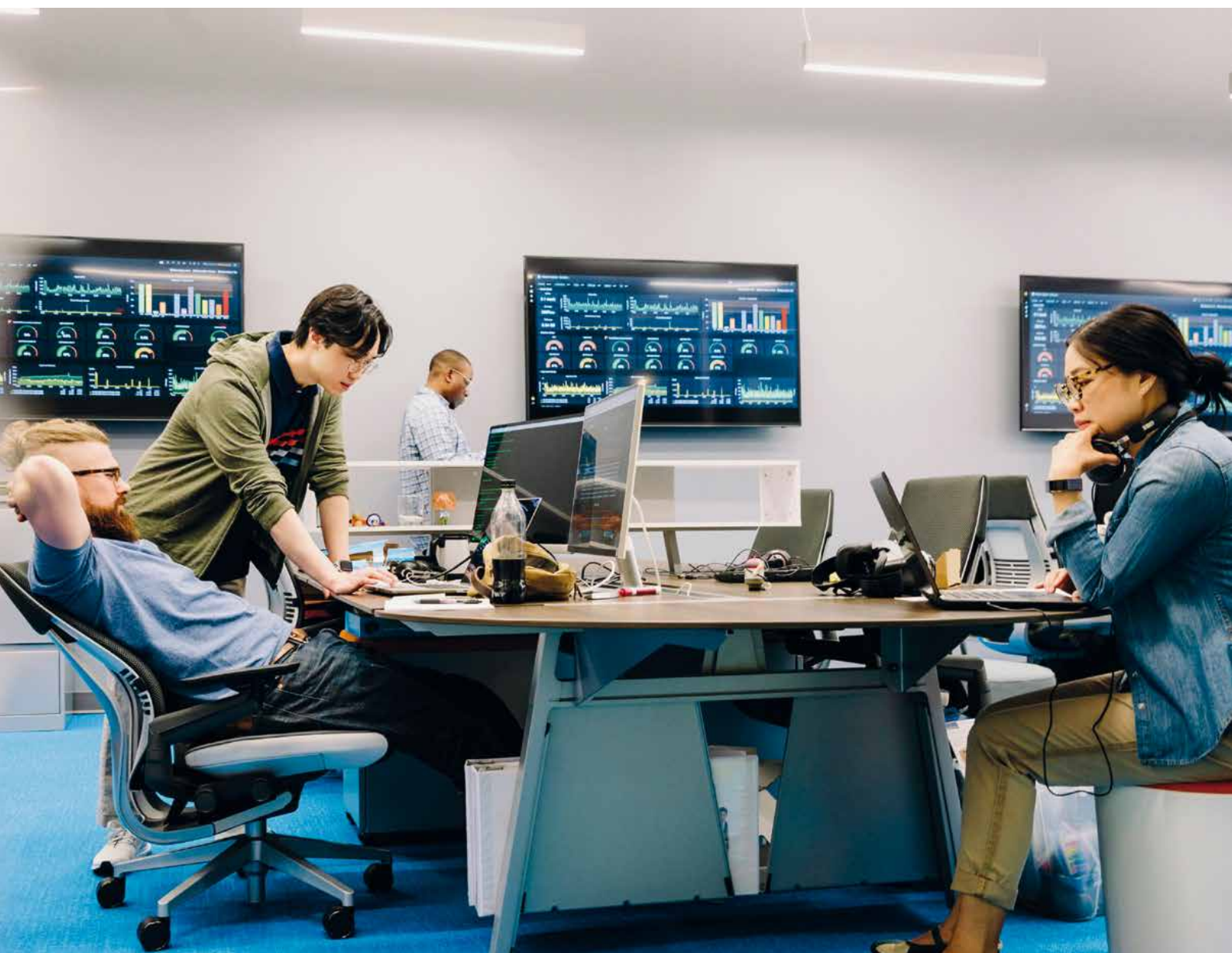
Internal support

The second remedy to AI blockers is focused more around internal influencers than external: the business model. We've already questioned who should lead AI projects from an economic perspective; IT or innovation teams? AI's place in the organizational structure of a company remains undetermined. Indeed, nearly everyone questioned in our survey indicated that organizational changes have been made to rollout AI projects more efficiently. For most, the prerequisite of change is senior management support. An average of 70% of FS professionals perceive management to have a positive view towards the use of AI with banks regarding senior AI support 25% more favorably than insurers.

Our research has found that two different approaches apply to AI business structure. Firms with poor adoption or early in the development stage view AI as an IT-led project whereas more mature businesses instead adopt a hub and spoke model whereby a hierarchy of control is created to share AI knowledge and experiences around the team. Such a model should help create a clear governance structure. However, the reality today is that there is still work to do in this respect, reflecting the early stage of the sector's AI journey.

When it comes to AI governance, 37% of respondents feel they already have clear ownership and allocation of roles,

27% regularly audit data but only 21% feel they have transparent AI policies for customers. The role of AI in FS shares a similar challenge to that of the widespread adoption of autonomous vehicles – if consumers don't trust them, they'll never reach mass market. In an area operating with sensitive data and subsequent regulatory restrictions, it is essential that the FS industry offers transparency over AI processes to consumers to ensure projects are not only successful, but more importantly, both legal and ethical.



Maturity score

If Stephen Hawking’s prediction that AI could spell the end of the human race proves to be correct, the financial industry need not fear for its life just yet.

“Seeing is believing. It is about making AI touchable for the entire company.”

Banking, Director of IT

“It took us way too long to recognize that we own a treasure chest of data. There was way too much thinking in silos instead of thinking of what happens if we combine data, can we derive new information out of it?”

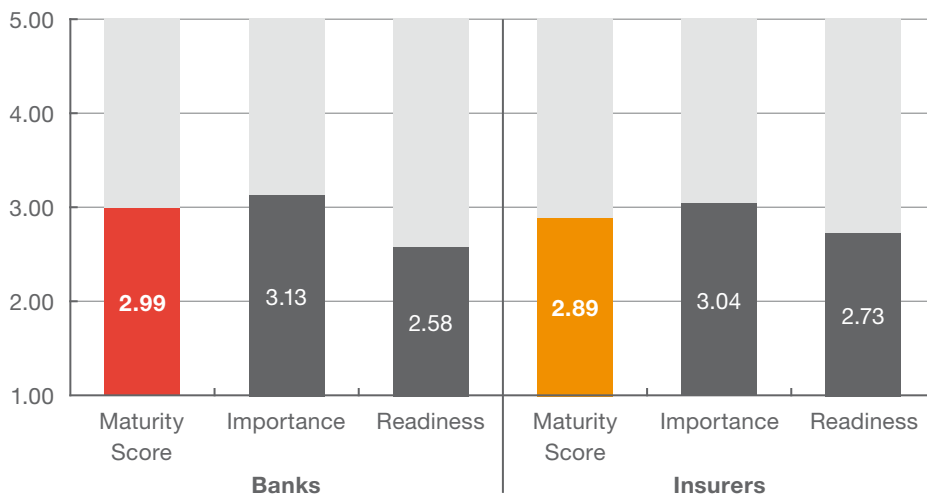
Banking, Senior Compliance Officer

When it comes to establishing a maturity score to determine the progress of AI in financial services across the DACH region, we have

evaluated the average values of the individual participants per sector to calculate the following model:

German banks achieve an average maturity score of 2.83 and German insurers 2.77 from five. Higher averages are generated primarily from Swiss companies, which demonstrably lead the DACH region when it comes to AI adoption in FS.

Fig. 6 AI Maturity Score



Results point to AI adoption in the financial services industry being in the early stages – businesses consider AI a normal part of everyday operations but widespread adoption is not yet the case. Instead, businesses are being realistic about their use of AI and piloting small scale solutions based around smaller efficiency improvements. While the hype of AI and the ambitious vision that it can play a major role in society is not denied by the FS industry, indications from the study are that AI is currently an evolutionary, not a revolutionary technology.



An enterprise-wide project

From an organizational perspective, the definitive opinion is that AI should be viewed as an enterprise-wide technology project, with IT often establishing the building blocks for AI adoption and handing the reins over to the wider business for advanced implementation. Thereafter, internal collaboration, led by the support of senior management, is essential to effectively utilizing data to drive efficiencies through AI. A centralized data pool promotes collaboration but can often be too wide-reaching for actionable insights, particularly when attempting to achieve a holistic view of customers, for whom AI transparency and ethics are of the utmost importance.

A significant unbalance exists in the financial service industry's willingness to adopt AI and the actual successful implementation of AI-related technologies; indeed, many

businesses surveyed had only reached the pilot stage with even more stuck at R&D. To advance AI adoption and ensure businesses do not bite off more than they can chew with AI, a process-orientated strategy is essential, in addition to increased support from external sources.

The biggest as-yet unsolved AI-related challenge facing the industry in the DACH region is not one of technology – the tools are there, nor one of resistance – businesses understand the importance of AI – but one of a rigid, inflexible mindset. Ironically, businesses are underestimating the role of the human employee in successful AI projects. Trusting in the technology, rather than feeling oppressed or displaced by it, is the only way that mental barriers can be broken down and the true potential of AI be realized.

The future

We are five years away from the AI revolution that many have predicted – that’s the unequivocal conclusion of our research into AI adoption in financial services throughout the DACH region. While regions such as Asia and North America are leading the world, DACH is only really getting started, propped up by a burgeoning Switzerland.

However, the financial services industry remains poised to take maximum advantage of AI as today’s early-stage projects mature into facilitators of improved back office functions, enhanced customer journeys and personalized services. The future offers an exciting collaboration between human professionals and Artificial Intelligence. Bank advisors will work closely with chatbots and other electronic interfaces to enhance customer service and therefore improve retention levels. Today’s repetitive, labor-intensive tasks will be automated and AI will eventually become a commoditized resource for financial services. The process of loan enquiries can be conducted

entirely by AI without any human involvement, applying artificial neural networks that automatically evaluate the creditworthiness of the borrower. Deep learning will break down vast data pools to provide actionable insights to prevent fraud, improve customer service, enhance predictive capabilities and accelerate knowledge management.

However, responsibility and ethics come first, if the sector is to ever reach this bold future. Businesses need not only the skills but the financial and legislative support from external sources to responsibly advance AI projects. Customers must be brought into the AI journey and understand how algorithms are making decisions, with the ability to introduce human-to-human interaction where necessary.

The future of AI in financial services is one where professionals are empowered by AI, rather than in fear of it. The future starts now and in the DACH region at least, the journey is only just beginning.

Disclaimer – interview respondents came from the following sub-sectors: 97 banking professionals, 41 insurance experts, 13 FinTech leaders.

Contacts

Study



Michael Berns

Director – Leader AI & FinTech,
PwC Germany
Tel. +49 69 9585-5407
michael.berns@pwc.com

Germany



Sven Hauke

Partner – Banking & Capital Markets
Leader Germany, PwC
Tel. +49 89 5790-5582
sven.hauke@pwc.com



Julia Unkel

Partner – Leader Insurance,
PwC Germany
Tel. +49 69 9585-2667
julia.unkel@pwc.com

Switzerland



Christian Westermann

Partner – Leader Digital and AI,
PwC Switzerland
Tel. +41 79 779-8561
christian.westermann@ch.pwc.com



Stephen Strebel

Director – Analytics Transformation FS,
PwC Switzerland
Tel. +41 79 821-1292
stephen.strebel@ch.pwc.com

About us

Our clients face diverse challenges, strive to put new ideas into practice and seek expert advice. They turn to us for comprehensive support and practical solutions that deliver maximum value. Whether for a global player, a family business or a public institution, we leverage all of our assets: experience, industry knowledge, high standards of quality, commitment to innovation and the resources of our expert network in 157 countries. Building a trusting and cooperative relationship with our clients is particularly important to us – the better we know and understand our clients' needs, the more effectively we can support them.

PwC. Nearly 12,000 dedicated people at 21 locations. €2.3 billion in turnover. The leading auditing and consulting firm in Germany.

