



eraneos

#4U

Artificial intelligence

Contributors to this #4U issue

Artificial intelligence may have once seemed like something out of a science fiction movie but it is very much the reality today. When you engage with a web shop and the most relevant item is offered to you, you are likely benefitting from AI technology. But modern uses of AI go much further than providing recommendations to customers – they offer genuine competitive advantages.



From left to right: **Christian Mauz**, Partner; **Stefan Preuss**, Senior Manager; **Amir Mikail**, Senior Consultant; **Alberto-Giovanni Busetto**, Group SVP Head of Data & AI, Adecco Group; **Marcus Schwemmler**, Head of Artificial Intelligence and Machine Learning, Mobiliar; **Catherine Pugin**, Digitalbeauftragte Kanton Waadt; other authors: **Sandro Saitta**, Senior Manager; **Sophia Ding**, Managing Consultant; **Belinda Müller**, Consultant

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AI is dramatically changing the world as we know it



In recent years, fascinating progress has been made through the use of artificial intelligence. This was primarily driven by constantly growing computing power, which provides the foundation for complex algorithms. We've become used to natural speech recognition, automatic translations, and driver assistance systems. But AI can do much more and is making inroads into areas that were long thought impossible.

Christian Mauz

Algorithms have become ever more naturally integrated into our daily lives over the past few years and nowadays support us in the most diverse of areas. I can talk to the navigation system in my car in natural language, and driver assistance systems can handle routine actions such as lane departure warnings, speed control, or light control. Although these AI applications seem very simple, they're very challenging to implement and require a great deal of computing power.

We're currently at the tipping point, and will soon see great technological advances in line with Moore's law. Algorithms and AI are advancing more and more into areas such as creativity, decisions affecting humans, and functions vital to life. AI decides whether we're creditworthy or should be invited to a job interview. Algorithms create pictures based on text descriptions, compose music, or independently write texts based on keywords. But often such AI applications are still only "lab-based innovation theater," and much remains to be done until we have functioning AI-based business cases.

As for every paradigm-changing force, clear framework conditions are needed for the responsible use of AI. The European Union is currently working on basic guidelines designed to achieve this objective. The focus falls on issues such as ethics and trustworthiness. This immediately gives rise to follow-up questions – for example, "How do I audit an algorithm?" or "How do I implement these guidelines in an organization?" I would like to see regulation create a solid foundation for the responsible use of AI and – similar to the GDPR – introduce global standards.

In the following pages we take a look at the current state of the art and the recognizable trends. I trust you will have an inspiring read.

"The age of AI is beginning now."

Christian Mauz,
Partner

Artificial intelligence – overcoming the central challenges in order to promote acceptance



The latest study “Generate Real Added Value with Data Analytics & AI”¹ by the Eraneos Group confirmed that 9 out of 10 companies consider data analyses to be strategically important. But only 39% carry out data analyses and monitor their success. Many factors can potentially slow down the transformation into a data-driven company. This article explains what artificial intelligence (AI) is, identifies the challenges associated with the use of AI in companies, and highlights some ways to accelerate the transformation into a data-driven company.

Sandro Saitta

Several studies have shown that the actual use of AI in companies relative to the awareness of the strategic importance of AI remains low. IBM² has calculated that only 35% of the companies surveyed use AI. According to Forbes,³ the average service years of a Chief Data Officer (CDO) with a company is around 2.4 years. Gartner⁴ estimates that half of all CDOs will fail. Why is this? And can we do something to counter it? Let’s start with a short introduction to artificial intelligence (AI) before identifying the challenges associated with the use of AI in companies and highlighting some ways to accelerate data-driven transformation.

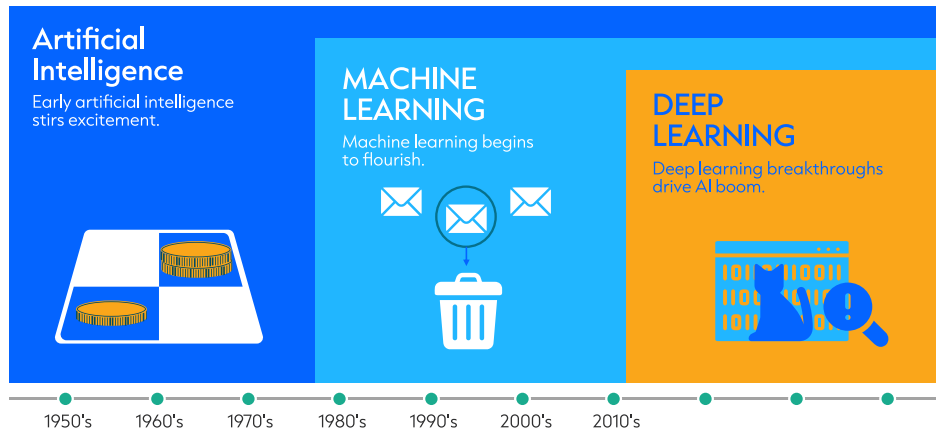
The term “artificial intelligence” was used for the first time in the 1950s in the context of investigating the question of how machines could be made to act with the same degree of intelligence that is expected from humans. Nowadays we mainly use statistics and algorithms from machine learning to create value from data (see figure 1). For a company, the objective is to efficiently use data by way of AI to create real added value for its customers.

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Poised for Success



Since an early flush of optimism in the 1950s, smaller subsets of artificial intelligence - first machine learning, then deep learning, a subset of machine learning - have created ever larger disruptions.

The most common sub-category of machine learning is supervised learning (see figure 2). With this family of algorithms, the computer is fed examples of input data (e.g., information about your customers) and output data or labels (e.g., whether the customer has bought a specific product). The algorithm uses this to create a model that links the input data and the output data. To test how good this model is, the data is then split into a training data set that is used to create the model and a test data set that is used to validate the model. As soon as the model has been built, forecasts can be made for cases where the input data is available but the output data is not yet known (i.e., new customers whose information is available but there is no data yet on whether they will buy a specific product). The objective of such models is to create added value for the company.

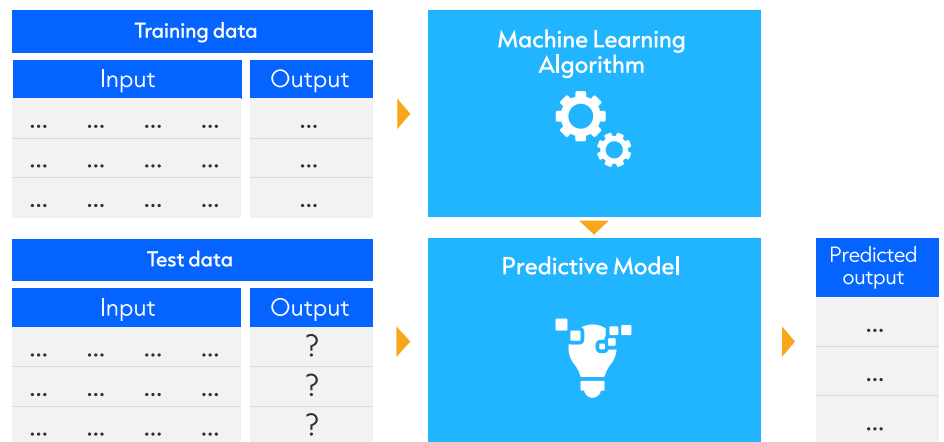


Figure 1: Artificial Intelligence, Machine Learning and Deep Learning (source: nvidia)

Figure 2: Supervised learning as an example of how machine learning works

Data-driven applications can be divided into three categories: optimization of the organization, development of new business models, and improvement of the user experience. A good balance of use cases from these three categories is key to developing a successful AI roadmap. For example, one option is to work simultaneously on the optimization of manufacturing processes, product recommendations, and the automation of customer support. Methods of artificial intelligence and in particular machine learning can be used in many departments in a company. These include marketing, supply chain management, finances, customer service, and R&D. The following projects which Eraneos recently carried out for its customers serve as examples of possible use cases.

Recent data and AI applications developed by the Eraneos Group

Upselling and churn management (Telco)

Using predictive analyses of customer data, Eraneos identified important customer groups and issued targeted product recommendations. We also worked on churn reduction by identifying those customers who are highly likely to stop using a specific product in the future.

Fraud detection (Swiss bank)

On the basis of the latest findings from research and practice, Eraneos developed and implemented a pragmatic tool for its customer that combines temporal-relationship pattern recognition in transaction graphs with visual data mining.

Optimization of production lines (Migros)

Optimization of production lines (Migros)

After a series of workshops to identify potential use cases, Eraneos implemented a machine learning project to increase production line productivity by minimizing malfunctions.

Classification of customer service tickets (local.ch)

An AI system developed by Eraneos analyses customer service tickets with the help of natural language processing (NLP). The objective was to identify the relevant topic for each ticket. The use of NLP and robotic process automation (RPA) also made it possible to identify further options for optimization.

COVID-19 disease prognosis (Baden hospital)

When COVID patients have to be moved to intensive care, a prognosis for their disease course is valuable with regard to treatment and hospital planning. Eraneos trained a machine learning algorithm to use patient data, symptom awareness, and laboratory values to predict the severity of a COVID-19 infection.



The number of AI applications in companies is constantly rising, mainly because the use of AI is made increasingly simple by the general availability of frameworks, in particular from hyperscalers (providers of cloud-based IT resources with flexible scalability). However, there remains a huge gap between specific individual projects and a central (data) strategy with a clear mandate from top management. This is because companies that wish to use AI are faced with many challenges (see box 2).

Challenges regarding the use of AI by companies

Access to the right data

Although gigantic volumes of data are often available, they have to be analyzed to make sure that this is the right data for the current task. If not, additional data has to be identified, collected, or even bought.

Definition of AI governance

AI governance is required to make sure that AI is applied correctly. This means that processes have to be introduced that guarantee the ethical and legal use of AI throughout the company (you can find more information about this in the "Assessments & audits" section).

Translation of business requirements

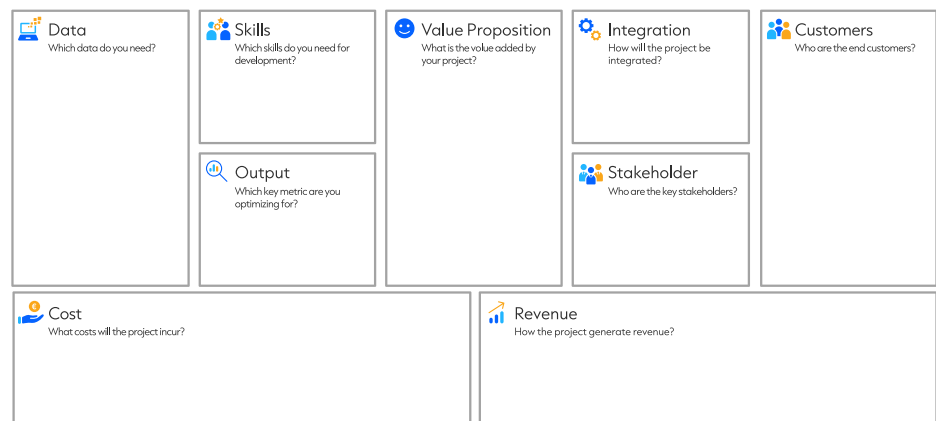
The translation of business requirements in a data science project often poses huge challenges to companies. For this task, employees with business as well as technical skills are needed to ensure that the business divisions and IT department have the same understanding of AI.

Improvement of data literacy

To enable data-driven transformation, the most important stakeholder groups, for example the top management, must know what AI is. It's not necessary to make everybody into a data scientist, but it's crucial that the managers understand the most important concepts, potential applications, and limits of AI.



AI Project-Canvas Titel:



The following recommendations support the successful use of AI: Firstly, it is worthwhile using existing methods such as CRISP-DM and Canvas – like the AI Project Canvas. The one-page Canvas in particular is essential when the expectations of the different parties have to be brought into line. Secondly, the early involvement of experts will help to accelerate integration and improve acceptance within the company. And thirdly, it is important to focus from the outset on the objective and operationalization to ensure that the idea is pursued and implemented from the prototype phase. To take the right decisions during the project, it also helps if it's clear for which application group(s) the solution is being developed and how it should be used.

We also recommend focusing on the human dimension in order to achieve a high degree of acceptance of artificial intelligence in the company:

Retraining and further training of employees

This concerns the development of internal talents. Firstly, management must understand the key AI concepts and terminology (see "Data literacy" above). And secondly, the employees whose tasks are being automated must have the skills required to carry out their new tasks.

Recruitment of the right talents

Most companies don't find it easy to recruit data talents. To specifically promote AI throughout the company, the internal requirements must first be understood and the relevant job profiles defined. It's also very important to have AI events and conferences.

Figure 3: Example of an AI Project Canvas (source: <https://tinyurl.com/The-AI-canvas>)

Establishment of an internal community

To bring the data talents within a company together, it's important to build up a network of data enthusiasts. If this community is centrally managed by an AI center of expertise, the members can exchange ideas, learn from one another, and build their own networks. Done correctly, such a community will improve the retention of talents.

To handle all of these challenges, the Chief Data / Analytics Officer is a new function that demonstrates the importance of data for companies. You can read more about this in the interview with Alberto-Giovanni Busetto (The Adecco Group) in this issue of Focus.

Auditing of AI systems



Artificial intelligence (AI) is radically changing the world and is making inroads into ever more areas of life. But to what extent can we rely on AI? What are the risks, and can we as a society cope with them? We believe that a dialog about ethics is needed and that options for assessing AI applications should be created. Regulatory developments in many countries are paving the way, but there is still much uncertainty regarding the different developments and specifications.

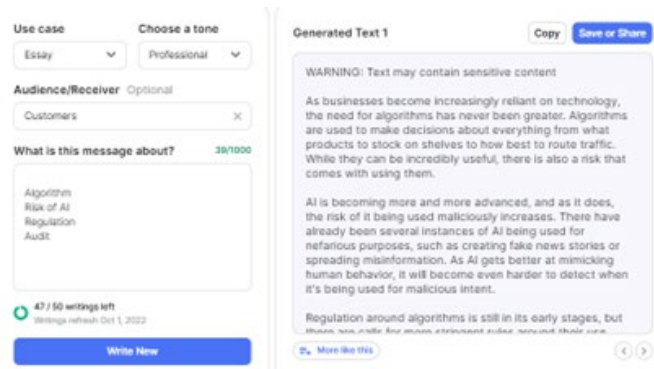
Belinda Müller, Stefan Preuss, Rebecca Fencel

The following text was written with the help of the AI-based application Youwrite (based on GPT3; on the basis of the keywords algorithm, risk of AI, regulation, audit; in just 2 seconds):

As businesses become increasingly reliant on technology, the need for algorithms has never been greater. Algorithms are used to make decisions about everything from what products to stock on shelves to how best to route traffic. While they can be incredibly useful, there is also a risk that comes with using them.

AI is becoming more and more advanced, and as it does, the risk of it being used maliciously increases. There have already been several instances of AI being used for nefarious purposes, such as creating fake news stories or spreading misinformation. As AI gets better at mimicking human behavior, it will become even harder to detect when it's being used for malicious intent.

Regulation around algorithms is still in its early stages, but there are calls for more stringent rules around their use. One major concern is that algorithms can perpetuate bias and discrimination if they're not designed properly. For example, if an algorithm is only trained on data from a certain demographic group, it may not be able to accurately recognize people from other groups. This could lead to unfair outcomes like someone being denied a loan or job because of their skin color or gender identity.



Algorithms are an essential part of modern life – they help us make decisions about everything from what products we buy to how we get around town. However, with this reliance comes risk. As artificial intelligence (AI) becomes more sophisticated, the potential misuse of this technology grows. We've already seen examples of AI being weaponized to create fake news stories or spread misinformation. And as AI gets better at imitating human behavior, it will become even harder to detect when its motives are less than pure. Currently, there isn't much regulation surrounding the use of algorithms – but some experts believe this needs change.

There is no doubt that algorithms touch every aspect of our lives. They help us think through complex problems and make difficult decisions quickly and efficiently. In many ways, they have made our world a better place by increasing productivity and efficiency in both our personal and professional lives. But with great power comes great responsibility- especially when that power is wielded by machines.

The following text was written by four employees over a period of four weeks: Driven by specialized hardware and new algorithms, artificial intelligence (AI) has made enormous progress in the past few years. AI systems have led to breakthroughs in research, for example protein structure prediction by Alpha-Fold and the highly complex strategy game Go in which the reigning world champion was beaten. But between the latest hype and the apocalypse scenarios painted in the media, any real assessment of the AI systems that we work with every day has fallen by the wayside. Such systems are used in all industries for automation and are revolutionizing entire business models.

At the same time, hype-reinforced AI technology is also used by organizations that have little understanding of its potential and risks. Although AI systems in many cases possess expert knowledge, they learn and decide differently from humans. As a result, AI systems cannot replace human experts, and we cannot trust in "basic common sense" when we use these systems. Blind trust in artificial intelligence can therefore lead to errors and consequently also revenue losses and reputational damage. To reduce this risk, AI systems have to be assessed by independent parties.

The framework conditions for the assessment of AI systems are provided by regulations. The European Commission submitted draft regulations in 2021. According to this draft, AI systems should be regulated on the basis of the risks posed by their use. Many applications should even be completely banned, such as the social scoring systems used by governments. Provision is also made for, among other things, system monitoring and regular risk assessments and audits for other high-risk applications, e.g., the analysis of curriculum vitae.

But how can one approach such a complex system? Using a grid of potential risks can help with the assessment or audit of an AI system. Eraneos has developed an assessment framework for AI systems (see figure 1).

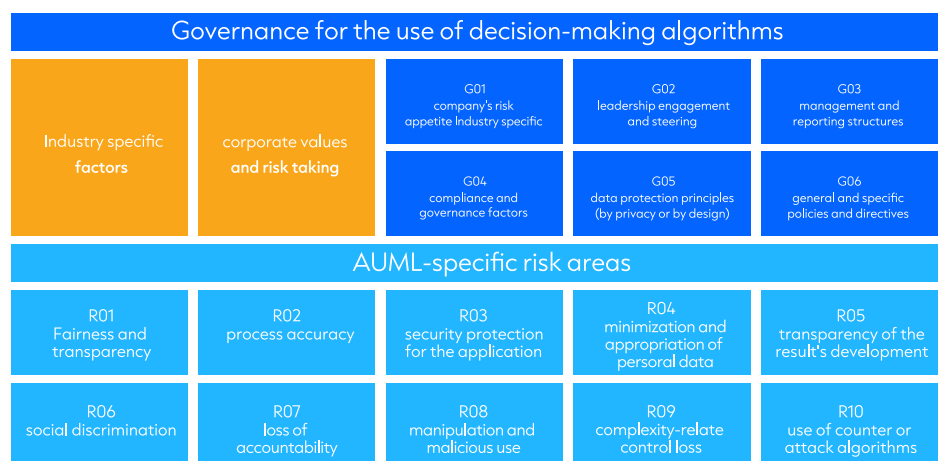


Figure 1: Eraneos framework for the assessment of AI systems

This framework builds on our experience with customers as well as well-known “AI fails” from research and the media. It distinguishes between the perspective of an organization that uses an AI system and that of a specific use case. Industry-specific factors, governance structures, and AI-specific risk areas can then be assessed across the entire lifecycle of the system. The framework defines not only questions regarding risk assessment but also measures that will defuse the potential risks.

For example, one of the framework’s risk areas is fairness. In the past few years, reports regularly appeared about AI systems that “acted” in an insulting, racist, or sexist manner. These characteristics didn’t evolve spontaneously. Rather, they were learned from the data that was used to train them. Because of the mountains of data that can be used to train an AI system, there’s a risk that unfair decisions can be taken. The Eraneos framework can be used to assess the fairness of an AI application, i.e., to find out if it harbors prejudices and may possibly discriminate against certain groups. Governance structures, e.g., an ethics commission, can also be established at the organizational level to review future AI use cases with regard to fairness.

The methods and tools of our framework are constantly being developed further. This pioneering work is important if we want to be capable of acting when the regulations enter into force.



The human being at the center
AI-supported working world of tomorrow
An interview with Alberto-Giovanni Busetto



“People take center stage in the AI-supported working world of tomorrow”

Alberto-Giovanni Busetto,
Group SVP Head of
Data & AI, Adecco Group

Die Adecco Gruppe ist das weltweit führende Beratungs- und Lösungsunternehmen für Talente. Ihre Dienstleistungen helfen Menschen dabei, ihr Potenzial freizusetzen und zu übertreffen, ihre Beschäftigungsfähigkeit zu fördern und ihnen Karrierechancen zu bieten, während ihre Lösungen Unternehmen ermöglichen, ihre Talentanforderungen und Unternehmensmodelle zu optimieren, um ihre Ziele zu erreichen. Gleichzeitig zielt die Adecco Gruppe mit ihrer Fürsprache und ihrer starken Verpflichtung für verantwortungsvolles Handeln darauf ab, eine bessere Arbeitswelt für alle zu schaffen.

Alberto, can you tell us more about yourself and your career in the field of AI?

Alberto-Giovanni Busetto: I would love to. In short, I do two things: I develop data and AI solutions that exploit the business opportunities that are available today, and I design solutions that will shape the business world of tomorrow. Twenty years ago I started wondering: what would happen if machines could use data to learn? To find out more, I started working in the field of machine learning in California and in Switzerland – from biotechnology to the financial and healthcare sectors to human resources, where I transformed major corporations, start-ups, and international organizations into data- and cognition-driven organizations. My experience has made it clear that corporate culture is the most important factor for success.

How is AI applied in your industry? Can you give us a concrete example?

AGB: Every aspect of our work (and maybe also our lives) is affected by AI, usually in the form of machine learning. Leading organizations understand that the way we think about people in the workplace is facing a massive disruption. In short, this means that AI is changing the way in which the HR department contributes to a company's competitive edge, particularly with regard to the acquisition and retention of talented employees, development of skills, and improvement of the applicant and employee experience. A clear example is direct interaction with applicants by way of NLP (natural language processing) in order to offer them attractive, relevant, and informative content. Other excellent examples include career planning and coaching, which can almost be seen as a GPS system for professional development.

What are the current challenges in the context of AI?

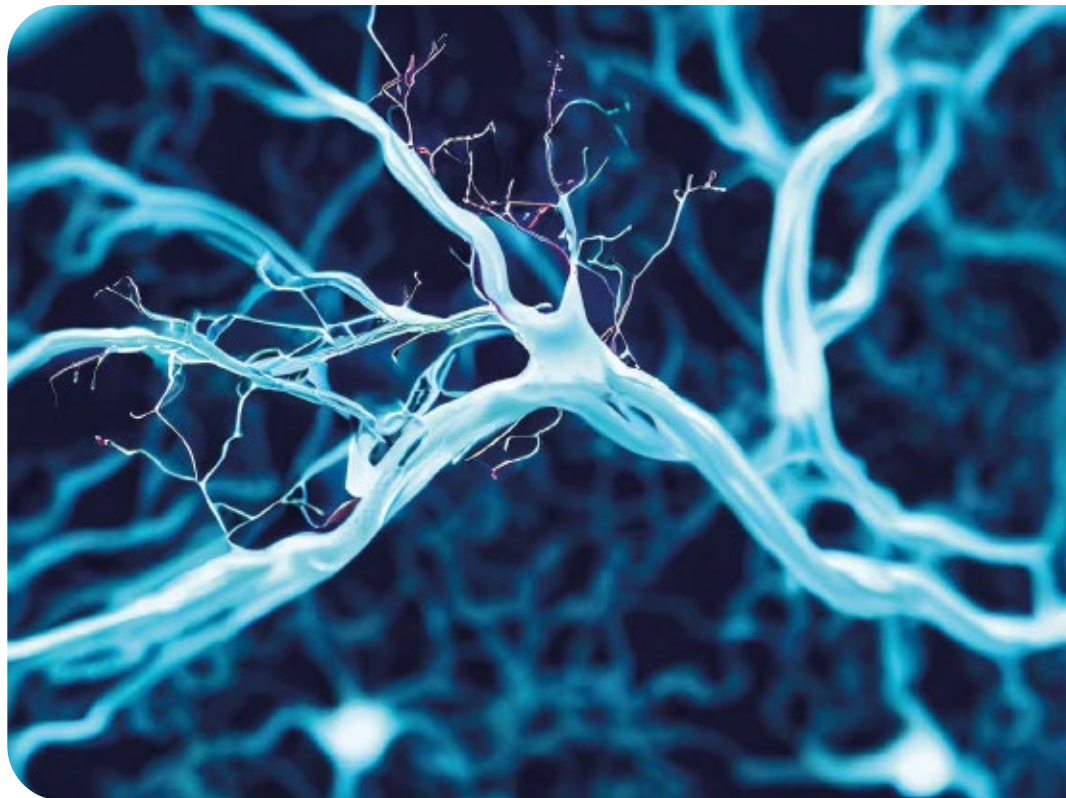
AGB: Outside the technological sector, culture poses the biggest challenge. Being AI-driven means, among other things, that you can proactively address matters, are open to experiments, can implement innovation in a target-focused manner, and – above all – are capable of creating a positive environment for talented employees. The oxymoron here is that AI centers around human beings. It's therefore crucial for the success of an organization to empower its players to bring about (positive) change.

What do you think about trustworthy AI? Is this important in your business environment?

AGB: Trustworthiness is absolutely critical to success in the context of AI. This is why I'm involved in AI ethics and digital justice, e.g., at the World Economic Forum. In our industry, I see this engagement as my professional obligation towards society. What I want to say to the readers is this: Trustworthiness is good for everybody – good for society, good for the economy, and good for you! In practice, trustworthiness in AI must include transparency, fairness, benevolence, and so much more. Remember that everything begins with you, your engagement, and your commitment.

What would you like to tell CDOs and data officers who take up their position in these times?

AGB: Your own job and those of others will be made easier through trust. To build up trust, you should start small and be prepared to expand quickly. Or as Hemingway put it: "Gradually, then suddenly." But a word of caution: Whenever possible, stay away from waterfall project management and from top-down product management. Instead, focus on agility and the love of experimentation, and talk directly to the end users.



Using artificial intelligence to successfully implement the corporate strategy An interview with Marcus Schwemmler



“AI on its own doesn't have a huge impact. It has to be embedded intelligently into systems and processes to create added value.”

Marcus Schwemmler,
Head of Artificial
Intelligence and Machine
Learning Mobiliar

Die Mobiliar, 1826 als Genossenschaft gegründet, ist die älteste private Versicherungsgesellschaft der Schweiz. 80 Unternehmer-Generalagenturen mit eigenem Schadendienst garantieren an rund 160 Standorten Nähe zu den über 2.2 Millionen Kundinnen und Kunden. In ihren Heimmärkten Schweiz und Fürstentum Liechtenstein beschäftigt die Mobiliar rund 6000 Mitarbeitende und bietet 330 Ausbildungsplätze an. Der Verwaltungsrat der Mobiliar stellt bis heute sicher, dass die genossenschaftliche Ausrichtung der Gruppe gewahrt bleibt.

Marcus, you joined Mobiliar this year as the Head of Artificial Intelligence and Machine Learning. How did you become involved in artificial intelligence (AI), and what fascinates you about AI?

Marcus Schwemmler: I don't like to repeat routine tasks. By the third time at the latest, I want to automate the process. Deep learning helps us, for example, to automate more complex processes where humans can generally also make mistakes. With this targeted use of artificial intelligence (AI), humans can be given more scope for tasks that are more complex or need more creativity.

What are specific use cases at Mobiliar where you can already see these effects and could use AI?

MS: There are a few very obvious use cases. Customer advisors have to complete a form for the claims process, for example. This process can easily be partially automated with AI. Mobiliar is investing a great deal in digitalizing the claims process with the help of AI, as this is our showcase service. We have 15 productive AI applications for the claims process alone. One of them extracts the type of loss from a text, for example. If the customer writes in the claims notification "Dear Mobiliar, I drove into a tree with my car," AI can recognize what happened and directly identify the type of loss. These AI-supported services enable us to automate smaller claims and provide our customers with better as well as faster support. However, we would still want to analyze large claims in more detail.

How do you collect feedback about the services from the specialist departments?

MS: At present, only the staff at the general agencies have contact with AI. It's our strategy to always first carry out a pilot with a general agency before rolling out the service to more departments. We therefore only collect feedback from the general agency in question. It's interesting that the feedback usually only concerns the user experience, i.e., the user interface that is used. Our colleagues usually don't even notice the AI itself, even though they know that an AI system is active in the background.

How do you collaborate with your colleagues in the specialist departments to develop these AI services? We often find that the data science departments and business departments don't speak the same language. How do you overcome this challenge?

MS: With much effort and commitment on the part of the data scientists. Excellent communication skills are definitely required. Our motto is "from push to pull." In other words: at present, the data scientists are the ones who identify other areas where the department can use AI to generate added value. But we want to move to a situation where the business department can do this itself and approach us with ideas and wish lists.

Here we rely on internal training courses which we develop ourselves and on lots of communication. In some areas we have great success, for example in the claims business about which we've already spoken. That is where we and the business department have been able to identify the biggest and fastest added value from the outset.

What makes the claims department special in this context?

MS: I think that in general, this department has the simplest use cases, which can also be implemented quickly. And the claims department is very important for Mobiliar as claims settlement is one of the company's core tasks.

"Core tasks" is a very good key term. How do you use AI to implement your corporate strategy?

MS: I have to start with the strategy. It says: "Mobiliar is the most personal insurance company in Switzerland." We invest a great deal of time, money, and energy in digitalization in order to put the focus on customer requirements in the digital age, too. However, in the context of digitalization and automation this doesn't mean that we now need fewer claims officers, but rather that the claims officers will be able to focus on more complex and creative situations in the future, for which they should have more resources.

Another interesting use case is the forms that have to be completed to take out SME insurance policies. A lot of information is needed for this. This information is available at Mobiliar, in the commercial register, or on the customer's website. We've developed an application that compiles all the information that is freely available, correctly classifies it, and enters this information into the form for the advisors. Our advisors then check this information and verify its accuracy with the customer. This makes it possible for the advisors to focus more strongly on their customers.

Companies starting out on their AI journey often begin with a data analyst, who is later joined by data engineers and data scientists. How was it for you, and where do you stand today?

MS: Much has changed over the past few years. Around seven years ago, Mobilian only employed four data analysts. They managed to inspire all of Mobilian with enthusiasm for data and demonstrate the added value of analyzing data to everybody, right up to the level of the executive board. The department now has around 30 employees and has thus grown massively. The use of AI to solve business problems has become very well established. But there are difficulties similar to those experienced at the start of the journey. We still have to specifically address the users and demonstrate the benefits of use cases to them.

There are many data scientists among these 30 employees. Not all data scientists are the same, however. We have full stack data scientists, software developers who work with the latest models, and experts with excellent communication skills who give training courses or coach young talents. We also have staff who focus on the topics of ethics and governance. We're very diversified and constantly think about the skills we still need – today as well as in the future.

If you could draw up a wish list, what would be the next three points on the list?

MS: In the area of data science, we need a good mix of full stack data scientists who can integrate the analyzed data into the business applications, and experts who can carry out ad hoc analyses with a stronger focus on statistics and who can communicate well. We also need data product owners. We've progressed very far with our machine learning ops process and the go-live of AI. But we still obtain many inputs from a central data warehouse (DWH). We also need additional resources in central data government and in IT, such as software developers. And against the background of our cloud first strategy, we are in particular need of cloud engineers.

AI is hotly discussed as a stand-alone technology. Are there other technologies that are decisive for the successful use of AI?

MS: AI on its own doesn't have a huge impact. It has to be embedded intelligently into systems and processes to create added value. This will become ever more relevant, for example when we pursue the industrialization of AI, i.e., the large-scale use of AI throughout the entire company. In contrast to a traditional insurance company, this would require data that is better structured and more available. Currently, data processing accounts for 80% of our work, while modeling only accounts for 20%. We definitely have to address this issue. Using data products or a data mesh would be the central success factor here. In a first step, we want to decentralize the data products or data ownership in the specialist departments. But to ensure interoperability, we will continue to apply central governance. The underlying infrastructure must also be ready. In the cloud everything is structured to ensure that the specialist departments can use the technology for their own data products.

With the EU AI Act, AI regulation is imminent in the EU. Switzerland is also seeing the first research projects focusing on the potential regulation of AI. Do you keep an eye on these developments?

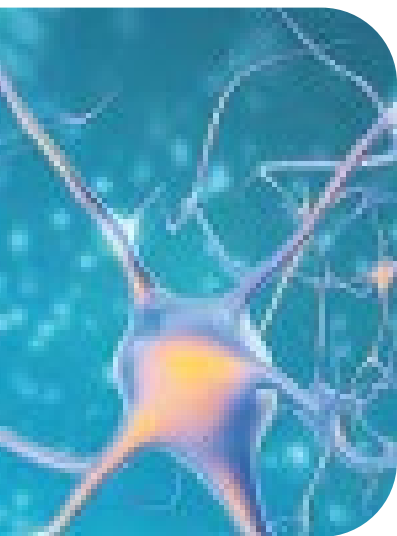
Yes, we follow these developments very closely. We have a board and a special team for data value creation governance who focus on these tasks. They include a number of internal people and are responsible for all issues concerning regulation, data management, data ethics, consent agreements with partners, etc. There are also initiatives such as compulsory further training courses on data protection for all data scientists.

What measures do you think are needed to gain the required trust of customers and employees in AI systems?

Trust determines the success of a company's business. Data protection is a very good example here. The protection of personal data is the most important consideration for us. This also includes technical protection, such as how to prevent a data leak. Before a service goes live it has to undergo many checks and tests. This strongly reduces the risks. Questions concerning ethics aren't yet very relevant for the use cases that we've implemented to date. Of course, models that are being developed will have to be tested for bias, but we're leaving that to the relevant teams. Generally speaking, AI model monitoring – i.e., the monitoring of models after the go-live – is handled centrally.

We'll soon have the first use case where AI is used by the customers, e.g., to make it easier for customers to complete the online claims notification form. This will work much the same as Google Search, where search terms are automatically completed with recommendations. However, Mobiliar is in general very cautious about expanding the use of AI to the customers.

Customers' trust in a company is closely intertwined with their trust in its employees. If a customer has to notify a claim and needs help, they'll probably always be happy that they don't have to chat to a bot. Humans therefore are and will remain an important linchpin for creating trust.



Artificial intelligence at the Vaudois administration An interview with Catherine Pugin



“We want to establish a culture of creating value from data within the administration.”

Catherine Pugin,
Digital Officer,
Canton of Vaud

Artificial intelligence (AI) aims to simulate human intelligence by way of algorithms. There’s no clear definition of AI. Generally speaking, AI is the use of machines and an array of mathematical and statistical methods to imitate specific aspects of the human character.

Do you use AI systems or algorithms?

Catherine Pugin: It’s important to understand that all of us indirectly use AI systems such as Google or social networks. Although the administration doesn’t yet have any flagship applications for specific purposes, AI is used in a number of pilot projects. At Canton Vaud’s General Directorate for Digital and Information Systems (DGNSI), we’re thinking about creating a unit that will focus on data science, the objective being to use this technology to better prepare and more efficiently use data.

What specific application of AI systems is of particular interest to you?

CP: Digitalization is resulting in growing volumes of data. A lot of this data is used once only for a specific purpose and then stored as an unused resource because it’s impossible to process so much information in a standardized manner. Algorithmic systems are therefore particularly suited to the editing of data and the recognition of patterns that humans won’t necessarily be able to see. AI would speed up certain tasks and enable the exploitation of this database – subject to the condition, of course, that clear guidelines are set to govern this process.

There have been a few scandals related to AI projects. How do you assess the risks of such projects and current efforts to manage these risks?

CP: We’re aware of the fact that AI harbors risks that can only be managed if we have the required technological, legal, ethical, and economic competencies. The public sector has a great responsibility towards individuals, is subject to additional legal provisions, and has to meet specific requirements, for example with regard to transparency. As the most recent scandals have undermined trust in AI, the state must set a good example for using AI. Firstly, the actual added value generated by using AI in a project rather than established technologies must be determined. And secondly, particular care must be taken in the execution of such projects, because AI could enhance certain prejudices already contained in the data, e.g., regarding gender or social equality.

For what application do you think algorithmic systems can generate the greatest added value?

CP: Given the current volumes of data, all services could be affected in the long term. But today I would mostly point to mobility and digital healthcare data. In cancer research, for example, AI offers promising applications for the recognition of malignant melanoma. In the energy sector, better use of data could undoubtedly help us to optimize the use of our resources. But there needs to be clear guidelines for such uses: first of all, a basis of trust must be created, and a culture of creating value from data must be established within public organizations.

What is your understanding of a culture of creating value from data?

CP: That's relatively simple. Today, every organization consists of several departments that work with data. Together, this data represents an intangible heritage, but not everybody realizes this. I think that people haven't yet been systematically trained to automatically think about the ways in which this data can be used. Asking this question is the first step towards a data culture. This would lead to the development of more specific ideas of what is possible, what the associated risks are, what technologies have to be applied, who the contact persons are, etc.

How can this habit be cultivated?

CP: Initially, specific individuals usually act as the driving force. I think that the creation of a data community within an organization could be a starting point. A community in which people work together and exchange ideas and best practices could have a snowball effect and spread to other departments or parts of the organization.

Can you give examples of such data communities?

CP: The Federal Statistical Office (FSO) currently has a new mission relating to data, and in this context the various departments are engaged in a discussion. I assume that similar data communities have also been set up in Canton Zurich. We're also working on creating such a structure – but this is rather complex as many players are involved whose profiles still have to be defined. We're now in the preliminary discussion phase.

How quickly do you think AI will establish itself?

CP: I think that it'll still take a while and that a cultural change is needed first. As before, data is still mostly used for marketing purposes – which is of relatively little use in public administration. The reasons why data could be relevant for the public sector need to be identified. But many players have to be involved if we want to understand what we can currently do with data. And awareness must be raised at the political level in order to speed up developments, in much the same manner as digital sovereignty, which has been the talk of the town since politicians have involved themselves in the topic.

How do you think the government's uncertainty regarding AI should be handled?

CP: I believe that a basic legal framework setting out the principles we wish to pursue must be created. However, this can't be done only at the cantonal level. A dialog has to be initiated at the national or even the European level: the European Union is already working intensively on these topics and it's important for Switzerland to also take a position in this regard. A public debate should also be launched. But these things need time as not all political players prioritize digital topics.

Why not?

CP: I think that very few politicians are comfortable with these topics. Many still see digitalization as a part of information technology and don't recognize its social impact. Digitalization changes the way in which we live and work to-



gether and communicate with one another. Happily, people are slowly starting to understand this. Last year's referendum about the eID Act has shown this: globally, this was the first time that a country held a democratic referendum about a digital law. For me this is a very interesting example as it shows that people have a fairly specific opinion about this topic.

Many of the world's current problems could probably be solved through new technologies such as AI. At the same time, it's said that digitalization is completely distinct. How can these two perspectives be harmonized?

CP: I think we should let go of the idea that technology will solve all problems. We must take a responsible approach to digitalization, because it has a substantial impact on society and the environment. This also applies to AI, as we can't ignore its energy costs, in particular in light of the current uncertainties regarding our energy supply. It would therefore be good to give some thought to this matter and accept that we can't solve everything with AI, simply because we don't have the required resources. We're in an interesting phase where we know that AI can help us solve problems, but can at the same time also create new problems. We should therefore find a happy medium.

We're also starting to talk about "trustworthy" AI. It's not enough to use the technology. We also need governance, rules and regulations. What role, if any, do you think the cantons play here?

CP: I'm of the opinion that the cantons should play a role here. As said before, we can't have different rules for every canton. The basic rules should apply for the country as a whole. Of course, each canton has reached a different level of maturity and has a different approach to handling digitalization. If we include all cantons in these discussions, we can create more space for local experimentation where the use of AI or algorithmic systems can be tested. But in the end, the different findings and outcomes have to be amalgamated. In this context, a structure such as Digital Public Services Switzerland could facilitate a dialog between the federal government, the cantons, and the municipalities.

What does transparency in relation to AI mean for you? How much understanding would be needed?

CP: The state is obliged to disclose the use of AI systems and explain their use to citizens upon request. In an ideal world, people should be able to decide for themselves how much transparency they need. Just imagine that we could use an algorithm to provide someone with the exact information they need. We could then offer very popular and readily understandable information to someone with limited basic knowledge. This person would know what data is used, for what purposes this data is used, and what legal remedies they have. The objective would be to grade the information up to a level where we define the kind of algorithmic systems that are being used. We would then have achieved an almost perfect level of transparency as everybody would have the information that is relevant to them. For a cantonal administration, it's also important to have reproducible results. Each outcome produced by an algorithmic system must be reproducible by a human being.



A person may not want any information about the way an algorithm works, but they would like to be able to check whether the system has made the right decision. For me, this is another aspect of transparency.

Do you think that a public dialog about these topics would be helpful?

CP: If we take another look at the debate triggered by the electronic identity law, we have to conclude that people want to and must have the opportunity to give their opinion about digital transformation. It's not our job to impose a technology. Any decisions should be taken together with the people of the country. The challenges lie in the question of how we can gradually present these issues to the public. The media are taking up these topics and there's reporting from ever more specialized journalists, but as people differ in their level of understanding of a complex topic such as AI, how can we involve everybody in the discussion without widening the digital gap by excluding those people who lack basic knowledge of the topic?

Do you think that the different age groups are seeing different developments with regard to these basic skills?

CP: We have to apply more subtle considerations than those that imply that older people don't understand anything about information technology. Although we currently don't have the data we need, there are many indicators that seem to imply that age isn't the only variable causing a digital gap. We would like to have real statistical data about this topic in order to better understand how we can address the people. It would be interesting to know what causes the disparities in digital competence.

Are you optimistic or pessimistic about a future with new technologies such as AI?

CP: I believe that the term "artificial intelligence" scares many people and is therefore more and more often replaced by the term "algorithmic system." I don't find strong AI (a machine with general thinking skills that imitates the human brain) to be a desirable objective. Rather, AI should be based on algorithms that meet the needs of the individual. In the healthcare sector, for example, most dermatologists nowadays use machines to examine birth marks. In this context, every individual can understand that a bigger database of birth marks will result in a better outcome. This is an important example of the practical use of AI to support the individual. In contrast, social networks, marketing, and advertising are rather dubious examples for the use of algorithmic systems. As is often the case with technological innovation, everything depends on how it's being used. In this context the authorities have the interesting role of having to consider and identify the effects of an intelligent use of data and algorithms.

Do you think that Switzerland will go the same way as Europe?

CP: Even though Switzerland isn't a member of the European Union (EU), we have a shared culture and shared values. The AI framework developed by the EU is also important for our country. Of course we'll have to adapt this framework to our specific needs, step by step. But it would be problematic to follow a totally different path.



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