

The state of AI in the Swiss tech industry: Results from a survey by ETH Zurich in cooperation with Swissmem and Next Industries

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Swissmem and Next Industries**

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Torbjørn Netland

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Executive Summary

This report summarizes the results of a study into the state of AI adoption and plans in the Swiss tech industries. In collaboration with Swissmem and Next Industries, the Chair of Production and Operations Management (Prof. Netland) at ETH Zurich administered a survey to Swissmem's members. The survey was sent to all Swissmem members in March 2024. Within a month, a total of 209 senior managers answered the survey. We followed up a selection of interesting answers by interviewing ten senior managers. The findings provide unique insights into the state of AI adoption in the Swiss tech industry as of spring 2024 and the plans for the next three years.

The top 10 key insights are as follows:

1. **AI can deliver real business value:** Deep-dive case studies reveal a variety of AI implementations driving business value.
2. **Few companies have an AI strategy:** Only one in four companies has an AI strategy.
3. **The Swiss tech industry is lagging other industries:** Managers believe that other manufacturing-related industries are further ahead in AI adoption.
4. **The current AI implementation is low:** Current adoption rates of AI in industrial applications are low. More than half of all companies have not yet considered using AI in manufacturing or supply chain management, and scaled implementations remain rare exceptions.
5. **Smaller companies are falling behind:** Smaller and currently less profitable companies seem to be falling behind in their AI adoption progress, indicating the risk that the technology benefits large companies rather than leveling the playing field.
6. **Predictive maintenance and machine optimization remain key application areas:** In their current and planned use of AI in manufacturing-related areas, companies show a sustained focus on predictive maintenance and machine optimization—two classic application areas for industrial AI.
7. **Supporting knowledge management with generative AI is a top priority.** Knowledge management is reported as a key focus area. Regarding AI models, companies are experimenting mostly with large language models, which one-third of companies expect to have scaled up within the next three years. This renders it the most popular among AI technologies studied.
8. **Companies report a shortage of AI talent:** Companies are limited in their AI adoption by insufficient in-house AI talent, with 68% of companies indicating that they do not have access at all or only to a limited extent. This is further exacerbated by a lack of access to AI training, reported by 56% of companies. Companies also struggle to access external talent, with over half of all companies reporting insufficient access to know-how from universities, consultants, and startups.
9. **AI is coming to office jobs:** Regarding future use, companies are most optimistic about their ability to scale their use of AI in industrial applications characterized by a high share of white-collar value-added, including engineering and R&D, sales and marketing, and customer service. In these fields, about one-third of companies expect to implement AI to scale within the next three years.
10. **Regulatory awareness is limited:** Only a few companies are aware of AI regulations.

Foreword

Today, digital transformation and the so-called fourth industrial revolution are hot topics—and rightfully so! Unprecedented access to data and new analytical tools is unlocking new levels of productivity in manufacturing. AI has great potential to increase manufacturing productivity, but only the manufacturers that match problems with solutions will benefit. In this report, we show with data that the reality of AI implementation in the Swiss tech industry lags behind the AI hype. Is this conservative stance toward AI due to disbelief in what AI can bring or lacking AI capabilities? This report brings answers by summarizing a survey we conducted in collaboration with Swissmem and Next Industries.

“AI has great potential to increase manufacturing productivity, but only the manufacturers that match problems with solutions will benefit.”

Prof. Torbjørn Netland, ETH Zurich

The potential of AI to disrupt manufacturing industries is high. As part of the expert panel of the World Economic Forum’s Global Lighthouse Network initiative, I observe firsthand how the world’s leading manufacturers are scaling AI applications across factories and supply chains. I also have the privilege of supervising students at ETH Zurich and advising spinoffs such as EthonAI and Manukai with great ideas about how AI is redefining the sector. EthonAI, for example, just announced a CHF 15 million Series A fundraising for its Manufacturing Analytics System led by Index Ventures.¹ Its solutions are already in use in Switzerland by Lindt & Sprüngli, Roche, and Siemens, among others.

In contrast, as we show in this report, the scaled implementation of AI in the Swiss tech industry is low. It is also below that of comparable surveys from other countries. A study by Researchscape in the US, UK, and Canada in 2024 reported that 70% of manufacturers with more than 100 employees were already using AI in at least one application.²

In other industry sectors, AI is already making its way to the mainstream. For example, the pharma industry uses AI to discover new drugs, the fast-moving consumer goods industry uses AI for quality inspection, and the semiconductor industry uses AI to find and eliminate root causes of yield loss. In office functions, copilots based on generative AI are redefining many work processes—with 57% of Swiss companies reporting to be early adopters, according to Manpower.³ In fact, most of us are using AI applications in our daily lives without even noticing. A considerable untapped potential for AI in the Swiss tech industry seems to remain.

We hope you find the results of this survey insightful.



Prof. Dr. Torbjørn Netland
Chair of Production and Operations Management, D-MTEC, ETH Zurich
Member of the ETH AI Center

¹ Beck, R.H.; Whiteman, D. *How One Company Is Using AI To Transform Manufacturing*, Forbes, May 20, 2024, [URL](#)

² Badarinath, R. *Through the roof: AI adoption accelerates manufacturing growth and transformation*, Forbes, May 2 2024, [URL](#)

³ ManpowerGroup Employment Outlook Survey: Resultate Q3 2024, [URL](#)

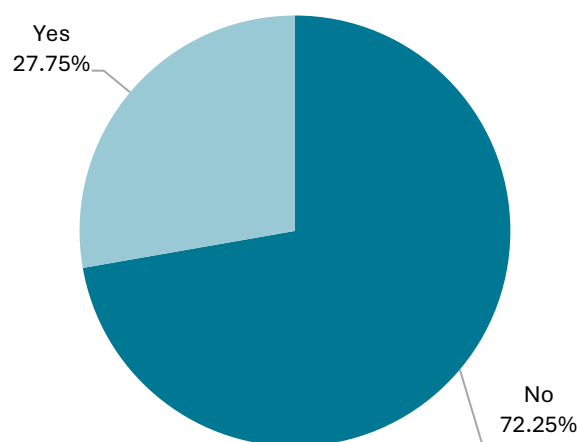
1 AI in the boardroom

AI has already become a boardroom topic in many companies, but how many have articulated AI strategies, and how do companies perceive their implementation rate compared to competitors and other manufacturing industries?

1.1 AI strategy

The survey asked managers whether or not their company has an AI strategy. Less than one-third of the surveyed companies (28%) had a specific AI strategy (as of May 2024). In other words, most companies still have no explicitly formulated AI strategy.

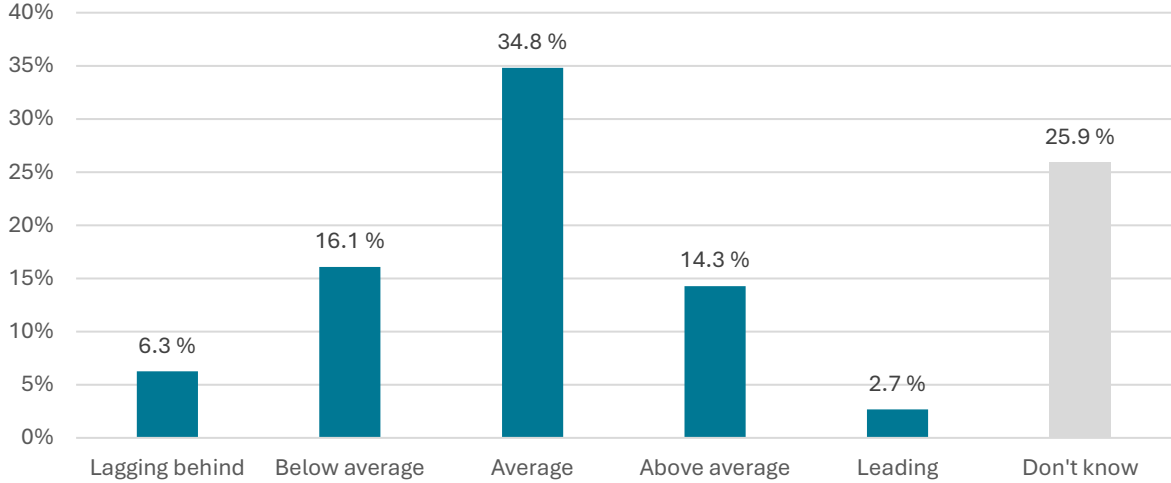
Figure 1: AI Strategy (N = 209)



1.2 Extent of AI adoption relative to others

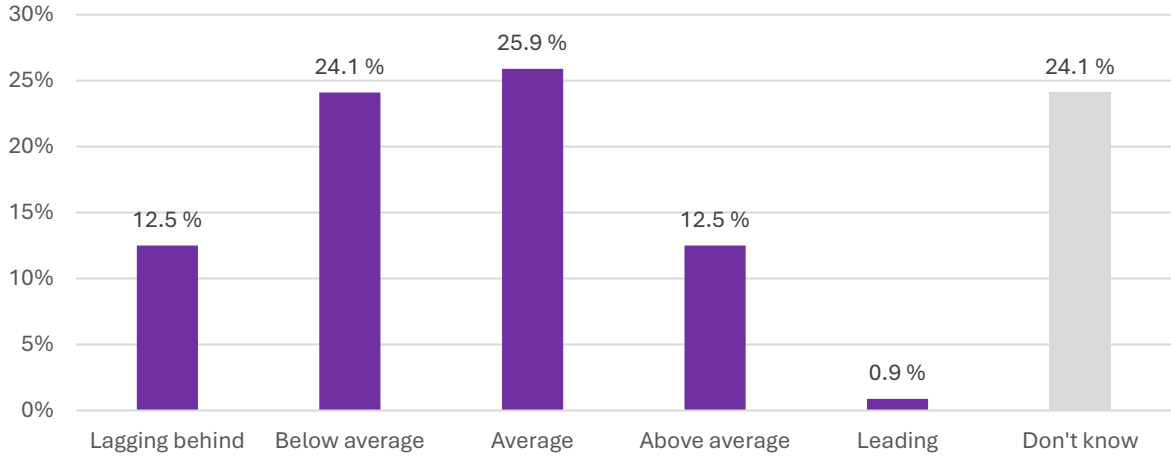
Companies seem to have a relatively realistic self-perception of their relative progress in implementing AI as far as their *competitors* are concerned. Most responding managers who could situate their AI adoption efforts relative to competitors felt that their progress was “average.” More companies believed to be below the average level of their competitors (22%) than above average (17%). This may indicate a slight tendency among companies to overestimate the implementation levels of their competitors.

Figure 2: Perceived adoption compared to competitors (N = 185)



Managers in the tech industry estimate *other manufacturing industries* to be ahead of their industry. About one quarter believe their company to be “average.” More than one third believe their companies’ AI adoption is below average compared to other manufacturing industries. Only 13% of companies believe to be ahead of the curve.

Figure 3: Perceived adoption compared to other manufacturing industries (N = 185)



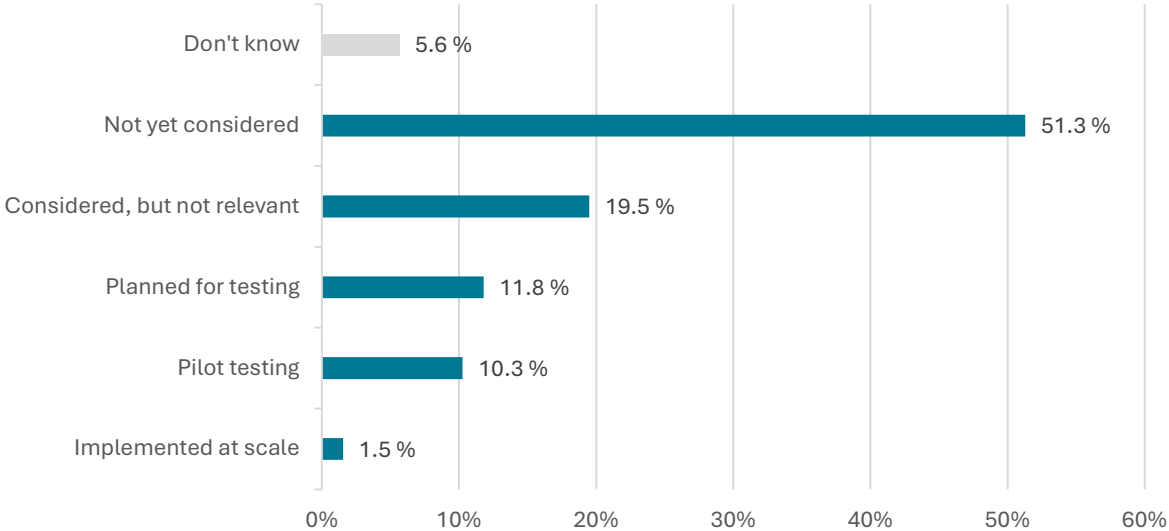
2 AI in manufacturing and supply chain management

2.1 AI adoption in manufacturing

Today

The majority of companies have not yet considered the use of AI in manufacturing-related applications (51%). Another 19% have considered the use of AI but found it not relevant enough to pursue it further. Slightly less than a quarter of companies are in the stage of testing AI applications, either planning tests (12%) or currently conducting pilot tests (10%). Only three companies (2%) in the full sample of respondents for this question (N = 195) have indicated that they have implemented artificial intelligence at scale in manufacturing.

Figure 4: Current adoption of AI in Manufacturing (N = 195)



Looking at the subsample of less profitable companies, we find that 76% of companies in this group have not yet considered the use of AI in manufacturing and only 2% are currently in the stage of pilot testing. This stands in contrast to the subsample of more profitable companies, for which we find that only 48% have not yet considered the use of AI in manufacturing, and already 18% are in the pilot testing phase.⁴

There are also considerable differences in the current application of AI in manufacturing across different sizes of companies. Approximately 20% fewer companies in the group of smaller companies have not yet considered applying AI in manufacturing. Furthermore, more than three times as many large companies are already in the pilot testing phase for AI applications in manufacturing than small companies. This suggests that larger, more profitable companies are currently leading the application

⁴ These analyses exclude companies that did not indicate their level of profitability. Profitability was assessed based on self-reported profit margins in the survey.

of AI in manufacturing. This highlights the potential threat to small and medium-sized companies that larger competitors may outpace them in utilizing AI and, in this way, dominate the market.

Overall, the results show that the adoption of AI in the Swiss tech industries is not advanced. This sentiment was also picked up during several of our in-depth interviews with senior managers.

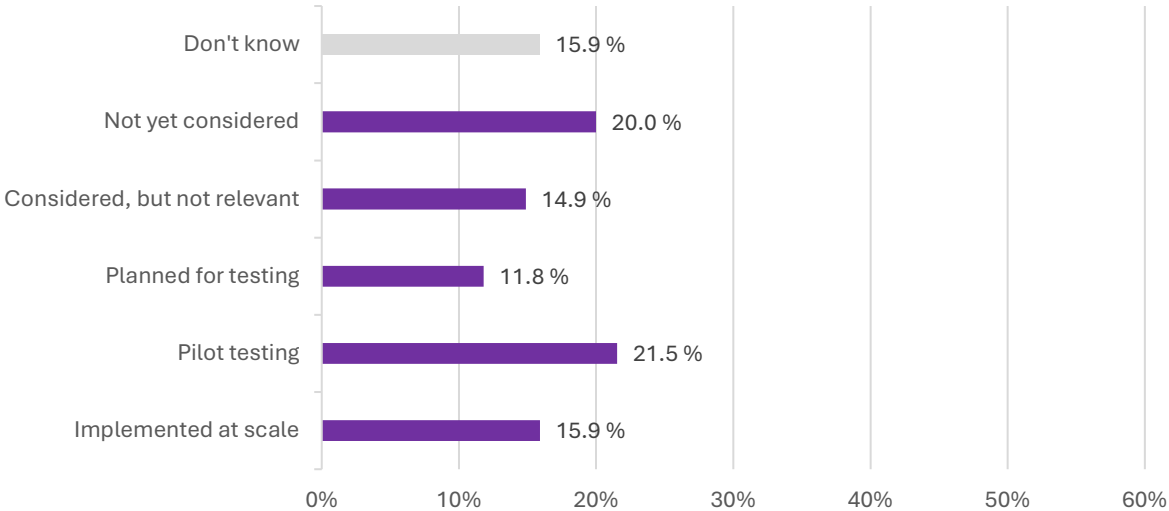
“According to our analysis, [AI] is not relevant in many areas of the tech industry.”

CEO, Component Manufacturer

Plans

Despite the current low adoption rate, companies have ambitious plans regarding AI implementation in manufacturing, with 16% expecting to implement AI at scale within three years. Furthermore, according to the expectations of the survey respondents, the share of companies in the pilot testing phase will double, with 22% of companies expecting to have reached this phase then. Only about 20% of companies expect to have still not considered using AI in manufacturing by the end of the next three years. 16% of the respondents did not know where their journey of AI implementation would take their company.

Figure 5: Planned adoption of AI in Manufacturing within 3 years (N = 195)



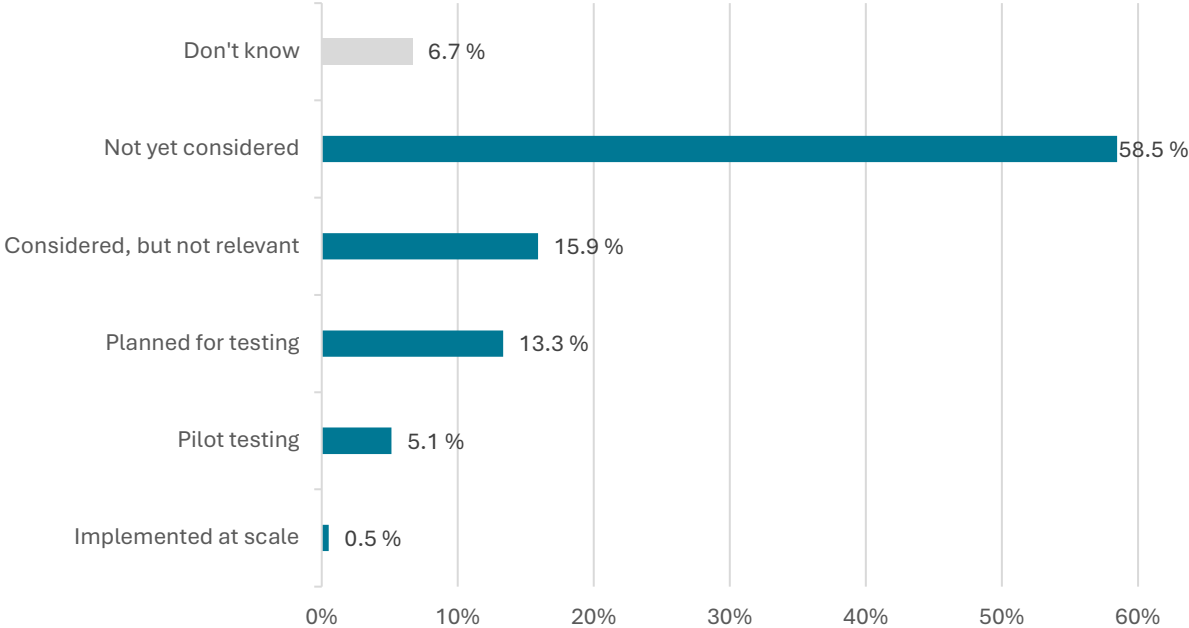
There are also considerable differences in terms of the planned application of AI in manufacturing between more and less profitable companies. Companies that are currently less profitable show less ambition in their future plans of AI adoption in manufacturing, with only 6% of companies in this group expecting to implement AI in manufacturing at scale within the next three years. This contrasts with 28% of companies in the group of more profitable companies planning to have implemented AI at scale in manufacturing by the end of the next three years. Moreover, twice as many companies in the group of less profitable companies expect to find out within the next three years that AI in manufacturing is not as relevant to them as in the group of more profitable companies. Also, comparing smaller and larger companies with a view to their planned AI application in manufacturing reveals a contrast: About five times as many smaller companies expect not to have considered the use of AI in manufacturing.

2.2 AI adoption in supply chain management

Today

Compared to manufacturing, a greater number of companies have not yet considered using AI in supply chain management (59%). Only about half as many companies (5%) are currently conducting pilot tests for applications of AI in supply chain management as for manufacturing.

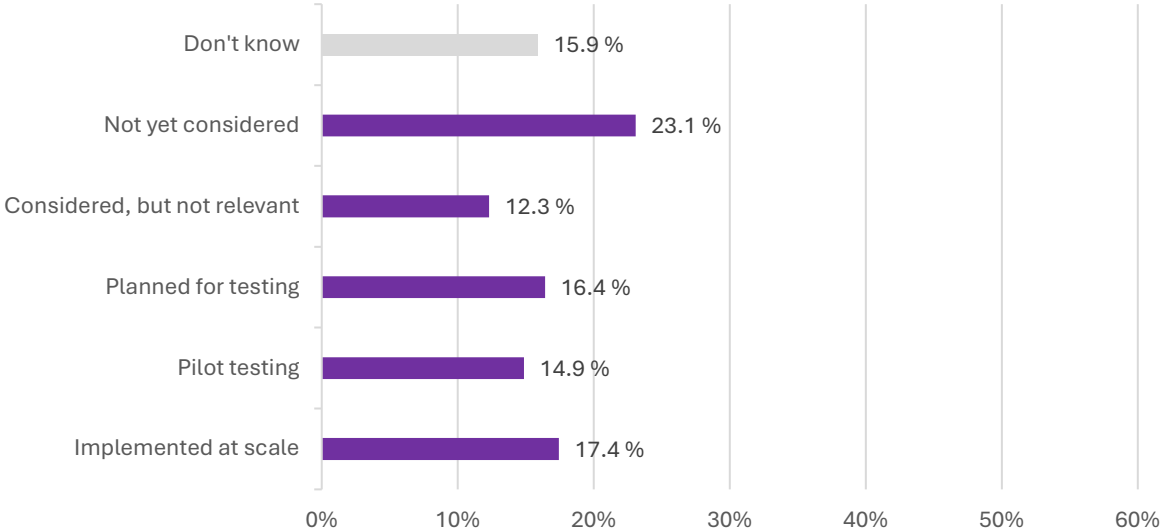
Figure 6: Current adoption of AI in Supply Chain Management (N = 195)



Plans

Despite relatively less current pilot testing activity, more companies expect to be able to implement AI applications at scale in supply chain management than in manufacturing (17%). This may either point to a certain optimism about the ease of implementation of AI applications in supply chain management or indicate that companies underestimate the effort of AI implementation in this sphere.

Figure 7: Planned adoption of AI in Supply Chain Management within 3 years (N = 195)



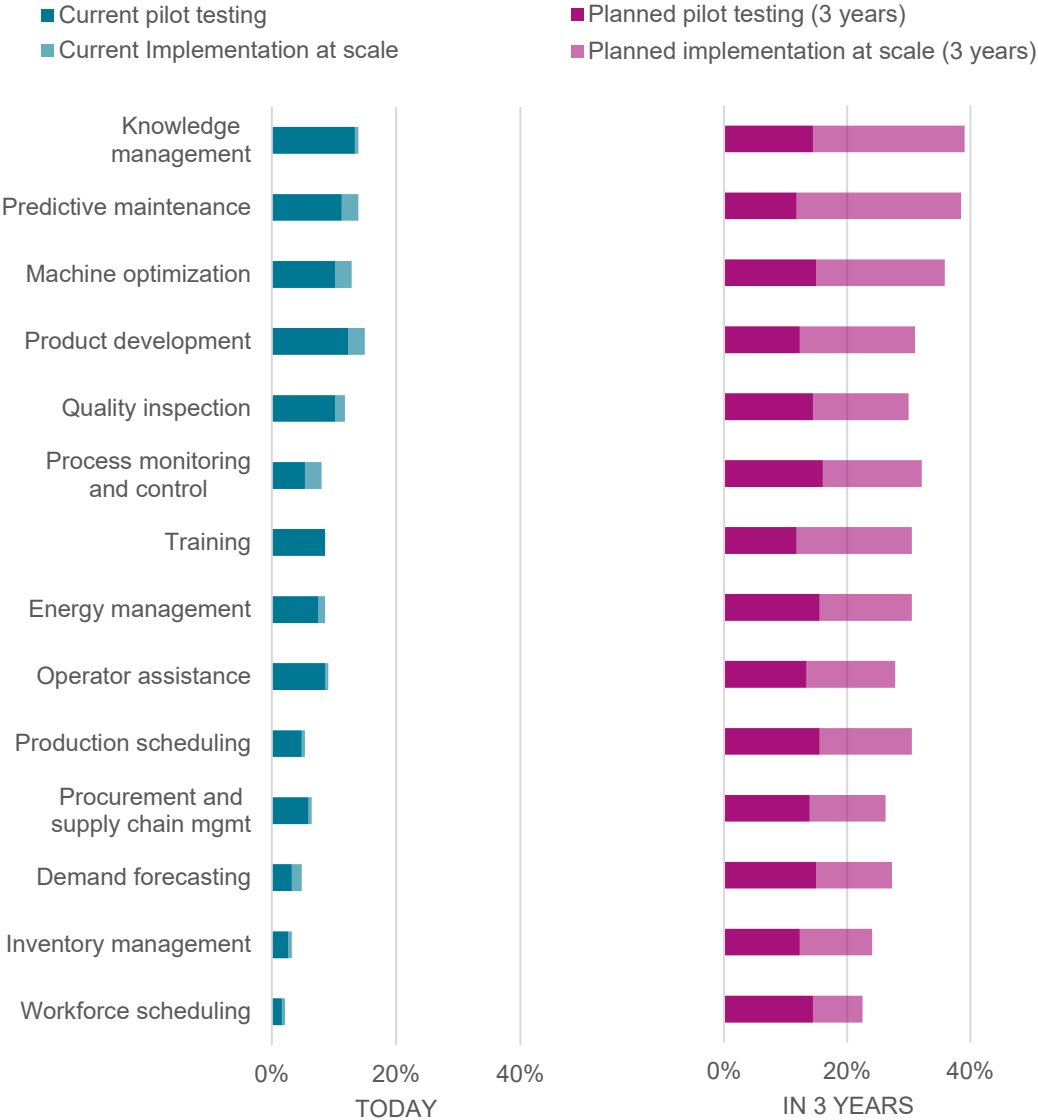
2.3 Application areas in manufacturing and supply chain Management

Next, we look at applications in manufacturing and supply chain management in greater detail. Companies experiment with the use of AI in different application areas within these fields.

Today

Currently, none of the AI application areas are scaled by a large number of companies. With about 3% of companies having implemented solutions at scale, currently leading implementation areas are predictive maintenance, machine optimization, product development as well as process monitoring and control. However, a several times higher share of companies is currently pilot testing AI applications in these and other industrial application areas of AI.

Figure 8: Current and planned industrial application areas of AI (N = 187)



The top three industrial application areas in which companies are currently testing AI applications are product development (15%), predictive maintenance (14%), and knowledge management (14%). The last popular areas to experiment with AI in industrial applications are demand forecasting (5%), inventory management (3%), and workforce scheduling (2%).

Plans

Planned use—constituted by pilot testing or implementation at scale—largely follows patterns of current use. Within three years, 39% of companies plan to either pilot test or implement AI applications in knowledge management as well as predictive maintenance. The third most common planned industrial application area of AI is machine optimization, with 36% of companies aiming to either have implemented or started testing AI applications in this area. The three *least* common industrial application areas in which companies plan to use AI applications are demand forecasting (27%), inventory management (24%), and workforce scheduling (22%).

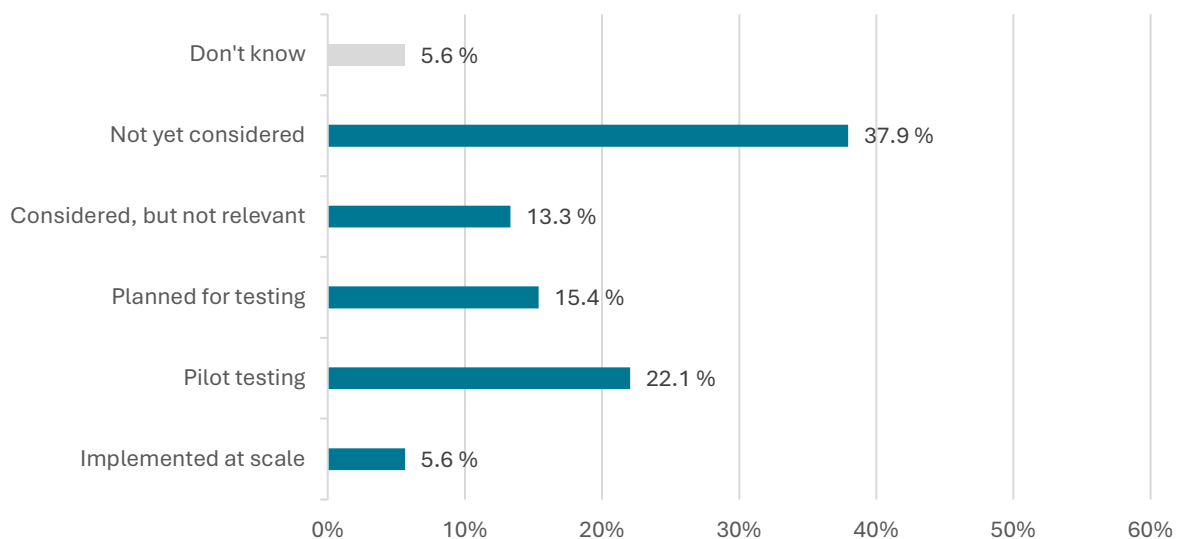
3 AI in other business areas

3.1 AI in engineering and R&D

Today

Regarding the use of AI in engineering and R&D, a noticeable difference to manufacturing and supply chain management is that a markedly lower share of companies has not yet considered the use of AI in this field (38%). In line with this, the number of companies that stated that they have implemented AI at scale in engineering and R&D is about three times larger than for manufacturing applications. Also, the share of companies that are already in the phase of pilot testing AI applications in this field is twice as large as for manufacturing (22%).

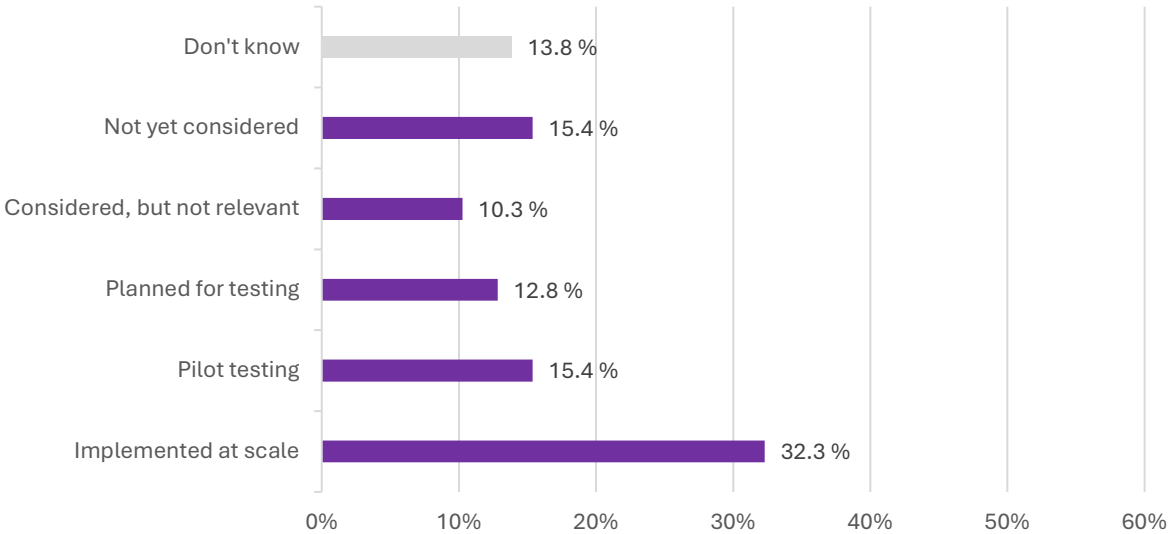
Figure 9: Current adoption of AI in engineering and R&D (N = 195)



Plans

Considering plans for AI adoption in engineering and R&D for the next three years, it becomes clear that a key priority of companies will be to push ahead with the implementation of AI in this field. About one-third (32%) of companies plan to adopt AI applications at scale in engineering and R&D. In other words, approximately twice as many companies intend to implement AI at scale in their engineering and R&D activities than in their manufacturing or supply chain operations. An additional 15% plan have reached the pilot testing phase in three years. This means that about half of all companies expect to apply AI in engineering and R&D within the next three years.

Figure 10: Planned adoption of AI in engineering and R&D within 3 years (N = 195)

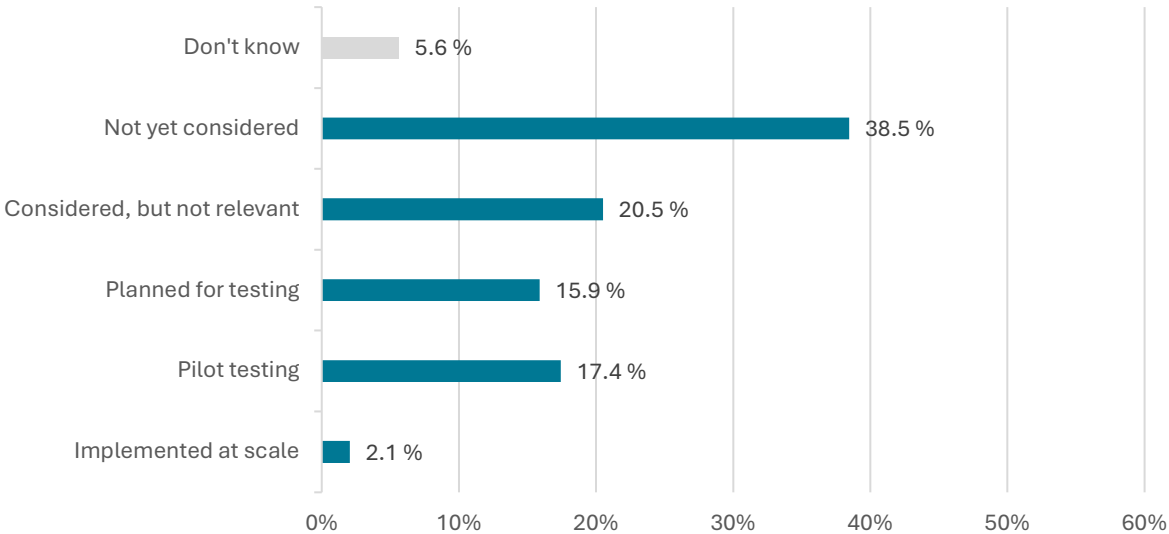


3.2 AI in sales and marketing

Today

The responses of companies regarding their current use of AI in their sales and marketing activities show that a relatively higher percentage of companies compared to other business activities like manufacturing or supply chain management (21%) have already considered the use of AI, but came to the conclusion that it is not relevant for their business. The number of companies that are already in the pilot testing phase is also relatively high, with 17%, which is more than three times as many as supply chain management. These figures indicate that companies have been moving relatively quickly to consider and test AI use in sales and marketing activities. However, also in this field, only the absolute minority of companies (2%) have implemented AI at scale.

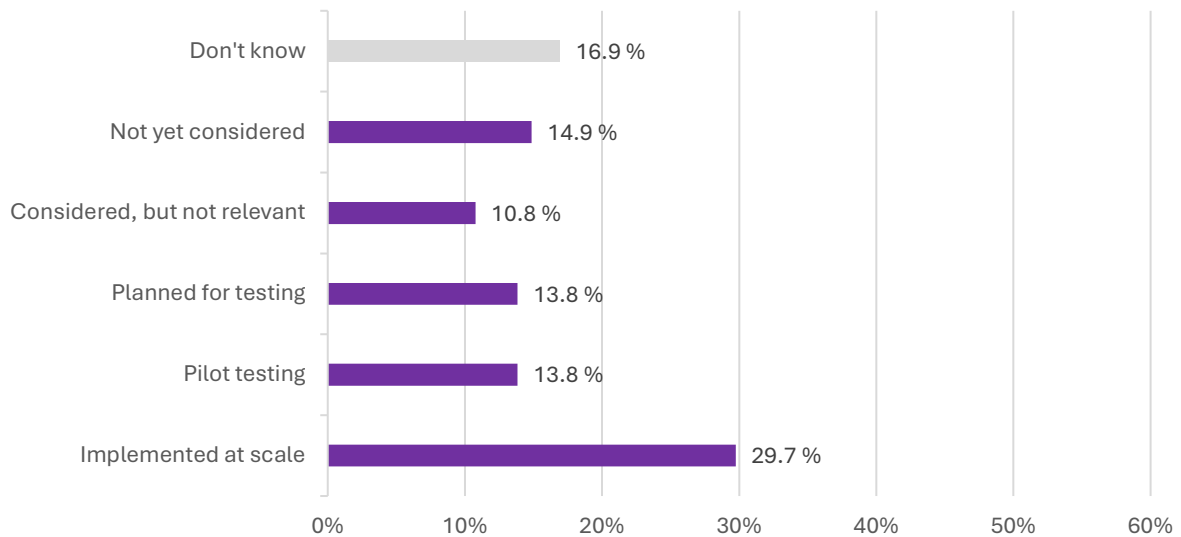
Figure 11: Current adoption of AI in sales and marketing (N = 195)



Plans

Companies show optimism towards their ability to implement AI in sales and marketing, as about twice as many companies expect to implement AI at scale in this field as are currently conducting pilot tests. The expected rate of adoption at scale is marginally lower than for engineering and R&D, and about twice as high as manufacturing or supply chain management. Also, comparing the current and expected future use of AI in sales and marketing, the relative share of companies that expect AI not to be relevant to them decreases, indicating expectations about new future uses in this field.

Figure 12: Planned adoption of AI in sales and marketing within 3 years (N = 195)



"In the future, AI can also assist salespeople with technical consultations, so we won't always need an engineer present."

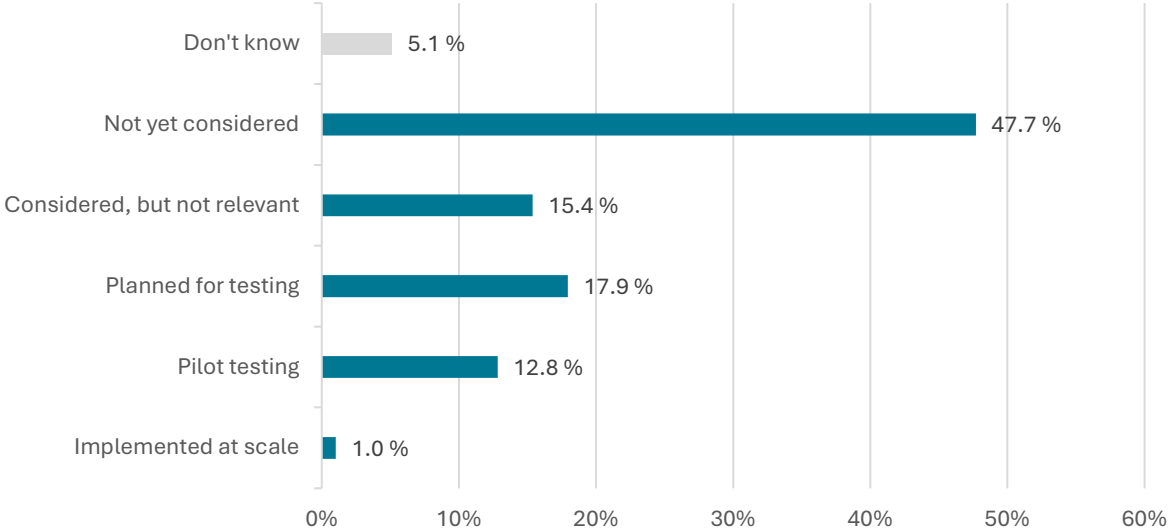
CTO, Supplier

3.3 AI in customer service and tech support

Today

Similar to application areas like manufacturing, approximately half of all companies (48%) have not yet considered using AI in customer service and tech support. Like other areas of application, implementation at scale in these areas is currently a rarity, suggesting untapped potential.

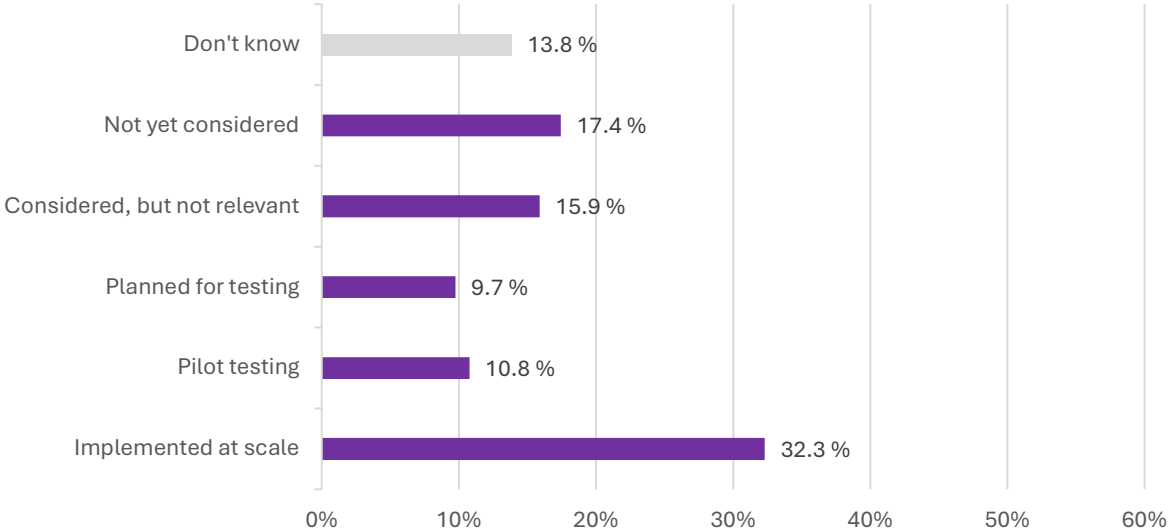
Figure 13: Current adoption of AI in customer service and tech support (N = 195)



Plans

About one-third of all companies expect to implement (32%) AI applications in customer service and tech support at scale, which is at a similar level as expected AI adoption in sales and marketing and about twice as high as supply chain management and manufacturing.

Figure 14: Planned adoption of AI in customer service and tech support within 3 years (N = 195)

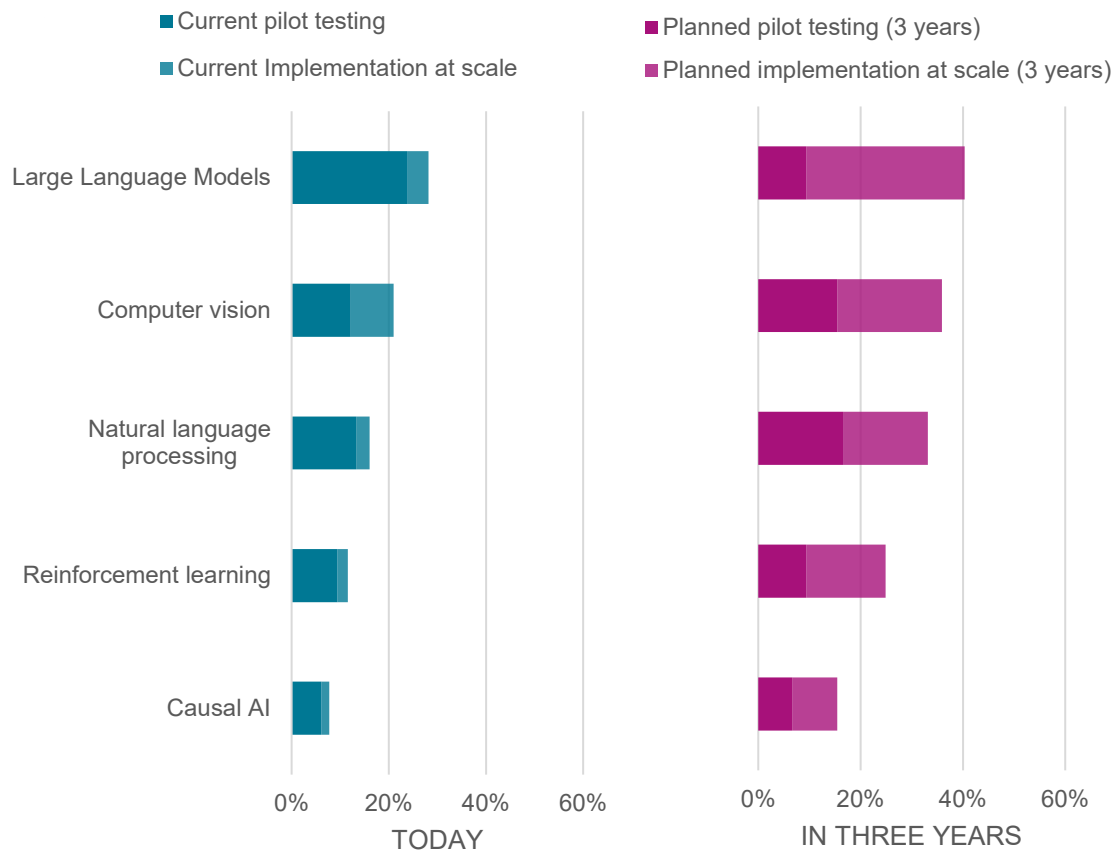


4 Choice of AI technologies

Companies are most optimistic about their ability to apply large language models to scale in the future. 31% of companies expect to be able to implement large language models to scale (up from currently 4%). This is 11% more than for computer vision, which is expected to be used to scale by 20% of the companies (up from currently 9%).

It is also noteworthy that a markedly lower share of companies is expected to be still in the pilot testing phase for the use of large language models in three years compared to other AI technologies that are relatively popular among companies. Only 9% of companies expect to be in the pilot testing phase for large language models, which compares to 15% for computer vision and 17% for natural language processing. This reflects both currently higher levels of pilot testing for large language models and may indicate a certain optimism among companies to be able to scale their use of large language models more quickly than other technologies.

Figure 15: Current and planned application of specific AI technologies (N = 181)



5 Drivers and barriers of AI adoption

Why are companies pursuing AI, and what is holding them back? This section examines the drivers and barriers to AI adoption in the Swiss tech industries.

5.1 Drivers of AI adoption

We asked companies about the importance of various factors for their adoption of AI. Efficiency improvement emerged as the most important driver of AI adoption, with 56% of companies stating that it drives their AI application either to a large or very large extent. The results also show that certain data opportunism exists among companies, as 48% of companies state that their AI adoption is either driven to a large or very large extent by the motive of using data that is available to them. With 44%, the third most important driver of AI adoption is companies' desire to improve their customers' experience.

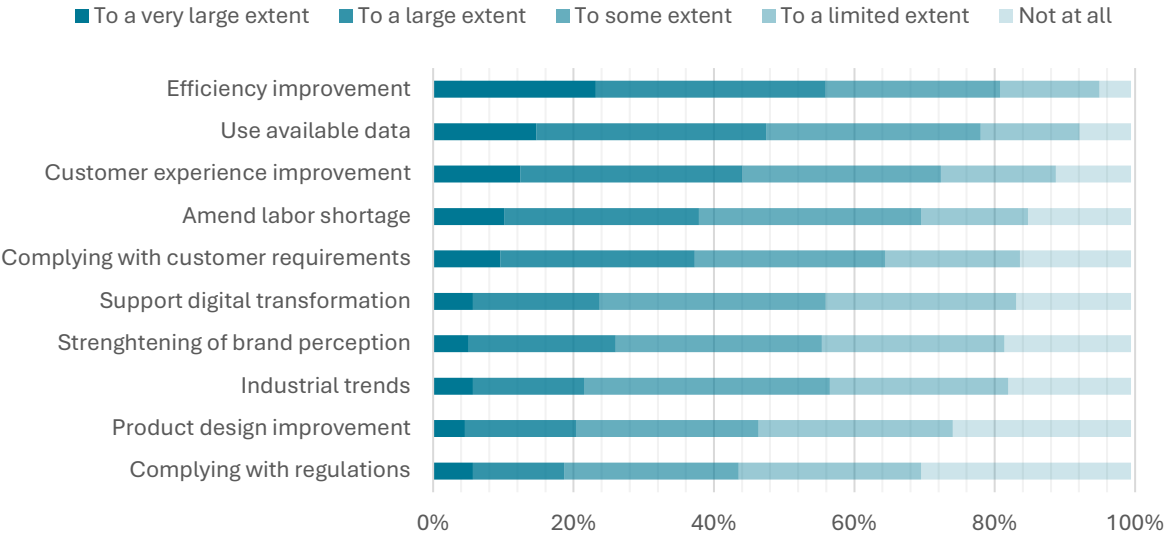
"In the past, there was active resistance against AI, but now everyone is looking at what they can do."

CTO, Supplier

The results also indicate that supporting ongoing digital transformation is of relatively lesser importance for companies' AI adoption. Only 24% of companies indicate that this motive drives their adoption to a large or very large extent. This may suggest that companies tend to view their AI adoption efforts as distinct from other already existing digitalization-related efforts and the implementation of other technologies.

Another noteworthy result is that only 22% of companies indicated that their AI adoption is driven to a large or very large extent by current trends in the industry. This result stands in contrast to the popular perception that AI is yet another hyped technology that only receives attention while currently trending.

Figure 16: Drivers of AI adoption (N = 177)



5.2 Barriers to AI adoption

According to the findings, the most important barrier is the lack of access to AI-related skills. Two-thirds of the companies (67%) answer that they either “not at all” or only “to a limited extent” have access to in-house AI skills. We find that lack of access to AI talent is even more of a burden for smaller companies. Looking at the group of smaller and medium-sized companies, we find that, for example, 31% of companies in this group state to have no access at all to in-house AI skills (23% in the main sample). 46% of respondents state they have no access at all to AI talent at universities, which is more than 10% more than in the general sample.

“More important than AI itself is the ability to work with AI, to develop it and to ask the right questions, and to interpret and critically examine the questions.”

COO, Machine Builder

Companies are also struggling to access external knowledge: 63% of companies have either only to a limited extent or not at all access to AI talent at universities. Also, accessing suitable talent and expertise from startups and consultants is a considerable hurdle for more than half of all companies.

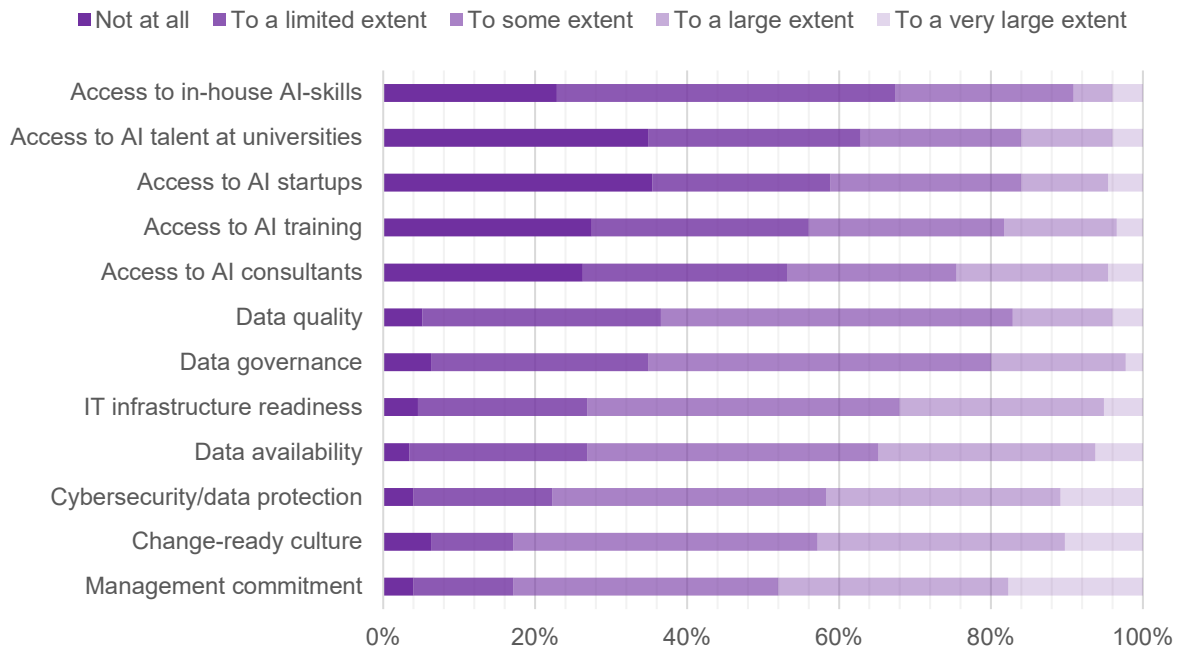
This shows that lack of access to AI skills and expertise is the most significant hurdle to AI adoption in the industry. This problem is exacerbated by the lack of access to AI-related training faced by more than half of all companies. With more efficient education and training in AI, Switzerland could be strengthened in its position as a manufacturing location. However, to deliver on this potential and not fall behind other countries instead, the skill and training gap in Switzerland concerning AI needs to be closed.

“AI-based technologies are advancing more internationally than in Switzerland. We do not have access to these skills and new technologies. We need more incentives for international collaboration in this field.”

Senior Manager, Component Manufacturer

The most important barriers beyond talent access are data quality and data governance, which about one-third of companies judge to be not at all sufficient or only to a limited extent in their companies (36%, respectively 34%). Noteworthy is also that among all the potential barriers we investigated, management commitment was judged to be the least significant hurdle. However, practical issues, including data quality and governance, continue holding companies back.

Figure 17: Barriers to AI adoption (N = 176)



Though cybersecurity and data protection appear to be no major concern for most companies with a view to the adoption of AI, they were raised as a concern during interviews.

“From a development perspective, it is extremely important for us as a company to be clear about what it means when we share data externally: who owns this data? This is also why we are currently staying away from it.”

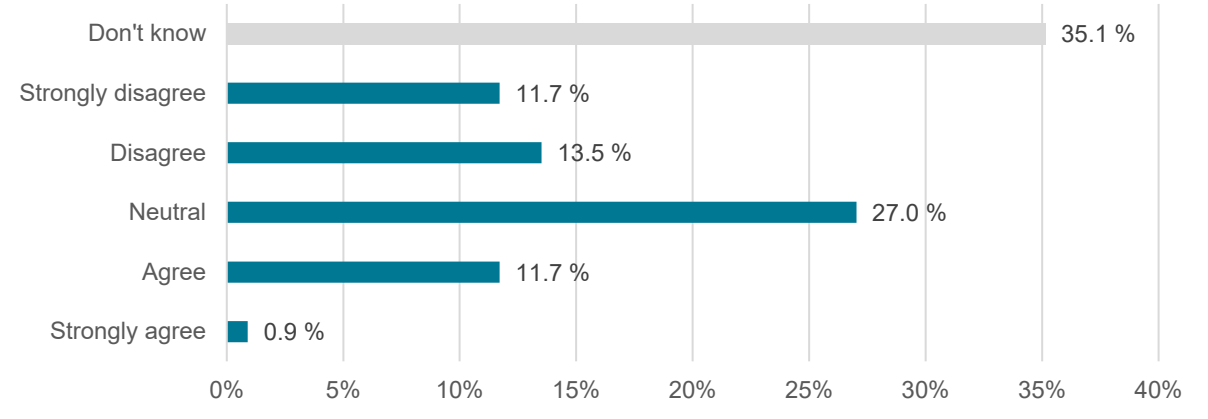
Director of Software Engineering, Machine Builder

6 Regulations

We also asked managers about their awareness and opinions concerning regulations in the field of industrial applications of AI. Remarkably, 63% of respondents were unaware of the AI regulations that their company is subject to. Only 18% of companies stated that they have a good understanding of the EU AI Act. Furthermore, 38% of companies did not know whether the EU AI Act affects them, with one-third believing it does not and 6% believing that it does. The remainder of the responding managers thought the impact of the EU AI Act was neutral toward their companies. These results show that the regulatory aspects of AI are not yet well understood by Swiss tech companies.

Generally, companies were divided in their answer to the question of whether or not more AI regulation is necessary in Switzerland. 35% of companies indicated that they do not know. One quarter disagreed or strongly disagreed with the introduction of more AI regulation in Switzerland (25%). About half as many managers approved of more regulation (13%). Another quarter was indifferent (27%) towards the idea of additional regulation.

Figure 18: Necessity of more AI regulation in Switzerland (N = 144)

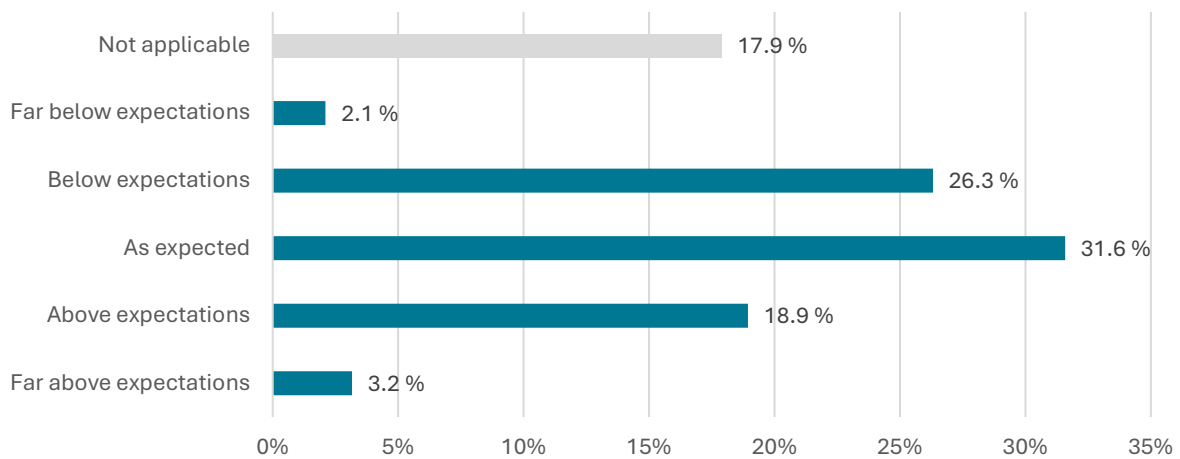


Only considering the group of companies that stated that they are aware of AI regulation that applies to them, the number of companies strongly disagreeing with more regulation in Switzerland is 5% higher, leading to higher overall disagreement levels in this group.

7 Benefits from AI adoption

Most commonly, current AI applications fulfill managers' expectations (32%). Aside from this, the number of managers stating that current AI applications have yielded returns above their expectations is somewhat lower than that of managers that have found returns to have been below expectations. This may potentially indicate that some managers had overly high expectations before implementing an application.

Figure 19: Returns on current AI applications (N = 144)



In our interviews with senior managers, we heard various contrasting opinions regarding the benefits of AI—from completely convinced of the benefits to very skeptical.

"Sometimes it is a small use cases that can make a big impact."

COO, Component Manufacturer

"I have already seen some good examples of AI use cases, but no 'game changer', more local optimizations. So far, no AI solution has convinced me enough to start a project in our company."

COO, Machine Builder

"Everyone is calling for AI – I would prefer to be informed about the associated risks."

Sales Director, Dealer

8 Case studies

We have interviewed senior managers from ten companies to learn more about the application of AI in their operations. Below, we provide a short collection of three representative use cases we encountered in our interviews with three firms: Georg Fischer, Swiss Krono, and Bossard. We also briefly present the views and approaches managers at these firms shared towards the use of AI.

8.1 Georg Fischer

Georg Fischer is a Swiss multinational company that specializes in piping systems, automotive and industrial components as well as precision machining.

The company uses AI-assisted camera systems for quality inspection to ensure quality and increase efficiency compared to solely manual inspections. Furthermore, an AI-assisted mobile application supports field service workers with information concerning common faults, replacement instructions, and item numbers. All that is needed is a photo of the part, thus facilitating service operations. In addition to this, the company is working on an AI system that will leverage the expertise of application engineers to inform the choice of manufacturing process parameters to further enhance quality and efficiency.

Looking to the future, the company is dedicated to creating a dedicated position for AI strategy development. The aim is to boost internal transparency and systematically explore over forty identified applications within Georg Fischer. For this, the company plans to collaborate with and draw on the expertise of external partners, including suppliers, universities, startups, and consulting firms. This way, the company aims to build an eco-system for future applications of AI and tackle the challenges associated with the acquisition of relevant talent.

“AI was long underestimated, and suddenly it was here – with real successes that are tremendous and that one would not have thought possible.”

Helmut Elben, Head of Corporate Strategy, Georg Fischer

Mr. Elben views AI as crucial for maintaining the competitiveness of Switzerland in the global manufacturing landscape. He is optimistic that Switzerland can gain a leading position, considering the talent pool in the country. He believes the opportunities of industrial applications of AI outweigh its risks, including data quality and intellectual property. Regulatory frameworks that seek to mitigate possible risks need to permit flexible and open-ended use of AI technology.

“AI is becoming a key topic on the C-level.”

Helmut Elben, Head of Corporate Strategy, Georg Fischer

8.2 Swiss Krono

Swiss Krono manufactures wood-based products, including laminate flooring, fiberboard, as well as chipboard for various applications in interior design.

The company utilizes AI to tackle problems associated with the inherent variability of wood as a natural resource. In an ongoing multi-year project with a machine manufacturer, they are developing and putting into practice an AI platform integrated into their production process. This platform is, among other things, able to predict quality outcomes and alert employees of potential deviations. AI is used to analyze lab test results in conjunction with machine parameters, accounting for around 4,000 variables in the company's use of machinery and material. In addition to this, an anomaly detection system has been introduced that continuously monitors important production parameters. AI-assisted camera systems are used to detect issues such as dull blades or sudden changes in the size of wood chips. Such anomalies would then be reported to operators, allowing for interventions on their side to prevent machine downtime and production errors.

In the future, the company plans to roll out the use of its AI platform to additional production lines and incorporate additional variables, including heat and electricity consumption. This way, comprehensive cost tracking in real-time would be possible for each board produced, benefitting production efficiency. Furthermore, future developments and analysis of collected data will allow the company to also utilize its AI platform to determine production requirements for custom-made products. In that way, product development will be supported, and its integration with production will be strengthened. Ultimately, the goal is to create a closed loop where machines have the capacity to self-regulate.

“Our recipes are secret, but only those who share some of their data get something in return.”

Michael Knüsel, Technical Director, Swiss Krono

Mr. Knüsel said that the rise of AI is inevitable and that industry-wide challenges, including regulatory issues, data security or liability concerns, need to be addressed. He emphasized the importance of human oversight and stressed that AI suggestions need to be critically evaluated by operators. Despite achieving high efficiency with machine operation, human operators will still be required, and the role of AI is to support them rather than replace them.

8.3 Bossard

Bossard provides specialized fastening solutions, including screws, nuts, and bolts, as well as engineering and logistics services for manufacturing and assembly processes.

Bossard leverages AI across several operational areas to enhance the efficiency of its employees and support innovation. Currently, AI is employed in the company's order system through an application that uses machine learning to predict optimal order points, thus helping supply chain managers. Product prices for customized parts can be calculated using an AI-aided manufacturing simulation and validation model. Furthermore, the company is working on scaling the use of a smart camera, created together with the startup Sentinus within the scope of an Innosuisse project. This camera—which is part of their Smart Factory Assembly—helps to ensure that all process steps, such as the application of thermal paste, have been adhered to, and this supports employees in quality assurance. This facilitates quality assurance. Currently, the application is aimed at being industrialized into a low-code or no-code environment, making it a plug-and-play solution.

In the future, the company aims to increasingly utilize AI to improve its efficiency. This could, for example, be achieved by assisting salespeople in technical consultations. AI can also be used to handle customer inquiries via an integrated email helper tool that links requests to orders without requiring order numbers. This aligns with the general view of AI in the company as a technology that can elevate employee roles and enable them to further improve their decision-making based on insights from internal AI. The ambitious adoption of AI is also due to the growing interest on the part of customers.

“We can elevate everyone by one level through AI.”

Urs Güttinger, CTO, Bossard

9 Conclusions and implications

The results of this survey reveal that AI adoption in the Swiss tech industry is still limited. We also find notable differences regarding adoption rates between larger and smaller companies, with smaller companies lagging in their adoption of AI. The findings show that the main barriers companies currently face in their adoption of AI is insufficient access to suitable expertise—both in-house and external. These problems are exacerbated for smaller companies. Despite the existing barriers, we see a clear intent among companies to scale AI applications in the near future. With regard to manufacturing and supply chain management, companies intend to focus mainly on the areas of knowledge management, predictive maintenance, and machine optimization. Companies' optimism about scaling their use of AI is particularly strong in engineering and R&D. Policymakers and managers need to address the identified challenges through strategic planning and talent development. Ultimately, a conducive environment for AI adoption will be crucial for the Swiss tech industry to achieve its ambitious plans and to sustain its competitiveness and innovation.

9.1 Implications for managers

In view of the low adoption rates, and the barriers to and challenges of AI adoption, managers should consider formulating a coherent AI strategy for their company—aligned with their goals for digital transformation. Considering the high rates of planned adoption, the implementation of a clear AI strategy may become pivotal for companies to stay competitive, successfully collaborate with their peers and set themselves apart from their international competitors. This seems to be particularly relevant for small companies that need to prevent market dominance by larger firms that utilize AI to a greater extent. In this context, strategic partnerships can be particularly valuable for smaller businesses. Despite potentially smaller resources at their disposal for technology exploration, smaller companies should not neglect the opportunities of AI.

Furthermore, companies should invest in AI talent and contribute to its development. This could be achieved by forging strong partnerships with universities and startups. As limited access to AI talent remains a considerable barrier in the industrial application of AI, companies with better access are likely to gain a formidable competitive advantage. Companies should also consider investing in AI-related training for their current employees. This would improve both the acceptance of scaled use of AI and greater efficiency and understanding of employees in handling AI-based systems.

We also suggest that companies keep a realistic view of AI adoption and avoid overestimating the progress of other companies. As the results show, the Swiss tech industry is currently in a phase of exploring new technological opportunities rather than reaping its fruits. The findings from the survey should help managers gauge industrial dynamics, ranging from companies' focus on large language models to companies' planned emphasis on the use of AI in areas such as knowledge management.

Lastly, we suggest that managers seek a clear understanding of regulations relevant to the use of AI in their business and industry. Considering the nascent stage of AI as a technology in industrial use, the regulatory landscape is likely to remain dynamic. A thorough understanding of relevant regulations would help managers to assure compliance with them and mitigate risks, including data privacy, security, and ethical considerations. Considering companies' ambitious plans for AI adoption, better regulatory knowledge appears to be crucial.

9.2 Policy implications

The results from this survey highlight an AI skills gap in Switzerland that needs to be addressed to ensure the competitiveness of the Swiss tech industry. Policymakers need to address this problem and prepare the educational system to be able to meet the increasing demand for AI talent. This could be achieved by promoting partnerships between secondary and tertiary educational institutions and the tech industry to awaken curiosity for AI technology and ensure the alignment between curricula with industry requirements. At the same time, policymakers need to consider the impacts AI is likely to have on the future of industrial work. Which skills does the AI-assisted worker of the future need to have? How can the current workforce be upskilled to work side by side with AI-based systems? Questions such as these will need to be addressed.

The results also show that there is a certain resistance of companies towards new regulatory initiatives. Considering the current phase of exploration, this is understandable, as new regulations may stifle the current dynamics existing in the industry. However, policymakers must remain alert to evolving challenges, including data privacy, ethical issues, and intellectual property. Should new regulatory frameworks become necessary in the future, policymakers need to increase awareness and understanding of them in the industry, as current knowledge about existing regulatory frameworks remains low across companies.

Policymakers should also consider honoring the economic contribution of small businesses to the Swiss economy by supporting the adoption of AI among small and medium-sized companies. This would require the design of policies, including grant programs, that would allow to level the playing field to some extent. Collaborative projects and consortia that bring together small and medium-sized companies may enable them to share knowledge and resources and boost AI exploration and implementation, ultimately benefitting the Swiss industrial landscape and economy.

Lastly, the enthusiasm in the industry points to the need for further research in the field of AI, particularly its industrial application. To support the competitiveness of Switzerland's industries, funding for cutting-edge AI projects—both encompassing fundamental research and applied research with industry—should be considered. This is likely to encourage innovation and bear tangible benefits for the manufacturing sector with positive spillovers in the Swiss economy.

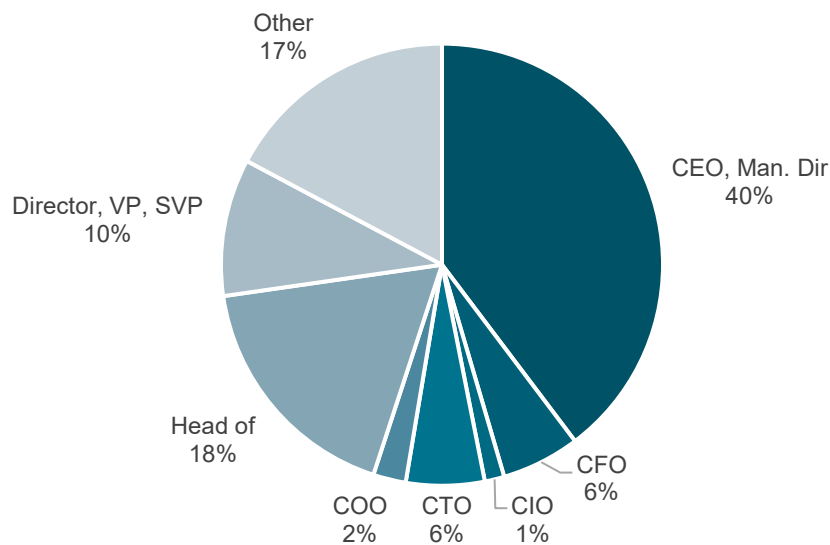
Appendix A. Sample

We received 209 responses for the survey, including 172 complete responses and 37 partially completed responses. Responding firms are headquartered in 23 out of Switzerland's 26 cantons.

Respondents

The survey was sent to senior leaders in Swissmem's member database. The organizational level of respondents is very high for this type of survey, with more than half holding CXO or Managing Director titles.

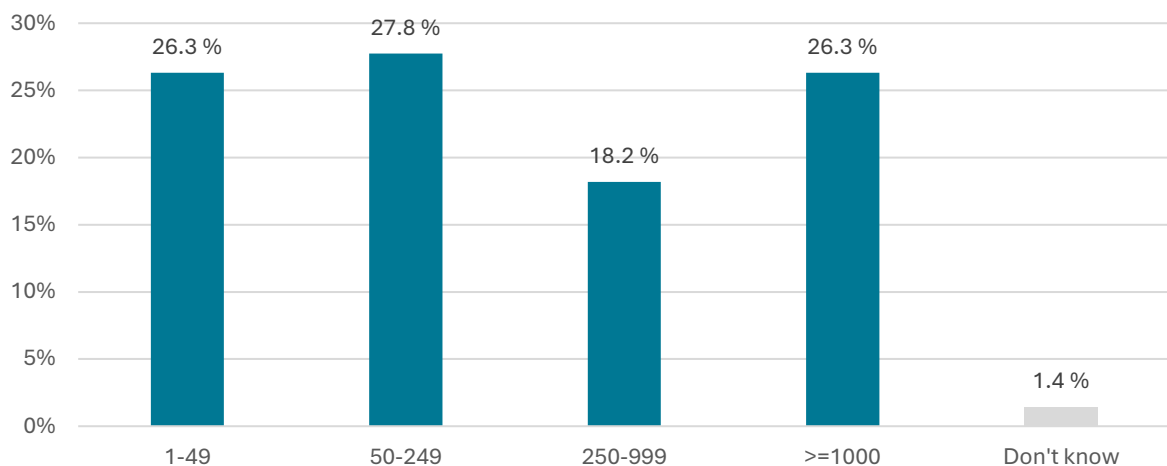
Figure 20: Respondent profiles (N = 209)



Firm size

More than half of the companies that participated in the study are small or medium-sized companies with either 1-49 (26%) or 50-249 employees (28%). 18% of participating companies have 250-999 employees. Approximately another quarter of the companies that participated in the survey have more than 1000 employees (26%).

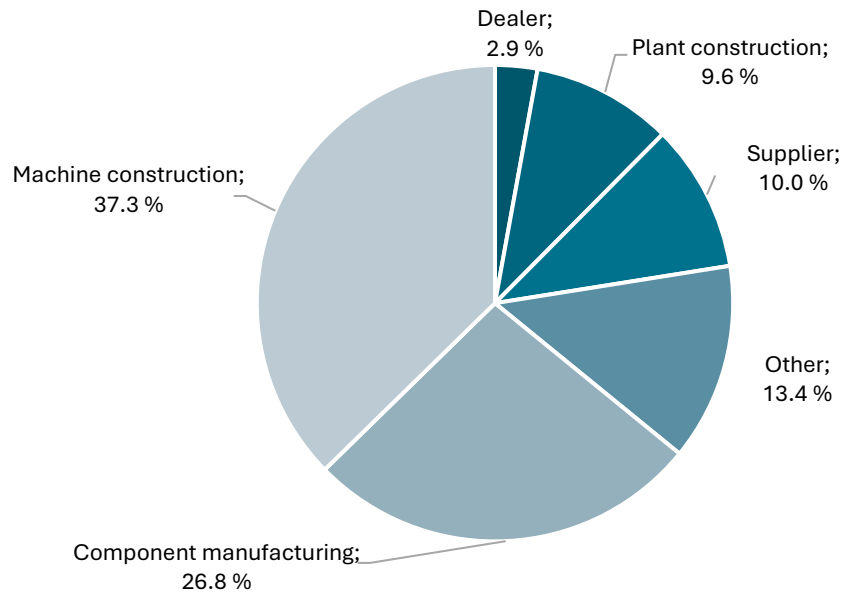
Figure 21: Total count of employees (FTE) of companies at the end of 2023 (N = 209)



Industry membership

The majority of managers who responded to the survey are from the machine construction industry (37%). The second most represented industry is component manufacturing (27%).

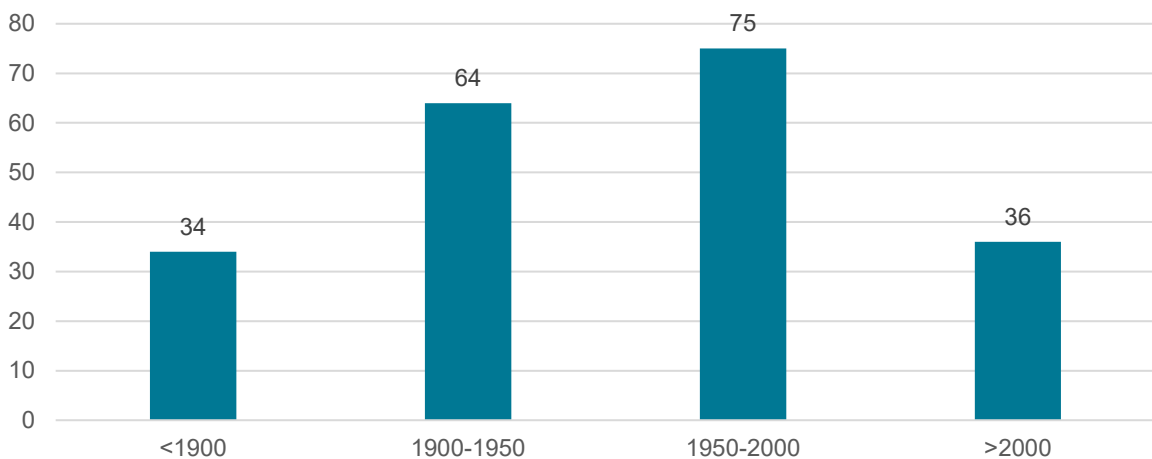
Figure 22: Industry membership (N = 209)



Firm establishment year

The sample companies' establishment years range from 1795 to 2024. The total sample of 209 firms spans a total of 15,712 operating years, with an average firm age of 75. The figure below provides an overview of the year the firms were established.

Figure 23: Firm establishment year (N = 209)



Recommended further reading

Baudin, M., Netland, T., (2022). Introduction to Manufacturing: An Industrial Engineering and Management Perspective. Taylor & Francis

Digital Switzerland, <https://digitalswitzerland.com/>

ETH AI Center, <https://ai.ethz.ch/>

Lee, J., (2020). Industrial AI: Applications with Sustainable Performance. Springer

Next Industries, <https://www.nextindustries.ch/wissen-industrie-40>

SATW, <https://www.satw.ch/en/focus-topics/artificial-intelligence>

Swiss AI Research Overview Platform, <https://www.sairop.swiss/>

World Economic Forum (2022). Unlocking Value from Artificial Intelligence in Manufacturing, White paper, <https://www.weforum.org/publications/unlocking-value-from-artificial-intelligence-in-manufacturing/>

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