The Deutschland Case: How AI Is Renewing The Industrial Business Model

MANAGEMENT SUMMARY

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1. Introduction: Germany's AI model as a competitive factor

Artificial intelligence (AI) is emerging as a key competitive factor for the German economy. According to this study, companies are already generating more than EUR 120 billion in turnover from product innovations that incorporate AI elements.

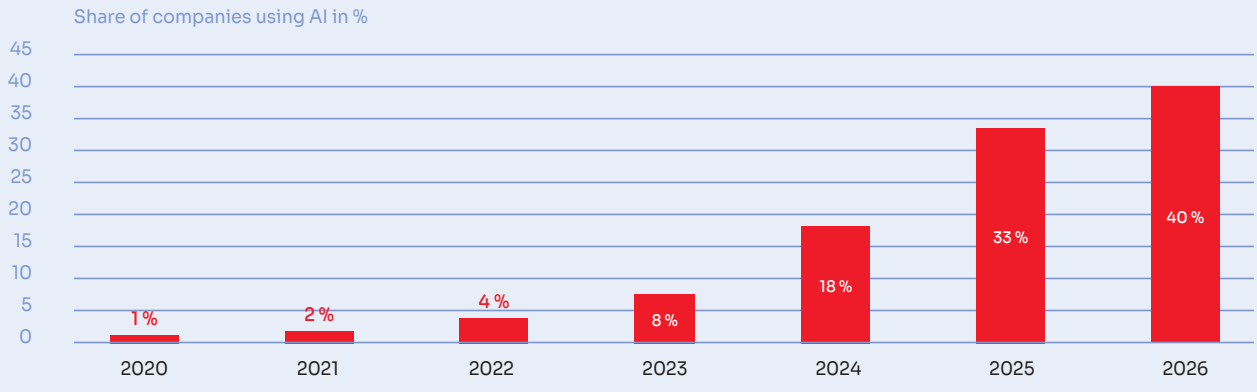
An approach to the commercial use of AI is emerging in Germany that is based on the further development of existing AI technologies, the integration of proprietary data and strong engineering expertise. Germany's competitive advantage lies in the industrial context. Companies are not developing AI in the form of basic models, but are primarily deploying it within existing manufacturing, development and value-added processes. Industrial AI combines machines, sensor technology, real-time data and machine learning models – an environment in which Germany enjoys particular competitive advantages due to its strong industrial base, extensive data sets and high level of technological expertise.

At the same time, the findings highlight how important the successful deployment of AI is for competitiveness and innovation, and how it is increasingly becoming a key priority for economic and regional policy. To sustainably harness the economic potential of the technology, key building blocks include the expansion of AI expertise and further training initiatives, improved access to data, and high-performance digital infrastructure. Equally important are reliable and predictable framework conditions that offer companies guidance and investment security, whilst at the same time not hindering the development and application of new AI solutions.

2. Competitive dynamics and the widespread adoption of AI

The German AI sector is highly dynamic: the use of AI applications among companies in Germany has more than doubled since 2024 (+118 per cent) and currently stands at 40 per cent.

Figure 2.1
Trends in AI usage over time



Source: Company survey, N = 500

Companies are adopting AI in a differentiated manner: on average, the surveyed companies are familiar with 6.4 AI foundation models and actively use 2.7 of them. Three out of four AI users pursue a multi-model strategy and select models specifically according to use case and adaptability.

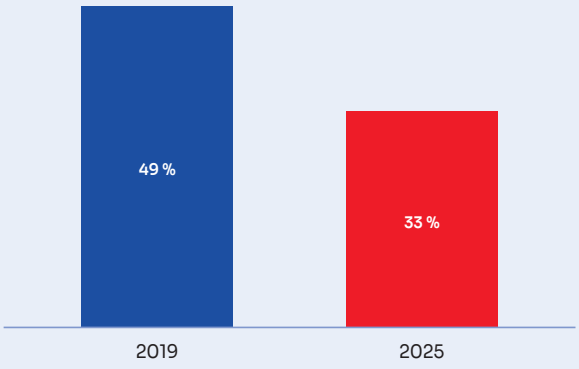
The areas of application for AI now extend far beyond individual pilot projects. Almost all AI users employ the technology for text and speech processing (90 per cent) – ranging from document analysis to scientific bots. Around half use AI for image and video analysis, as well as for process automation. In addition, many users employ AI for predictive models, customer service applications, and software development. Therefore, AI is permeating various business functions and professional roles; it's no longer confined to IT departments.

An analysis of 55 million online job advertisements from German companies underscores this shift. Companies are expecting AI skills in an ever-increasing number of job profiles: only one in three job advertisements requiring AI skills is still an IT role; in 2019, it was one in two. AI is increasingly becoming a foundational and cross-cutting technology, with practical skills in its application expected in a growing number of roles.

Figure 2.2

Share of IT roles in AI job advertisements

Share of all online job advertisements requiring AI skills



Source: Analysis based on Textkernel (2026)

The pace of investment underscores that this is not a short-term trend: almost two-thirds of companies (64 per cent) are planning to increase their AI budgets – an indication that the use of AI is seen as a long-term competitive factor and that market momentum is likely to remain at a high level in the future. In addition to technological capabilities (64 per cent), a particularly strong influence on companies' investment decisions is exerted by reliable regulatory and legal frameworks (43 per cent).

The momentum in the AI sector is also reflected in a new generation of specialised AI start-ups: around 71 per cent of the AI start-ups surveyed were founded since 2021. 21 per cent of these were founded in 2022 – the year in which generative AI came increasingly into the public and economic spotlight worldwide following the release of the ChatGPT language model. A survey commissioned by the German Startup Association (2025)[1] confirms the importance of AI for the dynamism in the German start-up sector: around 45 per cent of the start-ups surveyed state that AI is at the heart of their product or business model. Compared with the previous year, this represents an increase of six percentage points. This trend illustrates that the use of AI is increasingly becoming a strategic area of innovation for young, technology-oriented companies.

[1] Hirschfeld et al., 2025: German Startup Monitor 2025, https://startupverband.de/media/file/rs-deutscherstartupmonitor2025

3. The Deutschland Case: Application-oriented AI based on industrial expertise

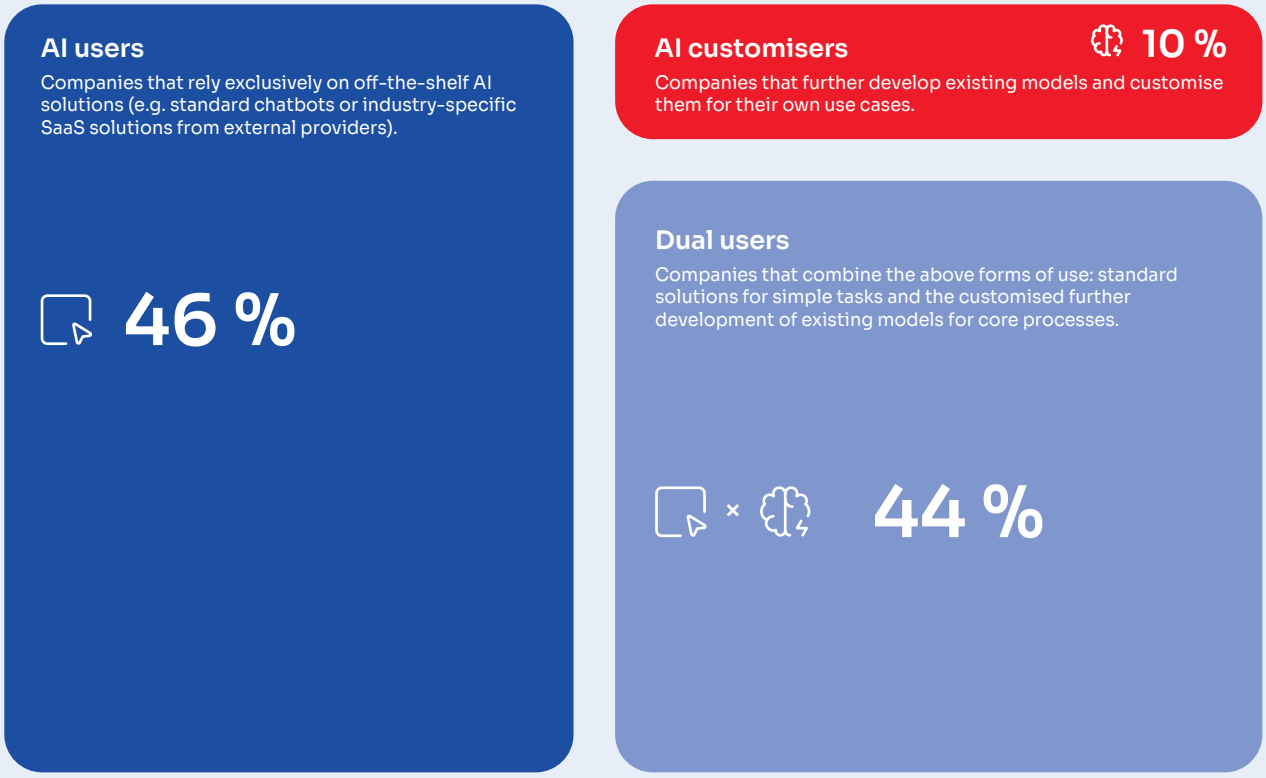
Germany's competitive advantage in the AI era lies in combining AI with industrial value creation and further developing it for specific use cases. Strategic advantages exist particularly where AI is closely linked to manufacturing, development and value-creation processes. Germany is ideally placed for this: it has a strong industrial base accounting for around 20 per cent of value creation, extensive data sets, and strong expertise in production technologies and applied research.

At company level, three groups of AI users can be distinguished in Germany:

- **AI users** who rely exclusively on off-the-shelf solutions,
- **AI customisers** who further develop existing models, and
- **dual users**, who combine the above forms of use.

Figure 3.1
Groups of AI users in Germany

Companies using AI



Source: Company survey, N= 226

More than half of companies (54 per cent) adopt a customised approach – including dual users, who deploy both general-purpose and customised AI applications in parallel. Overall, 44 per cent of companies combine both forms of use, whilst one in ten companies uses only models they have developed themselves. 46 per cent of companies are limited to the use of off-the-shelf solutions.

A key difference between users and customisers lies in their approach to data. AI customisers and dual users are far more likely to regard their operational

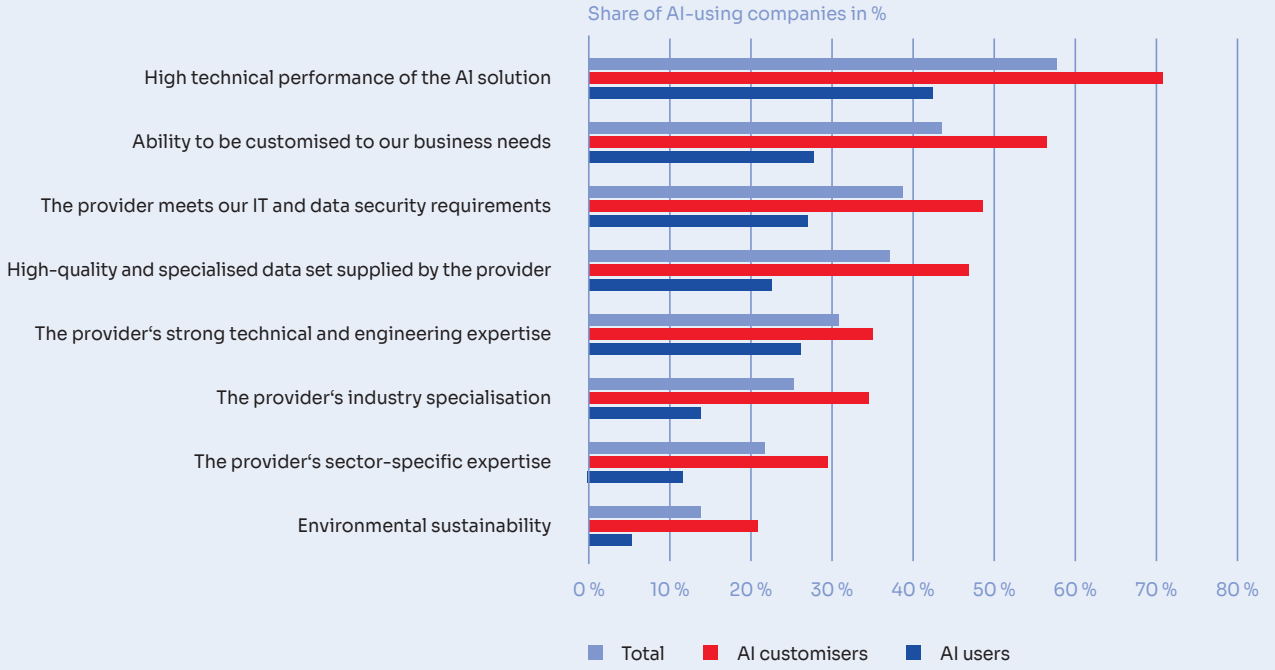
data as a key success factor than users of off-the-shelf solutions (54 per cent compared with 23 per cent). The integration of company-specific data thus proves to be a key lever for unlocking additional value-creation potential beyond standardised applications.

This logic of customisation also shapes the choice of provider:

- 58 per cent of all companies cite the technical performance of the models as the most important selection criterion, whilst 43 per cent cite customisation options;
- Among AI customisers, these figures rise to 71 per cent and 57 per cent.

This group is looking for models that are powerful yet capable of integrating with their own data sets and internal business process logic. Accordingly, 83 per cent of AI customisers rely on multi-AI and utilise the technology across a broader spectrum of applications. In particular, in the area of process automation – a key driver of productivity – their adoption rate, at 63 per cent, is significantly higher than that of general users (36 per cent).

Figure 3.2
Selection criteria for AI applications



Source: Company survey, N = 140

Companies that combine general-purpose AI models with customisation for specific use cases achieve better economic results. The survey shows that a dual AI strategy is associated with greater innovation and stronger employment growth:

- 20 per cent of these companies recorded employment growth between 2024 and 2025 (compared with 17 per cent of all AI users).
- At 6.1 per cent, the average employment growth is above the average for all AI users (5.2 per cent).
- Around 82 per cent of them are classified as innovators and have brought at least one product or service innovation to market since 2023 (compared with 70 per cent of all AI users).

The results suggest that AI unleashes economic potential particularly when general-purpose foundation models are combined with company-specific data and process knowledge. In this way, AI reinforces precisely those competencies – such as engineering expertise and sector-specific know-how – that significantly shape the competitiveness of the German business model.

Focus of AI start-ups: further development rather than developing their own foundation models

The AI start-ups surveyed fit seamlessly into this pattern. Their business model is based primarily on adapting and customising existing AI models for specific use cases. Their solutions are predominantly built on existing foundation models (83 per cent), involve targeted fine-tuning (68 per cent) and, in 71 per cent of cases, utilise their own or customer-specific data.

According to their own assessment, their competitive advantages lie primarily in three areas:

- Industry-specific expertise (88 per cent),
- engineering expertise (87 per cent) and
- the customisation of AI solutions to meet client needs (79 per cent).

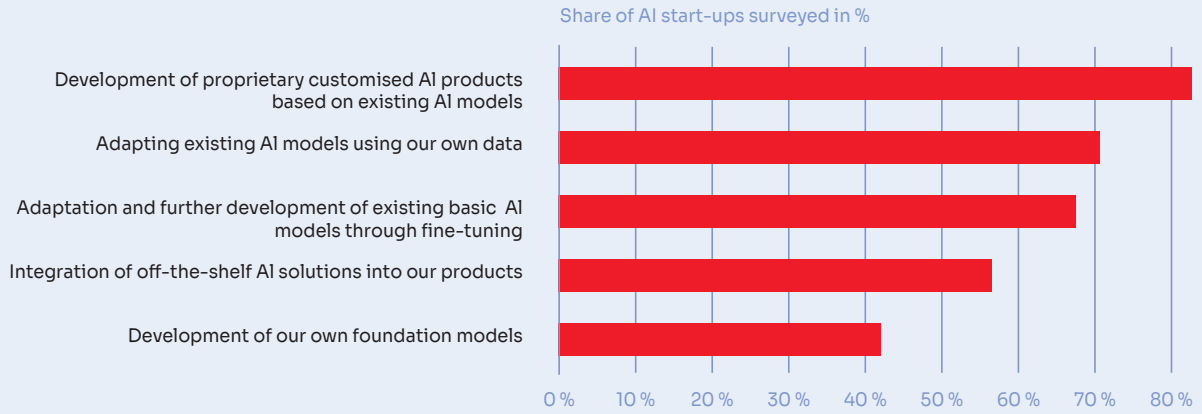
Access to data plays a key role in this context. A high-quality, specialised database – particularly machine and process data – is essential for 71 per cent; 84 per cent use industry-specific data, whilst 78 per cent use public datasets. Key areas of application include process automation, the development of predictive models, software solutions, and image and video analysis. More than half of the AI start-ups surveyed are specifically developing solutions for industrial applications (51 per cent).

The AI start-ups surveyed thus act as intermediaries between global foundation models and the needs of the German economy:

- They adapt the latest AI technologies for industrial use,
- refine them with proprietary data, and
- deploy them within existing system landscapes.

Figure 3.3

Forms of AI development among the AI start-ups surveyed



Source: AI start-up survey, N = 79

The industry sector: active AI customisers

The customisation of AI applications is particularly pronounced in the industrial sector. AI in industry is subject to different requirements than in purely software-based application areas. Hardware, sensor technology and machine learning models must work together whilst meeting high standards for real-time capability, robustness and the ability to be deployed within existing system landscapes. This places specific demands on technical performance, data integration and the incorporation into machinery.

This is reflected in the selection criteria of industrial companies: 59 per cent of industrial companies cite high technical performance as a decisive factor when choosing AI solutions. 46 per cent attach great importance to a specialised data base (compared with 37 per cent in the services sector), whilst around a third prioritise sector-specific expertise (compared with one-fifth in the services sector).

At the same time, the industrial sector is proving to be a particularly active AI customiser. One in four industrial companies uses AI; among these AI users, 62 per cent are already pursuing a specialisation approach in which existing models are further developed into bespoke solutions using their own data and application knowledge.

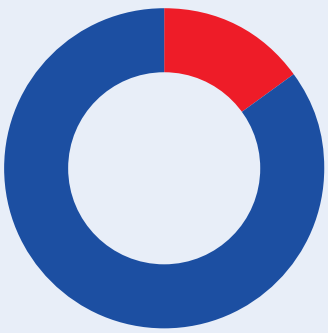
The effects on the industry's innovative strength are clear: 71 per cent of AI-using industrial companies are innovators. More than one in three companies has implemented a process or product innovation with the help of AI since 2023. Among industrial companies not using AI, this proportion stands at only around 20 per cent.

The results show Germany's independent positioning in the international AI competition: competitive advantages arise above all where existing AI technologies are combined with industrial process knowledge, sector-specific expertise and high-quality data. The AI start-ups surveyed are supporting this development by customising foundation models for specific industrial application areas and implementing them into existing processes.

4. AI is emerging as a driver of innovation in the German economy

German companies are already generating over EUR 120 billion in turnover from product innovations that incorporate AI elements. This means that the share of turnover generated by innovations with AI elements now stands at more than 15 per cent of total innovation turnover. One in ten companies has launched at least one product innovation incorporating AI elements in the past three years.

Figure 4.1
AI as a driver of innovation in Germany

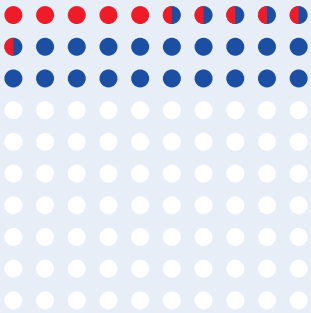


Companies are already generating **€120 billion in revenue** through product innovations with AI elements

- **15 %** Revenue from product innovations with AI elements
- **85 %** Revenue from product innovations without AI elements

Figure 4.1

Spread of AI innovations

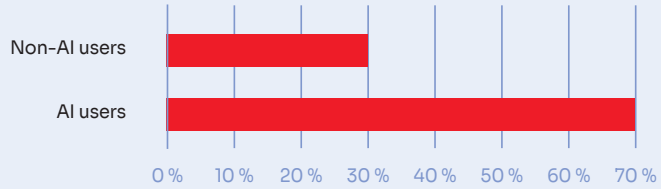


11 per cent of all companies have developed an **AI product innovation**.

Every fifth company has developed at least one **innovation with an AI element** in the last three years.

- Only AI product innovation
- Only product innovation without AI
- Both product innovations with and without AI
- No product innovation

The innovation gap



AI users are **more than twice** as likely to be innovators.

- Share of innovators

Source: Company survey, N = 226

Overall, 41 per cent of AI-using companies have produced product or process innovations incorporating AI elements over the past three years. One in five AI-using companies states that all of its innovations during this period incorporated AI elements. Applied to the economy as a whole, this means that one in five companies in Germany has developed a process or product innovation using AI. This means that the proportion of these companies is just as high as the proportion of companies that were innovative but implemented their innovations exclusively without AI elements.

The innovation gap between AI users and non-users is considerable: 70 per cent of companies using AI are classified as innovators, compared with just 30 per cent of companies not using AI. AI is thus emerging as a strategic lever for competitiveness, growth and technological renewal in Germany.

The boost to competitiveness achieved through the use of AI for innovation is evident not only in the turnover generated but also in higher employment growth. Companies with innovations incorporating AI elements recorded an average employment growth of 11.5 per cent last year, whilst innovators without AI elements stood at 1.1 per cent. These effects are particularly pronounced among dual users, who combine off-the-shelf AI solutions for standardisable tasks with targeted fine-tuning for core processes. This group consistently achieves better results than pure users: 82 per cent are classified as innovators (compared with 70 per cent of all AI users), 20 per cent report employment growth (compared with 17 per cent), and the average employment growth rate of 6.1 per cent is above the average for all AI users (5.2 per cent). The differences are moderate but consistent: companies that do not merely apply AI but further develop it using their own data and process knowledge achieve higher growth and stronger innovation performance. The use of AI is thus already contributing to the innovation and growth momentum of German companies.

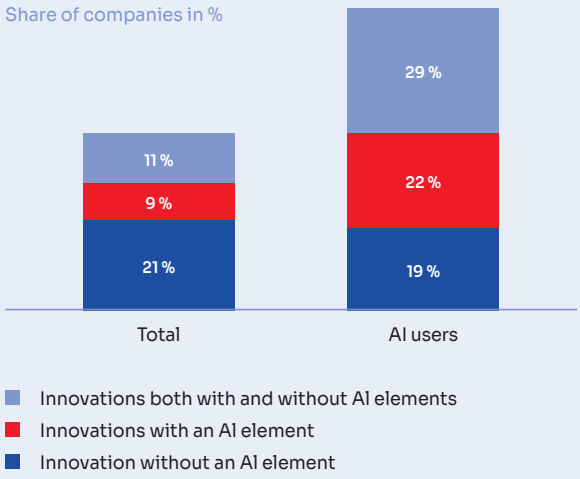
At the same time, the results show that the economic potential of AI has so far only been partially realised. Around 15 per cent of revenue generated through innovation is currently attributable to innovations incorporating AI elements. 60 per cent of companies in Germany do not yet use AI. There is a significant diffusion gap between the pioneers and the wider business community.

The causes lie less in technological barriers than in a lack of application prospects and implementation resources. The companies cite the following as the main obstacles:

- a lack of relevance of AI to their own business model (61 per cent),
- a lack of capacity and resources to engage with AI (34 per cent),
- as well as the lack of suitable AI applications (32 per cent).

Therefore, the further adoption of AI will depend less on new technological breakthroughs than on its successful application to specific business use cases. It will be crucial to support companies in identifying potential applications, building up expertise and applying AI within existing business processes.

Figure 4.2
Distribution of innovators – all companies and AI users



Source: Company survey, N = 226

5. Framework conditions for scaling up AI: skills, data, infrastructure and planning certainty

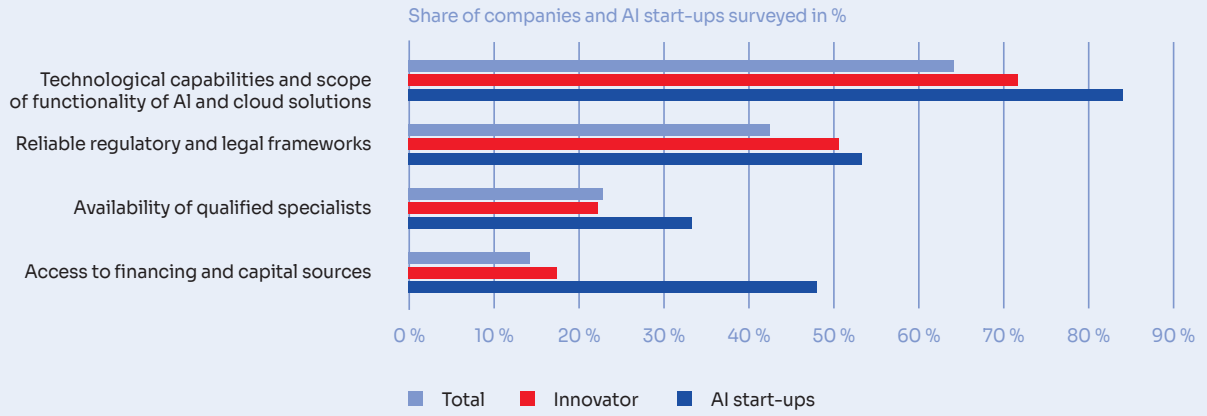
The study's findings show that the further adoption and commercial use of AI in Germany are driven by three key framework conditions:

- **Skilled workers, competencies and training:** As the use of AI becomes more widespread, the demand for AI skills is growing across the entire economy. The study's findings show that a lack of capacity and insufficient engagement with the topic are among the main reasons for the lack of AI adoption to date. At the same time, around 60 per cent of companies regard information and training programmes as important measures for promoting AI applications. Building up competency is therefore becoming a key prerequisite for closing the existing AI adoption gap and supporting companies in making productive use of the technology.
- **Data access and industrial data:** The greatest potential for value creation arises where general AI models are combined with company-specific data and domain knowledge. High-quality, interoperable and usable data sets are a decisive competitive factor, particularly for industrial applications.
- **Powerful and scalable digital infrastructure:** Companies are investing more in modern digital infrastructure and are increasingly relying on flexible multi-cloud strategies. Furthermore, the study shows that cloud users innovate more than twice as often as companies that do not use cloud services. Access to scalable computing capacity and high-performance Internet networks can therefore play a key role in supporting the further development and adoption of AI applications and digital innovations.

Regulatory clarity as the basis for investment and planning certainty

Whether companies invest in digital infrastructure, skills and data depends largely on the economic and regulatory framework. The survey shows that, alongside technological capabilities, reliable regulatory and legal frameworks in particular influence companies' investment decisions. 43 per cent of companies cite this as a major influencing factor – this figure rises to 51 per cent among innovators and to 53 per cent among AI start-ups. To scale up AI further, companies and AI start-ups need stable and predictable conditions that provide investment certainty, enable innovation and allow sufficient scope for the development, testing and scaling of new applications.

Figure 5.1
Influence on investment decisions



Source: Company survey N = 226; AI start-up survey; N = 76

6. Conclusion and Outlook

The economic diffusion of AI is only just beginning. With the increasing capabilities of AI models and new developments such as agent-based and multimodal systems, the range of possible applications will continue to expand in the coming years. This development offers Germany the chance to combine existing industrial strengths with new digital technologies and to increase productivity, innovation and competitiveness in a sustainable way. If Germany creates the conditions for the widespread application, further development and scaling of AI, it will be well placed to establish itself as a leading location for applied and industrial AI in Europe.

About the study

This study is based on a multi-stage methodological approach that combines a literature review, surveys of 500 companies and more than 80 AI start-ups, and an analysis of 55 million online job advertisements. The focus is on a comprehensive analysis of current developments and competitive dynamics in the AI sector in Germany. In addition to reviewing existing research findings, the study collected empirical data on the use of technology, investment and innovation strategies, and the requirements placed on employees and their skills. By combining quantitative and qualitative perspectives, the study provides nuanced insights into the use, development and significance of AI in German companies, as well as the AI start-up landscape.

Download the full study →

(available in German only)

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eco – Association of the Internet Industry
Lichtstrasse 43h
50825 Cologne
Germany

Tel.: +49 221 70 00 48-0
Email: info@eco.de

eco – Capital Office Berlin
Französische Strasse 48
10117 Berlin
Germany

Tel.: +49 30 2021567-0
Email: berlin@eco.de

international.eco.de

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IW Consult GmbH
Konrad-Adenauer-Ufer 21
50668 Cologne
Germany

Tel.: +49 221 49 81-758

iwconsult.de/en/

Authors of the study

Jan Felix Engler
Henry Goecke
Hanno Kempermann
Christian Kestermann
Armin Mertens
Fiona Seiler