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Embracing the GenAI opportunity

How Europe can seize the vast potential of Generative Artificial Intelligence

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About the authors

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EXECUTIVE SUMMARY

The GenAI decade

This report explores how Generative AI (or 'GenAI') will reshape businesses and economies in Europe over the course of this decade.

We believe that GenAI is one of the most significant technologies of the era, and the present decade will be defined by GenAI-driven advances. The opportunity is huge: our analysis shows that overall, GenAI has the potential to raise annual GDP growth in Europe[1] by between 0.4% and 0.7% by 2030, representing a substantial uplift in a period where growth unadjusted for AI effects is forecast to be only around 1.4%.[2] GenAI could furthermore help contain Europe's structural shortage of skilled labor, while conferring both short-term and long-term competitive advantages on companies that successfully adopt GenAI at speed.

Against that background, we identify the industries and individual countries most exposed to the opportunities as well as the risks of GenAI, and the strategies and public policies most likely to foster a benign, growth-oriented implementation of GenAI capabilities in business.

Understanding this technology and its implications is not a choice for leaders, but a necessity.

1 Scope = EU + Switzerland + Norway
2 Source: S&P Global real GDP forecast (January 2024)

The power of GenAI

To understand the power and impact of GenAI we need first to comprehend the inherent advantages of this transformational iteration of AI technology.

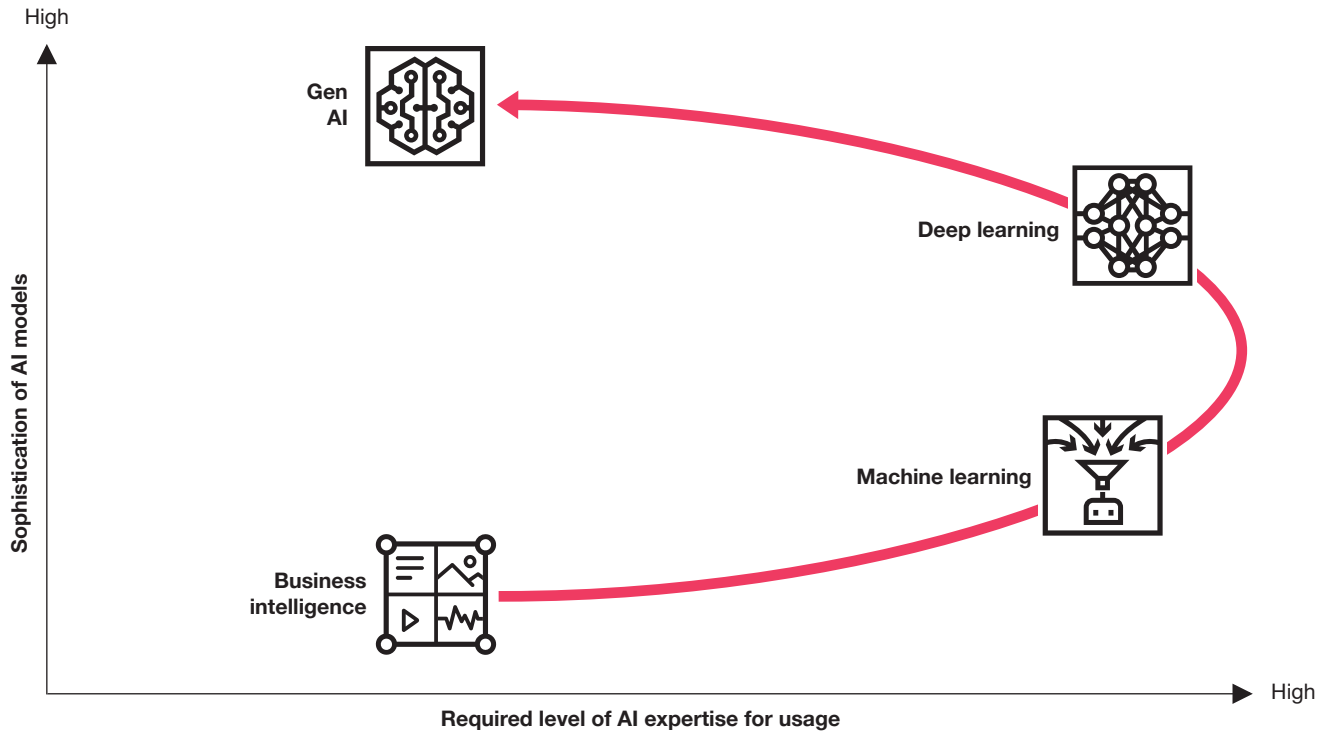
In practice, the key characteristic of GenAI is that maximum benefit can be gained with minimal knowledge of AI – in contrast to Machine Learning and Deep Learning. GenAI can be used without any specific AI or even computing skills, and can respond to ambiguous inputs to create both quantitative and qualitative outputs.

Put simply, GenAI can answer the kinds of questions a non-specialist human might ask, and generate an output that includes pictures and audio as well as text in any language. More sophisticated in terms of output than any previous automated intelligence and learning application, yet simpler in terms of usability, GenAI is a true turning point in terms of range, adaptability, and user-friendliness (*see Exhibit 1*).

Critical new technologies have always boosted GDP. Since the introduction of mechanization to agriculture in the 18th century, such technologies have either been enablers of greater automation or automation innovations themselves. GenAI has been called 'the automation of automation', promising a step-change in industrial productivity.

EXHIBIT 1
Overview of GenAI

Development of AI sophistication and required expertise



Source: Strategy& analysis

GenAI in action: who wins?

The arrival of GenAI as an accessible technology across all sectors of the economy is likely to significantly improve innovation capabilities and business efficiency along the entire value chain. As a result, it will deliver even broader and more impactful productivity gains than other disruptive technologies in the past.

The potential benefits of GenAI, however, are unevenly distributed across sectors. Therefore, implementation of the technology will tend to increase the value-added differential between different industries. Yet in all sectors, companies can maximize the advantages of GenAI through careful assessment of internal use cases, seen through the lens of real-world productivity gains.

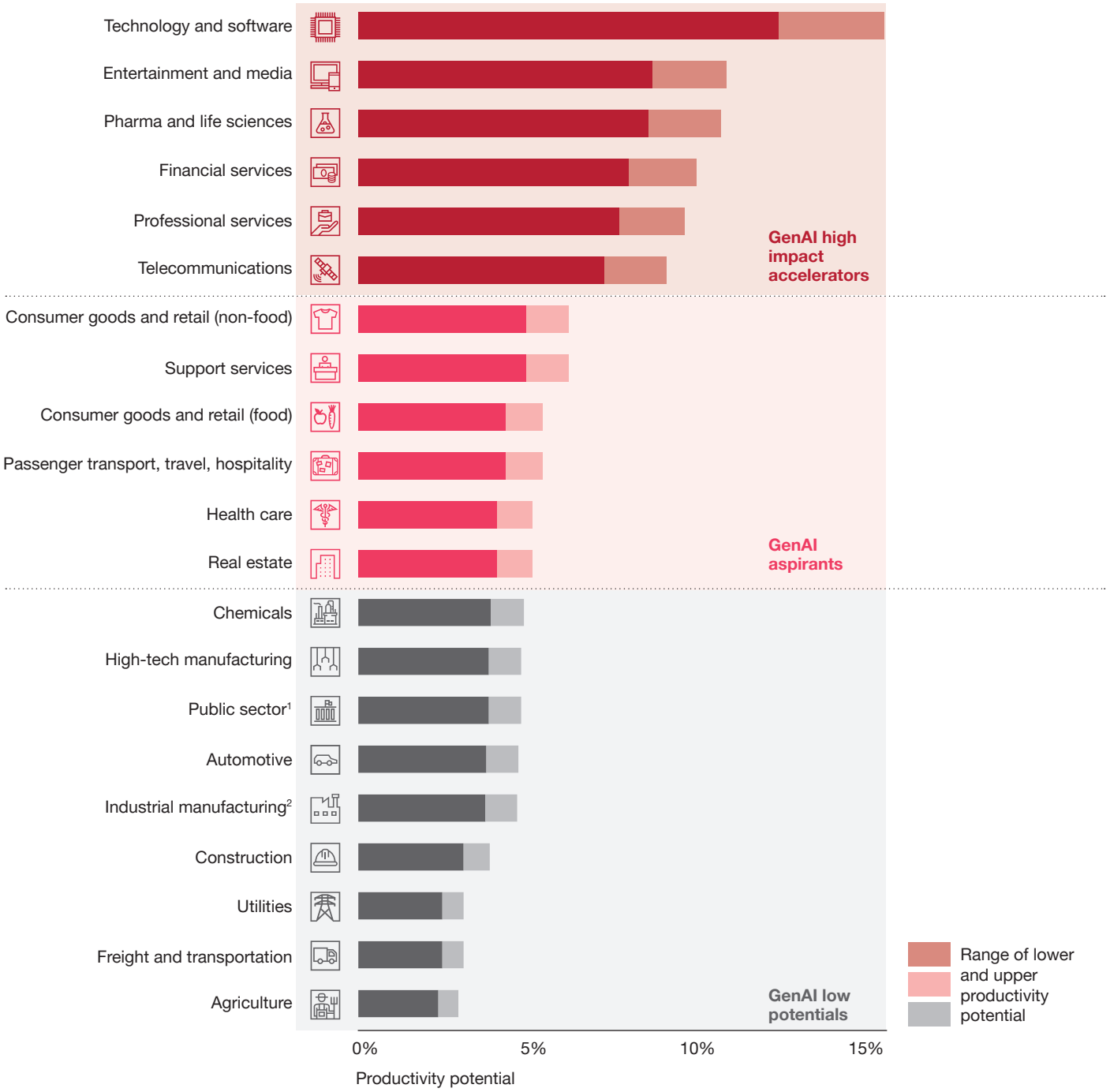
In the GenAI decade, the technology's potential for different industries can be defined as high-impact (companies have the potential to accelerate the development of the GenAI family of technologies and achieve rapid impact both on revenues and bottom-line performance); GenAI-aspirant (companies can capture new efficiencies from GenAI applications developed largely outside their own domain, with impact on the bottom line); and low-potential (physical labor or production dominates the value chain and automation, supplemented in part by GenAI, can make a notable but lower contribution to productivity if implemented effectively) (*see Exhibit 2, next page*).

For industries with lower impact potential, there might be a risk of 'missing the boat' and being slowly but steadily overtaken by competitors. For high-impact industries, the challenge is that true business model disruption may occur – and companies are either able to keep up, or find themselves out of business quickly. Either way, they need to closely monitor the movements of their peers.

"GenAI will deliver even broader and more impactful productivity gains than other disruptive technologies in the past."

EXHIBIT 2

GenAI potential by industry



1 Including public admin. and other services, defense and education
2 Including mining and quarrying
Source: Strategy& analysis

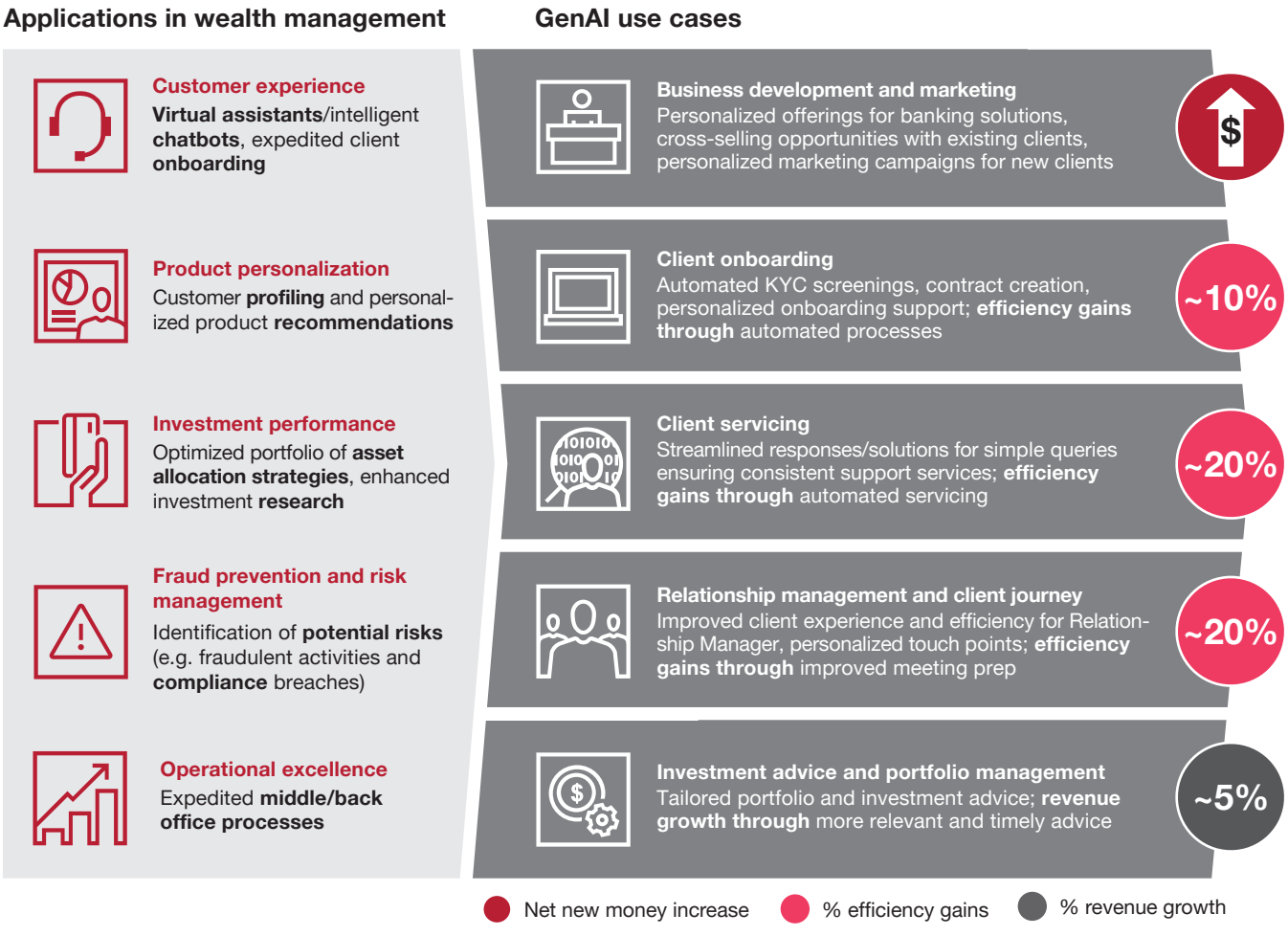
This is the real world

GenAI is a logical extension of the Predictive AI technologies that many companies have already implemented in their business processes and customer-facing operations. It is not a bolt from the blue, so comes as no surprise that real-world use cases are already being translated into the working machinery of business. In some cases, these GenAI implementations remain 'next steps'; in others, they are already operational. And the cross-industry nature of GenAI applications is already apparent.

In **financial services** we observe significant GenAI impacts on client services in wealth management. GenAI is well adapted to streamline the onboarding process, personalize wealth management products and deliver high-value investment advice, leading to greater efficiency for relationship managers and an enhanced customer experience (*see Exhibit 3*).

EXHIBIT 3

GenAI-empowered client servicing assistance in wealth management – use cases

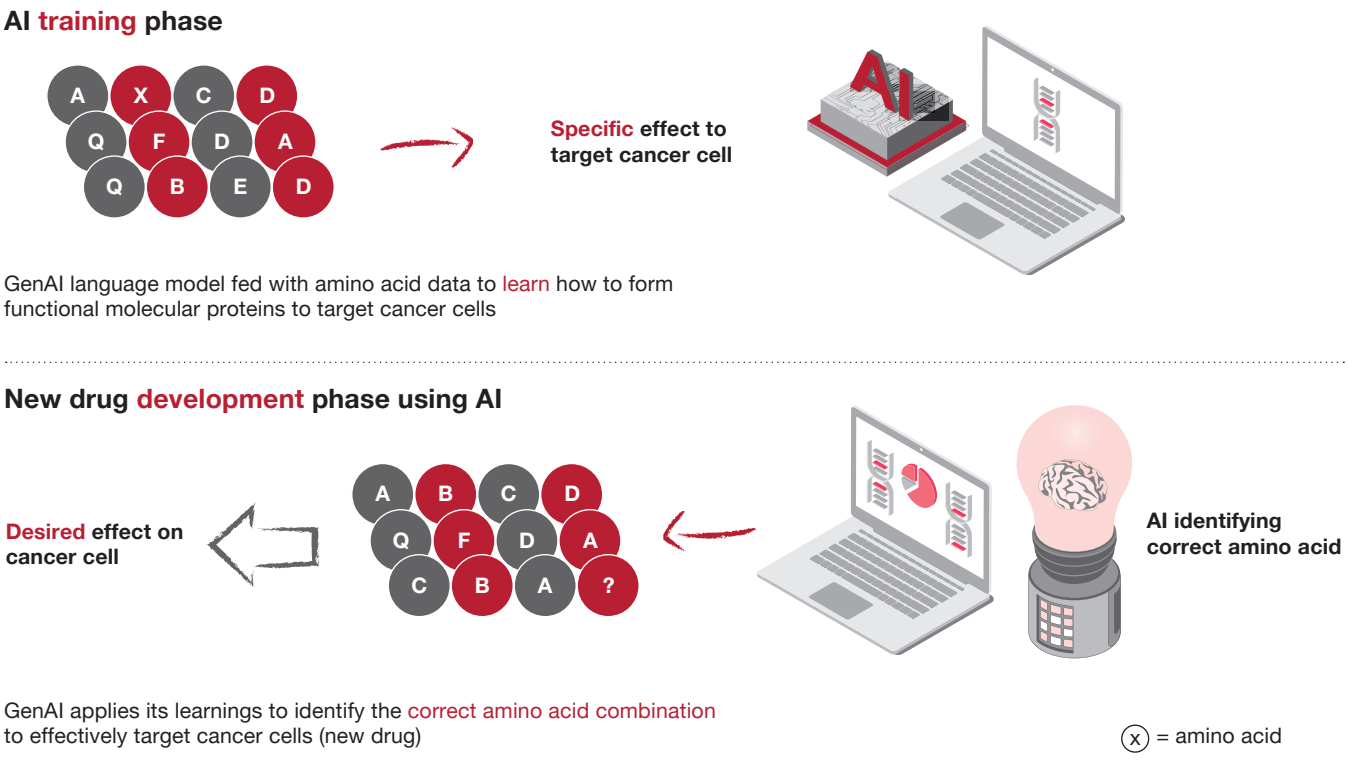


Source: Strategy& Asset Management Study (2023); Strategy& analysis

In **life sciences** GenAI has the potential to revolutionize drug discovery. Faster and more comprehensive R&D in protein molecule research is already a reality: a GenAI algorithm generates detailed understanding of individual amino acids, their functionality and interaction in complex molecular proteins. This methodology enables discovery of new molecules and targeted drugs. Together with better personalization of treatment plans, the tailoring of therapy to specific cancer types, earlier diagnosis based on medical data patterns and individual case data, there is an unprecedented increase in the body of underlying biochemical knowledge underway. Besides top-line growth, GenAI also leads to faster innovation and drug development in a more effective way than conventional R&D (*see Exhibit 4*).

EXHIBIT 4

GenAI-driven R&D to enable targeted and tailored cancer treatment



Source: TUM School of Computation, Information and Technology, PredictProtein; Strategy& analysis

In **manufacturing** we expect R&D, process, and customer experience benefits from GenAI applications, which are already speeding up product development and time-to-market, leading to significantly lower R&D costs. GenAI will also bring about reductions in average handling times, more efficient issue resolution, and improved customer satisfaction particularly through the development of features such as richer 'connected car' applications and services in the automotive industry (*see Exhibit 5*).

EXHIBIT 5

GenAI-driven R&D, manufacturing and customer experience impact in automotive

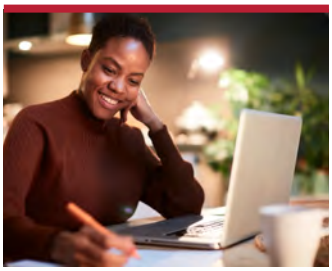
Research and development

GenAI systems provide **code-free** and **ongoing testing** and **scenario simulation** in vehicle software development

Production

Computer vision systems based on GenAI **monitor production processes** and allow for **real-time tracking** of assets and more comprehensive installation team data

Aftersales



GenAI-based **chatbots** and **virtual assistants** improve the **customer support experience** with greater availability, faster responses and fewer human mistakes

Connected services

In-vehicle **personal assistants** based on GenAI offer **personalized** and **fast support** while improving overall **experience** and comfort

Source: Strategy& analysis

In the **information and communications technology (ICT)** sector GenAI has the potential to foster services that are better tailored to local markets, enabling the building of end-customer specific tools, improved review of input data, and enhanced privacy and IP protection.

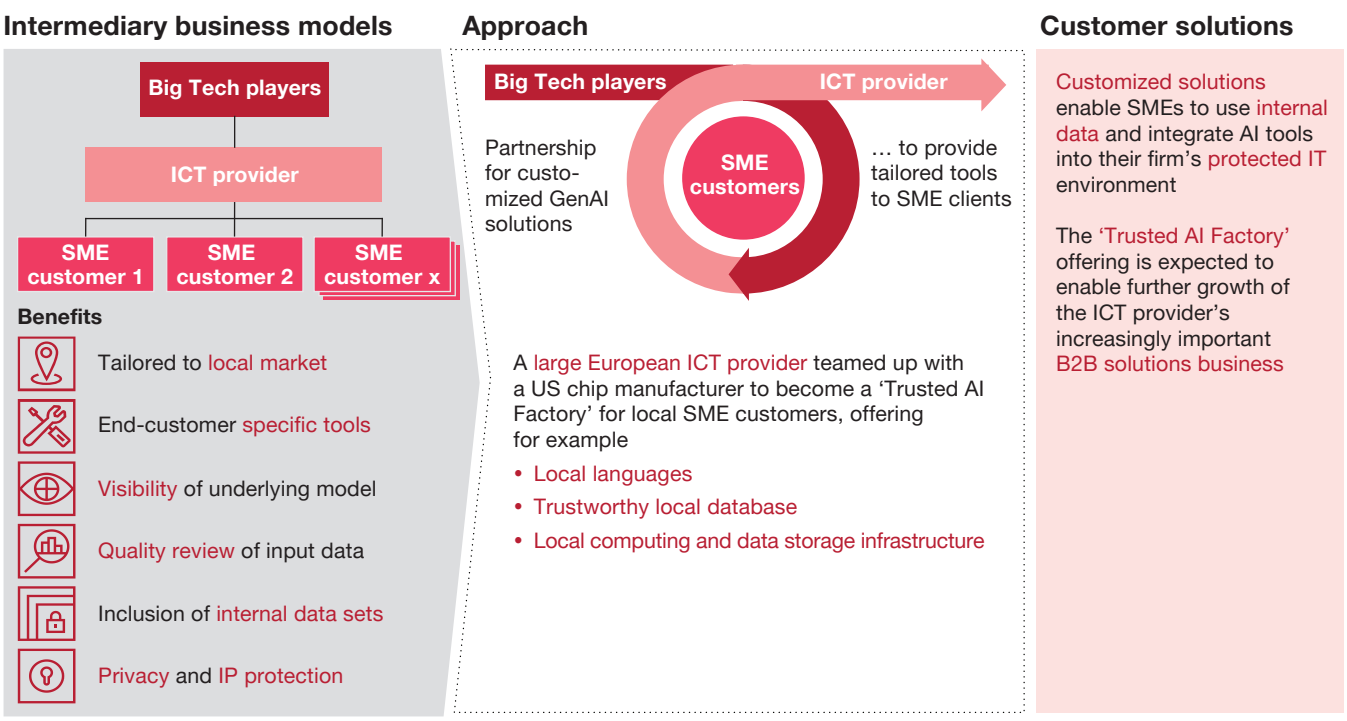
CASE STUDY

Large European ICT provider builds GenAI business model

GenAI is already driving the creation of new businesses that take on the role of GenAI intermediaries between Big Tech and end-user companies. This is exemplified in the case of a large European ICT provider that partnered with a US chip manufacturer to develop a GenAI suite tailored to a range of B2B needs. This company invested in more than 30 GenAI innovations to build a new generation of products that are relevant to the local business context and regional language specifics.

The ICT's GenAI 'intermediary' business model is to create a 'Trusted AI Factory' with products tailored exactly to an otherwise under-served market, and act as a bridge between users and Big Tech providers and as a knowledge source for local business customers. (*see Exhibit 6*).

EXHIBIT 6
ICT 'Trusted AI Factory' intermediaries



Source: Strategy& analysis

Country impacts

Country by country, the GenAI advantage is structural

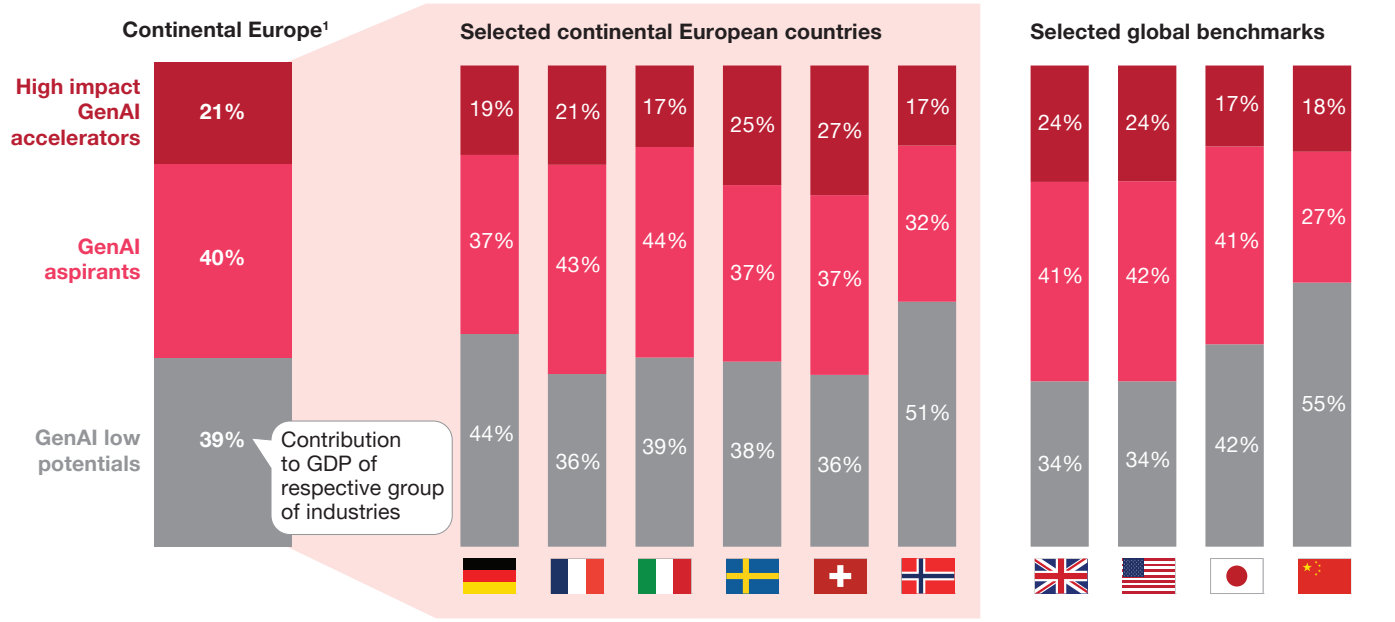
The industrial structure of individual economies shapes outcomes in the GenAI era. Countries with economies heavily skewed toward high-impact industries including technology, entertainment, life sciences, and financial and professional services, as well as ICT, are positioned for large productivity and top-line revenue gains through successful implementation of GenAI in their businesses. Countries where low- and medium-impact businesses predominate, such as agriculture, utilities, construction, manufacturing, retail and support services, can also benefit from the implementation of GenAI, although the impact is less likely to be transformational (*see Exhibit 7*).

Businesses that perform high levels of data collection and processing have a head start in the race to maximize GenAI benefits.

The share of high-impact, high-potential business in the total economy is on average higher in the US and UK than in the EU.

EXHIBIT 7

Exposure to industries in terms of contribution to GDP – EU and selected countries

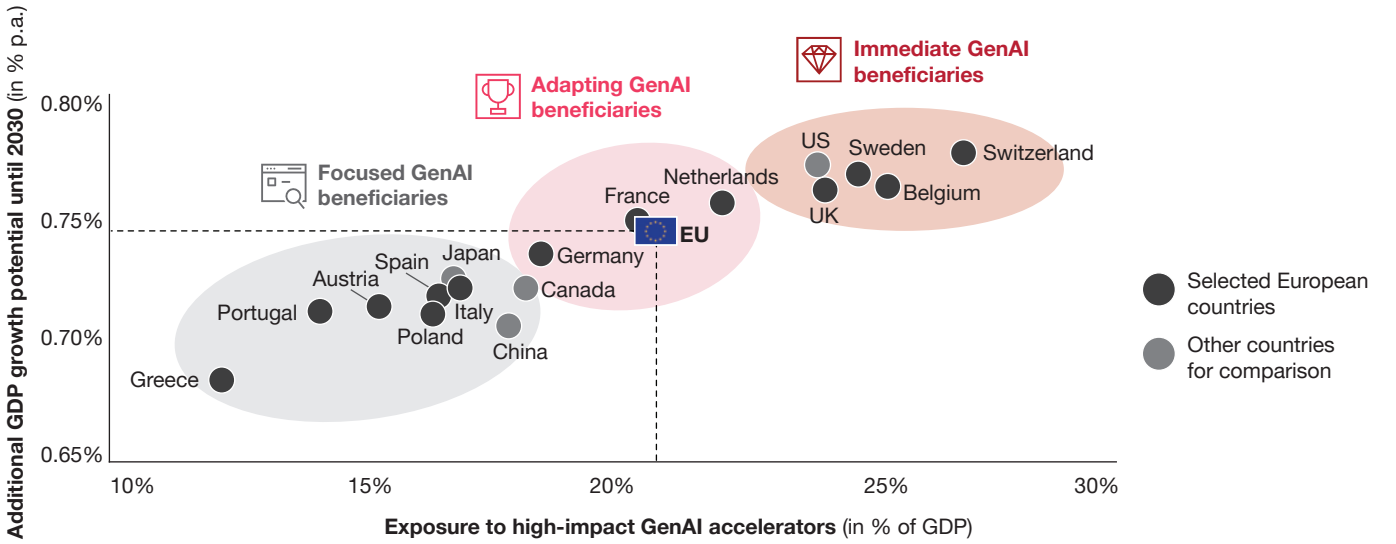


1 European Union plus selected non-EU economies (Switzerland, Norway)
Source: S&P Global, Strategy& analysis

However, it is characteristic of GenAI, with its potential applications across the entire economic value chain, that benefits are governed by the level of corporate understanding and creativity as much as by the nature of individual businesses. This means that outcomes can be altered by supportive corporate strategies and public policies.

Based on an analysis of use cases along the value chains of more than 20 industries, we estimate the potential for GenAI-driven increases in top-line growth and operational efficiency across the EU and several comparator countries. It can be seen that many countries with large industrial sectors remain significantly behind the leaders in terms of GenAI impact (*see Exhibit 8*):

EXHIBIT 8
Country comparison of GenAI-driven yearly GDP growth potential (ambitious scenario)



Focused GenAI beneficiaries

Countries with a significant share of GDP from industries with less to gain from GenAI (for example agriculture, industrial manufacturing, and construction). Selected smaller industries may have started to leverage GenAI, but structural barriers and digitization deficits need to be addressed to enable broader GenAI adoption.

Adapting GenAI beneficiaries

Countries in which industries with intermediate or moderate GenAI potential (e.g., consumer goods and retail, travel and hospitality, health care) contribute a greater share of GDP. Further digitization and targeted innovation along value chains may be required to accelerate GenAI adoption and narrow the gap with immediate GenAI beneficiaries.

Immediate GenAI beneficiaries

Countries whose current industry structure is well suited to realize GenAI-driven productivity and innovation gains.

1 Total additional yearly GDP growth potential on top of current projections until 2030 in an ambitious scenario that assumes widespread application of GenAI with respective productivity gains
Source: S&P Global; Strategy& analysis

Size of the prize

The trillion-dollar question

Our analysis suggests that the implementation of GenAI across the economies of continental Europe has the potential to increase annual GDP growth rates by 0.4% to 0.7% between now and the end of this decade. The higher end of this range is equivalent to roughly 1 trillion USD in 2030, a massive boost to GDP in an era of historically low growth, which is currently forecast to be below 1.5% between now and 2030.

We have derived two implementation scenarios to map the effects of GenAI, in addition to a 'no-change' base scenario (*see Exhibit 9, next page*):

Scenario 1

Under this best-case scenario, Europe will see high-impact accelerator businesses take an increasing share of the economy, and 80% to 90% of potential GenAI-driven productivity gains will be achieved by 2030. This scenario assumes that companies are receptive to GenAI innovation and adopt GenAI strategies. They also need to be willing to make the required investment (which may only generate a return after some time) and take the risks associated with the new technology. We further assume that public policy and regulation becomes broadly supportive of implementation in Europe. Total impact: an additional 0.7% GDP growth.

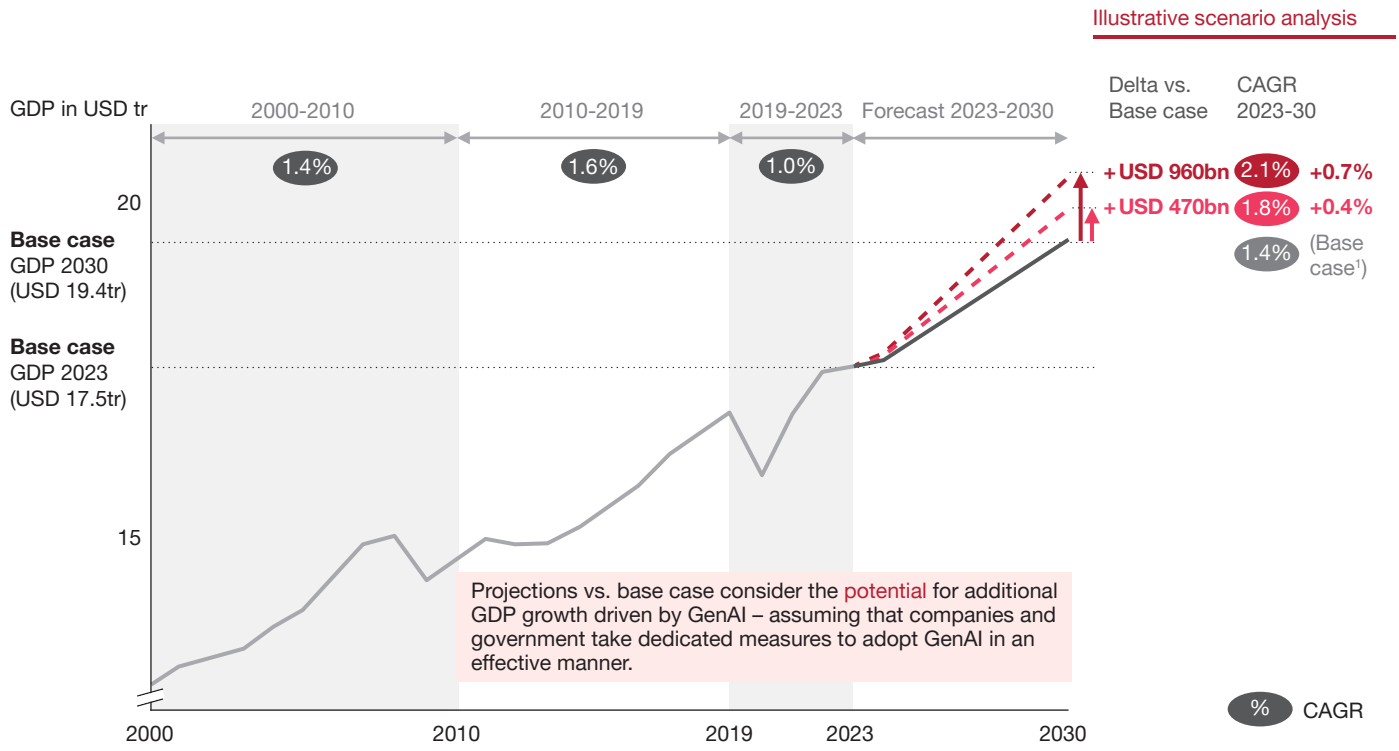
Scenario 2

Under this moderate-case scenario, Europe has only limited success in attracting or developing more high-impact accelerator businesses, and no more than 40% to 50% of potential productivity gains are realized by 2030. The moderate case will see companies constrained by skills and funding shortages, and a lack of regulatory clarity or proactive public policy on GenAI. Total impact: an additional 0.4% GDP growth.

> "GenAI has the potential to boost European GDP growth rates by 0.4% to 0.7% p.a. between now and the end of this decade – an additional GDP of roughly 1 trillion USD in in the best case."

EXHIBIT 9

Impact of GenAI potential on continental Europe's GDP growth



Scenarios and underlying assumptions

Base case

European[2] GDP growth forecast until 2030 based on S&P Global[1].

Intermediate: Moderate application of GenAI

Limited realization of GenAI benefits along value chains, achieving an assumed 40-50% of GenAI-driven productivity potential by 2030[3] (given limited capabilities, insufficient access to talent, or regulatory unclarities).

Ambitious: Widespread application of GenAI

Effective implementation of GenAI across companies' value chains, achieving an assumed 80-90% of GenAI-driven productivity potential by 2030[3] (thanks to factors including openness to innovation, a clear GenAI strategy, or attractive location factorts).

1 Forecast of real GDP based on S&P Global (January 2024)
2 European Union plus selected non-EU economies (Switzerland, Norway)
3 Linear increase of GenAI potential until 2030 assumed
Source: S&P Global, Strategy& analysis

The global context

The prospects for a GenAI revolution in Europe need to be seen in the context of differing policy assumptions and implementation capabilities across Europe, the US and China:

The US: innovation leader
The US is the clear innovation leader in the GenAI field, with GenAI implementations driven by a cultural bias toward rapid innovation and supported by a decentralized and outcome-oriented policy approach distributed across several federal agencies. The US also benefits from an unparalleled ecosystem of large tech providers complemented by fast-moving start-ups, and a ready supply of new technology funding.

China: centralized and state-directed
China is pursuing a centralized approach designed to shape all AI development across the economy, with state control paramount but supported by strong public perceptions of technological progress as beneficial. While GenAI innovation is mainly driven by the US, Chinese companies are fast-adopters and tend to quickly integrate GenAI into their products and daily life applications.

Europe: risk-based approach
Europe is taking a risk-mitigation approach to GenAI. This is designed to balance individual rights with AI priorities, an approach embodied in the EU AI Act, which has the potential to become a de-facto regulatory baseline for GenAI. Europe has the advantage of high-quality research institutions and a track record of collaborative approaches to innovation but lacks true Big Tech champions.

Ten success factors for a smooth and effective GenAI transition

To capture maximum benefit from the GenAI decade, there is an urgent need for European companies and governments to review and extend their strategy and policy approaches to GenAI in the following key dimensions:

Corporate openness toward innovation and transformation

1. Demonstrate 'skin in the game' and lead the change	Company executives should put GenAI at the top of the strategic agenda and commit to make the required investments even though the effective gain from the nascent technology may be hard to assess upfront and the bottom-line impact may only be clear at a later stage. They should raise awareness of GenAI throughout the company and involve employees in developing use cases and tools. Dedicated GenAI training should be delivered across the entire organization as a greater number of employees – not only in IT, but also those in business functions – need to understand how to enable and embed GenAI in their key activities. This is a major contrast to prior technological innovations. Employees should understand the technology behind GenAI and be enabled to assess its benefits and risks. They need to be familiarized with the tools relevant for their daily work and the purpose of these applications. Client advisors at banks, for instance, should be clear about questions such as "Will GenAI help me improve interaction with my clients and generate more sales?" or "Will it lead to efficiency gains in my daily routine and save me 10%, 20% or even 30% of my time?"
2. Leverage the GenAI ecosystem to accelerate your GenAI journey	Partnerships with global GenAI behemoths or specialized start-ups could help companies accelerate implementation and enable them to reap the fruits of GenAI investment early on. Smaller companies lacking scale and in-house expertise to develop their own tools could partner with ICT companies acting as 'GenAI intermediaries' to develop tailored country- and company-specific GenAI solutions. Less tech-enabled industries with limited GenAI know-how and only few 'best practices,' such as the hospitality and tourism sector, could benefit from GenAI intermediary partnerships.

Funding and investment

3. Evaluate each GenAI project's P&L impact early on and channel investment	Companies are advised to assess the impact of GenAI on their business model and funnel funds to areas where the technology promises highest bottom-line impact. Companies in innovation-driven sectors could use GenAI for new product development with the goal of shortening innovation cycles and moving ahead of competitors in the race for new products. Aiming to deliver minimum viable products and prototypes which enable quick-wins would allow executives to assess P&L impact early on and direct investments toward the most promising projects.
4. Public commitment and dedicated investment vehicles are key to attracting private funds	Governments are encouraged to join forces with leading financial services players to launch dedicated 'AI transformation' investment solutions that allow institutional investors and wealthy individuals to invest in the GenAI opportunity. Initial seed money from governments could demonstrate their commitment and help attract further venture capital and other private funds.
5. Invest funds without falling into the subsidy trap	Governments should refrain from providing financial incentives and subsidies to individual 'GenAI accelerator' firms, to avoid lock-in situations or write-offs if the companies fail to deliver their GenAI promise. Instead, governments should direct funds to raise location attractiveness, for example by building dedicated GenAI innovation clusters that attract GenAI ventures, leading high-impact accelerator companies and academic institutions, and start to create comprehensive GenAI ecosystems. If companies and governments fail to channel funding in the right direction, they risk diluting the expected 0.4% to 0.7% GDP boost and pay too high a price for a modest economic impact.

Innovation and technology-friendly location factors

6. Provide a nationwide state-of-the-art digital environment	Building up GenAI ecosystems to create national GenAI champions and attract foreign high-impact accelerators relies not only on sufficient capital and direct investments, but also on access to high-performance computing power and cloud storage capacities. These ecosystems should not become 'digital islands.' Instead, the entire economy will require a digital scale-up: administrative processes need to be streamlined and digitalized, and the availability of fast and reliable internet is a prerequisite for an attractive GenAI location. The risk of disruptive cyber-attacks should not be underestimated and calls for an effective defense strategy.

7. Involve and empower the population	A location's attractiveness does not end at the government and company level. To build a sustainable and widely accepted GenAI-empowered economy, governments need to ensure buy-in from citizens. This includes education about the opportunities and risks of GenAI to address reservations about the new technology and allow people to use it for their benefit. Companies and governments should also point out that in some industries, GenAI will be needed to overcome labor shortages and ensure continuous value creation. In other industries, the fear of job losses should be addressed through dedicated upskilling and industry-switching programs. A skilled and tech-savvy labor force will be a key pillar of a successful GenAI-driven economy.

Strategic, innovation-friendly, and actionable regulatory guardrails

8. Find a regulatory balance between technology openness and risk mitigation	The implementation of the recently adopted EU AI Act will have a big impact on how GenAI can create benefits for society and deliver the expected economic boost. We advocate a pragmatic approach that addresses societal concerns around privacy and data protection, and provides sufficient space for innovation and development of 'benign' GenAI solutions. At the same time, regulation must impede the 'malign' version of GenAI. Given the rapid advancement of the technology, regulation should be flexible enough to anticipate or closely follow future developments.
9. Ensure actionable regulatory guardrails and industry-specific standards	Regulatory standards should be defined jointly with industry representatives. They should meet the industry's needs and susceptibility to risks. Smart and targeted documentation requirements and lean bureaucracy will make GenAI regulation applicable for large high-impact accelerators as well as smaller ventures. Start-ups should be relieved of regulatory over-complexity through a simplified approach that enables entrepreneurship and ensures location attractiveness for innovative ventures.
10. Pursue a level international playing field and avoid falling behind global GenAI development	The EU's AI Act should be aligned with like-minded countries such as the US or Japan to ensure a level playing field and develop an international 'technology coalition' that seeks healthy competition and advocates common values. Europe should also align on a GenAI strategy that goes beyond regulation and defines how the continent aims to reap the benefits of the technology to strengthen Europe's competitiveness and geopolitical position. A dedicated AI strategy body may be required to monitor further developments across the globe to foresee and identify new technological opportunities and spot potential threats early on.

Conclusion

GenAI is one of the defining technologies of this decade. Only a clear strategy will enable European countries and companies to succeed in the global GenAI race and prevent them from falling behind on the competitive and geopolitical stage. Policymakers must make timely decisions about the appropriate use of public investment to support GenAI implementation.

Yet leaders must also acknowledge that GenAI is just one of multiple technological developments in this decade. They must not put all their eggs into the same basket and rather consider GenAI as one extremely powerful asset within the broader technology portfolio.

The ultimate question for European economies and companies is whether they will be passively defined by GenAI, or actively define the impact of GenAI for their future.

We believe that by following our 10 success factors, companies and governments will be able to embark on a smooth and successful GenAI transition, and make the most of the growth potential we have quantified in this paper.

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