

WHITE PAPER

The Impact of AI and GenAI on the Semiconductor Industry

IDC U.K.

June 2024



Funded by
the European Union



ALL
PROS.EU



TABLE OF CONTENTS

Summary	2
Synopsis.....	2
IDC's Recommendations	2
Key Takeaways.....	2
In this White Paper	3
Welcome and Introduction by the European Commission.....	4
GenAI and the new silicon landscape	5
Beyond the Buzzwords: Demystifying AI	7
Bring AI to Your Data.....	8
About IDC.....	10
IDC U.K.....	10



CONSORTIUM



DISCLAIMER

The information and views set out in this document are those of the authors and speakers invited to the webinar and do not necessarily reflect the official opinion of the European Commission. Nor does the European Commission guarantee the accuracy of the information included in this report. Neither the European Commission, nor any person acting on the European Commission's behalf may be held responsible for the use which may be made of the information contained therein.

SUMMARY

The webinar hosted by IDC in the context of ALLPROS.eu discussed the impact of AI and GenAI in the semiconductor market, broadly around the world, but also specifically in the EU. The work developed by the EU in this topic needs to be accelerated, as skills and technologies are rapidly evolving.

To keep pace, the EU organisations need to prioritise the development of programmes by investing in highly valuable streams of revenue for European industries, such as the Automotive industry. Challenges and opportunities need to be clearly identified for tactical investment.

Speakers highlighted the projections that the AI market will grow drastically over the next few years, and the need to develop solutions for workloads that can deliver business value. Lessons need to be learned where AI has been unsuccessful, and efforts should be made to tackle the challenges of this era and prepare for the next chapter, with investments that support AI workloads in the long run. These investments should support edge infrastructure, data centres with liquid cooling, and investment in Education for a highly skilled workforce.

The webinar provided valuable insights into the current and future impact of AI in the semiconductor industry, emphasising the importance of long term strategic planning, skills development, and the creation of an ecosystem where Governments, Academia, Manufacturing industry and Service delivery all work together to develop a competitive and differentiator market.

SYNOPSIS

The webinar discussed how the introduction of AI and Generative AI (GenAI) is impacting the semiconductor industry all around the world and specifically in Europe. The potential of GenAI is causing companies across various verticals, company sizes and geographies to rush to understand how this could impact and benefit their businesses. As a result, this is resulting in huge disruption in the semiconductor market as budgets shift and change.

IDC'S RECOMMENDATIONS

- » A non-conventional approach to investment is required - Investing in R&D and specialised niche areas.
- » Creation of an ecosystem that is self-sustained – States to provide strategic guidance, policies and investment, Academia to provide specialised resources, companies to create new products and solutions.
- » Support the development of next generation data centres, designed for power intensive workloads, in the EU digital sovereignty space.
- » Look at current projects under the purview of the EU to assess where investments in Edge can be more fruitful, and use funding currently available to create them.
- » Look for specific productised, pre-validated workloads, to be able to deploy them in a "path of less resistance" approach.
- » Analyse where to deploy AI, looking not only at security and sovereignty, but also latency and power and investment where lacking.
- » Look at both the AI engine as well as the data. Look to have it deployed in the right way, in the right place, with the adequate infrastructure.

KEY TAKEAWAYS

- » Europe lacks the structure for investment in up-and-coming technologies. It does not have the legacy of angel investors from the private sector like in the US, and it has much more constraint regulation for public investment than in China.
- » The AI market is booming, but it will require on-premises infrastructure, since European companies prefer the use of private IT.
- » It is hard for companies to navigate the hype of AI and find true business value in AI adoption.
- » AI is highly complex, carrying risks and requiring substantial investments.

In this White Paper

This White Paper highlights the main points of [The Impact of AI and GenAI on the Semiconductor Industry | ALLPROS.eu](#) webinar that took place in June 2024.

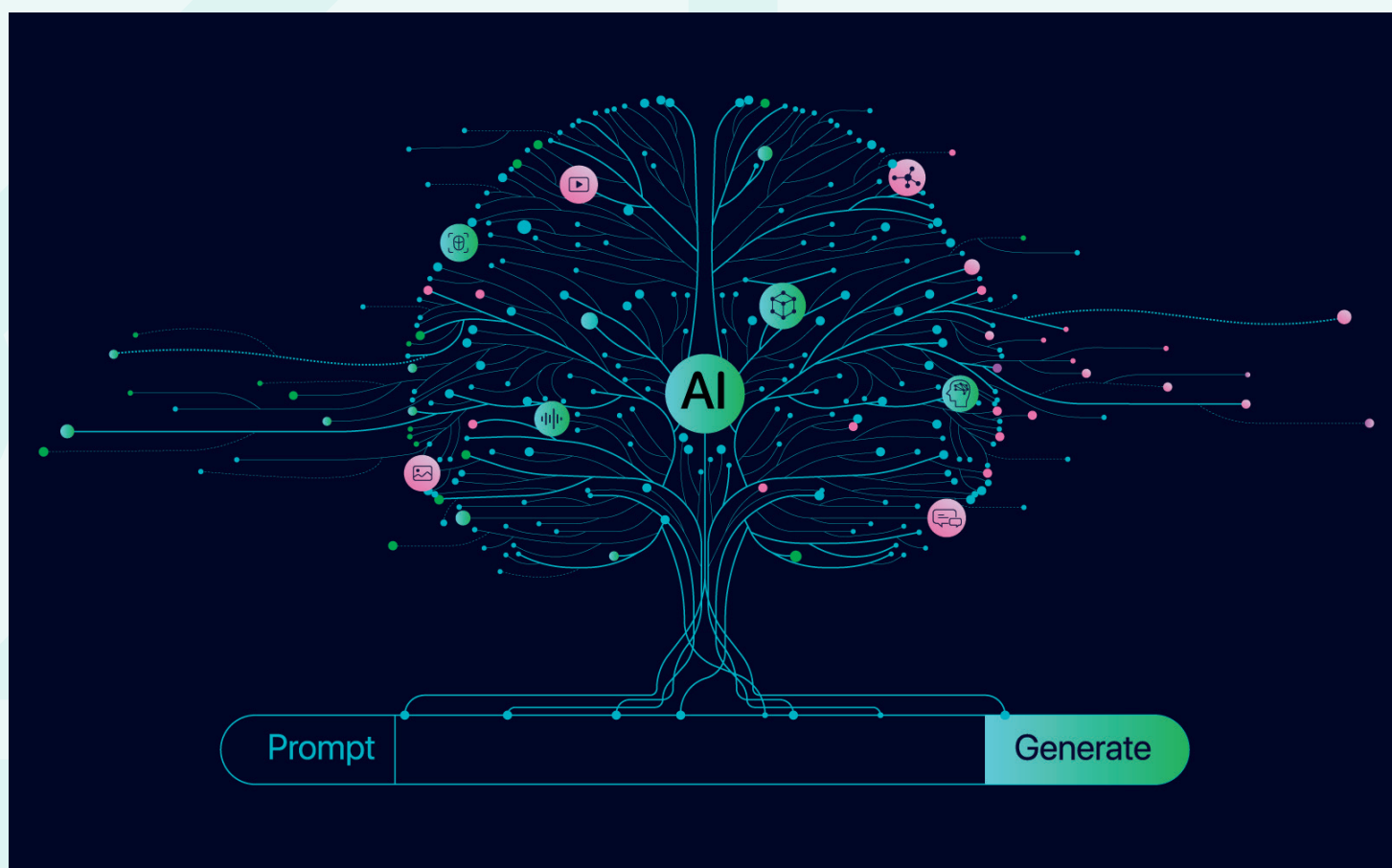
Niccolò Zazzeri, Project Manager at Trust-IT, moderated the webinar that gathered multiple stakeholders related to the Semiconductor Industry, who shared their views on the current impacts of Artificial Intelligence on the industry.

The webinar opened with an overview of the semiconductor industry by Thomas Reibe, from the European Commission (EC), comparing the global scene with the current and future roles of the European Union (EU) in the development of the industry.

Then, Luis Fernandes, from IDC spoke about the estimated growth of the AI market, covering some of its drivers and challenges.

The discussion of the growth of AI continued in the next presentation from Walter Riviera of Intel, who talked about some of the misconceptions around AI and how to spot where the value for business opportunities might be.

Finally, Serban Zirnovan from Dell Technologies spoke about how Hardware vendors can help in the AI journey, serving as trusted partners to fulfil business opportunities while avoiding the pitfalls as previously identified by Walter.



Welcome and Introduction by the European Commission

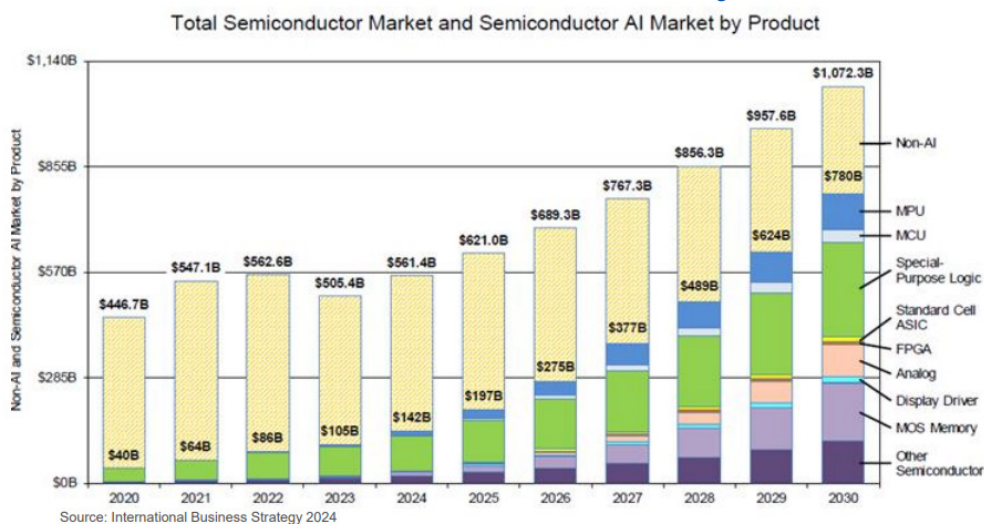
✍ By Thomas Reibe, European Commission

Thomas Reibe began by showing forecast data from different sources signalling an increase in AI revenue in the semiconductor industry, which will have a significant impact for years to come. He then spoke about Nvidia, which has been a major contributor so far to that increase. Most of Nvidia's growth has come from their data centre portfolio. This surpassed Gaming as the number one specialised market in which Nvidia operates in 2023, and took off in early 2024 to reach 47.5Bi USD.

Figure 1

Forecast Semiconductor market with breakdown of semiconductor AI market by product 2020-2030

Semiconductor market driven by AI



2

Semiconductor market driven by AI in 2030: 72%!



Source: International Business Strategy, 2024

Thomas then addressed the geographical distribution of the semiconductor AI market, of which the United States is still the biggest market, followed by Taiwan and China. He then pivoted to Europe, summarising the current state of the market, from manufacturers, to specialised sub-component subject matter experts (SMEs) designers and manufacturers, to Research and Development (R&D) and Academia.

While American and Taiwanese companies are clearly taking the lead, Chinese manufacturers are prioritising AI chips development, and are actively engaged in acquiring IP from European companies that can design new technology but lack the funds to properly develop it to a mass production stage.

He concluded by looking forward to the semiconductor market in the EU, stressing the need to nurture R&D and Academia and support the industry to develop, create and mass produce the next iterations of the AI ecosystem market, in terms of software as well as hardware.

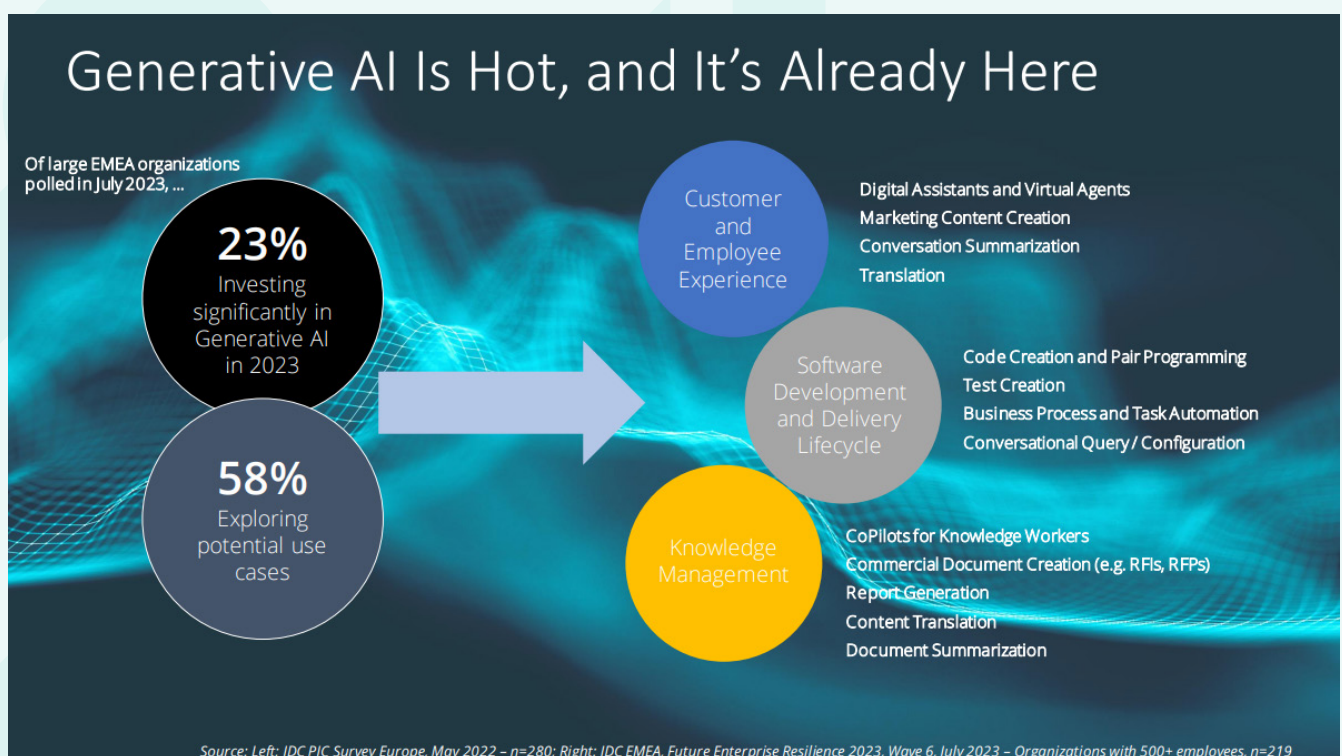
... *"We have quite a substantial research [investment] on low power edge AI solutions."*
— Thomas Reibe

GenAI and the new silicon landscape

✍ By Luis Fernandes, IDC

Luis Fernandes started by setting the scene on what AI and GenAI mean in the current semiconductor ecosystem to European companies, the criticality of AI workloads, and how much investment these workloads receive from European companies.

Figure 2
Data research on AI workload investments



Source: IDC, 2024

He looked at the impact on the market that Nvidia and Microsoft (to a lesser extent) are making with AI. However, he warned that a big part of Nvidia's AI-driven success might be temporary, and recommended caution in the long run to ensure a sustainable market for AI.

The biggest customers of AI chips right now are hyperscalers and other massive players. However, Europe tends to be very conservative when it comes to the exclusive use of public cloud providers.

There is a huge preference for hybrid cloud deployments, with 4 out of 5 companies choosing carefully which workloads go where, with full data centre deployments almost non-existent in Europe.

This is true also for AI workloads. Although European companies are not strangers to using public cloud to deploy AI workloads, most only wish to use public cloud in the early stages of a project deployment, preferring to deploy their production environment on-premises.

“What we are seeing is most of the CIOs are willing to use the public cloud to run things, to run pilots, PoCs, to build test and development environments but then for the most part, they want to revert back to the private cloud to run their production in the private cloud.”

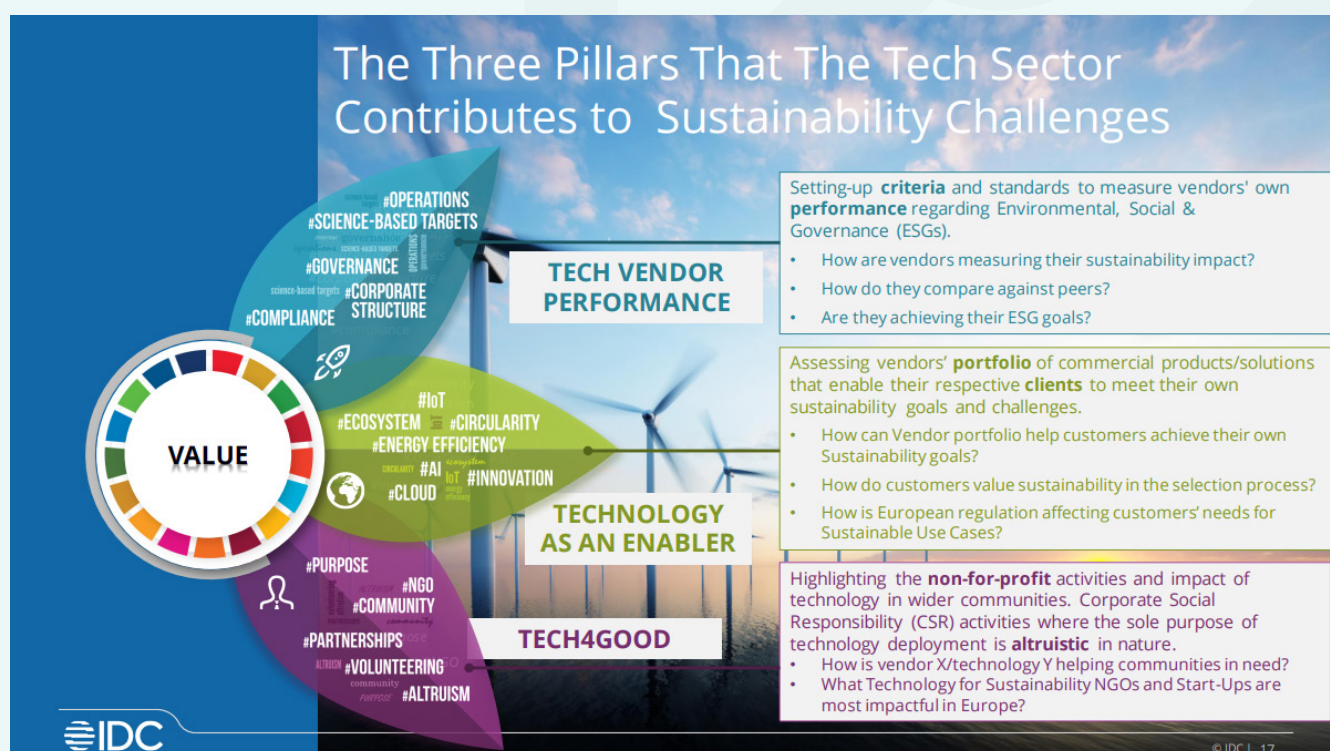
— Luis Fernandes

With IT becoming highly strategic, and being an instrumental source of competitive advantage and differentiation, IT managers hold crucial decision roles. However, when it comes to AI, they could use more engagement with business line executives.

When it comes to budget, AI has been syphoning away investment from other areas, as it has become the most important workload these days. Therefore, it needs to have its own budget, as standard IT Operations cannot be under-funded indefinitely.

On the climate front, these new workloads have the potential to substantially increase the need for power consumption of the IT infrastructure. To that point, some countries have already started to place moratoria on developing new data centres, since the power grid is no longer able to sustain the increase in power demand.

Figure 3
The Tech three pillars to address sustainability



Source: IDC, 2024

More efficient data centre design, alternative cooling options (like direct-die liquid cooling), and processes to monitor, manage and reduce power consumption, might be steps in the right direction when looking for a new environment to run AI and GenAI workloads.

Beyond the Buzzwords: Demystifying AI

By Walter Riviera, Intel

Walter Riviera spoke about some of the hype around AI, and how AI is transforming the way we work and live our day-to-day lives.

He gave a historical context of AI from Machine Learning (ML) to Deep Learning (DL) to GenAI and AI Everywhere. He then addressed some of the challenges of AI, including complexity, cost, and data security and privacy of implementing AI workloads.

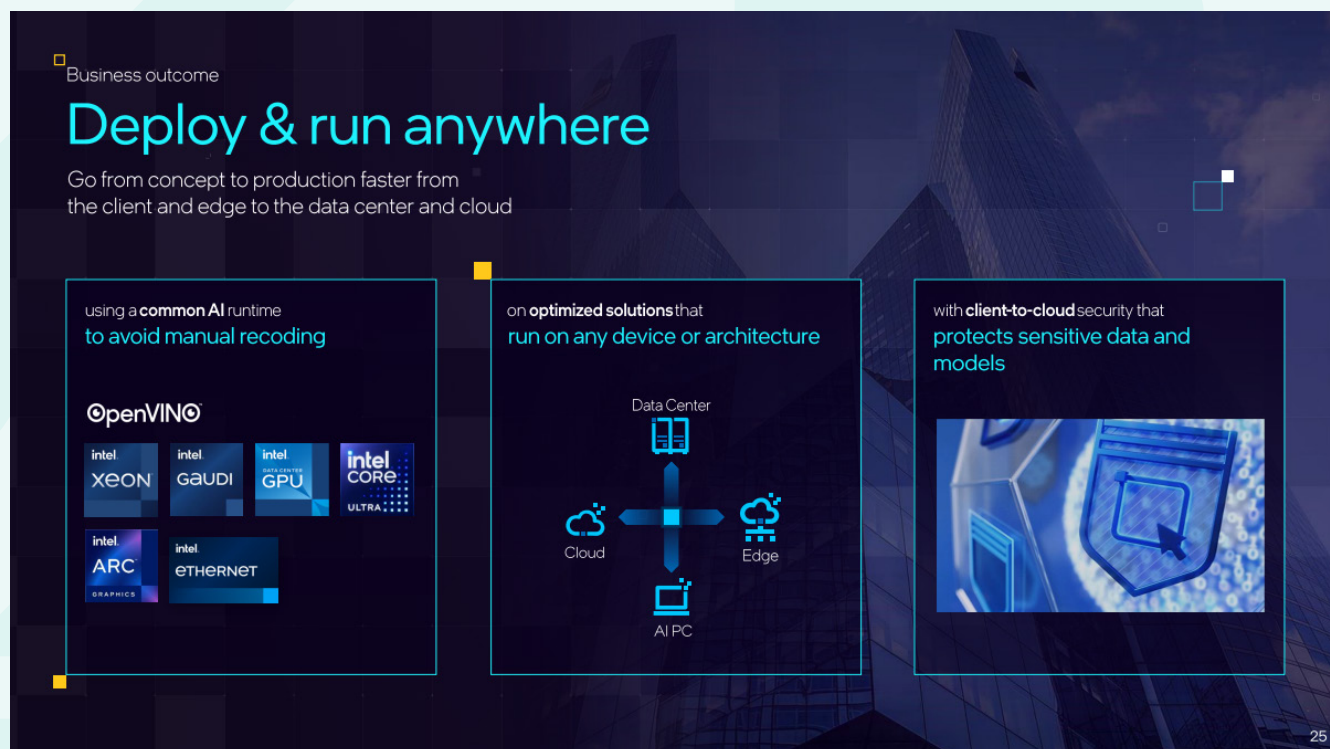
"Everyone is talking AI, and rightfully so, but the super star is the data."
— Walter Riviera

He mentioned the challenges of training massive AI Models, where one possible solution would be the use of Federated Learning.

He showcased a few customer spotlights, and then spoke about one of the misconceptions of AI: we all talk about LLMs (Large Language Models), yet the market is pivoting to SLMs (Short Language Models), which are highly specialised systems designed for one specific function.

He mentioned that companies should maximise value and stay secure and responsible, by not necessarily deploying AI for workloads that do not require the biggest, most complex, most expensive systems.

Figure 4
Model to deploy AI workloads



Source: Intel, 2024

Bring AI to Your Data

✍ By Serban Zirnovan from Dell Technologies

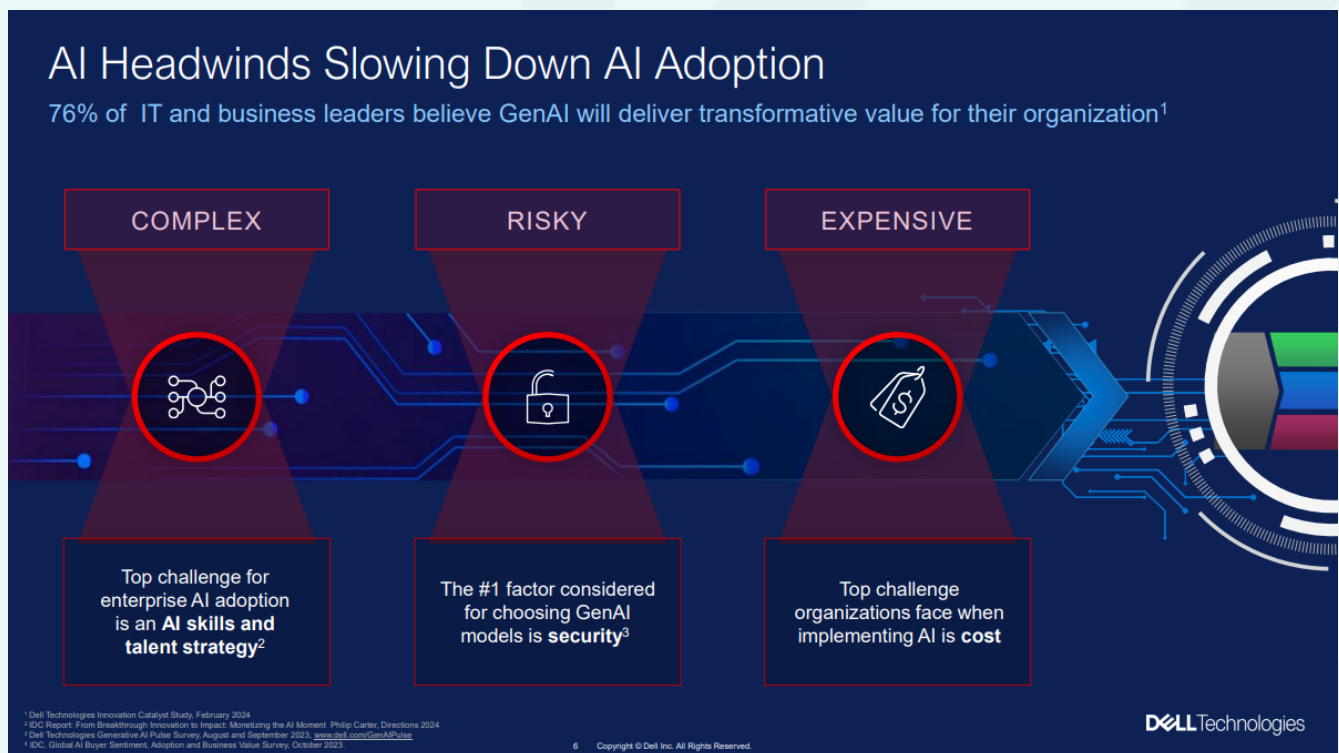
Serban Zirnovan talked about how AI can bring value to your organisation. AI is in its infancy but has the potential to be as revolutionary as the advent of the Internet.

A lot of companies are thinking about the return from AI, but haven't even stopped to think about the investment.

Customers are looking for partners that can help them navigate this new era. An important aspect is that a lot of the spending will be on-premises or on the edge, as most of the data created will come from the edge.

They are also realising that it's more efficient to bring AI to the data than vice versa. This trend has become evident as some AI headwinds are slowing down the AI adoption across Europe, whether due to data sovereignty, lack of skills or cost.

Figure 5
Challenges faced because of AI

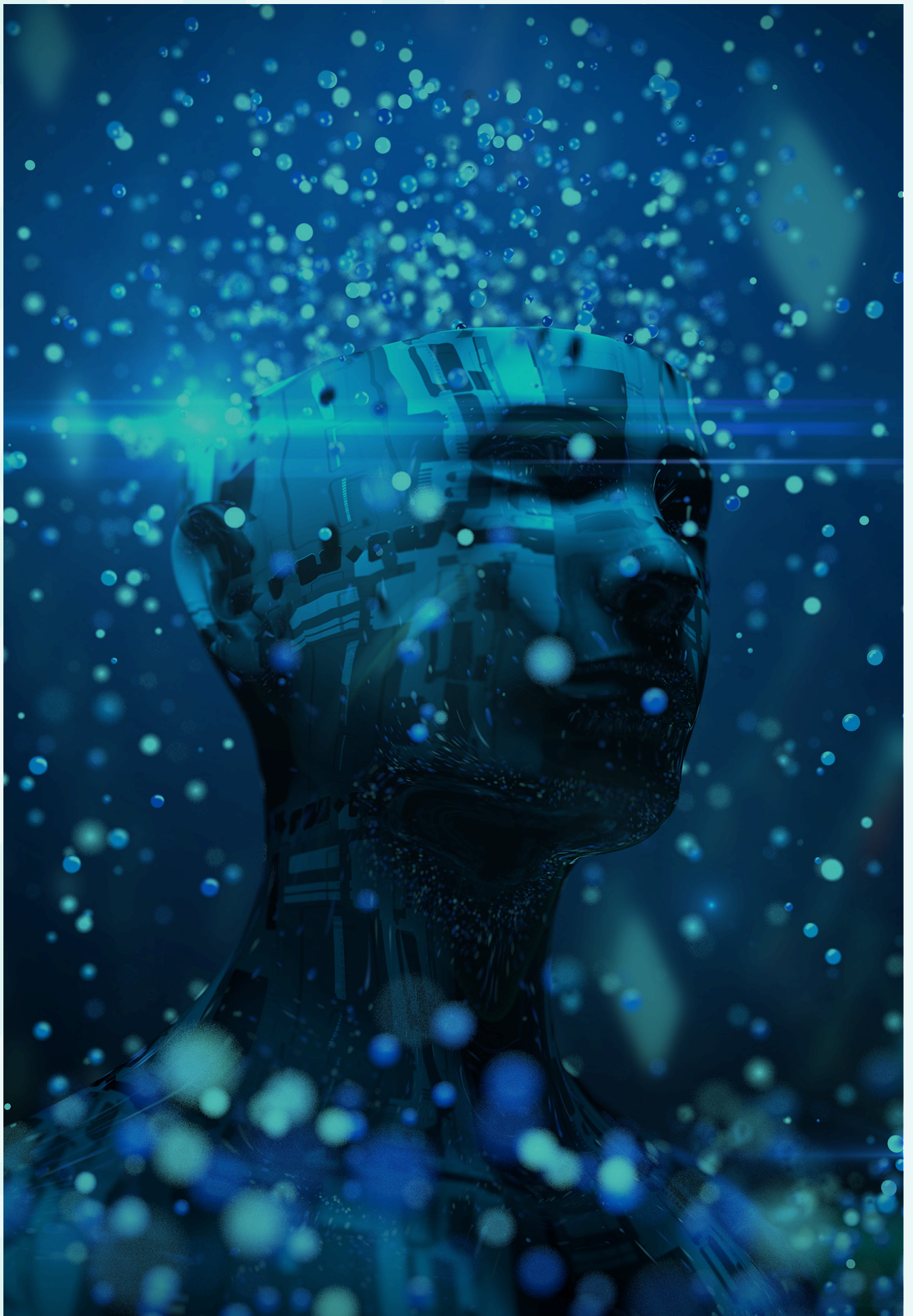


Source: Dell, 2024

Serban suggested a strategy based on simplicity, security and economy. He then showcased some of the AI solutions that Dell is leveraging and how they create solutions leading to the outcomes that companies are looking for.

..... *"Looking at the use cases, one conclusion immediately surfaces. There is no one-size-fits-all type of approach."*

— Serban Zirnovan




ABOUT IDC




International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets. With more than 1,300 analysts worldwide, IDC offers global, regional, and local expertise on technology, IT benchmarking and sourcing, and industry opportunities and trends in over 110 countries. IDC's analysis and insight helps IT professionals, business executives, and the investment community to make fact-based technology decisions and to achieve their key business objectives. Founded in 1964, IDC is a wholly owned subsidiary of International Data Group (IDG, Inc.).

IDC U.K.

5th Floor, Ealing Cross,
85 Uxbridge Road
London
W5 5TH, United Kingdom
44.208.987.7100
Twitter: @IDC
blogs.idc.com
www.idc.com



 **ALLPROS eu**
Watch the new video
and follow our channel

 **allpros.eu**
 **@allpros_eu**
 **company/allpros-eu**