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AI and IoT: The Next Chapter for Digital Transformation

Publication date:
June 2024
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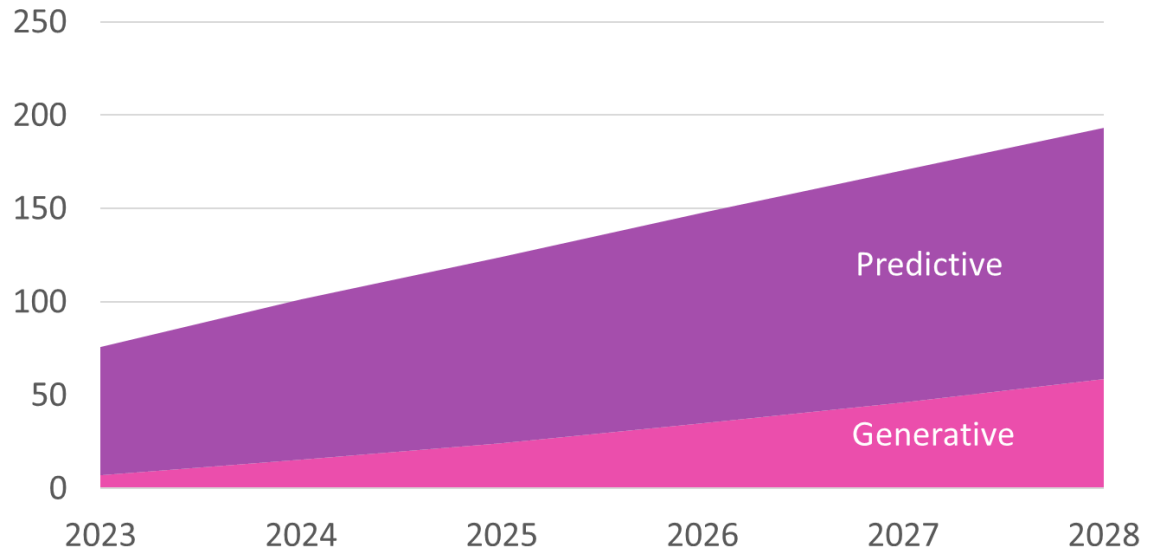
Global digital transformation continues to accelerate in pace and scale, bringing about significant and lasting change, fundamentally altering how businesses and entire industries operate into the future. One of the core requirements of this transformation is that enterprises have access to a wide range of timely, accurate data. This demands the ability to receive information and data from a range of connected sensors, devices, and equipment in real-time – and this is where the Internet of Things (IoT) has been leading the charge in both consumer and enterprise applications.

The Generative AI Impact (Revenue versus Predictive AI for 2023-2028)



Source: Omdia AI Software Market Forecast

Omdia expects the worldwide installed base of IoT devices to approach 38 billion devices by the end of 2023 and eclipse 82 billion in 2030. However, while standalone IoT applications can deliver value they also create challenges – and it's increasingly clear that to be truly impactful, an IoT solution must be augmented and supported by AI. This holds the key to unlocking efficiency, intelligence, personalization, and productivity - impacting sectors from automotive and industrial manufacturing to transport, utilities, and smart cities.

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Despite the clear benefits that these new solutions could bring across verticals, adoption (at least in IoT) has often been cautious in the past – with challenges in understanding and proving ROI at the outset, or the fear of choosing the wrong technological solution (e.g. between different connectivity options). However, the unstoppable force of Generative AI (GenAI) might just be the tool to push more consumer and enterprise solution adoption than ever before.

In 2023, the AI software market pivoted as GenAI applications erupted onto the scene. Startups and hyperscalers released a wave of large language and diffusion models, the basic building blocks for GenAI applications, and enterprises noticed and opened up AI budgets to explore what GenAI could do for the bottom line. Omdia research estimates an overall market valuation going from zero in late 2022 to $74bn by 2028 – but also that the interest in GenAI created a temporary spurt in demand for traditional (predictive) AI too.

The question for the industry – from consumer device makers to enterprise adopters – becomes how best to harness that power of AI into real-world applications, with a clear ROI. In particular, where they can best leverage the IoT infrastructure they already have, and bring new value to the equation.

Where there is evolving proof of benefits to the bottom line as more companies find cost savings, labor productivity, or enhanced revenue streams from AI projects, the pace of adoption will continue to ramp upwards.

The Digital Assistant Example

Omdia predicts that the top three horizontals for GenAI with projected revenues in 2028 will be:

- Visual analytics ($16.6bn)
- Customer experience ($7.5bn)
- Chatbots & virtual assistants ($6.9bn)

Given the strengths of GenAI technology, it's no surprise to see these horizontals at the forefront of deployment – and with an obvious use case in the world of digital assistants for both consumer and enterprise applications.

Consider the range of possibilities that such assistants could bring – with personalized experiences for both professional and personal uses - from retail recommendations to writing assistants, and from movie theatres to manufacturing plants.

For example, when it comes to employee and customer safety, access to all the operational and business data in the world is not enough to avoid all potential damage, injury, financial loss, or even life-threatening situations. By leveraging advanced algorithms capable of interpreting visual data gathered from video (e.g. surveillance cameras, or from a mobile device), however, it is possible to go well-beyond basic loss prevention to encompass a host of real-time, transformational capabilities. For example, computer vision can use the idea of anomaly detection to mitigate dangerous situations while simultaneously improving operational efficiency anywhere many people come together - resulting in both improved safety for employees, and reduced costs for the business.

In cases such as these, the power of bringing GenAI inferencing capabilities to the edge IoT device (including smartphones) could help unlock exponential growth in adoption and value creation for users.

Navigating The Challenges to Success

As models become progressively more capable and less dependent upon data center hardware, enterprise practitioners will find new, as yet unimagined opportunities to build, refine, extend, and deploy GenAI models at the edge, where humans and machines come together. Highly adaptive and smaller GenAI foundation models are powering explosive growth in recent months - yet the speed of innovation and ease of access to GenAI technologies have created a false sense of security among early enterprise adopters. Risks abound and the rapid rate of GenAI innovation can leave many practitioners and enterprises either open to unseen risks or frozen in inaction. For example, this includes concerns such as:

- **Cost -** GenAI's dependence on hardware acceleration makes computing costs for LLMs significantly higher than standard machine learning (ML) and deep learning (DL) approaches.
- **Privacy –** Particularly where consumer devices (such as smartphones) are the edge inferencing device, how do you protect consumer data from being misused or unsecure?
- **Time to Market –** In such a fast-growing market, how do developers move quickly enough on the right solutions, and bring new value to their end-users in line or ahead of their competition?

Developers (and enterprise practitioners) therefore have the unenviable task of bringing these edge solutions together that can deliver all of the promise and with none of the risk. This is clearly more than just a hardware problem – it combines the need for the right chipset, software, application and development ecosystem. In the convergence of IoT and AI, this also brings new collaboration across businesses – particularly from the IoT Embedded Engineers – into ways of working that might be new.

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For example, there is a need for software tools that bridge the gap between cloud training and edge inference. There will be an architecture split between the data center and the edge. Developers will be even more important than usual, as they are completely open to what applications will use the increasing inference power available at the edge. Consequently, they will sell the hardware.

And with more tools (both hardware and software) to play with on the device, AI features will become more accessible to users of more devices. Hybrid AI will be a key part of this—where edge devices will rely on lighter AI models for on-device features and cloud AI computing for bigger GenAI tasks.

The Next Steps

With all this in mind, it's no wonder that enterprises look to the support of their vendor network in every step of the process – particularly those able to help simplify the end-to-end process across hardware, software and ecosystem. For example, the development of stronger SoCs such as Qualcomm's Snapdragon 8 Gen3 might be providing the hardware to give devices the capability to run these models, but the Snapdragon Compute Platforms and Qualcomm AI Stack sit alongside as part of the overall support for developers and engineers to bring these solutions to life.

In all cases, the first goal is to continue to build and identify the right use cases – such as virtual assistants – and to understand the value the new solution can bring – just as was always the key to IoT deployment. But with the augmentation of IoT with AI technology, digital transformation projects are surely only just getting started.

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