



# Moving AI from Idea to Execution

## Retail

RESEARCHED BY



Omdia was established following the merger of Ovum, Heavy Reading and Tractica with the acquired IHS Markit technology research portfolio.

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# A Message from Lenovo & NVIDIA

Focused on a bold vision to deliver smarter technology for all, Lenovo is developing world-changing technologies that create a more inclusive, trustworthy, and sustainable digital society. By designing, engineering, and building the world's most complete portfolio of smart devices and infrastructure, we are also leading an Intelligent Transformation – to create better experiences and opportunities for millions of customers around the world.

Accelerating AI relies on GPUs. NVIDIA delivers GPU acceleration everywhere it's needed—to data centers, desktops, laptops, and the world's fastest supercomputers. As companies are increasingly data-driven, the demand for AI technology grows. From speech recognition and recommender systems to medical imaging and improved supply chain management, AI technology is providing enterprises the compute power, tools, and algorithms their teams need to do their life's work.

Analytics and AI are changing the way organizations do business in industries from Manufacturing to Retail, Healthcare to Finance. Nearly half of enterprises have started their AI journey but many are challenged with moving AI from research to reality.

As the Power of 2, Lenovo and NVIDIA unite to bring innovative solutions and intelligent infrastructures used to solve your greatest challenges of today and tomorrow. We equip data-centered researchers, pioneers and visionaries across all industries with the instruments of their life's work and help them to evolve, transform and implement enterprise AI solutions to deliver Smarter Technology for All.

Learn how Lenovo and NVIDIA can help you harness the value of your data and transform your business.

To find out visit [www.powerof2.nvidia.lenovo.com](http://www.powerof2.nvidia.lenovo.com).



# The Widening World of AI

Global adoption of AI continues to accelerate, moving from initial promise into real-world value for all types of organizations. Omdia, a powerhouse that combines Informa Tech's market leading analyst houses, of Ovum, Heavy Reading, Tractica, and the majority of IHS Markit's Technology research, predicts surging growth and investment through 2021 and beyond, as early adopters deepen investments and fast followers initiate new projects.

In fact, if AI was a country, then its GDP would place in the top #100 in 2020 (between Jordan and Congo). In less than 5 years, that swells to \$200bn USD spending and a top #50 berth (between Portugal and Peru). AI is powering a global digital transformation and it's moving fast.



Source: Omdia

According to the US Bureau of Labor Statistics, the US attained a 5.4% increase in productivity during Q1 2021, the second strongest quarterly growth in the past decade. Omdia believes the real-world deployment of AI technology and the spread of AI beyond hyperscalers is driving new levels of efficiency and productivity. This boost in AI continues to help businesses thrive in a COVID-affected world and AI budgets are only set to increase in the longer term.

To power that growth, AI will reach further down into the ecosystem – including to small and midsized businesses (SMBs) – as it becomes more understood, easier to implement, more scalable and more affordable.

This Omdia eBook, commissioned by Lenovo and NVIDIA, tracks that move from niche to mainstream for AI across all industries – and in particular for the vertical of Retail.

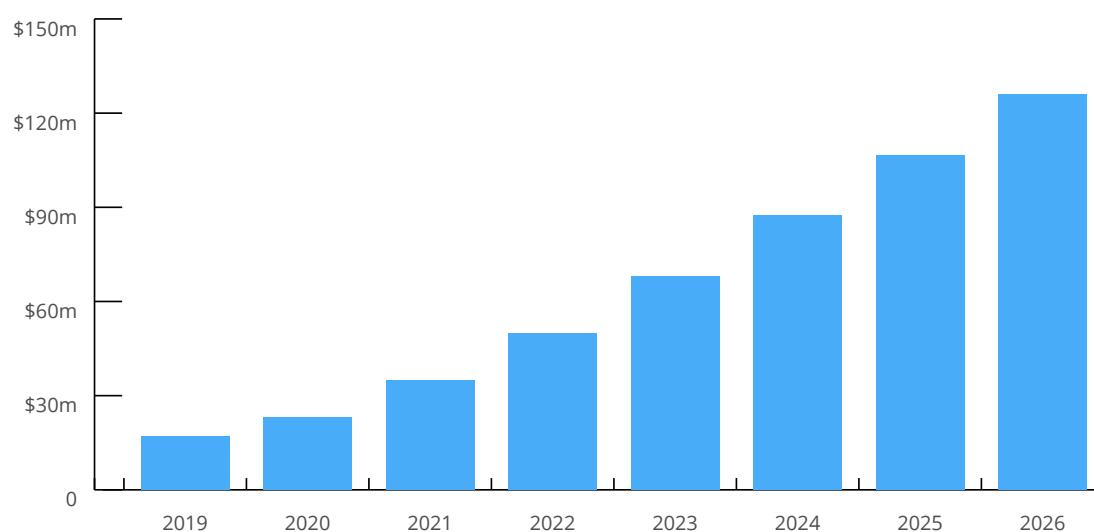
*"Now more than ever, knowledge gained from enterprise data and analytics can serve as an actionable antidote to global uncertainty."*

Bradley Shimmin, Chief Analyst, AI Platforms, Analytics, and Data Management - Omdia

# AI Moves to the Mainstream

AI spending has grown tremendously in recent years – and the global market for AI software alone is expected to increase from \$17bn in 2019 to \$126bn by 2026. Significant opportunity lies ahead for AI software market penetration, despite short-term economic and market turbulence.

## Global AI Software Spending



Following a traditional adoption path, many enterprises first pilot the technology with proof-of-concept (PoC) projects, before later moving to full-scale implementation, and often finding AI software can help cut costs and generate

new revenue streams. Yet, AI software remains a relatively small portion of overall software sales, with varying acceptance across industries.

For many, moving beyond the PoC stage has been a significant challenge – but 2020/2021 is proving to be a tipping point in attitudes (especially as COVID accelerates some of the existing trends towards digital and virtual solutions). In an Omdia survey, 24% of enterprises now say they have fully deployed AI in at least one function, as the barrier to entry for what were traditionally highly specialized data and analytics practices has fallen steadily over the past five years.

It's no longer a conversation of how AI 'could' transform businesses, but how it is already doing so. With an increasing number of players involved, the democratization of AI also moves out of the niche and into the mainstream.



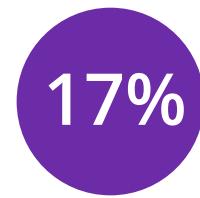
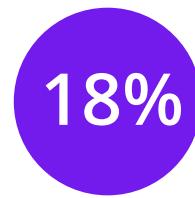
**Enterprises deployed AI  
in one or more functions**

# The AI Drivers and Challenges

A mixture of technical and non-technical challenges have held back adoption of AI in many businesses to date – with lack of qualified personnel (the human challenge), complexity (the technical challenge) and lack of budget (the monetary challenge) the top three ranked amongst enterprises.

However, as adoption increases and businesses increasingly see the ROIs proven out from AI solutions and use cases, the business value becomes clearer and businesses are ready for the next wave of projects.

## The most common AI project KPIs (% of total)



Cost reduction

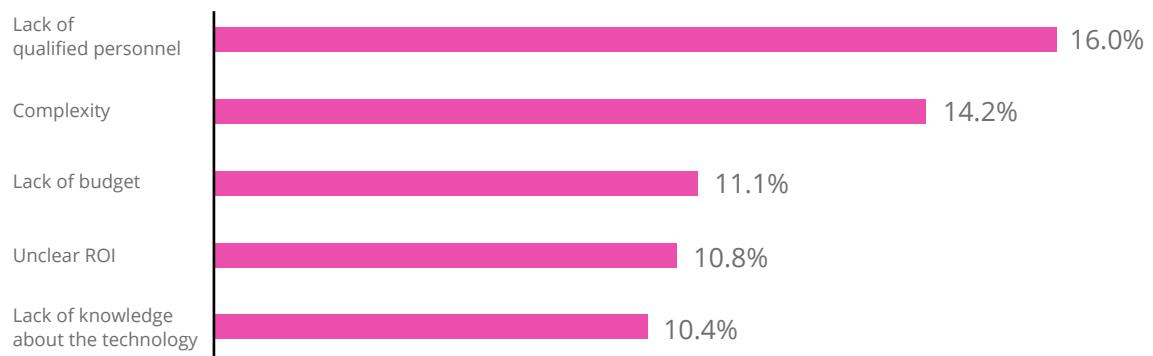
Engagement

Time reduction

A critical element of this learning is identifying and deploying the best performance metrics. With so much investment at stake and the early-stage nature of AI market adoption, key performance indicators (KPIs) for AI are the most important guardrail for senior management to use to guide their AI strategies. Predictably, the most common KPIs focus on cost reduction, engagement and time reduction.

Most encouragingly, the payoff period for AI is also moving closer – a particularly important consideration for the SMB community who can drive the next wave of adoption. In a recent Omdia survey, 72% of small and midsized businesses (SMB, Less than \$1bn revenue) respondents said they were confident/very confident AI will deliver positive results towards their business goals within the next 12-24 months. Omdia expects this confidence to translate into surging growth of AI applications in 2021.

## What is the biggest factor slowing your organisation's adoption of AI?

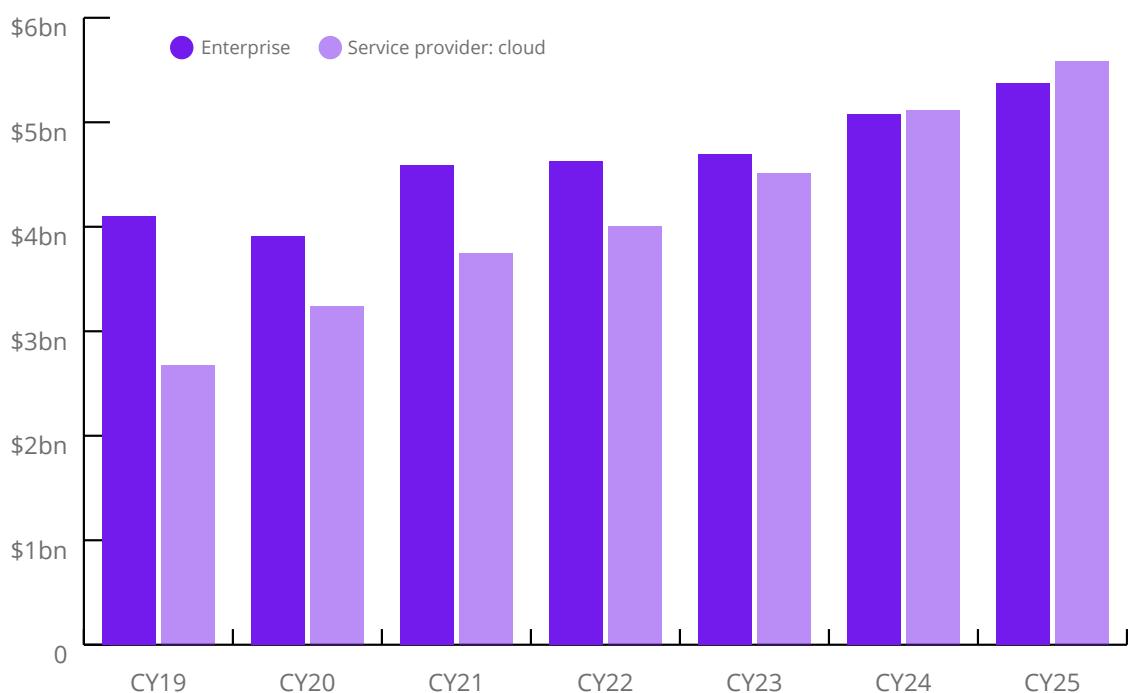


Notes: 2020 State of AI Survey (in conjunction with Information Week and ITPro Today; n=288. Source: Omdia

# Breaking Down AI Barriers

Early adopters of AI may gain a competitive advantage, but fast followers can quickly close the gap. In particular, fast followers can game plan potential acceleration of their AI deployment, develop specifications and RFPs to channel AI vendor proposals, learn from the process to choose their vendors/find tools, and move to deployment (and ROI) with ever increasing speed. This is true for both Large Enterprise and SMBs.

**Data center server equipment by market segment worldwide forecast (\$)**



As the market grows, the abundance and ubiquity of data coupled with the maturation of self-service analytics has helped companies democratize data among business users and break down data silos between departments. The democratization of AI also extends to the vendor community. For example, where AI hardware used to be the reserve of cloud hyperscalers, AI is now firmly within the broader market for enterprise data centres – with massive potential for AI-enabled servers.

**Most adopted AI professional services (% of total) – Omdia end-user survey**

**23% Integration services**    **21% Customization services**    **20% Training services**

Fast followers can reap the benefit of seeing AI-enabled hardware offered to them in accessible and affordable options, with familiar-looking approaches and solutions. For enterprises and SMBs where the human challenges of knowledge/staff training remains a barrier, buying in ready-made AI expertise and professional services provides a clear and easy adoption path. In fact, vendor expertise is the top reason why enterprises selected a particular commercial AI solution vendor (selected within the top 3 by 79%), with spending on AI professional services split across the spectrum of solution types.

Vendor-led, affordable, accessible and scalable solutions are key in accelerating the AI growth path through the SMB community.

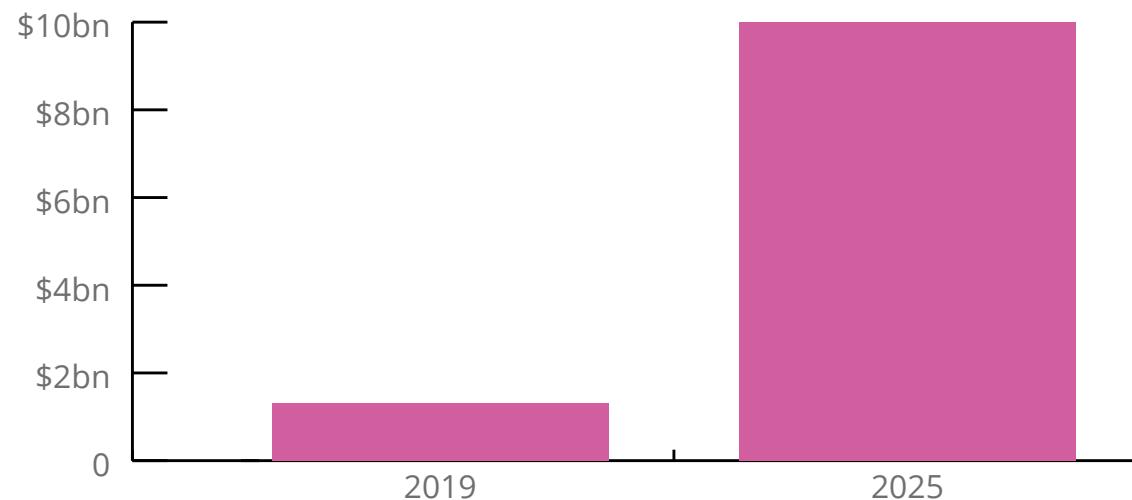
# Vertical Market - Retail



# Retail – An Introduction for AI

The retail industry has long been facing quickly evolving market pressures due to digitalization and technology advances. Disruptors such as Amazon, Alibaba, Walmart, and many startups are using AI to build lean, analytics-driven organizations based on scale and efficiency. The goal of these organizations is to drive top-line revenue and reduce operating costs. These more efficient and scalable disruptors draw more buyers and sales with sharper pricing, personalized customer journeys, all while driving down costs through efficiencies in supply chain & inventory management.

## AI software spend for Retail



For many, this means turning to the power of AI to target efficiencies and improved customer experience – that's why Omdia projects spend on AI software by retailers will grow from \$1.3 billion in 2019 to nearly \$10 billion in 2025.

Further accelerating the transition, more recently COVID-19 has increased the pressure retailers are facing to change how they do business. Can AI help retail survive? The short answer is yes. As in many AI use cases across verticals, the pandemic simply magnifies the need for automation and more principled predictive analytics.

Pre-pandemic, Omdia AI software forecasts had retail as a top #5 vertical for AI spend – yet it jumped to #2 in the post-pandemic forecast. From brick-and-mortar stores to online-only operations, and from Quick Service Restaurants to fashion retailers, the AI snowball in retail is only picking up in pace.



*Pre-pandemic, Retail was ranked  
the #5 vertical AI software market  
spend forecast. Post-pandemic, Retail ranks at #2.*



# Retail – Applications & Challenges

In the customer-facing world of retail, most AI applications are driven by two key goals:

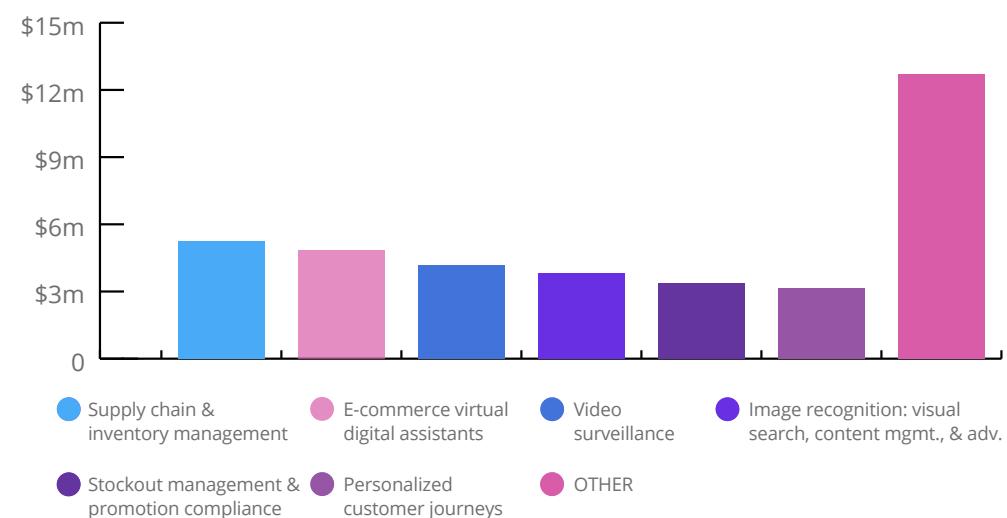
- **Increase revenue** – such as through improved customer experience, search functionality and marketing/offers. In such a competitive space, customers will quickly spend elsewhere if the customer experience is challenging, with much spent for online tools such as virtual digital assistants (VDAs) and recommendation engines. Successful retailers are leveraging a wealth of contextual personal data and predictive analytics to serve up personalized recommendations, promotions, and marketing.
- **Reduce costs** – such as through supply chain optimization, in-store analytics, demand forecasting. The stakes are high, and it is estimated that hundreds of billions of dollars are lost every year through missed opportunities and excess costs due to these issues. Adopted applications include creating digital maps of in-store inventory to manage out-of-stock inventory, correct pricing, and label and promotion misplacements; and applying predictive analytics and data science to significantly improve price optimization and demand forecasting/inventory management

In the Omdia AI Software Forecast, retail use cases span across these twin aims of increased revenue and reduced costs, as companies strive for efficiency through the use of AI. Meanwhile, barriers to adoption come from a variety of different

sources and range from unrealistic expectations about the capabilities of AI, a near-continuous hype cycle, social controversy, demand for accurate input data, and change management and talent issues.

Retailers also remain cautious to deploy customer-facing applications without seeing real-world success/ROI from existing systems. The price of bad AI can potentially outstrip the cost of not deploying at all – but increasing education and visibility of the benefits is driving the market forwards.

## AI software spend (2019-2025)



# Retail – Case Study

## Customer Experience and the Price of Not Adopting AI

In a crowded competitive market, Quick Service Restaurants (QSRs) compete on customer convenience and experience, while controlling wastage and streamlining supply chains as much as possible. AI applications not only have the capability to improve operations here, but can even become a key marketing tool for a brand.



**Interview with Cynthia Countouris, Global Director of Product Marketing, AI for Retail, Restaurant and CPG**

*The potential for AI to transform QSRs is clear, with the scale already tipped heavily towards full deployment rather than simply proof of concept studies. Applications span the full spectrum of Customer Experience, Store Analytics, Forecasting and Optimization in creating the Intelligent QSR.*

*Implementing AI applications to help increase demand forecasting frequency and accuracy, while helping reduce waste/spoilage may not be a new concept, but the returns for the business can be massive in a price competitive market. For example, we've seen some clients improve forecasting accuracy by up to 20% through AI to date. Of course, in the wake of the COVID-19 pandemic a greater focus has also fallen on in-store applications for improved customer experience and standards compliance such*

*as real-time associate alerts, product quality assurance and sanitation management. However, in the age of businesses competing on customer experience, much of the current topical trend is towards NLP/Conversational AI applications such as voice order taking. In fact, we've found solutions leveraging NVIDIA GPUs and frameworks can run inference 10x faster than CPUs, and currently have an accuracy for order taking at 85%+ and improving with increased training.*

*One of the biggest cost-saving AI solutions we've deployed is with a large fast food brand, where the Lenovo N50 Jetson NX is being deployed to provide video visual analysis for the store. In particular, we've used this for a security application to use object detection and alert the store HQ when people are detected in restricted areas – and this is now deployed at over 1,500 stores. The same client is now trialling the same video analysis engine for food quality monitoring too, using the same hardware.*

*There's huge potential for AI to improve all aspects of operational efficiency within the sector, but we're also seeing the AI-focus morph to become part of the entire brand too, where technological innovation is positioned as part of the customer attraction.*

*The conversation therefore shifts from "why should I adopt AI" to instead, "how can I gain the benefits sooner?"*

# Appendix

## About Lenovo

Focused on a bold vision to deliver smarter technology for all, Lenovo is developing world-changing technologies that create a more inclusive, trustworthy, and sustainable digital society. By designing, engineering and building the world's most complete portfolio of smart devices and infrastructure, we are also leading an Intelligent Transformation—to create better experiences and opportunities for millions of customers around the world.



## About NVIDIA

In 1999 sparked the growth of the PC gaming market, redefined modern computer graphics, and revolutionized parallel computing. More recently, GPU deep learning ignited modern AI — the next era of computing — with the GPU acting as the brain of computers, robots, and self-driving cars that can perceive and understand the world.

### NVIDIA AI



### NVIDIA Virtualization (vGPU)



### NVIDIA Data Center



## About Omdia

Omdia is a global technology research powerhouse, established following the merger of the research division of Informa Tech (Ovum, Heavy Reading, and Tractica) and the acquired IHS Markit technology research portfolio\*. We combine the expertise of more than 400 analysts across the entire technology spectrum, covering 150 markets. We publish over 3,000 research reports annually, reaching more than 14,000 subscribers, and cover thousands of technology, media, and telecommunications companies.

Our exhaustive intelligence and deep technology expertise enable us to uncover actionable insights that help our customers connect the dots in today's constantly evolving technology environment and empower them to improve their businesses – today and tomorrow.

\* The majority of IHS Markit technology research products and solutions were acquired by Informa in August 2019 and are now part of Omdia.



# References/Further Reading

## Analysts

**David Green:** Consulting Director, AI & IoT:

David.green@omdia.com

## Methodology

The Technology team at Omdia is the leading source of information, insight and analytics in critical areas that shape today's technology ecosystem—from materials and components, to devices and equipment, to end markets and consumers. Businesses and governments in more than 150 countries around the globe rely on the deep market insight we provide from over 300 industry analysts in technology sectors spanning IT, telecom, media, industrial, automotive, electronics, IoT and more. What sets Omdia's AI research Practice apart is our team of technical, experienced analysts, and our end-to-end coverage of the industry.

This eBook pulls together insights from the Omdia AI analyst team, alongside quantitative research highlights from syndicated reports from the Analytics & Data Management Intelligence Service, Artificial Intelligence Applications Intelligence Service, and Artificial Intelligence Business Toolkit Intelligence Service. Some of the key publications within those are listed to the right.

## References

- ⇒ Artificial Intelligence Software Market Forecasts – 2Q21 Analysis
- ⇒ AI Business Performance Metrics Database – 2Q21 Analysis
- ⇒ AI Market Maturity Survey
- ⇒ AI for Healthcare Applications Report – 2021



## The Omdia team of 400+ analysts and consultants are located across the globe

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E insights@omdia.com  
E consulting@omdia.com  
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