

Investment opportunities in the age of Artificial Intelligence

Fullerton Insights
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Executive Summary

- ▶ With recent developments and advancements in Artificial Intelligence (AI), Fullerton subscribes to the view that a major paradigm shift is unfolding. However, with all the hype surrounding AI, and the rapid rise in the share prices of obvious enablers, it is imperative for investors to evaluate sectors that will be best placed to monetise the benefits of AI longer term versus those that may not have the capacity to do so.
- ▶ In this Fullerton Investment Insights paper, we seek to identify players that embody the scale at which AI's advancement will be pervasive and explore potential investment opportunities radiating to the broader economy.
- ▶ We explain why the tech sector, especially in the US, has been a favourable investment vehicle for many years and shed light on the 'game-changing' boost AI can deliver.
- ▶ We also expand on how direct impacts from new technologies, coupled with spillover demand spending, may prove significant and far-reaching across sectors like consumerism, industrialisation, healthcare, and finance.

1. The investment case for the tech sector and the ‘game changing’ boost Artificial Intelligence (AI) brings

The tech sector has exhibited robust fundamentals for more than a decade and AI presents another potential game-changing development.

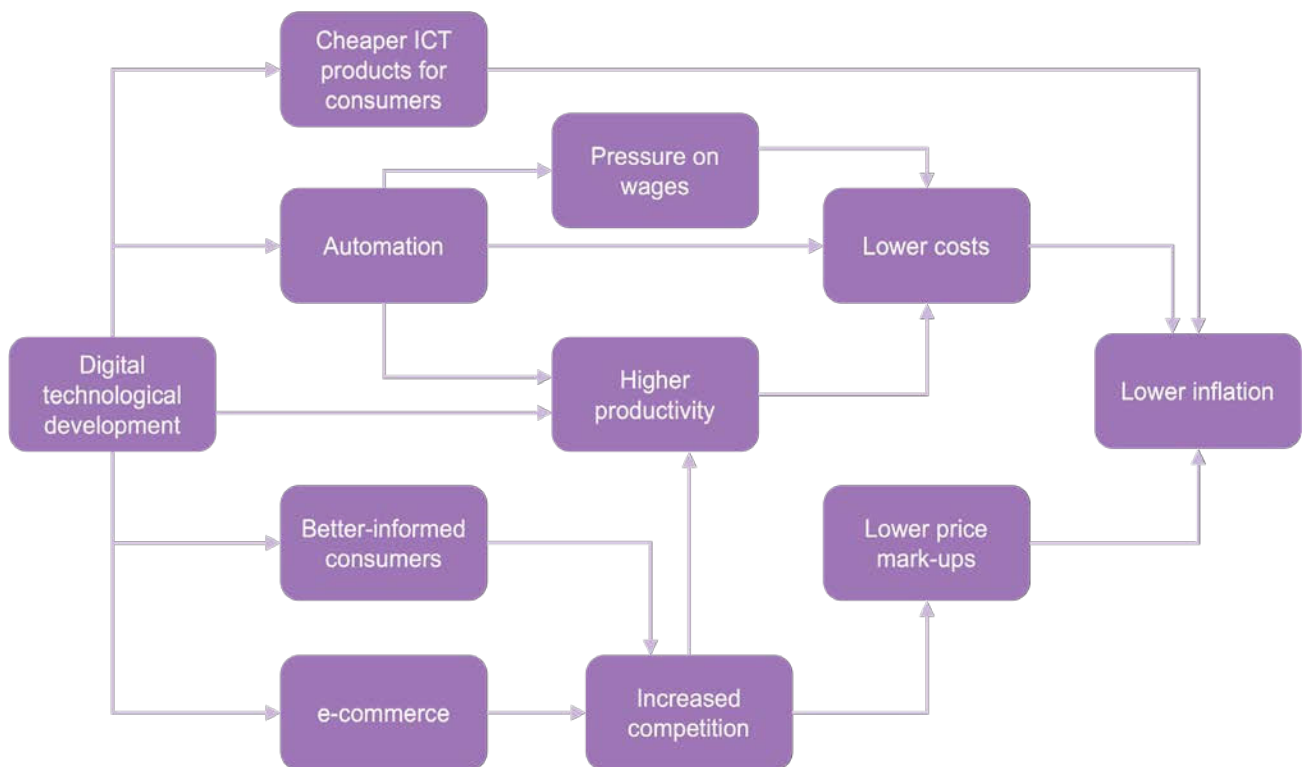
Fullerton has had a positive view on the performance of the tech sector, especially across the US, for many years because of its strong fundamentals. The tech sector has benefited from several ‘game-changing’ transformations since 2000, with the advent of the internet, ecommerce, and social media, and most recently the ‘metaverse’¹.

From the macro perspective, all these developments seem to have contributed to stronger than otherwise productivity growth and lower than otherwise inflation. Figure 1 gives a stylised representation of the key interlinkages and forces at play that can drive such outcomes. For example, machines have automated many repetitive tasks, especially across industry, facilitating efficiency gains and higher value-added outputs. Greater productivity has helped reduce raw material demands,

costs of production, and better aligned wages to workers’ value creation. Improvements in technology have led to a more rapid transmission of ideas, increasing ecommerce and competition, while creating better quality outputs at lower prices to consumers.



Figure 1: How new technology feeds through the macro economy to increase productivity and lower inflation



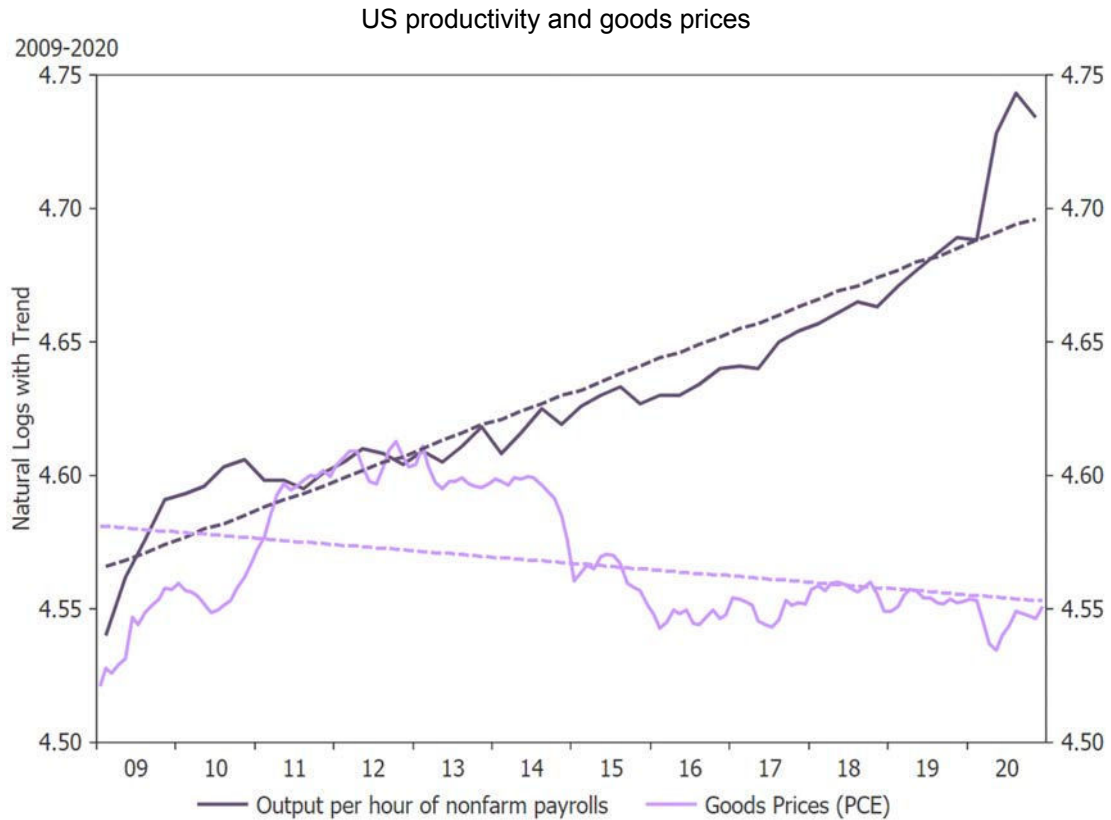
Source: Risksbank (2015) “Digitisation and inflation”

1. An iteration of the internet, the ‘metaverse’ is a network of virtual worlds. It will likely revolutionise digital experiences, fostering greater consumerism with enhanced social interactions, new products, and services. Further details on Fullerton’s positive outlook for the tech sector can be found here: https://www.fullertonfund.com/wp-content/uploads/2023/01/Insights_Enduring-structural-themes_d6_LR.pdf

The US economy, being one of the most open in the world to free-market forces, and flexible enough to deploy new technologies, provides robust supporting evidence that the 'internet age' of the last decade

has been a resounding success. Over the period US productivity growth averaged 1.7% p.a while consumer goods prices fell by almost 0.2% p.a on average (see Figure 2).

Figure 2: US productivity and prices of consumer goods over the last decade



Source: Refinitiv Datastream, August 2023

However, strong US productivity growth is not a new trend – it has averaged around 1.5-2.0% p.a since 1950. What has shifted over time is the contributions from different types of technology, that have come and gone, in underpinning such efficiency gains i.e from mass-production, assembly lines, to office automation, fax machines, and to the age of the internet. Key developments of the last decade that have been more unique during this 'Tech industrial revolution' is the downtrend in consumer goods prices (Figure 2) and the robust rewards for the tech sector's investors.

The tech sector's strongest fundamental is its sustained earnings growth in excess of the market, even when Average Selling Prices (ASP) are falling

What has made the US tech sector such a strong investment proposition over the last decade or so is that it has enjoyed a strong trend in earnings growth expectations in excess of the market and its PE ratio has risen (see Figure 3). That suggests that market pricing is always more optimistic about earnings performance to come and as a result the value of tech stocks has enjoyed a steady uptrend.

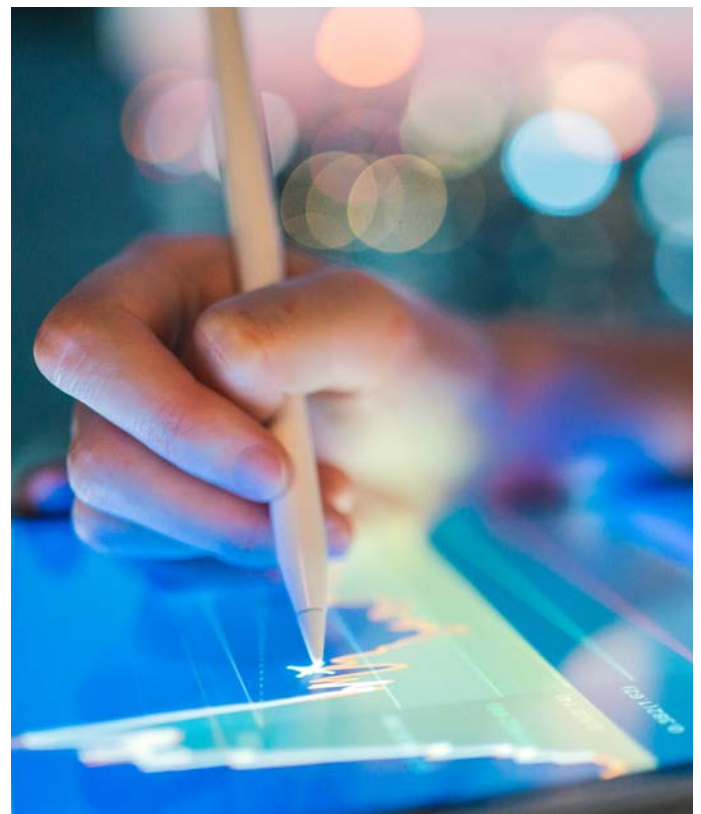
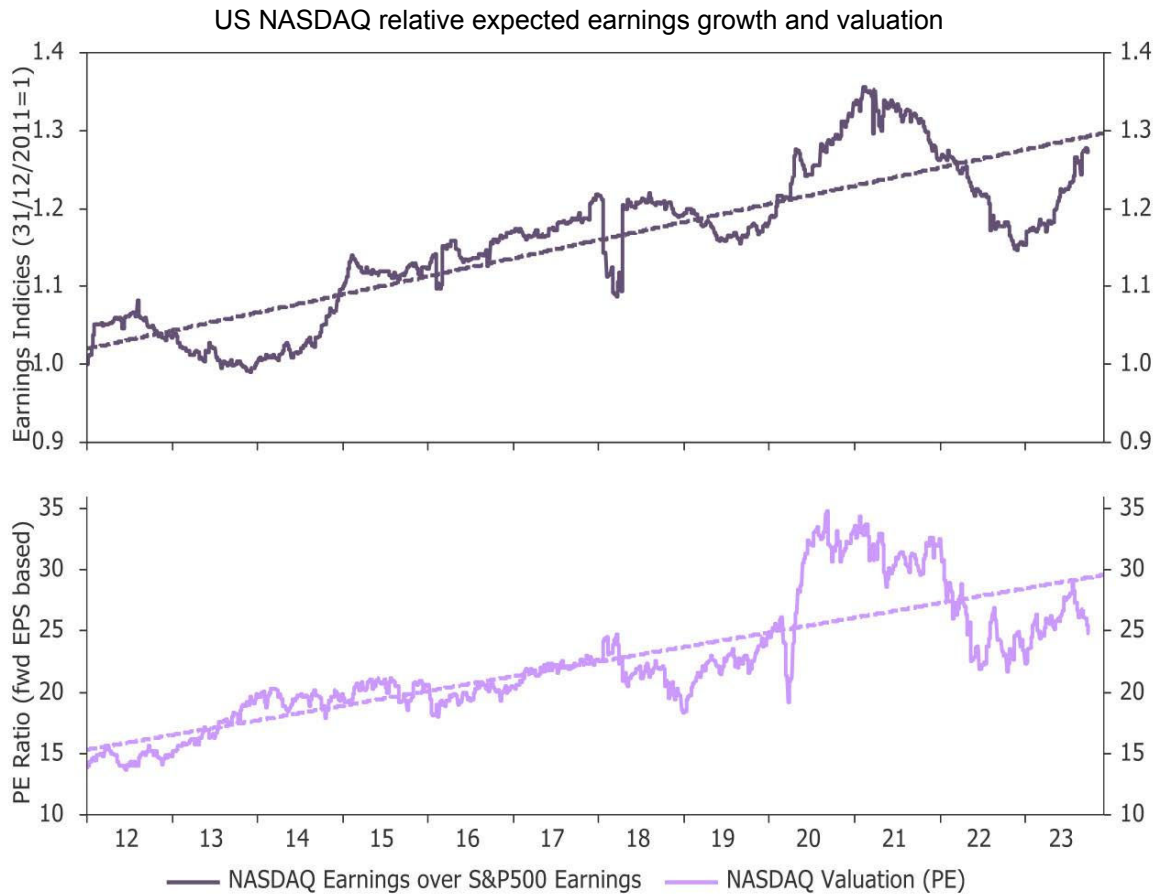


Figure 3: The tech sector has presented a strong investment case for many years

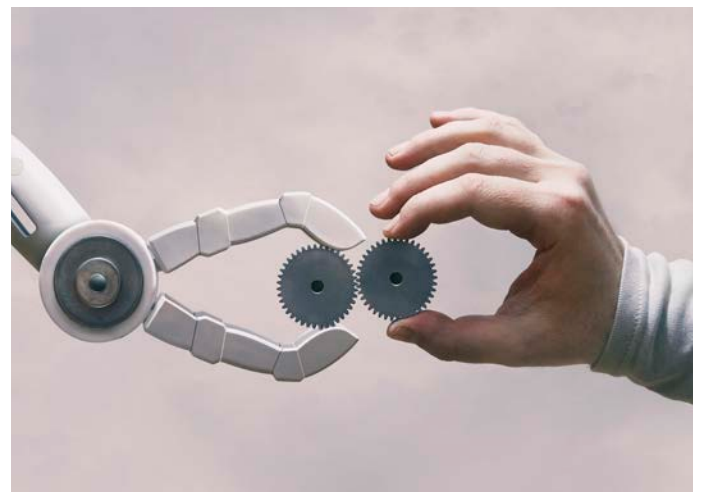
Source: Refinitiv Datastream, October 2023

Figure 3 also suggests that despite the strength of the US IT rally so far there is still potential upside to come as earnings growth expectations continue to heal back toward trend. This is more a reflection of cyclical dynamics rather than the possibility that AI creates a more favourable long-term performance trend. In fact, with the recent sell-off, the Nasdaq has become relatively cheaper.

Bullish investment expectations are not without fundamental support: studies expect significant net macro gains from AI-technologies

Unsurprisingly then, given the long track-record of data linking positive macro benefits to new technologies, the potential impact of AI is no different. PWC (2017)² forecasts that AI-related technologies will boost global GDP by \$15.7 trillion by 2030. This translates to an extra \$1.2tn p.a. of spending, or roughly 1%pts of growth, from 2023 to 2030. Of this contribution, around 40% comes from increased productivity, driven by business both automating processes and augmenting their existing labour force with new technologies. The remaining 60% reflects spillover demand effects

stemming from new products and services facilitated by AI-related technologies. Mapping all this back to the latest US data, it implies that its economy-wide productivity could be boosted by a factor of 25% over the long-term. Asia is also expected to be a key growth beneficiary from the adoption of AI, with its GDP forecast to rise by around 50% of the estimated global stimulus impact by 2030.



2. PWC (2017) "Sizing the prize What's the real value of AI for your business and how can you capitalise?".



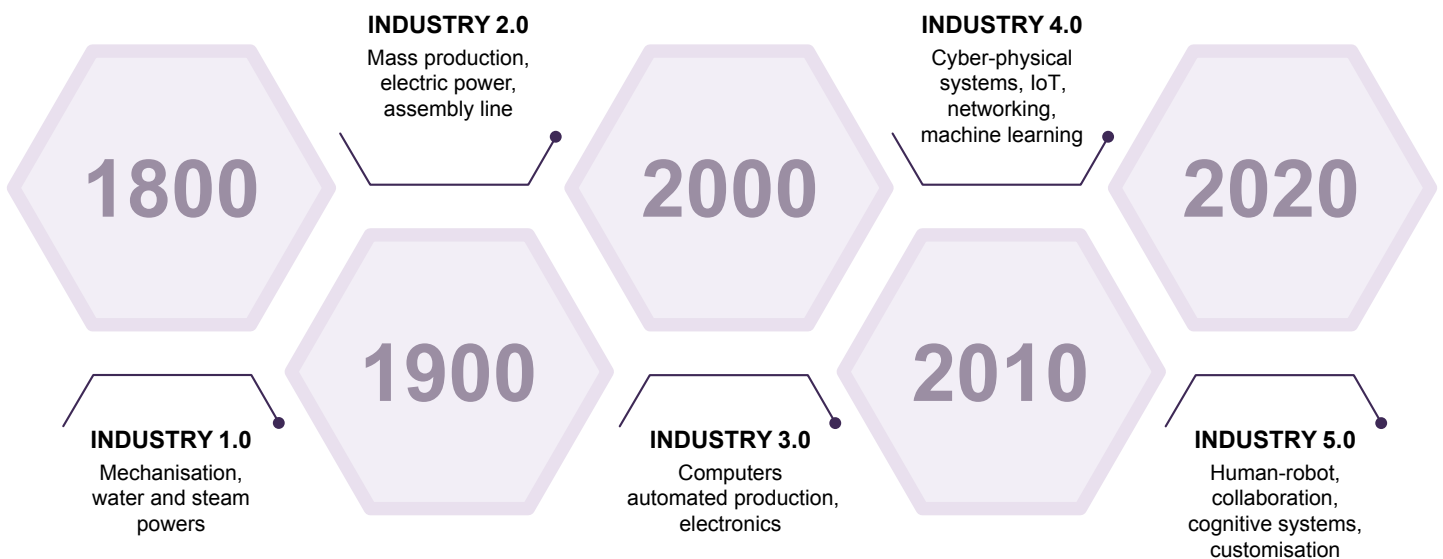
Fullerton subscribes to the view that AI may prove to be the core of the ‘fifth industrial revolution’

Artificial Intelligence (AI), as its name suggests, is the process of simulating human intelligence in machines through programming that can facilitate learning and independent actions. AI can be thought of as a machine-based system that can, with varying degrees of human intervention, acquire and apply knowledge to make recommendations, predictions, or decisions that impact real or virtual environments³.

The significance of AI is that it may mark the fifth industrial revolution where the next leg-up in value-added outputs and productivity will be a tech-driven combination of humans and machines at work (see Figure 4). The impacts of these big-bang ‘industrial revolutions’ in Fullerton’s view has been a key driver of the strong fundamentals across tech. Jeff Bezos, Founder and Executive Chairman of Amazon, perhaps best summarised the importance of the revolution unfolding: “We are now solving problems with machine learning and artificial intelligence that were... in the realm of science fiction for the last several decades.”⁴

Figure 4: The fifth industrial revolution involves the combination of humans and machines at work

The five waves of industrial revolution



Source: Bank of America, “Me, Myself and AI”, February 2023

3. An industry-standard AI definition is presented by the OECD (2019) “AI principles: Deliberations of the Expert Group on Artificial Intelligence”.

4. CNBC, May 2017.

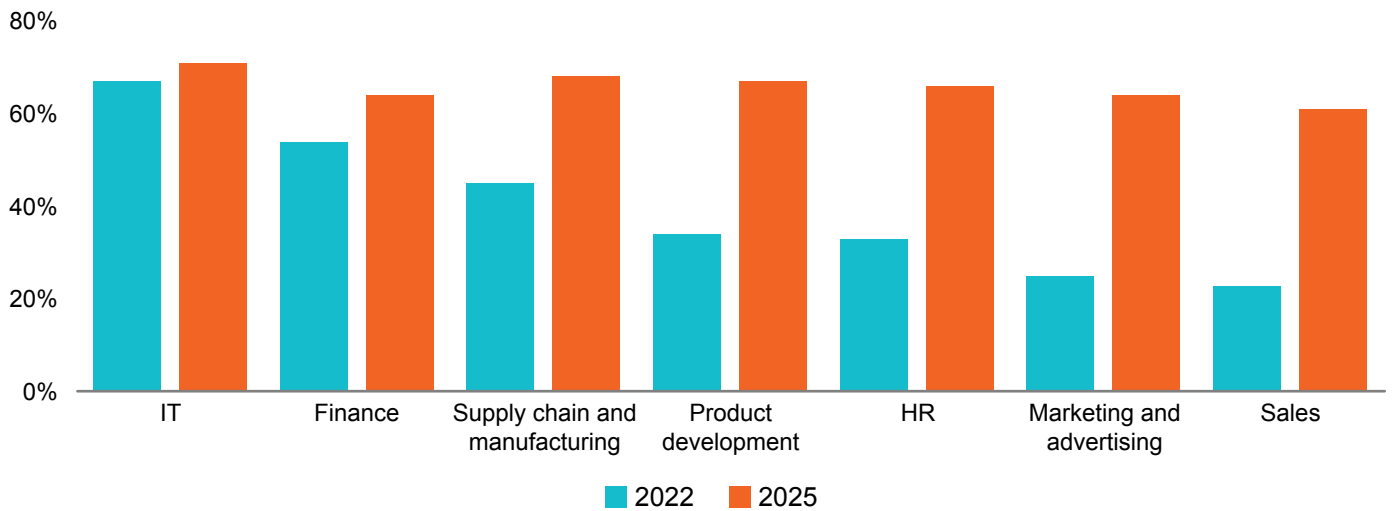
AI utilisation has been following a rising trend for many years, across a wide variety of business applications to help boost revenues and control costs

With AI’s capabilities to digest and analyse vast volumes of data, recognise patterns, make predictions, and generate content, it can have significant payoffs for businesses. Motivations behind AI adoption are focused on revenue generation, where AI can enhance product

quality and consumer experiences, as well as on costs, where AI can boost efficiencies and productivity.

Well before investor interest surged this year, there has been a strong trend in AI utilisation across a variety of sectors deploying a range of technologies. From its latest global survey of CIOs, Databricks and MIT found 94% of all respondents were already deploying AI-related technology. More importantly, significantly stronger utilisation is planned over the next few years especially across tech, manufacturing, consumerism, and finance (see Figure 5).

Figure 5: Corporate survey of AI usage (current and expected) across business functions



Source: Deutsche Bank, Databricks, May 2023

Across all business types, some of the key areas of application include Robotic Process Automation, Computer Vision, followed closely by Natural-language text understanding, Virtual Agents, and Deep Learning (see Figure 6).



Figure 6: Top 5 most commonly deployed AI technology/process in 2022⁵

Technology / Process	Utilisation / features	Sector / Examples
Robotic Process Automation (RPA)	RPA software robots can drive business processes and outputs, especially across industry and logistics. This allows end-to-end processes to be highly automated, resulting in: <ul style="list-style-type: none"> Reduced production errors and enhanced product quality Lower incidence of workplace injuries Reduced waste and faster production cycles Greater productivity, flexibility, and scalability 	Robots in industrial production: <ul style="list-style-type: none"> IRM – Industrial Robotic Arms AMR – Autonomous Mobile Robots Cobots – have more sophisticated safety functions allowing for full integration with human dominant production lines Robots in logistics, distribution, and supply-chains: <ul style="list-style-type: none"> MHR – material-handling robots – utilised especially in warehousing e.g Sparrow: Amazon’s Robotic Arm⁶
Computer Vision	Computer Vision gives machines “the sense of sight”, to assemble, interpret, and act upon visual cues through images or surroundings.	e.g Autonomous Vehicles
Natural-Language Text Understanding	Natural-Language Understanding (NLU) uses algorithms to discern the connotations in human communication (from emotion to intent).	e.g Amazon Comprehend, Microsoft Azure, Google Translate, IBM Watson
Virtual Agents and Conversational Interfaces	Uses Natural Language Processing (NLP) to understand customer intent and search inquiries.	e.g Salesforce’s Einstein GPT – delivers AI-created content and support for the entire spectrum of customer service management.
Deep Learning	Deep Learning Models can recognise complex patterns in pictures, text, sounds, and other data to produce insights, predictions, and recommendations.	e.g Recommendation Engines (RE) utilised heavily across entertainment and eCommerce sectors (especially Netflix, Amazon, Shopee)

Source: Fullerton Fund Management, August 2023

New job creation can dominate any job destruction

As firms harness AI to increase automation, boost productivity, and lower costs, the process may result in some job and output displacement. For example, IBM Chief Executive Arvind Krishna announced a hiring pause for back-office roles, stating “I can easily see 30 per cent of that getting replaced by AI and automation over a five-year period⁷”. According to Challenger (May 2023)⁸ artificial intelligence contributed to roughly 5% of all jobs lost in May, as interest in the rapidly evolving technology’s ability to perform advanced organisational tasks and lighten workloads has intensified.

However, while some jobs may become redundant with greater AI integration, employment opportunities will also be created from shifts in productivity, an expanded value-chain from AI, and greater consumer spending. In addition to new jobs created to think creatively about how AI can be developed and applied, a new set of personnel will also be required to build, maintain, and operate these advancing technologies. All of this will facilitate the creation of new jobs that would not have existed in a world without AI. Reflecting the latter is a key reason why most studies forecast net gains to global GDP over time from AI adoption.

5. Source: McKinsey (Dec 2022) “The state of AI in 2022” and Fullerton Fund Management.

6. <https://www.aboutamazon.com/news/operations/amazon-introduces-sparrow-a-state-of-the-art-robot-that-handles-millions-of-diverse-products>

7. Source: Straits Times, 2 May 2023 <https://www.straitstimes.com/business/ibm-to-pause-hiring-for-jobs-that-ai-could-do>

8. <https://omscgcinc.wpenginepowered.com/wp-content/uploads/2023/06/The-Challenger-Report-May23.pdf>

2. Why has investor interest surged in AI?

The roll-out of Generative AI has been critical in driving investor sentiment, and its penetration has been rapid

Until now, AI could only read and write without the capacity to understand and subsequently generate content for consumers – as a result it was mostly contained to academia with the technical expertise to utilise it. For most of its history AI was confined to use cases that were very specific and could not be applied generally e.g IBM’s Deep Blue in defeating the World Chess Champion, Gary Kasparov (in 1997), Apple’s Siri (2010), and Google’s DeepMind AlphaGo defeating the Go World Champion (in 2017).

This changed on 30 November 2022, with the release of OpenAI’s ChatGPT – an AI chatbot that uses machine learning technology to generate new and original forms of content, or aptly named, Generative AI. Within the span of just 5 days, ChatGPT was host to 1 million users. This in comparison to other applications such as Netflix, which needed 3.5 years to reach 1 million users, highlights that Generative AI has already achieved unprecedented adoption rates (see Figure 7). Nvidia’s CEO Jensen Huang alludes to Generative AI as “the iPhone moment of AI” and that ChatGPT’s emergence is “one of the greatest things that has ever been done for computing” (Source: Dean’s Speaker Series, Berkeley, Jan 31, 2023).

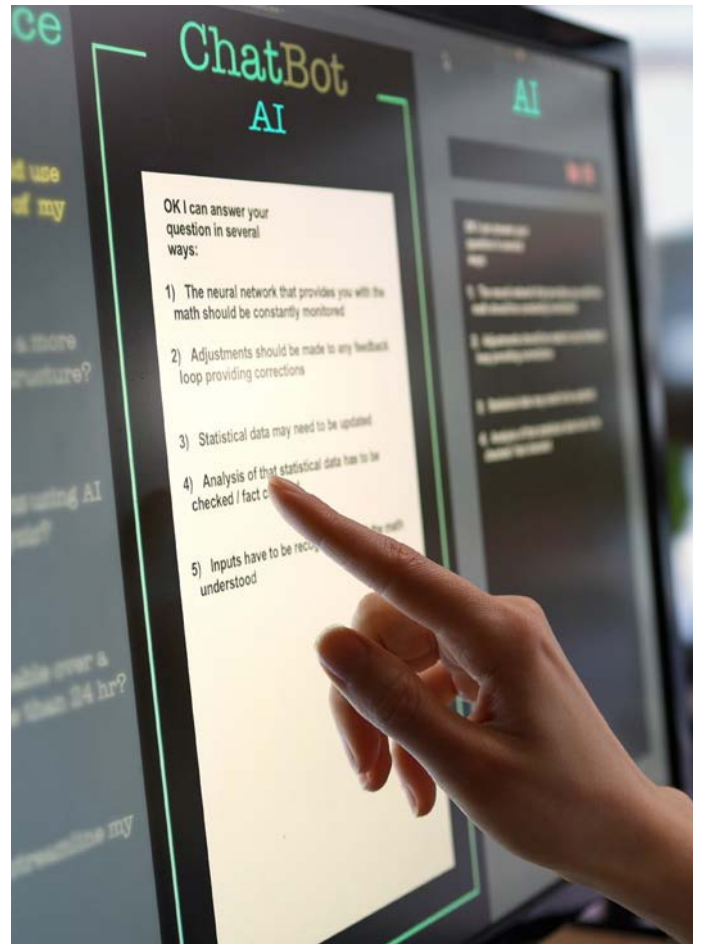
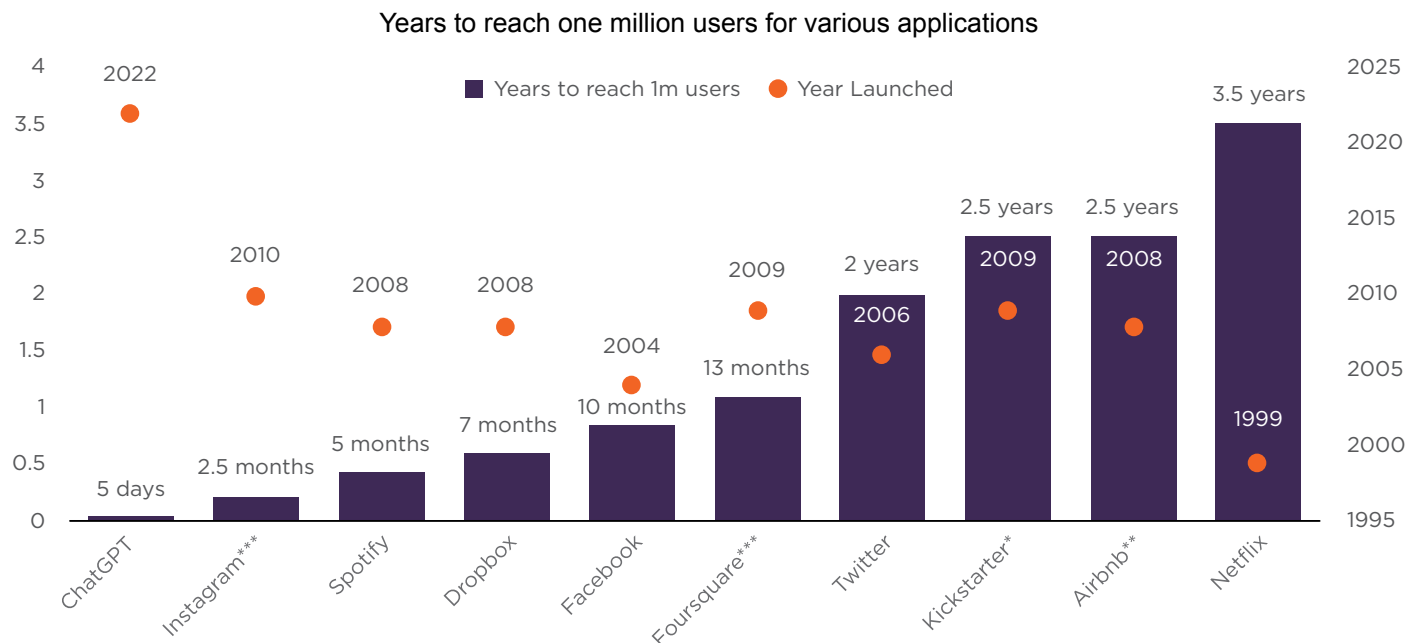
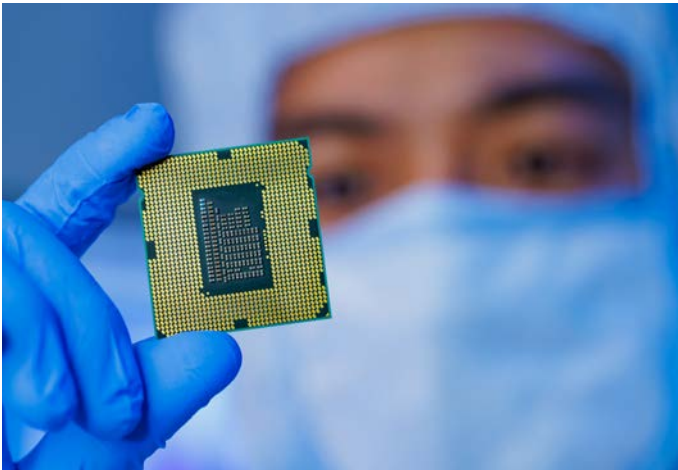


Figure 7: Rapid penetration of Generative AI



Source: BofA Global Research, Statista, February 2023. *one million backers **one million nights booked ***one million downloads.



prices rally significantly, especially across sectors like software, semiconductors, tech-hardware, and media. These companies have either quickly incorporated Generative AI capabilities into their product and service offerings, announced plans to do so, or are direct beneficiaries along the value-chain from the increased demand in AI. For example, on 24 May 2023, Nvidia Corp, a global flagship player in the semiconductor space, saw its share price surge significantly after announcing stronger revenues – such success reflecting ChatGPT and the instant demand for its computer chip designed for Generative AI.

... with limited evidence it is a ‘speculative bubble’

A common concern is that the strength of the US tech sector rally has been ‘too much too fast’ and that it may already be a ‘speculative bubble’. However, from the ‘top-down’ perspective, there is limited evidence suggesting the overall tech market is stretched. Much of the rebound in US tech stocks has simply been a recovery back to its historical trend outperformance over the broader market (see Figure 8).

Stronger returns are already flowing to investors...

Aside from trends toward further AI adoption, what has likely fuelled investor sentiment the most is that large payoffs are already flowing for key players. Companies most directly exposed to AI have seen their share

Figure 8: US tech sector performance relative to the broader market (with trend)



Source: Refinitiv Datastream, October 2023

To the extent that the world is shifting to a fifth ‘industrial revolution’ then that increases the prospect of a ‘structural break’ where the trend performance of US tech stocks becomes stronger than the past. If the latter proves correct then there is still ample opportunity for

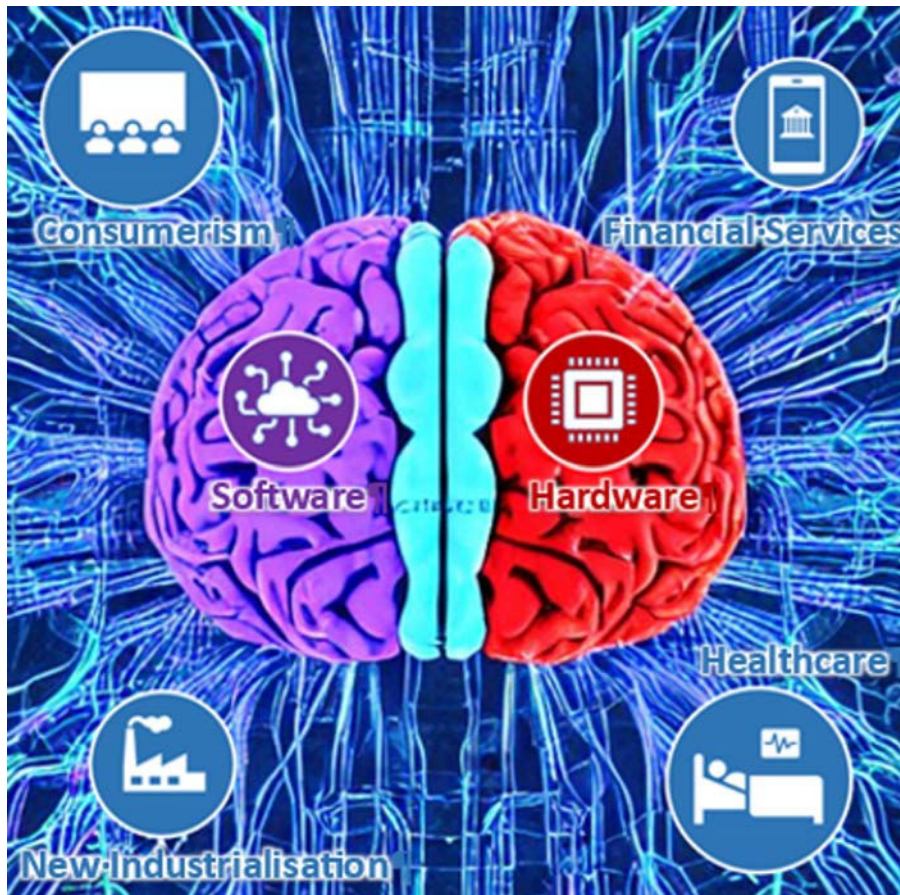
investors to gain exposure to tech stocks over time, as well as invest across other sectors that could be potential beneficiaries (see Section 3) from the AI-linked spillover spending and productivity gains effect.

3. Potential investment opportunities

The impact of AI-related technologies is likely to be far-reaching and fundamentally significant. Every corporate sector will be impacted by AI to varying degrees, from the most immediate beneficiaries within 'the brains of

AI' - software and hardware⁹ - before spreading out to other corporate adopters across consumerism, new industrialisation (including tech), healthcare and fintech (see Figure 9).

Figure 9: Potential opportunities radiating out from 'The Brains of AI'



Source: Image created through AI generation using Stable Diffusion model

Opportunities across Software begin with Hyperscalers....

AI adoption essentially requires three components: computing power, data, and algorithms. Hyperscaler¹⁰ companies have access to all three of these elements, and as such we believe they are the best positioned to ride the tailwinds of AI. This reflects their ability to take advantage of vast, high-quality data provided from cloud platforms, and translate it into tangible services

and support for corporates across the board. For example, Microsoft, is well advanced with incorporating Generative AI capabilities across all its key product lines i.e Microsoft 365 Copilot, Dynamics 365 Copilot, GitHub Copilot, Business Chat, Teams Premium, Azure OpenAI Services, and Viva Sales. In many respects Microsoft is in a unique position to transform the way software augments productivity gains across a wide variety of new technology uses.

9. Software encompasses the algorithms, models and programming frameworks that enable machines to learn, reason and make predictions. Hardware comprises the physical infrastructure and computational resources.

10. Hyperscalers are large Cloud Service Providers (CSP) that can provide computing and storage solutions at enterprise scale. See <https://www.redhat.com/en/topics/cloud/what-is-a-hyperscaler>

... and extend to Platforms....

Large, differentiated platforms have the advantage of offering unique experiences to consumers with efficient integration of AI into their services, which can give added boosts to sales and operating revenues. For example, platforms like Adobe, are able to embed Generative AI capabilities across its entire portfolio of creative, marketing and document management products (encompassing its Cloud's AI framework, Adobe Sensei, and Firefly - its creative generative AI engine in Photoshop).

and Data Clouds¹¹

AI is only as useful as its underlying dataset, and therefore companies providing cloud services stand to benefit from greater AI adoption and especially across Large Language Models (LLM). A good example is cloud-data software vendors, like Snowflake, which enables users to utilise LLM to create innovative applications and enhance analysis of unstructured data.

Potential opportunities are also significant across Hardware

AI is creating new opportunities for semiconductor companies, as they produce the hardware critical to enable AI applications. Specific benefactors across the hardware space encompass graphics-processing units (GPUs), field programmable gate arrays (FPGAs), application-specific integrated circuits (ASICs), memory, storage, and networking. One of the highest profile beneficiaries from investor optimism surrounding AI is Nvidia where its range of GPUs directly meet the demands for generative AI and LLM applications.

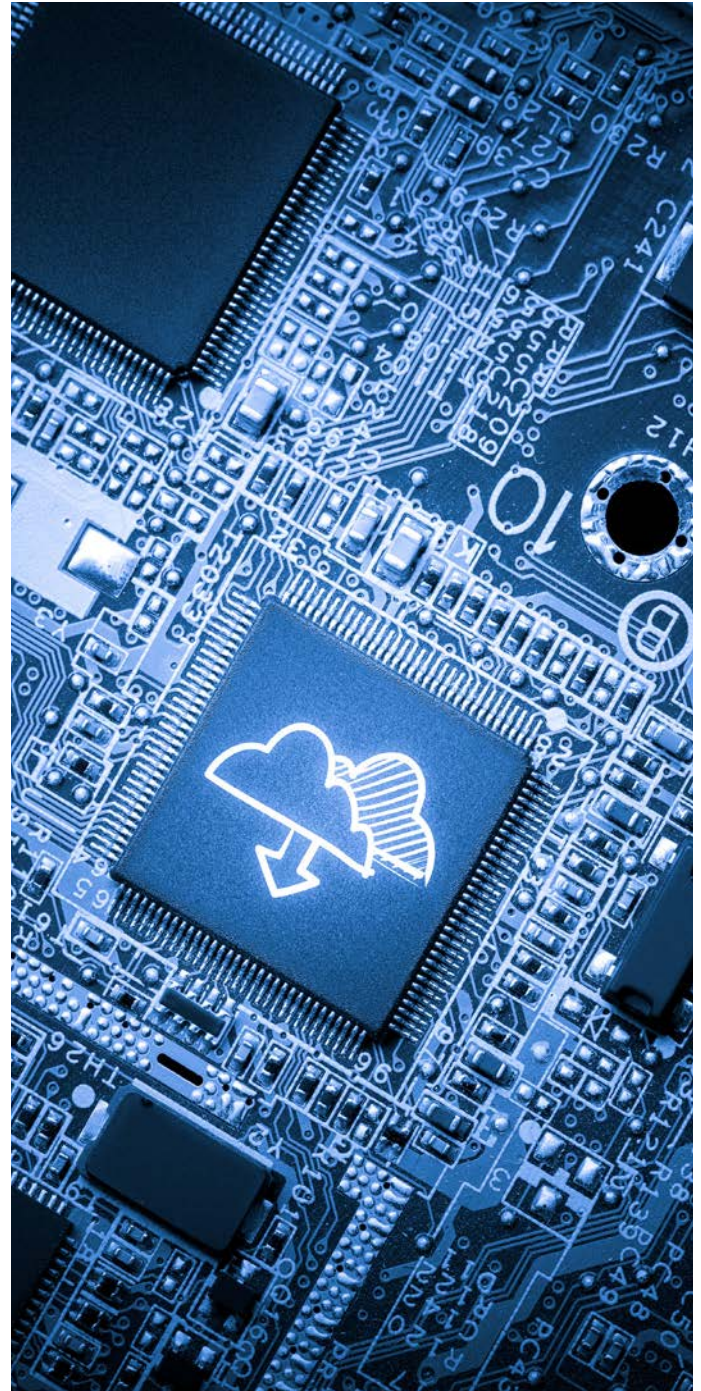
Memory chipmakers, such as SK Hynix, already have significant market share in providing the high-bandwidth memory chips that are critical inputs for AI-hardware makers (like Google and Nvidia). Generative AI will also drive stronger demand from high-performance storage systems, especially capacity hungry unstructured data sets. Companies like Dell Technologies can benefit as they are already a global leader in providing high-performance storage solutions. Lastly, network carriers that are in the midst of deploying 5G will also benefit over time from AI-driven demands.

Opportunities radiating out from 'The Brains of AI'

Investors will have to be diligent in distinguishing between 'AI marketing (and hype)' versus 'AI reality'. Mentioning the magic word 'AI' will not yield payoffs

unless it translates into tangible outcomes such as new products, fresh revenue streams, and enhanced profit margins.

Many of the industries that stand to benefit from AI adoption over time (see Figure 9) encompass sectors that Fullerton has a positive outlook on. The following table summarises Fullerton's assessment on potential barriers and benefits each sector may experience from AI-related technologies, thus creating investment opportunities across different time horizons.



11. Data Clouds are integrated data management systems that unify data sources and supporting infrastructure. Data clouds facilitate an ecosystem where users fully utilise their own data and effortlessly sharing and consuming related services.

Consumerism

With modern consumerism being driven by digitalisation, social media, and the Internet¹², we now see the integration of AI as another factor that stimulates and bolsters this 'consumer culture'. The application of AI within a wide-range of sectors will drive new, hyper-personalised user experiences, fuelling demand for companies able to implement and roll out these functions early. Additionally, consumers will now have greater control over the content they consume, with AI having a twofold effect of lowering barriers to entry and unlimited content generation.

Sectors	Areas with Potential	Consumer Benefit	Timeframe Near-term (NT): 0-3y Medium-term (MT): 3-7y Long-term (LT): 7y+	Barriers to Overcome	Use Cases
Entertainment e.g. NetEase, Unity, Ubisoft, NCSOFT	Gaming experience Entertainment products Audio-visual editing	Lower entry price into gaming Accessibility and speed of entertainment (games, videos, podcasts) to market Immersive, fresh user experience	NT – Use of Gen AI to produce video game content faster MT – Infinite content refresh for storyline, environment, and architecture; editing of podcasts and videos without rerecording LT – Combination of mixed reality and AI, providing purely new and immersive experience for users	Backlash by artists due to potential revenue loss Lack of datasets with consented content to be trained on, raising ethical concerns	AI generated content would cut demand for video game illustrators, which accounts for half of R&D costs, savings which could be passed on to consumers in the form of cheaper and faster-to-market games Infinite content refresh of game environment lengthens the shelf life of a game, without the need to deploy extensive resources
Automotive e.g. Uber, Waymo (Google), Apollo Go (Baidu), Cruise (General Motors)	Autonomous ride-sharing Predictive engine maintenance In-vehicle digital user experience	Vehicles to drive consumers 'on-demand' Time saved on driving Efficiency in time use	NT – Automated driver assistance systems, Virtual avatars MT – Predictive engine maintenance LT – Autonomous ride sharing	Safe performance under extreme weather conditions Consumer trust in technology Regulatory acceptance	Autonomous ride-sharing would allow for 'on-demand' access and choice of vehicle type, leading to time saved on driving Virtual avatars that utilise NLP to deliver an enhanced user experience

12. See <https://www.fullertonfund.com/fullerton-insights/enduring-structural-themes-to-outlast-the-cyclicality-of-markets-from-east-to-west/> for a more detailed discussion

Sectors	Areas with Potential	Consumer Benefit	Timeframe Near-term (NT): 0-3y Medium-term (MT): 3-7y Long-term (LT): 7y+	Barriers to Overcome	Use Cases
Information Technology e.g. Google, Microsoft, Amazon, Shopify	Developer tools Search engines Niche markets	Increased productivity through AI-dev tools Search engines offer improved shopping experience Exposure to niche companies that meet consumers' needs	NT – OpenAI's ChatGPT incorporated into Microsoft's Bing, Google's Bard AI quickly advancing MT – Programming would now rely solely on AI LT – Customers gain exposure to targeted niche services and products	Search engines may face higher traffic acquisition costs Regulatory oversight on Gen AI content due to copyright laws	AI-integrated search engines delivering personalised answers (e.g. shopping and travel planning) Small businesses now have greater accessibility to market their products and services through Gen AI, bypassing expensive advertising services
Communications and New Media e.g. Meta, Netflix, Spotify, Adobe	Content ideation and creation Social insights Personalized content targeting	Hyper-personalization for a truly unique shopping experience Increasingly personalised content, recommendations, and supply	NT – Content recommendation for consumers, mass AI-generated content (images, audio, etc) MT – Individualized AI-enabled marketing campaigns and hyper-personalized AI-created content LT – Virtual personal shopping associates offering custom products within physical retail locations	Difficult to cut through all the unstructured data and isolate crucial information AI-generated content difficult to tag, recommend and monetise	Mapping customer needs and predicting segment changes allow for tailored web content and dynamic pricing to offer a truly unique shopping experience Use of social media sentiment analysis tools allow businesses to curate and market content for their target audience

Source: Fullerton Fund Management, August 2023

New Industrialisation

AI has the potential to transform the manufacturing industry with increased productivity, decreased costs, and enhanced quality. For example, AI technology such as RPA, Automated Supply Chain Management and Computer Vision will greatly enhance and optimise the manufacturing process through the supply chain and predictive capabilities in maintenance and defect monitoring.

Sectors	Areas with Potential	Consumer Benefit	Timeframe Near-term (NT): 0-3y Medium-term (MT): 3-7y Long-term (LT): 7y+	Barriers to Overcome	Use Cases
Manufacturing e.g Foxconn, Boeing, Changying Precision Tech, Adidas	Network planning Supply chain Maintenance and monitoring On-demand production	Greater degree of customisability and flexibility in manufacturing of goods Fewer delays and defects, faster delivery	NT – Automation of a larger number of production processes MT – Augmented intelligence in supply chain optimisation, predictive scheduling, and defect monitoring LT – Prescriptive analytics in product design that allow real time solutions recommended by AI, replacing the need of simply predicting and responding	Equipping all points in the supply chain with necessary AI technology Openness of producers to collaborate	Autonomously intelligent systems able to self-learn can make the manufacturing and supply chain process more predictable and controllable Use of Computer Vision observes production and identify flaws, avoiding defects and ultimately resulting in fewer product recalls

Source: Fullerton Fund Management, August 2023

Healthcare

AI and automation holds the potential to transform how healthcare is delivered – addressing both the need for better and more cost-efficient care, especially as populations age and their health needs become more complex. The application of AI across healthcare sectors, such as medical devices, drug development, genomics, and internet healthcare, will help medical professionals comprehend the vast pool of available medical data and determine the complex interdependencies between different health factors. The technology will allow for improved diagnostics, increased surgical success rates, accelerate the drug discovery process, and introduce new ways to go about monitoring and predicting health conditions.

Sectors	Areas with Potential	Consumer Benefit	Timeframe Near-term (NT): 0-3y Medium-term (MT): 3-7y Long-term (LT): 7y+	Barriers to Overcome	Use Cases
Medical Devices e.g. Medtronic, Stryker, Lantheus Holdings, Intuitive Surgical	Surgical robots Diagnostic applications	Accurate and earlier diagnostics for early intervention and targeted diagnoses Higher availability of procedures	NT – Wearables able to access and predict conditions MT – Cost savings as product development cycles advance LT – Robot doctors carrying out diagnosis, treatment, surgeries	Public acceptance of automating medical procedures Complexity of human biology	AI surgical robots trained on intricacies in complex cases allow for predictable, consistent surgeries, improving procedural efficiency and efficacy AI-enabled diagnostics improve image preparation and rapid screening in preventive care
Drug Development and Genomics e.g. Illumina, AstraZeneca, CRISPR Therapeutics	Drug discovery Replacement of research models (animal testing) Disease prediction and intervention	Increased access and availability of safer/more effective drugs not violating ethical concerns Predicting risks of diseases and adopting early intervention practices	NT – Predictive diagnostics that generate better outcomes in drug discovery trials MT – Virtual drug development and removal of animal testing methods LT – AI applications able to determine risk factors based on genomic data	Security and privacy concerns of patient information the models are trained on Increased regulatory oversight	Drug discovery can be more efficient, being market-ready faster and safer Elimination of a key ESG risk in animal testing drives demand and support for development trials AI predictive apps recognise relationships in genetic makeup for early intervention treatments and procedures

Sectors	Areas with Potential	Consumer Benefit	Timeframe Near-term (NT): 0-3y Medium-term (MT): 3-7y Long-term (LT): 7y+	Barriers to Overcome	Use Cases
Telemedicine/ Internet Healthcare e.g. Strive Health, Boston Scientific, MDLive (Cigna)	Convenience and accessibility to medical treatment	Transcend spatial constraints to seek medical help in a timely manner	NT – Tele consultations, same-day delivery of medication, AI-powered dermatology tools MT – AI-enabled programs to detect emotions for mental and behavioural health service; monitor patient movement for neurological impairments LT – AI systems offering independent diagnosis	Difficult to ascertain medical conditions through everyday digital devices Need for specialized AI devices to be readily available to consumers	AI would be used as a technical means within telemedicine to provide various forms of health and medical services, such as medical information inquiry, remote consultation, treatment, and rehabilitation AI programs allow for predictive monitoring of emotions and movements for possible early diagnoses

Source: Fullerton Fund Management, August 2023

Financial Services

With its advanced algorithms and machine learning capabilities, AI enables financial institutions to analyse vast amounts of financial data in real-time, enhancing decision-making processes and risk management. The use of AI tools within the Banking and FinTech sectors could enhance customer service, improve operational efficiencies, and allow firms to expand market share by targeting customer segments traditionally underutilising financial services, opening up new possibilities for innovation and growth.

Sectors	Areas with Potential	Consumer Benefit	Timeframe Near-term (NT): 0-3y Medium-term (MT): 3-7y Long-term (LT): 7y+	Barriers to Overcome	Use Cases
Banking & FinTech e.g. Deutsche Bank, J.P. Morgan, Morgan Stanley, DBS, WeChat (Tencent)	Fraud detection Credit risk assessment Operational efficiency Wealth management Application user experience Customer service	Branchless banking services, but greater population access to the banking system Instant customer support through chatbots and virtual assistants Personalised engagement in user's entire commerce journey	NT – AI-powered customer support, chatbots and financial planning robo-advisors MT – Replacement of back-office roles by autonomous intelligence and augmentation of middle and front office functions LT – Banking/FinTech super apps that offer customers an ecosystem of apps and services integrated seamlessly	Platforms burdened with legacy tech infrastructure require costly overhaul Operating costs may rise from the need for greater catch-up investment (before efficiencies are realised) Banks that lead on the investment front may grow faster with well-targeted marketing	Application of AI on non-traditional data (i.e customer inventory level and consumer buying behaviour) to target new customers may offer significant growth AI models can be applied internally across functions, break down organizational silos and reduce turnaround time FinTech players and wealth managers can now focus on building deeper relationships with clients, via thorough learning of customer data

Source: Fullerton Fund Management, August 2023

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