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Artificial Intelligence as a cross-topic driver in thematic investing

Since the public release of OpenAI's ChatGPT large language model at the end of 2022, the integration of Artificial intelligence (AI) in core business processes has been gaining cross-industry traction. With its growing significance and proliferation, AI is showing its disruptive potential to drive structural shifts in the way we live, work, produce, and collaborate. An unconstrained thematic investing approach to AI can help identify opportunities arising from these transformational processes, offering investors the chance to participate in cross-sectional growth prospects.

We have identified several use cases to show AI's present and future impacts on our chosen themes for thematic investing.



Digital Life

Where there is cyber there should be AI-backed security

With an increasing level of connection and with more services moving to a cloud environment, cyber security is growing in significance as

complex and deeply integrated IT environments are exposed to new cyber-risks from multiple layers and access points.

To protect companies from sophisticated cyber-threats, a multi-layered, holistic, scalable, and seamless cyber security approach is needed. With the integration of AI, features like automated threat detection, malicious patterns prediction, accelerated data protection, and risk-based conditional access can contribute to establishing a multi-layered defence of business processes, data, and IT infrastructure.



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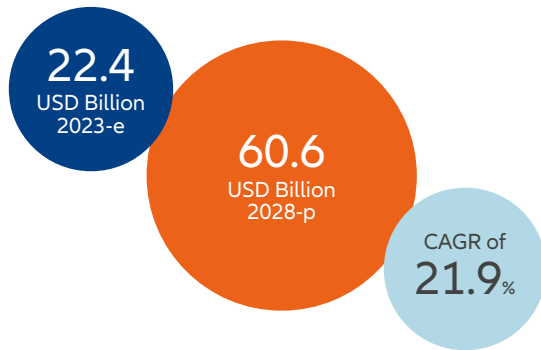
**Embracing
Disruption**

ARTIFICIAL INTELLIGENCE AS A CROSS-TOPIC DRIVER IN THEMATIC INVESTING

For instance, two leading US-based companies that provide sophisticated cyber and cloud security services have developed solutions based on the idea of “zero trust”. Dependent on user identity, device security credentials, and access policies, access rights are granted or withhold. These real-time risk-based conditional access applications facilitate and speed up the steering of a multitude of individual access requirements from users. This, in turn, protects complex and thus more vulnerable IT environments from breaches.

In parallel, cyber security solutions that help companies identify data leakages in AI applications or assist in designing and building safer AI environments are also gaining importance.

The disruptive power of AI-powered cyber security solutions is also reflected in the projected double-digit market growth of this segment:



[Marketsandmarkets.com: AI in cybersecurity Market by Offering, Deployment Type, Security Type, Technology, Application, End User and Geography – Global Forecast to 2028.](https://www.marketsandmarkets.com/Market-Reports/ai-in-cybersecurity-market-report.html) As of August 2023



Health Tech

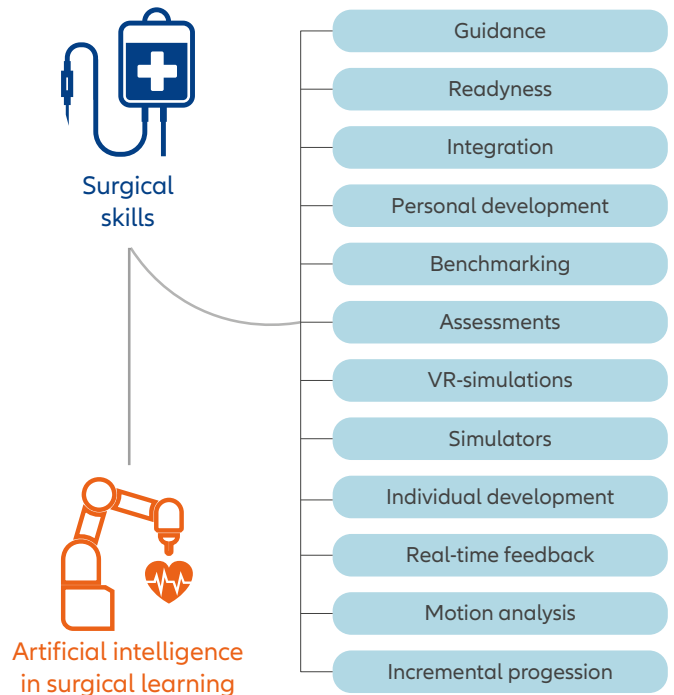
TrAIning for surgeons

“An experimental study of the National Center for Tumor Diseases Dresden (NCT/UCC) on the practical value of machine learning (ML) methods in abdominal surgery found that all of the four applied ML models outperformed at least 26 out of 28 human participants in pancreas segmentation demonstrating that ML methods have the potential to provide relevant assistance in anatomy recognition in minimally invasive surgery in near-real-time.”¹

In modern health tech, AI is deployed in the development of advanced surgical education. For example, a US-based company that develops and manufactures robot-assisted minimally invasive surgery products, is working on building AI training applications.

By collecting and evaluating information from millions of surgical interventions, and by comparing different surgical techniques, the company’s AI training applications will be able to make personalised recommendations during all steps of surgical learning, helping practitioners improve their skills both continuously and selectively.

Not least, the AI-backed training of surgeons can also help to lower the likelihood of complications and improve clinical results, through training surgeons to use the most appropriate combinations of instruments and approaches in an intervention.



Source: [Multidisciplinary Digital Publishing Institute: Artificial Intelligence in Surgical Learning.](https://www.multidisciplinarydigitalpublishing.com/artificial-intelligence-in-surgical-learning/) As of February 2023

How AI-enhanced conversational agents can help control costs and deliver faster services

AI-enhanced conversational agents can amplify personalised care through useful and time-saving features. For instance, a US-domiciled healthcare and insurance company, deploys Natural Processing Language (NPL) models – an area of AI – to understand callers’ requests, reply automatically, or redirect incoming calls to internally available resources and responsible departments. This can contribute to shortening the call duration and speeding up responses to patients’ questions.

Automatically conducted real-time authorisations of patients’ insurance plans can also lead to significant cost savings, especially in terms of expensive labour time, compared to manual processes.

Collecting and classifying data for an improved patient service experience

AI-enhanced conversational agents can collect and classify patient data gained from conversations and propose services that are tailored to individual needs and patient history. This, in turn, can significantly improve patient experiences.

Based on the data and information gathered, AI can also predict certain conditions, leading to better clinical outcomes and further substantial cost-savings.



Clean Water and Land

AI in agriculture

The application of machine learning, a subset of AI, can help farmers create a cost-effective, fine-tuned seeding and spraying schedule that will optimise crop yield and quality, reduce weeds, while significantly diminishing the use of pesticides. The real-time differentiation and localisation of weeds permits a targeted deployment of herbicides and the shortest path to weed control. This is an essential contribution to food security.

A global manufacturer of agricultural machinery and farm management software has developed a computer-vision and machine-learning backed precision agriculture system. This can contribute to a substantial reduction of pesticides, while supporting farmers in saving valuable resources and promoting better root health in crops.

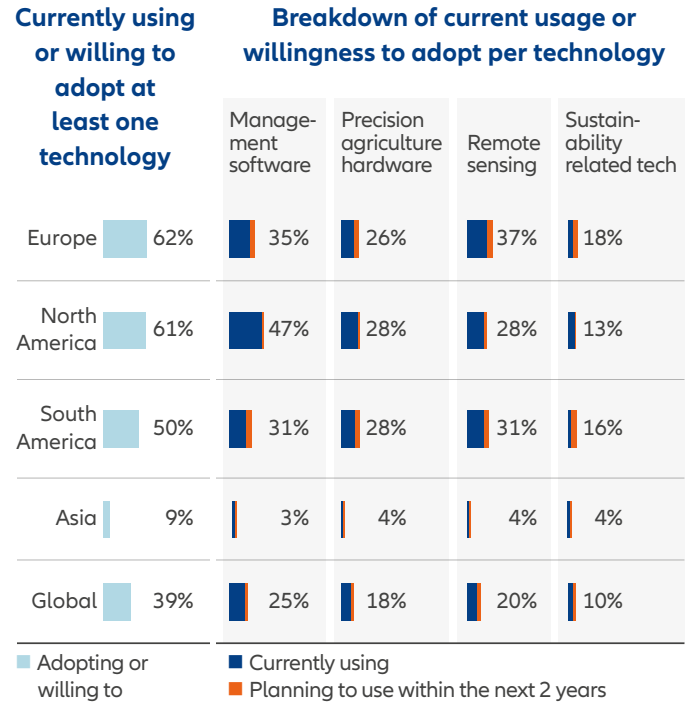
Higher adoption rates could drive further growth of precision agriculture market

Although the global precision farming market size is projected to amount to USD 20.84 billion by 2030, showing a staggering double-digit compound annual growth rate (CAGR) of 12.8%², there remains plenty of room for improvement.

A still mediocre adoption rate of sophisticated information technology among global farmers is both hampering the advancement of precision farming market’s size and value, as well as offering investment

opportunities to participate in the segment’s growth potential.

This is especially true for Asia, which has the world’s largest amount of arable land³ and, in parallel, the lowest adoption rate for precision farming.



Source: [McKinsey survey among 5,500+ farmers across the globe](#). As of 2022



Infrastructure

AI in infrastructure

Applying AI-controlled data analysis tools in equipment management to predict failure patterns in construction and engineering equipment can help avoid breakdowns, reduce maintenance intervals, adapt operating parameters to changing conditions, and prolong the operating life of machines. With less error-prone, high-performance equipment, construction projects can be carried out in a more cost and time-efficient way.

Within the context of AI-controlled and data-driven construction and engineering equipment, so called digital twins – digital replicas of physical assets – are gaining in importance.

A US-based provider of infrastructure services for electric power, pipeline, industrial and communications industries, has created a data modelling method that can design an entirely replicated digital twin of a complete manufacturing plant. Based on Industrial Internet of Things (IIoT) technology, the analytics engine can predict both potential operational failures and operational savings prospects, while minimising the effects on plant operations.

Addressing labour shortages and enhanced safety measures

The implementation of connected and autonomous vehicles on construction sites, for instance, can help address labour shortages and reduce project delays. At the same time, autonomous vehicles responding to enhanced safety measures at construction sites are contributing to safer working environments for operators, as the latter are detached from the machine and not exposed to heavy vibrations, and dust, etc., when excavating.

Technological transfer

Finally, the technological learnings gained with autonomous vehicles in mining and industrial settings can be transferred to autonomous driving in urban settings.

For the period of 2022 to 2028, the AI market in construction is predicted to show double-digit growth of 24.3%, reaching a value of USD 9.53 billion in the next five years⁴.



Intelligent machines

With increasing complexity in semiconductor fabrication processes, human cognitive capabilities can no longer keep up with multiple decisions that must be taken in an ever-accelerating way. In this context, AI-based techniques that collect huge amounts of data across the manufacturing process have become a key tool for determining whether each individual processing step was executed correctly.

“Human first-computer last”

A US-company that delivers critical processes in microchip manufacturing conducted a study⁵ that compared humans to machines in developing a semiconductor process. The results showed that humans excel in the early stages of process development, while algorithms are more

cost-efficient near the tight tolerances of the target. Partnering computer algorithms with human experts can thus lead to a significant reduction of cost-to-target.

How AI delivers value to the semiconductor industry

According to a recent McKinsey survey, semiconductor companies could massively benefit from deploying AI, potentially adding an annual value up to USD 95 billion over the long term.

Artificial intelligence could generate \$85 billion to \$95 billion for semiconductor companies over the long term

Impact of artificial intelligence on semiconductors EBIT,¹ USD billion



¹ Earnings before interest and taxes.

² Near-term potential refers to gains within the next 2-3 years.

³ Long-term potential refers to gains achieved 4 years or more in the future.

Source: [McKinsey: Scaling AI in the sector that enables it: Lessons for semiconductor-device makers](#). As of April 2021.

In contrast to this upside potential, less than a third of semiconductor-device makers are already generating value by implementing AI/ML, whereas around 70% are still in pilot stages and progressing sluggishly.

This, in turn, illustrates the growth capacity of integrating AI/ML into the manufacturing and designing of semiconductors.



Next Generation Energy

Diminishing downtimes: AI/ML-enabled predictive maintenance solutions

According to US Department of Energy (DoE) estimates, the cost of power cuts to American businesses is around USD 150 billion annually⁶. This emphasises the importance of intelligent predictive maintenance solutions, especially for sensitive energy infrastructure.

A US-semiconductor manufacturer develops ML-powered smart predictive maintenance solutions that are directly implemented on sensors or IoT devices. This not only diminishes latency and improves real-time managerial decisions, but also augments data protection, lowers bandwidth requirements, and helps to proactively avoid unforeseen breakdowns, resulting in savings on emergency repairs and longer asset life.



Pet Economy

From treating to preventing: the digitalisation of clinical treatments

AI software can detect complex diseases with increasing accuracy and help interpret veterinary results. This, in turn, leads to more accurate diagnoses, more efficient medication and cures and to a quicker and more reliable identification of individual preventive care requirements. This could foster the growth of the vet care market, not least with regards to pets' longevity and the special (nutritional) needs of geriatric pets.

A multinational company that develops and distributes products and services for the veterinary market designed an AI-powered haematology analyser that removes time-consuming and error-prone manual processes, delivering higher accuracy of results and giving reliable guidance for veterinarians.

AI as a thematic investment case

The emergence of AI has added new and fascinating facets to our unconstrained thematic investing approach. It has opened multiple new angles for participating in the growth prospects resulting from AI-driven structural shifts. Understanding and assessing in detail AI's disruptive power, and its impact on the several themes covered by our thematic approach, can help investors identify untapped opportunities and stay ahead of the curve.

- ¹ [International Journal of Surgery: Anatomy segmentation in laparoscopic surgery: comparison of machine learning and human expertise – an experimental study](#). As of August, 2023
- ² [Businesswire.com: \\$20+ Billion Opportunities in the Precision Farming Market](#). As of March, 2022
- ³ [FAO: Land use statistics and indicators. Global, regional and country trends 1990–2019](#). As of June, 2021
- ⁴ [Mordorintelligence.com: AI In Construction Market Analysis](#). As of July, 2023
- ⁵ [Lamresearch.com: AI Study Identifies Game-Changing Development Approach for Speeding Up, Slashing Cost of Chip Innovation](#). As of April 2023
- ⁶ [US Department of Energy: Report Explores U.S. Advanced Small Modular Reactors to Boost Grid Resiliency](#). As of January 2018

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