



Authored by:
Tejas Dessai

Date: March 22, 2024
Topic: **Thematic, Disruptive Technology**



GLOBAL X ETFs INSIGHTS

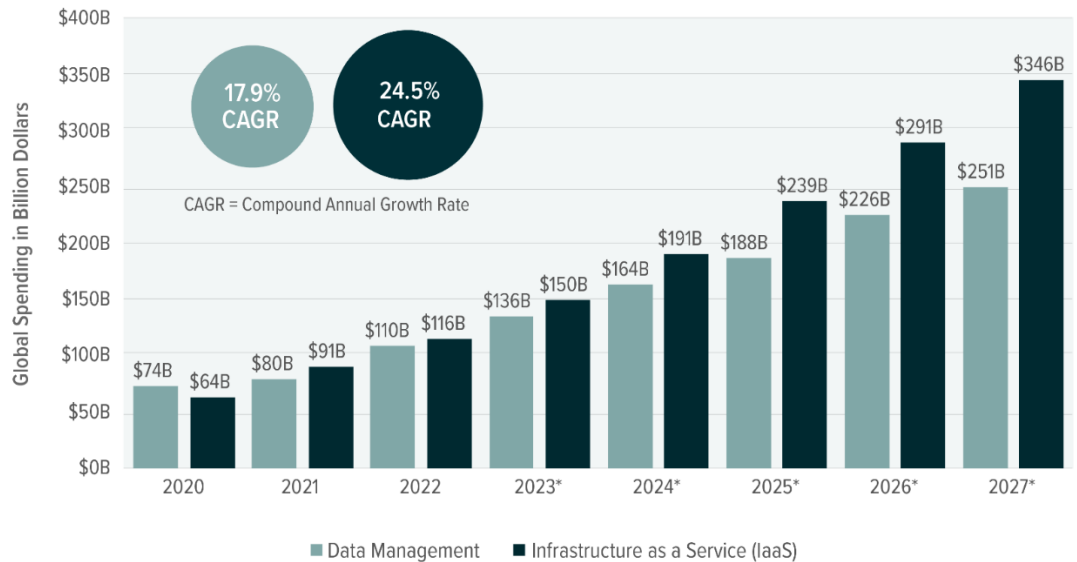
How AI Is Shaping the Future of Data Platforms & Infrastructure in 2024

Data is AI’s fuel. And the more data AI gets, the more of a data flywheel AI creates. In our view, the value chain involved in the processing and handling of all that data is not to be overlooked. Growing business demand for generative AI solutions creates demand for specialised software and hardware to support the capture, storage, and processing of massive amounts of data. Additionally, as generative AI models are trained on internal and private data, needs grow for secure and efficient data access solutions, governance solutions, and ancillary cloud computing infrastructure.

In this piece, we highlight how generative AI creates significant growth opportunities for the companies in the cloud infrastructure and data management markets.

AI LIKELY TO ACCELERATE GROWTH FOR CLOUD INFRASTRUCTURE AND DATA MANAGEMENT PLATFORMS

Sources: Global X ETFs with information derived from: Gartner. (2023, April 19). Gartner Forecasts Worldwide Public Cloud End-user Spending to Reach Nearly \$600 Billion in 2023 and Research and Markets. (2023, March 24). Global Data Management Software Market: Analysis by Type, by Organization Size, by Deployment Type, by Application, by Region Size & Forecast with Impact Analysis of Covid19 and Forecast up to 2028.



*Indicates forecast

Key Takeaways

- Growing demand for generative AI solutions necessitates substantial investments by enterprises in data management, storage, and infrastructure solutions, in addition to hardware.
- Synthetic data and data generated by AI agents are likely to grow significantly alongside real-world data.



- We expect companies that provide data management and cloud infrastructure solutions to grow in stature as ways for investors to gain compelling exposure to the Artificial Intelligence theme.

High-Quality Data for AI Wanted

Generative AI models are trained on large data sets of structured and unstructured information, which forms the basis of their ability to reason and respond to questions. For perspective, Open AI's GPT-3 was trained on a 45-terabyte (TB) dataset that combined several data sources from the open web, including Common Crawl (60%), WebText2 (22%), Books1 (8%), Books2 (8%), and Wikipedia (3%).¹

Growing AI adoption and increased enterprise investments should stimulate additional training efforts by developers and technology companies in foundational models. Model performance scales with the size and quality of input training data, so as AI deployment grows, so too will demand for high-quality data feeds.² Real-world data can only take these models so far, though. Because real-world data can be limited and scarce, alternative sources of information, such as private data and synthetic data, are likely to become more prominent in AI's development.³

Private data refers to proprietary enterprise data and information that can be used to train models for specific internal use cases. Due to the narrow focus of private data assets, these models can be more efficient and useful than off-the-shelf models. For example, Bloomberg's 50-billion parameter large language model, trained on financial data sets, outperforms similarly sized open models on financial natural language processing (NLP) tasks.⁴ We expect similar examples to emerge in healthcare, logistics, manufacturing, defence technology, cybersecurity, and other industries.

Synthetic data is information manufactured artificially through algorithms rather than from real-world events. This data can be designed to appear nearly perfect. In most cases, synthetic data is utilised to fill-in real-world datasets, replacing historical data that is no longer relevant or sometimes inaccessible. It is also cost efficient, entails no privacy concerns, and is perfectly annotated. By 2024, nearly 60% of all the data used to developing AI and analytics is expected to be synthetic.⁵

More Investments in Hardware and Software Needed

The training and development of new models, the integration of real-world data for AI based reasoning and assessment, and the use of private data and synthetic data require comprehensive investments in data infrastructure.

Heightened data usage and processing as AI's footprint expands primarily creates a need for data centre storage and memory. With data centre vacancies already at historic lows, the construction of new data centre capacity to support demand for AI-focused workloads is witnessing an uptick.⁶ Billions of dollars in capital investments from cloud hyperscalers like Microsoft, Amazon, Google, data centre giants like Equinix, as well as private equity companies are being catalysed towards purpose-built AI datacenters.⁷

Storage for AI processing must also accommodate low-latency and real-time access to data, so storage solution vendors are expanding their portfolios. For example, Seagate Technologies recently launched a Seagate SkyHawk AI 24TB storage platform, which is designed for image and video storage at the edge of AI applications.⁸ Alongside AI server installations is demand for high-bandwidth memory (HBM), which is designed for low-power consumption and ultra-wide communication lanes.⁹ Companies like Samsung and HK Hynix dominate this market.¹⁰

On the data software side, enterprises will likely have to invest in platform solutions and build pipelines and other necessary infrastructure that enables models to interact with users and systems. Traditional enterprises may also have to clean, process, and reshape their existing data assets to make it ready for AI training and



inferencing. Vector database services, like those provided by MongoDB and increasingly by incumbents like Oracle, are specialised storage systems optimised for storing and searching through vector data. Generative AI models use vector search technology to parse through extensive information repositories by identifying relevant data points based on their vectors, which are numerical representations in a multi-dimensional content.

AI agents interacting with each other is likely to become common, requiring unique systems integrations that give data solutions providers room to innovate. Also, capturing error-free data from real-world AI applications, including Internet of Things devices, robotics, drones, and other mechanical systems, requires investments in better sensing setups, edge processors, and edge networks, as well as associated software and data platforms.

These investments extend to broader cloud strategies as enterprises configure their IT operations to be compatible with public and private cloud systems. Existing digital transformation agendas should accelerate, to the benefit of cloud-based computing infrastructure services vendors such as Microsoft, Amazon Web Services, and Google Cloud as well as large platform vendors like ServiceNow.^{11,12,13,14}

Conclusion: Infrastructure Essential to AI's Data Flywheel

Generative AI models need access to high-quality, real-time, and proprietary data to fulfil their vast potential. The public and private sector buildout of the data management and infrastructure platforms needed to make that happen positions the companies selling the cloud infrastructure, storage hardware, databases, data warehouses, data streaming tools, and more to benefit. And within those wares, we believe there are attractive opportunities for investors to capture AI's growth.

Footnotes

1. Dennis Layton, Medium. (2023, January). ChatGPT — Show me the Data Sources.
2. AI Multiple Research. (2023, Jan 03). Data Quality in AI: Challenges, Importance & Best Practices in '24.
3. MIT News. (2022, November 3). In machine learning, synthetic data can offer real performance improvements.
4. Bloomberg. (2023, March 30). Introducing BloombergGPT, Bloomberg's 50-billion parameter large language model, purpose-built from scratch for finance.
5. MIT Sloan. (2023, Jan 23). What is synthetic data — and how can it help you competitively?
6. CBRE. (2023, September 26). North American Data Center Trends H1 2023.
7. Wall Street Journal. (2023, August 23). AI-Ready Data Centers Are Poised for Fast Growth
8. Seagate. (2023, December 12). Seagate SkyHawk AI 24TB Elevates Edge Security Capacity and Performance.
9. WCCFTech. (2024, Feb 12). HBM Memory Prices Reaches An All-Time High, 500% Surge Amid Huge Demand
10. TrendForce. (2023, April 18). HBM Supply Leader SK Hynix's Market Share to Exceed 50% in 2023 Due to Demand for AI Servers, Says TrendForce.
11. Microsoft Earnings Release. (2024, January 24). Microsoft Cloud Strength Drives Second Quarter Results.
12. Amazon Earnings Release. (2024, February 1). Amazon.com Announces Fourth Quarter Results.
13. Alphabet Investor Relations. (2024, January 30). Alphabet Announces Fourth Quarter and Fiscal Year 2023 Results.
14. ServiceNow Investor Relations. (2024, January 24). ServiceNow Reports Fourth Quarter and Full-Year 2023 Financial Results.



The value of an investment may go down as well as up and past performance is not a reliable indicator of future performance.

Trading may not be suitable for all types of investors as they carry a high degree of risk. You may lose all of your initial investment. Only speculate with money you can afford to lose.

Changes in exchange rates may also cause your investment to go up or down in value.

Tax treatment depends on the individual circumstances of each client and may be subject to change in the future.

Please ensure that you fully understand the risks involved. If in any doubt, please seek independent financial advice. Investors should refer to the section entitled "Risk Factors" in the relevant prospectus for further details of these and other risks associated with an investment in the securities offered by the Issuer.

This information is not intended to be, or does not constitute, investment research.

These insights are strictly for general information purposes provided at the date of publication and may change without notice and are not a recommendation, solicitation or offer to buy or sell any financial products or to adopt any approach to investment. There is no guarantee that any matter discussed will be successful. Reliance on any part of this information is at your own discretion.

This information may provide estimates and future forecasts and are not a representation of any future performance. This information is not complete or exhaustive and we make no representations or warranties, express or implied, concerning the accuracy or comprehensiveness of these insights.

These insights do not take into account a person's own financial position or circumstances of any person or entity in any region or jurisdiction. This information should not be relied upon as a primary basis for any investment decision. Its applicability will depend on the particular circumstances of each investor.

This information does not constitute tax advice and investors and potential investors are advised to consult their professional advisors concerning possible taxation or other consequences of purchasing, holding, selling, converting or otherwise disposing of any investments under the laws of the relevant region and/or their country of incorporation, establishment, citizenship, residence or domicile, or other liability to tax and in light of their particular circumstances.

Past performance is no indication of current or future performance. The performance data does not take account of the commissions and costs incurred on the issue and redemption of units.

Communications issued in the European Union relating to Global X UCITS ETFs are issued by Global X Management Company (Europe) Limited ("GXM Europe") acting in its capacity as management company of Global X ETFs ICAV. GXM Europe is authorised and regulated by the Central Bank of Ireland. GXM Europe is registered in Ireland with registration number 711633.

Communications issued in the United Kingdom and Switzerland in relation to Global X UCITS ETFs are issued by Global X Management Company (UK) Limited ("GXM UK"), which is authorised and regulated by the Financial Conduct Authority. The registered office of GXM UK is 77 Coleman St, London, EC2R 5BJ, UK. Information about us can be found on the Financial Services Register (register number 965081).

Information for Investors in Switzerland

This is an advertising document. The state of the origin of the fund is Ireland. In Switzerland, the representative is 1741 Fund Solutions AG, Burggraben 16, CH-9000 St.Gallen. The paying agent is Tellco AG, Bahnhofstrasse 4, 6430 Schwyz. The prospectus, the key information documents, the articles of association as well as the annual and semi-annual reports may be obtained free of charge from the representative. Past performance is no indication of current or future performance. The performance data do not take account of the commissions and costs incurred on the issue and redemption of units.

