

Innovation Insights Quarterly

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Innovation continues to propel us further at the frontier, from renewables accessing deeper waters to harness more clean energy to artificial intelligence in the digital realm exhibiting greater understanding and capabilities. In this publication, we outline five advancements that we found interesting this quarter. Despite the macro-level uncertainty that tends to occupy the news conversation, the pace of innovation is accelerating and will ultimately translate into significant value creation for the economy.

Largest floating wind farm harnesses offshore wind potential in deeper water

The world's largest floating wind farm produced its first power output, providing more flexibility for energy generation in deeper waters of over 900 feet.¹ The farm was built by Equinor, a Norwegian partially state-owned energy company. It is located over 80 miles off the coast of Norway in the rough and windy North Sea.

Oil companies generated US\$1.4 trillion in free cash flow last year.² In contrast, the US Inflation Reduction Act amounts to just US\$369 billion over 10 years. We expect fossil extraction companies to be early adopters of many new technologies as they have the capital, institutional knowledge, and desire to generate clean emissions.

Conclusion: The transition to carbon-free and less carbon-intensive energy will take many forms, and floating wind farms represent one way the world will move toward carbon-neutral generation as the global power grid becomes increasingly complex.

Artificial intelligence (AI) continues to find new use cases including creating images directly from text

A neural network created by AI research lab OpenAI,³ can generate new images from simple text captions, while combining diverse input words in a reasonable manner. The AI was trained with images and accompanying descriptions, and it goes beyond single-object recognition as it appears to understand the relationship between objects and actions. The model can extend images beyond their original boundaries, make realistic edits, and create new variations of the image in a requested artistic style.

Conclusion: AI continues to demonstrate novel creative capabilities by leveraging the exponential growth of data to train machine-learning models. Yes, the images are a bit silly, but in time they may be used in surprising ways, such as in the medical field for x-ray verification, facial or ocular recognition, or combined with the latest AI-based chat to produce superior query results.

OpenAI Generated Images

Images Created from the Text “An Esteemed Otter in Medieval Garb Performing Shakespeare Soliloquy, Digital Art”

AI seamlessly integrates incongruous text into an image accurately matching the description.



NASA sends rocket to the moon adding a new player in the space economy

NASA's Artemis 1 mission launched an uncrewed capsule to fly around the moon, representing the first crew-capable flight by NASA in almost 50 years.⁴ The purpose of the program is to return astronauts to the lunar surface by 2025, and eventually put boots on Mars. The United States is revitalizing its space program by adding capital and technology to the "space economy." Thus, we expect to see further investment in telecommunications, meteorology, robotics, tourism, and even low-gravity materials manufacturing. For decades, moving a payload to space was prohibitively expensive—upwards of \$27,000 per pound using the space shuttle. The development of reusable rockets has dropped the cost significantly,⁵ with the SpaceX Falcon Heavy estimated at around US\$850 per pound, providing easier access beyond the earth's gravitational well.

Conclusion: Space travel remains a frontier: private companies have been driving innovation, and we anticipate the emergence of industries that capitalize on the reduced barriers to access space and the lunar surface.

Accessible Alzheimer's diagnosis and medication trials brings us closer to better treatment

Alzheimer's disease is the most common form of dementia, affecting over 44 million people worldwide, and remains one of the biggest unmet needs in medicine. Alzheimer's has to date been diagnosed through later-stage symptoms and confirmed only through brain autopsy or other costly and invasive tests. Now low-cost blood tests on the market, measuring tau and amyloid beta proteins, can help doctors provide an earlier diagnosis.^{6,7} Combined with a new generation of medications to slow cognitive decline, patients can maintain their level of brain function for a longer time. Research on a handful of medications continues to work through clinical trials, but hurdles remain at each step for safety and efficacy in preserving cognitive function.⁸

Conclusion: Treatment for Alzheimer's remains one of the most clinically unmet needs in medicine that has baffled scientists for decades. However, the medical field's progress with understanding the human genome advances it further toward providing better solutions.

Collapse of cryptocurrency exchange illustrates limited systemic risk to traditional financial system

The collapse of FTX, the second largest exchange of cryptocurrency, shows how the lack of regulatory guardrails for a new technology can enable malfeasance on an unprecedented scale. As the bankruptcy court works through the process of unwinding the company, it is clear the technology, hailed as disruptive, has so far had limited impact beyond cryptocurrency speculation. The cryptocurrency asset class's 72% drawdown from a high of US\$3 trillion has not demonstrated contagion risk to the traditional banking system.⁹

Conclusion: Despite a significant devaluation of cryptocurrencies and digital bank runs on various crypto exchanges, the limited impact to the traditional financial system suggests the technology has not been disruptive and decentralized finance applications remain in a nascent stage.

Endnotes

1. Source: A. Frangoul, "The 'world's largest floating wind farm' produces its first power," *CNBC*, November 14, 2022
2. Source: A. Chronis, J. England, K. Hardin and A. Mittal, "Striking the balance: How and where will oil and gas producers deploy their cash?" *Deloitte*, August 25, 2022.
3. Source: Open AI, DALL-E 2.
4. Source: K. Chang, "NASA Blazes a Path Back to the Moon with Artemis Rocket Launch," *New York Times*, November 16, 2022.
5. Source: B. Venditti, "The Cost of Space Flight Before and After SpaceX," *Visual Capitalist*, January 27, 2022.
6. Source: L. McGinley, "Blood tests for Alzheimer's are here. Here's what you need to know." *Washington Post*, November 17, 2022.
7. Source: *PrecivityAD*, "Alzheimer's Breakthrough: C2N First to Offer a Widely Accessible Blood Test," October 29, 2022.
8. Source: M. Prillaman, "Alzheimer's drug slows mental decline in trial – but is it a breakthrough?" *Nature*, September 29, 2022.
9. Source: G. Ip, "How Crypto's Collapse May Have Done the Economy a Favor," *The Wall Street Journal*, November 23, 2022.

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