

Flash note
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Relevant Technological Developments in the Market III

Dear Client,

This note is part of a series of publications aimed at sharing our assessment of the latest technological advancements with the potential to continue driving the market. Additionally, we seek to accurately measure the exact point where we stand within the technological cycle.

Developments in Artificial Intelligence during the month of August

1. **Projected Evolution of AI according to consulted experts:** The progress in artificial intelligence (AI) can be categorized into three main phases, as established by the scientific community. Currently, we are in the first phase:
 - a. ANI (Artificial Narrow Intelligence): In this phase, systems are designed to perform highly specific tasks with an efficiency that surpasses human capabilities, always operating under a set of predefined rules. Although these models can outperform humans in specific tasks, they still lack the ability to perform activities outside of their initial programming. This stage is commonly known as "weak AI."
 - b. AGI (Artificial General Intelligence): The next phase, expected to materialize in the near future, represents an advancement where models will be able to perform any intellectual task that a human being is capable of, with cognitive abilities comparable to our own. Experts suggest that we are nearing this milestone, given the rapid advancements in machine learning and neural networks, indicating the possibility of creating systems with general abilities, not limited to a single domain.
 - c. ASI (Artificial Superintelligence): The hypothetical ASI phase would involve artificial intelligence surpassing the best human brains in all fields, including creativity and reasoning. According to Nick Bostrom, this advancement could trigger extraordinary achievements but also raises serious ethical and control challenges.

The rapid evolution of AI demands a proactive approach to investments. One example of its impact is GPT-4, which reached 100 million users in just two months, an unprecedented milestone in the history of internet applications. This phenomenon suggests that the future hardware infrastructure needed to support this technology will be significantly different in technical specifications and investment volume compared to previous disruptions. In summary, we are only at the beginning of a new era, and this must be considered when managing your portfolios.

- 2. Promising Outlook for NPU (Neural Processing Unit) Manufacturers:** The demand for personal computers with AI capabilities has experienced exponential growth during the second quarter of 2024. The integration of AI into these devices is transforming the way we interact with technology, thanks to NPUs, which enable the execution of more personalized tasks, such as voice and image recognition, smarter virtual assistants, and creative content generation. Manufacturers like Qualcomm, AMD, and Intel are making significant investments in the development of processors with NPUs, offering an optimal combination of performance and energy efficiency, making them the ideal choice for portable devices. With the growing availability of these processors, it is foreseeable that AI will become a standard feature in personal computers in the near future.
- 3. A New Chapter in the Evolution of Generative AI with Grok-2 by Elon Musk:** Grok-2, developed by Elon Musk's company xAI, represents a significant evolution over its predecessor, Grok-1.5, with improvements in chat and coding capabilities. The company claims that the difference is "like night and day." One of the most notable features of Grok-2 is its ability to generate images from textual descriptions (prompts). However, the lack of restrictions in image generation, especially regarding political figures, has raised concerns about the potential for visual misinformation. While this capability opens new possibilities for digital creativity, it also represents a risk in terms of the viral spread of fake images.
- 4. AI Explores New Senses: Toward an AI Capable of Smelling:** Artificial intelligence has already achieved the ability to see and hear, and now olfactory capabilities are being explored. According to experts, this new functionality could have relevant applications, such as detecting food spoilage, supporting the preservation of products by identifying healthy and stable components and ingredients, detecting diseases, and optimizing production processes in various industries, including detergents, shampoos, insect repellents, and even perfumery. Alex Wiltschko, a former employee of Google Research, has worked on creating a "map of the primary odors." By using machine learning software and training an AI model with 5,000 molecules responsible for aroma, they have classified odors into types to help machines acquire the sense of smell. Although there are creative applications for this technology, it could also pose challenges for some industries, such as fragrances, in the form of easily cloned scents.
- 5. Gemma: The New Google Language Model Surpassing Gemini and Marking a Milestone in AI Democratization:** Gemma is the latest family of language models developed by Google, based on the technology used for the Gemini models but with greater versatility. A key aspect of Gemma's architecture is its larger "d_model" (size of internal representations), which allows for capturing more nuances and complex relationships, although it also increases the demand for computational resources. This development reinforces our investment thesis in hardware and computational capacity improvements, including chip design, design software, servers, cooling systems, and chip manufacturing components, which have been the focus of recent actions in our discretionary management mandates. A notable variant of Gemma is "CodeGemma," a model designed for code generation and completion. This tool not only completes code fragments but also allows for code insertion within existing lines, representing a significant advancement for developers operating in collaborative environments. As an open model, CodeGemma is an important step toward the democratization of artificial intelligence.

- 6. The Segment Anything Model (SAM 2) and Its Revolutionary Potential in Medicine:** The new artificial intelligence model developed by Meta, SAM 2, is designed to identify and segment objects in images or videos in real-time with six times greater accuracy than its predecessor. This capability makes it an especially useful tool in the healthcare field, where it can improve analysis and diagnosis from medical photographs or surgery videos. Additionally, SAM 2 can scale its use to other areas of interest, such as security, where it can identify and report threats in real time.
- 7. Gemini Live (Google) Replaces Google Assistant:** The generative AI of Gemini has been integrated into all recent Google products, and the launch of Gemini Live has been particularly notable. This new "mobile conversational experience" seems poised to replace Google Assistant, which is now limited to certain aspects of Google Home. With Gemini Live, Google has significantly outperformed other voice assistants in terms of capability and naturalness. Gemini Live is a conversational AI that can react to our words even while it is responding, operating in the background and allowing interaction with the device even when it is locked. In Google's words, it is "like having a friend in your pocket," and it is on track to become the center of the mobile experience, integrating with all Google applications.
- 8. The Growing Presence of AI in Banking:** Artificial intelligence technologies are being adopted at an accelerated pace in global banking. The Hong Kong Monetary Authority (HKMA) has issued new regulations and protocols to ensure that banking applications using AI offer consumers the option not to use this technology and do not generate biases that may harm certain user groups. According to the HKMA, 39% of licensed financial institutions in Hong Kong have adopted or plan to adopt generative AI technologies, although many of them are still in the early stages of implementation. Examples include the use of internal chatbots for financial advice.
- 9. OpenAI Launches Fine-Tuning for GPT-4:** OpenAI has introduced one of the most requested features by developers: fine-tuning for GPT-4. This option allows the model to be customized using specific training data, adjusting the structure and tone of responses or following detailed instructions for a particular domain. OpenAI aims to enable users to adapt GPT-4 to their specific needs to maximize its performance.
- 10. Gmail Says Goodbye to Email Errors:** Google has added two new AI features to Gmail for Android, iOS, and the web version: 'Help Me Write' and 'Refine My Draft.' These features allow for improved email drafting by formalizing, elaborating, or abbreviating the text according to the user's needs. 'Refine My Draft' is particularly useful for day-to-day emails, allowing for quick and efficient structural improvements and error correction.

With this note, after having managed your positions during your vacations, it is now my turn to take a break. As Napoleon Bonaparte said, "Rest belongs to work as eyelids belong to the eyes." I leave you in the hands of an exceptional team that will continue to provide you with the best service.

See you soon, refreshed and recharged!