Using generative AI decision-making technologies

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Executive Summary

With information overload now causing widespread decision paralysis and psychological stress, technologies that support or supplant human decision-making are garnering growing interest. Technological innovations like generative AI may revolutionize decision-making processes in the financial sector, which has a long history of utilizing data to make decisions.

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Drivers behind adoption of decision-making technologies

As the Internet gained ubiquity, the amount of available information and the speed with which information disseminates have both increased exponentially. The Internet has enabled individuals to collectively emit torrents of information via social media in addition to information published and broadcast by traditional mass media. These dynamics have resulted in information overload, where incoming information flows exceed humans' capacity to process them. Information overload causes psychological stress and leads to lower-quality decisions. While information is supposed to help humans make better decisions, too much information is counterproductive to sound decision-making. This reality has spurred growing interest in technologies that aid human decision-making.

Types of decision-making technologies

Decision making is the act of determining which among multiple options would best achieve a given objective of an individual or a group. Nobel laureate economist Herbert Simon broke down the human decision-making process into four steps: intelligence gathering, design, choice and review (see diagram). Decision-making technologies are used in the following three ways.

Decision-making process
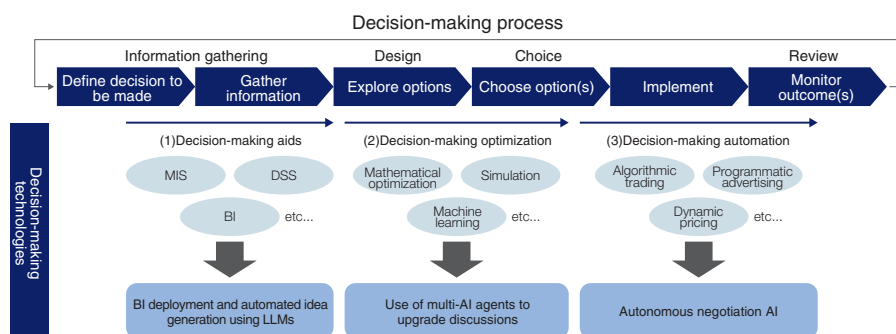
Source: NRI

(1) Decision-making aids

IT systems have long been used to help humans make decisions. The earliest examples include management information systems (MIS) and decision support systems (DSS), which were respectively in vogue in the 1960s and 1970s. Since the turn of the millennium, many companies have turned to business intelligence (BI) to help make decisions. However, BI tools require skill to use effectively. This skill barrier has limited BI tools' utilization until recent advancements in generative-AI large language models (LLM) started to break down the barrier.

Microsoft has added an OpenAI LLM to its Power BI tool. Its Copilot for Power BI creates tables, graphs and other graphics in response to natural language prompts and automatically analyzes data's features and principal components. In data analysis, a high degree of skill, particularly statistical expertise, is required to identify the causative factors behind phenomena observed in the data. Generative AI, however, has the potential to allow anyone to easily use BI tools, thereby making the information and insights required for decision-making accessible to everyone. Such a technological breakthrough could revolutionize corporate decision-making by enabling anyone to proficiently apply data analytics to business use cases.

(2) Decision-making optimization

When making decisions, people gather needed information, explore alternative courses of action and choose the one they deem best suited to the matter at hand. Technologies that can be used to optimize decision-making include mathematical optimization, simulations and machine learning. Real-world problems, however, usually involve various constraints. Navigating these constraints is where humans' diverse knowledge, experience and values come into play. One technology currently seen as a promising way to tap into such diversity is multi-AI agent systems, which use multiple LLMs to arrive at broadly informed decisions. By utilizing an ensemble of varied LLMs in concert with each other, multi-AI agent systems present multi-faceted perspectives at every step of the process from information gathering to analysis and interpretation. Multi-AI agents consequently provide a wider variety of choices and insights to their users. The major Japanese advertising agency Hakuhodo has developed and commercially deployed a multi-agent brainstorming tool that combines several AI agents, each with specialized knowledge required for product development. It is expected to

reduce product development setbacks and drive more diverse idea generation.

(3) Decision-making automation

Companies have started computerizing the process of making final decisions and implementing them by using autonomous negotiation AIs, a technology that automatically and instantaneously identifies the optimal choice in a negotiation setting under a complex set of constraints. Walmart, which sources merchandise from over 100,000 suppliers, uses Pactum AI's AI-powered autonomous negotiation platform to negotiate contracts with suppliers. Walmart reportedly realizes average cost savings of 3% by sourcing merchandise from suppliers via the platform. Such automated decision-making may make sense for companies that need to make large numbers of fast decisions amid rapidly changing market conditions.

Concerns and outlook

While decision-making technologies continue to evolve, they still pose a number of concerns, including data quality/reliability and black-boxification of decision-making. Low-quality data are not conducive to good decisions and decisions derived from opaque criteria/processes tend not to inspire much confidence. Additionally, AI decision-making aids depend on collaboration between humans and AI. Both sides' respective roles and responsibilities need to be clearly delineated.

As decision-making technologies evolve, they may yield many major benefits for companies and individuals. Measures to rectify the above concerns could very well upgrade decision-making technologies into important tools that deliver fast, spot-on decisions in the current age of information overload.

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