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Artificial Intelligence Enabling Business: An Analysis of Current Status and Future Prospects of Applications from China's Perspective to the Global Context

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Abstract: 2023 is the year generative AI is introduced to the mainstream, with users directly trying out generative AI apps like ChatGPT. And, 2024 will be the year that businesses and industries adopt generative AI. 2024 will see businesses see their profits and revenues positively impacted by generative AI, with more organizations moving to an AI-first mindset. This trend will be driven by a more realistic and informed approach to use case identification, stability and security of generative models, and a shift to smaller, more specialized open-source models running in integrations that can be hosted by organizations in their own cloud environments. The purpose of this article is to provide an overview of the current status and future outlook of AI applications in business.

In recent years, big data, cloud computing, and novel information technologies have emerged as the "norm" for advanced commercial enterprise operations. The trend of intelligent business has gained significant traction, with numerous commercial enterprises strategically outlining their business intelligence blueprints [1]. Notably, artificial intelligence (AI) has found extensive applications across a growing number of commercial sectors [2]. China's AI market has experienced a period of rapid expansion in recent years. Data from AiMedia Consulting reveals that the scale of China's AI industry surpassed RMB 10 billion in 2016 and is anticipated to reach RMB 15.210 billion in 2017, further proliferating to RMB 34.430 billion by 2019. This remarkable growth is underpinned by the vast data generated from China's large population and substantial market size, which serves as a fundamental prerequisite for establishing a robust AI ecosystem [3]. The year 2024 is poised to witness the most profound impact of generative AI within the business realm. Many organizations have commenced the process of understanding the mechanics of generative AI and its potential implications for their operations. These entities are actively considering the enhancement of existing products and services or the creation of new revenue streams through AI-driven innovation [4]. The objective of this article is to present a comprehensive overview of the current status and future prospects of AI applications in the business domain.

1. AI-enabled business application scenarios

1.1 Ultra-personalized marketing for all-domain scenarios

The capabilities of AI in natural language processing, pattern recognition, and other domains offer boundless potential for ultra-personalized marketing across omni-domain scenarios [5]. In the context of omni-domain marketing, enterprises endeavor to encompass all user scenarios through intelligent products, expanding multidimensional aspects such as time, space, specific situations, and relationships. Leveraging AI technology, these enterprises conduct intelligent and scenario-oriented marketing, aiming for the seamless integration of the virtual and physical realms. Within AI-enabled or constructed scenarios, computer vision or natural language capabilities are employed to automatically perceive and recognize scene information, facilitating the understanding and extraction of contextual needs. Based on the requirements of different scenarios, original content is created that is highly tailored to the specific context, enabling users to engage in immersive interactions. Examples include AI-customized brand voice packages and LBS-based AR interactive marketing in travel scenarios, as well as the utilization of AI and VR/AR technology in the virtual world to create brand scenarios and rich interactive content, encompassing brand exhibition halls, experiential spaces, interactive games, and more. This approach integrates brand information and product services into shopping, entertainment, exhibitions, and other scenarios, realizing the virtual and real linkage in marketing.

Regarding ultra-personalized marketing, AI technology enables each individual to receive an experience that is highly aligned with their unique characteristics, needs, and habits when accessing services. This level of personalization extends into behavioral, emotional, cognitive, preferential, aesthetic, and expectational dimensions, achieving deep personalization and enhancing the user experience, personalization, and customized recommendation effects. With the advancement of personalized large models, each individual will possess their own AI doppelganger, and both brands and individuals will have their exclusive GPT. The intelligent fusion of exclusive personal models and general large models can harness the advantages of both, ultimately optimizing marketing effectiveness.

1.2 Intelligent content production and communication

AI technology facilitates marketers in swiftly generating a substantial volume of high-quality content by automating content creation to satisfy the escalating demand for marketing, and engaging in vivid and captivating interactive communication with customers through diverse forms of expression. AI technology contributes to innovative breakthroughs in content production and interaction through three primary avenues. Firstly, comprehensive knowledge acquisition transcends disciplinary boundaries. Taking ChatGPT as an illustration, it possesses an "omniscient" function that enables the acquisition and comprehension of all knowledge and information across various domains, which can be amalgamated to provide marketing with an effective tool for creating a vast array of diverse content. Secondly, the activation and mutual integration of the "PUA" multi-end production effect are achieved. Under the empowerment of AI, the PGC, UGC, and AIGC (PUA) of content production can stimulate and integrate with each other, thereby enriching and enhancing the efficiency of content production. AI enhances PGC, making content production more efficient; AI empowers UGC to innovate AI netroots, people's recommendations, user seeding, word-of-mouth marketing, and virtual live broadcasting; and AIGC itself can generate new modes of intelligent customer service and virtual spokespersons. Thirdly, AI realizes the fusion of multiple communication forms. By utilizing AI voice, AI vision, and other technologies, it can generate a blend of text, images, audio, video, 3D models, and other forms of content expression, creating marketing

that aligns with customer interests and elicits emotional resonance [6].

1.3 Intelligent Insight and Analysis

Enterprises can accurately capture various types of data, integrate it with AI technology, and incorporate it into diverse marketing theoretical models to conduct comprehensive intelligent marketing insights and analysis of the industry, brand, and users. This process involves several key steps. Firstly, it aggregates data from online and offline sources, both internal and external, as well as from partners, to establish a comprehensive data bank that covers the entire domain of data. Afterwards, it analyzes industry trends and development patterns from multiple dimensions, such as market macro indicators, industry user behavior, and industry competition landscape. Subsequently, it delves into the current situation of the brand by examining various aspects, including search share, market competition, market potential, consumer decision-making preferences, and search characteristics. Additionally, it gains insights into the market relationship between the brand and other brands or competitors and predicts the future development of the brand. Finally, through the utilization of a massive user behavior labeling system, semantic categorization, knowledge mining, and other techniques, enterprises can accurately identify the target group and comprehensively perceive user behaviors and intentions.

1.4 Intelligent placement and optimization

AI technology significantly enhances advertisement placement by deeply understanding and matching customer behaviors and demands. It accomplishes the entire process of "intelligent targeting-intelligent bidding-intelligent creativity-intelligent optimization" and facilitates strategies such as intelligent bidding, precise volume expansion, and stable cost control with the assistance of big data and algorithms. This enables the realization of automatic volume exploration in the early stage, intelligent monitoring in the middle stage, and stable customer acquisition in the long term, ultimately improving the targeting accuracy and effectiveness of marketing advertisements [7].

With the deep integration of AI technology, intelligent placement is poised for improvement in three key aspects. Firstly, it reinforces stable cost control by upgrading the accuracy of the system model's pre-estimation of placement costs. This is achieved by harnessing the AI model's ability to accurately regulate data, enhancing overall cost control and perception, and shortening the cost regulation cycle. Secondly, global intelligent placement control is improved through the iterative upgrading of intelligent placement strategies. This enhances the control logic and autonomous mobility of the intelligent strategy in global budget and bid optimization allocation, further optimizing the accuracy of targeted volume expansion and exploring possibilities for lower costs and greater conversions. Thirdly, intelligent placement diagnosis provides closed-loop diagnosis and analysis, generating placement optimization solutions to enhance the placement effect at a deeper level.

1.5 Intelligent operation and management

Relying on AI intelligent tools or platforms, enterprises aim to secure long-term marketing positions by linking the user's entire lifecycle. Currently, there are three mainstream types of applications in this domain. The first type involves providing users with lightweight AI tools based on industry products and services. These tools leverage AI technology to develop small program utilities that address specific consumer pain points, such as AR makeup testing, AI skin analysis, and baby cry recognition.

The second type is the digital persona, which communicates and serves users in a personalized manner. Enterprises utilize natural language technology as the underlying force to enable the digital

persona to interface with users. By inputting business and service knowledge into the machine, the digital persona can offer users personalized business services or engage in emotional interactions and communications as a brand IP endorsement [8].

The third type is the intelligent management tool or platform for user operation and commodity management. These tools or platforms employ AI technology as the underlying foundation and integrate various intelligent functions, such as intelligent SaaS tools, intelligent store operation tools, community operation tools, and more.

2. AI Commercialization Enabling Other Fields

2.1 Commercialization application of AI in the field of education

The primary applications of AI in the field of education encompass assisted teaching, programming teaching, face recognition, and more. Specifically, AI is utilized in the following manners:

1) AI-assisted teaching involves scene simulation and data analysis, intelligent recommendation of courses and topics, and online learning assessment.

2) Face recognition and voice recognition technologies are employed for check-in procedures, attendance tracking, voice interactive learning, and automated learning progress monitoring.

3) AI programming teaching includes coding error correction, automatic code writing, data analysis and visualization, as well as algorithm creation and parsing tools [9].

Numerous educational products have already incorporated AI technology to enhance the quality and efficiency of teaching and learning. One such example is Class Bot, an AI-embedded online education tool developed by EDTK.US. This tool aids schools and training organizations in rapidly constructing online learning courses and improving the learning efficiency and graduation rate of online students. Class Bot utilizes homology-based AI technology to provide automated course design solutions tailored to different disciplines and levels. These solutions encompass course objectives, content, structure, pacing, and assessment. Additionally, Class Bot employs conversational-based AI technology to offer intelligent tutoring to students. It adaptively generates questions and parses of varying difficulty and type, based on the student's level and progress [10]. Furthermore, Class Bot employs AI technology to provide students with adaptive learning management, recommending suitable learning resources and paths based on their interests and goals, while dynamically adjusting and optimizing these recommendations based on students' behaviors and outcomes.

2.2 Commercialization application of AI in drug development

Currently, there are also relevant cases in China, primarily focusing on the AI drug development platform, with a notable domestic example being Hengrui Medicine. Hengrui Medicine has harnessed machine vision and natural language processing technology to successfully develop an intelligent virtual drug development platform. This platform is capable of analyzing the structure, properties, and efficacy of various drugs at a faster pace, thereby effectively accelerating the process of new drug development. By leveraging AI technology, Hengrui Medicine has achieved significant efficiency improvements in multiple key stages such as drug screening, target identification, and drug efficacy prediction, further shortening the time cycle from drug research and development to market availability, contributing Chinese wisdom to global pharmaceutical innovation [11]. The establishment of this platform not only demonstrates China's strength in the field of AI drug development but also brings new development opportunities to the global pharmaceutical industry.

2.3 Commercialization of AI in industrial systems

For instance, the water system, by employing AI algorithms, accomplishes real-time monitoring and control of water quality. Notable domestic cases include Jiangnan Water, which has harnessed AI and big data technology to establish a smart water supply system. This system is adept at achieving real-time monitoring of water quality, automatic control, early fault warning, and other functionalities through the utilization of advanced AI algorithms. By integrating these technologies, Jiangnan Water is able to provide users with a more stable and reliable water supply service, thereby enhancing the overall efficiency and effectiveness of water management. This innovative approach not only improves the quality of water supply but also contributes to sustainable water resource management. It serves as a testament to the potential of AI and big data in transforming traditional water supply systems into intelligent and efficient ones.

3. The Future of Artificial Intelligence in Business

In the future, the enterprise application of artificial intelligence ought to, and indeed will, concentrate on two primary domains: core business operations and innovation models.

Firstly, regarding the core business, areas intimately linked to enterprise functioning and management, such as risk management, supply chain logistics, marketing strategies, and integrated decision-making processes, have exhibited the most enduring value through numerous project implementations. Scenarios that amalgamate these facets, for instance, the enterprise's digital performance enhancement and real-time comprehensive analysis platform, the supply chain control tower amalgamating multi-directional predictive models, the store visit system augmenting dealer sales, and the store distribution and replenishment system addressing merchandise allocation challenges, hold particular appeal for enterprises due to their core relevance and the multitude of uncertainties they mitigate. These uncertainties encompass shifts in various factors, presenting ample avenues for artificial intelligence to assume a pivotal role [12].

Secondly, concerning the innovation model, artificial intelligence has the potential to revolutionize customers' traditional business paradigms, not only refining the customer experience but also potentially enabling enterprises to achieve a comprehensive leap, innovate, or even forge new enterprises. This phenomenon is not exclusive to artificial intelligence; every advancement in information technology has precipitated the emergence of new industry leaders. For instance, Sabre, the world's leading travel and airline e-commerce solutions provider, evolved from American Airlines' information technology department. In the 1960s, with IBM's assistance and utilizing the most advanced computer technology, they developed the SABRE computer reservation system. Alongside the advent of the Internet, e-commerce, and other technologies, SABRE has continually upgraded and evolved, becoming a technology enterprise several times the magnitude of traditional businesses in the industry [13]. Presently, IBM persists in collaborating with eco-partners dedicated to societal transformation through technology, assisting enterprises in practicing technological innovation and exploring the potential of business model breakthroughs facilitated by artificial intelligence. In the pharmaceutical field, AI plays a crucial role in providing treatment strategies, assisting in drug development, and aiding in diagnosis. Tempus is a company that utilizes AI for genetic analysis, employing technology capable of analyzing patients' genetic data to offer personalized treatment recommendations. Insilico Medicine, on the other hand, leverages AI technology in drug research and development, swiftly identifying potential new drug targets through the analysis of extensive biomedical data. Additionally, Watson Health's Watson Oncology solution has been applied in tumor diagnosis, analyzing a large volume of imaging data to provide doctors with personalized treatment suggestions. Additionally, our partnership with the Volkswagen Group aims to design and implement an AI-enabled telematics network, transitioning the Volkswagen Group into a software-driven

enterprise. Furthermore, AI's endeavors in green and low-carbon domains represent pivotal strides towards altering the global landscape, underscoring the versatility and potential of artificial intelligence in driving innovation and sustainability across diverse sectors.

4. Summary

Overall, China's AI commercialization market has indeed achieved remarkable milestones in recent years, highlighting the nation's prowess in harnessing the potential of artificial intelligence for practical applications. However, it is imperative to acknowledge that the success of AI commercialization and business functions [14] is not an overnight phenomenon. As AI technology continues to evolve and mature, it is crucial that market demand and regulatory policies keep abreast of these advancements. Given the relentless development and iteration of AI technology, coupled with the emergence of large models, we can confidently anticipate that future commercialization applications will exhibit exponential growth, permeating and transforming a broader array of fields and industries. This ongoing progress underscores the immense potential of AI to revolutionize various sectors, fostering innovation and driving economic growth not only in China but also globally.

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