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Digital Economy and Industrial Transformation: The Implications of AI in Manufacturing and Services

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Abstract:

In the context of the digital economy, artificial intelligence (AI) is increasingly being integrated into the decision-making process, providing powerful support for enterprises. Through data analysis and machine learning technologies, AI can process large amounts of information, providing a foundation for predictive analysis. This ability not only improves the accuracy of decisions, but also enables enterprises to respond quickly to market changes. Furthermore, AI can also automate various operational tasks, such as inventory management, customer service, and production scheduling, significantly improving work efficiency. With the introduction of AI, the internal structure of organizations has undergone profound changes. This study uses a case study approach to conduct a thorough discussion of Xiaomi as a representative example. Xiaomi has widely applied AI technology in product design, marketing strategies, and after-sales services, and its successful experience provides valuable lessons for other enterprises. At the same time, this thesis will examine the impact of artificial intelligence on employment dynamics and social structures. In some areas, while AI may lead to the reduction of certain jobs, it also creates new job opportunities, generating complex effects on the labor market. Therefore, it is necessary to comprehensively evaluate these changes and provide corresponding recommendations to help all parties better adapt to this transformation process. Finally, this study emphasizes the critical role of artificial intelligence in the contemporary economic landscape and proposes a series of recommendations for its popularization and application.

Keywords: Digital economy, Artificial intelligence, Xiaomi, Industrial, Manufacturing.

1. Introduction

Digital industrialization and industrial digitization are the two main categories used by Chinese academics to describe the digital economy. In terms of national economic industry categorization, digital industrialization is equivalent to the conventional information industry, which includes the production of electronic and communication equipment, Internet-related services, software, and information technology services. The added value of the digital economy is created in conventional industries as a result of ongoing integration of information technology with other sectors of the national economy. This section reflects efforts towards industry digitization [1]. Education, healthcare, and entertainment are among the industries impacted by the digital economy. Due to technological advancements and improvements in electronic communications, the global economy is moving towards digitization. The digital economy plays a critical role in advancing global digitization, and it is anticipated that its influence will only grow in future years [2]. Artificial Intelligence (AI) is a multidisciplinary field that encompasses computer science, psychology, linguistics, and philosophy. AI can be defined as machines exhibiting intelligence in its most basic form or machines that mimic cognitive functions associated with human minds such as learning and problem-solving [3]. AI has been utilized for developing innovative products that can increase company revenue [4]. AI's data capabilities can help businesses reduce costs or increase revenue. However, limited acceptance due to lack of social skills poses management challenges and leads to inconsistent task performance [5]. This paper employs a case study methodology to investigate the potential implications of AI on the labor market and social structures. With technology advancing at an unprecedented pace, AI has permeated various industries, fundamentally transformed production processes and significantly impacted individuals' work and lives. Through comprehensive examples, we will examine specific applications of AI technologies in both manufacturing and service sectors – such as the deployment of automated robots and intelligent production lines in manufacturing – which have not only enhanced production efficiency but also altered traditional skill requirements for workers. This transition has led enterprises to prefer candidates with advanced technological competencies, necessitating a reassessment of workforce skill demands. Furthermore, within the service sector, AI-driven data analytics, customer relationship management systems, and chatbots are progressively replacing certain repetitive roles, compelling employees to continuously upgrade their skills to navigate this evolving employment landscape. Consequently, we will analyze how these transformations influence job selection and employment prospects, including trends toward emerging occupations alongside the potential obsolescence or evolution of established roles. Beyond labor dynamics, this paper will investigate AI's pivotal role in fostering enterprise innovation; for instance, through big data analysis and machine learning algorithms that enable companies to more accurately discern market needs—thereby expediting product development cycles and bolstering competitive advantage. Moreover, this innovative capacity manifests not only at the product level but across various dimensions such as business process optimization and supply chain management—yielding substantial economic benefits for organizations. To comprehensively assess AI's impact on contemporary economies, we will evaluate its significant effects on industrial structural adjustments, resource allocation efficiencies, and market competition dynamics. In light of globalization's context where technological disparities increasingly highlight developmental gaps between nations; thus this study seeks to provide empirical evidence that aids policymakers in crafting more effective frameworks aimed at promoting technological advancement alongside social progress while offering pragmatic guidance for strategic enterprise planning.

2. Case description

Xiaomi Inc., established in 2010, is a technology business focused on the development of smartphones and creation of an innovation ecosystem. Xiaomi's key products are Mi phones. Furthermore, MIUI, MiTalk, Mi Box, Mi TV, and Mi Router are exclusive brands owned by the company. In addition, there are several additional goods that are categorized into over 2700 segments throughout 15 different sectors of the innovation ecosystem, encompassing fields such as intelligence, furniture, and food. In March 2018, Xiaomi achieved the status of being the fourth-largest smartphone maker globally, having produced over 260 million smartphones. Xiaomi, other from its main product, the smartphone, fostered development of 270 startups. Xiaomi has achieved the status of being the largest smart device platform in the world, with a network of 132 million connected devices and over 400 partners. Xiaomi made its initial public offering (IPO) in Hong Kong on 9 July 2018. Xiaomi achieved the distinction of joining the Fortune 500 in July 2019, making it the most recent and youngest addition to this prestigious list of companies [6]. The term "Internet mode" is commonly used in the context of Internet TV set-top boxes, Internet smart TVs, home smart routers, and smart home goods. Currently, Xiaomi Company is experiencing steady growth and possesses distinct advantages in terms of market share

and revenue creation. Xiaomi accomplished a significant breakthrough, particularly with the launch of Xiaomi Motors in 2024. Due to industrial upgrading and technological innovation, market competitiveness has intensified. However, Xiaomi has the potential to attain profitability and generate money. Between 2019 and 2023, there was an overall increase and decrease in operational revenue. The enterprise's gross profit margin has exhibited a consistent upward trajectory, increasing from 13.87% in 2019 to 21.21% in 2023 [7].

3. Analysis

Xiaomi has created several specialized departments, including the IoT Platform Department, the Artificial Intelligence Department, the Cloud Platform Department, and the Big Data Department, to advance its AI technology and strengthen partnerships with external companies. This strategy is designed to utilize AI in enhancing the IoT platform's functionality and expanding its reach. The use of AI not only establishes a competitive advantage but also enhances the dissemination of information and the movement of commodities within the supply chain [8]. Additionally, in April 2017, Xiaomi launched Xiaomi Youpin, an open e-commerce platform. Xiaomi Youpin features Xiaomi's in-house brands as well as ecosystem products, becoming a key element of the company's "new retail strategy." This initiative significantly expanded Xiaomi's product portfolio, enabling home products to maintain the same high value-for-money standard as its other offerings. In 2019, the Xiaomi IoT platform has 234 million smart hardware devices connected to it. The combination of AI and IoT resulted in a revenue of 28.8 billion yuan. Users have activated Xiaomi's smart speakers, Xiao Ai, about 8 billion times, resulting in the activation of over 100 million units. Xiaomi established a collaboration with over 400 enterprises, including as Siemens and Philips, and declared a strategic alliance with IKEA, Leading Ideal, and All Seasons Hotel. Xiaomi Youpin, which offers items from over 100 third-party brands, had yearly sales exceeding 1 billion yuan. Xiao Ai, the voice assistant developed by Xiaomi, has become one of the most active in the world, thanks to the contributions of over 8000 developers on Xiaomi's AI open platform. Xiao Ai now boasts more than 1300 talents [6].

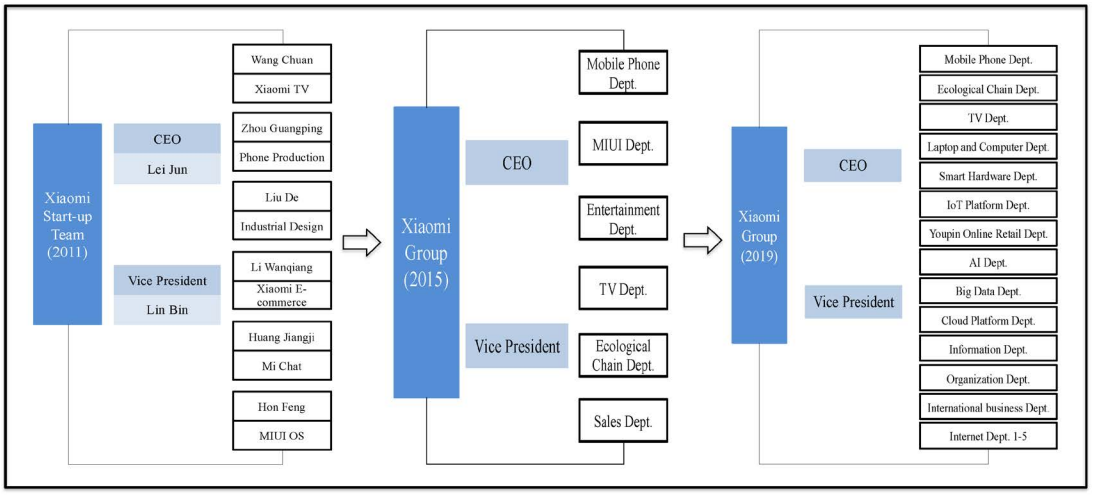

Fig. 1 Evolution of Xiaomi's Organizational Structure (2011–2019)

In 2011, Xiaomi started with a relatively small team. Lei Jun served as the CEO, with Lin Bin as Vice President. Other notable members of the start-up team included Wang Chuan (Xiaomi TV), Zhou Guangping (Phone Production), Liu De (Industrial Design), Li Wangqiang (Xiaomi E-commerce), Huang Jiangji (Mi Chat), and Hong Feng (MIUI OS). This structure focused on core product areas like phone production, e-commerce, and software (MIUI) in the figure 1.

By 2015, Xiaomi had grown into a larger group with more departments. Lei Jun remained the CEO, and Lin Bin continued as Vice President. New departments were established to manage various product lines and services, including the Mobile Phone Dept., MIUI Dept., Entertainment Dept., TV Dept., Ecological Chain Dept., and Sales Dept. This stage marks Xiaomi's diversification into entertainment and its ecological chain, reflecting its expanding business interests.

By 2019, Xiaomi had expanded further, adding more specialized departments to support its growth. Lei Jun remained the CEO, and Lin Bin was still Vice President. The organizational structure had grown significantly, including new departments like the Laptop and Computer Dept., Smart Hardware Dept., IoT Platform Dept., AI

Dept., Big Data Dept., Cloud Platform Dept., and International Business Dept. The company also established a division for its Internet Dept., showing Xiaomi's efforts to strengthen its digital and hardware ecosystem.

4. Suggestion

The rapid development of AI technology has heightened worries about human oversight of the intrinsically opaque character of AI systems [9]. The attention on the ethical principles and values driving AI research and usage has expanded due to the growing acceptance of AI and advancements in AI capabilities [10]. At the corporate level, it is imperative for companies to advocate for AI ethics and transparency to enhance data privacy protection measures. Organizations should establish comprehensive data usage policies and ensure that all employees comprehend both the content and significance of these guidelines. Conducting regular internal audits to evaluate compliance with relevant laws and industry standards regarding data processing procedures serves as a vital mechanism for bolstering transparency. Concurrently, training and retraining employees to adapt to evolving technical requirements is particularly crucial. This encompasses not only operational skills training related to new technologies but also fostering the ability to identify and manage potential risks associated with AI systems, thereby equipping employees to navigate an increasingly dynamic work environment.

At the governmental level, formulating robust policies and regulations is essential for supporting AI development. These policies may encompass various dimensions, including financial support mechanisms and tax incentives aimed at cultivating a conducive ecosystem for innovation. Additionally, establishing education and skills training programs will assist diverse sectors of society in understanding trends in AI development along with its application scenarios. By creating dedicated funds or collaborative projects, synergies can be fostered between universities, research institutions, and enterprises to promote talent cultivation and technological innovation—thereby facilitating an equitable technological advancement landscape. At the societal level, enhancing public comprehension and acceptance of AI is paramount. To achieve this objective, community lectures, seminars, and online courses can be organized to engage broader audiences in discussions surrounding AI topics. Simultaneously, promoting community involvement through feedback mechanisms remains a critical aspect that warrants attention. By gathering public opinions on technology development initiatives can better align with actual needs within society. In this context, various media platforms play a pivotal role by disseminating informative articles and videos designed to elevate public awareness regarding fundamental knowledge about AI as well as its implications—thus fostering a positive social atmosphere conducive to achieving synergistic outcomes between technological progress and societal advancement [11].

5. Conclusion

AI plays a pivotal role in fostering business innovation and has significant implications for employment and social structures. However, as technology progresses, AI encounters persistent challenges that may hinder its ongoing development. These challenges encompass data privacy protection, algorithmic transparency, and ethical considerations. Until these issues are adequately addressed, the advancement of AI could be constrained. Concurrently, cross-sector collaboration is poised to catalyze transformative changes in emerging technologies. Inter-industry cooperation can facilitate resource sharing and knowledge exchange, thereby expediting the innovation process. For instance, partnerships between technology firms and traditional industries can enhance data utilization efficiency and broaden application scenarios. Working with AI necessitates a judicious evaluation of its advantages, and the potential drawbacks linked to its application in corporate decision-making. Governments worldwide are actively investigating ways to bolster AI development through policy initiatives aimed at ensuring its contribution to economic growth and societal well-being. Consequently, strengthening education and training programs to align with new job demands while establishing appropriate legal and regulatory frameworks will be critical tasks moving forward. These measures will help mitigate the risks of job displacement due to automation while nurturing talent equipped with relevant skills to meet escalating market needs. In summary, effectively harnessing the collective efforts of diverse stakeholders will be essential for promoting the sustainable development of artificial intelligence in this rapidly evolving landscape.

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