Enterprise Management Innovation of Latecomers under the Context of Artificial Intelligence Technology: From Catching Up to Leading

-- Taking BYD as an Example

Haohan Xu[1, a]

[1]School of Economics and Management, Beijing Jiaotong University, Beijing, China

[a]Xhh22726030@163.com

Abstract. This paper focuses on the management innovation of latecomers in the context of artificial intelligence technology, using BYD as the research object and employing grounded theory for analysis. Through the coding analysis of relevant materials, it reveals the management innovation path and mechanism of BYD from the catching-up stage to the leading stage, including strategic adjustment, organizational transformation, and talent management, etc. The study finds that latecomers can achieve management innovation breakthroughs through artificial intelligence technology and thereby achieve the leap from catching up to leading, providing useful references for other latecomers.

Keywords: Artificial Intelligence Technology; Latecomers; Management Innovation; Grounded Theory; BYD.

1. Introduction

In the current era of increasingly changing technology, artificial intelligence technology is deeply transforming various industries and has become an indispensable force influencing enterprise transformation and development. Latecomers in the market, facing high pressures such as technological catching-up and market competition, are confronted with challenges. However, the emergence of AI technology provides valuable opportunities for latecomers. BYD, as a latecomer in the field of new clean energy vehicles in China, has achieved the transformation from catching-up to leading with artificial intelligence technology. This paper will use grounded theory to explore the management innovation of BYD in the context of artificial intelligence technology, aiming to provide a useful reference for latecomers.

2. Literature Review

2.1. Artificial Intelligence Technology and Enterprise Development

Artificial intelligence technology is widely applied in enterprises in various fields such as production and manufacturing, purchasing, and marketing (Daroń & Gorska, 2023), which can significantly improve the production efficiency, reduce costs, and enhance product quality, creating new competitive advantages for enterprises (Guo & Wang, 2021). Shang et al. (2024) have studied the impact of artificial intelligence technology on enterprise performance, believing that it is a vital driving force for enterprises to achieve breakthrough development[1-3].

2.2. Management Innovation of Latecomers

Latecomers, due to their late start, are at a disadvantage in terms of technology and market share (Arango, 2012). Therefore, in order to achieve catching-up and surpassing, latecomers urgently need to carry out management innovation (Xiao et al., 2013). Birkinshaw et al. (2008) illustrate that management innovation includes strategic innovation, organizational innovation, and institutional innovation. Through innovative management methods and approaches, latecomers can enhance their capabilities and gradually narrow the gap with leading enterprises[4-6].

2.3. Application of Grounded Theory in Management Research

Fendt & Sachs (2008) point out that grounded theory emphasizes the step-by-step coding of materials to extract concepts and categories from specific phenomena, thereby constructing theories. In management research, grounded theory can help researchers understand the management practices of enterprises and explore the hidden laws and mechanisms behind phenomena (Glaser, 2014)[7-8].

3. Research Methods

This study adopts the grounded theory research method, with BYD company as the case study object. Many channels were used to collect official reports, news reports, academic papers, industry analysis reports of BYD. The collected materials were subjected to open coding, main axis coding, and selective coding, gradually extracting core concepts and main categories to construct a theoretical model of management innovation of BYD in the context of artificial intelligence technology.

4. Research Process and Result Analysis

4.1. Open Coding

The collected materials were analyzed sentence by sentence. A total of 122 initial concepts were obtained. For instance, "BYD increases its investment in artificial intelligence" is marked as "increased research and development investment"; "establishing an artificial intelligence research project team" is marked as "cross-departmental team formation". Then, these initial concepts are further filtered and merged to form 30 sub-categories, such as "technology research and development investment", "organizational structure adjustment", "talent recruitment strategy" and so on.

4.2. Main-axis Coding

Based on the open coding, the logical relationships among them are summarized to form main categories. Through analysis, 7 main categories were determined, namely strategic planning, organizational change, technological innovation management, talent management, marketing innovation, financial management innovation, and corporate culture construction. For example, sub-categories such as "technology research and development investment" and "technical training" are classified into the main category "technological innovation management"; sub-categories such as "cross-departmental team collaboration" and "adjusting and simplifying the organizational structure" are classified into the main category "organizational change".

4.3. Selective Coding

Core categories are extracted from the main categories to construct a theoretical model. The core category of this study is "the application of artificial intelligence technology", which runs through all the main categories.

4.4. Analysis of BYD's Management Innovation Path from Catching Up to Leading

4.4.1. Management Innovation during the Catching-up Stage

During the catching-up stage, BYD mainly focused on technology introduction and imitation innovation. By increasing investment in research and innovation of artificial intelligence-related technologies, BYD drew on the painful lesson of Nokia's decline due to complacency, and resolutely implemented the strategic transformation of "openness". Under the guidance of the collaborative promotion strategy, BYD, leveraging the two key driving forces of technological innovation and business model innovation, has actively collaborated with internet enterprises and, relying on digital platforms to jointly develop an intelligent driving system. In organizational management, BYD has established a project team structure with excellent flexibility, dividing the team into five business segments. Each business segment has been granted greater management autonomy, aiming to fully

motivate the team's enthusiasm and accelerating the speed of technological research and product launch.

4.4.2. Management Innovation during the Leading Stage

Entering the leading stage, BYD began to focus on independent innovation and differentiated competition. In terms of enterprise strategy, it clearly defined the development direction centered on artificial intelligence technology, increased investment in research and development in the cutting-edge fields of artificial intelligence such as autonomous driving and intelligent connectivity. In organizational change, a more flattened and flexible organizational structure was constructed. Whether expanding business from batteries to the automotive industry, or decisively choosing new energy vehicles as the development direction, or making reasonable adjustments internally when the market was in a difficult situation, all of these indicated that the management of BYD had precise judgments on the industry trend and could firmly implement long-term strategic plans. They would not change direction due to short-term interests, but focused on enabling the enterprise to develop in the long term. Meanwhile, BYD continuously strengthened the engineer culture and implemented the talent strategy. It has a large team of engineers, with 11 major research institutes under it, gathering 110,000 engineers, who are the key force for the enterprise's innovation and development. In addition, BYD attaches great importance to the cultivation and recruitment of talents, creating an open and inclusive innovation environment for engineers, encouraging them to actively undertake various research projects, starting from the fundamental theoretical level, to explore solutions to technical problems. This engineer culture keeps the enterprise always innovative, achieving new breakthroughs in technological research and continuously providing intellectual support for the long-term development of the enterprise.

5. Analysis

5.1. Alignment of Research Results with Existing Theories

This study conducts an in-depth analysis of BYD and reveals the specific management innovation paths and mechanisms for latecomer enterprises to catch up and become leaders in the context of artificial intelligence technology. The results of this study, on the one hand, verifies the viewpoint that latecomer enterprises can achieve catching up and surpassing through management innovation. On the other hand, it emphasizes the significant role of artificial intelligence technology in enterprise management innovation. The management innovation practice of BYD provides certain references for latecomer enterprises on how to utilize new technologies to achieve management transformation.

5.2. Limitations of the Study

This study conducts a case study on BYD alone. Although it analyzes its management innovation process, there may be some limitations. Due to the differences in industry environments, enterprise scales, and other factors among different latecomer enterprises, their management innovation models may vary. Therefore, the applicability of the results in other enterprises needs to be further verified.

6. Conclusion and Implications

6.1. Research Conclusion

This study, using grounded theory, analyzes BYD as an example to deeply explore the management innovation of latecomer enterprises in the context of AI technology. The study finds that latecomer enterprises utilizes AI technology for strategic adjustments, organizational changes, technological innovation management, and talent management, among other innovative measures, to achieve the leap from catching up to leading, providing certain experiences and references for other latecomer enterprises.

6.2. Implications for Latecomer Enterprises

Latecomer enterprises should actively embrace and utilize artificial intelligence technology, using it as an important method to achieve management innovation and development leap. In terms of corporate strategy, they should clearly point in the direction of utilizing AI technology as a development focus, increase R&D investment, and strengthen technological cooperation and innovation. In terms of organizational transformation, they should build an efficient organizational structure, form cross-departmental collaboration, and improve the response speed and innovation ability of the enterprise. In terms of talent management, they are expected to establish a complete talent incentive mechanism and cultivate a group of high-end AI talents to provide intellectual support for the development of the enterprise.

6.3. Prospects for Future Research

In the future, it is important to further expand the scope of case studies, conduct comparative research on latecomer enterprises in different industries and with different scales. Moreover, it can study the specific application scenarios and mechanism of artificial intelligence technology in enterprise management innovation, providing enterprises with more precise management innovation strategies.

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