

Research on the impact of big data on enterprise decision-making

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Abstract: *The purpose of this paper is to explore in depth the impact of big data on business decision-making. By providing an overview of the application of big data in business and its relationship with enterprise management, this paper analyses the specific impact of big data on enterprise decision-making process, decision-making efficiency and decision-making accuracy. In addition, using Target Corporation as an example, the paper analyses in detail the refined application of big data in corporate decision-making, as well as the decision-making outcomes and far-reaching impacts driven by it. The findings show that big data not only optimises the decision-making process and improves decision-making efficiency, but also significantly improves the accuracy of decision-making and brings substantial business value to enterprises. Based on these findings, this paper provides insights and suggestions on how enterprises can better utilise big data for decision-making.*

Keywords: *Big data, Enterprise decision making, Impact study*

1. Introduction

1.1 Background of the study

Big data has become an important feature of today's era, with the Internet booming and information technology advancing. Big data is changing people's way of life while profoundly affecting the way of enterprise decision-making and business model. In this context, more and more enterprises begin to pay attention to how to use big data to improve the efficiency and accuracy of decision-making, so as to enhance the competitiveness and market position of enterprises.

1.2 Research significance

As an important strategic resource, big data, in the wave of informatisation and digitisation, has widely penetrated in all fields of society and has profoundly affected the decision-making of enterprises. Examined from the theoretical level, it not only broadens the boundary of inquiry of decision science - breaks the limitations of traditional decision science relying on limited data and experience, and introduces big data as a brand new perspective and methodology, which improves the accuracy and scientificity of decision making; at the same time, the study also, through the practical application of data in enterprise decision making analysis, it reveals the great potential of big data in improving decision-making efficiency, reducing decision-making risks, and exploring business opportunities.^[1]

From the perspective of practical application, the practical significance is far-reaching. Specifically, the study can assist enterprises in collecting, processing and analysing data efficiently in a complex big data environment, thereby optimising and upgrading the decision-making process and providing substantial operational guidelines and strategic recommendations. Enhancing the competitive of enterprises through precise insights into market dynamics and customer needs not only helps enterprises seize the first opportunity in the fierce market competition, but also promotes the innovation and modernisation of enterprise management. As an advanced technology tool, big data is a forward-looking management concept, and its in-depth application can give rise to the innovation of enterprise management mode, prompting enterprises to move forward in the direction of more scientific, efficient and flexible management, which is exactly what big data needs.^[2] To sum up, the research background of this thesis and its important significance is: not only can promote the development and innovation of enterprise management theory, but also can provide useful guidance and help for

practice.

2. Overview of Big Data

2.1 Application of Big Data in the Business Sector

Big data is a collection of huge data volume, diverse sources and fast processing beyond the capability of traditional data processing tools. Big data is characterised by large data volumes, fast processing speeds, multiple data types and low value density. Big data involves complex data types and fast data flow, not only the scale of massive data. At the same time, the value of big data is often hidden in the massive data, which needs to be professionally processed and analysed in order to find out where the value of big data lies. These characteristics make big data an important foundation for business decision-making today and a source of competitive advantage for organisational decision-making.^[3]

Big data is widely used in commercial applications. By collecting and analysing a large amount of user data, enterprises can gain a deeper understanding of customer preferences, buying habits, market trends, etc., so as to optimise their products and services and improve their marketing effectiveness. For example, e-commerce companies recommend personalised products for users, is the use of big data to analyse the user's shopping history, browsing behaviour; financial institutions use big data to assess credit risk and prevent financial fraud; production processes and supply chain management are optimised by the manufacturing industry with the help of big data. In short, big data provides a powerful tool for enterprises to gain insight into the market and make accurate decisions, and has become an important resource in the business field.^[4]

2.2 The relationship between big data and enterprise management

There is a close relationship between big data and enterprise management. In the digital era, big data has become an important resource for enterprise management. Through the collection, integration and analysis of massive data, enterprises can understand customer needs more deeply, grasp market trends, and provide powerful support for making scientific decisions. At the same time, big data technology can also help enterprises optimise internal operations, improve management efficiency and achieve refined management. Therefore, big data is not only a powerful tool for enterprise management, but also an important driving force to promote enterprise innovation and development.^[4]

Big data has become an important resource for enterprise operation in the digital era. By collecting, integrating and analysing huge amounts of data, enterprises provide powerful support for making scientific decisions, and can gain a deeper understanding of customer needs and grasp market trends. At the same time, big data technology can also help enterprises achieve the optimisation of internal operations, improve management efficiency and refine management. Making full use of big data to improve enterprise management, enterprises need to take a series of measures. First, it has established a perfect information collection and processing system to ensure that the information is accurate and complete. The second is to cultivate a professional material analysis team, use advanced material analysis technology, and explore the potential value in the material. In addition, enterprises should actively promote a data-driven decision-making culture, encourage employees to make decisions based on data, and improve the accuracy and efficiency of decision-making. While doing a good job of keeping the security and confidentiality of corporate and customer data, data security management should be strengthened to ensure that nothing is left to chance. Through the implementation of these measures, big data will become an important support and driving force for enterprise management, helping enterprises to achieve more efficient and accurate management and decision-making, and enhancing the overall competitiveness and sustainable development of enterprises. Therefore, big data is not only a powerful tool for enterprise management, but also an important driving force to promote enterprise innovation and development.^[5]

3. Analysis of the impact of big data on enterprise decision-making

3.1 The impact of big data on the enterprise decision-making process

The profound and multidimensional impact of big data on the enterprise decision-making process has fundamentally changed the enterprise decision-making foundation and decision-making mechanism,

and then reconstructed the entire decision-making system.

In terms of decision support, whereas in the past enterprise decision-making relied on limited data sets and subjective experience, the rise of big data technology has brought unprecedented data richness and diversity to enterprises. These data cover all aspects of an enterprise's internal affairs, while extending to external areas such as the market environment, competitive dynamics, and customer demand, painting a more complete and detailed picture of the market and industry for the enterprise, thus providing entrepreneurs and managers with a more solid cornerstone for decision-making. In the decision-making and analysis process, the use of big data technology enables enterprises to dig deeper into the connotation of the data, revealing the potential connection between the data and the future direction. With the help of advanced analysis tools and algorithms, enterprises can gain insights into market trends and anticipate customer needs, and then formulate more accurate and forward-looking strategic plans. This data-driven decision-making model not only enhances the rationality and rigour of decision-making, but also effectively reduces subjective bias and errors in the decision-making process, thus improving the overall quality and efficiency of decision-making.^[6] At the level of decision-making effect, the application of big data enables enterprises to capture market dynamics and changes in customer demand more keenly, so as to respond quickly and occupy the first opportunity in the market. This not only significantly improves the enterprise's market competitiveness, but also strengthens the enterprise's ability to resist risks and ensure sound development.

To sum up, big data plays a crucial role in the decision-making process of enterprises, which not only significantly improves the scientificity and accuracy of decision-making, but also profoundly optimises the decision-making process and execution effect, providing solid technical support and strategic guarantee for enterprises to achieve sustainable development in the complex and changing market environment.

3.2 The impact of big data on the efficiency of business decision-making

Big data technology has a profound and significant impact on the efficiency of enterprise decision-making. By virtue of the efficient processing and in-depth analysis of huge amounts of data, big data gives enterprises the ability to quickly extract core information, thus significantly compressing the time cycle from data collection to decision-making. In addition, the real-time qualities of big data enable enterprises to track market dynamics in real time and quickly adjust their business strategies accordingly, significantly enhancing the responsiveness of decision-making to market changes. More importantly, the predictive ability of big data helps enterprises to understand the future development trend, and then layout in advance to formulate adaptive strategies, which effectively reduces the frequency of adjustments in the decision-making process and the cost of trial and error.^[7] Therefore, the wide application of big data technology has undoubtedly injected a strong impetus for the improvement of enterprise decision-making efficiency, enabling enterprises to respond more quickly and flexibly in the fierce market competition, so as to firmly grasp the pulse of the market and win the first opportunity.

In practice, the application of big data technology by many enterprises has successfully improved their decision-making efficiency. Take the Jitterbug e-commerce platform under ByteDance as an example, with the help of advanced big data analytics, the platform conducts real-time tracking and in-depth excavation of users' shopping behaviours and preferences, and then realizes highly personalized product recommendations, which not only significantly improves the user conversion rate, but also drives significant growth in sales. Similarly, Meituan Takeaway optimises its delivery service by using big data to analyse multi-dimensional data such as traffic conditions and weather changes in real time, and dynamically adjusts its delivery strategy to ensure a highly efficient and smooth delivery process, which in turn improves customer satisfaction. These successful cases together show that big data has the ability to quickly process and analyse massive amounts of information, providing enterprises with real-time feedback and future trend forecasts, enabling them to quickly respond to changes in the market, make scientific decisions and continuously optimise their operational processes, and ultimately significantly improve their decision-making efficiency and overall competitiveness.

3.3 Impact of Big Data on Business Decision Accuracy

Big data and decision-making accuracy are interrelated. Massive and diverse data provide unprecedented opportunities for enterprise decision-making, which is the arrival of the era of big data. Through in-depth analysis and mining of these data, enterprises can more accurately grasp market

dynamics, understand customer needs, predict future trends, and then make more scientific and reasonable decisions. This data-based decision-making not only improves the accuracy and effectiveness of decision-making, but also reduces the risk and uncertainty of decision-making. Therefore, big data has become an important and indispensable tool for modern enterprises to improve the accuracy of decision-making. ^[8]

In summary, the application of big data technology has significantly improved the accuracy and effectiveness of enterprise decision-making. By providing comprehensive and accurate data support, revealing potential patterns and trends, and optimising the decision-making process, Big Data technology has become an important weapon for modern enterprises to achieve accurate decision-making and respond quickly to market changes.

4. Application Case of Big Data in Enterprise Decision Making: Target Corporation's In-depth Practice

4.1 Background

With the rapid development of information technology, big data has become an important basis for enterprise decision-making.

Corporation is a large American retailer headquartered in Minnesota, the second largest discount retail department store group in the United States after Wal-Mart and the seventh largest retailer in the United States (2021). As a large retailer in the United States, its in-depth practice in the application of big data has set an example for the industry.

4.2 Contextual Analysis and Target's Decision Dilemma in the Big Data Environment

With the deep development of the digital era, consumer behavioural patterns, market dynamics and competitive dynamics are evolving at an unprecedented pace. In this context, Target, as a widely influential retailer, is facing the urgent need to effectively extract key information from the huge and complex ocean of data to provide powerful support for corporate strategic decision-making. In order to respond to this challenge and commit to achieving more accurate marketing, more efficient inventory management and better customer service experience, Target decided to fully integrate and apply big data technology in its daily operation and long-term planning.

4.3 Analysis of the refined application of big data in Target's decision-making process

In Target's decision-making process, the application of big data presents two major refinement directions, namely, precision marketing and personalised service and precise control of inventory strategy.

In terms of precision marketing and personalised services, Target has demonstrated its excellent market segmentation capabilities by deeply mining and analysing consumer data. In addition to collecting consumers' basic information, such as age, gender and place of residence, Target further tracks their shopping history, online browsing behaviour, purchase frequency and spending amount at multiple levels. Through comprehensive integration and in-depth analysis of these data, Target has successfully created a fine-grained portrait of each consumer group, which accurately reveals consumers' shopping patterns, personalised preferences and unmet needs. These refined consumer profiles provide Target with deep market insights into the core needs and expectations of different consumer segments. Based on these insights, Target has crafted and implemented a series of highly targeted marketing strategies. These strategies focus on the immediate needs of consumers and anticipate possible changes in their needs in the future, providing personalised recommendations, tailored offers and accurate advertising. Through these well-planned marketing strategies, Target has not only significantly improved its marketing effectiveness, but also strengthened consumer satisfaction and loyalty to the brand, further solidifying its leadership position in a highly competitive market.

In the area of inventory management, big data has empowered Target to accurately manage its inventory strategy. Using a combination of sales, inventory and supply chain data, Target is able to gain real-time insights into the market performance and inventory dynamics of each product category to accurately predict future sales trends and demand fluctuations. Based on these data analyses, Target is able to develop a more refined inventory plan to ensure the rational allocation of inventory resources

and efficient turnover. This not only effectively avoids the risk of inventory backlogs and stock-outs, but also significantly improves the overall effectiveness of inventory management.

4.4 Big Data-Driven Decision-Making Results and Their Far-Reaching Impacts

Target has achieved impressive results at the decision-making level through the in-depth application of big data technology, which has had wide-ranging market and operational impacts. Target has successfully stood out from the fierce market environment by leveraging strategies such as precision marketing and personalised recommendations. This data-driven marketing strategy not only attracted a large number of loyal consumers, but also effectively increased Target's market share and further strengthened its market leadership.

In summary, Target has achieved significant results in its decision-making process through the in-depth practice of big data, which has not only enhanced its market competitiveness and operational efficiency, but also brought a better shopping experience to consumers, and Target's successful case provides valuable experience and inspiration for other enterprises in the retail industry, fully demonstrating the great potential and value of big data technology in promoting enterprise decision optimisation and transformation and upgrading. The successful case of Target provides valuable experience and inspiration for other enterprises in the retail industry, and fully demonstrates the great potential and value of big data technology in promoting enterprise decision optimisation and transformation.

5. Implications and Conclusions

5.1 Implications

In delving into the far-reaching impact of Big Data on the decision-making process of enterprises, especially through detailed analyses of iconic cases such as Target Corporation, these studies are not only decisive for a deep understanding of the central role of Big Data in the business environment, but also provide important practical guidance for enterprises to make more effective use of Big Data in the future. Big data has been proven to be a fundamental pillar in the science of business decision-making. Modern enterprises no longer rely solely on traditional experience and intuition when making decisions, but increasingly turn to in-depth analyses based on rich data resources. The treasure trove of information provided by big data and its powerful analyses enable enterprises to make more precise and rational strategic decisions.

In addition, the establishment of a data-centric corporate culture has become a key factor in business success. Leading companies have long recognised the importance of data as a strategic asset and are actively fostering a data-driven work environment within their organisations. This cultural shift encourages employees to use data in their daily work, conduct in-depth analyses, and make decisions based on it, which significantly improves overall operational efficiency and market responsiveness. At the same time, we have found that data integration across departments within an organisation is critical to maximising the value of big data. By breaking down long-standing data silos and effectively integrating data from sales, marketing, supply chain, finance and other departments, companies can gain a more comprehensive, multi-dimensional decision-making perspective and make smarter decisions.

It is worth mentioning that the influence of big data goes far beyond the daily operational decisions of enterprises. In fact, it has the potential to drive innovation at the strategic level. Through in-depth analyses of market trends, industry dynamics and competitors, companies can identify new growth opportunities, innovate business models and build competitive advantages. In the fast-changing era of big data, both the market environment and consumer needs are constantly evolving. As a result, adaptability and agility have become key elements of business success. Enterprises need to be able to respond quickly to market changes and flexibly adjust their strategic direction and execution strategies. This requires enterprises not only to have strong data analysis capabilities, but also to build flexible and efficient organisational structures and decision-making processes.

5.2 Conclusion

After an in-depth analysis of the impact of the application of big data in the business field on enterprise decision-making, this paper draws the following important conclusions:

The rise of big data technology and its widespread adoption in the business environment have had a profound and long-term impact on the decision-making mechanism of enterprises. By effectively integrating and utilising big data resources, enterprises are able to significantly improve the process of decision making and accelerate the speed of decision making, while increasing the accuracy of decisions. This change is not only reflected in the agility and real-time nature of the decision-making process, but more importantly, ensures the high quality and effectiveness of the decision-making outcome.

Target Corporation's case study provides strong evidence of the refined application of big data in enterprise decision-making. By deeply mining and analysing consumer data, Target has successfully achieved refined market segmentation and developed a highly targeted marketing strategy based on it. This data-driven marketing strategy not only significantly improves the effectiveness of marketing activities, but also achieves remarkable results in enhancing consumer satisfaction and fostering brand loyalty, giving Target a clear advantage in the fierce market competition.

In summary, big data has become an indispensable key element in the decision-making process of modern enterprises. For enterprises aiming to maintain market competitiveness, actively adopting big data technology, deeply exploring and utilising data resources, and integrating them into the decision-making process is a sure way to improve decision-making and ensure the sustainable development of enterprises. Looking ahead, with the continuous advancement of big data technology and the expansion of application fields, we have every reason to believe that big data will play an increasingly important and extensive role in corporate decision-making, and become a core driving force for corporate innovation and growth.

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