

Research on Decision Support of Business Administration for E-business in the Era of Big Data

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Abstract:

Focusing on the background of big data era, this paper discusses the important issue of business administration's decision support for e-business. By comprehensively applying the theories of management, economics and big data analysis, this paper analyzes the characteristics and relationship between business administration and e-business in the era of big data, as well as the theoretical basis and specific aspects of business administration supporting e-business decision-making. It is found that business administration provides comprehensive and key support for e-business decision-making from multiple dimensions such as strategy, operation and marketing, and helps e-business enterprises to define their direction, optimize their operation and market accurately in a complex and changeable market environment. It is concluded that in the era of big data, it is of great significance to strengthen the decision support of business administration for e-business to enhance the competitiveness of e-business enterprises and promote the healthy development of the industry. The mode of mutual promotion and coordinated development of the two will become an important trend of future business development.

Keywords:

Big Data Era, Business Administration, E-business, Decision Support, Business Environment.

1. Introduction

The era of big data has arrived. The emergence of massive data and the continuous innovation of data analysis technology have profoundly changed the mode of business operation and the way of decision-making [1]. In this context, e-business, as an important form of digital economy, is booming at an unprecedented speed [2]. Business administration, as a key discipline of enterprise operation management, is also facing brand-new challenges and opportunities in the era of big data [3].

With the help of Internet platform, e-business has broken the time and space limitations of traditional commercial activities, greatly expanded the market boundary and changed the interaction mode between enterprises and consumers [4]. However, with the increasingly fierce market competition and the diversification of consumer demand, e-business enterprises are faced with many complex problems in the decision-making process, including the accuracy of market positioning, the effectiveness of operating strategies, and the pertinence of marketing means [5].

As a comprehensive discipline, business administration covers management, economics and other fields of knowledge, aiming at optimizing enterprise resource allocation and improving enterprise operation efficiency and competitiveness through scientific management methods and strategies [6]. In the era of big data, the theories and methods of business administration provide strong support for the decision-making of e-business. In-depth study on the decision support of business administration for e-business in the era of big data is of great significance for improving the scientific decision-making of e-business enterprises, enhancing market competitiveness and promoting the healthy development of digital economy. This paper will discuss this topic in depth in order to provide useful reference for theoretical research and practical application in related fields.

2. The Relationship Between Business Administration and E-business

The era of big data is characterized by massive data, high-speed circulation, diverse types and high value density. The speed of data generation and transmission is extremely fast, and the demand for real-time data processing is urgent [7]. This data environment has profoundly changed the business environment, with more transparent market information, intensified competition among enterprises and more accurate insight into consumers' needs, prompting enterprises to respond quickly to market changes and adjust their strategies and operating modes. The era of big data promotes the transformation of business administration from experience-driven to data-driven. Traditional business administration relies on managers' experience and intuitive decision-making. Now, with the help of big data analysis, we can accurately grasp market trends and consumer preferences. In organizational management, more attention is paid to flexibility and cooperation to adapt to rapid changes [8]. In terms of resource allocation, accurate delivery is achieved based on data analysis to improve resource utilization efficiency. At the same time, marketing management has also changed from mass marketing to precision marketing to improve marketing effect.

At present, e-business is developing rapidly and the market scale continues to expand. Big data injects new impetus into its development, realizes personalized recommendation, enhances users' shopping experience, accurately predicts demand and optimizes inventory management. In the future, e-business will develop towards intelligence and omni-channel integration [9]. Intelligence is embodied in intelligent customer service and intelligent product selection. Omni-channel integration is a seamless connection between online and offline, providing consistent services for consumers.

Business administration provides theoretical guidance and management framework for e-business to ensure its orderly operation. From strategic planning to daily operation management, business management theory helps e-business enterprises to make clear their direction and rationally allocate resources. E-business provides a new practice scene and research topic for business administration. Its rapid development brings new management problems, and promotes the theoretical innovation and method improvement of business administration, which promote each other and develop together.

3. Management Related Theories in the Application of E-business Decision-making

The decision-making theory in management science is one of the core bases of e-business decision-making. Decision theory emphasizes that the decision-making process should be based on scientific methods and rational analysis. In the field of e-business, enterprises are faced with many key choices such as market entry decision and product pricing decision [10]. See Table 1 for the analysis of influencing factors of e-business market entry decision.

Table 1. Analysis of Influencing Factors for Market Entry Decisions in E-business.

Influencing Factor	Specific Content	Quantitative Indicator Examples	Data Acquisition Sources	Impact on Decision-Making (1-5 Scale)
Market Size	The potential total consumption volume in the target market during a specific period, including the breakdown of different product or service segments	Market sales volume and growth rate over the past three years; projected market size for the next five years	Industry reports, government statistical data, data from professional market research institutions	4
Competition Level	The number of competitors, market share distribution, intensity of competition, and changes in the competitive landscape	Industry concentration index; product differentiation degree of competitors; barriers to entry for new entrants	Industry analysis reports, corporate annual reports, market research	4
Policy Environment	Relevant industrial policies, regulations, and laws at the national and local levels targeting the e-business industry, including tax policies, entry thresholds, and regulatory requirements	Policy support intensity score (1-5); frequency of policy changes	Government official websites, policy interpretation documents	3
Consumer Behavior	Consumer purchasing habits, preferences, consumption capabilities, and decision-making processes	Consumer purchase frequency, average consumption amount, and purchase preference proportions for different product categories	E-business platform's proprietary data, market research questionnaires, user behavior analysis tools	4
Technological Development	The development level and trends of technological innovations related to	New technology application penetration rate; technology	Technology information platforms, industry technology seminar	3

	e-business, such as payment technologies, logistics technologies, and big data application technologies	upgrade and replacement cycle	materials, technology research reports	
Economic Environment	The impact of macroeconomic conditions, such as GDP growth, inflation rates, and interest rate levels, on e-business consumption	Correlation analysis between GDP growth rate and e-business sales volume; consumer confidence index	Macroeconomic databases, economic research institution reports	3
Socio-cultural Factors	The impact of changes in socio-cultural attitudes, such as shifts in consumption concepts, demographic changes, and regional cultural differences, on the e-business market	Proportion of e-business consumption among different age groups and regions; product demand tendencies under specific cultural backgrounds	Sociological research reports, market research	3

Organizational theory also plays a key role in e-business enterprises. A reasonable organizational structure can ensure the efficient operation of enterprises. E-business enterprises often adopt flat organizational structure to reduce levels and improve information transmission efficiency and decision-making speed. The organizational form with the project team as the core can flexibly allocate resources for different business projects and quickly respond to market changes. In terms of organization and coordination, clarify the responsibilities and cooperation processes of various departments to avoid decision-making delays caused by unclear responsibilities (see Figure 1).

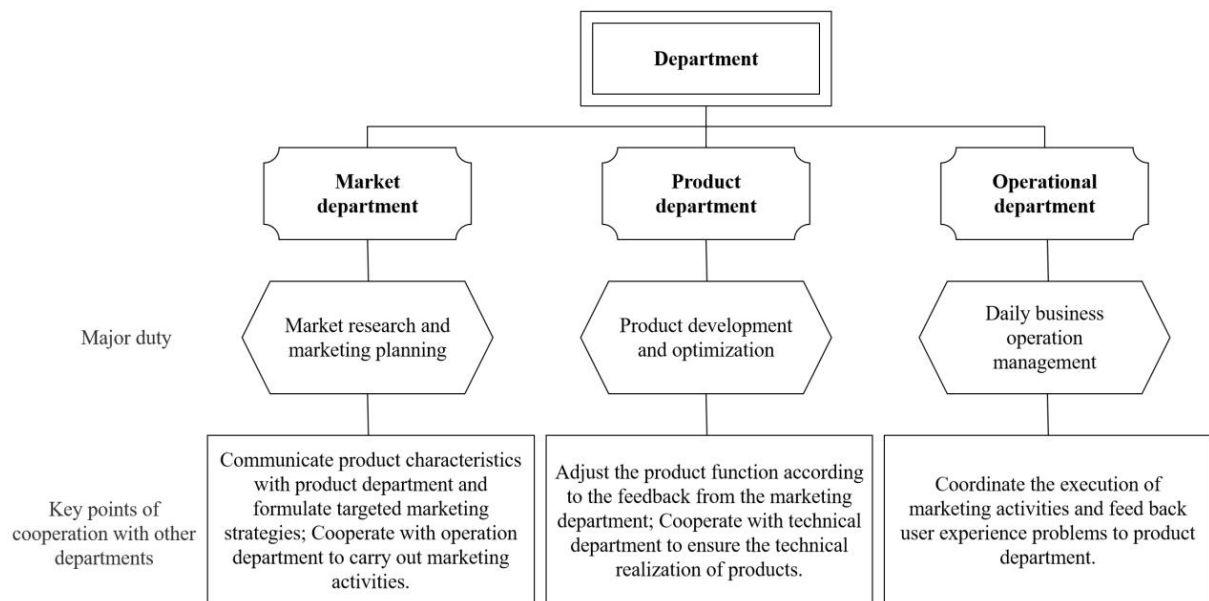


Figure 1. Organizational structure and responsibility distribution of e-business enterprises.

4. The Role of Big Data Analysis Theory in E-business Decision-making Aided By Business Administration

The theory of information economics has a far-reaching impact on e-business decision-making. In the e-business environment, the problem of information asymmetry still exists, but big data technology has eased it. Enterprises analyze consumer behavior data through big data, reduce the degree of information asymmetry, and better formulate price strategies and product promotion strategies. The theory of industrial economics helps e-business enterprises to analyze the competitive situation in the industry. Using five forces model, e-business enterprises can analyze the threats of existing competitors, potential entrants, substitutes, suppliers' bargaining power and buyers' bargaining power. Through the analysis of these forces, enterprises can clearly define their position in the industry and formulate competitive strategies, such as cost leadership strategy, differentiation strategy or centralized strategy.

Big data analysis theory provides a powerful tool for business administration to assist e-business decision-making. Data mining technology can extract valuable information from massive e-business data, such as consumer purchase patterns, product correlation and so on. Through cluster analysis, consumers are divided into different groups, and personalized marketing strategies are formulated according to the characteristics of each group. Predictive analysis is based on historical data to predict market demand and sales trends, which helps enterprises to plan production, inventory and marketing activities in advance and improve the foresight and accuracy of decision-making.

5. Specific Aspects of Business Administration's Support for E-Business Decision-making

5.1. Strategic decision support

In the era of big data, business administration helps e-business enterprises to make accurate strategic decisions. Through the analysis of market trends, competitors and their own resource capabilities, determine the market positioning and development direction of enterprises. For example, with the help of PEST analysis model, the influence of political, economic, social and technical factors on e-business industry is comprehensively considered. On the political level, pay attention to the supervision and support of policies and regulations on the e-business industry; On the economic level, analyze the impact of macroeconomic situation and consumer income level on e-business consumption; On the social level, study the market opportunities brought about by changes in consumer consumption concepts and demographic structure; On the technical level, track the application trend of new technologies such as artificial intelligence and blockchain in the field of e-business. Based on these analyses, enterprises can formulate differentiated competitive strategies, such as focusing on market segments, providing unique products or services and avoiding fierce homogenization competition.

5.2. Operational decision support

Business administration plays a key role in the decision-making of e-business operation. Taking supply chain management as an example, through reasonable planning of supplier selection, procurement plan, inventory management and logistics

distribution, operational efficiency is improved and costs are reduced. In supplier selection, the factors such as product quality, price, delivery date and reputation of suppliers are comprehensively evaluated (see Table 2).

Table 2. *Evaluation Indicators for E-business Suppliers.*

Evaluation Indicator	Weight	Specific Description
Product Quality	30%	Product qualification rate, quality stability, etc.
Price	25%	Comparison with prices of similar products in the market, degree of price discount
Delivery Time	20%	On-time delivery rate, order processing cycle
Reputation	15%	Business reputation, customer evaluations, etc.
Service Capability	10%	After-sales service response speed, problem-solving ability

Reasonable inventory management is the key to e-business operation. Using economic order quantity model, combined with sales data forecast and inventory cost analysis, the optimal order quantity and order time are determined to avoid inventory backlog or shortage. In the aspect of logistics distribution, we should optimize the distribution route planning and choose suitable logistics partners to improve the distribution efficiency and customer satisfaction.

5.3. Marketing decision support

Business administration provides strong support for e-business marketing decision-making. Through market segmentation, the market is divided into different market segments according to factors such as consumers' age, gender, consumption habits and purchasing power. According to the characteristics of different market segments, formulate accurate marketing strategies. Customer relationship management system is used to collect and analyze customer data, understand customer needs and purchase history, and realize accurate marketing and personalized service for customers. Evaluate the effect of marketing activities through data analysis, adjust marketing strategies in time, and improve the return rate of marketing investment.

6. Conclusions

Under the wave of big data era, the close combination of business administration and e-business has become an inevitable trend of business development. After in-depth study, this paper comprehensively expounds the various contents of business administration's decision support for e-business.

From the theoretical basis, management, economics and big data analysis theory have built a solid framework for this decision support. The decision-making and organization theory of management makes the decision-making of e-business enterprises more scientific and efficient; Economic theory helps enterprises gain insight into the market situation and formulate reasonable strategies; Big data analysis provides a powerful tool for accurate decision-making. In terms of specific support and strategic decision-making, help enterprises to define market positioning and development direction in order to adapt to the complex market environment; In operational decision-making, optimize key links such as supply chain, inventory and logistics to improve operational efficiency and benefit; When making marketing decisions, realize market segmentation and precise marketing, and enhance customer stickiness and marketing effect.

To sum up, business administration provides indispensable support for e-business decision-making and greatly enhances the ability of e-business enterprises to meet

challenges and seize opportunities. Follow-up research in related fields also needs to be followed up to explore more effective decision support models and promote the sustained prosperity of the e-business industry.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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References

- [1] Kang, L.G.; Wu, C. Construction of an Enterprise Intelligent Safety Performance Management Model Driven by Big Data. *Science and Technology Management Research*, 2021, 41(10), 185-192.
- [2] Wang, M.Y. Risk Identification and Avoidance Strategies for Contract Management of Feed Enterprises in the Context of E-business. *China Feed*, 2024, 1(14), 109-112.
- [3] Liu, S.C.; Wang, X.F. Evolutionary Game Analysis of the Cooperative Order between Home Appliance Enterprises and E-business Platforms. *Operations Research and Management Science*, 2020, 29(10), 76-83.
- [4] Chen, Y. Economic Management Strategies of Logistics Enterprises in the Context of E-business. *Economics*, 2022, 5(4), 121-123.
- [5] Wu, Q. Application of Management Accounting in Enterprises in the Big Data Era. *Economics*, 2021, 4(4), 68-70.
- [6] Wu, Y.H. Research on the Application of Big Data in the Innovation of Enterprise Marketing Management. *Economics*, 2021, 3(6), 54-55.
- [7] Feng, M.Y.; Chen, H.B.; Guo, X.X. Research on the Relationship among Big Data Capability, Supply Chain Collaborative Innovation and Operational Performance of Manufacturing Enterprises. *Journal of Industrial Engineering and Engineering Management*, 2023, 37(3), 51-59.
- [8] Wang, D.P.; Liang, S.H.; Zhou, Y. Decision-making in Closed-loop Supply Chains Considering the Reputation of Manufacturers and the Participation of Big Data Service Providers. *Computer Integrated Manufacturing Systems*, 2023, 29(7), 2474-2484.
- [9] Liu, P.F.; Wang, Y.T.; Su, C.C. Research on the Innovation Mechanism and Path of Enterprise Knowledge Management Empowered by Big Data: Based on the Case of Huawei. *Science & Technology Progress and Policy*, 2021, 38(1), 122-131.
- [10] Li, X.G.; Qiu, R.Z.; Sun, Y. Research on Supply Chain Decision-making Considering Platform Differentiation in a Competitive Environment. *Management Review*, 2023, 35(10), 283-297.



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