# Factors Influencing the Adoption of Big Data Technology in Financial Management: A Case Study of Aiyoupin E-commerce Company in Chongqing Municipality, China

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*Abstract:* This study examines key factors affecting big data technology adoption in financial management through a case study of Chongqing Aiyouping E-commerce. Findings reveal multi-level influences: Technically, challenges include technology complexity and analytical skill requirements; Organizationally, management support, culture, and employee skills prove crucial; Environmentally, policy changes, competition, and customer demands significantly impact adoption. Aiyouping succeeded through tech infrastructure development, talent cultivation, cultural optimization, and policy adaptation, enhancing financial decision-making and risk management. However, persistent challenges include data security, update costs, and talent shortages. The research provides practical insights and theoretical support for big data implementation in financial management.

## 1. Introduction

### 1.1 Background and significance of the research question

Big data's characteristics of volume, velocity, variety, and veracity are transforming financial management across industries. Rapidly growing e-commerce company Aiyoupin faces complex financial challenges requiring advanced data processing and analysis beyond traditional methods. This study examines big data technology's application in Aiyoupin's financial operations and its influencing factors to enhance financial management and market competitiveness.

The research aims to improve Aiyoupin's financial analysis accuracy and decision-making efficiency through real-time data insights, creating corporate value

Findings will provide reference for similar enterprises adopting big data technology by sharing Aiyoupin's implementation experiences and challenge-solving approaches.

Theoretical significance: The study enriches big data application theories in financial management by analyzing Aiyoupin's adoption factors and revealing implementation patterns, offering new research perspectives.

This analysis explores key adoption factors and impacts of big data technology in Aiyoupin's

financial management, providing both theoretical enrichment and practical guidance for e-commerce enterprises.

## 1.2 Research Scope

This study focuses on "the factors influencing the adoption of big data technology in financial management at Aiyoupin E-commerce Company". It delves into the application of big data technology in the field of financial management and explores the various factors that influence Aiyoupin E-commerce Company's decision to adopt or deepen the use of these technologies.

The scope of this study is mainly focused on the application of financial evaluation system in big data environment. This study mainly takes the employees of Chongqing Aiyoupin E-commerce Company as the research object, the actual number of employees of the company is 400. A sample of 200 people was selected according to the scale.

## 1.3 Research Objective

To explore the pivotal factors driving the integration of Big Data technology within financial management systems across modern E-commerce enterprises.

## 1.4 Conceptual Framework

Figure 1 shows the basic scope of application of large data technology in financial management.
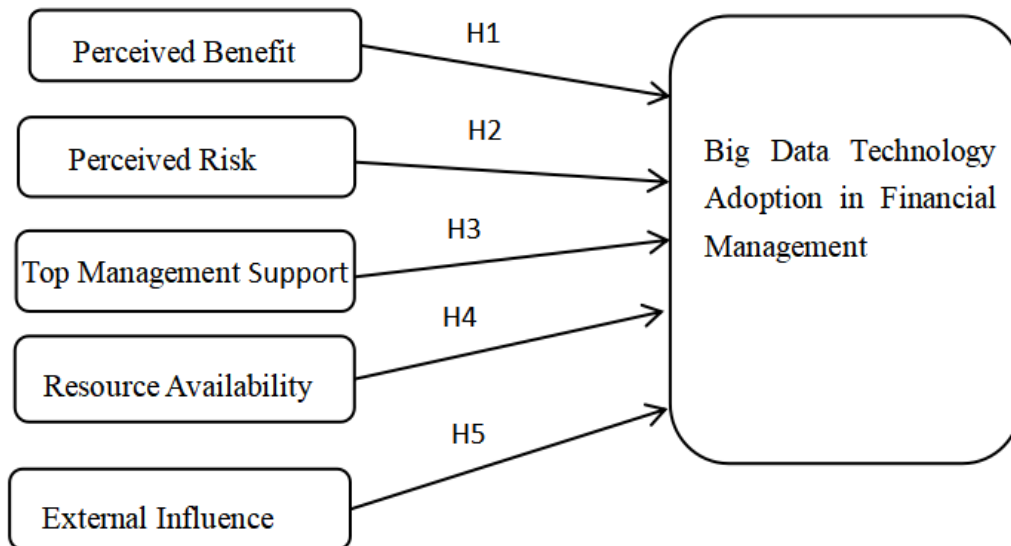


Figure 1: Basic concept diagram

## 2. Literature Review

### 2.1 Th literature of the applications of Big Data in financial management

The applications of Big Data in financial management encompass a wide range of activities that leverage large volumes of data to enhance decision-making, risk management, operational efficiency, and strategic planning in financial institutions and businesses.

The important role of big data analytics in financial fraud detection is highlighted, using diverse data and machine learning techniques for detection. Real-time processing is key. The positive results

of the case study suggest greater collaboration in the financial industry.[1]

Big data is revolutionizing financial risk management, with financial institutions leveraging it to enhance predictive modeling and real-time risk assessment. By analyzing multiple data sources, financial institutions can predict performance, identify risks, and respond to fraud in real time. In the future, technological advances will drive the continued innovation of big data in the field of risk management.[2]

Businesses using big data analytics can improve management forecasting behavior. Not only has big data enhanced corporate earnings forecasting power (supply channel), it has also attracted more analysts' attention (demand channel) highlighting the unexpected benefits of big data.[3]

## 2.2 The literature of perceived benefits on technology adoption

Management's belief in big data's advantages for financial management drives technology adoption. Potential benefits include enhancing efficiency, decision-making, prediction accuracy, and cost control. Recognizing these capabilities increases likelihood of implementation.

Perceived benefit is an important factor affecting the adoption of digital financial services by individuals and is seen as the driving force for their development. The study also considered perceived risk and generational differences, and found that perceived benefit has a significant positive impact on the adoption of digital financial services and is a key factor in promoting their adoption.[4].

Perceived benefit is the key factor influencing customers' adoption of Internet banking, and it positively affects customers' willingness to use it. The results show that perceived benefit and risk factors have significant positive effects on customer willingness.[5]

Perceived benefits, especially cost-effectiveness and communication benefits, have a significant positive impact on the adoption of sustainable digital technologies by Malaysian manufacturing smes. Leaders' attitudes completely mediate the relationship between perceived benefits and technology adoption, providing strategies for improving management technology capabilities and driving adoption.[6]

## 2.3 The literature of Perceived Risk

The potential risks associated with the adoption of big data, such as data security and technical complexity, are important factors that the management needs to weigh when considering whether to adopt big data. Data security risks involve data leakage, illegal access or abuse, which may lead to serious financial and legal consequences. Technology complexity may involve the difficulty of technology implementation, the learning cost of new technology and the speed of technology update iteration. The management's concern about these risks may affect their acceptance and adoption of big data technology.

Big data technology enables large enterprises to benefit more from abundant data, and the processing power of investors reduces their investment costs, thereby helping large enterprises to reduce costs and expand scale.[7]

Big data technology changes the cost structure, enterprises need to pay attention to the challenges of data, information, knowledge transformation, outsourcing, offshore and cloud computing development affect costs, bringing information literacy challenges and new opportunities.[8]

The application of big data technology to financial technology is complicated, involving multiple links such as data collection, analysis, modeling, etc., and requires rapid processing of technology to explore value, help financial decision-making and improve service quality. Awotunde et al.[9].

## 2.4 The literature of Top Management Support

The level of support and commitment of top management is crucial for the successful implementation of big data technology. Their support is not only reflected in providing necessary resources and funds, but also in creating favorable environment and conditions for the implementation of big data technology. The active participation and clear statement of top management can enhance employees' confidence in big data technology and promote its wide application within the company.

Top management support for big data technology adoption is critical, with active engagement ensuring resource allocation, promoting organizational support, mitigating risk, aligning technology plans with strategy, and driving a culture of change.[10]

Top management support is the most critical factor for the success of a project, and for the adoption of big data technology, its support is crucial, affecting far more than technical and management advice, determining the success or failure of a project.[11]

The direct and indirect involvement of senior management is critical to the success of information technology projects, and its ongoing support ensures strategic alignment, adequate resources, and organizational readiness for change.[12]

## 2.5 The literature of Resource Availability

Resource availability (budget, personnel, technology) critically impacts big data adoption. Sufficient budget ensures project continuity, skilled personnel offer technical expertise, and advanced technology enables data processing. Resource shortages hinder adoption and effectiveness.

The smes must strategically deploy financial, technological and human resources to adopt big data analytics and become more competitive.[13]

How big data analytics creates strategic value for businesses. The study highlights that adequate financial resources, talent with big data skills, and advanced technology infrastructure are key elements to achieve this goal.[14]

Through systematic reviews and long-term case studies, the impact of big data in the enterprise is explored. The authors emphasize that financial investment, human resource training, and the construction of technical infrastructure are key factors for the successful adoption of big data.[15]

## 2.6 The literature of External Influence

External influences like competitor pressure, customer demands, or government policies drive big data adoption. Competitors' success may drive urgency; customer expectations push companies to enhance services via big data; government regulations provide guidance and support for implementation.

Study how institutional pressures (regulatory and normative) influence environmental innovation in organizations. They find these pressures drive innovation adoption, moderated by resource availability, creating competitive advantages and enhancing legitimacy.[16]

Compares behavioral models with the TOE framework to explore how individual perceptions, influenced by external pressures like competition, customer demands, and regulations, affect technology adoption in organizations. Aligning perceptions with strategies is key to driving innovation.[17]

In the era of big data, the competitive landscape promotes enterprise innovation, customer demand leads technology forward, and the regulatory environment ensures orderly development, jointly promoting the wide application and improvement of big data technology in the financial field.[18]

## 3. Research Methods

The purpose of this study is to investigate the factors that influence Aiyoupin company adoption of big data technology for financial management. The study used a quantitative approach, using structured surveys to collect data from a sample of 200 employees out of a total of 400. The main data collection tool is a comprehensive questionnaire designed to assess Factors Influencing the Adoption of Big Data Technology in Financial Management. (Table 1)

The researchers measured statistical averages using liker's 5-point scale to explain the average of respondents' attitudes, as follows:

$$Range=(Maximum-Minimum)/scale\ level$$

$$Range= (5-1)/5=0.8$$

Table 1 Range of mean interpretation

| Range | Interpretation |
|---|---|
| 1.00-1.80 | Strongly Disagree |
| 1.81-2.61 | Rather Disagree |
| 2.62-3.42 | Moderate |
| 3.43-4.23 | Rather Agree |
| 4.24-5.00 | Strongly Agree |

In order to ensure the representativeness of the sample, we distributed 400 questionnaires to employees. The study is expected to collect 200 valid responses, which will provide a reliable data set for analysis.

$$n = \frac{N}{1 + N(e)^2}$$

Where, n = the sample size, N = the population size, and e = the level of precision (0.05)
For this research, applied the formula

$$N = 400$$

$$e = 0.05$$

$$n = \frac{N}{1 + N(e)^2} = \frac{400}{1 + 400(0.05)^2} = 200$$

The sample was made up of employees from different departments and levels of the company, reflecting different roles and experiences related to financial management. This method aims to comprehensively understand the factors that affect Aiyoupin company adoption of big data technology for financial management. The results of the survey are analyzed to investigate the factors that affect the adoption of big data technology in the financial management of Chongqing e-commerce companies, so as to help achieve the overall goal of the study.

## 4. Data collection

This study aims to investigate the key factors influencing the adoption of big data technology in the financial management systems of Aiyoupin E-commerce Company. Utilizing quantitative research methods, we distributed questionnaires to collect data from a stratified random sample of 200 employees within the organization's 400-member workforce. The survey instrument was meticulously designed to evaluate diverse dimensions of financial management performance, including but not limited to cost efficiency, data accuracy, and strategic decision-making agility, with

financial management performance serving as a core evaluative component.

## 5. Research Results

1) Demographic Statistics
This section presents the personal profiles of the respondents, including their age, gender, job role, department, and tenure at the company. It mainly reflects the frequency and statistical percentages of these variables.

Table 2 Summary of Demographic Data (n=200)

| Demographic Information | Frequency | Percentage |
|---|---|---|
| **Age** | | |
| **18-25** | 24 | 12 |
| **26-35** | 88 | 44 |
| **36-45** | 46 | 23 |
| **46-55** | 18 | 9 |
| **56 and above** | 24 | 12 |
| **Gender** | | |
| **Male** | 119 | 59.5 |
| **Female** | 81 | 40.5 |
| **Job Role** | | |
| **Manager** | 55 | 27.5 |
| **Supervisor** | 145 | 72.5 |
| **Department** | | |
| **Finance** | 46 | 23 |
| **Human Resources** | 58 | 29 |
| **IT** | 31 | 15.5 |
| **Sales and Marketing** | 25 | 12.5 |
| **Operations** | 40 | 20 |
| **Tenure at the Company** | | |
| **Less than 1 year** | 31 | 15.5 |
| **1-3 years** | 114 | 57 |
| **4-6 years** | 42 | 21 |
| **More than 6 years** | 13 | 6.5 |

In the table 2 Demographic Statistics section, we conducted a comprehensive and detailed statistical analysis of the personal profiles of the respondents. The data reveals that the respondents are mainly concentrated in the middle-to-young age group, particularly in the 26-35 (44%) and 36-45 (23%) age brackets. The gender ratio is relatively balanced, with males accounting for 59.5%, females accounting for 40.5%, demonstrating inclusivity towards gender diversity. In terms of job positions, supervisors constitute a larger proportion, reaching 72.5%, while managers only account for 27.5%. Regarding departmental distribution, there are more respondents from the Human Resources (29%) and Finance (23%) departments, while fewer are from the IT (15.5%) and Sales and Marketing (12.5%) departments. Additionally, the majority of respondents (57%) have been with the company for 1-3 years, indicating that new and mid-tenure employees are in the majority, while those with less than 1 year and more than 6 years of tenure are relatively fewer, accounting for 15.5% and 6.5% respectively.

Table 3 Correlation analysis

|  | External Influence | |
| --- | --- | --- |
|  | R | P |
| Perceived Benefit | 0.905 | 0.000** |
| Perceived Risk | 0.919 | 0.000** |
| Top Management Support | 0.912 | 0.000** |
| Resource Availability | 0.926 | 0.000** |
| External Influence | 0.893 | 0.000** |

The results presented in Table 3 offer insights into the correlation between External Influence and several other factors. The correlation coefficient (R) and significance level (P) are key metrics for understanding these relationships.

For Perceived Benefit, the correlation coefficient (R) with External Influence is 0.905. A correlation coefficient close to 1 indicates a strong positive linear relationship. The P - value of 0.000** (where ** typically indicates significance at a very high level, often less than 0.01) further emphasizes that this correlation is highly significant. This implies that as the perception of benefit from big data technology increases, the influence from external factors also shows a strong tendency to increase.

When considering Perceived Risk, the R value is 0.919, indicating an even stronger positive correlation with External Influence. The extremely low P - value of 0.000** again validates the significance of this relationship. It suggests that higher levels of perceived risk are closely associated with greater external influence, perhaps due to external factors highlighting potential risks or causing companies to perceive risks more acutely.

Regarding Top Management Support, the correlation coefficient is 0.912. This strong positive correlation, supported by the significant P - value of 0.000**, indicates that as top management support for big data technology adoption grows, external influence also appears to be more pronounced. It could be that external factors are driving top management to provide more support, or vice versa.

For Resource Availability, with an R value of 0.926, it shows the strongest positive correlation among these variables with External Influence. The highly significant P - value of 0.000** confirms that resource availability and external influence are closely intertwined. This might be because external factors, such as industry trends or market demands, are influencing the company's allocation of resources for big data technology, or available resources are attracting more external attention and influence.

Finally, the correlation of External Influence with itself has an R value of 0.893, which is still a relatively strong positive correlation, and the P - value of 0.000** validates its significance. This self - correlation might suggest some internal consistency in the measurement of external influence or that different aspects of external influence are highly related to each other.

In summary, all the factors - Perceived Benefit, Perceived Risk, Top Management Support, and Resource Availability - show strong and highly significant positive correlations with External Influence. This indicates that external influence is closely associated with these internal corporate factors in the context of big data technology adoption, and they may mutually influence and reinforce each other.

2) Regression analysis

Table 4 presents a detailed linear regression analysis result exploring the impact of multiple independent variables on the model. The study utilized linear regression to examine the specific effects of five variables—Perceived Benefit, Perceived Risk, Top Management Support, Resource Availability, and External Influence—on the overall model. Specifically:

Table 4 Linear regression analysis results

| | B | Std. Error | Beta | t | Sig | Multicollinearity | |
|---|---|---|---|---|---|---|---|
| | | | | | | VIF | Tolerance |
| Constant | 0.046 | 0.094 | | 0.493 | 0.022* | | |
| Perceived Benefit | 0.107 | 0.075 | 0.104 | 2.429 | 0.005* | 9.282 | 0.108 |
| Perceived Risk | 0.287 | 0.068 | 0.282 | 4.221 | 0.000* | 8.092 | 0.124 |
| Top Management Support | 0.187 | 0.075 | 0.182 | 2.509 | 0.013* | 9.431 | 0.106 |
| Resource Availability | 0.315 | 0.070 | 0.327 | 4.523 | 0.000* | 9.489 | 0.105 |
| External Influence | 0.088 | 0.069 | 0.086 | 2.277 | 0.003* | 9.321 | 0.101 |

R Square = 0.899, Adjust R Square= .896, F= 344.968, *P≤ 0.05

In the analysis of Perceived Benefit, the regression coefficient (B) of 0.107 indicates a positive impact on the model. The standardized regression coefficient (Beta) of 0.104 further validates the role of Perceived Benefit in the model. The Sig value of 0.005*, well below the commonly used significance level of 0.05, underlines the significant impact of Perceived Benefit on the model. In terms of multicollinearity, VIF is 9.282 (less than 10) and Tolerance is 0.108 (greater than 0.1), passing the collinearity test. Thus, it can be concluded that Perceived Benefit has a positive and significant impact on the model.

In the analysis of Perceived Risk, the regression coefficient (B) of 0.287 shows a positive impact on the model. The standardized regression coefficient (Beta) of 0.282 reveals the relative importance of Perceived Risk in the model. The Sig value of 0.000*, far lower than the significance level of 0.05, emphasizes the extremely significant impact of Perceived Risk on the model. Regarding multicollinearity, VIF is 8.092 (less than 10) and Tolerance is 0.124 (greater than 0.1), passing the collinearity test. Therefore, it can be determined that Perceived Risk has a positive and highly significant impact on the model.

In the analysis of Top Management Support, the regression coefficient (B) of 0.187 indicates a positive impact on the model. The standardized regression coefficient (Beta) of 0.182 verifies the significance of Top Management Support in the model. The Sig value of 0.013*, below the 0.05 significance level, highlights the significant influence of Top Management Support on the model. For multicollinearity, VIF is 9.431 (less than 10) and Tolerance is 0.106 (greater than 0.1), passing the collinearity test. Hence, it can be inferred that Top Management Support has a positive and significant impact on the model.

In the analysis of Resource Availability, the regression coefficient (B) of 0.315 demonstrates a positive impact on the model. The standardized regression coefficient (Beta) of 0.327 emphasizes the crucial role of Resource Availability in the model. The Sig value of 0.000*, much lower than 0.05, shows the extremely significant impact of Resource Availability on the model. Considering multicollinearity, VIF is 9.489 (less than 10) and Tolerance is 0.105 (greater than 0.1), passing the collinearity test. So, it can be concluded that Resource Availability has a positive and highly significant impact on the model.

In the analysis of External Influence, the regression coefficient (B) of 0.088 indicates a positive impact on the model. The standardized regression coefficient (Beta) of 0.086 validates the contribution of External Influence in the model. The Sig value of 0.003*, below the 0.05 significance level, underlines the significant effect of External Influence on the model. With respect to multicollinearity, VIF is 9.321 (less than 10) and Tolerance is 0.101 (greater than 0.1), passing the collinearity test. Thus, it can be said that External Influence has a positive and significant impact on the model.

# 6. Conclusions

Through our investigation and research in the Statistics section, we conducted a comprehensive and detailed statistical analysis of the personal profiles of the respondents. The respondents hold rather positive views on the adoption of big data technology within corporate groups across various financial aspects. They believe that the company utilizes big data technology for financial data analysis, planning, risk management, operational efficiency improvement, and the development of new products and services.

Respondents hold a rather favorable attitude towards the perceived benefits of big data technology in corporate groups, believing that big data can bring multiple advantages in financial data analysis, decision - making, cost reduction, competitive edge enhancement, and customer understanding.

Respondents have rather positive perceptions of the risks associated with big data technology adoption in corporate groups, highlighting concerns in data security, technological complexity, financial investment, internal conflicts, and the accuracy of analysis results.

Respondents have rather positive views on top management's support for big data technology adoption in corporate groups, highlighting their belief in management's emphasis, resource allocation, vision, personnel support, and result monitoring in relation to big data.

Respondents have rather positive views on the resource availability for big data technology adoption in corporate groups. They believe that the company has sufficient budget, capable personnel, proper technology and infrastructure, an efficient data management system, and supportive business partners to facilitate big data adoption.

Respondents have rather positive views on the external influence factors for big data technology adoption in corporate groups. They believe that competitors' actions, customer expectations, government policies, expert advice, and market pressure all play significant roles in influencing the company's decision to adopt big data technology.

All factors - Perceived Benefit, Perceived Risk, Top Management Support, and Resource Availability - exhibit strong and highly significant positive correlations with External Influence. This suggests that external influence is closely associated with these internal corporate factors in the context of big data technology adoption, and they may mutually influence and reinforce each other.

# 7. Suggestions

Future research needs to deepen the exploration of the application of big data technology in the field of financial management from multiple dimensions: On the one hand, the influential factor model of big data technology adoption should be refined, and a differentiated analysis framework should be constructed by distinguishing enterprise scale, industry attributes and regional characteristics; On the other hand, it is necessary to quantitatively evaluate its actual effectiveness in improving decision-making efficiency, optimizing risk management and reducing operating costs through empirical analysis, and explore innovative application scenarios that integrate with cutting-edge technologies such as artificial intelligence and cloud computing.

Building a precise influencing factor model: Based on case studies and empirical analysis, construct a big data technology adoption model that includes multidimensional factors such as technology, organization, and environment to more accurately predict and explain the behavior of enterprises adopting big data technology.

Integration of Big Data and Artificial Intelligence: Exploring the innovative integration of big data technology and artificial intelligence technology, such as using machine learning algorithms for data mining and analysis, to enhance the intelligence level of financial management.

Exploration of New Technology Application Scenarios: we need to explore the revolutionary potential of frontier technologies including blockchain and the Internet of Things in financial

management, examining how these disruptive forces might seamlessly converge with big data analytics to unleash groundbreaking breakthroughs and ignite sustainable transformation throughout the financial landscape.

## References

[1] Shoetan, P. O., Oyewole, A. T., Okoye, C. C., & Ofodile, O. C. (2024). Reviewing the role of big data analytics in financial fraud detection. Finance & Accounting Research Journal, 6(3), 384-394.

[2] Olaiya, O. P., Cynthia, A. C., Usoro, S. O., Obani, O. Q., Nwafor, K. C., & Ajayi, O. O. (2024). The impact of big data analytics on financial risk management. International Journal of Science and Research Archive, 12(2), 821-827.

[3] Goh, B. W., Li, N., & Ranasinghe, T. (2024). Big data analytics and management forecasting behavior. Accounting Horizons, 38(3), 59-76.

[4] Jain, N., & Raman, T. V. (2023). The interplay of perceived risk, perceive benefit and generation cohort in digital finance adoption. EuroMed Journal of Business, 18(3), 359-379.

[5] Lee, M. C. (2009). Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. Electronic commerce research and applications, 8(3), 130-141.

[6] Yacob, P., & Peter, D. (2022). Perceived Benefits of sustainable digital technologies adoption in manufacturing SMEs. International Journal of Innovation and Technology Management, 19(04), 2250012.

[7] Begenau, J., Farboodi, M., & Veldkamp, L. (2018). Big data in finance and the growth of large firms. Journal of Monetary Economics, 97, 71-87.

[8] Bhimani, A., & Willcocks, L. (2014). Digitisation, 'Big Data' and the transformation of accounting information. Accounting and business research, 44(4), 469-490.

[9] Awotunde, J. B., Adeniyi, E. A., Ogundokun, R. O., & Ayo, F. E. (2021). Application of big data with fintech in financial services. In Fintech with artificial intelligence, big data, and blockchain (pp. 107-132). Singapore: Springer Singapore.

[10] Mooney, A., Mahoney, M., & Wixom, B. (2008). Achieving top management support in strategic technology initiatives. Howe School Alliance For Technology Management, 12(2), 1-3.

[11] Young, R., & Jordan, E. (2008). Top management support: Mantra or necessity?. International journal of project management, 26(7), 713-725.

[12] Jarvenpaa, S. L., & Ives, B. (1991). Executive involvement and participation in the management of information technology. MIS quarterly, 205-227.

[13] Alharthi, A., Krotov, V., & Bowman, M. (2023). Factors affecting Big Data analytics adoption in small and medium enterprises: Evidence from emerging markets. Information Systems Frontiers, 25(3), 627–644.

[14] Grover, V., Chiang, R. H., Liang, T. P., & Zhang, D. (2018). Creating strategic business value from big data analytics: A research framework. Journal of Management Information Systems, 35(2), 388-423

[15] Wamba, S. F., Akter, S., Edwards, A., Chopin, G., & Gnanzou, D. (2015). How 'big data' can make big impact: Findings from a systematic review and a longitudinal case study. International Journal of Production Economics, 165, 234-246.

[16] Berrone, P., Gelabert, L., Fosfuri, A., & Gómez-Mejía, L. R. (2007). Can institutional forces create competitive advantage? Empirical examination of environmental innovation. Strategic Management Journal, 28(1), 61–78.

[17] Li, J. C. (2020). Roles of individual perception in technology adoption at organization level: Behavioral model versus toe framework. Journal of System and Management Sciences, 10(3), 97-118.

[18] Meng Qing-Wen. (2017). Competition strategies of financial institutions under the background of big data technology. Chinese Business Theory (26), 2.