

Research Article

The Influence of Firm Resources and IT Capability on Firm Performance: A Study of Big Data Platform Enterprises in Hangzhou, Zhejiang Province, China

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Abstract

This study examined the influence of firm resources and IT capability on the performance of big data platform enterprises in Hangzhou, Zhejiang Province, China. Drawing on the Resource-Based View, firm resources were measured through organizational culture, human capital, and innovation, and IT capability through IT infrastructure, IT business spanning, and IT proactive stance. Data were collected through an online questionnaire from 413 decision-makers, managers, and key employees of big data platform enterprises, selected by convenience sampling. The questionnaire demonstrated good reliability, with Cronbach's alpha coefficients ranging from .800 to .915. Data were analyzed using descriptive statistics, pearson correlation, and multiple linear regression at both the construct level and the dimension level.

The descriptive results showed that all seven variables were rated at a moderate level. At the construct level, firm resources ($\beta = .330$) and IT capability ($\beta = .336$) were positively and significantly associated with firm performance, together explaining 36.40% of the variance ($F(2, 410) = 117.447, p < .001$), supporting the two main hypotheses. At the dimension level, all six dimensions were positively and significantly associated with performance, supporting the six sub-hypotheses, while the model comparison indicated that the dimensions contributed in a broadly comparable manner ($\Delta R^2 = .0003, p = .996$). The findings

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suggest that these resources function as a complementary set, and that big data platform enterprises should develop firm resources and IT capability in a coordinated way rather than concentrating investment on any single dimension.

Keywords: *Firm Resources, IT Capability, Firm Performance, Big Data Platform Enterprises, Resource-Based View*

Introduction

Data has become a core strategic asset in the digital economy, and big data platform enterprises play a central role in this transformation. These firms collect, store, and analyze large volumes of data to deliver intelligent products and services to other industries, enabling their clients to improve decision making and operational efficiency. Unlike firms that use information technology mainly to support existing operations, these enterprises treat data itself as the core product, so their competitiveness rests directly on the internal resources and capabilities through which data is collected, processed, and converted into services. The scale of this growth is evident in China, which generated 41.06 zettabytes of data in 2024, an increase of 25.00% over the previous year, while its digital industry recorded business revenue of approximately 35 trillion yuan (about US\$4.86 trillion), close to 10.00% of national GDP (Xinhua, 2025). Hangzhou, the capital of Zhejiang Province, is one of the country's main centers of this industry, with a well-developed big data industry chain, supportive local policy (Zhou et al., 2024), and leading firms such as Alibaba. The city therefore provides an appropriate setting for examining how big data platform enterprises convert their internal resources into stronger performance.

Sustaining performance in this sector, however, has become measurably harder in recent years. Since the introduction of China's Anti-Monopoly Guidelines for the Platform Economy, platform markets have experienced weaker investment inflows and reduced entry of new firms (Rong et al., 2026), and even leading platform enterprises have recorded declines in profitability under the combined pressure of regulation and competition (Khoo et al., 2025). Under these conditions, why some enterprises sustain their performance while others operating in the same environment do not is a question that industry growth figures alone cannot answer. The Resource-Based View (RBV) provides a theoretical basis for addressing this question. Barney (1991) argues that a firm gains sustained competitive advantage from resources that are valuable, rare, inimitable, and non-substitutable. Sirmon et al. (2007) extend this argument by showing that advantage derives less from owning such resources than

from how effectively a firm structures, bundles, and deploys them as conditions change. From this perspective, the performance of a big data platform enterprise depends on the strategic resources it accumulates and the capabilities through which those resources are deployed.

Firm resources and IT capability have each been linked to firm performance, but largely in separate streams of research. Studies of IT capability and performance (Chae et al., 2018; Rehman et al., 2020) and of firm resources and performance (Price & Stoica, 2015) have typically examined one category at a time, leaving their relative influence within a single model unclear. The evidence is also far from conclusive, as some studies report significant positive effects while others find weak or non-significant relationships depending on industry context (Chae et al., 2018; Rahman & Zhao, 2020). Empirical evidence drawn specifically from big data platform enterprises in China remains limited, even though the data-intensive nature of this sector makes it a particularly informative context for testing these relationships. Examining both categories within a single model, at both the construct and the dimension level, is therefore valuable theoretically and practically, particularly for managers deciding how to allocate limited resources between organizational development and technology investment.

This study examines how firm resources and IT capability influence the performance of big data platform enterprises in Hangzhou, Zhejiang Province, China. By placing both categories in a single RBV-based model and examining their influence at both the construct and the dimension level, the study contributes to the resource-based literature and provides practical guidance for strengthening competitive position. The findings are expected to assist big data platform enterprises in resource allocation decisions and to serve as a reference for firms in similar technology-intensive contexts.

Objectives

1. To examine the influence of firm resources (organizational culture, human capital, and innovation) on the firm performance of big data platform enterprises in Hangzhou, Zhejiang Province, China.
2. To examine the influence of IT capability (IT infrastructure, IT business spanning, and IT proactive stance) on the firm performance of big data platform enterprises in Hangzhou, Zhejiang Province, China.

Literature Review

Resource-Based View

The Resource-Based View (RBV) provides the theoretical foundation of this study. Barney (1991) defines firm resources as the assets, capabilities, organizational processes, firm attributes, information, and knowledge controlled by a firm that enable it to conceive and implement strategies for improving its efficiency and effectiveness. Resources that are valuable, rare, inimitable, and non-substitutable are regarded as the source of sustained competitive advantage (Barney, 1991). Sirmon et al. (2007) extend this view by showing that advantage depends not only on possessing such resources but on how effectively a firm structures, bundles, and leverages them as environmental conditions change. The RBV is particularly relevant to big data platform enterprises, whose performance depends on internal resources and capabilities in a rapidly changing technological environment.

This logic maps directly onto the variables examined in this study. Organizational culture, human capital, and innovation are built gradually within a specific organization, which makes them socially complex and difficult for competitors to imitate or acquire (Barney, 1991). The three dimensions of IT capability reflect the organizational deployment emphasized by Sirmon et al. (2007), because technology assets contribute to advantage only when a firm aligns them with strategy and continuously renews them. These properties serve here as the conceptual rationale for variable selection rather than as empirical claims, since the rarity and inimitability of the resources are not directly measured in this study.

Firm Resources

Following Barney (1991), firm resources refer to the internal assets and attributes that a firm accumulates and deploys to pursue its strategy. Firm resources include both tangible assets, such as capital and physical equipment, and intangible assets, such as culture, knowledge, and innovative capacity. This study focuses on intangible resources because tangible assets can generally be acquired in factor markets, which limits their capacity to generate sustained advantage. In digital firms in particular, competitiveness rests on knowledge-based intangible resources that can be scaled without proportional physical investment (Giustiziero et al., 2023).

Three dimensions are examined in this study. Organizational culture encompasses the shared beliefs, values, and practices that shape member behavior and influence a firm's adaptability and innovation. However, empirical evidence on its effect remains mixed. Yesil and Kaya (2013) found no significant effect of organizational culture on the financial

performance of firms in a developing country, whereas Pradana et al. (2022) reported that a digitally oriented organizational culture improved firm performance, suggesting that the relationship may depend on context. Human capital refers to the knowledge, skills, and capabilities of employees and managers. Stiles and Kulvisaechna (2003) concluded from an extensive review that the development of human capital is positively linked to organizational performance, and recent evidence from Chinese listed firms indicates that investment in digitally skilled human capital is positively linked to profitability and growth (Cao et al., 2026). Innovation refers to the transformation of ideas, information, and knowledge into new or significantly improved products, services, and processes. Hafeez et al. (2012) identified innovation as a key driver of firm performance, particularly for small and medium-sized enterprises in developing economies.

IT Capability

IT capability refers to a firm's ability to mobilize and deploy IT-based resources in combination with other organizational resources to support business processes and achieve strategic objectives. The conceptualization of IT capability as comprising IT infrastructure, IT business spanning, and IT proactive stance was originally developed by Lu and Ramamurthy (2011) and has been widely adopted in subsequent research, including Nwankpa and Roumani (2016), whose measures this study follows. IT infrastructure refers to the firm's capacity to provide reliable, secure, and adaptable technological foundations, including hardware, software, networks, and shared services, that support business operations. IT business spanning refers to the managerial ability to align and integrate IT resources with organizational strategic goals so that technology investments contribute to business value. IT proactive stance refers to the firm's deliberate orientation toward continuously searching for and exploiting IT innovations to capture new business opportunities.

Ilmudeen (2022) further showed that effective IT governance strengthens IT-enabled dynamic capabilities, which in turn promote the agility and innovative capability that support firm performance. In data-intensive settings more specifically, Ghasemaghahi (2021) showed that the performance benefits of big data depend on which characteristics of the data a firm develops, underscoring that technology capability contributes to performance through how it is deployed rather than through ownership alone.

Firm Performance

Firm performance refers to the extent to which a firm achieves its goals and strategies over a given period. Herciu (2017) argues that performance should be defined and measured

through both financial indicators, such as profitability, growth, and market value, and non-financial indicators based on stakeholder expectations, such as customer satisfaction. Consistent with this multidimensional view, recent studies of technology-intensive firms have combined financial and market indicators to assess performance (Latifi et al., 2021; Huang et al., 2023). This consideration is particularly relevant for data-intensive businesses, in which the returns from data resources are not always immediate or purely financial, so assessment should capture market outcomes such as customer acquisition, customer satisfaction, and service quality alongside financial results. In this study, firm performance is examined in terms of both the financial performance and the market performance of big data platform enterprises.

Empirical evidence on firm resources and IT capability has developed in two largely separate research streams, and the findings in each stream remain inconsistent. On the resource side, Price and Stoica (2015) found that firm resources influenced the performance of small and medium-sized enterprises, whereas Yesil and Kaya (2013) reported no significant effect of organizational culture on financial performance. On the technology side, Nwankpa and Roumani (2016) found that IT capability enhanced firm performance, although the effect operated through digital transformation. Rehman et al. (2020) reported that absorptive capacity and corporate entrepreneurship partially mediated the relationship between IT capability and performance in manufacturing SMEs. Chae et al. (2018) showed that the strength of this relationship varied considerably across industries, and Rahman and Zhao (2020) found no significant association between IT capability and performance among United States firms. In the Chinese context, Huang et al. (2023) reported that digital innovation improved the performance of listed firms by improving labor productivity, lowering operating costs, and strengthening competitive advantage. He et al. (2022) further showed that the resource investment of Chinese firms responds strongly to the institutional environment in which they operate, and Guo et al. (2022) found that the performance of Chinese digital startups depends on business model innovation, in particular on how firms propose, create, and capture value. However, few studies have examined firm resources and IT capability within a single model, and evidence from big data platform enterprises in China remains scarce. This study addresses this gap through the conceptual framework presented in the following section.

Conceptual Framework

Drawing on the Resource-Based View and the literature reviewed above, this study models firm resources and IT capability as direct predictors of the performance of big data platform enterprises, as shown in Figure 1. Because evidence on these relationships in this sector remains limited and inconsistent, establishing the baseline associations is a necessary first step before the mediating mechanisms identified in earlier studies can be meaningfully examined. The hypotheses were therefore stated at two levels, with two main hypotheses at the construct level and six sub-hypotheses at the dimension level.

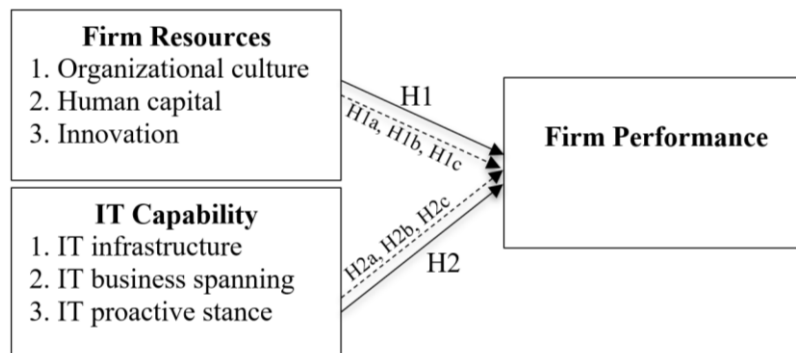


Figure 1 Conceptual Framework

Source: Developed by the authors

Based on this framework, the following hypotheses were formulated:

H1: Firm resources, consisting of organizational culture, human capital, and innovation, have a positive influence on the firm performance of big data platform enterprises in Hangzhou, Zhejiang Province, China.

H1a: Organizational culture has a positive influence on firm performance.

H1b: Human capital has a positive influence on firm performance.

H1c: Innovation has a positive influence on firm performance.

H2: IT capability, consisting of IT infrastructure, IT business spanning, and IT proactive stance, has a positive influence on the firm performance of big data platform enterprises in Hangzhou, Zhejiang Province, China.

H2a: IT infrastructure has a positive influence on firm performance.

H2b: IT business spanning has a positive influence on firm performance.

H2c: IT proactive stance has a positive influence on firm performance.

Methodology

This study employed a cross-sectional, quantitative, correlational survey design. All variables were measured at a single point in time using a structured questionnaire, and the analysis examined the relationships between firm resources, IT capability, and firm performance.

Population and Sample

The population consisted of decision-makers, managers, and key employees of big data platform enterprises in Hangzhou, Zhejiang Province, China. The unit of analysis was therefore the individual respondent. Firm resources, IT capability, and firm performance are attributes of the firm, but they were measured through the assessments of employees working within them. Although the exact number of such employees is not officially documented, the population can be considered large given the concentration of digital economy enterprises in Hangzhou (Zhou et al., 2024). The sample size was determined using Cochran's (1977) formula for an unknown population. With a 5% margin of error, a 95% confidence level, and a population proportion of 0.50, the calculation yielded a minimum required sample of 385 respondents. To account for potential data loss, data collection continued beyond this minimum, yielding 413 valid responses. A convenience sampling method was employed, with respondents reached online through QQ and WeChat.

Research Instruments

The questionnaire consisted of three parts: Part 1 screened respondents for employment in a Hangzhou big data platform enterprise and age over 21; Part 2 gathered seven demographic items covering gender, age, education, firm size, position, tenure, and monthly income, which were used to describe the sample and were not entered into the regression models; and Part 3 measured the study variables through 24 items, comprising nine items on firm resources adapted from Yesil and Kaya (2013), Stiles and Kulvisaechna (2003), and Hafeez et al. (2012), nine items on IT capability adapted from Nwankpa and Roumani (2016), Rahman and Zhao (2020), and Ilmudeen (2022), and six items on firm performance adapted from Herciu (2017), Latifi et al. (2021), and Huang et al. (2023). All items in Part 3 were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Mean scores were interpreted in five levels of agreement: 4.21–5.00 highest, 3.41–4.20 high, 2.61–3.40 moderate, 1.81–2.60 low, and 1.00–1.80 lowest.

The quality of the instrument was assessed in terms of both reliability and construct validity before testing the research hypotheses. Reliability was examined using Cronbach's

alpha, and construct validity through exploratory factor analysis of the 24 measurement items, using principal component extraction with Promax rotation. Sampling adequacy was satisfactory ($KMO = .917$) and Bartlett's test of sphericity was significant, $\chi^2(276) = 5,048.97$, $p < .001$. Seven components with eigenvalues greater than 1.00 were extracted, accounting for 73.31% of the total variance, and the structure corresponded to the seven constructs specified in the framework. All items loaded on their intended component between .797 and .905, and no item showed a cross-loading of .35 or above. As shown in Table 1, the alpha coefficients ranged from .800 to .915, composite reliability from .881 to .932, and average variance extracted from .696 to .737, all exceeding the recommended thresholds.

Table 1 Reliability and Convergent Validity of The Measurement Model (n = 413)

Variable	No. of Items	Loading range	Cronbach's α	CR	AVE
Organizational culture	3	.829 – .897	.826	.892	.734
Human capital	3	.807 – .905	.822	.886	.722
Innovation	3	.824 – .871	.821	.887	.723
IT infrastructure	3	.835 – .885	.834	.893	.737
IT business spanning	3	.797 – .879	.823	.884	.717
IT proactive stance	3	.823 – .858	.800	.881	.713
Firm performance	6	.799 – .868	.915	.932	.696

Note. α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted. Recommended thresholds: factor loading $> .50$, $\alpha > .70$, CR $> .70$, AVE $> .50$ (Hair et al., 2010).

Discriminant validity was assessed using the criterion of Fornell and Larcker (1981), which compares the square root of the average variance extracted for each construct with its correlations with the other constructs. The square roots of AVE ranged from .834 to .858 and exceeded all inter-construct correlations reported in Table 3, the highest of which was .438.

Because all variables were reported by the same respondent in a single questionnaire, common method bias was examined using Harman's single-factor test (Podsakoff et al., 2003). All 24 items were entered into an unrotated factor analysis constrained to a single factor, which accounted for 36.27% of the variance. As this value is below the 50% threshold, common method bias was not considered a serious concern in this dataset.

Data Analysis

Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the sample and the levels of the study variables. Pearson correlation was used to examine the relationships among the variables.

Multiple linear regression using the Enter method was then applied at two levels. Model 1 entered firm resources and IT capability as two predictors of firm performance, corresponding to the level at which the hypotheses were stated. Model 2 entered the six dimensions as separate predictors. The two models were compared using an F-test for the change in R^2 , which assesses whether distinguishing among the dimensions accounts for variance beyond that accounted for by the two constructs.

Six assumptions of multiple regression were examined. Linearity was assessed through the scatterplot of standardized residuals against standardized predicted values. Independence of errors was assessed using the Durbin-Watson statistic, with values between 1.50 and 2.50 considered acceptable. Multicollinearity was assessed using tolerance and variance inflation factors, with tolerance above .10 and VIF below 10 taken as evidence that multicollinearity was not a concern (Hair et al., 2010). Influential outliers were assessed using Cook's distance, with values below 1.00 considered acceptable. Normality of residuals was assessed using the Shapiro-Wilk test together with skewness and kurtosis. Homoscedasticity was assessed using the Breusch-Pagan test, computed by regressing the squared residuals on the predictors and multiplying the resulting R^2 by the sample size. Statistical significance was set at $p < .05$, and all analyses were conducted using IBM SPSS Statistics.

Results

1. Respondents' General Information

A total of 413 respondents completed the questionnaire, all working in big data platform enterprises in Hangzhou. The sample was close to balanced by gender, with 52.10% female and 47.90% male. Most respondents were aged between 26 and 45, together accounting for 73.60% of the sample. High school (35.80%) and undergraduate (35.60%) qualifications were the most common educational backgrounds. Nearly half worked in firms of 201 to 500 employees (48.70%), and managerial roles dominated, with grassroots and middle managers making up roughly 69.00% of respondents. Tenure was concentrated at 6 to 8 years (41.60%), and the most common monthly income band was 6,001 to 9,000 yuan (42.90%).

2. Levels of Firm Resources, IT Capability, and Firm Performance

As shown in Table 2, all seven variables were rated at the moderate level, with means between 3.28 and 3.37. Organizational culture recorded the highest mean among firm

resources, and IT proactive stance the highest within IT capability, while firm performance recorded the lowest of the seven.

Table 2 Means and Standard Deviations of The Study Variables (n = 413)

Variable	Mean	SD	Interpretation
Organizational culture	3.37	0.99	Moderate
Human capital	3.32	1.04	Moderate
Innovation	3.34	1.02	Moderate
IT infrastructure	3.30	1.06	Moderate
IT business spanning	3.29	1.00	Moderate
IT proactive stance	3.33	0.97	Moderate
Firm performance	3.28	1.01	Moderate

3. Relationships among Firm Resources, IT Capability, and Firm Performance

Pearson correlation was used to examine the relationships among the study variables, and the results are presented in Table 3.

Table 3 Correlation Matrix of The Study Variables (n = 413)

	OC	HC	INNO	ITINFRA	ITBS	ITPS	FP
OC	1						
HC	.427**	1					
INNO	.389**	.418**	1				
ITINFRA	.359**	.425**	.412**	1			
ITBS	.396**	.427**	.409**	.423**	1		
ITPS	.326**	.351**	.331**	.331**	.355**	1	
FP	.419**	.438**	.420**	.436**	.426**	.390**	1

Note. ** p < .01 (2-tailed). OC: Organizational culture, HC: Human capital, INNO: Innovation, ITINFRA: IT infrastructure, ITBS: IT business spanning, ITPS: IT proactive stance, FP: Firm performance

As shown in Table 3, all six dimensions of firm resources and IT capability were positively and significantly correlated with firm performance ($p < .01$). Human capital showed the strongest correlation with firm performance ($r = .438$), followed by IT infrastructure ($r = .436$), IT business spanning ($r = .426$), innovation ($r = .420$), organizational culture ($r = .419$), and IT proactive stance ($r = .390$). The correlations among the predictors themselves ranged from .326 to .427.

4. Influence of Firm Resources and IT Capability on Firm Performance

Before the regression models were tested, the six assumptions specified in the Data Analysis section were examined, and the results are summarized in Table 4. The scatterplot of standardized residuals against standardized predicted values showed no systematic pattern, supporting linearity. The Durbin-Watson value of 1.986 fell within the acceptable range of 1.50 to 2.50, indicating independence of errors. Tolerance values ranged from .661 to .781 and VIF values from 1.280 to 1.513, indicating that multicollinearity was not a concern. The maximum Cook's distance was .022, well below 1.00, indicating no influential outliers. The Shapiro-Wilk test was significant, $W = .988$, $p = .002$; however, skewness ($-.12$, $SE = .12$) and kurtosis ($-.66$, $SE = .24$) were within ± 1 , indicating only a mild departure from normality, and this test is sensitive to small deviations in large samples. The Breusch-Pagan test was also significant, $LM = 27.26$, $p < .001$, although the auxiliary R^2 of .066 indicated that the degree of heteroscedasticity was modest. These two departures do not bias the regression coefficients, but the standard errors and significance tests were interpreted with caution.

Table 4 Results of Regression Assumption Testing ($n = 413$)

Assumption	Evidence	Result
Linearity	No systematic pattern in the plot of standardized residuals against standardized predicted values	Met
Independence of errors	Durbin-Watson = 1.986 (criterion 1.50–2.50)	Met
No multicollinearity	Tolerance .661–.781; VIF 1.280–1.513	Met
No influential outliers	Maximum Cook's distance = .022 (criterion < 1.00)	Met
Normality of residuals	Shapiro-Wilk $W = .988$, $p = .002$; skewness $-.12$ ($SE = .12$), kurtosis $-.66$ ($SE = .24$)	Not met; mild departure
Homoscedasticity	Breusch-Pagan $LM = 27.26$, $p < .001$; auxiliary $R^2 = .066$	Not met; modest degree

Model 1 entered firm resources and IT capability as two composite predictors, corresponding to the level at which H1 and H2 were stated. The model was statistically significant, $R = .604$, $R^2 = .364$, adjusted $R^2 = .361$, $F(2, 410) = 117.447$, $p < .001$, and accounted for 36.40% of the variance in firm performance. As shown in Table 5, firm resources ($\beta = .330$) and IT capability ($\beta = .336$) were both positively and significantly associated with firm performance, and the two standardized coefficients were of nearly equal size.

Table 5 Multiple Regression of Firm Resources and IT Capability on Firm Performance: Model 1 (Composite Level)

Predictor	b	SE	β	t	p
(Constant)	.420	.191		2.199	.028
Firm resources	.420	.066	.330	6.404	< .001
IT capability	.441	.068	.336	6.516	< .001

Note. $R^2 = .364$, adjusted $R^2 = .361$, $F(2, 410) = 117.447$, $p < .001$, Durbin-Watson = 1.987, VIF = 1.711, Dependent variable: Firm performance.

Model 2 entered the six dimensions as separate predictors in order to test H1a to H1c and H2a to H2c. The model was statistically significant, $R = .604$, $R^2 = .365$, adjusted $R^2 = .355$, $F(6, 406) = 38.817$, $p < .001$, and accounted for 36.50% of the variance in firm performance. As shown in Table 6, all six dimensions were positively and significantly associated with firm performance, with standardized coefficients ranging from .131 for IT business spanning to .163 for IT infrastructure.

Table 6 Multiple Regression of Firm Resources and IT Capability on Firm Performance: Model 2 (Dimension Level)

Predictor	b	SE	β	t	p	VIF
(Constant)	.415	.194		2.141	.033	
Organizational culture	.151	.048	.149	3.171	.002	1.402
Human capital	.137	.047	.142	2.910	.004	1.513
Innovation	.133	.047	.134	2.817	.005	1.441
IT infrastructure	.155	.045	.163	3.429	.001	1.442
IT business spanning	.132	.049	.131	2.722	.007	1.478
IT proactive stance	.153	.047	.147	3.286	.001	1.280

Note. $R^2 = .365$, adjusted $R^2 = .355$, $F(6, 406) = 38.817$, $p < .001$, Durbin-Watson = 1.986, Dependent variable: Firm performance.

The two models were then compared to determine whether distinguishing among the six dimensions accounted for additional variance beyond the two composite predictors. As shown in Table 7, the increase in R^2 from Model 1 to Model 2 was .0003, $F(4, 406) = 0.048$, $p = .996$, which was not statistically significant. The six dimensions therefore did not differ reliably in the strength of their associations with firm performance and contributed in a broadly comparable manner.

Table 7 Comparison of The Composite-Level and Dimension-Level Models

Model	R ²	Adjusted R ²	F	p
Model 1 (composite level)	.364	.361	117.447	< .001
Model 2 (dimension level)	.365	.355	38.817	< .001

Note. $\Delta R^2 = .0003$, $F(4, 406) = 0.048$, $p = .996$.

5. Summary of Hypothesis Testing

Table 8 summarizes the results of the eight hypotheses. H1 and H2 were tested in Model 1, and both were supported, as firm resources and IT capability were each positively and significantly associated with firm performance. The six sub-hypotheses, H1a to H1c and H2a to H2c, were tested in Model 2 and were all supported.

Table 8 Summary of Hypothesis Testing

Hypotheses	β	p	Result
H1: Firm resources have a positive influence on the performance of big data platform enterprises.	.330	< .001	Supported
H1a: Organizational culture has a positive influence on firm performance.	.149	.002	Supported
H1b: Human capital has a positive influence on firm performance.	.142	.004	Supported
H1c: Innovation has a positive influence on firm performance.	.134	.005	Supported
H2: IT capability has a positive influence on the performance of big data platform enterprises.	.336	< .001	Supported
H2a: IT infrastructure has a positive influence on firm performance.	.163	.001	Supported
H2b: IT business spanning has a positive influence on firm performance.	.131	.007	Supported
H2c: IT proactive stance has a positive influence on firm performance.	.147	.001	Supported

Note. H1 and H2 were tested in Model 1; H1a–H1c and H2a–H2c were tested in Model 2.

Discussion

The findings support both construct-level hypotheses. Firm resources and IT capability were each positively and significantly associated with the performance of big data platform enterprises, with standardized coefficients of nearly equal size, and together they accounted for 36.40% of the variance in performance. These results are consistent with the central proposition of the Resource-Based View that internally accumulated resources and capabilities correspond to differences in firm performance (Barney, 1991). Two qualifications frame the interpretation that follows. First, the descriptive results showed that all seven variables were rated at a moderate level, which suggests that the resources of these enterprises are not yet fully developed and that meaningful room for strengthening them remains. Second, the findings

indicate associations consistent with RBV expectations rather than direct evidence of the value, rarity, inimitability, or non-substitutability of the resources, since these properties were not measured in this study.

The most informative finding concerns the comparison between the two models. Separating the six dimensions added virtually nothing to the explained variance, which indicates that the dimensions were associated with performance in a broadly comparable manner rather than through one or two dominant elements. This pattern corresponds closely to the argument of Sirmon et al. (2007) that resources generate value when they are structured and bundled together rather than deployed in isolation. The nature of a data business helps to explain why. Value is created along a connected chain in which a supportive culture sustains data-driven ways of working, skilled employees operate and interpret the technology, innovation converts data into marketable services, reliable infrastructure keeps operations running, business spanning keeps systems aligned with strategy, and a proactive stance renews the technology base before it becomes obsolete. Weakness at any point in this chain limits the value of the remaining elements. Consistent with this interpretation, Guo et al. (2023) found that investments in information technology and in IT human resources were associated with substantially stronger innovation outcomes when made together than when made separately, and Liu et al. (2013) reported that IT capabilities were linked to firm performance through organizational capacities rather than operating alone.

On the resource side, the positive association of organizational culture with performance contrasts with the non-significant result reported by Yesil and Kaya (2013) in a traditional developing-country setting and aligns with Pradana et al. (2022), who found that a digitally oriented culture was positively related to performance. A plausible explanation is that in data platform enterprises culture is engaged in the daily work itself, because norms of experimentation and evidence-based decision making shape how employees actually use data, so its relevance to performance is more direct than in conventional settings. The association of human capital with performance is consistent with recent evidence from Chinese listed firms that investment in digitally skilled human capital is positively linked to profitability and growth (Cao et al., 2026), and it reflects the reality that in this sector the analytical skill of employees largely determines the quality of the services delivered to clients. The role of innovation accords with Guo et al. (2022), who found that the performance of Chinese digital start-ups depends on how firms propose, create, and capture value, since sustained performance in a data business requires continuously converting data assets into new service offerings.

On the technology side, the three dimensions of IT capability were also associated with performance to a similar degree, which supports the conceptualization of Lu and Ramamurthy (2011) that infrastructure, business spanning, and proactive stance are complementary organizational abilities rather than substitutes. Reliable infrastructure provides the operating baseline that data services require, business spanning ensures that technology investments serve strategic priorities rather than accumulating as unused capacity, and a proactive stance protects the firm against the rapid obsolescence that characterizes this industry. This reading is consistent with Ghasemaghaei (2021), who showed that performance benefits arise from which characteristics of data a firm actually develops rather than from data holdings as such, and with Ilmudeen (2022), who found that governance of technology strengthens the dynamic capabilities through which agility and innovation emerge.

At the same time, the model accounted for 36.40% of the variance in performance, which means that most of the variation reflects factors beyond the six dimensions examined. Several explanations deserve consideration. Externally, the operating environment of Chinese platform enterprises has shifted considerably, as regulatory tightening has been accompanied by weaker investment inflows into platform markets (Rong et al., 2026) and by measurable pressure on the profitability of even leading firms (Khoo et al., 2025), while the institutional environment also shapes how firms invest in building resources (He et al., 2022). Internally, factors not measured in this study, such as strategy, financing conditions, and leadership, plausibly account for part of the unexplained variance. Methodological considerations also warrant caution, because the data were self-reported perceptions collected from single informants at one point in time, and although the diagnostic checks reported in the Results did not indicate serious common method bias (Podsakoff et al., 2003), the two assumption departures noted there mean that the estimates should be read as indicative associations rather than precise effects.

Taken together, this study makes three contributions. First, it places firm resources and IT capability within a single model in a sector where evidence has been scarce, which addresses the separation of the two research streams noted in the literature review. Second, the two-level design yields a finding that single-model studies cannot reveal, namely that the six dimensions were statistically indistinguishable in their associations with performance, which extends the application of the RBV to data-intensive Chinese enterprises by suggesting that these resources function as a complementary bundle and by cautioning against ranking dimensions on the basis of coefficient size alone. Third, the boundaries of these claims should be stated plainly. The

findings rest on cross-sectional perception data from one city and one sector, the bundle interpretation is a proposition that requires testing with designs capable of examining complementarity directly, and generalization beyond comparable technology-intensive contexts should be made with care.

Recommendations

Recommendations for Applying the Results

1. Because the six dimensions were associated with performance in a broadly comparable manner, big data platform enterprises should develop firm resources and IT capability in a coordinated way rather than concentrating investment on any single dimension. Development plans that pair technology upgrades with corresponding investment in people and culture are more consistent with these findings than technology spending alone.

2. Managers should treat the six dimensions as a connected chain and direct attention to its weakest link. Periodic internal assessment of organizational culture, human capital, innovation, IT infrastructure, IT business spanning, and IT proactive stance would allow enterprises to locate the dimension that currently constrains the others and to prioritize development accordingly.

3. Because all seven variables were rated at a moderate level, there remains clear room for development across the board. Practical starting points include strengthening data-driven norms and evidence-based decision making in daily work, expanding the digital and analytical skills of employees through structured training, and establishing routines that convert data assets into new or improved services on a regular cycle.

4. At the technology level, enterprises should maintain reliable and scalable systems for storing and processing data, keep technology investment aligned with business strategy through regular joint planning between IT and business units, and monitor emerging technologies so that renewal occurs before existing systems become obsolete.

Recommendations for Future Research

1. This study used convenience sampling through online channels, which limits the generalizability of the findings. Future research should employ probability sampling where a complete sampling frame is available, to improve the representativeness of the sample.

2. The data were self-reported perceptions collected from single informants at one point in time, and two regression assumptions showed departures as reported in the Results. Future studies should combine survey data with objective performance indicators, collect data from

multiple informants per firm, and apply estimation methods that are robust to non-normality and heteroscedasticity.

3. The main model accounted for 36.40% of the variance in firm performance, leaving a substantial share unexplained. Future studies should incorporate additional internal and external factors, such as strategy, financing conditions, market competition, and the regulatory environment, and should examine mediating mechanisms through which resources translate into performance using structural equation modeling.

4. The finding that the six dimensions were statistically indistinguishable suggests that these resources may function as a complementary bundle. This proposition should be tested directly with designs suited to complementarity, such as interaction models or configurational approaches.

5. The study was confined to big data platform enterprises in Hangzhou. Replication in other regions and industry contexts would help establish whether the findings hold more broadly.

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