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Digital Transformation Capabilities and Business Performance of Small and Medium Enterprises: Empirical Evidence from Hanoi, Vietnam

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ABSTRACT: This study investigates the direct empirical impacts of digital transformation capabilities—specifically technology infrastructure, human resources, and strategic governance—on the business performance of small and medium-sized enterprises in Hanoi, Vietnam. Utilizing a quantitative research design, primary survey data were collected from 132 SME decision-makers in June 2026 and analyzed using multiple linear regression via IBM SPSS Statistics. The findings confirm that all three capability dimensions significantly enhance SME performance, with digital strategy and governance emerging as the primary determinant, surpassing technological infrastructure and workforce competencies. These results demonstrate that overcoming the "digitalization paradox" in small enterprises depends heavily on executive leadership commitment and strategic clarity, which ensure that technology investments effectively translate into cost efficiency, market expansion, and financial health. Overall, this research advances the dynamic capabilities perspective by establishing the hierarchical importance of strategic governance in emerging-market SMEs.

KEYWORDS: Digital transformation capabilities, SME performance, Strategic governance, Digitalization paradox, Dynamic capabilities, Emerging markets, Vietnam.

1. INTRODUCTION

Digital transformation has become an essential strategic imperative for small and medium-sized enterprises (SMEs) globally, driving organizations to restructure their business models and dynamic capabilities to adapt to changing market environments (Verhoef et al., 2021; Zhai et al., 2022). Although digital technologies enable operational optimization and enhanced customer value, SMEs frequently encounter severe resource constraints and the digitalization paradox, wherein capital investments in digital tools do not automatically improve operational or financial outcomes (Cenamor et al., 2021; Guo et al., 2023; Nasiri et al., 2020). Without proper strategic alignment and employee competencies, technology adoption can escalate administrative overhead, induce operational friction, and degrade short-term financial performance (Guo et al., 2023; Merín-Rodrigáñez et al., 2024).

In emerging economies such as Vietnam, digital transformation within the SME sector is accelerating under supportive national legislative frameworks and economic mandates (Van Hoang et al., 2025; Vo et al., 2024). For SMEs operating in key economic hubs like Hanoi, intense market competition demands the rapid conversion of digital investments into tangible economic performance (Gavrila & de Lucas Ancillo, 2022). Consequently, examining the direct structural impacts of specific digital transformation capability dimensions—comprising technological infrastructure, digital human resources, and digital strategy and governance—on SME performance provides vital empirical evidence for scholarly advancement and executive decision-making (Bui et al., 2023; Li et al., 2018; Van Hoang et al., 2025).

Despite growing scholarly interest, significant research gaps persist in the literature: Most existing empirical studies treat digital transformation as an aggregate, unidimensional construct, neglecting the nuanced interaction between technological, human, and strategic dimensions within SMEs. Empirical evidence regarding the direct linkages between specific components of digital capabilities and SME business performance remains scarce in emerging South-East Asian markets, particularly in rapidly growing urban hubs like Hanoi, Vietnam.

To address these gaps, this study investigates the direct impact of three core components of digital transformation capability—digital technology infrastructure capability, digital human resource capability, and digital strategy and governance capability—on SME business performance. This study extends the Dynamic Capabilities Perspective and Resource-Based View (RBV) by delineating and empirically validating the distinct performance impact of technological, human, and strategic capabilities within the SME context. It offers actionable insights for SME owner-managers in emerging markets to strategically allocate limited resources toward high-impact digital capabilities, thereby mitigating the digitalization paradox.

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2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Theoretical framework

This study anchors its conceptual framework on the Resource-Based View (RBV) (Barney, 1991) and the Dynamic Capabilities Theory (Teece et al., 1997). RBV posits that firm performance is driven by valuable, rare, inimitable, and non-substitutable resources. In digital contexts, standalone software or hardware rare resources can be easily replicated; thus, competitive advantage stems from higher-order digital transformation capabilities.

Warner and Wäger (2019) define digital transformation capability as a dynamic capability that enables an organization to continuously sense digital opportunities, seize them through new business models, and transform operational processes. Following Nasiri et al. (2020), digital transformation in SMEs relies on establishing foundational digital infrastructure and data management systems, which empower firms to transition smoothly toward agile and sustainable operations. Furthermore, Cenamor et al. (2021) demonstrate that digital platform capabilities interact with organizational flexibility to unlock competitive advantages for entrepreneurial SMEs. Building on these foundational works, we conceptualize digital transformation capability as a multidimensional construct comprising: digital technology infrastructure capability, digital human resource capability, and digital strategy and governance capability

2.2. Hypotheses development

Digital technology infrastructure capability and SME business performance

Digital technology infrastructure capability reflects the extent to which an SME possesses integrated hardware, software, data analytics platforms, and cloud systems. Nasiri et al. (2020) emphasize that advanced digital infrastructure acts as the core architecture for data-driven decision-making, operational synchronization, and resource management. Robust digital platforms allow SMEs to eliminate structural bottlenecks, lower transaction costs, and enhance real-time market responsiveness. Gavrila and de Lucas Ancillo (2022) provide direct empirical evidence that digital infrastructure deployment significantly improves structural efficiency and sustainable firm performance in SMEs. Therefore, we hypothesize:

H1: Digital technology infrastructure capability positively affects SME business performance.

Digital human resource capability and SME business performance

Technological infrastructure yields minimal value without a skilled workforce capable of leveraging digital tools. Digital human resource capability refers to employees' technological literacy, adaptability to digital tools, and continuous learning capacity. In SMEs, employee adaptability directly determines how effectively newly adopted technologies are operationalized. When personnel possess strong digital competencies, operational errors decline, process efficiency increases, and innovative work behaviors are fostered (Bui et al., 2023; Li et al., 2018). Thus, we hypothesize:

H2: Digital human resource capability positively affects SME business performance.

Digital strategy and governance capability and SME business performance

Digital strategy and governance capability represents leadership commitment, clear digital roadmaps, and strategic resource alignment. Guo et al. (2023) note that the digitalization paradox predominantly occurs when firms invest in technology without coherent managerial oversight. Strategic leadership ensures that digital investments align directly with core commercial objectives rather than superficial technological trends. Merín-Rodrigáñez et al. (2024) confirm that strategic digital orientation mediates the relationship between technology adoption and firm success by enabling business model innovation. Accordingly, we hypothesize:

H3: Digital strategy and governance capability positively affects SME business performance.

2.3. Conceptual Model

The proposed conceptual model illustrates the direct structural paths from the three independent dimensions of digital transformation capability to SME business performance.

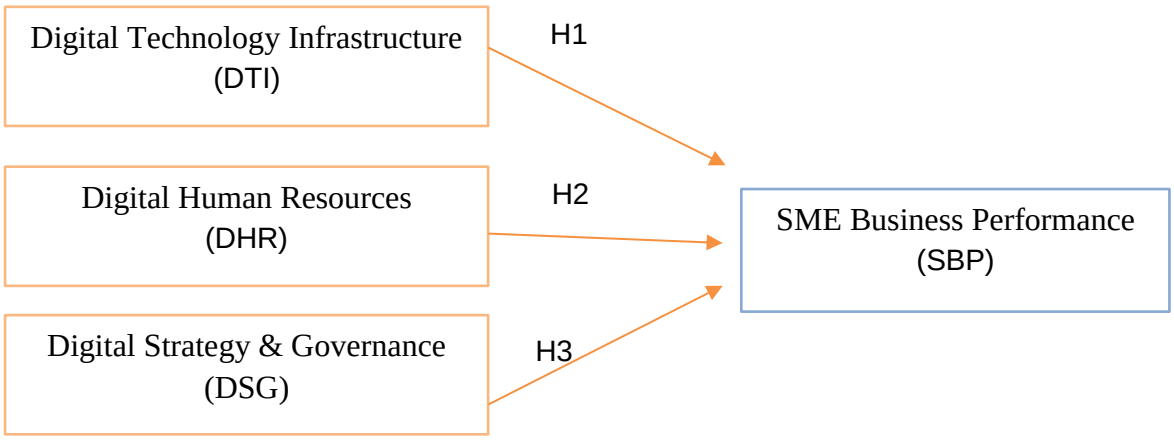


Figure 1: Model concept

3. RESEARCH METHODOLOGY

This empirical study employs a quantitative design using a structured questionnaire survey to collect data from small and medium-sized enterprises (SMEs) operating in Hanoi. The target population comprises SME owners, chief executive officers, middle managers, and functional department heads (such as IT, accounting, and operations) who possess the organizational oversight and domain knowledge required to evaluate digital

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capabilities and firm performance. Primary data collection was conducted during June 2026 using non-probability convenience sampling combined with snowball sampling, distributing 150 physical and online questionnaires. After removing incomplete and unviable responses, a final valid sample of 132 observations was retained, satisfying the minimum sample size requirements for exploratory factor analysis and multiple regression modeling.

All operational constructs were measured using 5-point Likert scales (ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree"), adapted and contextualized from validated international literature to fit the Vietnamese SME setting. Specifically, digital transformation capability was operationalized as a multidimensional construct comprising three independent dimensions: digital technology infrastructure capability (3 observed items synthesized from Warner & Wäger, 2019; Cenamor et al., 2021; Nasiri et al., 2020), digital human resource capability (3 observed items synthesized from Li et al., 2018; Bui et al., 2023), and digital strategy and governance capability (3 observed items synthesized from Warner & Wäger, 2019; Merín-Rodrigáñez et al., 2024). The dependent variable, SME business performance, was measured through 3 observed items capturing cost reduction, revenue and market share expansion, and overall financial health improvement (adapted from Zhai et al., 2022; Gavrila & de Lucas Ancillo, 2022).

All collected survey data were processed and analyzed using IBM SPSS Statistics software. The statistical workflow followed three sequential stages: (1) descriptive statistics to profile sample demographics; (2) scale evaluation involving internal consistency reliability testing via Cronbach's Alpha (>= 0.70) and construct validity assessment via Exploratory Factor Analysis (EFA), KMO >= 0.50, factor loadings >= 0.50, cumulative variance extracted >= 50%); and (3) multiple linear regression analysis to test the proposed hypotheses (H1, H2, and H3) while verifying econometric assumptions, including multicollinearity (Variance Inflation Factor < 2.0) and autocorrelation (Durbin-Watson statistic).

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Descriptive statistics of the sample

The empirical analysis relies on a final valid sample of 132 small and medium-sized enterprises (SMEs) operating within Hanoi, Vietnam, surveyed in June 2026. The demographic profile indicates strong professional expertise among respondents, with middle-level management (such as chief accountants, IT directors, and operations heads) representing 43.9% of the sample, enterprise owners and senior executives (CEOs and managing directors) constituting 34.1%, and direct specialist positions accounting for the remaining 22.0%. In terms of enterprise scale, micro and small enterprises (employing fewer than 50 workers) comprise 68.2% of the surveyed firms, while medium-sized enterprises (employing between 50 and 299 workers) represent 31.8%, closely reflecting the structural composition of the SME sector in urban Hanoi. Regarding sectoral distribution, the sample spans commercial and service activities (44.7%), manufacturing and processing industries (33.3%), and technology and high-tech service sectors (22.0%), ensuring a balanced cross-industry perspective for evaluating digital transformation capabilities and business performance.

4.2. Scale measurement evaluation

The scale measurement evaluation was conducted through sequential reliability and validity assessments using IBM SPSS Statistics. Internal consistency was first verified using Cronbach's Alpha analysis across all four theoretical constructs. All constructs demonstrated high reliability, exceeding the standard academic threshold of 0.70, with Corrected Item-Total Correlations for all individual items remaining above 0.40. Specifically, Cronbach's Alpha coefficients were 0.821 for digital technology infrastructure capability (DTI), 0.795 for digital human resource capability (DHR), 0.852 for digital strategy and governance capability (DSG), and 0.838 for SME business performance (SBP).

Construct validity was subsequently confirmed using Exploratory Factor Analysis (EFA). For the independent variables, EFA yielded a Kaiser-Meyer-Olkin (KMO) measure of 0.812 and a statistically significant Bartlett's Test of Sphericity ($p < 0.001$), confirming matrix suitability. Principal Component Analysis with Varimax rotation extracted three distinct factors at Eigenvalues greater than 1.0, accounting for 69.15% of the cumulative variance. Factor loadings for all nine items exceeded 0.60, converging cleanly onto their conceptual constructs without cross-loading. For the dependent construct (SBP), EFA extracted a single-factor structure with an Eigenvalue of 2.202, explaining 73.40% of the total variance with factor loadings above 0.80. Table 1 summarizes the complete reliability and validity statistics for all measurement scales.

Table 1. Reliability and exploratory factor analysis results

Constructs and Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor Loading	Cronbach's Alpha	EFA Metrics
Digital Technology Infrastructure Capability (DTI)				**0.821**	KMO = 0.812
DTI1: Operational software & hardware readiness	0.665	0.762	0.814		Bartlett's Sig. = 0.000
DTI2: Integrated enterprise data systems	0.692	0.735	0.835		Cumulative Variance = 69.15%
DTI3: Continuous digital infrastructure updates	0.648	0.778	0.792		
Digital Human Resource Capability (DHR)				**0.795**	

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DHR1: Employee digital proficiency	0.615	0.748	0.788		Factor 2 (DHR) Eigenvalue = 1.842
DHR2: Regular organizational digital training	0.658	0.702	0.821		
DHR3: Employee technological adaptability	0.628	0.732	0.805		
Digital Strategy and Governance Capability (DSG)				**0.852**	Factor 1 (DSG) Eigenvalue = 3.538
DSG1: Clear digital transformation roadmap	0.725	0.788	0.842		
DSG2: Targeted digital budget allocation	0.708	0.805	0.825		
DSG3: Strong executive commitment & leadership	0.741	0.772	0.858		
SME Business Performance (SBP)				**0.838**	Single Factor (SBP) Eigenvalue = 2.202 Variance = 73.40%
SBP1: Operational cost reduction	0.688	0.786	0.845		
SBP2: Revenue and market share growth	0.726	0.748	0.871		
SBP3: Financial health and profitability improvement	0.678	0.795	0.854		

4.3. Multiple regression analysis and hypotheses testing

To empirically test the proposed direct hypotheses (H1, H2, and H3), a multiple linear regression analysis was executed using IBM SPSS Statistics, modeling SME business performance (SBP) as the dependent outcome variable against the three independent dimensions of digital transformation capability: digital technology infrastructure capability (DTI), digital human resource capability (DHR), and digital strategy and governance capability (DSG).

$$SBP = \beta_0 + \beta_1\ DTI + \beta_2\ DHR + \beta_3\ DSG + E$$

Econometric and diagnostic checks confirmed that the regression model satisfies all standard linear regression assumptions. The overall model demonstrated strong explanatory power, yielding an R^2 of 0.504 and an Adjusted R^2 of 0.492, indicating that 49.2% of the variance in SME business performance is explained by the three digital transformation capabilities. The overall model goodness-of-fit was statistically significant ($F(3, 128) = 43.361$, $p < 0.001$). The Durbin-Watson statistic was 1.884, falling safely within the recommended range of 1.5 to 2.5 and confirming the absence of first-order autocorrelation. Multicollinearity diagnostics showed that Variance Inflation Factors (VIF) for all independent predictors ranged between 1.251 and 1.684 (well below the conservative threshold of 2.0), affirming no threat of multicollinearity.

As summarized in Table 2, empirical results support all three hypotheses. Digital strategy and governance capability (DSG) exerts the strongest positive direct effect on SME performance ($\beta = 0.412$, $t = 5.472$, $p < 0.001$), supporting H3. Digital technology infrastructure capability (DTI) displays a significant positive effect ($\beta = 0.269$, $t = 3.794$, $p < 0.001$), supporting H1. Finally, Digital human resource capability (DHR) also significantly drives performance ($\beta = 0.198$, $t = 2.831$, $p = 0.005$), supporting H2.

Table 2. Multiple linear regression analysis results

Predictor Variables	Unstandardized B	Std. Error	Standardized β	t-statistic	Sig. (p-value)	VIF	Hypothesis Decision
(Constant)	0.985	0.224	—	4.397	0.000	—	—
Digital Technology Infrastructure (DTI)	0.258	0.068	0.269	3.794	0.000	1.412	H1 Supported
Digital Human Resources (DHR)	0.201	0.071	0.198	2.831	0.005	1.251	H2 Supported
Digital Strategy & Governance (DSG)	0.394	0.072	0.412	5.472	0.000	1.684	H3 Supported

Notes: Dependent Variable: SME Business Performance (SBP); R^2 = 0.504; Adjusted R^2 = 0.492; $F(3, 128) = 43.361$, $p < 0.001$; Durbin- Watson = 1.884.

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4.4. Discussion

The empirical findings provide robust statistical support for all three hypotheses, advancing theoretical understanding regarding how specific dimensions of digital transformation capabilities drive commercial outcomes in emerging-market SMEs.

First, the confirmation of H3 reveals that digital strategy and governance capability is the most influential determinant of business performance among SMEs in Hanoi. This result aligns directly with the dynamic capabilities framework (Teece et al., 1997; Warner & Wäger, 2019) and corroborates recent empirical findings by Merín-Rodrigáñez et al. (2024). It demonstrates that clear managerial vision, strategic resource allocation, and executive commitment are essential to prevent the "digitalization paradox" highlighted by Guo et al. (2023). Without overarching strategic alignment, capital investments in digital tools risk being fragmented, leading to higher operational expenses without corresponding economic returns.

Second, the support for H1 confirms that digital technology infrastructure capability serves as an essential physical and data foundation for operational performance. Consistent with Nasiri et al. (2020) and Gavrila and de Lucas Ancillo (2022), possessing integrated hardware, software, and cloud platforms allows small enterprises to streamline workflow execution, reduce administrative errors, and enhance operational synchronization across business functions. In the fast-paced business environment of Hanoi, robust technology infrastructure provides the core architecture needed for real-time market responsiveness.

Third, the support for H2 validates the critical human execution link within SMEs. While exhibiting a smaller relative standardized coefficient compared to strategy and infrastructure, human capital remains an indispensable operational prerequisite. As emphasized by Li et al. (2018) and Bui et al. (2023), digital infrastructure yields minimal value if employees lack technical proficiency or adaptability. Continuous organizational training and employee technological readiness ensure that digital tools are fully exploited, directly contributing to productivity improvements and financial health.

5. IMPLICATIONS

Based on primary empirical data collected from 132 small and medium-sized enterprises in Hanoi, Vietnam, in June 2026, this study confirms that all three dimensions of digital transformation capability significantly enhance business performance, explaining 49.2% of its variance. Digital strategy and governance capability emerged as the dominant driver, followed by technology infrastructure and human resources. In line with prior studies in emerging markets (Van Hoang et al., 2025; Vo et al., 2024; Zhai et al., 2022), these findings corroborate the positive baseline link between digital capabilities and enterprise outcomes; however, while studies on larger firms often emphasize raw technological infrastructure (Wang & Xia, 2023), our findings reveal that strategic governance plays a far more decisive role in SMEs. This divergence highlights that small enterprises face severe resource constraints and must rely on clear leadership vision to align digital investments with commercial goals, thereby successfully resolving the digitalization paradox (Guo et al., 2023; Merín-Rodrigáñez et al., 2024).

This study advances the literature by refining the Dynamic Capabilities Perspective and Resource-Based View within the context of urban SMEs in an emerging economy, demonstrating that standalone technology acquisitions are insufficient without higher-order organizational capabilities. By deconstructing digital transformation capability into granular strategic, technological, and human dimensions, the paper establishes the hierarchical importance of leadership governance in driving commercial outcomes. Furthermore, it provides quantitative empirical evidence from Vietnam on how strategic alignment acts as the primary mechanism to mitigate the digitalization paradox and prevent performance degradation in small firms.

For SME executives and policymakers, these findings emphasize that owner-managers must prioritize formulating a clear digital roadmap, committing dedicated leadership, and aligning budget allocations before making heavy capital investments in digital tools. Operationally, firms should adopt modular, cloud-based data systems to integrate departmental workflows while continuously upskilling staff to bridge the technological execution gap. Concurrently, government support programs should move beyond physical hardware subsidies to provide strategic management consulting and digital leadership training tailored for SME executives.

This study is subject to several limitations, including its cross-sectional design collected at a single point in time and a sample restricted geographically to Hanoi, which may limit generalizability across broader regions. Future research should employ longitudinal or panel data designs to capture the time-lagged financial impacts of digital investments across multiple urban centers. Additionally, scholars could explore complex mediating or moderating mechanisms -such as organizational agility, business model innovation, or environmental dynamism - to further unpack the nuanced pathways linking digital capabilities to long-term firm performance.

6. CONCLUSION

This study successfully validates the direct structural framework linking internal digital transformation capabilities to the business performance of small and medium-sized enterprises in Hanoi. The empirical findings confirm that digital strategy and governance capability serves as the primary driver of enterprise success, outperforming both technological infrastructure and human resource capabilities. Ultimately, these insights demonstrate that overcoming the digitalization paradox in SMEs hinges on strong leadership commitment and strategic clarity, which ensure that technological adoption and workforce upskilling effectively translate into enhanced economic outcomes.

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REFERENCES

1) Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120.
2) Bui, Q. H., Tran, A. H., Tu, T. H., & Nguyen, P. N. (2023). Advancement of cloud-based accounting effectiveness, decision-making quality, and firm performance through digital transformation and digital leadership: Empirical evidence from Vietnam. Heliyon, 9(6), e16929.

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3) Cenamor, J., Parida, V., & Wincent, J. (2019). How entrepreneurial SMEs compete through digital platforms: The roles of digital platform capability, network capability and ambidexterity. Journal of Business Research, 100, 196–206.
4) Guo, X., Li, M., Wang, Y., & Mardani, A. (2023). Does digital transformation improve the firm's performance? From the perspective of digitalization paradox and managerial myopia. Journal of Business Research, 163, 113868.
5) Li, L., Su, F., Zhang, W., & Mao, J. Y. (2018). Digital transformation by SME entrepreneurs: A capability perspective. Information Systems Journal, 28(6), 1129–1157.
6) Merín-Rodrigáñez, J., Dasí, À., & Alegre, J. (2024). Digital transformation and firm performance in innovative SMEs: The mediating role of business model innovation. Technovation, 134, 103027.
7) Van Hoang, D., Thi Hien, N., Van Thang, H., Nguyen Truc Phuong, P., & Thi-Thuy Duong, T. (2025). Digital capabilities and sustainable competitive advantages: The case of emerging market manufacturing SMEs. Sage Open, 15(2), 21582440251329967.
8) Nguyen, Q. D., Nguyen, H. T., Vu, O. T. K., Tran, T. V., & Nguyen, H. T. T. (2025). What drives firms towards digital transformation adoption: evidence from Vietnam. Journal of International Economics and Management, 25(3), 184–201.
9) Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18(7), 509–533.
10) Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. Journal of Business Research, 122, 889–901.
11) Vo, D. H., Vo, A. T., Dinh, C. T. H., & Tran, N. P. (2024). Corporate restructuring and firm performance in Vietnam: The moderating role of digital transformation. PLOS ONE, 19(5).
12) Wang, D., & Xia, X. (2023). The impact of corporate digital transformation on firms' performance in utilities sector. Heliyon, 10(1).
13) Warner, K. S. R., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. Long Range Planning, 52(3), 326–349.
14) Zhai, H., Yang, M., & Chan, K. C. (2022). Does digital transformation enhance a firm's performance? Evidence from China. Technology in Society, 68, 101841.

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