

The Impact Mechanism of Chief Information Officer Establishment on Enterprise Digital Transformation

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ABSTRACT

In the VUCA era, the importance of the CIO role has become increasingly prominent. Many enterprises have recognized the critical role of establishing a CIO position in driving internal institutional change and achieving digital transformation. This study collected data from 430 Chinese enterprises via questionnaires. Based on the institutional entrepreneurship theory perspective, a theoretical model was constructed and tested using PLS-SEM. Results indicate that establishing a CIO position significantly and positively impacts an organization's digital transformation. Organizational agility mediates the relationship between CIO appointment and digital transformation. This study provides insights into how the CIO role drives internal institutional change, enhances organizational capabilities, and ultimately facilitates digital transformation.

1 Introduction

In the context of the digital age, digital transformation has emerged as a crucial enabler for organizations aiming to achieve long-term growth and strengthen their competitive position in the market. As companies operate within a rapidly changing and increasingly intricate technological environment, the strategic incorporation of digital technologies and data-informed decision-making into core business functions has become indispensable. Digital transformation goes beyond the mere implementation of new technology; it involves a comprehensive reevaluation of business models, operational workflows, customer interaction approaches, and corporate culture. During this evolution, businesses encounter various obstacles, such as efficiently gathering and interpreting external market insights, unifying disparate internal

digital platforms, and overcoming organizational resistance or inefficiencies linked to technological change.

To effectively navigate these complex challenges, enterprises need strong leadership that can align information systems with broader strategic objectives. This demand has led to the establishment of a key executive role—the Chief Information Officer (CIO). First introduced in the late 20th century and formally acknowledged in academic and corporate literature by the early 2000s, the CIO acts as a vital link connecting technological capabilities with business strategy. As noted by Banker et al. (2011), the creation of the CIO role was a direct reaction to the rising complexity of managing digital assets within modern organizations. The responsibilities of the CIO extend beyond maintaining IT infrastructure and ensuring system security and stability, encompassing innovation leadership, pro-

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moting digital competence across teams, and identifying strategic opportunities where technology can generate a competitive edge.

Institutional entrepreneurship theory posits that forces exist within organizations to guide the establishment of new internal institutions. DiMaggio et al. (1988) first introduced the concept of institutional entrepreneurs, thereby incorporating the notion of agency into institutional theory. Agency refers to a process of temporary embedded social participation, whereby actors engage constructively with their structural environment and can alter and reproduce it to a certain degree.

As key figures assisting enterprises in gathering external information, integrating internal resources, and achieving digital transformation, Chief Information Officers (CIOs) can assume the vital role of institutional entrepreneurs during corporate digital transformation.

However, many traditional enterprises still do not establish the CIO position, believing that conventional enterprise information departments are sufficient to shoulder the responsibility of facilitating digital transformation. To investigate how the presence or absence of a CIO impacts an enterprise's digital transformation, this study, grounded in institutional entrepreneurship theory, proposes hypotheses and constructs a PLS-SEM model to address this question, thereby providing insights for enterprise digital transformation.

2 Literature review

2.1 Institutional entrepreneurship theory

Institutional entrepreneurship theory evolved from new institutional theory. DiMaggio et al. (1988) first introduced the concept of institutional entrepreneurs, thereby incorporating the notion of agency into institutional theory. Agency refers to a process of temporary embeddedness in social participation, where actors engage constructively with their structural environment, capable of altering and reproducing it to some extent. Institutional entrepreneurs, by exerting their initiative, adjust and create the institutional logic within the organization, enabling the organization to gain legitimacy in a changing external environment and maintain its competitiveness.

Previous research has identified two primary motivations for institutional entrepreneurship: exogenous and endogenous factors. External factors, drawing from institutional theory, emphasize external organizational context influences such as economic fluctuations, political crises, and technological innovations. Internal factors, conversely, consider institutional contradictions within the context that trigger institutional entrepreneurs' transformative

awareness, thereby mobilizing their subjective initiative for institutional change activities (Watson, 2007). Maguire et al. (2004), based on 13 case studies of Canadian AIDS treatment organizations, pointed out that organizations or individuals recognize the potential benefits of altering existing institutions or creating new ones. They create profitable opportunities by establishing and promoting the rules, values, beliefs, and behavioral patterns necessary to gain recognition. Additionally, researchers have explored the process of institutional entrepreneurship. Maguire et al. (2004) argued that within emerging fields, institutional entrepreneurs should implement strategies to theorize practices, coordinate stakeholder relationships, and secure dominant positions within the emerging field to gain strong legitimacy.

2.2 Digital transformation

Research on digital transformation began with Morton(1990) 's findings, which concluded that the effective implementation of digital technologies internally would inevitably trigger fundamental changes within enterprises. Coile(2000) first innovatively coined the term "digital transformation" in 2000.

Currently, academic consensus on the concept of digital transformation remains elusive. A review of existing literature reveals that scholars generally define it as a process driven by digital technologies and data elements. This process treats data as a critical resource for corporate value creation, integrating and restructuring organizational frameworks, business processes, and commercial models to achieve deep convergence between digital technologies and traditional production factors. Compared to traditional models, digital transformation emphasizes the deep integration and comprehensive application of digital technologies, data elements, and digital platforms across enterprise management domains, focusing on creating new value for businesses through transformation(Wu et al.,2021).

As the influence of digital transformation continues to grow, academia has engaged in diverse discussions. On one hand, these discussions revolve around key issues such as how enterprises can build ecosystems or platforms based on digital technologies and enhance their collaborative capabilities with stakeholders. On the other hand, they focus on exploring how digital transformation can establish competitive advantages, drive business model innovation, and foster organizational innovation. In recent years, organizational development innovation and business model optimization have been increasingly influenced by digitalization. How to better stimulate the momentum of corporate digital transformation and enhance its effectiveness requires sustained joint efforts from both

the theoretical and practical communities (He et al., 2019).

2.3 Chief Information Officer(CIO)

Existing research has not produced a consistent definition of the Chief Information Officer (CIO). After summarizing previous studies on the role's essence, Bendig et al. (2023) define the CIO as the role responsible for managing an organization's information technology infrastructure, transforming perceptions of data and IT within the organization, seizing business opportunities created by IT, building digital capabilities, developing agile infrastructure, and driving strategic organizational change.

Furthermore, with increasing emphasis on digital transformation, many enterprises have introduced the concept of the Chief Digital Officer (CDO) beyond the CIO role. Compared to the CIO, the CDO focuses more intensely on managing the enterprise's digital transformation process (Singh et al., 2017). Existing research on the CIO role broadly covers two dimensions: antecedents and outcomes. Regarding antecedents, Benaroch et al. (2017) argue that certain triggering events—such as IT failures or negative market feedback—serve as significant drivers for companies to establish a CIO position. Bendig et al. (2022) contend that industry characteristics significantly influence CIO creation; furthermore, Bendig et al. (2023) suggest that CEO traits—such as IT background and tenure—also impact CIO establishment and the CIO's organizational effectiveness. Regarding the outcomes of CIO appointments, existing research indicates that the presence of a CIO can effectively enhance organizational operational efficiency (Benaroch et al., 2017) and boost corporate performance (Feng et al., 2021). Bendig et al. (2023) further propose, based on attention allocation theory, that appointing a CIO can effectively promote digital innovation at both technological and commercialization levels within an organization. Furthermore, some studies suggest that the act of appointing a CIO can predict future corporate actions. For instance, Li et al. (2021) argue that the existence of a CIO can predict a company's strategic intent to adopt AI.

2.4 Organizational agility

Organizational agility refers to a firm's ability to perceive and interpret market disruptions and to develop adaptive responses that sustain a competitive advantage (Kalaiganam et al., 2021; Teece et al., 2016). This capability enables organizations to reconfigure priorities and implement strategic initiatives more rapidly than competitors, reflecting the speed with which a firm can initiate, modify, and realign its actions in response to dynamic

market conditions (Sambamurthy et al., 2003).

Notably, firms led by millennials often demonstrate a faster adoption of emerging technologies. Likewise, while some organizations successfully adapt and expedite new initiatives during periods of disruption, others face challenges in maintaining pace. These disparities underscore the increasing importance of organizational agility in contemporary business environments and have prompted significant scholarly attention. Definitions of agility vary across the literature: some scholars characterize it as the ongoing capacity to respond to changing market conditions (Doz et al., 2008), while others highlight the importance of sustaining flexibility in the face of novel developments (Christensen, 2016; Weber and Tarba, 2014). In contrast, Teece et al. (2016) conceptualize agility primarily as a mechanism for value creation. As such, as firms develop new capabilities to navigate evolving markets, they must simultaneously overcome inertia embedded in existing systems, cultures, structures, and processes.

3 Hypothesis

The rise of digital technologies and growing recognition of their potential led to the creation of the CIO role within organizations (Banker et al., 2011). Drawing on Bendig et al. (2023), this study posits that the Chief Information Officer serves as a pivotal figure responsible for managing an organization's IT infrastructure, transforming perceptions of data and information technology within the organization, seizing business opportunities created by IT, building digital capabilities, developing agile infrastructure, and driving strategic organizational change. Papagiannidis et al. (2020) contend that the CIO plays a vital role in corporate digital transformation, particularly when organizations face turbulent environments, as those with a CIO are better equipped to navigate such challenges. Within the digital transformation context, Singh et al. (2017) identify three primary roles the CIO typically assumes in corporate digital innovation processes: entrepreneur, digital evangelist, and coordinator. The entrepreneur role advocates for innovation through new technologies, prioritizes customer-centric approaches, and sometimes identifies methods to adjust the organization's business model. The digital evangelist role motivates employees to communicate and collaborate across organizational levels and departments, conveys digital technology application strategies, and drives the organization's digital transformation. The coordinator role facilitates cross-functional cooperation within the organization during transformation and develops information technology and its infrastructure. These three CIO functions demonstrate the significant impact of establishing a CIO role on corporate digital

transformation. In addition, Schaper et al. (2024) further examined the role of individual characteristics of chief information officers in corporate digital exploration from a senior leadership perspective. The following hypothesis is proposed:

H1: CIO establishment has a positive impact on an enterprise's digital transformation.

As the central node of technology governance, the CIO drives modular, scalable digital technology architectures to decouple rigid legacy systems, providing organizations with an agile technological foundation. Furthermore, through strategic planning and institutional design, the CIO institutionalizes agile principles—transforming them from localized development practices into core organizational paradigms. This reshapes the feedback loop between strategy and execution, shortening the decision-action cycle.

Organizational agility plays a pivotal intermediary role in an organization's transformation and change processes within uncertain environments. Agility builds a low-cost, rapid-iteration organizational learning system, enabling enterprises to continuously validate digital business hypotheses through minimum viable products, accelerating knowledge accumulation and cognitive iteration. Furthermore, organizational agility empowers enterprises to sense environmental signals in real time and dynamically reconfigure resources and processes. This ensures transformation strategies adapt to technological evolution and market shifts, avoiding the pitfalls of rigid planning. Agile culture and empowerment mechanisms transform digital transformation from top-down projects into distributed, self-organizing innovation processes involving all employees. This significantly enhances the breadth, acceptance, and sustainability of transformation initiatives. The following hypothesis is proposed:

H2: Organizational agility plays a mediating role between CIO establishment and digital transformation.

4 Variable measurement and Data Collection

This study employed a questionnaire approach to collect data. The presence of a CIO was treated as a dichotomous variable (0-1). Agility and digital transformation were measured using a 5-point Likert scale. Specifically, agility measurement referenced Pingali et al. (2023) and comprised five items. Digital transformation was assessed using the scale developed by Nasiri et al. (2020), consisting of five items.

Conducted within a Chinese context, the study distributed and collected a total of 637 questionnaires, yielding 430 valid responses.

Table 1 Characteristics of Sample Enterprises.

Item	Category	Size
Years	Within 2 years	24
	2—5 years	61
	5—10 years	97
	More than 10 years	248
Scale	Less than 10 people	38
	10—50 people	59
	50—100 people	35
	100—500 people	75
	500—1000 people	95
Ownership	Over 1000 people	128
	State enterprise	146
	Private enterprises	220
	Wholly Foreign-Owned Enterprise	40
Industry	Sino-foreign joint venture	24
	Hotel/Catering/Tourism	19
	Financial sector	53
	Construction Industry	65
	Business services/consulting	30
	Trade/Wholesale/Retail	51
	Manufacturing	128
Warehousing/Transportation/Logistics	28	
	Others	56

5 Analysis and results

5.1 CMB

This study employed Harman's one-factor test to examine common method bias. When the variance explained by the first factor after rotation was less than 50%, it indicated that the scale's item design did not exhibit severe common method bias. Results revealed five items with eigenvalues exceeding 1. The first factor explained 36.87% of variance, falling below the 50% threshold. This indicates no significant common method bias in this study.

5.2 Reliability and validity

This study employed the PLS algorithm in SmartPLS 4 to conduct reliability analysis on the questionnaire data. Table 2 presents the reliability and convergent validity analysis results for each variable. As shown in the table below, the factor loadings for each item ranged from 0.791 to 0.888, significantly exceeding the 0.6 threshold. The Cronbach's α coefficients of agility and digital transformation are 0.883 and 0.902 respectively, substantially surpassing the 0.7 threshold. This indicates strong internal consistency across all variables and confirms the high reli-

ability of the data collected through the questionnaire.

Convergent validity is usually tested by two important indicators: Composite reliability (CR) and Average variance extracted (AVE). When the combined reliability is greater than 0.7 and the average variance extraction value is greater than 0.5, it can be indicated that the variable scale has good convergent validity. It can be seen from Table 2 that the OA and combined reliability are 0.914 and 0.927 respectively, which are much higher than the threshold of 0.7. The AVE values are 0.68 and 0.719 respectively, both greater than the standard of 0.5. Therefore, it can be considered that the scales of each variable

in this study have good convergent validity. Discriminant validity can usually be illustrated by comparing the square roots of the average variance extracted values of each variable with the magnitudes of the correlation coefficients (Fornell and Larcker, 1981). When the square root of the AVE of a variable is greater than its correlation coefficient with other variables, it indicates that the discriminant validity between the variables is good. As shown in Table 3, the square roots of AVE for each variable in this study are all greater than their correlation coefficients with other constructs, indicating good discriminant validity among the variables.

Table 2 Reliability and Validity Analysis.

	Item	loading	Cronbach's alpha	Composite reliability	AVE
OA	AG1	0.833	0.883	0.914	0.68
	AG2	0.819			
	AG3	0.829			
	AG4	0.82			
	AG5	0.822			
DT	DT1	0.856	0.902	0.927	0.719
	DT2	0.813			
	DT3	0.886			
	DT4	0.888			
	DT5	0.791			

Table 3 Square Root of AVE and Correlation Matrix.

	CIO	OA	DT	YEAR	IND	SIZE
CIO	1					
OA	0.329**	0.825				
DT	0.238**	0.616**	0.848			
YEAR	0.026	0.011	0.112	1		
IND	-0.025	0.032	0.03	0.068	1	
SIZE	0.235	0.189	0.235	0.581	0.066	1

Note: ** indicates $p < 0.01$ (two-tailed test); bolded values in the table represent the square roots of the AVE for each variable.

5.3 MODEL TEST

This study used SmartPLS 4 to test the model. Firstly, the model fitting and explanatory power are tested through the PLS algorithm of SmartPLS 4. The results show that the SRMR of the model is 0.047, which is less than the threshold of 0.08, indicating that the model has a good fit. R2 is 0.397, indicating that the model has a certain degree of explanatory power.

Secondly, by using the Bootstrapping algorithm and adding control variables, verify the impact of CIO establishment on digital transformation and the mediating role

of organizational agility between the two. It can be seen from Table 4 that the direct effect of CIO establishment on DT is not significant ($p > 0.1$), while the indirect effect is significant ($p < 0.001$). The direct effect of CIO establishment on OA is significant ($p < 0.001$), the direct benefit of OA on DT is significant ($p < 0.001$), and the mediating effect of organizational agility between CIO establishment and digital transformation is significant ($p < 0.001$). Both H1 and H2 have been verified, which also indicates that organizational agility plays a fully mediating role between the establishment of CIOs and digital transforma-

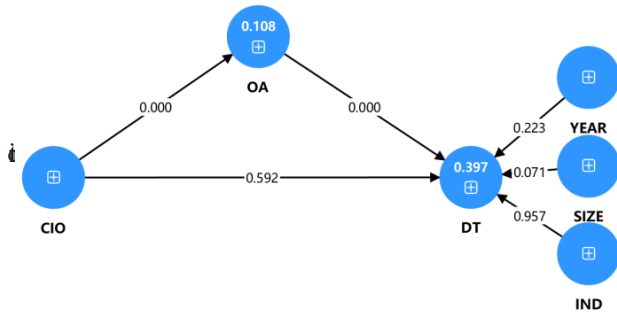


Figure 1 Research Model.

Table 4 Result.

	Coefficient	SD	T statistics	P values
CIO→DT	0.044	0.082	0.536	0.592
CIO→OA	0.672	0.089	7.575	0.000
OA→DT	0.592	0.048	12.331	0.000
CIO→OA→DT	0.398	0.056	7.055	0.000
Indirect effect: CIO→DT	0.398	0.056	7.055	0.000

6 Conclusion

This study constructed a research model from the perspective of institutional entrepreneurship theory to explore the influence mechanism of the establishment of CIOs on the digital transformation of enterprises. Specifically, data from 430 Chinese enterprises were collected through questionnaires, and the data were analyzed using SPSS26.0 and Smartpls4. The research model was verified based on the PLS-SEM method.

6.1 findings

The main conclusions of this study are as follows:

First, this study verifies that the establishment of a CIO has a significant positive impact on the digital transformation of enterprises. The establishment of a CIO enables enterprises to better collect external information, integrate internal resources, and break through internal resistance to change, thereby helping enterprises achieve the goal of digital transformation. Furthermore, we have also found that the establishment of a CIO does not have a direct impact on an enterprise’s digital transformation, but rather achieves it by enhancing the organization’s capabilities and improving its internal state.

Secondly, agility plays a mediating role between the establishment of a CIO and the digital transformation of an enterprise. The establishment of a CIO can effectively enhance organizational agility, and organizational agility can promote the digital transformation of an enterprise. On the one hand, the CIO is the digital strategist of an

enterprise, helping it understand technological development trends, plan for its future, and be able to rationally optimize business processes and enhance efficiency. On the other hand, CIOs are also drivers of organizational and cultural change, capable of building agile technical architectures, cultivating digital talents, breaking down barriers between IT departments and business departments, promoting cross-functional collaboration, and establishing an agile working model centered on products and services. Organizational agility can enhance an enterprise’s ability to resist external risks, improve operational efficiency and innovation awareness, optimize resource allocation, and strengthen organizational resilience, thereby facilitating the digital transformation of the enterprise.

6.2 Contribution

This research, rooted in institutional entrepreneurship theory, offers a systematic exploration of how the creation of the Chief Information Officer (CIO) role catalyzes enterprise digital transformation through a newly developed theoretical framework. Institutional entrepreneurship emphasizes the agency of individuals in modifying, sustaining, or dismantling organizational institutions. By formally positioning the CIO, organizations designate a leader equipped with both technical proficiency and strategic foresight to challenge established practices, champion digital innovation, and align resources with transformative objectives.

The study contributes meaningfully to scholarly discourse on digital transformation. First, it expands current literature by uncovering the mechanisms through which structural interventions—such as the formalization of the CIO position—trigger wide-ranging organizational change. While much prior work has centered on external influences or patterns of technology adoption, this study redirects attention to internal leadership, illustrating that executive-level digital champions are instrumental in initiating and advancing digital evolution. Empirically, it demonstrates that institutionalizing digital leadership via the CIO role sends a strong signal of organizational commitment, helping legitimize new digital practices and reduce resistance from traditional units or stakeholders.

Second, the study identifies organizational agility as a key mediating factor between the presence of a CIO and successful digital transformation. Defined as an organization’s capacity to detect shifts in its environment, adapt swiftly, and reallocate resources effectively, agility is shown to be significantly enhanced by the CIO’s strategic influence. Findings indicate that beyond deploying new technologies, CIOs drive change by reengineering workflows, enabling cross-departmental coordination, and

cultivating a culture oriented toward rapid learning and responsiveness. In agile firms, for instance, decision-making is distributed, feedback cycles are accelerated, and iterative experimentation is normalized—all outcomes supported by the CIO’s strategic engagement.

Additionally, the study emphasizes the need to synchronize human capital strategies with digital goals. Appointing a CIO is not merely a staffing choice but a strategic institutional decision to elevate digital leadership within the executive hierarchy. This structural empowerment allows the CIO to shape corporate strategy, prioritize digital investments, and ensure alignment across departments. Evidence from multiple sectors shows that companies with influential CIOs are more likely to deploy unified digital systems, embrace analytics-based decision processes, and navigate market volatility successfully.

6.3 Limitation and future work

This study also has the following limitations: First, the data source is based on a questionnaire survey, which is relatively limited in scope. Additionally, questionnaire responses are significantly influenced by individual cognitive factors, introducing a degree of subjectivity. Second, while this study examines the mediating role of organizational agility, it is important to note that organizational agility is only one factor affecting corporate operations and transformation. Other pathways through which the establishment of a CIO position influences corporate digital transformation remain to be explored. Finally, while this study validates that establishing a CIO role aids corporate digital transformation, it does not differentiate specific CIO behaviors. Future research could examine how individual CIO characteristics and behavioral patterns influence corporate digital transformation.

Project

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