Digital Technology Affordances, Organizational Resilience, and Enterprise performance: The Contingent Role of Organizational Unlearning

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Abstract： How to effectively utilize digital technology to enhance firm performance has become an important issue for firms in the digital intelligence era.Based on resource orchestration theory and organizational unlearning theory,the mechanism of the impact of digital technology availability on enterprise performance,as well as the mediating role of organizational resilience and the moderating effect of organizational unlearning are empirically analyzed through survey data of 302 small and medium-sized enterprises (SMEs).The results show that digital technology affordance (cumulative affordance,variation affordance) has a positive effect on firms' performance;organizational resilience has a mediating role between digital technology affordance and firms' performance,and organizational unlearning positively moderates the relationship between digital technology affordance and organizational resilience.

Key words: digital affordance;organizational resilienc;,enterprise performance

Introduction

In the era of digital economy,big data and artificial intelligence technologies are embedded in the process of enterprise new product development with unprecedented breadth and depth, which has an important impact on enterprise research and development innovation and production operations, especially the role of digital technology in the transformation and upgrading process of small and medium-sized enterprises is becoming more and more prominent.It has been shown that enterprises can accelerate the process of transformation and upgrading through the application of digital technology to improve the performance of enterprises [5]. Throughout the academic results in recent years,it is found that the research on the availability of digital technology provides a new perspective to explain the above paradox.Cheng Cong concluded that digital technology affordance brings a wide range of possibilities for digital innovation,which has a positive impact on firm performance,but the specific impact of the process of the "black box" has not yet been explored.In particular, small and medium-sized manufacturing enterprises lack the resources and capabilities required for digital transformation and are vulnerable to organizational inertia and perceptions.

In summary,based on the theoretical understanding of the relationship between digital technology affordance,organizational resilience, organizational unlearning and enterprise performance,this study takes SMEs as the target,empirically investigates the mechanism of digital technology affordance on enterprise performance,and further analyzes the mediating role of organizational resilience and the moderating effect of organizational unlearning.The results of the study not only enrich and expand the academic results of resource orchestration theory,deepen the understanding of the mechanism of digital technology affordance affecting enterprise performance and its boundary conditions,but also provide important theoretical and practical insights on the effective use of digital technology by manufacturing enterprises to enhance

organizational resilience and enterprise performance.

1 Literature Review

1.1 Digital technology affordance

Digital technology affordance refers to the potential behavioural possibilities provided by digital technology relative to a specific entity, reflecting the interactions between an organization and digital technology in a specific context[7].Based on the homogenization and reprogrammability characteristics of digital technology,this study draws on existing results to categorise digital technology affordance into two dimensions: cumulative affordance and variant affordance [1].Cumulative affordance refers to the digital technology,which can be digital characterisation and homogenization of the data and information generated by the enterprise's production,sales and operation activities;variant affordance refers to the support for the enterprise to realize the combination of digital technology relying on the reprogrammability of the digital technology.Cumulative affordance and variant affordance affect firms' digital innovation in two different ways.Mechanisms of Differential Impact of Digital Technology Affordance on Organizational Resilience in SMEs.

1.2 Organizational resilience

The term "organizational resilience" was first published by the management scientist Meyer (1982) and refers to the ability of an organization to restore previous order in response to sudden and unprecedented environmental shocks. Ma et al. (2018) and others consider Organizational resilience to be an Organizational capability that enables organizations to cope in the face of unexpected,and sometimes catastrophic,events and turbulence events and more broadly,turbulent environments to survive ,adapt, recover,and even thrive [6].Arvalho and Areal (2016) view Organizational resilience as a capability that enables organizations to not only cope with and recover from threats and stresses,but also to thrive and grow in the face of adversity.

Lengnick-Hall and Beck (2005) defined Organizational resilience capability as a unique blend of cognitive,behavioural, and situational attributes that enhances a firm's ability to understand the current situation and develop customised responses that reflect that understanding [4].

1.3 Organizational unlearning

Organizational Unlearning is a strategic knowledge management process that refers to the act of an organization creating cognitive space for absorbing new knowledge and adapting to dynamic environments by proactively identifying,filtering,or divesting itself of outdated, inefficient,or conflicting knowledge systems.Its core lies in breaking the path dependence of the organization on established practices,processes and mental models,and realizing the iterative upgrading of the cognitive system through knowledge substitution and knowledge reconstruction [3].Organizational Unlearning is an important way for enterprises to break path dependency and organizational inertia in the era of digital economy,which enables them to better adapt to the digital context by facilitating the renewal of organizational concepts and practices.The affordance of digital technology provides multiple possibilities for organizational action,but specific actions are influenced by organizational perceptions, goals, and willingness.

2 Theoretical analysis and research hypotheses

2.1 Digital technology affordance and organizational resilience

Digital technology affordance is divided into two categories: cumulative and variant affordance.Cumulative affordance transforms dispersed production and operation information into quantifiable representations with the help of standardized data collection, storage and analysis.Through ERP,CRM and other systems, real-time

data from production, sales, supply chain and other links can be processed to eliminate information silos,provide a global basis for corporate decision-making,and improve resource integration efficiency and risk identification.For example, manufacturing enterprises use IoT devices to accurately capture equipment status data,which can be transformed into capacity optimization strategies and enhance the ability to resist risks.

Variant affordance is based on the modularity and reprogrammable characteristics of digital technology, supporting technology combination innovation and allowing enterprises to flexibly adjust resource structure and business models.For example,cloud computing and low-code development platforms allow low-cost reconfiguration of technological components,and open innovation supported by digital platforms can integrate external knowledge,enhance the diversity of technological variation,and realize the simultaneous enhancement of enterprise adaptive resilience and innovation resilience.Digital technology acts on organizational resilience through dual paths, Thus,the hypothesis:

H1 Digital technology affordance has a positive effect on organizational resilience.

2.2 Organizational resilience and enterprise performance

Organizations with resilience have more advantages in digital transformation by virtue of their alertness and adaptive adjustment characteristics.In terms of financial indicators,financial volatility is lower;in terms of business development,sales growth is higher;in terms of survival dimension,there are more opportunities for survival,and they perform better in terms of corporate sustainability performance.

Companies with strong organizational resilience can more keenly capture long-term,intangible,multi-dimensional risks and effectively manage them, properly respond to social and environmental pressures,and promote the development of the organization in the direction of the common good.At the same time,enterprise development is a long-term strategic goal,and operation methods that are not in line with profitability,environmental protection and social interests will lead to crises,which resilient enterprises can better avoid or cope with,and improve enterprise performance.Thus,the hypothesis:

H2 Organizational resilience has a positive impact on enterprise performance.

2.3 The mediating role of organizational resilience

As a collection of technical attributes, the value of digital technology affordance needs to be realized through the transformation of organizational capabilities.According to resource orchestration theory, digital technology is a static resource,which needs to be transformed into a competitive advantage by the organization's dynamic capabilities(e.g., resource integration, knowledge reconstruction).

Cumulative affordance generates massive information resources,but organizational resilience transforms these resources into a basis for decision-making through cross-sectoral synergy mechanisms.For example, after an enterprise deploys IoT devices,it needs to establish a real-time data analytics center to transform device operation data into capacity optimization strategies instead of just storing the data.

Variant affordance provides the possibility of technological restructuring,and organizational resilience enables technological resilience adaptation through dynamic capabilities.For example, after the introduction of AI customer service system in traditional stores in the retail industry,enterprises with strong organizational resilience can quickly reconfigure the skills of their employees to realize the switch of "online + offline"service mode,while enterprises with insufficient resilience will be idle due to the rigidity of the

process,and it is difficult to improve performance.Thus,the hypothesis:

H3 Organizational resilience mediates the relationship between digital technology affordance and firm performance.

2.4 Moderating role of Organizational unlearning

Organizational unlearning willingness affects the relationship between DTA and organizational resilience.When willingness is low,enterprises stick to the old concepts and practices,trapped in the old knowledge system,lack of new technology exploration, reduced interaction with digital technology ,reduced willingness to innovate, weakening the promotion of digital technology on innovation ability, affecting the formation of organizational resilience.

When willingness is high, enterprises take the initiative to update their concepts and practices, adapt to digital change, actively explore new technologies and knowledge,promote the reorganisation and application of old and new knowledge,and enhance the effect of digital technology empowerment.Cui Miao showed that organizational unlearning can change organizational perceptions and practices, eliminate barriers to innovation,promote deep-level organizational change, enhance innovation capacity,and thus promote organizational resilience.Thus,the hypothesis:

H4 Organizational unlearning positively moderates the relationship between digital technology affordance and organizational resilience.
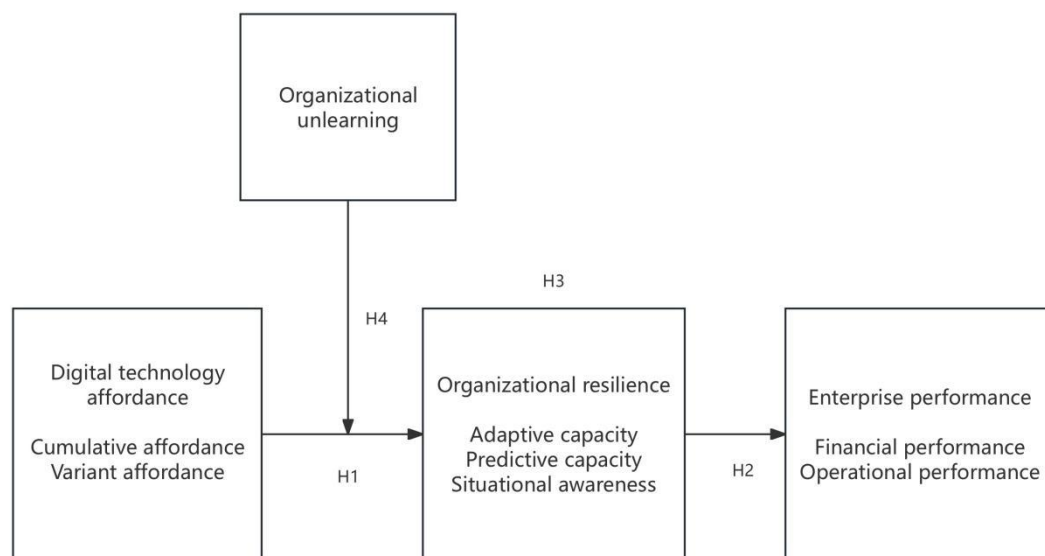

Figure 1 The theoretical framework of this study

3 Research design and data sources

3.1 Definition of variables

The dependent variable in this study is digital technology affordance, which is divided into two dimensions, cumulative affordance and variant affordance.

The mediator variable is organizational resilience,which is measured in three dimensions,namely adaptive capacity, predictive capacity and situational awareness.

The dependent variable is firm performance,which is categorized into financial performance and operational performance .Financial performance is mainly measured by return on investment, profitability, etc. and operational performance is measured by sales growth rate and market share growth rate.

The moderating variable is organizational

unlearning,which is a strategic knowledge management process that refers to the behavior of an organization to create cognitive space for absorbing new knowledge and adapting to the dynamic environment by proactively identifying, filtering, or divesting outdated, inefficient, or conflicting knowledge systems.

The control variables selected are firm size, industry type, nature of the firm, and age of the firm,which may affect the performance of the firm and need to be controlled in the empirical analysis.

3.2 Data sources

This study used a structured questionnaire to obtain data,which was filled out by the managers of the enterprises.These employees are the main force of innovation in the relevant enterprises,have practical experience in enterprise digitalization-related activities,and have a comprehensive understanding of the situation related to digital transformation.The core variables of the questionnaire were measured using a five-point Likert scale, and the questionnaire was distributed through an online survey in this study.For the collected questionnaire results,the questionnaire needs to be reviewed for information before data entry.For the unanswered ones,the questionnaires were filled out according to some obvious pattern, and the questionnaires with obvious errors and contradictions or the options selected in full were treated as invalid.

4 Empirical analysis

4.1 Descriptive statistical analysis

In order to better understand the basic situation of the sample data, this study conducted descriptive statistical analysis of all variables. Based on SPSS 26.0,the descriptive analysis of the demographic characteristics of the respondents and the process of digital transformation of the organization (Table 1) shows that the sample covers an anis multi-level organizational structure and is representative of the practice.

Indicator	Category	Frequency	Percentage%
Gender	male	148	49
	female	154	51
	Under 25	0	0
	26~35	108	35.8
Manager's age (years)	36~45	106	35.1
	46~55	76	25.2
	56~65	2	0.7
	Over 65	10	3.3
	Junior high school and below	6	2
Education	Junior college or high school	42	13.9
	College or Bachelor's Degree	184	60.9
	Graduate students and above	70	23.2
	Senior Management	104	34.4
office positions	Middle Management	169	56
	Grassroots Management	29	9.6
	0-1	8	2.6
	1-3	108	35.8
Years of digital transformation	3-5	107	35.4
	5-10	73	24.2
	>10	6	2
Years of working	0-1	71	23.5

	1-3	75	24.8
	3-5	65	21.5
	5-10	46	15.3
	10-15	20	6.6
	>15	25	8.3
	0-2	10	3.3
	2-5	12	4
Firm age (years)	5-10	98	32.5
	10-15	97	32.1
	>15	85	28.1

Table 1 Firm characteristics (N=302)

4.2 Reliability and validity analysis

In this study,Smart PLS 4.0 was used to test the reliability and convergent validity of the measurement model, and the results are shown in Table 2. The Cronbach's α coefficients, combined reliability (rho_c) and average variance extracted (AVE) of all latent variables satisfy the threshold criteria, indicating that the measurement instrument has high internal consistency and convergent validity.The Cronbach's α values for each latent variable ranged from 0.759 to 0.852,all exceeding the threshold value of 0.7. Mean variance extraction was distributed between 0.578 (EP) and 0.673 (DTA).Although organizational resilience was slightly below the stringent criterion of 0.6, it still met the minimum threshold of 0.5 [2] and its combined reliability (rho_c=0.921) was significantly higher than 0.7,so all question items were retained.The remaining variables had AVE values above 0.6, further supporting the convergent validity of the measurement model.

		Cronbach's alpha	(rho_a)	(rho_c)	（AVE）
Digital Technology affordance(DTA)	Cumulative affordance（CA）	0.825	0.825	0.884	0.655
	Variant affordance（VA）	0.757	0.759	0.861	0.673
Organizational resilience(OR)	Adaptive capacity（AC）	0.873	0.874	0.905	0.612
	Predictive capacity（PC）	0.835	0.836	0.883	0.603
	Situational awareness（SA）	0.82	0.821	0.874	0.581
Enterprise performance（EP）	Financial performance（FP）	0.828	0.83	0.879	0.592
	Operational performance (OP)	0.851	0.852	0.894	0.627

Organizational Unlearning (OU)	Organizational unlearning(OU)	0.817	0.818	0.872	0.578

Table 2 Reliability and validity analysis

4.3 Hypothesis testing

In this research paper, we first constructed the structural model of Digital Technology Affordance,Organizational Resilience, Firm Performance, and Organizational Unlearning.After running 5000 subsamples using SmartPLS4.0 on the structural equation model using the partial least squares algorithm Bootstrapping algorithm, the research hypotheses are tested by observing the path coefficients and significance results between the variables, the larger the path coefficients, the stronger the influence relationship between the relevant variables on the path of the influence is represented.According to the T-test criterion (T > 1.96),P-test criterion (P < 0.05, P < 0.01, P < 0.001 significance in the order of correlation, significant correlation, and extremely significant correlation),from the table, it can be seen that the T-value of all hypotheses is greater than 1.96,and the P-value of all hypotheses is less than 0.05, so that the hypotheses H1, H2, H3, and H4 are all valid.Also, the value of the variance inflation factor (VIF) indicates that there is no serious multicollinearity problem in the model, which further validates the reliability of the model.

	Mean	STDEV	T Value	P Value
CA -> AC	0.204	0.057	3.577	0
CA -> PC	0.209	0.056	3.728	0
CA -> SA	0.273	0.062	4.414	0
VA -> AC	0.119	0.05	2.385	0.017
VA -> PC	0.111	0.044	2.501	0.012
VA -> SA	0.171	0.051	3.325	0.001
AC -> FP	0.375	0.063	5.922	0
AC -> OP	0.305	0.062	4.934	0
PC -> FP	0.291	0.06	4.81	0
PC -> OP	0.346	0.064	5.429	0
SA -> FP	0.257	0.057	4.473	0
SA -> OP	0.278	0.057	4.886	0
CA -> AC -> FP	0.077	0.025	3.024	0.003
CA -> AC -> OP	0.062	0.022	2.825	0.005
VA -> AC -> FP	0.045	0.021	2.127	0.033
VA -> AC -> OP	0.036	0.017	2.079	0.038
CA -> PC -> FP	0.061	0.022	2.709	0.007
CA -> PC -> OP	0.072	0.025	2.843	0.004
VA -> PC -> FP	0.032	0.015	2.132	0.033
VA -> PC -> OP	0.038	0.017	2.256	0.024
CA -> SA -> FP	0.07	0.021	3.395	0.001
CA -> SA -> OP	0.076	0.023	3.332	0.001

VA -> SA -> FP	0.044	0.017	2.604	0.009
VA -> SA -> OP	0.047	0.018	2.693	0.007
OU x CA -> AC	-0.239	0.05	4.782	0
OU x CA -> PC	-0.21	0.047	4.475	0
OU x CA -> SA	-0.158	0.05	3.173	0.002
OU x VA -> AC	-0.139	0.047	2.96	0.003
OU x VA -> PC	-0.098	0.037	2.616	0.009
OU x VA -> SA	-0.09	0.041	2.193	0.028

Table 2 Structural model results

5 Conclusions

Based on the resource-based view and dynamic capability theory, this study reveals the mechanism of digital technology affordance affecting enterprise performance through organizational resilience, and explores the moderating effect of Organizational unlearning.The study found that digital technology affordance has a significant positive effect on organizational resilience.Cumulative affordance improves resource integration efficiency and risk identification through data homogenization, while variant affordance promotes business agile reconfiguration through modular technology,which together strengthen organizational resilience. Organizational resilience is a key mediator of business performance improvement.Highly resilient organizations significantly improve financial and operational performance through risk buffering and innovation backwardation,verifying the transmission path of "technology → capability → performance".Organizational unlearning can accelerate the acceptance and use of digital technology by facilitating the formation of new practices and perceptions of digital technology,thereby building organizational resilience and enhancing corporate performance.

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