IMPACT OF DIGITAL STRATEGIC ORIENTATION ON ORGANIZATION PERFORMANCE THROUGH DIGITAL TRANSFORMATION CAPABILITY

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ABSTRACT. This study explores the digital transformation capability at the organizational level and conceptualization of the construct of the dimensions of digital transformation capability according to the dynamic capability theory. The digital transformation capability contains three hub-factors: sensing, organizing and restructuring. In addition, this research empirically analyzes the positive impact of digital strategic orientation on organization performance through digital transformation capability. Firstly, we developed the measurement items of digital transformation capability, based on real cases of digital transformation. Then we collected data from the companies that are randomly located in different areas and cities in China. This survey covered different industries such as electronics, automobile, machine and equipment. Second, we collected 98 questionnaires and analyzed the data using smart PLS 3. This study has important academic significance for the theoretical development of digital transformation capability.

Keywords: Digital strategic orientation, Customer orientation, Technology orientation, Digital transformation capability, Firm performance

1. Introduction. The world is moving towards the digital future. Through digital transformation, enterprises are subverting business models, improving efficiency and enhancing customer experience [1]. Recent researches have contributed to increasing our understanding of specific aspects of the digital transformation phenomenon. At a high level, digital transformation encompasses the profound changes taking place in society and industries through the use of digital technologies [2]. At the organizational level, companies must find ways to innovate with these technologies by devising strategies that embrace the implications of digital transformation and drive better operational performance [3]. The dynamic capability approach is primarily concerned with strategic change [4], which is at the heart of digital transformation research. It also provides analytical tools to unpack the processes by which organizations change their resources and strategy in order to adapt to changing environments [5]. Given that a major challenge in aligning is how organizations purposefully change their digital technology and business resources to fit with emergent strategy, we believe that the dynamic capability approach provides a helpful theoretical foundation for examining the phenomenon of digital transformation capability.

However, we reviewed the existing literature and found that there are many papers on the topics of ICT, IT and IS, but digital transformation capability papers are still insufficient. Most of the digital transformation papers are case studies. Although the digital

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transformation process of individual companies is explained in detail, it is difficult to have general applicability. In the existing literature, only a few papers emphasize the capability of digital transformation, so it needs to further develop papers of digital transformation capability. Therefore, this study will explore digital transformation capability at the organizational level and seek to answer the question of how to conduct digital transformation capability unfolds through organizational actions. The main research questions motivating this study are as follows: 1) does digital strategic orientation have a positive impact on digital transformation capability? 2) what kind of contents consists of digital transformation capability? 3) does digital transformation capability have a positive impact on performance?

To address these research questions, the rest of this study is arranged as follows. In Chapter two, we review studies of dynamic capability theory and digital transformation capability. In Chapter three, we establish our research model based on digital transformation literature and dynamic capability theory. The digital transformation capability contains three second-order factors: sensing, organizing and restructuring. In Chapter four, we introduce research design. In Chapter five, we introduce our findings in detail through research model, including the relationship between digital strategic orientation and performance through digital transformation capability. Finally, we provide conclusion including implications and the limitations of this study.

2. Literature Review.

2.1. **Digital strategic orientation.** After reviewing the literature on strategic orientation and digital transformation, we find that there are two factors driving the digital transformation of companies: consumer orientation and technology orientation.

Consumer Orientation. Consumer behavior is changing as a response to the digital revolution. Market figures show that consumers are shifting their purchases to online stores, and digital touch points have an important role in the customer journey affecting both online and offline sales [6]. With the help of new search and social media tools, consumers have become more connected, informed, empowered, and active [7]. Digital technologies allow consumers to co-create value by designing and customizing products, perform lastmile distribution activities, and help other customers by sharing product reviews [8]. Mobile devices have become important in today's consumer behavior and facilitate show rooming behavior, the practice of examining merchandise offline, and then buying it online [9]. Consumers also strongly rely on apps, and new AI-based technologies, like Amazon's Echo and Google Home, that are entering consumers' lives. These new digital technologies are likely to structurally change consumer behavior [10], and, consequently, the use of new digital technologies can easily become the new norm and defy traditional business rules. If companies cannot adapt to these changes, they become less attractive to customers, and are likely to be replaced by companies that do leverage such technologies.

Technology Orientation. Since the coming of the Internet and its worldwide adoption, an increasing number of accompanying technologies, such as smart phones, Web 3.0, cloud computing, speech recognition, online payment systems, and crypto-currencies have risen that have strengthened the development of e-commerce. E-commerce global sales were 2.3 trillion in 2017 and e-retail revenues are projected to grow to 4.88 trillion in 2021 [11]. The omnipresence of big data [12] and advent of emerging digital technologies, such as artificial intelligence (AI), block chain, Internet of Things (IoT), and robotics, are projected to have far-reaching effects on business [13]. Although perhaps not each of these technologies will be as powerful as expected, the wide entrance of new digital technologies clearly signals the need for companies to transform their business digitally. Moreover, these new digital technologies may also affect the enterprise's cost structure through replacing costlier humans during service delivery with the help of robots or virtual agents or optimizing logistic streams and reducing supply chain costs through the use of AI and block chain.

2.2. Dynamic capability theory and digital transformation capability. The most widely cited definition of dynamic capability comes from [14]: "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments". A relative amount of literature draws on dynamic capability theory to explore constitutive elements of digital transformation. However, research on dynamic capability building in relation to digital transformation remains scarce [15], with some noticeable exceptions.

In essence, dynamic capability enables an analysis of how organizations cope with dynamic and shifting relations in their environment [16] – a characterizing aspect of digital transformation. Indeed, [17] emphasized this argument by reviewing the extensive literature on digital transformation, and calling for research into how digital transformation unfolds, and what role the underlying capability and micro-foundations have in that process. Responding to this call, based on the dynamic capability theory, we developed the digital transformation capability, including three sub-factors: sensing, organizing and restructuring.

In this study, digital transformation capability refers to company's use of digital technology (such as big data, cloud computing, and artificial intelligence) to promote the transformation of business model, organizational structure and company culture of the company. In this way, we conceptualize dynamic capability scope in tandem with the digital transformation literature. We next define and explain each of the three activities in turn: sensing refers to the firm's activities to identify digital opportunities. In the context of digital transformation, this involves capability for monitoring the market and identifying digital opportunities. Thus, continuously evaluating the firm's environmental fit and needs to manage disruptive change, environmental turbulence, and sensing opportunities from prior digital transformation become critical concerns. Organizing includes the firm's activities to align digital resources to address the sensed digital opportunities and capture value from doing so. This means turning the new digital resources into digital capability by allocating existing resources with new ones. Further, companies need to create conditions to operational and strategize them both inside and outside of the firm to permit new value paths. Restructuring describes the firm's activities to innovate and reconfigure the organized digital resource. Therefore, the firm needs to reconfigure the new digital resources with existing organizational structure (e.g., routines, rules, and values) through constantly developing with other resources.

3. Research Model and Hypotheses.

3.1. **Research model.** In this study, we established a research model (see Figure 1) for developing the concept of digital transformation capability, the relationship of digital strategic orientations and operational performance through digital transformation capability. This section further reviews the literature on the constructs and more importantly, discusses how the two strategic orientations may relate to digital transformation capability. These relationships are specifically framed as research hypotheses.

3.2. Research hypotheses.

3.2.1. Digital strategic orientation and digital transformation capability. A firm's digital strategic orientations show what strategy it will use to guide its decision making, resource allocation, and marketplace interaction. Although past research pointed to the link between strategic orientations and firm performance, more researches are needed to provide reasons for why strategic orientations contribute to firm performance [18]. This study attempts to empirically study digital strategic orientation and firm performance through



FIGURE 1. Research model

digital transformation capability. Previous literature suggests that the path from strategic orientations to firm performance is via dynamic capability, for example, agility capability, management capability and e-marketing capability [19]. Thus, digital strategic orientations may relate to digital transformation capability. Understanding customer needs and other changes in the market can effectively be accomplished by collecting and analyzing relevant data about customers and the market.

H1: Customer orientation has a positive influence on digital transformation capability. Similarly, digital transformation requires both new technical knowledge and new knowledge about customers and the market. Thus, it can be argued that companies with customer orientations are likely to develop digital transformation capability, compared to those that lack customer orientations. As digital transformation capability involves the ability to adopt, and use technology, and generate technical knowledge, it presupposes a technological orientation. Additionally, past research indicates that technological orientation works in a similar way as the customer orientations do to contribute to digital transformation capability [20]. Based on these findings of past research, we hypothesize

H2: Technology orientation has a positive influence on digital transformation capability.

3.2.2. Digital transformation capability and firm performance. Dynamic capability plays an important role in an organization as it underscores the accumulation of capability embedded in a firm and it is directly associated with performance [21]. However, exploiting these opportunities requires companies to be equipped with strong dynamic capability as well as continuous digital transformation. Firm performance is the firm's ability to use its assets to generate revenues, measured in monetary terms. According to the dynamics capability literature, the effect of dynamic capability on firm performance is mediated by functional performance, i.e., the efficiency and effectiveness of a firm's ordinary capability. Firm performance is defined as the operational efficiency and effectiveness of the firm's business processes, and as such it reflects the degree to which the firm's ordinary capability is optimized for the current environment. The transformation component of dynamic capability, represented here by digital transformation capability, is integral to an organization's ability to optimize its processes in relation to the internal and external environment, and thereby maximize its competitive performance. The ability of the firm to quickly reconfigure sub-optimal processes enables it to increase the complexity of its action repertoire [6]. The link between the efficiency and effectiveness of a firm's processes and its organizational performance is well established in the IS literature and has been noted as particularly important in the digital transformation context. Improving the efficiency of organizational processes reduces the costs associated with the operation of the firm, thereby improving its bottom line [22]. Effectiveness of business processes ensures that products and services produced are commensurate with the needs of internal and external customers. Thus, both theoretical reasoning and empirical evidence point to

the positive relationship between digital transformation capability and firm performance. Based on these findings of past research, we hypothesize

H3: Digital transformation capability has a positive influence on firm performance.

4. Research Design.

4.1. Measurement model. We used five items to measure consumer orientation [18] and technology orientation [13]. Specifically, based on dynamic capability [14], we developed digital transformation capability, and measured three dimensions of sensing, organizing, restructuring. Most of our measurement scales were adopted from or developed based on the previous studies. And we used five items to measure firm performance. Following [23], we controlled for firm size, firm age. Firm size, assessed by a firm's number of employees, can impact activities and improve firm performance through economies of scale or scope. Firm age, measured as the number of years since the establishment of the firm, has been suggested to influence a firm's performance. In the following measurement details, all of the variables were measured using 5-point likert-type scales ranging from 1 ='strongly disagree' to 5 = 'strongly agree'. Measuring digital transformation capability is challenging. Consequently, we have searched literature extensively to identify relevant items, which could help to assure content validity. Based on the investigation of multiple cases of digital transformation in advance, we contacted the person in charge of digital transformation (CEO, CIO, CTO and department manager) of the company, and developed the measurement project of digital transformation capability after several adjustments from the perspective of process.

4.2. Sampling and data collection. We used standard questionnaires to collect data for this research. Once a draft questionnaire was developed, we got feedback from several academic and managerial experts. Feedback from these experts was then taken and integrated into the final version of the questionnaire. The original questionnaire was developed in English and we translated it into Chinese using a typical careful translation/back translation process to ensure accuracy and consistency. Several Chinese managers were invited to check whether the Chinese version of questionnaire was totally clear. Based on their feedback, a few minor changes were applied to increasing clarity.

The development of dynamic capability could be contingent on the dynamics of the environment. China offers a rich context to test digital transformation dynamic capability because its complex, fast-changing nature makes it critical for companies to survive and prosper in this country. The survey was conducted between July and August of 2020. The data covered different manufacturing industries such as electronics, automobile, and pharmaceuticals. Finally, collect 98 questionnaires and analyze using smart PLS 3.

5. Data Analysis.

5.1. Test of the measurement model. The results of data analysis can be presented in two steps. First, in order to ensure the measurement validity and reliability of our theoretical framework, criteria on internal consistency, indicator reliability, convergent validity, and discriminant validity have been evaluated for our constructs. In terms of internal consistency, all of the composite reliability values and Cronbach's α values were > 0.8 (see Table 2). We also achieved good indicator reliability as all the indicator loadings were > 0.7, and most of them were > 0.8. In terms of convergent validity, all AVE (average variance extracted) scores were > 0.5 (see Table 2). In the factor loading comparison of the first-order and second-order factors, the second-order factors are all larger than the first-order factors. All constructs have a good discriminant validity as the indicators' outer loadings on their own constructs were all higher than all their cross loadings with other constructs (see Table 3).

TABLE 1. Demo	graphic statistics
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Item	Category $(N = 98)$	Frequency	Percentage
	Employee	6	6.1
Position	Manager	47	48.1
POSITION	Senior Manager	29	29.5
	Executive (CEO, CMO, CFO, CIO)	16	16.3
	Within 5 years	33	33.7
Founding	Within 5-10 years	26	26.5
Founding year	Within 10-15 years	23	23.5
	More than 15 years	16	16.3
	Automobile	18	18.4
	Machine & Equipment	12	12.2
	Electronics	18	18.4
	Chemical industry	4	4.1
	Textile & Clothing	7	7.1
Main industry type	Food & Beverage	12	12.2
	Medical & Medicine	10	10.2
	Logistics & Distribution	8	8.2
	Information & Communication	0	0
	Others	9	9.2
	Less than 100	18	18.4
	100-300	24	24.5
Employees	300-2000	37	37.7
- •	2000-10000	11	11.2
	More than 10000	8	8.2
	To meet customer needs and customer satisfaction	60	61.2
Digital transformation objectives	To speed up decision making and delivery	31	31.6
	To sustain competitive advantage	64	65.3
	To diminish production and	48	49
	process cost		
	To enhance operational efficiency	52	53.1
	To facilitate new product development	55	56.1
	Others	16	16.3

5.2. Test of the structural model. To evaluate the structural model of our theoretical framework, we examined construct collinearity, the coefficient of determination (R^2) , the significance of path coefficients, and direct and mediation effects [24]. The R^2 scores for the digital transformation capability are 0.400 and firm performance was 0.588. In addition, the tested model has been expanded to examine construct collinearity and the results were excellent (all of the variance inflation factor (VIF) values were far below 5 which further shows that multicollinearity is not an issue for our model/data [25]). Significance of path coefficients was calculated by using a bootstrapping algorithm with 5,000 subsamples for two-tailed test. The numbers and significance of path coefficients can be seen in Figure 2 and Table 4.

5.3. Test of the digital transformation capability mediating effects. In this study, there are two mediating effects (CUO \rightarrow DTC \rightarrow FP, TO \rightarrow DTC \rightarrow FP), in order to verify whether there is mediating effect between digital transformation capability and

Factor	Items	Loadings	AVE	CR	Cronbach's Alpha	
Customer orientation	cuo1	0.728		0.895	0.846	
	cuo2	0.896	0.682			
	cuo3	0.842			0.040	
	cuo5	0.830				
	to1	0.823				
Technology orientation	to2	0.880	0.708	0.907	0.863	
recimology orientation	to4	0.844	0.100	0.307	0.005	
	to5	0.818				
	sen1	0.840				
Sensing	sen3	0.863	0.734	0.917	0.879	
Densing	sen6	0.867	0.734			
	sen7	0.857				
	org1	0.801	0.665	0.888		
Organizing	org2	0.887			0.831	
	org4	0.802			0.001	
	$\operatorname{org}5$	0.766				
	res1	0.868				
Restructuring	res2	0.860	0.723	0.912	0.872	
Restructuring	res3	0.857	0.120		0.012	
	res5	0.814				
	fp1	0.740		0.876		
	fp2	0.780				
Firm performance	fp3	0.762	0.585		0.823	
	fp4	0.814				
	fp5	0.726				

TABLE 2. Factor loadings, AVE, CR, and Cronbach's Alpha values

TABLE 3. Discriminant validity test

	CUO	FP	ORG	RES	SEN	ТО
CUO	0.826					
FP	0.503	0.765				
ORG	0.466	0.588	0.815			
RES	0.383	0.708	0.632	0.850		
SEN	0.533	0.653	0.568	0.563	0.857	
ТО	0.604	0.518	0.434	0.458	0.596	0.842

CUO = Customer Orientation; TO = Technology Orientation; SEN = Sensing; ORG = Organizing; RES = Restructuring; FP = Firm Performance.

Hypothesis	Path	Coefficient	p	t	Result
H1(+)	Customer Orientation \rightarrow Digital Transformation Capability	0.295	0.004**	2.899	Accept
H2(+)	Technology Orientation \rightarrow Digital Transformation Capability	0.409	0.002**	3.164	Accept
H3(+)	Digital Transformation Capability \rightarrow Firm Performance	0.767	0.000***	12.280	Accept

TABLE 4. Hypothesis testing results

***p < 0.001, **p < 0.01, *p < 0.05.



FIGURE 2. Results of model

TABLE 5. Mediation effect

Path	Direct effect	Indirect effect	Total effect	VAF	Mediation type observed
$CUO \rightarrow DTC \rightarrow FP$	0.295(2.899)	0.226(2.682)	0.659	34.29%	Partial Mediation
$TO \rightarrow DTC \rightarrow FP$	0.364(3.164)	0.314(2.948)	0.678	46.31%	Partial Mediation

CUO = Customer Orientation; TO = Technology Orientation; DTC = Digital Transformation Capability; FP = Firm Performance. VAF > 0.80 full mediation, $0.20 \le VAF \le 0.80$ partial mediation, VAF < 0.20 no mediation.

firm performance, we test the mediating effect, and the results show that there are some mediating effects between digital transformation capability and firm performance in these two paths (see Table 5).

6. Discussion and Conclusion.

6.1. **Implications.** This study has important academic significance for the theoretical development of digital transformation capability. First, we have developed a new dynamic capability for digital transformation, emphasizing the importance of digital transformation capability to the company. Secondly, we use empirical analysis to verify the impact of digital transformation capability on firm performance. Third, digital strategic orientation as a resource can have a positive impact on digital transformation capability, in which TO and consumer orientation have a positive impact. Fourth, digital transformation capability, but technology orientation has a greater impact. Fourth, digital transformation capability has partial mediating effect in the relationship between digital strategic orientation and firm performance.

This study also has important practical value for the theoretical development of digital transformation capability. First, in the process of digital transformation, the company should make clear the type of transformation it is in and select the appropriate and matching scheme strategy in terms of company vision and digital technology, so as to achieve the purpose of transformation and upgrading smoothly. Second, in the process of digital transformation, through the collection of the company's daily operation data, customer's use of product service data, market industry, trend and other data, a panorama of the company's daily operation is formed, which reflects the improvement of product research and development, service process improvement, precision marketing, sales model upgrading, inventory optimization and other business improvement. Therefore, it is very important to build the corresponding digital transformation capability.

6.2. Limitations and future research. The limitations of this study are as follows. First, in addition to consumer orientation and technology orientation, other orientations

such as competitor orientation may also influence digital transformation capability. It is necessary to consider other aspects in future research. Second, in addition to digital strategic orientation, digital competence may influence digital transformation capability, and further research is necessary. Third, in addition to the process perspective of dynamic capability, digital transformation capability can also be measured from other aspects.

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