DYNAMIC DIGITAL CAPABILITIES AND COMPETITIVENESS OF SMALL FIRMS IN NIGERIA

Emmanuel T. Emielu, Covenant University
Rowland E. Worlu, Covenant University
Chinonye L. Moses, Covenant University
Emmanuel E. Okoh, Covenant University

ABSTRACT

This study investigated how digital capabilities enable the competitiveness of Nigerian corporate training firms. Competing in the digital era is considered challenging due to the rapid pace of technological and environmental disruptions, which is now made worse by the consequences of the Covid-19 pandemic. New insights are called for and research in this area is still sparse, especially with regards to small business organizations. Data from a survey of 373 CEOs of oil and gas training firms were analysed using IBM SPSS 25 and Partial Least Squares 3.0. From the findings, significant positive associations were found between digital sensing capability and competitive intelligence (β=0.879, R2=0.772, t=23.711>1.96, p=0.000 <0.05); digital seizing capability and distinctive competence (β=0.858, R2=0.736, t=15.541>1.96, p=0.000 <0.05); and digital reconfiguration capability and innovativeness (β=0.884, R2=0.781, t=24.406>1.96, P=0.000<0.05). Therefore, the study concludes that digital capabilities are vital for competitiveness of corporate training firms. With the trend towards online delivery, training firms can respond to competition by building and deploying digital sensing, seizing, and reconfiguration capabilities.

To be more competitive, training firms and SMEs in general, should consider digitalizing efforts at leveraging competitive intelligence, building distinctive competence, and seeking external collaborations to boost innovativeness. This study advanced evidence for the role of dynamic digital capabilities to achieve success with digital business transformation. It further provided an empirical model for small businesses that wish to build digital capabilities for sustainable advantage.

Keywords: Competitiveness, Corporate Training, Digital Transformation, Dynamic Capability, SMEs.

INTRODUCTION

In a global economy driven by diverse market forces and complexities, being competitive is imperative for continuous relevance in the marketplace (Chukwuemeka & Onuoha, 2018; Falciola et al., 2020). Competition takes on an even more critical role in the digital age, because, while digital technologies have the potential to make some firms more competitive, they could equally leave others worse off (Adamik & Nowicki, 2018; Talafidaryani, 2020). This is especially the case for small businesses in developing economies, due to their limited resources and capabilities (Belitski & Liversage, 2019). Digital technologies are now embedded in the way people work, live, interact, and conduct business (Bharadwaj et al., 2013; Verhoef et al., 2019).

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However, maximizing digital technology to be competitive is contingent on the unique capabilities of each firm (Mikalef & Pateli, 2017; Teece, 2007; Warner & Wäger, 2019).

Despite this recognition, the influence of digital capabilities on small business competitiveness seems to have been little studied (Nadeem et al., 2018). While some scholars have implicated entrepreneurial learning (Muhammadiyah & Nurlaela, 2021), human capital management (Salem & Abdien, 2017); and quality management (Yee & Eze, 2012) as drivers of competitiveness, little has been studied from the digital technology and dynamic capability (DC) perspectives (Nwankpa & Roumani, 2016; Teece, 2007; Vial, 2019). This study examines how digital sensing, digital seizing, and digital reconfiguration capabilities enable competitiveness, measured by competitive intelligence, distinctive competence, and innovativeness. By empirically validating specific digital capabilities that influence small business competitiveness in developing economies, this study advanced understanding of the critical role of digital capabilities, which is important for business survival in the present technology era. In addition, the study answers to Warner & Wäger's (2019) call for an empirical validation of *"how incumbent firms in traditional industries build DCs for digital transformation"*.

The rest of the paper covers a review of the literature on digital capability and firm competition; followed by a brief theoretical discussion of dynamic capability, then the methods are presented. The discussion of findings and research agenda conclude this paper.

Digital Capabilities

Digital capabilities refer to combinations of digitally enabled organisational resources to mobilise a strategic response to environmental opportunities and threats. Digital capabilities are especially valuable for innovative customer solutions in the present era (Bolton et al., 2018). Competition in the digital era is being defined by the ability to shape and control digital networks (Iansiti & Lakhani, 2020). Mikalef & Pateli (2017) distinguished between two categories of organizational capability–ordinary and dynamic–and argued that IT infrastructures create sustainable competitive performance when mediated by DCs.

Dynamic Digital Capability

A firm's DCs refer to the embedded routines and practices that help it to deliver superior value and sustain its competitiveness in a manner that defies imitation and duplication by competitors (Teece, 2018). The DC framework can be used to understand the process of digital business transformation as a competitive strategy (Warner & Wäger, 2019; Vial, 2019). DC focuses on the capacity of a firm to protect, enhance, or combine its resources for strategic renewal, in response to perceived threats or opportunities (Talafidaryani, 2020). By adopting IT-enabled DCs, firms can articulate the capabilities needed to compete in a digital environment (Sousa-Zomer et al., 2020) through market capitalising and operational alignment agilities (Mikalef & Pateli, 2017).

Teece (2007) advanced sensing, seizing, and reconfiguring as the three basic clusters of DCs. Warner & Wager (2019) proffered nine micro foundations that underpin these three clusters of DCs. Following Teece (2007) and Warner & Wäger (2019), this study applied digital sensing, digital seizing, and digital reconfiguration to operationalize dynamic digital capability. Sugiyarti & Ardyan (2017) argue that dynamic sensing capabilities enable SME firms to improve their innovation capacity, accelerate market entry, and improve performance. According to Teece (2007), interpreting new events and developments with accuracy and deciding which technologies to pursue, or markets to target, are critical success factors that differentiate firm

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performance. In effect, sensing capability may be regarded as an opportunity discovery activity by organisations. The seizing capability underscores the need to profit from identified opportunities, which if not done effectively, dilutes the efforts and resources spent on digital sensing, and thereby undermining business performance (Sousa-Zomer et al., 2020). Seizing opportunities may involve rapid prototyping, balancing of digital portfolios, and strategic agility as higher-order DCs (Warner & Wäger, 2019). Reconfiguration DCs refer to the set of organizational routines and processes that transform opportunity capture to realize the full potentials of digital strategic change (Vial, 2019; Warner & Wäger, 2019). To execute a digital business strategy, firms need transformative capabilities that efficiently and effectively reconfigure resources (structures, processes, networks, and people) for strategic renewal (Karimi & Walter, 2015). The capacity to implement change requires a variety of managerial and organizational processes, external agents, including sometimes, competitors (Medeiros et al., 2020; Venkatraman, 2017).

Competitiveness

The variables applied to measure competitiveness in this study are competitive intelligence, distinctive competence, and innovativeness. These were selected from among several others because they are associated with the internal dimension of competitiveness (Sousa-Zomer et al., 2020), and therefore, in line with the study's main underpinning theory of dynamic capability, which is an internally referenced source of competitive advantage (Newbert, 2008; Teece, 2007).

In the digital age, competitive intelligence is viewed as a process that goes beyond data collection (Calof & Sewdass, 2020) and a vital leverage for innovation as a matter of survival. Venkatraman (2017) posits that, with the rapidity of the emergence of new products and competitors, and at speeds that leave no room for swift response, today's businesses should look more widely and think more broadly because their competitors are no longer just other companies in the industry, but any company in any industry, that sees an opportunity in a targeted industry. Distinctive competence comprises the aggregate of demonstrable characteristics, skills and activities that an organisation tends to perform better, relative to others within a similar environment (Snow & Hrebiniak, 1980). Sousa & Rocha (2019) described distinctive competences as complex bundles of skills and accumulated knowledge, exercised through organizational processes which translate to order fulfillment, new product development, and service delivery. Innovativeness is compelled by the competitive need to produce a new product, process, or service that is potentially attractive to a market (Dentil & Hemlin, 2012). Bouwman et al. (2019) considered innovativeness in two dimensions: orientation towards openness to new ideas, and capacity to act in innovative ways. From a developing country perspective, Egbetokun et al. (2016) argued that the concept of innovation should include scenarios where products and technologies that may have first been developed elsewhere are modified for local adoption. Lending support to the contextual localisation of innovation, Akosile (2017) opined that the presentation of innovation as a radical and cutting-edge product of big firms in advanced countries is a global standard that unwittingly strips it of its contextual influence, to the disadvantage of developing countries.

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RESEARCH MODEL AND HYPOTHESES

Digital Sensing Capability and Competitive Intelligence

Prior studies suggest competitive intelligence as an enabler of competitiveness (Calof & Swedass, 2020; Maune, 2014). Expectedly, a strong big data analytics capability can enhance competitive intelligence, given the massive volume and speed of digital information flows these days (Mikalef et al., 2020). However, big data analytics, though desirable, may not be easily accessible to small business firms, both in terms of acquisition and utilisation (Belitski & Liversage, 2019). This paper contends that other digital affordances available and affordable to SMEs can enable them to develop their own forms of market, competitor, and technological intelligences (Sugiyarti & Ardyan, 2017), to benefit from such strategic insights. In fact, given the generative nature of digital technology, small businesses can access needed digital capabilities at desirable levels, especially with the ubiquity of subscription business models. Therefore, we hypothesise that

H_1: *Digital sensing capability significantly influences competitive intelligence.*

Digital Seizing Capability and Distinctive Competence

A strong relationship is indicated between strategic positioning choices and human capital, as a distinctive competence (Skaggs & Youndt, 2004). However, despite the recognition by business leaders to invest in digital business transformation, willingness does not necessarily mean readiness or capability. Unique competences are needed to transform digital capabilities into positive performance outcomes. This study holds the view that as a firm engages in digital seizing activities such as rapid prototyping, organizational learning takes place, which is likely to enhance its competence building. Thus, we hypothesise that

H_2: *Digital seizing capability is positively associated with distinctive competence.*

Digital Reconfiguration and Innovation

As regards, digital reconfiguration capability and firm innovativeness, there appears to be direct positive effects between smart human resource management technology, digital task interdependence, and disruptive technology (Ogbeibu et al., 2021). Traditionally, technology and innovation have been closely linked, and digital technology is similarly regarded by researchers and practitioners. It is contended in this study that, an organisation's search for strategic renewal is likely to be strongly influenced in terms of innovation orientation and capacity (Bouwman et al., 2019), by the extent to which it can leverage digital capabilities for on-going strategic renewal. Therefore, the third hypothesis of this study is that

H_3: *Digital reconfiguration capability significantly enhances firm innovativeness.*

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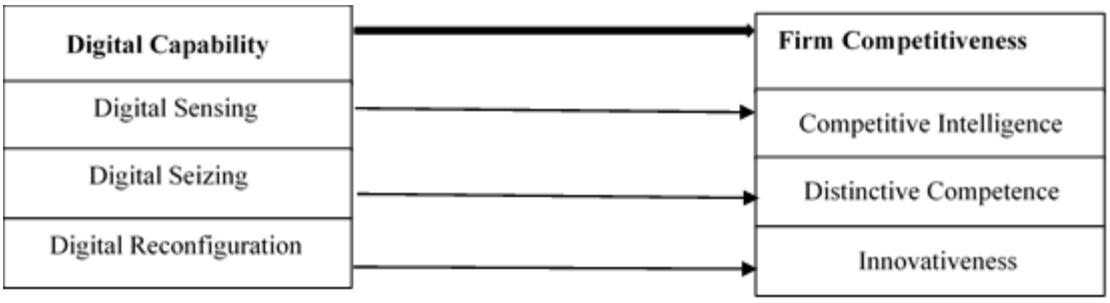

FIGURE 1
CONCEPTUAL MODEL OF THE EFFECT OF DIGITAL DYNAMIC CAPABILITY ON FIRM COMPETITIVENESS

Figure 1 contains the study's conceptual model, illustrating the hypothesized relationships between digital sensing, digital seizing, and digital reconfiguration capabilities and competitive intelligence, distinctive competence, and innovativeness, respectively. The model assumes the direct effects of the dynamic digital capabilities on the associated constructs of firm competitiveness.

RESEARCH METHODS

The population of this study comprised 373 corporate training firms which are members of the association of industry training firms and were approached via the association's secretariat. The association admits only corporate members represented by their CEOs. Member organisations are mostly Small and Medium Enterprises (SMEs), but a few Higher Education Institutions and some Multinational Enterprises hold memberships for strategic reasons. The choice of training and development firms for this study was influenced by the consideration that learning and skills are important enablers of competitiveness in today's digital or knowledge economy. Besides, despite new pressures from energy transition advocates, oil and gas remains a mainstay of the Nigerian economy, deserving scholarly focus on the providers of learning and capacity building.

The sampling method was complete enumeration; this is recommended where the population and sample sizes are likely to be small, so that analysis and generalization can be enriched. At the beginning of the survey in November 2020, the membership list obtained through the Secretariat contained 373 training firms. 262 responses were received and used for the analysis, representing a 70.2% response rate. Data collection was administered through a questionnaire to the CEOs. A prior pilot study of 20 respondents from another association of training firms in the country confirmed the reliability of the instrument, after removing items that returned factor loadings of <0.70. The Cronbach Alpha is a popular measure of reliability by researchers because of its accuracy and effectiveness (Pallant, 2005). All the questions were close ended to ensure uniformity of responses. The rating was based on a 5-point Likert scale ranging from 5-Strongly Agree to 1-Strongly Disagree. A 5-point Likert scale gives respondents the independence to have a balanced level of choice and neutrality, and a symmetric way of rating (Joshi et al., 2015).

The data were analysed using IBM SPSS v.22 statistical procedures, while Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to clarify the relationships and test

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the model for fitness. Model testing indicated a good fit, free of common method bias. With PLS-SEM, researchers can represent complex relationships between latent or theoretical constructs in a structured way, and estimate the model fit from the empirical data (van Riel et al., 2017).

RESEARCH FINDINGS

In Appendix, Tables A1 & A2 shows the reliability of the factor loadings which were confirmed and determined significant at $p \leq 05$ and $t \geq 1.96$. Similarly, convergent validity was established for all the loading items at AVE $\geq$ 0.5. Table A3 (a-c), also in Appendix, shows the correlation matrices of the discriminant validity for each set of the observed variables, indicating that all the diagonal elements of the constructs outperformed the largest squared association between them.

Table 1
STRUCTURAL MODEL FOR DIGITAL CAPABILITY AND FIRM COMPETITIVENESS

Hypothesis	Path Coefficient	R^2	Std. Dev	T-value	P-value	Remarks
Digital Sensing → Competitive Intelligence	0.879	0.772	0.037	23.711	0.000	Hypothesis is supported
Digital Seizing → Distinctive Competence	0.858	0.736	0.0575	15.540	0.000	Hypothesis is supported
Digital Reconfiguration → Innovativeness	0.884	0.781	0.036	24.406	0.000	Hypothesis is supported

The summary of the empirical results is presented in Table 1. The broad research objective of the study was to investigate the effect of dynamic digital capabilities and competitiveness of training firms in Nigeria. Based on the results, all the hypotheses were supported in their alternate forms. Significant positive associations were found between digital sensing capability and competitive intelligence (β=0.879, R^2=0.772, t=23.711>1.96, p=0.000 <0.05); digital seizing capability and distinctive competence (β=0.858, R^2=0.736, t=15.541>1.96, p=0.000<0.05); and digital reconfiguration capability and innovativeness (β= 0.884, R^2=0.781, t=24.406>1.96, P=0.000<0.05). Digital reconfiguration and innovativeness exhibited the strongest relationship which is a testament to the imperative of organisational capability for strategic renewal (Mikalef & Pateli, 2017). Evidently, the best efforts at digital sensing and digital seizing can only be effective if choices made, and resources committed are truly agile and aligned with environment and market conditions, which is the purview of the dynamic reconfiguration capability. However, digital sensing capability ranks closely behind digital reconfiguration in significance. This is in line with the literature that digital business transformation is essentially a strategic renewal process that is innovation-driven, based on on-going intelligence about environmental dynamics, and focused on delivering superior customer value (Vial, 2019). Significantly, the study's findings validate the work of Warner & Wäger (2019) incumbent firms sustain their competitiveness relevance in the emergent digital economy, by building appropriate digitally enabled DCs.

Furthermore, the significant relationship between digital re-configuration and innovativeness is severally supported in the literature. Teece (2007) opined that digital reconfiguration calls for continuous alignment and re-alignment of tangible and intangible assets. Adeosun et al. (2021) found learning capabilities as a significant predictor of process and

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technological innovations. Furthermore, knowledge management and innovation were reported as important capabilities for driving organisational performance (Ardi et al., 2020). Besides, Olaleye et al. (2021) reported that innovation predicts a firm's resilience when mediated by strategic agility. Therefore, it may be surmised that digital reconfiguration enables the agile utilisation of external and internal firm resources to stimulate firm innovativeness, achieve competitiveness, and drive performance.

Seeking new accreditations and affiliations is top on the agenda for innovativeness apparently because of the need to constantly evolve learning in an industry known for its specialised global skills. This is in line with another resercher who identified success factors of training companies to comprise, qualified trainers and unique and adapted curricula. This requires the combination of market sensing, opportunity identification and the recombination of existing or new resources and capabilities in innovative ways to make a unique learning impact. For the training firms, implementing new digital projects may mean the introduction of digital learning tools like Learning Management Systems, or using data analytics to customise or personalise learning.

CONCLUSION

The study evaluated the effect of dynamic digital capabilities on firm competitiveness and confirmed a significant positive association. Therefore, the study concludes that digital capabilities are vital for competitiveness of SMEs in developing countries. With the trend towards online training, training firms can respond to competition by building and deploying digital sensing, seizing, and reconfiguration capabilities. Online learning will require much more than PowerPoint and Zoom to be effective and competitive. Organisational DCs enabled by digital technologies will be needed for competitive success.

Theoretically, the study provided empirical support for the validity of the DC theory as being appropriate for researching digital business transformation. DC theory posits that sustainable competitive advantage goes to firms that are better at leveraging agile capabilities like sensing, seizing, and reconfigurating, to apprehend and respond to rapidly changing environments. Practically, an empirical model for research and management practice is contributed, that established digital sensing, digital seizing, digital reconfiguration, as predictors of competitive performance. To be more competitive, training firms and SMEs in general, should consider digitalizing competitive intelligence gathering, building distinctive competences, and seeking external collaborations to boost innovativeness. There is also a need to be more intentional at building digital awareness.

Limitations and Research Agenda

The geographical and sectoral scope of this study is limited to Nigerian training firms. Other industries or regions may be considered to validate the study's findings. Secondly, the research was based only on questionnaire, for reasons already given under methodology. Future studies incorporating in-depth interviews are suggested. Further studies may also consider extending this study's hypotheses or using other theoretical frameworks such as, Complexity Theory, Organisational Learning Theory, or Technology–Organisation–Environment Theory.

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APPENDIX

Table of Measurement Model Items

Table A1
CONSTRUCT VALIDITY AND RELIABILITY OF STUDY CONSTRUCTS

	LD	VIF	TS	PV	AVE	CR	CA
Constructs	≥ 0.7	<3.0	>1.96	<.05	≥0.5	≥ 0.8	> 0.7
Digital Sensing Capability (DigSen)					0.823	0.959	0.946
DigSen1	0.931	2.622	48.242	0.000			
DigSen2	0.904	2.680	33.246	0.000			
DigSen3	0.901	2.579	37.427	0.000			
DigSen4	0.914	2.067	45.081	0.000			
DigSen5	0.888	2.180	25.356	0.000			
Competitive Intelligence (ComInt)					0.819	0.958	0.945
ComInt1	0.931	2.158	35.919	0.000			
ComInt2	0.912	2.253	41.461	0.000			
ComInt3	0.945	3.012	65.869	0.000			
ComInt4	0.886	2.308	22.266	0.000			
ComInt5	0.867	2.751	19.249	0.000			
Digital Seizing Capability (DigSei)					0.838	0.939	0.903
DigSei1	0.900	2.569	18.912	0.000			
DigSei2	0.933	2.496	57.530	0.000			
DigSei3	0.914	2.937	42.117	0.000			
Distinctive Competence (DisCom)					0.808	0.977	0.973
DisCom1	0.915	3.002	38.249	0.000			
DisCom2	0.924	3.102	38.279	0.000			
DisCom3	0.922	3.120	34.417	0.000			
DisCom4	0.923	2.657	39.541	0.000			
DisCom5	0.928	2.356	41.773	0.000			
DisCom6	0.915	2.622	30.812	0.000			
DisCom7	0.793	2.846	11.459	0.000			
DisCom8	0.933	2.247	43.550	0.000			
DisCom9	0.918	2.854	39.271	0.000			
DisCom10	0.801	2.792	13.223	0.000			

Table A2
CONSTRUCT VALIDITY AND RELIABILITY OF STUDY CONSTRUCTS

Digital Reconfiguration (DigRec)					0.879	0.956	0.931
DigRec1	0.929	2.624	42.353	0.000			
DigRec2	0.933	2.581	50.824	0.000			
DigRec3	0.951	2.639	74.233	0.000			
Innovativeness (Inn)					0.818	0.969	0.963
Inn1	0.830	2.789	16.751	0.000			
Inn2	0.914	2.571	34.514	0.000			
Inn3	0.925	2.671	38.555	0.000			
Inn4	0.925	2.384	44.397	0.000			
Inn5	0.912	2.734	33.837	0.000			
Inn6	0.922	2.858	42.780	0.000			
Inn7	0.899	2.384	24.684	0.000			

Note: LD=Loading; VIF=Variance Inflation Factor; TS=t-statistics; PV=p-value; AVE=Average Variance Extracted; CR=Composite Reliability; CA=Cronbach's Alpha

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Table 3a DISCRIMINANT VALIDITY FOR HYPOTHESIS ONE				
	ComInt	**DigSen**	**DisCom**	**Inn**
ComInt	0.905			
DigSen	0.879	0.907		
DisCom	0.909	0.844	0.899	
Inn	0.919	0.872	0.928	0.904

Table 3b DISCRIMINANT VALIDITY FOR HYPOTHESIS TWO				
	ComInt	**DigSei**	**DisCom**	**Inn**
ComInt	0.905			
DigSei	0.892	0.915		
DisCom	0.910	0.858	0.899	
Inn	0.920	0.896	0.928	0.904

Table 3c DISCRIMINANT VALIDITY FOR HYPOTHESIS THREE				
	ComInt	**DigRec**	**DisCom**	**Inn**
ComInt	0.905			
DigRec	0.856	0.938		
DisCom	0.912	0.865	0.899	
Inn	0.921	0.884	0.927	0.904

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