The Role of Dynamic Capabilities in Improving Readiness for Digital Business Transformation

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Abstract
As digital technologies development continues, as the risk for existing business in all industries increases due to the new innovated, digital-based products and services that are changing market conditions. Digital transformation strategy enables incumbent firms to keep their existence in the digital era. However, firms need first to assess their readiness for digital transformation strategy requirements. The lack of agreed model that explains the process of digital transformation strategy in general and on firm’s readiness for this strategy were enough justifications for the researcher to conduct this study. The researcher fills this gap by proposing new model for digital transformation readiness. The study also examines a mediation role for dynamic capabilities in reconfiguring operational capabilities in a firm so that to enhance its readiness for digital transformation strategy. The findings of this research shall empirically validate the proposed model and it will reveal the role of dynamic capabilities in improving firm’s digital transformation readiness. The research indicates that dynamic capabilities are developed by other organizational capabilities such as culture values and ICT capabilities. It also points to the essential role of dynamic capabilities in adapting operational capabilities for any market change. Organizations shall prepare themselves for digital transformation strategy by focusing on developing capabilities needed for this strategy to reduce the risk of failure. The proposed model can be considered as a significant contribution in the area of the digital transformation strategy. The model in practical wise will help managers to assess their firm’s readiness for digital transformation strategy and fill any gap identified. The proposed model for digital transformation readiness is recommended to be further extended to include more effecting factors including technological and environmental factors.

Keywords: Digital; Transformation; Dynamic; Readiness; Capabilities

BACKGROUND AND INTRODUCTION
Pre-digital firms are facing real threat due to digital disruption facilitated by the rapid digital technology’s development. Digital disruption happened when new digital-based business players introduced new innovated services and products based on digital technologies so that to it can threaten traditional services and products. Due to digital disruption, the market structure and the rules of competition have been changed and completely different competitive opportunities and risks are result (Porter & Heppelmann, 2014). Start-ups such as Uber, WhatsApp, Amazon, Airbnb surprise business leaders with their capabilities to create attractive digital-based business models (Sanchez, 2017). The mention disruption is now affecting strategies of many industries including transportation, telecommunication and others (Karimi & Walter, 2015, Stewart et al.; 2016). Enterprises of all sizes in different industries are discovering that for themselves and hence they have to deploy an emerging set of new business practices that are based on the new digital tools and technologies (Hanna, 2011). Telecommunication industry as other industries is being disrupted by digital services that offer telecommunication media for people over the internet and they have been known as Over The Top (OTT) services such as Skype, WhatsApp, Imo and others. Such services are substituting traditional telecommunication services due to its attractive features for users (Onyeji-Nwogu et. al, 2017). As evidence of such impact, the researcher has combined annual telecommunication traffic reports and growth in Internet users in Yemen provided by the Ministry of Telecommunication in Yemen that includes reports for the period of 2006 - 2018. The graph in Figure 1 below shows growth in International Direct Dialing (IDD) and Mobile Messaging before 2012. By 2012 and while Internet users continue to grow and with the increasing use of digital communication applications over the internet such as Skype, WhatsApp and other applications that grant customer better experience, the traditional telecommunication services usage declining. For example, IDD annual growth reached 40% in 2008 then dropped to negative growth of 20% by end 2017. Similarly, the total number of mobile SMS messaging dropped from 76 Million messages in 2008 to less than 38 Million messages in 2017. Hence both IDD and SMS messaging usage decline with time as Internet users keep
As per (Mihardjo & Sasmoko, 2019), telecommunication companies among other businesses need to consider adapting their services in a new way and to develop new featured digital capabilities to be able to address the digital disruption they are facing. Digital transformation refers to the change process that is enabled by digital technologies (Larjovuori et al., 2018). It is fundamentally changing existing value chains across industries and enables essential business enhancement (Afandi, 2017). Not only digital transformation enables firms to respond to digital disruptors, it is even can make them able to disrupt other businesses. Although the digital transformation becomes a hot topic for researchers and already being investigated by my scholars, there is still no agreed framework for digital transformation (Mihardjo & Sasmoko, 2019; Afandi, 2017). Such framework that lead to understanding the process to achieve digital business transformation objectives in a firm. Many managers still see digital transformation ambiguous process to implement (Afandi, 2017). According to Fitzgerald et al. (2014), many firms struggle to achieve the expected benefits from this process. Scholars (Mihardjo & Sasmoko, 2019; Sow & Aborbie, 2018; Orji, 2019, Afandi, 2017) refer these difficulties to the missing capabilities and skills required by digital transformation. This justified knowledge gap motivated the researcher to conduct this study. The researcher is proposing a model to assess firms’ readiness to proceed with digital business transformation. The researcher is also examining the role of dynamic capabilities in reconfiguring firms’ operational capabilities to enhance their readiness for digital business transformation. This conceptual paper include introduction (objective, questions, problem statement and background of the study), literature review (hypothesis development, underpinning theory, operational definition, theoretical framework), discussion and conclusion.

LITERATURE REVIEW

Due to the spread of new disruptive products that impact many industries, the digital transformation strategy become an important area to be investigated by many scholars. The continuous technological development has changed the principles of market dominant and competitive advantages rules (Packmohr, Mosconi, Santa-Eulalia, 2020). Hence incumbents need to consider digital transformation strategy if they need to keep in the market. The improved performance of Information and Communication Technologies (ICT) infrastructure will bring many opportunities for communities and enterprises to learn and produce innovative products and services (Hanna, Nagy, 2016). Many Scholars focused on drives and opportunities of digital transformation and its effect on firm’s performance. Regarding the success of digital transformation, some scholars found that the digital transformation success depend on factors related to customer centricity, governance and innovation as Mhlungu et al. (2018) found. Others found that IT capabilities plays an important role in digital transformation success Hsu et al. (2018). Others see strategy, people, regulation, customer readiness are among important success factors for digital transformation (Sanchez, M. A. (2017), Parida et al., (2016), Aboelmaged, M. G. (2014), Müller, E., & Hopf, H. (2017)). The researcher decided to consider the capabilities-based approach to develop a new model for digital transformation readiness for the reason that digital transformation cannot be successful process without organizational capabilities that can drive this process. The readiness of firms for digital transformation being addressed in this study is an important topic in relation to digital transformation. The researcher focuses in this study on the association relationship between operational capabilities and in particular ICT capabilities and organizational culture and the firm’s organizational readiness for digital transformation. The focus also will be on a possible mediation role for dynamic capabilities to prepare the operational capabilities for the digital transformation strategy. The outcome of this study will constitute of a model for the digital transformation readiness that can be a contribution in knowledge body of the digital transformation strategy, in the next sections, the researcher presents some definitions for the main themes of this study.

Digital Business Transformation

To survive in a digital environment, incumbents are required to start planning for their digital transformation strategy. Many definitions for digital transformation have been found in literature. While the essence of digital transformation strategy is the use of new digital technologies, such as G5, artificial intelligence, cloud computing, and Internet of things (IoT) technologies to lead the business to major improvements (Warner & Wäger, 2019), while digitization is concern on converting functions in a firm from manual to digital by using computers, Digital Transformation or digitalization has a comprehensive concept that effects all aspects in a firm operation (Bharadwaj et al. 2013; Porter & Heppelmann 2014). Digital transformation refers to the major transformation of the entire business world through developing new business models based on the digital technologies with a fundamental effect on customer experience PwC (2013) as cited by (Schallmo & Williams, 2018). With digital technologies, firms can improve their business performance to keep competitive and adopt possible opportunities (Stief et al., 2016). It is as per (Hartl, 2019) a large-scale business transformation that completely affects various areas of the firm. Companies that don’t consider digital transformation strategy today will find it difficult to keep its competitiveness advantage in a digital-based environment (Zeike et al., 2019). Liu et al. (2011) also defined digital transformation as an organizational transformation that integrates digital technologies and business processes in a digital economy. A digital transformation process and digital projects cannot run separately from the rest of the company. Hence, digital transformation is a common effort that expects the inclusion of all teams (Ivančić et al., 2019). Many researchers tried to...
explain the digital transformation phenomenon via different frameworks found in literature. Nevertheless, there is still no consensus on a single framework and there is lack of model for digital transformation that can answer all aspect in relation to this strategy. Fitzgerald et al. (2013) found that majority of companies facing challenge to attain all benefits from this process. It is vital to mention that migration into digital world is not a transit change. It is however a migration through many steps including technological and organizational modification (Rajnai & Kocsis, 2018). Although digital technologies are the main tool for the digital transformation strategy, technology is still only one requirement and the other related changes inside and outside companies are much more important and impact the entire organizational and operational structure (Müller & Hopf, 2017).

Organizational Readiness for Digital Transformation

The readiness for change is a term that has been used by scholars since long time ago. It is defined by (Albano, 2010) as people preparedness level within a firm to execute organizational development practices. The organizational readiness is known as an important prerequisite for the successful change within an organization. The effectiveness of organizational change is usually influenced by many factors and the readiness is on top of those factors (Armenakis et al., 1993). The readiness assessment is needed prior major change within an organization. This assessment expose any gaps that might be identified between their own estimation concerning the planned change and that of others (Holt et al., 2007). Resources readiness provides organizations with the capability to be defensive and proactive in some cases in adopting new technologies or designing innovated services (Arfin, 2016). Organizational readiness for change was described by (Weiner, 2009) by the shared commitment and belief of the organization member their capability to perform that change.

Many changes failed because organizational readiness was not assessed for this change (Albano, 2010). Among many approaches that conceptualize organizational readiness for change found in literature are two approaches presented by (Armenakis et al., 1993). The first approach considers the organizational readiness for change has relation to the psychological state of organizational team. According to this view, Organizational readiness can be assessed by team’s Change Commitment and Change efficacy (Albano, 2010). The second approach embraces the professional view as suggested by Campbell et al. (2001). Campbell proposed six factors of eHealth readiness (turf, efficacy, practice context, apprehension, time to learn and ownership). Holt et al., (2007) study result in five factors expected to be the essential impactful readiness factors, confirmed empirically. Those factors include (a) discrepancy: content of the change, (b) efficacy: capability of performing the change, (c) organizational valence: the important of the change for the organization, (d) management support: the leader commitment for the change, and (e) personal valence: the benefits of the change for personals. The researcher is considering those factors to measure the organizational readiness construct throughout this study.

ICT Capabilities

IT plays an important role in improving performance in organizations. Since introduced in 1970s, IT automated many functions in organizations. There are huge number of studies found in literature focusing on the role of IT in business (Bharadwaj 2000; Wade and Hulland 2004, Dehning and Richardson 2002). In the digital economics, firms increase their dependency on advanced information and communication technologies to accomplish tasks and delivering services Hsu et al. (2006). IT capability is one of the driving forces for digital transformation as per many studies. The IT capability motivates the role of technology in achieving the digital transformation targets (Sambamurthy et al., 2003; Chen et al., 2014) as cited by Nwankpa and Roumani, (2016.). ICT capabilities on the other hand can impact digital transformation indirectly by its role in developing dynamic capabilities needed for digital transformation (Karimi & Walter, 2015; Warner & Wäger, 2019). Parida et al., (2016) investigated the role of ICT in developing dynamic capabilities and his study revealed that ICT capabilities have an important role in developing dynamic capabilities of small firms. One of the major definitions of digital transformation considers it as organizational migration to big data, cloud computing, mobile and social media environments Nwankpa and Roumani, (2016.). All these applications are IT-based systems that need the ICT capabilities to be secured by team. ICT capabilities can be described by its components. Parida et al., (2016) used three components to measure ICT capabilities in a firm including:

1- ICT internal Use. This component is related to the use of IT systems to improve internal operations. This can be expressed by reducing operation cost, improving decision-making process, offering better ways for service delivery as well as enhance financial and administrative operations.

2- ICT use for collaboration: This component is related to the use of ICT applications in identifying, establishing and maintaining collaboration with new business external partners including contractors, agents and suppliers Tan et al., 2010). The great offers of ICT systems in information exchange, knowledge sharing can help to build a long terms collaboration between firms and external business partners (Parida et al., 2016).

3- ICT use for Communication: ICT systems also offers firms tools for communication that can address the geographical presence of business branches or people which in turn improve work process regardless of offices locations. ICT systems also allow team to accomplish their tasks despite their attendance in offices as ICT allow connections to the system remotely. The Hypothesis that shall be tested:

H1: ICT capabilities is positively influencing Organizational readiness for digital transformation.

Organizational Culture

Digital business transformation strategy execution is not straightforward process, and firms need to considers many conditions before and during digital transformation and organizational culture is among these considerations (Osmundsen et al., 2018). To meet business improvements, comprehensive organizational changes are needed. To meet changes in the market as well as changes in customer preferences and experience, firms need to transform their entire business operations including structures, processes and culture values (Fitzgerald et al. 2014). Culture is often being considered as an essential strategic asset that enable business transformation and the effective use of digital
According to McKinsey’s survey of global executives conducted on 2016, found that culture is the most significant barrier to digital effectiveness as more than 33% of respondents consider cultural and behavioral attributes have direct impact to enable the effective use of digital opportunities (Goran et al, 2016).

Dynamic Capabilities
As the technological development continues to impact the business environment conditions and change its competitiveness rules, the more need for special organizational capabilities that can respond to such dynamic changing of environment. With this new organizational capabilities, organizations and employees can learn quickly, identify new opportunities and build new assets strategies (Teece, 2007). Teece, Pisano, and Shuen (1997) have developed the new concept of dynamic capabilities and defined such capabilities by the abilities of firms to integrate, build, and reconfigure internal resources and capabilities to deal with dynamic environments (Teece, 2007). Some scholars consider dynamic capabilities framework as extension for Resources-Based view (RBV) that have been used to describe the static market (Helfat & Peteraf, 2003, Mikalef & Pateli, 2017; Teece, 2007, Reilly & Pamela Sharkey, 2009). It becomes known among scholars that dynamic capabilities are related to turbulent environment.

Despite the high attention that dynamic capabilities have been received by many scholars, these capabilities still lack of understanding in terms of what it constitutes of and how they can be developed (Pavlou & El Sawy, 2011). In the context of digital transformation, few studies were found to investigate the role of dynamic capabilities in digital transformation process. Many studies revealed that dynamic capabilities are among organizational capabilities needed for digital transformation strategy (Wu, 2010, Leonurdus W. Wasono, Mihardjo et al., 2019, Banerjee et al., 2018, Yew et al., 2018, Wang & Ahmed, 2007, Hermano & Martin-Cruz, 2016). The researcher in this study investigates a mediation role for the dynamic capabilities considering that any firm doesn’t possess such capabilities might not able to respond to dynamic markets and will not be in a good position to use the digital transformation to protect its business that been disrupted by digital players. Many frameworks were found to conceptualize dynamic capabilities and to measure the dynamic capabilities. One of those frameworks is the one proposed by Pavlou and El Sawy, (2011). As per this framework, dynamic capabilities involve the following components:

1- Sensing Capability: sensing capabilities includes activities related to searching and frequently scanning the environment for new opportunities. The keep knowledge of environment changes including those related to changes result from the technological development. Organizations can also identify new opportunities by keep getting customers feedback on their products and services. The change of customer feedback could lead to a change in customer preferences due to possible new services they found including new technology related services. Customers in many cases among the earliest to perceive the right to applying new technological ideas (Teece, 2007).

2- Learning capability: In some studies (Zahra and George (2002), Parida et al., (2016)) learning capability is referred to absorptive capability. Executive internal experiences and the absorption of external information as per Parida et al., (2016) are a learning mechanism to create competitive advantages. Knowledge sharing and documenting practices are also learning activities that enhance dynamic capabilities within organizations (Lin & Wu, 2014).

3- Integration capability: Pavlou and El Sawy, (2011) defined integration capabilities as the organization ability to combine internal and external knowledge resources. Teece (2007) also views the knowledge integration as an essential pillar for dynamic capabilities. Activities that include in this capability such as customer information collection, Recording and integrating historical methods and experiences and potential market exploration (Lin & Wu, 2014, Pavlou and El Sawy, 2011). The two hypotheses to be tested are:

H2: Dynamic Capabilities mediates the relationship between ICT capabilities and Organizational Readiness for Digital business transformation.

H4: Dynamic Capabilities mediates the relationship between Organizational Culture and Organizational Readiness for Digital transformation.
UNDERLYING THEORIES
The researcher developed the framework of this study based on three theories in relation to the study. First Resources-Based View (RBV) of Barney, (1986) that refer the success of firms to internal resources and capabilities. RBV stated that firms can attain and sustain competitiveness advantage by developing resources in such way that are difficult to be imitated and such resources to be rare including organization capabilities (Saá-Pérez & García-Falcón, 2002). With the changing conditions of markets of being volatile and face frequent changes due to technologies development, the questions about ability of operational capabilities in continue providing competitive positions increased (Drnevich and Kriauciunas, 2011). Many scholars argue that RBV is dealing with static environment and it was developed before the digital era. Hence Dynamic Capabilities View (DCV) introduced as to update RBV. Some scholars consider DCV as extension for RBV to deal with the changes occurred in the environment due to digital technologies (Mikalef & Pateli, 2017; Reilly & Pamela Sharkey Scott, 2009; Zaidi & Othman, 2012). Dynamic capabilities were separate from operational capabilities, which relate to the current operations of a firm (Arfin, 2016).

The Dynamic capabilities is viewed as responsive for the market changing conditions in which dynamic capabilities to renew existing capabilities to survive the firm to continue to be competitive. (Winter, 2003). The researcher built his conceptual idea from this argument and for this objective, the researcher is interested to examine this concept in the context of digital transformation readiness. Hence the researcher is examining a possible mediation role for the dynamic capabilities between operational capabilities such as ICT capabilities and organizational culture values and the organizational readiness of firms for digital business transformation strategies. The third theory that was used to build the conceptual framework of this study is the Technological, Organizational, Environmental (TOE) framework. TOE framework (shown in Figure 2) was proposed by Tornatzky and Fleischer in 1990 to categorize factors influencing adoption of innovation. It determines three categories of an organization that influence the adoption of technological innovation. The three area include: technological factors, organizational factors and environmental factors (Oliveira & Martins, 2011).

TOE framework was also used extensively in literature where studies addressing the behavior against introducing new technologies. It was also being used in the area of digital transformation by some scholars and to categorize success factors of digital transformation strategy. Among those studies including: (Sun et al., 2018, Leung et al., R. 2015) in adoption of Big Data and (Awa, H. O., Ukoha, O., & Emecheta, B. C. 2016) in adoption of ERP application.

THE THEORETICAL FRAMEWORK
The researcher proposing a Digital Transformation Organizational Readiness (DTOR) model based on RBV, DCV and TOE. The model shows the organizational readiness factors in terms of organizational capabilities involving ICT capabilities and organizational culture values while dynamic capabilities is supposing to have mediation role in this relationship. The theoretical framework shown in figure 3 shows direct association between ICT capabilities and Organizational culture with dynamic capabilities. On the other hand, the dynamic capabilities are having direct relationship with organizational readiness for digital transformation.

DISCUSSION AND CONCLUSION.
This study emphasizes the key role of organizational capabilities in the success of organization when facing any environment change. In relation to dynamic capabilities development, Arfin (2016) mentioned that dynamic capabilities and their antecedents are distinct constructs, and there are several external and internal capabilities and factors that play as enablers that impact the deployment of dynamic capabilities as cited from (Ambrosini and Bowman, 2009). The findings of this study shall verify the role of dynamic capabilities in digital transformation process and how it can affect the readiness of firms for this process. The possibility of dynamic capabilities development by culture values and ICT capabilities shall also be identified. The proposed model will be valuable contribution to the literature in relation to digital transformation. This model will also emphasize the importance of ICT capabilities and the supportive organizational culture values for change to secure the successful operations of digital transformation and to achieve the maximum benefits of this process. The model will also indicate to the importance of dynamic capabilities to make the firm able to respond to changes in the market and especially to effectively use the technological development in sensing and seizing new opportunities and reconfigure internal resources and capabilities to match the changing customer needs. The model from the other hand will assist managers to assess their firms readiness for digital transformation and identify any gaps in terms of organizational capabilities and skills to be addressed. This model still needs to be extended in future studies to include other technological and environmental factors that have impact on firm’s readiness for digital transformation. It is also recommended to examine this model in different industries with different environment conditions.

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CO-AUTHORS CONTRIBUTION
Fakhru1 Anwar Zainol Professor, Faculty of Business and Management. Universiti Sultan Zainal Abidin | UniSZA Prof. Fakhru1 is the main supervisor for this researcher. He is involving in all processes and stages of this project.

Murad Al-Nashmi Professor, Faculty of Business and Management, University of Science & Technology. Prof Murad is a Co-author who has support contribution in some parts of this project.

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