



The role of ICT and innovation in enhancing organizational performance: The catalysing effect of corporate entrepreneurship

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ABSTRACT

Information and communication technologies (ICT)-based innovations and applications have become major drivers of enhanced organizational performance, economic growth, and social change. However, although the body of research that is pertinent to this area has substantially grown, the importance of complementary factors such as corporate entrepreneurship in enhancing the impact of technological innovation on organizational performance has yet to be addressed. This paper develops and tests a framework that depicts and examines the nature of the relationship between ICT-adoption/use and organizational performance in the Lebanese market, taking into consideration the impact that corporate entrepreneurship may have on this relationship. PLS is used to test the proposed relationships along with the significance of the mediation effect of corporate entrepreneurship. A multigroup analysis is also deployed to examine the impact of ICT-use level on the model. The proposed model is proven to be fit, the hypotheses are supported, and the implications are discussed.

1. Introduction

Over the past three decades, the research has shown that organizations initiate corporate entrepreneurship to add to their body of knowledge to facilitate increased revenues (Mcgrath, Venkataraman, & MacMillan, 1994), improved profitability (Zahra, 1993), enhanced competitiveness (Kuratko, Covin, & Garrett, 2009), and innovativeness (Ferreira et al., 2015) as an important potential growth driver (Burgelman & Doz, 2013; Morris, Kuratko, & Covin, 2011; Soriano & Huarng, 2013). This warrants a deeper understanding of corporate entrepreneurship in organizational settings, especially the role it plays in enabling ICT and innovation to be well integrated into an organization's resources and strategies and consequently drive organizational performance to higher levels.

The rapidly changing business environment has led to increased reliance on ICTs to attain and maintain competitiveness, improve profitability, and succeed in today's dynamic market (Shamsuzzoha et al., 2012; Stanimirovic, 2015). This has been a driver of innovation-related activities, all of which tend to be technology-based (Siegel, 2011) and are designed to obtain better efficiency and higher performance (Consoli, 2005; Ferreira et al., 2015; Igun, 2014). However, despite the wide adoption of ICT by organizations in various sectors, several survey reports have found that many projects fail. In 2012, Gartner reported that fewer than 30% of information systems projects such as Business Intelligence meet their business objectives (Saran,

2012) and that 55 to 75% of enterprise resource planning (ERP) projects encounter failure in meeting their intended objectives, with 74.1% of them exceeding costs and 50% not realizing enough benefits (Jacobs, 2012). More recently, according to a study by KPMG, 70% of businesses suffered project failures during 2014, and 50% failed to achieve their intended goals (Amankwah-Amoah, 2016; Erel, 2014).

The above outcomes drive us to question the proper use of the adopted ICT in organizations. According to Kusumaningtyasa and Suwartob (2015) ICT adoption is defined as the “willingness to take the new innovation related to computer and internet”. In fact, the usage of ICT is defined by Blurton (2002) as the “diverse set of technological tools and resources used to communicate and to create, disseminate, store, and manage information”. Accordingly, Manochehri, Al-Esmail, and Ashrafi (2012) state that to benefit from ICT adoption, organizations should provide needed infrastructure and hire skilled ICT personnel. In other words, the necessary means to make effective use of the adopted ICT should be available for it to contribute positively to organizational performance.

The above suggestions draw attention to the importance of having certain complementary factors in an organization to enable better use of ICT and accordingly reaping its benefits towards creating innovative business opportunities and achieving competitive advantage. In this regard, entrepreneurs' ideas and actions are needed to capture the business opportunities made possible by ICT and the resulting innovations; thus, entrepreneurs need to be proficient in the language of

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technology, i.e., in matching technological potential with market changes, new customer needs, emerging problems, and possible opportunities.

This finding sheds light on the importance of examining the extent to which innovation and entrepreneurship can enhance the role played by ICT in galvanizing organizational performance. The previous studies have examined the relationship between ICT adoption and/or use and innovation. The previous research has also studied the role played by corporate entrepreneurship in enhancing organizational performance. While the importance and value of entrepreneurial strategies and actions have been highlighted (Covin & Miles, 1999; Mortara, Napp, Ford, & Minshall, 2011), understanding how corporate entrepreneurship interacts with organizational resources, such as ICT and innovation, has yet to be addressed. This could be attributed to the fact that corporate entrepreneurship has the necessary elements needed by organizations to achieve higher performance and productivity in the rapidly changing global economy (Kuratko & Audretsch, 2013). The previous studies have also examined the relationship between innovation and entrepreneurship (Rosenbusch, Brinckmann, & Bausch, 2011; Zhao, 2005) and reported the importance of entrepreneurial strategies in the achievement of competitive advantage (Roaldsen & Borch, 2011). However, to the best of the authors' knowledge, there is a lack of studies integrating, in the context of a holistic framework, the impact of ICT and ICT-based innovations on organizational performance, taking into consideration the role of corporate entrepreneurship in this relationship.

Taking the Lebanese market into consideration, the purpose of this research is threefold. Drawing on a sound theoretical framework, the first purpose of the study is to propose a holistic and integrated model that explains the relationship between ICT adoption and/or use and organizational innovation levels on one hand and organizational performance on the other. This is important because different companies have different ICT investment strategies, ICT resources, diffusion levels, and innovation capacities (Anaya, Dulaimi, & Abdallah, 2015; Coltman, Tallon, Sharma, & Queiroz, 2015). The second purpose is to examine the role that corporate entrepreneurship may play in the above relationship. This is crucial as it will allow the identification of the means to eliminate or mitigate the impact of the pitfalls that may hinder the efforts to capitalize on the opportunities made possible by ICT capabilities and innovation. Incorporating corporate entrepreneurship into the model is based on a synthesis that will draw upon a review of both the theoretical and empirical research pertinent to ICT, innovation, and corporate entrepreneurship. The third purpose is to assess the impact of ICT on this relationship. The significance of this purpose stems from the fact that technology adoption, i.e., investing in and purchasing IT, cannot be equated with technology use (Lanzolla & Suarez, 2012). Rattner (2014) contends that adopting technology for the mere sake of its adoption is a waste of resources. The author reported case examples of social entrepreneurs successfully using information and communication technologies that helped them to create social impact.

Emphasizing a holistic and dynamic framework linking ICT adoption and/or use, innovation and corporate entrepreneurship to a firm's competitiveness level makes this study useful for academicians, government analysts, ICT developers and strategists, as well as information and innovation specialists. To begin, academicians can use the framework as a foundation for assessing the contribution of each of the four factors that enhance organization performance. Moreover, the flexibility of the model allows it to be used as an integrated tool, or it can be deployed to examine certain selected relationships. In addition, the study can facilitate the understanding of companies' different performance and competitiveness levels. The model will further help ICT managers and decision makers to consider the various challenges and opportunities posed by the new computing models, including wireless and mobile computing, cloud computing, and social media (Buyya, Ranjan, & Calheiros, 2009). Finally, ICT designers and developers will find the study useful in supporting firm strategy-technology fit as it

allows for examination of the impact of every innovation and/or ICT strategy or tool on a company's competitiveness objectives. With the aforementioned purpose in mind, the study addresses the following questions:

- What is the relationship between ICT adoption and/or use and innovation level on one hand and a firm's corporate entrepreneurship and performance on the other?
- How does innovation affect the ICT adoption and/or use—performance relationship?
- How does corporate entrepreneurship affect the ICT adoption and/or use -and -innovation relationship with organizational performance?
- How does ICT use affect the relationships among ICT adoption, innovation, corporate entrepreneurship, and organizational performance?

The remainder of the paper is organized as follows: The previous studies examining ICT adoption and/or use, corporate entrepreneurship, and organizational performance are reviewed. The theoretical frameworks underlying our proposed model and hypothesis are discussed. Next, we describe the research methodology used and present the results of the data analysis. This is followed by a presentation of a discussion about the results. Finally, the study conclusion, limitations as well as implications and recommendations for future research and practice are presented.

2. Theoretical framework

Two theoretical frameworks underpin this research as follows: (1) the dynamic capabilities view (DCV) (Teece, Pisano, & Shuen, 1997), and (2) the theory of Innovation Translation. The dynamic capabilities view endeavours to find sources of value creation and realization – i.e., capabilities – in rapidly changing environments, thus driving a company to better allocate resources and achieve a sustainable competitive advantage (Eisenhardt & Martin, 2000; Teece et al., 1997). Teece et al. (1997) define dynamic capabilities as ‘the ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments’. The dynamic capabilities view attempts to explicitly show how resources can be developed, integrated, and released within a firm using a process approach; it acts as a buffer between firm resources and the changing business environment. Dynamic resources help a firm adjust its resource mix, thereby maintaining the sustainability of its competitive advantage, which otherwise might quickly erode.

The applicability of this view to the information systems research stream has been demonstrated by several researchers (Braganza, Brooks, Nepelski, Ali, & Moro, 2017; Daniel & Wilson, 2003; Wade & Hulland, 2004). Wade and Hulland (2004) considered information systems (IS) to be resources with many features that are pertinent to dynamic capabilities. This stems from the fact that ICT and IS can profoundly support organizations operating in dynamic and rapidly changing markets and conditions. The dynamic capabilities view has been used by many studies examining the contribution of ICT to firm value (e.g., Cepeda & Vera, 2007; Kindstrom, Kowalkowski, & Sandberg, 2013; Rohrbeck, 2010; Tian, Wang, Chen, & Johansson, 2010). ICT helps in the generation, integration, development, and enhancement of key resources over time. E-business, E-commerce, new production methods, new services, new business models, and effective ways for better supply-chain management, customer relationship management, and decision support are some of the many ways that ICT manifests its dynamic capabilities features. This conforms to the theory of innovation (Schumpeter, 1934), which holds that organizations can achieve economic gains and attain competitive advantage by introducing successful innovations and innovatively managing their resources (Davicik & Sharma, 2016). This can be accompanied by a steady

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