

11th International Strategic Management Conference 2015

The effect of dynamic capability to technology adoption and its determinant factors for improving firm's performance; toward a conceptual model

Zainal Arifin^{a,*}, Frmanzah^b

^a PLN Indonesia, Jakarta 12160, Indonesia

^b Universitas Indonesia, Depok 16424, Indonesia

Abstract

Based on TOE framework this paper analyze the influence of the Dynamic capabilities (DCs) associated with technology adoption for improving firm's performance. This study proposed technology adoption as a functional competence/ capability which mediate relationship between DC with firm's performance. It is focusing on the determinant factors of technology adoption at firm level and showing a conceptual model of the indirect effects of DCs at firm level, which can be key predictors of firm performance in dynamic environment. The four determinant factors has been identified are externalities, entrepreneurial leadership, slack resources, and absorptive capability. The results of this research is mostly relevant to top corporate executives (BOD) or top management team (TMT) who seek to provide some supporting "hardware" content, and to improve firm's "software" ability, in order to achieve a successful technology adoption in their organization. A further research for showing its empirical results is highly recommended.

© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of the International Strategic Management Conference

Keywords: Technology Adoption, TOE framework, Dynamic Capability.

1. Introduction

Recently it is widely accepted on strategic management literatures that technological change and innovation are fundamental sources of productivity and sustainable growth (Woodward, 1965; Thompson, 1969; Perrow, 1970; Stevenson, 1983; Markides, 1997; Morris, 1998; Johnson and Scholes, 2002; Acevedo, 2002; O'Mahony and Ark, 2003), technology adoption is a form of strategic innovation which is a fundamentally different way of competing in an existing business (Schumpeter, 1934; Hitt et. al., 2006; Ireland and Webb, 2007; W. Riddell and Song, 2012) and the successful adoption technology in firms is significantly affect their competitive advantages especially firm's

* Corresponding author. Zainal Arifin. Tel. +62-21-725-0550 fax. +62-21-722-7062

Email address: zainal.arifin22@pln.co.id

performance (Porter, 1985, 1990; Barney, 1991; D'Aveni, 1994; Hitt and Brynjolfsson, 1996; Cornford and Smithson, 2003; Rayport and Jaworski, 2004; Hatch, 2005; Kotler and Keller, 2006; Majundar et al., 2013).

Concerning to this issue then some research examining the use of technology in the production process to increase firm's productivity has been conducted in the 19th and 20th centuries (Abramovitz, 1956; Solow, 1957; Stephen and Prescott, 1994; Saloner and Shepard, 1995 etc). Then a range of studies have linked technology to firm performance, as measured through wages, firm productivity, growth, and other factors (Acevedo, 2002). Many researches argue that technology adoption brings down the operational costs (Amado et al., 2010), contributes 6 to 81% marginal increase in output (Brynjolfsson and Hitt, 2000; Adewoje et al., 2012), not only improve the efficiency (cost reduction) but also increases the effectiveness (improve performance and make the organization more flexible and better accountability) (Sabbaghi and Vaidyanathan, 2008; Rusli, 2012), reduce environmental impact instead of lowering energy costs (Bressler et al.; 2011), and also leads to significant reduction in firm mortality (Sinha and Noble, 2008).

However, the impact of technology adoption especially on information and communication technologies (IT/ICT) remains uncertain. The relationship between technology and productivity has long been debated over the last few decades. Some empirical studies in the 1980s and in the early 1990s did not find relevant productivity improvements associated with IT investments (Becchetti et al., 2003). Additionally Berndt and Morrison (1995) also found a negative relationship between profitability and investment in computer equipment. In this context, the notion of productivity paradox of IT was created and has been one of the main issues in IT research areas (Brynjolfsson and Hitt, 1996; Rai et al., 1997). While Shu and Stressmann (2005) noticed that even though Information and communication technologies have been one of the most essential dynamic factors relating all efforts, it cannot improve banks' earnings in terms of return on assets. Eventually a quantitative research by Jawabreh et al. (2012) found that there is a negative correlation between IT adoption with a profit rate of the airlines firm.

This paradox requires further research to examine what are initially the determinant factors of technology adoption? Is its context and content affect the influence to the firm's performance?

2. Literature Review

Recognizing the determinant factors of technology adoption will be highly useful for its successful implementation to achieve the organization objectives (Tornatzky and Fleischer, 1990; Ireland and Webb, 2007). Strategically, the successful adoption technology in firms is significantly affect their competitive advantages especially firm's performance (Porter M., 1985, 1990; Erickson et al., 1990; Barney, 1991; Hitt and Brynjolfsson, 1996; Cornford and Smithson, 2003; Lasry and Callahan, 2004; Rayport and Jaworski, 2004; Kotler and Keller, 2006; Majundar et al., 2013).

Practically using a strategic management cases approach (Wit and Weyer, 2010) technology adoption can be classified into two major emerging contents; IT (Information Technology) or ICT (Information and Communication Technology) and Non-IT adoption. IT/ICT is commonly a general technology which is applicable to all users at many level organization (e.g. internet, computer/laptop, mobile phone, SMS, smart phone, GPS etc) and a specific technology for solving particular industrial problems such as SCM (Supply Chain Management), RFID (Radio Frequency Identification), the Enterprise Resource Planning (ERP) and Electronic Data Interchange (EDI) etc. Otherwise Non-IT is mostly a company specific technology to meet some special need of firms or industry such as: CNC (Computer Numerical Control), CFD (Computerized Fluid Dynamic), 3D scanner, Automation Manufacturing equipments etc. Nevertheless some Non-IT can be classified as system specific technology such as Fuzzy logic, Solar thermal, Artificial intelligence, Photo voltaic, Synthetic fuel and so on.

Then contextually, the study of technology adoption can be approached from several levels (Taylor and Tod, 1995). Some researchers investigated the adoption from a macro-view within social context or at country level (Kiiski and Pohjola, 2002; Ferle et al., 2002). Others have examined this issue at an organizational or intra-firm level (Harrison et al, 1997; Plouffe et al., 2001). Some other research focused to investigate technology adoption by the individual determinants (Mathieson 1991; Davis 1989, Vinkatesh et al., 2003 etc).

Extending Taylor and Todd's (1995) classification, the research on the determinants of technology adoption can be distinguished into three stream; first, those based on intention-based models relying on how users accept or not accept and further use or reject technology; second, diffusion innovation focusing to why and how a new technology spread around organization or community; and third, how the new technology affect the goal, objective and performance of

Download English Version:

<https://daneshyari.com/en/article/1108457>

Download Persian Version:

<https://daneshyari.com/article/1108457>

[Daneshyari.com](https://daneshyari.com)