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# A conceptual model of factors affecting e-procurement usage and impact among Jordanian listed firms: The moderating role of environmental uncertainty


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### ABSTRACT

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E-procurement usage enables the organization to reduce business cost, access wider market and streamlining purchasing processes. Despite these benefits, the government reported showed only 32.6% of the firms in Jordan use e-procurement system. E-procurement usage among Jordanian firms still in early stage. Therefore, it is imperative to conduct further study to recognize the potential and issues of the impact of e-procurement usage on the firm performance. The population of this study consisted of firms listed on Amman Stock Exchange (ASE). Based on Diffusion of Innovations (DOI) theory, Technology, Organization and Environment (TOE) framework and the Resource-Based View (RBV) theory, authors proposed an integrated model to examine the antecedents and impact of e-procurement usage among Jordanian firms. This paper investigates the role of environmental uncertainty in the impact of e-procurement usage on firm performance. Unfortunately, the role of environmental uncertainty is nearly ignored on the impact of e-procurement usage on firm performance. Hence, this paper argues on the interaction between e-procurement usage and performance impact under the role of Environmental Uncertainty. This proposition could improve understanding e-procurement usage.

#### Keywords:

E-procurement usage, firm performance, DOI theory, RBV theory, TOE framework,

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## 1. Introduction

Advances in information technology (IT) across the past two decades have been significant [1]. These advances have enabled more efficient processing of information, including accounting and business information, through the use of IT. Nowadays, Information Technologies made it presence in all kinds of businesses of all sizes and has a significant bearing in extending business productivity. The revolution in Information Communication Technologies (ICT) has resulted in changes in many aspects of people's daily lives around the world [2]. These changes and development have promoted the usage of e-procurement. E-procurement system seeks to achieve greater efficiency in firm performance, by enhancing the performance of purchasing process.

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E-procurement in Jordan has grown significantly over the last few years. As a developing country, Jordan shows readiness for e-procurement compared to other developing countries, the infrastructure technology in Jordan is strong; however, there are still limitations to e-procurement usage in Jordan [3]. Although with the growth of e-procurement in Jordan, there are many challenges enforced to use e-procurement [3]. E-procurement has the potential to integrate developing countries into the global economy and improve trade efficiency globally [4]. Despite the benefits of e-procurement usage, Telecommunications Regulatory Authority (TRA) in Jordan found that not all firms are using e-procurement. According to TRA [5] only 32.6% of the businesses use e-procurement system. Therefore, it is imperative to conduct further study to recognize the potential and issues of the impact of e-procurement usage on the firm performance.

According to Hameed and Counsell [6], there are two stages of adoption, firstly pre-adoption stage secondly post-adoption stage. Researchers focused on the pre-adoption of e-procurement which serves as the first step in innovation rather than e-procurement usage post-adoption which serves as the second step [7, 8]. Hence, this study focus on post-adoption stage (e-procurement usage) among firms in Jordan. The post-adoption stage focus on understanding how to the innovation use. This stage includes innovation design and implementation [9-11].

This study further investigates the contingent effect of external (environmental) factors, specifically, the environmental uncertainty that likely moderates the relationship between e-procurement usage and performance impact as suggested by Melville *et al.* [12]. Wade and Hulland [13] suggested to investigate the technologies impact under a different level of environmental uncertainty. The results would help academicians and researchers to realize why several factors yield inconsistent findings in terms of the associations between many independent latent variables and performance impact [14].

This paper investigates whether the e-procurement impact on firm performance. This paper aims to understand the technological, organizational and environmental determinants of e-procurement usage. By integrating Diffusion of Innovations (DOI) theory, Technology, Organization, Environment (TOE) framework, and Resource-based View (RBV) theory. Previous research has applied the integrated model of the DOI theory, TOE framework, and RBV theory [15, 16]. This paper seeks to explain the factors affect to e-procurement usage and their impact on firm performance.

This study offers several contributions to researchers and practitioners. For researchers, this study has incorporated DOI theory, TOE framework and RBV theory to examine key elements that facilitate or inhibit the firms to e-procurement usage and impact of e-procurement usage on firm performance, and to improve our comprehension of the current e-procurement usage among Jordanian firms. As for the practitioners, this study focuses on TOE factors that promote greater use e-procurement and to offer a number of suggestions to senior management to facilitate greater diffusion of e-procurement technologies.

This paper is divided into three parts. Part one comprises the literature review while part two comprises the proposed model and a list of research hypotheses built using the theories. Lastly, part three contains the conclusion and the discussion on the implications of this paper.

## 2. Literature Review

E-procurement refers to the use of IS in the purchase process [17, 18]. Abu-Elsamen [17] defined e-procurement as “a comprehensive process of establishing agreements for the acquisition of products or services (contracting) or purchase products or services in exchange for payment (purchase) electronically” (p. 144). E-procurement is a Business to Business (B2B) purchasing

practice that use Electronic Commerce (e-commerce) to identify potential sources of supply, purchase services and goods, transfer payment, and interact with suppliers [19]. E-procurement enables the organization to reduce business costs, reduce purchasing time, accessing wider markets and streamlining purchasing processes [20]. E-procurement has provided an opportunity for top managers to boost the profitability and competitiveness of the businesses by smooth purchase order processes, expanding supplier bases, simplifying purchase payment and reducing cost [21]. According to De Boer Harink and Heijboer [22], e-procurement is consisting of many applications, which includes esourcing, e-tendering, e-information, e-reverse, e-auction, e-MRO, Web-based enterprise resource planning (ERP) and e-collaboration. The primary objective of e-procurement usage is to improve the firm performance, businesses use e-procurement with the hope of improving managerial effectiveness, internal efficiency, coordination and cost reduction [23]. According to Lin and Lin [24], business organizations increasingly attempt to improve their performance by using internet-based technologies that facilitate and improve the share of information, transactions, improve customer service and strengthen coordination with trading partners. A few studies in the middle east especially in Jordan investigated the factors that effect on e-procurement usage among businesses [3,25, 26]. This paper serves to investigate the factors that affect the usage of e-procurement among Jordanian firms and the role of environmental uncertainty between e-procurement usage and firm performance. This information is useful for managers to reduce uncertainty in decision making, improved ability of planning and controlling activities [16].

### 3. Conceptual Framework and Hypotheses

The present study's conceptual framework incorporates DOI theory, TOE framework, and RBV theory. This paper investigates factors influencing the use of e-procurement by listed companies in Amman Stock Exchange (ASE) from different contexts as well as the impact of e-procurement usage on the firm performance. The three main factors that influence on e-procurement usage are examined from the contexts of technology, organization, and environment. The hypotheses of the study play a major role in completing the research model. Figure 1 exhibits a research framework.

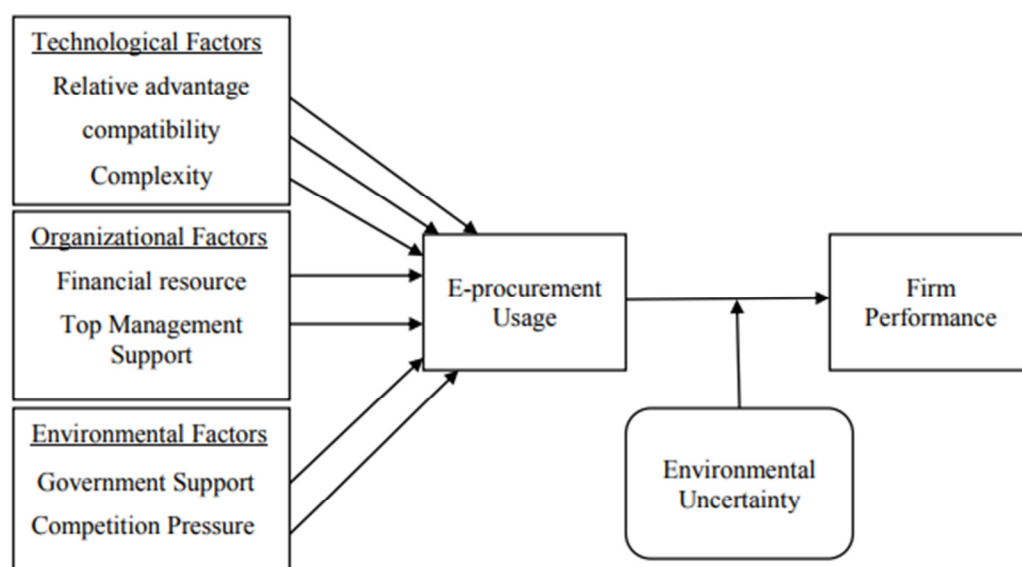


Fig. 1. Research framework

### 3.1 Technological Factors

In terms of technical factors that are associated with e-procurement usage, the literature has identified many technical factors that affect the usage of e-procurement.

#### 3.1.1 Relative advantage

Relative advantage is defined as the degree to which an innovation is perceived as better than the idea it supersedes [27]. Relative advantage is one of the most important factors in IS usage [28]. Relative advantage and adoption/usage are found to be positively related [29, 30]. Thus, this study hypothesizes the following:

H1: Relative advantage have a positive effect on e-procurement usage.

#### 3.1.2 Compatibility

Compatibility defined is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of the potential adopters [27]. Compatibility consider how existing processes are similar to the processes required to use e-procurement. E-procurement usage demands new skills and methods to use it correctly [31]. The perceived compatibility of e-procurement usage could increase the usage. Thus, this study hypothesizes the following:

H2: compatibility have a positive effect on e-procurement usage.

#### 3.1.3 Complexity

Rogers [11] defines complexity as "the degree to which an innovation is perceived as difficult to understand and to use" (p. 257). When the complexity of innovation increases, the rate of IT application decreases [32]. Hence, this paper hypothesizes the following:

H3: Complexity have a negative effect on e-procurement usage.

### 3.2 Organizational Factors

The organizational factor represents different mechanisms, structures, and characteristics that influence the propensity of adoption and assimilation of an innovation [33].

#### 3.2.1 Financial resource

Previous studies showed that financial resource is also a critical factor for technology implementation [16, 34, 35]. Due to the fact that e-procurement usage is an investment in software, hardware, system integration and employee training, sufficient financial resource is required in order to help businesses in developing e-procurement system [36]. Businesses that dedicate greater financial resources to web based development and IS are more likely to achieve success in e-procurement usage [37]. Hence, this paper hypothesizes the following:

H4: Financial resources have a positive effect on e-procurement usage.

### 3.2.2 Top management support

Premkumar [38] defined top management support as the level of the effort and resource support for innovation given by the top management. Top management support is a driver for IS adoption/ usage in Jordan [39], which play important role in the adoption and diffusion of IS in other developing countries [40, 41]. In addition, the managers need to ensure that e-procurement is used in ways compatible with the firm practices, values, technology infrastructure, and strategy [42]. The organization inclines to adopt and use new technology innovation especially when the top management supports the innovation and this will eventually generate positive outcomes [41]. Hence, this paper hypothesizes the following:

H5: Top management supports have a positive effect on e-procurement usage.

### 3.3 Environmental Factors

Jeyaraj *et al.*, [43] defined environmental factors as exterior elements that are out of the firm's top management control. Researchers found the environmental factors influence to adopt and usage innovations by businesses, the environmental factors examine the organization's external landscape [33]. According to Sutanonpaiboon and Pearson [44] and Pan [45], two major external pressures encountered by businesses are government support and competitive pressure.

#### 3.3.1 Government support

Ifinedo [46] defined government support as to the authority assistance and commitment to encourage and inspire organizations to use and diffuse IS in its context. Many studies have addressed government support for IS adoption and usage as government policies can promote the adoption of IS among businesses [6, 16, 47]. With a supportive government, it will be more likely for firms to adopt new IT. Hence, this paper hypothesizes the following:

H6: Government support has a positive effect on e-procurement usage.

#### 3.3.2 Competition pressure

Zhu and Kraemer [48] defined competitor pressure as a level of pressure from competitors within the environment in which the businesses operate. The competitive pressure is a key determinant of integration and diffusion of innovation. Prior studies have concluded that the competitive pressure is significant influencing on IT/IS usage [40, 16, 49, 34]. This implies that when firms face strong competition, they tend to be more proactive in the implementation of IS [24]. Hence, this paper hypothesizes the following:

H7: Competition pressure has a positive effect on e-procurement usage.

### 3.4 E-Procurement Usage and Firm Performance

E-procurement usage refers to which the organization uses e-procurement [23]. In fact, the ultimate goal of using e-procurement for any firm is to improve firm's performance. The benefits of e-procurement usage divided into two categories, namely effectiveness and efficiency [50].

Effectiveness includes better control over the supply chain, proactive management of key procurement data and higher quality purchasing decisions. Efficiency includes lower procurement costs, more highly organized information, lower cycle time and lower unauthorized buying. Based to Teo and Lai [23] with the more extensive use of e-procurement systems, the benefits of e-procurement increase, when compared to less extensive e-procurement usage, may have differential effects on internal efficiency, managerial effectiveness, cost reduction, and coordination improvement [51]. In the present study, authors use RBV theory to suggest a positive link between e-procurement usage and performance impact. Hence, it is expected that the more usage of e-procurement, will increase impact on the firm performance. Hence, the following hypothesis is proposed:

H8: E-procurement usage has a positive effect on performance impact.

### *3.5 The Moderating role of Environmental Uncertainty on the Relationship between E-Procurement Usage and Firm Performance*

According to Lenz [52] environmental uncertainty refers to the source of events and changing trends that make opportunities and threats for organizations. Ettlie and Reza [53] pointed out that environmental uncertainty can be viewed as unexpected changes of competitors, customers, and technology. Based on Lutfi [16] environmental uncertainty as "the perspective of uncertainty on customers, suppliers, competitors, and technology". Jordan context face uncertain environment; firms request additional information as to smooth the decision making. As such, under highly environmental uncertainty, firms with superior e-procurement usage are more capable to find a wider market, reduce business costs and reduce purchasing time, thus, are more probable to attain greater impact on the firm performance. Lutfi [16] stressed that environmental uncertainty does not moderate the relationship between AIS usage and AIS effectiveness. In another report, Wade *et al.* [13] further point out a stronger relationship between firms' resources such as AIS usage and its impact on firms operating under highly uncertain business environment. According to this argument, authors anticipate that the impact of e-procurement usage on performance impact will be greater under highly environmental uncertainty as illustrated in the following hypothesis: .H9: Environmental uncertainty moderates the relationship between E-procurement usage and performance impact

#### 4. Research Method

This study considers companies listed in Jordan stock market (JSM) directory as a sampling frame to study this issue. 233 Jordanian firms are registered on the Amman Stock Exchange (ASE) [54]. The targeted respondents are top managers of the firms. These type of managers have sufficient understanding of their decision process and can give relatively reliable information and own the ability to fill up the questionnaire [55]. The sample size in the present study is the same as the population size, this approach because of the small population size of 233 firms and the generally low response rate in Jordanian context where the response rate typically falls between 25-29% in organization level [40, 16].

## **5. Conclusion**

The objective of this study is to explore the impact of e-procurement usage on the firm performance from an organizational perspective. Therefore, this study integrated model that draws upon DOI theory and TOE framework to explain the antecedent's factors on e-procurement usage and RBV theory to explain the relationship between e-procurement usage and firm performance under the role of environmental uncertainty. The managers and decision makers can use the



findings of the present study to understand which factors would most probable facilitate the e-procurement usage. Furthermore, the findings of this paper are to enable the decision makers and managers to manage the effects of these factors more effectively.

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