

## **A Review of the Impact of ICT on Business Firms**

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**Abstract:** The importance of using Information Communication Technology (ICT) such as enterprise resource planning (ERP) and electronic commerce (e-commerce) by business firms cannot be overstated. ICT applications have been the major interest of researchers and practitioners due to the benefits that can be generated from these applications.

**The purposes** of this study are to find the impact of ICT technologies and application on business firms. An intensive literature review has been conducted to identify the trends and patterns of academic researches.

**Suggestions** based on the review have been made. There are gaps in the literature pertaining to the role of e-commerce and ERP. More studies needed to fill the gaps.

**The finding** shows that most of the studies have focused on adoption factors, benefits and barriers of e-commerce rather than using e-commerce in area such as productivity and cost. The relationship between ERP and productivity was found to be significant.

**Keywords:** ICT, ERP, E-Commerce, Firm Performance.

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### **1.0 Introduction**

The use of ICT technologies and application has started since 1990s. However, in recent years ICT application such electronic commerce (e-commerce) and ERP has become indispensable for business to survive and thrive. The increased competition forced firms to find sources of competitive advantages and strengthen their competitiveness. The association between the production and e-commerce is new and only few studies have been conducted in this area (e.g Salwani, Marthandan, Norzaidi and Chong, 2009). E-commerce has the capabilities to reduce the cost of operations and maximize the revenues. Therefore, it can be applicable and usable in the production of goods and services. ERP is an integrated system that can bring together all the applications that a company needs in one single system. This enables companies to speed up the decision making process and respond faster to the changes in the market (Madininos, Chatzoudes and Tsairidis, 2011)

The purpose of this study is to investigate the impact of ICT application such as e-commerce and ERP on the production process of companies. It aims as well to highlight the role of each application and find the significance of these applications for business firms.

This study consists of five sections, first section introduction and the next section is the draws methodology of this research. The third section reviews the literatures pertaining to the areas of this study. The fourth section presents the findings of this study. Fifth section concludes the paper and comes up with the recommendations for future research.

### **2.0 Methodology**

This paper aims to review the literature to find pattern and trends of using ICT applications in the business firms. The methodology that this research is using is intensive literature review .i.e. the research is using secondary data. The data collected from previous studies. The research objectives focused on e-commerce and ERP and their implications.

### **3.0 Literature review**

The extreme competition has led many business firms to search for new more powerful tools. A lot of firms have chosen to use Information and Communication Technologies as outstanding strategies to overcome the competitive environment and achieve a successful business (Sigala, 2003, as cited in Martinez, Gabriel and Navarro, 2010). In fact, these technologies are very important for a firm to create a sustainable competitive advantage (Barney, 1991, Mahoney and Pandian, Chen and Liaw, 2001, as cited in Martinez, Gabriel and Navarro, 2010). But it is clear that firms are confronting the challenge of using these modern technologies and Internet based tools to have an effective business (Cagliano *et al*, 2003, as cited in Martinez, Gabriel and Navarro, 2010). However, in recent years, there has been an outbreak of new (ICTs) for firms that focus on the customer to make decision. Nevertheless, the usage of these new tools is still not enough to have a successful

business (Cagliano et al, 2003, as cited in Martinez, Gabriel and Navarro, 2010). Recent developments in the technological world has generated principal business running forces (San – Jose, Ituralde and Maseda, 2009, as cited in Oluwole and Adewale, 2014), while the results of using ICT are clear in the improvements of productivity of firms (Brynjolfsson and Hiltt, 1996, as cited in Oluwole and Adewale, 2014).

Using ICT tools businesses can be run more powerfully, and they make businesses to be digitally linked (Burhalis, 2003, as cited in Oluwole and Adewale, 2014). Furthermore, the interaction between ICT investment and firm performance has been researched by many researchers, for example, (Bitler, 2001, as cited in Oluwole and Adewale, 2014) studied the relationship between Information and Communication Technology usage and firm performance, when his research showed that there was a big performance diversity between firms that use ICT tools and those that do not depend on these technologies.

Cho, Ozment, & Sink, (2008). DV Firm performance in e-commerce marketplace, IV Logistic outsourcing, logistic capabilities Result i)Logistic capabilities have a positive relationship with firm performance, ii) logistic outsourcing has negative a relationship with firm performance in e-commerce marketplace.

Salwani, Marthandan, Norzaidi & Chong, (2009). DV E-commerce usage which was measured by business performance IV i)technological context .technological competence ii)Organization context . firm size ,firm scope , when technological investment managerial beliefs. iii)Environmental context. Mediator variable were back end integration, frond end functionalities. A moderator variable was e-commerce experience.

Result Technology competency, firm size, firm scope, web-technology investment, pressure intensity, and back-end usage have significant influence on e-commerce usage .Among these variables, back-end integration is found to function as a mediator. E-commerce experience is found to moderate the relationship between e-commerce usage and business performance.

Martínez-Caro & Cegarra-Navarro, (2010) DV Capital productivity, IV Internet-based applications, groupware applications, and collective systems Result, Groupware applications and collective systems have positive a relationship with capital productivity.

Dezdar & Ainin, (2011b). DV ERP implementation success. IV Top management support, training and education, enterprise-wide communication. Result, Top management support, training and education, and enterprise wide communication have a positive and significant relationship with ERP implementation success.

Dezdar & Ainin, (2011a) DV ERP implementation success. IV Project management, and team composition. Result, The relationship between project management and team composition with ERP implementation success is found to be significant.

Shatat, & Udin, (2012). DV SCM performance ,IV Integration, material management, production planning, controlling, and workflow management. Result -There is positive a and significant relationship between integration, material management, production planning, and controlling and SCM performance. -The workflow management does not have a significant relationship with SCM performance.

Hong, Dobrzykowski, & Vonderembse, (2010) DV Mass customization .IV Lean practices, IT use, (enterprise resource planning and e-procurement, e-commerce)Result - Lean practices, e-commerce, and e-procurement have strong relationship, with mass customization performance .However, enterprise resource planning has no relationship with mass customization performance.

Hwang & Min, (2013) DV Supplier Performance ,IV External environment, ERP implementation, and supplier capability. Result,The Internal environment is mediator variable .External environment has little influence on its decision to adopt and implement ERP. through the mediating role of an internal environment, an external environment still indirectly influences the ERP adoption and ERP implementation decision. ERP could enhance the ERP adopter's supplier capability

Maditinos, Chatzoudes & Tsairidis, (2011)IV ERP system effective implementation, IV Top management support, user support , consultant support, conflict resolution, knowledge transfer, communication .Result Consultants support, knowledge transfer, effective communication, conflict resolution are significant factors for the implementation of ERP. Top management support, and users support have no significant relationship

Nurmilaakso, J. M. (2009). DV - labor productivity .IV Internet access, standardized data exchange with the trading partners, enterprise resource planning (ERP) system, and customer relationship management (CRM) website on the Internet, and supply chain management (SCM).Result ,Internet access, standardized data exchange with the trading partners, ERP system, and CRM system contributes significant increases in labor productivity, website on the Internet, and SCM system do not result in a significant increase..

## **4.0 Finding**

The findings of this study are presented as follows:

### **4.1 E-commerce**

E-commerce has become a widely accepted method for business operation. Till 2005 most of the research in e-commerce was exclusively conducted in the western world (Molla, and Licker, 2005). The introduction of e-commerce in the business has participated effectively in reducing the cost and maximizing the revenues of firms. Even though most of the firms use e-commerce for online buying and selling, however, it can be used in other areas such as logistic outsourcing (Cho, Ozment and Sink, 2008). The performance of e-commerce is dependable on many factors that can increase the deployment of e-commerce (Salwani et al., 2009).

#### **4.1.1 Firm Performance with E-commerce**

The use of e-commerce in the business world has benefited companies greatly. Cho et al, (2008) examines the relationship between logistic capability, logistics outsourcing and firm performance. They find a positive relationship between logistic capability and firm performance in the e-commerce market. Logistics outsourcing and firm performance were not found to be positively linked.

Following quantitative approach, Salwani et al., (2009) investigate the impact of e-commerce usage on business performance in the tourism sector in Malaysia. They use moderate variable and mediate ones. The results reveal that technology competency, firm size, firm scope, web-technology investment, pressure intensity, and back-end usage have significant influence on e-commerce usage. Among these variables, back-end integration is found to function as a mediator. E-commerce experience is found to moderate the relationship between e-commerce usage and business performance.

### **4.2 Enterprise Resource Planning**

One of the new applications in business firms is the use of ERP system. ERP systems can be defined as an integrated software package composed of a set of standard functional modules such as production, sales, human resources, finance, etc., which can be adapted to the specific needs of each organization (Laudon and Laudon, 2012). In this section, the use of ERP by business firms and the factors that enhance the adoption of ERP is highlighted.

#### **4.2.2 ERP and Productivity**

Nurmilaakso, (2009) in his study investigated the relationship between labor productivity and ICT applications such as: standardized data exchange with the trading partners, enterprise resource planning (ERP) system, and customer relationship management (CRM) , a website on the Internet, and supply chain management (SCM). The finding reveal that Internet access, standardized data exchange with the trading partners, ERP system, and CRM system contribute significant increases in labor productivity, whereas a website on the Internet, or SCM system do not result in a significant increase.

Another study conducted by Martínez-Caro and Cegarra-Navarro (2010) to find the relationship between capital productivity, and internet-based applications, groupware applications, and collective systems. The findings reveal that the relationship between groupware application and collective systems with capital productivity is positive and statistically significant.

The use of ERP in mass customization was investigated by Hong, Dobrzykowski and Vonderembse (2010). They investigated the relationship between lean practices and IT use represented by ERP, e-procurement, and e-commerce. The finding indicates that lean practices, e-commerce, and e-procurement have strong relationships with mass customization performance. However, enterprise resource planning has no relationship with mass customization performance.

#### **4.2.3 ERP Successful Implementation**

Maditinos et al., (2011) investigate the factors that lead to effective implementation of ERP system. They find that consultants support, knowledge transfer, effective communication, conflict resolution are significant factors for the implementation of ERP. Top management support, user support have no significant relationship.

Similarly, Dezdar and Ainin (2011b) investigate the factors that lead to ERP successful implementation and they disagree with Maditinos et al (2011). Their findings reveal that top management support, training and education, and enterprise wide communication have a positive and significant relationship with ERP implementation success. Another study conducted by the same authors Dezdar and Ainin (2011a) but they use

different variables. The findings of the study reveal that the relationship between project management and team composition with ERP implementation success is significant.

#### **4.2.4 ERP and Supply Chain**

Shatat and Udin (2012) investigate the relationship between SCM performance and the components of an ERP system which are integration, material management, production planning, controlling, and workflow management. The findings show that there is a positive and significant relationship between integration, material management, production planning, and controlling and SCM performance. The workflow management does not have a significant relationship with SCM performance.

In the same vein, a study by Hwang and Min (2013) to investigate the relationship between supplier performance and external environment, ERP implementation, and supplier capability. The Internal environment is used as a mediator. The findings show that the external environment has little influence on its decision to adopt and implement ERP. However, through the mediating role of an internal environment, an external environment still indirectly influences the ERP adoption and ERP implementation decision. Also, it is found that ERP could enhance the ERP adopter's supplier capability.

### **5.0 Conclusion**

This study was a literature review study. Based on the review, e-commerce is an effective application for business firms to acquire raw material effectively and to use it for logistic purposes. There are many factors that can significantly enhance the performance of e-commerce (e.g. technology competency, firm size and etc.). However, more studies can be done to discover more about e-commerce. Reviewing the literature, it is found that most of the studies pertaining to e-commerce related to adoption factors, benefits and barriers. There is a need for more studies in another area for example, productivity and cost.

ERP is one of the ICT applications which have been widely used recently. The association between ERP and productivity was found to be positive regarding capital and labor productivity. However, a negative relationship was found between mass customization and ERP. This is a conflicting result. Mass customization can be described as labor and capital productivity because customization required capital as well as labor. Therefore, more study in this regard can be done to investigate the relationship between the terms.

The success factors of ERP were having mixed results. While some they claim that top management support is very important, other disagree and find that top management has no significance. A research can be conducted in this area to clarify this issue.

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