

# An Analysis of the Impact of Computer Based Technologies on Business Communications

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## Abstract

This article utilizes Information Communication Technology (ICT) frameworks to investigate the impactful effect of Information Communication Technology (ICT) such as enterprise resource planning (ERP) and electronic commerce (e-commerce) on businesses in general. A narrative literature review analysis (or type) of research has been adopted, while a Boolean search of 24 articles met the criteria for inclusion. As part of the literature search, the data collection procedure took into account the first and second authors of the completed simultaneous electronic and ancestral searches for peer-reviewed articles by using the online database, Association of Computing Machinery (ACM), and five databases from A Database Management System (DBMS): Oracle Database Software (ODS), A Relational Database Management System (RDMS), Journal *Data Mining and Knowledge Discovery (JDMKD)* as well as Google scholar and advanced Google scholar. As part of the findings for the study utilized for the article, many scholars made specific inferences to the ICT applications in firms and businesses. Out of the twenty-four articles, six of the researchers, thus 24%, underscored and also perceived that e-commerce has become a widely accepted method for business operation. Researchers of 4 articles—thus 17% - explicitly stated in their research that the use of e-commerce in the business world has benefited companies greatly. A total of 7 (29.5%) researchers—provide detailed discussion in the literature about labor productivity and ICT applications in businesses, mass communications, firms, and organizations, as well as the effective implementation of ERP in firms, businesses, and organizations. Above all, the article has unearthed implications as well as made cogent suggestion for future research in order to contribute to overall educational policy of society. Toward this end, three (12.5%) researchers provide a discussion about Supply Chain Management (SCM) performance and the components of an ERP system as well as ERP successful implementation emphasizing on the application and importance of ICT to businesses.

**Keywords:** ICT, Enterprise, Resource, Planning, Businesses, Firms, E-commerce, Computers, Database

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## INTRODUCTION

The use of ICT technologies and application has started since 1990s. However, in recent years ICT application such as 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. Salami, Marthandan, Nor Zaidi & 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 (Mediations, Chatzoudes & Tsiaris, 2011).

In today's local, national and international business organizations, information is a priceless commodity, whatever form or pattern it takes, without up the minutes, accurate information most commercial organization. Such business offices serve as nerve, hubs or center of information which take in, process store and relay data and messages in a host of situations, financing, selling, building, making, advertising, servicing or advising so as to enable all sorts of people to function in their jobs ranging from senior managers planning company activities over the next five to six years to start assistants querying the current retail price a product. While manual and paper-based system of information processing are still much in use, in the form of book, diaries, letter, movies etc., more and more office facilities or gadgets are today being undertaken by electronic and computer-based technology (Yusut, 2005).

Meanwhile, according to Ogwe (2016), information and communication technology, both in the private industry and large business organization has been resourceful and fruitful. In some decades ago, in the early 1905s, business embarked on the first widespread use of computer primarily and basically as tools for recording and processing accounting analysis and transactions. Thus, information technology has only really been part of business for about the last 24 years. Nonetheless information technology is one of the most paramount resources in today's business environment. But what exactly is information and communication technology. Ogwe Victoria (2016) defined information and communication technology as an umbrella term that includes all technologies for

the manipulation and communication of information. In the same vein, Kabari L.G. (2015) sees information and communication technology as the use of technology in managing and processing information, especially in large organizations.

Further still, Aronu (1999) defines information and communication technology as the combination of two technologies' computing and telecommunication (the cornerstone of information technology and the main purpose of which is to transmit representation of information (signals) between remote locations). One must admit that the modern business organization have been reshaped, compared to the business of years ago. Again, history has it that man has to cross over oceans, spend huge amount of capital (money) and energy to transmit information or transact business. Since the evolution of computers, professionals/experts have contributed to research with a view of making computer a greater advantage to the business organization.

The modern business organization at present is connected to a global system of communication that ensures speedy information and business transaction. The global system of communication involves the use of computer, GSM, tax machine etc. buying and selling electronically is changing the pattern or the way people reason, think and carryout transaction all over the world. Time, distance, and competitive product quality, is no longer the problem. This has triggered off increased economic activities and is having a considerable and remarkable impact on the modern business organizations in the world at large. The modern business organization should not be left out in this trend. In spite of many business awkwardness, and hindrances ranging from poor computer appreciation to inadequate communication gadgets and facilities, the modern business organization must strive to harness the huge economic potentialities of internet in this amazing and galvanizing technology that has revolutionize global economies.

Today's organizational environment is quite different from that of the past. The global competitive information technology, the quality service revolution, and diversity and ethics has force management of all kind of organizations to totally rethink and reschedule their approach to both operations and human resources. Because of the urgent and sudden shift, organizations are now more responsive to both their internal and external environments. The modern business organization is characterized by state of art information technology. However, most modern business organizations inspite of the enormous benefits associated with technological advancement are yet to help pace with drastic change and measure and also the cost involved in acquiring the gadgets, training and retraining of workforce. Also, paramount is the general attitude to embracing the technology. In order to further explain to readers in a plain sense, the study specifically seeks to answer the following researched question: How have researchers in ICT, electronic commerce, and enterprise resource planning addressed the relational concepts for businesses, firms, and organizations across the globe, particularly in the United States of America?

## Method

Petticrew and Roberts (2008) have argued that a narrative literature review referred to as a systematic review that synthesizes the individual empirical studies—by systematically extracting, checking, and narratively summarizing information on their methods and results (p.39). In relation to narrative research studies, an in-depth search and inclusion criteria are explicitly explained and underscored. Narrative research inquiry is a group of approaches that rely on the written or spoken words or visual representation of individuals (Lichtman, 2013, p.95). These approaches emphasize the lives of individuals as told through stories. The emphasis, in these approaches, is on the story and often the epiphany. Narrative can be both a method and the phenomenon under study (Lichtman, 2013, p.95). These definitions are pertinent to this particular review study because “narrative methods of research consider, “real world measures” that are appropriate when “real life problems” are investigated” (Lieblich et al., 1998, p.5). In addition, narrative reviews are beneficial in providing conclusions for researchers who examine topics that do not have one optimal way of measuring outcomes (Baumeister, 2003). The narrative nature of this review allowed the researcher to examine and describe a wide range of outcomes of research designed to address the relationship between students' enrolment and financial aid availability within higher education.

## Data Collection

Selection of articles. Based on the definition of Information Communication Technology (ICT), Enterprise Resource Planning (ERP) and Electronic commerce (E-commerce), the researcher used the following criteria to select articles for the purposes of the review:

- Study content included a focus on importance of ICT to businesses. Studies focusing on other types of ICT strategies and importance without relying on its relational impact on businesses.
- Study content included also focus on ICT applications, importance of Enterprise Resource Planning (ERP) and Electronic commerce (E-commerce) on organizations within and outside United States of America.
- Researcher reported findings from empirical research designs (i.e. qualitative, quantitative, survey, or mixed methods designs).
- All ICT, Enterprise Resource Planning (ERP) and Electronic commerce (E-commerce) related articles

- published in peer-reviewed journals.
- Whole books, book chapters, dissertations, and theoretical manuscripts were excluded based on the lack of peer-review in such publications.

As part of the literature search, the data collection procedure took into account the first and second authors of the completed simultaneous electronic and ancestral searches for peer-reviewed articles by using the online database, Association of Computing Machinery (ACM), and five databases from A Database Management System (DBMS): Oracle Database Software (ODS), A Relational Database Management System (RDMS), Journal *Data Mining and Knowledge Discovery (JDMKD)* as well as Google scholar and advanced Google scholar.

In fact, by using the Boolean indicators, “or”, “and” and “not” the following search terms were entered into databases, ICT technologies, ICT and businesses, ICT and firms, ICT and organizations, Enterprise Resource Planning (ERP) and businesses, Enterprise Resource Planning (ERP) and firms, Enterprise Resource Planning (ERP) and organizations, Electronic commerce (E-commerce), ICT applications in general, ICT applications with practitioners and firms. It is important to note that the initial search results yielded about 6,012 relevant articles on Database Management System (DBMS), 200 on Oracle Database Software (ODS), 150 on A Relational Database Management System (RDMS), and 1,200 on both Google scholar and advanced Google scholar.

Based on the large number of authors using the terms “ICT” , “Enterprise Resource Planning (ERP)”, “Electronic commerce (E-commerce)”, and “Businesses” in numerous ways, an abstract filter was also applied to the selection criteria. The study further widens the scope of the search to minimize the sampling of the selected articles by focusing on the specific relationships between ICT, Enterprise Resource Planning (ERP), Electronic commerce (E-commerce), and businesses or firms or organizations. This particular search yielded about 250 articles through the help of abstract filters. After the abstract filtration to reduce the size of the articles selections, the researcher uses the two concepts, “ICT” and “Businesses” to determine whether those remain articles meet the inclusion criteria, and 52 articles were chosen for inclusion. The researcher gave the 52 articles to two different ICT experts, and one MBA professor with knowledge in ICT at Southern University and A & M College to further review the 52 articles independently in order to ensure the reliability and validity of the analysis (or results). As a result of the three independent reviews by experts in the field, and a completed total of three ancestral searches resulted in 24 articles for final inclusion. Therefore, a total sample of 24 articles which met the inclusion criteria were used for the purposes of review analysis.

### Data Analysis

For the article, both deductive and inductive coding of the concepts were used for the search. In relation to the experts’ views and readings of the 24 articles, deductive codes were developed but were later observed to be insufficient in capturing all the concepts relevant to the estimation of the results or the findings. In view of the gap in estimation, the researcher further develops an inductive coding to strengthen the analysis. The researcher used counter-stories to operationalize the tenets of ICT theories as part of the coding processes.

### General Findings

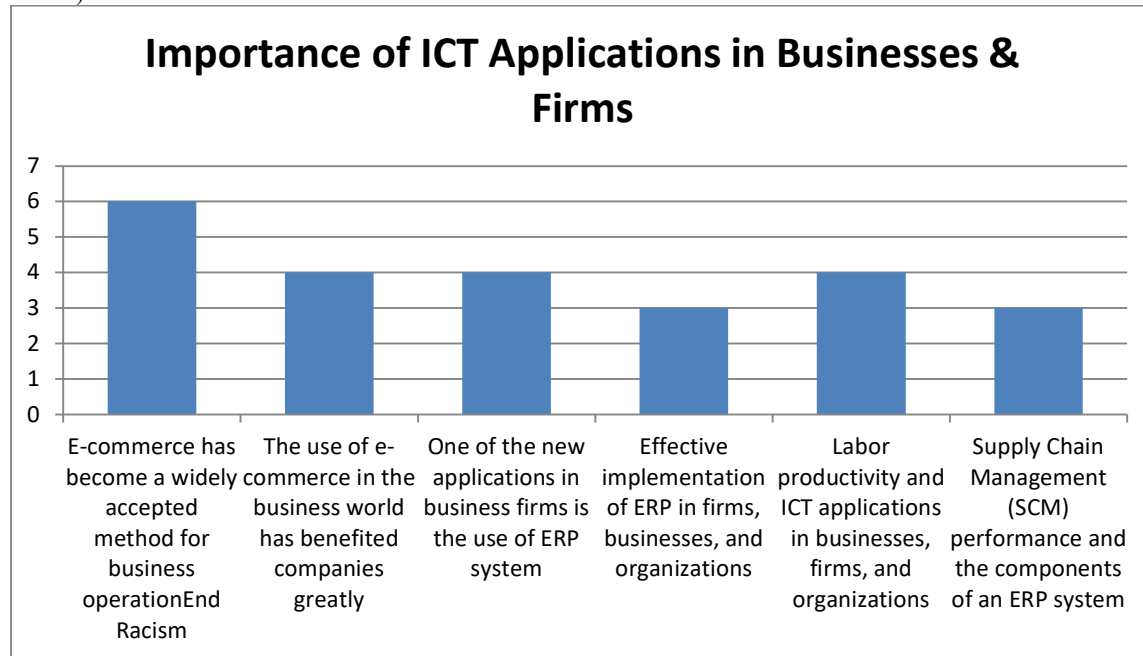
**Table 1: Characteristics of Identified Studies**

| Characteristics of Identified Studies   | Percentage (%) | Number (n) |
|---|----------------|------------|
| E-commerce has become a widely accepted method for business operation           | 24             | 6          |
| The use of e-commerce in the business world has benefited companies greatly     | 17             | 4          |
| One of the new applications in business firms is the use of ERP system          | 17             | 4          |
| Effective implementation of ERP in firms, businesses, and organizations         | 12.5           | 3          |
| Labor productivity and ICT applications in businesses, firms, and organizations | 17             | 4          |
| Supply Chain Management (SCM) performance and the components of an ERP system   | 12.5           | 3          |

*Note: Twenty-four total articles.*

Researchers of 6 (24%) articles explicitly stated that e-commerce has become a widely accepted method for business operation. Four (17%) researchers (Cho et al., 2008; Salwani et al., 2009; Ozment & Sink, 2008; Molla & Licker, 2005) explained in their research that the use of e-commerce in the business world has benefited companies greatly. Additionally, four (17%) other research teams (Vonderembse, 2010; Laudon & Laudon, 2012; Nurmilaakso, 2009; Martinez-Caro & CiaraNavarro, 2010) vividly stated that one of the new applications in business firms is the use of ERP system. Above all, three (12.5%) researchers (Laudon & Laudon, 2012; Nurmilaakso 2009; Martinez-Caro & CiaraNavarro, 2010) arguably discussed the effective implementation of ERP in firms, businesses, and organizations. Again, four (17%) researchers (e.g. Martinez-Caro and CiaraNavarro, 2010; Hong, Dobrzykowski &Vonderembse, 2010; Arumugam, 2013; Hussein et al. 2013) provide detailed discussion in the literature about labor productivity and ICT applications in businesses, mass communications, firms, and organizations. Toward this end, three (12.5%) researchers (Deodar & Aiming, 2011; Shatat & Udin,

2012; Mediations et al., 2011) provide a discussion about Supply Chain Management (SCM) performance and the components of an ERP system as well as ERP successful implementation (see Figure 1 and Table 1 for more details).



**Figure 1: Importance of ICT Applications in Businesses & Firms**

#### Discussion of Findings with Simplify Themes

**E-commerce:** E-commerce has become a widely accepted method for business operation. Till 2005 most of the research in ecommerce was exclusively conducted in the western world (Molla, & 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 & Sink, 2008). The performance of e-commerce is dependable on many factors that can increase the deployment of e-commerce (Salwani et al., 2009).

**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, webtechnology 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.

**Enterprise Resource Planning:** One of the new applications in business firms is the use of ERP system (Vonderembse, 2010; Laudon & Laudon, 2012; Nurmilaakso 2009; Martinez-Caro & CiaraNavarro, 2010). 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 & Laudon, 2012). In this section, the use of ERP by business firms and the factors that enhance the adoption of ERP is highlighted.

**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 Martinez-Caro and CiaraNavarro (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 the following researchers (Martinez-Caro and CiaraNavarro, 2010; Hong, Dobrzykowski & Vonderembse, 2010; Arumugam, 2013; Hussein et al. 2013). 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 eprocurement have strong relationships with mass customization performance. However, enterprise resource planning has no relationship with mass customization performance (Arumugam, 2013; Hussein et al. 2013).

**ERP Successful Implementation:** Mediations 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 has no significant relationship (AL-Hashimy., 2018). Similarly, Deodar and Aiming (2011) investigate the factors that lead to ERP successful implementation and they disagree with Mediations 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 Deodar and Aiming (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.

**ERM 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.

## CONCLUSION & RECOMMENDATIONS

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.

In conclusion, information and communication technology is the strength (heart) of modern business organization. Without adopting information and communication technology, businesses will have serious limitations and consequences in the future and will imply the danger of lagging behind socially and economically with all the implications that this entails. The study further shows that by using the information and communication technology (ICT) new techniques and tools in businesses grows in less time with profit. The new tools improve the business and become more sober in the operations and their effect on competitiveness needed to meet demands of clients (customers) since the industry perpetually experiences the entry of new firms and organizations.

Based on the findings of this study, the following recommendations are discussed below.

1. Agencies authorized with the development of business capabilities need to reorient the information and communication technology capability and communication linkage identified in this study.
2. Since we are in the era of computer, organizations should strive to provide the necessary modern technological facilities needed in the modern business to ease the running of day-to-day business activities.
3. Institutions offering information and communication technology (ICT) and management course both private and public should adequately equip the students with modern business technological device and tools.
4. Workers should be given some in service training both practically and theoretically for the efficient and effectiveness of their duties and functions.

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