E-commerce Implementation: A Critical Review

Eman Altameem and Riyad Almakki

Department of Information Systems, Al-Imam Muhammad Ibn Saud Islamic University, KSA

Abstract

Organizations around the world have become increasingly reliant on electronic commerce systems. Each of the e-commerce systems are involved in various activities where they are gradually playing a major role . However, the resistance and negligence of organizations to implement e-commerce effectively often impact such leverage. The principles of this study are mainly to identify the key enablers that are common for a successful implementation of e- commerce systems. From the literature, it was found that IT Infrastructure, Enterprise Integration, Compatibility, Security, Convenient Website, IT Agility, Omni-Channel and Innovation Adoption consider essential enablers. The findings of this study will be examined in a future research.

Keywords: E-commerce, E-commerce Implementation, Saudi Arabia, Key Enablers.

1. Introduction

Today, information and communication technologies have become so rampant that the world's economic prosperity depends on them. The widespread use of the internet has motivated entrepreneurs to engage in online business thereby causing an e-commerce revolution. E-commerce has been supported by various enablers including increased internet penetration around the world and the emergence of new wireless network technologies such as 3G and LTE (communications technologies) that provide very fast browsing speeds. According to Al-Otaibi and Bach [4], e-commerce has mostly benefited small and medium companies because it eases marketing and advertising that would otherwise have cost them a fortune.

Laudon and Traver [34] predict that the internet will continue being relevant even in the new knowledge economy because it removes communication barriers that prevent seamless interaction among companies for instance language, culture and geographical distance. With e-commerce, organizations can easily communicate, share information, and do business rapidly and conveniently.

The term ''e-commerce'' emerged only in latest years as businesses became aware of the potential role of the internet as a powerful tool for conducting business. With e-commerce, local economies and businesses can become global within a very short period of time. Even within the local context, the effect of e-commerce is still felt as it enhances communication, information sharing and business transactions among investors, managers, customers and other stakeholders [7].

Today, the discussion on utilizing e-commerce is one of the current and hot debates in the world of trade and commerce. Due to indefinite advantages of e-commerce, interest of organizations to employ this, is being increased, day-by-day. Private organizations in Saudi Arabia are taking the chance by becoming part of these technology revolutions. Consequently, it's important to conduct a study that highlight the importance of e-commerce and investigate the key success enablers for e-commerce implementation.

2. Literature Review

The positive effects of e-commerce on retailing have made it a topic of interest within informatics circles. Most organizations have been able to gain immensely, shortly after implementing e-commerce in their traditional offline businesses. According to Kanchanopast [30], such enterprises have taken advantage of the ability of e-commerce to link enterprises with customers and business partners.

Kanchanopast [30] defines e-commerce as the use of the internet to trade goods/services, and information in a secure manner. Additionally, Cegielski and Rainer [45] define e-commerce as the integration of business processes so that business transactions pertaining to products/services and information can be conducted electronically using computer networks.

E-commerce has increased organizational efficiency and performance and this has caused numerous operational and strategic benefits for organizations [46]. In this light, small and medium enterprises as well as large multinationals can build their brand name without incurring hefty costs hence increase profits [4].

Consequently, e-commerce has become a subject of interest among academicians, governments, business and those in the manufacturing and services industries.

2.1 E-commerce in Saudi Arabia

The potential of e-commerce has made it a powerful tool in emerging economies. However, emerging economies are characterized by unstable business environment and cultures and this inconsistency makes it difficult to design an e-commerce implementation scheme that could work for all countries.

Nonetheless, for the case of Saudi Arabia, CITC [17] estimated the number of internet users that increased from 41% in 2010 to 70.4% in 2016. The Saudi Arabia population is embracing e-commerce services despite e-commerce being a relatively new wave in the country. Regardless, the pace at which e-commerce implementation is progressing is worrying. Although there is a perception that e-commerce is being preferred by businesses in Saudi Arabia, a study by CITC [16] indicates that only a few firms, majorly in the manufacturing sector, have implemented e-commerce. Saudi Arabia's growth rate in the IT sector portray the country as the best place in the Middle East region to invest in e-commerce activities [43].

Saudi Arabia is also best suited for e-commerce investments because it stands out in different sectors in the Gulf region [5]. The government of Saudi Arabia has also demonstrated its support for the implementation of comprehensive e-commerce systems as evidenced by the establishment of an official firm for holding online transactions as well as laws regarding e-commerce.

2.2 Key enablers of E-Commerce Implementation

This study aims at identifying the enablers of e-commerce hence act as a guideline for organizations that wish to implement e-commerce systems. These enablers should reveal what's more important if one desires to design and implement an effective e-commerce system.

2.2.1 Enterprise Integration

In the modern times, technology has become a key deciding enabler in making decisions regarding internal and external business situations. Processes are highly interconnected and environmental enablers are highly dependent on this interconnectivity of processes [1]. Enterprise integration involves the use of technology to bring together software, hardware, information and other resources to establish organizational processes that are impactful and resource driven [1].

As an academic discipline, enterprise integration involves itself with the study of cooperation and communication within organizations. Indeed, it is a technical field of Enterprise Architecture centered on

topics such as distributed computer networks, exchange of product data, interchange of electronic data and system interconnection [20].

As Sealey [51] states, e-commerce is impossible without the integration of processes undertaken by the customer, the business and the relevant partners. There ought to be a platform for the integration of the virtual roles of each stakeholder in the business transaction. Apart from creating customer loyalty, enterprise integration allows e-commerce platforms to manage huge volumes of data from different applications and systems. Manual handling of such data could be very challenging if not impossible. In support of enterprise integration, Gallegos [23] confirms that e-commerce companies that allow different applications to manage different parts of the product ordering and fulfillment process, and then integrate those applications, end up realizing better profit margins especially due to reduced delivery time. Nonetheless, given the rate at which the business environment is changing, business challenges will evolve and this will demand more advanced approaches to enterprise integration.

2.2.2 IT Infrastructure

Since time immemorial, IT infrastructure has been recognized as a key source of competitive advantage hence an essential determinant of success rate for organizations. IT infrastructure is necessary for supporting business operations. Some of the elements that fall under IT infrastructure include IT facilities, equipment, applications and processes that support the business's functional areas. Broadbent et al. [12] defined IT infrastructure as, "the base foundation of the IT portfolio, which is shared throughout the firm in the form of reliable services, and is usually coordinated by the IS group".

However, in the context of e-commerce, IT infrastructure is not just about having the right technological machinery. Alsmadi et al. [6] have set light on the importance of infrastructure in e-commerce and have presented the general infrastructural requirements for successful e-commerce transactions.

Robertson and Sribar [47] state that the technologies that fail to support business operations optimally could cause losses for the business. On the other hand, an investment in IT infrastructure that aligns perfectly with the business operations contributes significantly to improvement in the quality of business processes [32]. In light of the discussion above, it is clear that IT infrastructure can be a major source of competitive advantage.

For that, the focus on infrastructure is obviously important to to avoid the wastage of time, money and effort that would otherwise be incurred during frequent re-establishment of the IT infrastructure due to changes in market dynamics or emergence of new developments [55], [50].

2.2.3 Security

Security is an area which is growing in significance, as more business applications are being automated and more sensitive information is being stored. Whitman and Mattord [61] define security as a state of being safe from danger or entities that could intentionally do harm. A system is termed secure provided it guards the information within it from unauthorized access or modification [14].

According to Johnson and Goetz [27], security is a key issue not only in the design of new products/services but also in the continued relevance of the existing products. Many scholars agree on the rising importance of information system security [35], [22].

However, security constraints have not prevented people from engaging in online shopping. According to a report by Hosting Facts [26], over 40% of smartphones users engaged themselves with online shopping in 2016. It is worth noting that although security has not yet forced smartphone users to avoid online shopping, the situation could change in the future if appropriate measures are not taken. For an e-commerce venture to succeed, all transactions must be secure [30], [39]. Guaranteeing security and privacy of an e-commerce platform user is positive related to the growth of that particular platform [37], [30], [9], [11].

Moreover, some studies [37], [30], [9], [8], [40], [56], [28] indicated that issue of security is a frequent criteria for the technical dimension of e-commerce implementation.

2.2.4 Compatibility

For an IT project to be taken up for implementation, it has to be consistent with the needs, goals and cultural values of the organization [38], [3], [2]. Ascertaining compatibility is vital as it ensures safety among potential adopters.

A highly compatible IT innovation is highly meaningful to an organization. When existing systems are compatible with internet-based transactions, organizations require lower effort to streamline a new innovation and this makes it more ready to utilize e-business [54].

In general, compatibility is considered a criterion for assessing the completeness of e-commerce initiatives and its important enabler for e-commerce implementation success [38], [18], [3], [36].

2.2.5 Convenient Website

A website for e-commerce should not only contain important information about products but should also be attractive and compelling to the target consumers. This is especially crucial if the website has a large product portfolio. Heightened competition forces online retailers to offer their customers more products/services for the purpose of convenience [49].

Convenience refers to "the usability of the website for the purpose for which it was designed" [21]. Convenience is also the undertakings of e-commerce websites to minimize consumer's shopping time and effort. To enhance convenience, a design must consider the following elements: availability convenience, benefit convenience, transaction convenience, decision convenience and post being convenience [49]. Given the nature of shopping within online platforms, an e-commerce website should offer more product information than what individuals in physical stores can provide [31].

According to Chen and Dhillon [15], the trustworthiness of e-commerce venture is closely associated with the website usability, functionality, structure and appearance. Aspects such as increased choices, easier comparisons, speedy searches, and lower prices act as incentives for online shoppers [49]. This is confirmed by a study by Turban and Gehrke [57], whereby it was found that website aspects such as security, navigation efficiency, customer focus, business content and loading speed are key determinant of the success rate of an e-commerce venture.

According to Salehi et al.,[49]. "Website information convenience is an important enabler to attract customer and it plays a key role in e-commerce success". Thus, convenience is an indispensable element to consider during e-commerce design and as a key enabler of e-commerce, it can be a source of competitive advantage.

2.2.6 Innovation Adoption

According to Odhiambo [42], the realization of operational efficiency and better customer service whether in an existing or a new business is a long journey characterized by continuous innovation. Vuarin and Rodriguez [49] contrast innovation and invention and argue that innovation is "doing something which did not exist before in a particular territory or technical area'". As per Rogers [48], some important attributes of innovations include trialability and observability, security/confidentiality, complexity, compatibility and relative advantage.

According to Odhiambo [42], the adoption of e-commerce is majorly influenced by customer pressure perception of innovation. According to Duan et al. [19], trading partners' pressure on an enterprise to innovate is positively associated with the likelihood of the enterprise to adopt new technological innovations.

2.2.7 IT Agility

The need for a variety of products according to the demands of customers leads to rapid changes in market trends. Enabling agility will sufficiently help industries to respond quickly to market changes and needs of the customers and still control quality and costs [53].

According to Gong and Janssen [24], in 1991, agility concept was initially used in the description of practices that were observed and considered to be important. Sengupta and Masini [52] refer to IT agility as replacement or reconfiguration of IT systems when reality changes take place in the marketplace. Belanger and Anderson [10] list four characteristics of e- commerce agility. They include: market entry, features and functionality, dynamic content and integration of latest technology.

IT agility is significant and essential because it enables facilities to leverage on new technologies and respond to the changes in the market. In addition, in order for e-commerce systems to optimize their success, they must apply IT agility [33], [41], [58].

2.2.8 Omni-channel

Most organizations which implemented e-commerce allowed opportunities to pass because they focused on a single or two channels thereby neglecting all the other channels that might result to less sales, poor customer experience and loss of the value for the brand. This results to huge losses and fallback from competition .These issues can be solved by implementation of omni-channel [44].

Omni-channel refers to aiming at a unique and seamless experience despite the consumer's purchase phase or the channel used by the consumer [44], [13].Gupta et al. [25] states that is essential for academic researchers and practitioners to recognize elements which force consumers to choose over different channels In addition, Wallace et al. [60] pointed out that past research affirms the ability of omni-channel to enhance portfolio service performances via channels which are offered to consumers.

3. Research methodology

In this research, the design will be descriptive. The case study based on the qualitative method will be chosen because the data gathered thusly answered the questions of how, why, and which element were in place and related to the success of e-commerce. The researchers will undertake some case studies as a vehicle for empirical research which will be used to develop a theory concerning the success of e-commerce. The case studies will be based on five companies from different sectors in Saudi Arabia. The aim is to develop an understanding of how the literature could be interpreted in a real world environment.

4. Conclusion

This paper has presented a review of the existing literature about e-commerce. E-commerce and its importance in the context of Saudi Arabia and elsewhere, has also been discussed. Various e-commerce implementation enablers have been identified including enterprise integration, IT infrastructure, security, compatibility, website convenience innovation adoption, IT agility and Omni-channel among others. The findings of this study will be examined in a future research.

References

[1] Abbasi, E., Chawla, U. B. D., & Hussain, L. (2015). Trends and Future for Enterprise Integration. International Journal of Innovation, Management and Technology, 6(1), 71.

[2] Akbulut, A. (2002) "An Investigation of the Factors that Influence Electronic Information Sharing between State and Local Agencies". Eighth Americas Conference on Information Systems, pp. 2454-2460.

[3] Al-Ghaith, W., Sanzogni, L., & Sandhu, K. (2010). Factors influencing the adoption and usage of online services in Saudi Arabia. EJISDC: The Electronic Journal on Information Systems in Developing Countries, (40), 1.

[4] Al-Otaibi, A., and Bach, C.(2014) " Consumer Awareness and Potential Market for e- commerce in Saudi Arabia: Challenges and Solutions" , ASEE 2014 Zone I Conference , April 3-5 , University of Bridgeport, Bridgeport, CT, USA.

[5] Alrawi, K.W. and Sabry, K.A. (2009) "E-commerce Evolution: A Gulf Region Review " , International Journal of Business Information Systems , 4, 5, 509-526.

[6] Alsmadi, I., Alhami, I., and Alsmadi, H., (2009). "The Requirements for Building an E-commerce Infrastructure", International Journal of Recent Trends in Engineering, Vol 2, No. 2.

[7] Anderson, M, Sims, J, Price, J and Brusa, J . (2011) "Turning "Like" to "Buy" Social Media Emerges as a Commerce Channel ", Booz & Company Inc.

[8] APEC (1999). The APEC E-commerce readiness assessment initiative an overview of the assessment process. Available at http://www.apec.org/apec/publications/free downloads/2000.html.

[9] Aydemir, C.A., 2013. Survey Aimed at E-Commerce Applications in Firms Operating in Diyarbakir Organized Industrial Zone. International Journal of Business and Social Science, 4(1): 43-59.

[10] Belanger,N. and Anderson,E., (2015) , Organizing for Success Inside and Out .

[11] Bhimani A. (1996) "Securing the Commercial Internet," Communications of the ACM, Vol. 39, issue 6, pp. 29-35.

[12] Broadbent, M., Weill, P. & St Clair, D. (1999) "The Implications of Information Technology Infrastructure for Business Process Redesign". MIS Quarterly, Vol. 23, No. 2, pp. 159-82.

[13] Brynjolfsson, E., Hu, Y.J. and Rahman, M.S. (2013). Competing in the age of omnichannel retailing. MIT Sloan Management Review, 54 (4), 23-29.

[14] Bullock.J, Haddow .G, Coppola.D (2014)," Introduction to Homeland Security: Principles of All-Hazards Risk Management ", 5th Edition.

[15] Chen, S.C. and Dhillon, G.S., (2003). Interpreting Dimensions of Consumer trust in e-commerce, Information Technology and Management. pp. 303-318.

[16] CITC (Communications and Information Technology Commission) (2010) Internet Usage Study in the Kingdom of Saudi Arabia, Communications and Information Technology Commission, Riyadh

[17] CITC (Communications and Information Technology Commission) (2016) the Kingdom of Saudi Arabia growth The ICT Sector, Communications and Information Technology Commission, Riyadh

[18] Cosgun, V., & Dogerlioglu, O. (2012). Critical Success Factors Affecting e-commerce Activities of Small and Medium Enterprises. Information Technology Journal, 11(12), 1664.

[19] Duan, X., Deng, H., & Corbitt, B. (2012). Evaluating the critical determinants for adopting e-market in Australian small-and-medium sized enterprises. Management Research Review, 35

[20] Fowler, M. (2002). Patterns of enterprise application architecture. Addison-Wesley Longman Publishing Co., Inc.

[21] Feindt, S., Jeffcoate, J., & Chappell, C. (2002). Identify Success Factors for Rapid Growth in SME Ecommerce. Small Business Economics, 19(1), 51-62.

[22] Fumy, W. (2004) "IT security standardisation". Network Security. pp. 6-11.

[23] Gallegos, G.(2014)." The Growing Allure of E-Commerce Systems Integration ".

[24] Gong, Y., & Janssen, M. (2010). Measuring process flexibility and agility. In Proceedings of the 4th International Conference on Theory and Practice of Electronic Governance (pp. 173-182). ACM.

[25] Gupta, A., Su, B. C., & Walter, Z. (2004). An empirical study of consumer switching from traditional to electronic channels: A purchase-decision process perspective. International Journal of Electronic Commerce, 8(3), 131-161.

[26] Hosting facts," Internet stats & facts for 2016",(2016) , Available: https://hostingfacts.com/internet-facts-stats-2016/

[27] Johnson, M., and Goetz, E., (2007). Embedding Information Security into the Organization. IEEE Security & Privacy 5(3): 16-24.

[28] Jun, M. C. S. (2003). Key obstacles to EDI success: From the US small manufacturing companies' perspective. Industrial Management& Data Systems, 103(3), 192–203.

[29] Kalakota R. and Whinston A.B., (1996). Frontiers of Electronic Commerce. Reading MA: Addison Wesley.

[30] Kanchanopast. S. (2014) "The Factors Influencing Successful Implementation of E-Commerce within SMEs Businesses".

[31] Keh , T. H., & Shieh, E. (2001). Online Grocery Retailing: Success Factors and Potential Pitfalls. Business Horizons, 44(4), 73.

[32] Kumar, U., Lavassani, K., M., Kumor, V., and Movahedi, B. 2008. "Measurement of Business Process Orientation in Transitional Organizations: An Empirical Study in Business Information Systems", 11th International Conference, W. Abramowicz and D. Fensel (eds.), Innsbruck, Austria, May 5-7, Berlin: Springer, pp. 357-368.

[33] L2Inc ," E-COMMERCE AGILITY",(2015) ,Available : https://www.l2inc.com/wp-content/uploads/2015/04/E-Commerce-Agility_NYC_April-30_v1.pdf

[34] Laudon , K.. And Traver, C .(2014) "E-Commerce 2015", 11th Edition.

[35] Lee, S. & Kim, K. J. (2007) "Factors affecting the implementation success of Internet-based information systems". Computers in Human Behavior, Vol. 23, No. 4, pp. 1853-1880.

[36] Ling, C. Y. (2001). Model of factors influences on electronic commerce adoption diffusion in small & medium sized enterprise. Curtin University of Technology.

[37] Makki, E., & Chang, L. (2015). E-commerce acceptance and implementation in saudi arabia: previous, current and future factors. The International Journal of Management Research and Business Strategy, 4(3), 29-44.

[38] MOHAMED, R. M. F. (2014). CRITICAL SUCCESS FACTORS OF E-COMMERCE IN FASHION & LIFESTYLE DESIGN RETAIL INDUSTRY IN SME IN SRI LANKA "A Case study Analysis on No-limit Corporation".

[39] Mukherjee, A., and Nath, P. (2003) "A model of trust in online relationship banking", International Journal of Bank Marketing, Vol. 21 Iss: 1, pp.5 – 15.

[40] Mukti, N. A. (2000). Barriers to putting business on Internet in Malaysia. The Electronic Journal of Information Systems in Developing Country, 2(6), 1–6.

[41] MuleSoft: Increasing ECommerce Agility (2012).

[42] Odhiambo, O. P. (2013). E-Commerce Adoption among Micro, Small and Medium Sector in Nairobi County, Kenya (Doctoral dissertation, Kenyatta University).

[43] PayPal Insights: e-commerce in the Middle East, (2013) , Available :https://www.paypal.fr/crossborder-insights/pdf/PayPal-Insights-E-commerce-MiddleEast-2012-2015.pdf.

[44] Pollamarasetty, S., & Potti, R. (2016). Omni-Channel Retailing: Enriching Customers' Shopping Experience. Handbook of Research on Strategic Supply Chain Management in the Retail Industry, 233.

[45] Rainer, K. and Cegielski, C. (2012) " Introduction to Information Systems: Enabling and Transforming   Business", (3th ed). Jonh Wiley & Sons Inc.

[46] Ray, J. S. (2011). Using Effective E-Commerce Strategies to Improve Organizational Performance. Available at SSRN 2115064.

[47] Robertson, B. & Sribar, V. (2002) The Adaptive Enterprise: IT Infrastructure Strategies to Manage Change and Enable Growth. Intel Press, Oregon.

[48] Rogers, E. M. (2003). Diffusion of Innovations (fifth ed.) Free Press. New York.

[49] Salehi, F., Abdollahbeigi, B. & Langroudi, A. C. (l2012). The impact of website information convenience on e-commerce success of companies. Procedia-Social and Behavioral Sciences, 57, 381-387.

[50] Schalken, J., Brinkkemper, S. & Vliet, H. V. (2005) "Measuring IT infrastructure project size: infrastructure effort points". Proceedings of 17th International Conference on Advanced Information Systems Engineering, Porto.

[51] Sealey, R., (2000). E-business integration drives EAI: interview with Aberdeen's Tom Dwyer, EAI Journal, (Dallas, TX) available at: http://www.EAjournal.com.

[52] Sengupta, K., Masini, A. (2008). IT agility: striking the right balance. Business Strategy Review, 19(2), 42-48.

[53] Somanath, N. K, Sabu., K. Krishnanakutty, V.(2013). MEASURING AGILITY OF A PROCESS PLANT USING COMPREHENSIVE AGILITY MEASUREMENT TOOL (CAMT).

[54] Teo, T. S. H., Ang, J. S. K. and Pavri, F. N. (1997) "The State of Strategic IS Planning Practices in Singapore", Information and Management, 33.1:13-23.

[55] Traxler,D.(2012)."7 Key Ecommerce-Infrastructure Decisions".

[56] Turban, E. (2002). Electronic commerce 2002. Englewood Cliffs, NJ: Prentice-Hall.

[57] Turban, E. and Gehrke, D. (2000). Determinants of e-commerce web site. Human Systems Management, 19(2):111–120.

[58] van Oosterhout, M. (2010). Business agility and information technology in service organizations (No. EPS-2010-198-LIS).

[59] Vuarin, P., & Rodriguez, M.(1994).Innovation and communication with LEADER. LEADER Magazine,7, 13-16.

[60] Wallace, D. W., Giese, J. L., & Johnson, J. L. (2004). Customer retailer loyalty in the context of multiple channel strategies. Journal of retailing, 80(4), 249-263.

[61] Whitman, M. E., Mattord, H. J., (2011). Principles of Information Security, Course Technology Press, Boston, MA.