Factors affecting the Adoption of Electronic Commerce – A Review

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The purposes of this paper is to identify factors affecting the adoption of electronic commerce (E-commerce, hereafter), the significant growth of E-commerce applications is notable worldwide. More and more organizations are switching to online business to achieve better positions in the digital-based competitive market. The process of E-commerce is complex in nature and involves changes to business models and procedures. It is therefore worthy to study this new business phenomenon based on the experience of the organizations that have embarked on E-commerce. This study has, based on an extensive review of literature on factors affecting the adoption of E-commerce. The study identified 32 factors affecting the adoption of E-commerce.

Keywords: Adoption, Electronic Commerce, Adoption Factors, E-commerce, E-markets, Electronic Markets

Introduction

Innovation adoption has been obtained a countable attention in the previous researches (Rogers, 1983; Davis, 1986; Davis, 1989; Moore and Benbasat, 1991; Davis, 1993; Premkumar and Potter, 1995; Agarwal and Prashad, 1997; Taylor and Todd, 1995; Agarwal and Prashad, 1998; Agarwal and Prashad, 1999; Tan and Teo, 2000; Kendall et al. 2001; Sathye and Diana, 2001). Many studies are still being initiated to explore the adoption of newly innovated technologies both in individual and organizational perspective (Wang and Tasi, 2002; Ramayah et al. 2003; Ramayah, Jantan and Aafaqi, 2003; Azam, 2004; Budhiraha, 2004; Ramayah, Ignatius and Aafaqi, 2005; Molla and Licker, 2005a; Azam, 2006a; Ramaya et al. 2006). The previous studies utilized different models to address innovation adoption particularly technology adoption, mostly derived from Rogers innovation diffusion theory, Theory reasoned action by Ajzen Feishbein, Theory of Planed Behaviour or Technology Acceptance Model (TAM). Although Rogers's theory is the oldest theory among these four and TAM is the newest, every theory has the utility and currently is being used, some times replicated, in different adoption studies.

As the internet became more and more commercialized and users started to participate in the World Wide Web in the early 1990s, the term Electronic Commerce was coined and E-commerce applications expanded rapidly (Turban et al. 2002). The Internet and E-commerce especially have much more to offer in the way of increasing the efficiencies and competitive advantage of procurement (Teo et al. 2009). E-commerce is a fundamental shift in the manner by which firms are interacting with buyers and suppliers.

Research Methodology

The main purpose of this study is to identify critical Factors

affecting the Adoption of Electronic Commerce. Following an extensive literature review this research was able to find out 32 factors affecting the adoption of E-commerce. The research approach for this study consists of a meta-analysis of the research literature. Research papers for analysis were gathered from leading information system journals for the 29 year period 1983-2012.

Studies on E-commerce Adoption

Hsiao (2001) explored the difficulties encountered in the adoption of E-commerce. It is related with an initiative that was intended to help SMEs (small- and medium-sized enterprises) in Singapore adopt an Internet-based electronic marketplace. Drawing on the theory of technological frames, the study traces the case over 13 months and analyzes the early adoption problem in three time periods. Even though all of the favorable conditions were present the technology provider failed to gain the commitment of adopters this was the main consideration for conducting the study. Inductively, the results indicated four key issues that explain the adoption difficulties: lack of familiarity (with E-commerce), risk aversion, lack of trust (among trading partners), and incongruent cultural practice. The results indicated that unless the technology fears of adopters are acknowledged, the technologies well-intended programs may be met by adopter's negative responses and may lead to the failure of IOS (inter-organizational systems) adoption.

Hasselbring and Weigand (2001) explored E-commerce is the new buzzword for doing business on the Internet. A main trouble for E-commerce lies in the need for the information systems of the involved organizations to exchange meaningful information. For letting the information systems of business partners achieve electronic business communication, semantic interoperability is necessary to ensure that exchange of

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information makes sense -that the provider and receiver of information have a common understanding of the "meaning" of the requested services and data. Traditional EDI is not enough to solve electronic business communication problems in an open and dynamic environment.

Esichaikul and Chavananon (2001) identified the potential common and specific factors dealing with the success of implementing Business-to-Consumer Electronic Commerce, Business-to-Business Electronic Commerce and Electronic Business, as well as to provide the guidelines for achieving the development of these applications. Principally, the factors are organized into a class of factors: policy factors, organization factors, human resources management factors, business factors, customer relationship management factors, technology factors, security factors, and environment factors.

Power (2002) draws on data collected from 553 Australian companies and focuses on differences in the adoption of established (e.g. EDI) and emerging (e.g. the Internet) technologies for the direction of supply chains. Overall, the adoption and use of existing technologies can be qualified as fixed, evidently costly, and perceived to be limited in terms of potential benefit. On the other hand, adoption and use of new technologies such as the Internet would appear not to be suffering from these orthodox confinements. The limitation of EDI to big companies is not evident in the use and adoption of the Internet, neither is the limitation on use at the manufacturing end of the supply chain. This resolves that there is evidence that the adoption of emerging Internet-based technologies for the direction of supply chains does not appear to be subject to many of these constraints. However, it is not clear whether this ease of adoption will entail that the benefits will also flow as easily to these companies.

Gottschalk and Abrahamsen (2002) examined that in Norway business organizations had plans to utilize electronic marketplaces for purchases. Survey results indicated that most organizations had plans; only 3 percent had no plans while 34 percent had concrete plans to utilize electronic marketplaces for purchases and the main benefit expected from utilizing electronic marketplaces for purchases was reduced transaction costs.

Bertschek and Fryges (2002) explored the determinants of E-commerce adoption borrowing from the literature on the adoption of new technologies and considering factors like firm size, corporate status, human capital and international competitive situation. An ordered probit model is employed to a data set containing about 3,000 enterprises from the German manufacturing industry and the German services sector in the year 2000. They discover positive and significant effects of firm size, the share of highly qualified employees and the export share. An IT-intensive production process raises the probability of a broad use of E-commerce. A significant influence on the use of E-commerce is the bandwagon effect, implying that firms are more likely to use this new Internet

application if others within the same industry likewise do it.

Vlachopoulou and Manthou (2003) examined that successful virtual working requires organizations to adopt new approaches towards managing and leading in the following key areas: managing infrastructure, people, and information and joint activities/processes. Marketing transformation and integration between the partner's internal and external activities and relationships are the prerequisites in order to combine their core competencies creating dynamic virtual collaboration networks.

Thatcher and Foster (2003) examined the factors influence the E-commerce adoption in Taiwan and the extent to which culture plays a role in the adoption decision in electronics and textile companies. Results indicated that organizational, industrial and governmental factors do indeed influence E-commerce adoption decisions and cultural factors moderate the direct influence of government policies and industry pressures.

Teo and Ranganath (2004) examined Web-based E-commerce initiatives in Singapore. Data were collected from 108 firms using a survey, which showed that 52.8% companies have adopted E-commerce; of these, two-third had a formal plan and/or task force for E-commerce deployment. Customer-related applications were generally more popular than supplier-related applications. Problems in E-commerce adoption included the fear of granting suppliers and customer's access to corporate systems, insufficient time for staff to develop new skills in E-commerce difficulty of measuring benefits.

Gajšek and Pucihar (2004) explored that traditional selling channels are supplemented by new ways of doing business via Internet. One of this new ways is also electronic markets. Doing business on electronic market is not wide spread yet in Slovenia. But on the other hand some companies in Slovenia already have some experiences with eMarketplaces. From the seller perspective, company is efficient when it wins and runs business on electronic market with support of Internet intermediary. Exploring for new business partners in longer period of time will bring good results only, if it will be support by top management. For successful selling on electronic market its own trade mark and size of the company are not crucial factors. To get the best results it is required to educate employees, to daily plan activities on electronic market and to acquire quality and safety certificates for products and processes.

Driedonks et al. (2005) investigated factors that affect the rate of adoption of E-commerce electronic marketplaces as innovations. The study reports a case study of Auctions Plus, an electronic marketplace in the Australian beef industry. It was discovered that key stakeholder groups do not appear to be substantially worse off with Auctions Plus from an economic exchange-process point of view. Considering the social and political dimensions of electronic marketplaces, however,

contributes to further understanding of the case. Important influences appear to be loss of social capital, the nature of communication channels, time taken to reach critical mass, and the power of one group originally not recognized as a key player – the stock and station agent intermediaries.

Kaynak et al. (2005) investigated the internet-based Ecommerce adoption profile of small and medium-sized enterprises (SMEs) in Turkey as well as the factors affecting their willingness to adopt E-commerce usage. E-commerce adoption is evaluated by a composite index of the usage frequency of 14 E-commerce application tools. The study draws on the data gathered from a sample of 237 manufacturing SMEs with internet connection. It was discovered that E-commerce adoption was significantly determined by its perceived benefits. However, the comprehended limitations of E-commerce applications were found to have no statistically significant effect on E-commerce adoption. The analysis also evidenced that company and industry-specific factors, with the exception of amount of resources allocated for export development, and did not appear to have any important impact on E-commerce adoption.

Pucihar and Gričar (2005) explored that bringing together large numbers of buyers and sellers and automating transactions, e-marketplaces expand the choices available to buyers, give sellers access to new customers (buyers), and reduce transaction costs for all participants. Business environment factors, how an organization does business, have an influence on the organization's decision about adopting emarketplace activities. In some cases, the business environment encourages adoption of e-marketplace activities, while in others it is discouraged. This study presented the importance of the following business environmental factors: trust between business partners, encouragement from the business environment, use of E-commerce between business partners and an organization's relationship to the business environment. Factors were derived from research in 119 large organizations in Slovenia.

Johnson and Johnson (2005) explored that world of supplying in any industry is rapidly changing. No longer can providers of industrial products use traditional face-to-face relationships to sell its products. Technology helps the exchange of goods and services in a global marketplace. By failing to recognize and expand on these opportunities, providers will not be able to serve. There will be a conversion period where suppliers will still be able to operate in the traditional tiered model. Over time they will be required to communicate and interact most of the business through a trade exchange.

Guo and Rui (2006) investigated the major reasons for E-marketplace adoption among SMEs in their international marketing practices. Empirical study shows that the perceived performance gap gives a firm incentive to try and adopt new marketing approaches, whereas the perceived potential utility and the perceived resource readiness showed how well the E-

commerce e-marketplace solution fits with the firm's situation. Jointly, these three factors explained a SME's adoption decision for E-commerce e-marketplace initiatives.

Fu et al. (2006) presented a three-layer hierarchical structure of the factors involved in adopting an electronic marketplace (EM) model and to examine the relative weightings given to various strategic factors by the securities industry (SI) and the heavy electric machinery industry in Taiwan. They explored weights of "proactive" factors are found to be greater than those of "defensive" factors for instance, contrary to previous findings in this area, the "risk of adopting new technology" is not found to be the major factor influencing decision making. Several factors are found to have different routes of influence in determining decision making in dissimilar industries.

Pucihar and Podlogar (2006) explored opportunities for, and threats to e-marketplaces' use. Success factors of e-marketplace adoption are divided into three groups: organizational factors, e-marketplace factors and environmental factors. The authors argue that each of these group influences significantly an organization's e-readiness for e-marketplace adoption. The importance of each of these factors is described on the basis of the results of research, conducted in 119 large organizations in Slovenia. Furthermore, the authors believe that by understanding these factors, organizations will be able to prepare better for successful e-marketplace adoption and successfully exploit important competitive advantages offered by new E-commerce business models.

Costantino and Pietroforte (2006) explored that the adoption rate of E-commerce applications in the US construction market varies widely, notwithstanding their potential benefits. The adoption of E-commerce applications varies according to the nature and phases of the transaction process, type of production inputs as well as size and type of construction firm.

Thatcher et al. (2006) explored on data derived from over 20 interviews with CEOs, CIOs, and MIS managers in electronics and textile companies in Taiwan. This study adds to existing literature by describing the degree to which various organizational, industrial, governmental and cultural factors influence E-commerce adoption decisions in Taiwan. Results indicate that industrial, governmental, organizational, and cultural factors do indeed influence E-commerce adoption decisions. However, the nature of the cultural influence is dictated by industry conditions.

Huy (2006) explored that some Vietnamese enterprises have adopted E-commerce and already got benefits from it. In the study sample consists of 800 small and medium-sized enterprises in Vietnam. The results pointed that size of the enterprise, its resources and strategic orientation, employees' knowledge of E-commerce, managers' attitudes towards innovation and their knowledge of new technologies and E-commerce, the intensity of competition, support from the government, the national infrastructure, the perceived relative advantages, the complexity and compatibility of E-commerce

all have an influence on the adoption of E-commerce in SMEs in Vietnam, but this influence differs depending on whether it involves users or prospectors. Moreover, size of the firm, its resources and strategic orientation, employees' knowledge of E-commerce, managers' attitudes towards the adoption of innovation and their knowledge of new technologies and E-commerce, support from the government, and the national infrastructure, as well as perceived relative advantages of E-commerce, are positively correlated to the degree of E-commerce utilization by users in SMEs in Vietnam.

Son and Benbasat (2007) investigated the impetus for organizational participation in E-commerce electronic marketplaces (e-marketplaces). With insights obtained from transaction cost theory and institutional theory identified two groups of factors, efficiency- and legitimacy-oriented, respectively, that may influence organizational participation in E-commerce e-marketplaces. The effects of these factors on adoption intent and on usage of E-commerce e-marketplaces are empirically tested with data collected from the purchasing side of 98 potential adopter and 85 current adopter organizations, respectively. The results indicated that all three efficiency-oriented factors—product characteristics, demand uncertainty, and market volatility—and their sub constructs have a significant influence on usage. However, only demand uncertainty is found to have significant influence on adoption intent. The results also show that two legitimacy-oriented factors-mimetic pressures, and normative pressures-and their sub constructs have a significant influence only on adoption intent, but not on usage. Finally, unlike efficiencyoriented factors, legitimacy oriented factors are found to contribute to a significant increase in variance explained for only adoption intent among potential adopters.

Giunta and Francesco (2007) explored that firm size, geographical location, functional composition of the workforce, R&D activity, subcontracting, exports and collaboration between firms are all highly significant determinants of IT adoption.

White et al. (2007) examined twenty-six specific factors and their impact on adoption is discussed. The identification of a significant count of factors specific to this domain provides real meaning and depth to those interested in the future of emarketplaces. In particularly, the factors identified provide those that operate such e-marketplaces with a elaborated and actionable understanding of the issues they should address in order to survive, and provide users or potential users of consortium marketplaces with a practical framework with which to assess individual marketplaces.

Chian-Son Yu (2007) explored following an empirical survey, critical factors influencing a firm's willingness to use an emarketplace are identified via a pre-joining, decision to join, and post-joining research structure. The differences between Firms participating and not-participating in e-marketplaces were also examined.

Result indicated that First, three principal factors driving a company to adopt e-marketplaces are identified, namely "firm characteristics", "competitiveness of the business environment", and "promotion from top management". Second, at the pre-adoption stage, the firm intention to adopt e-marketplace is considerably influenced by "competitiveness of the business environment" and "promotion from top management". Third, at the post-adoption stage, only "competitiveness of the business environment" significantly influences e-marketplace-adopting firm intention to continue using the e-marketplace. Fourth, "the competitiveness of the organization environment" is the most critical cause influences on firm decision to adopt or not adopt an e-marketplace, while the second and third significant causes are "promotion from top management" and "firm characteristics". Fifth, examining the differences between e-marketplace-adopting firms and emarketplace-non- adopting firms reveals that adopting-firms have significant higher stimulation from peers and the government, level of computerization, and promotion from CEO and senior management than non-adopting firms.

Zhang and Dhaliwal (2007) examined that in-depth process by which Chinese firms adopt E-commerce or critical factors that may influence the value those firms gain from Ecommerce. The study identified key organizational and institutional factors that influence Chinese firms' adoption of E-commerce. Results indicated that Chinese firms can realize the benefits of E-commerce by incorporating the technology within their internal business processes and by using the technology externally with partners in the same trading community. The results also showed that Chinese firms' engagement in E-commerce is significantly influenced by institutional factors. Building on the existing literature, this study indicated how resource-based theory and institutional theory can provide a solid theoretical backbone for practitioners, researchers, and policy makers in exploring Ecommerce adoption by Chinese firms.

Tan et al. (2007) explored that E-commerce adoption by businesses in China from internal, external and contextual perspectives in an empirical study of 134 Chinese SME's. This study validated the Perceived eReadiness Model. It further analyzes the organizational and contextual factors that affect business-to-business eCommerce adoption in China. Findings suggested that the important inhibiting factors in China are restricted access to computers, lack of enterprise-wide information sharing, lack of internal trust, intolerance towards failure, and incapability of dealing with rapid change. These variables are analyzed in the context of Chinese culture.

Azam and Quadddus (2009) explored that the rapidly increasing age of internet, to utilize the newly emerged technology dependent communication and transaction medium, E-commerce, in acquiring their competitiveness, the slow rate of adoption is evident. A descriptive research study was designed with the data gathered from 222 SMEs through a self administered structured questionnaire. A multiple

regression model was estimated to asses the factors influencing the adoption of E-commerce and estimate their effects, where adoption intention is considered as explained variable and business experience, internet usage, number of computer literate officer and revenue of company have been added with six attributes of innovation, relative advantage, compatibility, complexity, trial ability, observability, and uncertainty are considered as explanatory variables. The study reported the effects of perceived compatibility, complexity, observability and uncertainty, company internet usage and number of computer literate officer appear as significant with the overall regression explaining 34.2% of willingness to adopt E-commerce.

Jianyuan et al. (2009) explored that the rapid development of E-commerce, the research on E-commerce adoption become more necessary and important. The result indicated that relative advantage, network externality, technological trust, top manager support have significant positive affects the adoption intention of organizations in China.

Elahi and Hassanzadeh (2009) explored that in order to acquire the numerous advantages of E-commerce. Issue of evaluating electronic commerce adoption has its own importance. The result indicated that there is a significant positive relationship between stages of electronic commerce development and degree of e- commerce adoption in the companies.

Mockler et al. (2009) explored that organizations should be aware that although E-commerce may provide many benefits and the future looks bright, it is not the magic solution it was once assumed to be but rather just another potential business tool to be implemented under the right circumstances.

Teo et al. (2009) examined factors associated with the adoption of e-procurement. A survey was administered to collect data from 141 companies in Singapore. Using logistic regression analysis, result indicated top management support, firm size, perceived indirect benefits, and business partner influence are positively and significantly associated with the adoption of e-procurement. However, industry type does not show any relationship with e-procurement adoption.

Pham et al. (2011) explored that E-commerce is making significant contributions to reduction in costs of doing business, improved product/service quality, new customer and supplier penetration, and generation of new ways or channels for product distribution.

AlGhamdi et al. (2012) studied diffusion and adoption of online retailing in Saudi Arabia. It identified and explored key factors influence Saudi retailers to adopt E-commerce selling to their customers. They include provision of trustworthy and secure online payment options, government support and assistance for E-commerce, development of strong ICT Infrastructure and educational programs for people and building the awareness of E-commerce in the country.

Taylor et al. (2012) examined the factors that affect Internet and E-commerce adoption among small exporting handicraft firms in Ghana. Results indicated that the internal factors that affected internet and E-commerce adoption of the firms were perceived benefits of the technology from manager/owner characteristics, lack of qualified staff to develop and support E-commerce website from firm characteristics, and limited resources from cost and return on investment. The key external factors affecting the adoption included limited lack of online payment process, Internet Service Providers (ISP), pricing structures, and limited availability of online banking services, power failure, and low competition in the industry. Implications for theory and management have been discussed.

Table 2.1 Summary of factors affecting Adoption from Literature Review

Adoption Factors	Literatures
Increasing market efficiency	Detourn et al. (2000), Skjott-Larsen et al. (2003), Hsiao (2003), Heikkila (2002) and Mclvor and Humphreys (2004)
Attracting new buyers	Min and Galle (1999), Skjott-Larsen et al. (2003), Prasad and Babbar (2000) and Bendoly and Schoenherr (2005)
Increasing price competitiveness	Skjott-Larsen et al. (2003)
Strengthening customer relations and marketing activities	Noekkenved (2000), McIvor and Humphreys (2004), Boyer and Hult (2005), Gimenez and Ventura (2005)
Lowering transaction cost	Detourn et al. (2000), Skjott-Larsen et al. (2003), Dewar and Dutton (1986), Bendoly and Schoenherr (2005), Mclvor and Humphreys (2004) and Min and Galle (1999), Gottschalk and Abrahamsen (2002), Barnes et al. (2004), Pucihar and Gricar (2005), Rahman (2004)
Lowering inventory level	Detourn et al. (2000) and McIvor and Humphreys (2004)
Strengthening customer service and interaction	Skjott-Larsen et al. (2003), Kumar and Crook (1999), Noekkenved (2000), Gimenez and Ventura (2005), Heikkila (2002) and Boyer and Hult (2005)
Strengthening integration and collaboration of marketing activities with other industries	Hsiao (2003), Noekkenved (2000), AMR (1998), Gural et al. (2001) and Gimenez and Ventura (2005)
High competition	Trouong (2002), Heck and Ribbers (2002), Zhu et al. (2008), Akkeren and Cavaye (1999), Rashid and Qirim (2001), Wang and Tasi (2002), Ling (2001), and Heck and Ribbers (2002)
Increasing product visibility	Detourn et al. (2000) and Premkumar et al. (1994)
Cost of adopting new technologies and equipment	Hsiao (2003), Kendall et al. (2001), Premkumar and Ramamurthy (1995), Premkumar et al. (1994) and Thong and Yap (1995)

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Complexity of new technologies	Thong and Yap (1995), Thong (1999) and Tornatzky and Klein (1982)
Compatibility of new technologies	Hsiao (2003), Premkumar et al. (1994), Tornatzky and Klein (1982), Thong and Yap (1995), Premkumar and Ramamurthy (1995), Rogers (1983) and Truman (2000)
Pressure from Customers to adopt E-commerce	Rashid and Qirim (2001), Ling (2001), Wang and Tasi (2002), Son and Benbasat (2007), Heck and Ribbers (2002), and Daniel and Grimshaw (2002), Joo and Kim (2004), Yu (2007), Teo et al. (2009)
Speed of Internet network	Flynn (2000), Taylor et al. (2012)
Transaction security and trust	Hsiao (2003), Kumar and Crook (1999), Truman (2000), Hart and Saunders (1997) and Knights et al.(2001), Turban et al. (2002), Pucihar and Gricar (2005), Jianyuan et al. (2009), Taylor et al. (2012)
Organizational scope	Premkumar and Ramamurthy (1995) and Markus and Soh (2003)
Compatibility of E-commerce with Other Systems	Rashid and Qirim (2001), Ling (2001), Trouong (2002), Heck and Ribbers (1999), and Lee and Kim (2007)
Pressure from Suppliers to adopt E-commerce	Heck and Ribbers (1999), Wang and Tasi (2002), Ling (2001), and Rashid and Qirim (2001), Yu (2007), Teo et al. (2009)
Issue of Internet security	APEC E-commerce (1999), Wang and Tasi (2002), Mukti (2000), Jun (2003), and Turban et al. (2002), Taylor et al. (2012)
Organizational empowerment	Dewar and Dutton (1986)
Government regulations and pressures	Bailey and Capozzoli (2001), Yu (2007)
Organizational innovative ability	Premkumar and Ramamurthy (1995) and Thong (1999)
Depth of management decisions	Hsiao (2003), Premkumar and Ramamurthy (1995), Thong (1999), Grover et al (1995) and Thong and Yap (1995), Teo et al. (2009)
Infrastructure available for the adoption of E-commerce	APEC E-commerce (2000), Kirkman et al. (2002), CSPP (1998), Molla and Licker (2005)
Government promotion and investment for	Gibbs et al (2003), Kirkman et al. (2002),

E-commerce	Molla and Licker (2005), Thatcher et al. (2006)
Customers readiness to adopt E-commerce	Doherty et al. (2000), Zhu et al. (2002), Sung (2006), Hoffman and Chatterjee (1995), and Turban et al. (2008), Taylor et al. (2012)
Ability of a business to support E-commerce in terms of information-technology hardware and infrastructure	Hsiao (2003), Tan and Wu (2002), Kraemer et al (2002), Farhoomand et al (2000), Markus and Soh (2003), Gural et al (2001) and Grieger (2003), Taylor et al. (2012)
Trustworthy and secure online payment options	Thatcher et al. (2006), AlGhamdi et al. (2012), Taylor et al. (2012)
Government support and assistance for E-commerce	Hart and Saunders (1997), Thatcher et al. (2006), AlGhamdi et al. (2012), Taylor et al. (2012)
Development of strong ICT Infrastructure	Tan and Wu (2002), Thatcher et al. (2006), AlGhamdi et al. (2012), Taylor et al. (2012)
Educational programs for people and building the awareness of E-commerce in the country	Budhiraha (2004), Thatcher et al. (2006), AlGhamdi et al. (2012), Taylor et al. (2012)

Conclusion

The advent of the E-commerce has transformed industries and redefined the rules of competition. The old rules still exist; however they have also given way to new channels and infomediaries, and changed the nature of relationships between businesses and between businesses and their customers. Given present trends the E-commerce influence will continue to grow into the foreseeable future as businesses collaborate with suppliers and partners; source, produce and distribute products and services globally.

The E-commerce has and will continue to provide managers with fast and accurate information from a wide range of operating areas including transportation, inventory, purchasing, customer service, production scheduling, order processing, and vendor operations to enable them to improve profitability of their supply chain. On a continuing basis, the E-commerce will enable logistics managers to monitor their supply chain operations and reduce costs when inefficiencies arise. The consequences of this are and will continue to affect the profitability of organizations dramatically.

This research is useful for proponents of E-commerce, especially software vendors. Software vendors are provided with an insight into the key factors that are significantly associated with E-commerce adoption. Armed with this

information, vendors can thus devise more effective and efficient promotion strategies for their E-commerce software. This research has been restricted to leading information systems journals. This means that it may not be representative of all information systems journals.

References

Agarwal, R., & Prasad, J. (1997). The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. *Decision Sciences*, 28(3), 557-582.

Agarwal, R., & Prasad, J. (1998). The antecedents and consequents of user perceptions in information technology adoption. *Decision Support Systems*, 22(1), 15-29.

Agarwal, R., & Prasad, J. (1999). Are individual differences germane to the acceptance of new information technologies? *Decision Sciences*, 30(2), 361-391.

AlGhamdi, R., Nguyen, A., Nguyen, J., & Drew, S. (2012). Factors influencing E-commerce Adoption by Retailers in Saudi Arabia. arXiv preprint arXiv:1211.2799.

AMR. (1998). Are we moving from buyer and seller to

- collaborators. Atlanta, GA.
- Azam, M. (2006a). Implementation of B2C e-commerce in Bangladesh: The effects of buying culture and e-infrastructure. *ADVANCES IN GLOBAL BUSINESS RESEARCH*, 3(1), 55-56.
- Azam, M., & Quadddus, M. (2009). Adoption of b2b ecommerce by the SMEs in Bangladesh: an empirical analysis.
- Bailey, E., & Capozzoli, E. (2001). *INTERNATIONAL TRADE AND THE INTERNET*.
- Barnes, D., Hinton, M., & Mieczkowska, S. (2004). E-commerce in the old economy: three case study examples. *Journal of Manufacturing Technology Management*, 15(7), 607-617.
- Bendoly, E., & Schoenherr, T. (2005). ERP system and implementation-process benefits: Implications for B2B e-procurement. *International Journal of Operations & Production Management*, 25(4), 304-319.
- Bertschek, I., & Fryges, H. (2002). The adoption of businessto-business e-commerce: Empirical evidence for German companies. *Center for European Economic Research (ZEW)*.
- Boyer, K., & Hult, G. (2005). Extending the supply chain: Integrating operations and marketing in the online grocery industry. *Journal of Operations Management*, 23(6), 642-661.
- Carter, P., Carter, J., Monczka, R., Slaight, T., & Swan, A. (2000). The Future of Purchasing and Supply: A Ten Year Forecast1. *Journal of Supply Chain Management*, 36(1), 14-26.
- Cooperation, A. P. E. (2000). E-Commerce readiness assessment guide. *Version*, *5*, 35.
- Costantino, N., & Pietroforte, R. (2006). The Adoption rate of E-commerce in the US and ITALIAN construction markets: some reasons for its variability: ITcon.
- Daniel, E., & Grimshaw, D. (2002). An exploratory comparison of electronic commerce adoption in large and small enterprises. *Journal of Information Technology, 17*(3), 133-147.
- Davis, F. (1986). A technology acceptance model for empirically testing new end-user information systems: theory and results.
- Davis, F. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International journal of manmachine studies*, 38(3), 475-487.

- Davis, F., Bagozzi, R., & Warshaw, P. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science*, 35(8), 982-1003.
- Detourn, N., Fischer, J., & Larson, P. (2000). B2B e-commerce—the dawning of a trillion-dollar industry. *Motley Fool Research*, 11-12.
- Dewar, R., & Dutton, J. (1986). The adoption of radical and incremental innovations: an empirical analysis. *Management science*, 32(11), 1422-1433.
- Doherty, N., Ellis-Chadwick, F., & Hart, C. (2000). An investigation of the factors affecting the adoption of e-commerce amongst UK-based retailers: © Loughborough University.
- Driedonks, C., Gregor, S., & Wassenaar, A. (2005). Economic and social analysis of the adoption of B2B electronic marketplaces: A case study in the Australian beef industry. *International Journal of Electronic Commerce*, 9(3), 49-72.
- Elahi, S., & Hassanzadeh, A. (2009). A framework for evaluating electronic commerce adoption in Iranian companies. *International Journal of Information Management*, 29(1), 27-36.
- Esichaikul, V., & Chavananon, S. (2001). *Electronic Commerce* and *Electronic Business Implementation Success Factors*.
- Farhoomand, A., Tuunainen, V., & Yee, L. (2000). Barriers to global electronic commerce: A cross-country study of Hong Kong and Finland. *Journal of Organizational Computing and Electronic Commerce*, 10(1), 23-48.
- Flynn, A., & Purchase, S. (2001). Perceptions of Barriers to E-commerce. Paper presented at the ANZMACconference Massey University, New Zealand.
- Fu, H., Ho, Y., Chen, R., Chang, T., & Chien, P. (2006). Factors affecting the adoption of electronic marketplaces: A fuzzy AHP analysis. *International Journal of Operations & Production Management*, 26(12), 1301-1324.
- Gajsek, B., & Pucihar, A. (2004). Factors Facilitating Successful Adoption Of eMarketplace By SMEs: The Case In Slovenia. *BLED 2004 Proceedings*, 18.
- Gibbs, J., Kraemer, K., & Dedrick, J. (2003). Environment and policy factors shaping global e-commerce diffusion: A cross-country comparison. *The Information Society, 19*(1), 5-18.
- Gimenez, C., & Ventura, E. (2005). Logistics-production, logistics-marketing and external integration: Their impact on performance. *International Journal of Operations & Production Management*, 25(1), 20-38.

- Giunta, A., & Trivieri, F. (2007). Understanding the determinants of information technology adoption: evidence from Italian manufacturing firms. *Applied Economics*, 39(10), 1325-1334.
- Gottschalk, P., & Abrahamsen, A. (2002). Plans to utilize electronic marketplaces: the case of B2B procurement markets in Norway. *Industrial Management & Data Systems*, 102(6), 325-331.
- Grieger, M. (2003). Electronic marketplaces: A literature review and a call for supply chain management research. *European journal of operational research*, 144(2), 280-294.
- Grover, V., Goslar, M., & Segars, A. (1995). Adopters of telecommunications initiatives: a profile of progressive US corporations. *International Journal of Information Management*, 15(1), 33-46.
- Guo, R., & Xu, Y. (2006). The adoption of internet-based business-to-business e-marketplaces among small and medium-sized enterprises in their international marketing practices.
- Gural, C., Ranchhod, A. and Hackney, R. (2001). Internet transactions and physical logistics: conflict or complementarity. *Logistics Information Management*, 14(1/2), 33-43.
- Hart, P., & Saunders, C. (1997). Power and trust: Critical factors in the adoption and use of electronic data interchange. *Organization science*, 8(1), 23-42.
- Hasselbring, W., & Weigand, H. (2001). Languages for electronic business communication: state of the art. *Industrial Management & Data Systems*, 101(5), 217-227.
- Heikkilä, J. (2002). From supply to demand chain management: efficiency and customer satisfaction. *Journal of Operations Management*, 20(6), 747-767.
- Hoffman, D., & Novak, T. Chatterjee. (1995). Commercial scenarios for the Web: Opportunities and challenges. Journal of Computer-mediated Communication, Special Issue on Electronic Commerce, 1(3).
- Hsiao, R. (2001). Technology fears: Barriers to the adoption of business-to-business e-commerce. *ICIS 2001 Proceedings*, 22.
- Hsiao, R. (2003). Technology fears: distrust and cultural persistence in electronic marketplace adoption. *The Journal of Strategic Information Systems*, 12(3), 169-199.
- Huy, L., & Filiatrault, P. (2006). The adoption of e-commerce in SMEs in Vietnam: a study of users and prospectors. *PACIS 2006 Proceedings*, 74.

- Jianyuan, Y., & Chunjuan, Z. (2009). An Empirical Study on Influence Factors for Organizations to Adopt B2B E-Marketplace in China.
- Johnson, M., & Johnson, D. (2005). Integrated strategy of industrial product suppliers: Working with B2B intermediaries. *Internet Research*, 15(4), 471-492.
- Joo, Y., & Kim, Y. (2004). Determinants of corporate adoption of e-marketplace: an innovation theory perspective. Journal of Purchasing and Supply Management, 10(2), 89-101.
- Jun, M., & Cai, S. (2003). Key obstacles to EDI success: from the US small manufacturing companies' perspective. *Industrial Management & Data Systems, 103*(3), 192-203.
- Kaynak, E., Tatoglu, E., & Kula, V. (2005). An analysis of the factors affecting the adoption of electronic commerce by SMEs: Evidence from an emerging market. *International Marketing Review, 22*(6), 623-640.
- Kendall, J., Tung, L., Chua, K., Ng, C., & Tan, S. (2001). Receptivity of Singapore's SMEs to electronic commerce adoption. *The Journal of Strategic Information Systems*, 10(3), 223-242.
- Kirkman, G., Osorio, C., & Sachs, J. (2002). The networked readiness index: Measuring the preparedness of nations for the networked world. *The global information technology report 2001–2002, 4*, 20.
- Knights, D., Noble, F., Vurdubakis, T., & Willmott, H. (2001). Chasing shadows: control, virtuality and the production of trust. *Organization Studies*, 22(2), 311.
- Kraemer, K., Gibbs, J., & Dedrick, J. (2002). Environment and policy factors shaping e-commerce diffusion: A cross-country comparison. *Proc. 23rd ICIS, Barcelona, Spain*.
- Kumar, R., & Crook, C. (1999). A multi-disciplinary framework for the management of interorganizational systems. *ACM SIGMIS Database*, 30(1), 22-37.
- Lee, S., & Kim, K. (2007). Factors affecting the implementation success of Internet-based information systems. *Computers in Human Behavior*, 23(4), 1853-1880.
- Ling, C. Y. (2001). Model of factors influences on electronic commerce adoption dif-fusion in small & medium sized enterprise. *Curtin University of Technology.* Working Paper.
- Markus, M., & Soh, C. (2003). Structural influences on global ecommerce activity.
- McIvor, R., & Humphreys, P. (2004). The implications of

- electronic B2B intermediaries for the buyer-supplier interface. *International Journal of Operations & Production Management*, 24(3), 241-269.
- Min, H., & Galle, W. (1999). Electronic commerce usage in business-to-business purchasing. *International Journal of Operations & Production Management*, 19(9), 909-921.
- Mockler, R., Dologite, D., & Gartenfeld, M. (2009). B2B E-Business. *Electronic business: concepts, methodologies, tools, and applications*, 238.
- Molla, A., & Licker, P. (2005). eCommerce adoption in developing countries: a model and instrument. *Information & Management*, 42(6), 877-899.
- Moore, G., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192-222.
- Mukti, A. (2000). Barriers to putting businesses on the Internet in Malaysia. *The Electronic Journal of Information Systems in Developing Countries*, 2(0).
- Noekkenved, C. (2000). Collaborative processes in e-supply networks: towards collaborative community B2B marketplaces. *Research Report. Pricewaterhouse-Coopers*.
- Pham, L., & Nguyen, D. (2011). Determinants of e-commerce adoption in Vietnamese small and medium sized enterprises. *International Journal of Entrepreneurship*, 15, 45-72.
- Power, D. (2002). Application of established and emerging B2B e-commerce technologies: Australian empirical evidence. *Integrated Manufacturing Systems*, 13(8), 573-585.
- Prasad, S., & Babbar, S. (2000). International operations management research. *Journal of Operations Management*, 18(2), 209.
- Premkumar, G., & Potter, M. (1995). Adoption of computer aided software engineering (CASE) technology: an innovation adoption perspective. *ACM SIGMIS Database*, 26(2-3), 105-124.
- Premkumar, G., & Ramamurthy, K. (1995). The Role of Interorganizational and Organizational Factors on the Decision Mode for Adoption of Interorganizational Systems*. *Decision Sciences*, 26(3), 303-336.
- Premkumar, G., Ramamurthy, K., & Nilakanta, S. (1994). Implementation of electronic data interchange: an innovation diffusion perspective. *Journal of Management Information Systems*, 11(2), 157-186.

- Pucihar, A., & Gricar, J. (2005). Environmental factors defining eMarketplace adoption: Case of large organizations in Slovenia.
- Pucihar, A., & Podlogar, M. (2006). E-Marketplace Adoption Success Factors: Challenges and Opportunities for a Small Developing Country. *Electronic Business in Developing Countries: Opportunities and Challenges*, 88-117.
- Rahman, Z. (2004). Use of internet in supply chain management: a study of Indian companies. *Industrial Management & Data Systems*, 104(1), 31-41.
- Ramayah, T., Dahlan, N., Karia, N., & Kassim, N. (2006). Perceived characteristics of innovating (PCI): The case of human resource information systems (HRSI). *ADVANCES IN GLOBAL BUSINESS RESEARCH*, 159-165.
- Ramayah, T., Ignatius, J., & Aafaqi, B. (2005). PC Usage among students in a private institution of higher learning: The moderating role of prior experience. *Educators and Education Journal*, 20, 131-152.
- Ramayah, T., Jantan, M., & Aafaqi, B. (2003). Internet usage among students of institutions of higher learning: The role of motivational variables.
- Ramayah, T., Jantan, M., Mohd Noor, M., Razak, R., & Koay, P. (2003). Receptiveness of internet banking by Malaysian consumers: The case of Penang. *Asian Academy of Management Journal*, 8(2), 1-29.
- Rashid, M., & Al-Qirim, N. (2001). E-commerce technology adoption framework by New Zealand small to medium size enterprises. *Research Letters in the Information and Mathematical Sciences*, 2(1), 63-70.
- Rogers, E. (1983). *Diffusion of innovations (3rd ed.)*: Macmillan, New York, NY.
- Sathye, M., & Beal, D. (2001). Adoption of electronic commerce by SMEs: Australian evidence. *Journal of E-Business*, *I*(1), 1-11.
- Senn, J. (2000). Business-to-business e-commerce. *Information Systems Management, 17*(2), 1-10.
- Skjott-Larsen, T., Kotzab, H., & Grieger, M. (2003). Electronic marketplaces and supply chain relationships. *Industrial Marketing Management*, 32(3), 199-210.
- Son, J., & Benbasat, I. (2007). Organizational buyers' adoption and use of B2B electronic marketplaces: efficiency-and legitimacy-oriented perspectives. *Journal of Management Information Systems*, 24(1), 55-99.
- Sung, T. (2006). E-commerce critical success factors: East vs.

- West. Technological Forecasting and Social Change, 73(9), 1161-1177.
- Tan, J., Tyler, K., & Manica, A. (2007). Business-to-business adoption of eCommerce in China. *Information & Management*, 44(3), 332-351.
- Tan, M., & Teo, T. (2000). Factors influencing the adoption of Internet banking. *Journal of the AIS*, 1(1es), 24-34.
- Taylor, S., & Todd, P. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, 6(2), 144-176.
- Taylor, T., & Owusu, E. D. E. (2012). Factors Affecting Internet and e-Commerce Adoption among Small and Medium-Sized Enterprise Non-Traditional Exporters: Case Studies of Ghanaian Handicraft Exporters. European Journal of Business and Management, 4(13), 25-37.
- Teo, T., Lin, S., & Lai, K. (2009). Adopters and non-adopters of e-procurement in Singapore: An empirical study. *Omega*, *37*(5), 972-987.
- Teo, T., & Ranganathan, C. (2004). Adopters and non-adopters of business-to-business electronic commerce in Singapore. *Information & Management*, 42(1), 89-102.
- Thatcher, S., & Foster, W. (2003). B2B e-commerce adoption decisions in Taiwan: The interaction of organizational, industrial, governmental and cultural factors.
- Thatcher, S., Foster, W., & Zhu, L. (2006). B2B e-commerce adoption decisions in Taiwan: The interaction of cultural and other institutional factors. *Electronic Commerce Research and Applications*, 5(2), 92-104.
- Thong, J. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15(4), 187-214.
- Thong, J., & Yap, C. (1995). CEO characteristics, organizational characteristics and information technology adoption in small businesses. *Omega*, 23(4), 429-442.
- Tornatzky, L., & Klein, K. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on engineering management*, 29(1), 28-45.
- Trouong, D., Rao S.S. (2002). Development a contingency model for adoption of electronic commerce, Decision Science Institute, annual meeting proceedings.
- Truman, G. (2000). Integration in electronic exchange environments. *Journal of Management Information Systems*, 17(1), 209-244.
- Turban, E. (2008). Information technology for management:

- John Wiley & Sons, Inc. New York, NY, USA.
- Turban, E., King, D., Lee, J., Warkentin, M., & Chung, H. (2002). *Electronic commerce: A managerial perspective 2002*: Prentice Hall.
- Van Akkeren, J., & Cavaye, A. (1999). Factors affecting entrylevel internet technology adoption by small business in Australia: An empirical study.
- Van Heck, E., & Ribbers, P. (2002). *The adoption and impact of EDI in Dutch SMEs*.
- Vlachopoulou, M., & Manthou, V. (2003). Partnership alliances in virtual markets. *International Journal of Physical Distribution & Logistics Management*, 33(3), 254-267.
- Wang, J., & Tsai, K. (2002). Factors in Taiwanese firms' decisions to adopt electronic commerce: An empirical study. *World Economy*, 25(8), 1145-1167.
- White, A., Daniel, E., Ward, J., & Wilson, H. (2007). The adoption of consortium B2B e-marketplaces: An exploratory study. *The Journal of Strategic Information Systems*, 16(1), 71-103.
- Wu, C. (2004). A readiness model for adopting Web services. Journal of Enterprise Information Management, 17(5), 361-371.
- Yu, C. (2007). What drives enterprises to trading via B2B emarketplaces. *Journal of Electronic Commerce Research*, 8(1), 84-100.
- Zhang, C., & Dhaliwal, J. (2007). An Empirical Study of Chinese Firms' Adoption of Business-to-Business Electronic Commerce.
- Zhu, K., Kraemer, K., & Xu, S. (2002). A cross-country study of electronic business adoption using the technology-organization-environment framework.
- Zhu, Q., Sarkis, J., Cordeiro, J., & Lai, K. (2008). Firm-level correlates of emergent green supply chain management practices in the Chinese context. *Omega*, 36(4), 577-591.