

An Investigation of Key Adoption of Non-business E-Commerce in Malaysia

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ABSTRACT

Non-business EC is a relatively new research niche in the general e-commerce stream. It denotes the use of e-commerce by non-business institutions such as academic institutions (as in the present study), not-for profit organizations, religious organizations, and government agencies to reduce their expenses or to improve their operations and customer service. A field survey was conducted to determine key factors that facilitate the adoption of non-business EC in Malaysian Universities. Since e-commerce adoption decision is a strategic one, a comprehensive list of potential facilitators and non-facilitators for the strategic use of information technology was derived from past research and used as the basis for collecting data from 65 schools, centres and units from 5 public universities in Kota Kinabalu and Kuala Lumpur. These data were factor-analysed to determine the key underlying dimensions of facilitators. On the basis of the resulting five dimensions namely, relative advantage, network orientation, information efficiency, innovativeness, and competitiveness, regression analysis was done to determine the impact of the five dimensions on adoption. The results suggest that relative advantage, network orientation, and information efficiency are the most important facilitators. Inhibitors were not estimated eventually, as there were no non-users among the respondents.

Keywords

E-Commerce, Non-Business, Adoption, Facilitators

1.0 INTRODUCTION

As we enter the second millennium, we experience one of the most important changes in our lives – the move to an Internet-based society. One of the most significant changes is in the manner business is conducted especially in how the marketplace and commerce is managed. Electronic commerce (henceforth e-commerce) describes the manner in which transactions take place over networks,

mostly the Internet. It is the process of electronically buying and selling goods, services, and information.

E-commerce could be classified based on the nature of transaction. Turban et al. (2000) distinguished the following types: Business-to-Business, Business-to-Consumer, Consumer-to-Consumer, Consumer-to-Business and Non-business E-commerce. Non-business E-commerce includes non-business institutions such as academic institutions, not-for profit organizations, religious organizations, and government agencies using various types of e-commerce to reduce their expenses or to improve their operations and customer service.

The e-commerce revolution has brought a myriad of opportunities and risks each resulting in either facilitating or inhibiting its adoption. The global nature of the technology, low cost, opportunity to reach hundreds of millions of people, interactive nature, variety of possibilities, and resourcefulness and rapid growth of the supporting infrastructures (especially the web) result in many potential benefits to organizations, individuals, and society. Potential benefits of e-commerce to organizations include: (1) expansion of the marketplace to national and international markets, (2) decreases the cost of creating, processing, distributing, storing, and retrieving paper-based information, (3) ability for creating highly specialized businesses, (4) allows reduced inventories an overhead by facilitating "pull"-type supply chain management, (5) the pull-type processing enables expensive customisation of products and services which provides competitive advantage to its implementers, (6) reduces the time between the outlay of capital and the receipt of products and services, (7) initiates business processes reengineering projects, (8) lowers telecommunication cost-the Internet is much cheaper than Value Added Networks (VANS), (8) other benefits include improved image, improved customer service, new found business partners, simplified processes, compressed cycle and delivery time, increased productivity, eliminating paper, expediting access to information,

reduced transportation costs, and increased flexibility (Turban, Lee, King, & Chung, 2000).

Turban et al., (2000) grouped the limitations of e-commerce into technical and non-technical. Technical limitations include: (1) lack of system security, reliability, standards, and some communication protocols, (2) insufficient telecommunication bandwidth, (3) the software development tools are still evolving and changing rapidly, (4) difficult to integrate the Internet and e-commerce software with some existing applications and databases, (5) vendors need special Web servers and other infrastructures, in addition to the network servers, (6) some e-commerce software might not fit with some hardware, or may be incompatible with some operating systems or other components. Non-technical limitations are: (1) cost and justification-the cost of developing e-commerce in-house can be very high, and mistakes due to lack of experience may result in delays, (2) security and privacy issues, (3) lack of trust and user resistance, (4) other limiting factors are lack of touch and feel online, government regulations and standards are not refined enough for many circumstances, there are not enough support services, in most applications there are not enough sellers and buyers for profitable e-commerce operations, could result in breakdown of human relationships, and accessibility to the Internet is still expensive and/or inconvenient for many potential customers.

1.1 Research Problem

Despite these limitations, e-commerce adoption and use continues to grow rapidly around the world. The Internet B2B space is gaining much attention, with valuation for publicly traded B2B companies escalating rapidly. Estimates for the size of this burgeoning space vary widely from Gartner Group's prediction of \$7.29 trillion by 2004 to Goldman Sachs' estimation of \$1.5 trillion (Kearney, 2000), shows that the future hold great promise for adopters. Similarly, Arthur Anderson (2000) indicated that B2B represents 84% of total e-business revenue and the growth prospects are substantial with the revenues predicted to be anywhere from \$2.7 trillion to over \$7 trillion in the next three years. In Malaysia, one of the fastest growing economies of East Asia, the need to study e-commerce adoption and adoption facilitators and inhibitors in non-business organizations is critical as it will help to create a more favourable environment for greater use of e-commerce as a tool for competitiveness, resilience, and success in the global business environment.

The current research focuses on the non-business e-commerce. Being the most un-common type of e-commerce (Turban et al., 2000), an understanding of its major drivers will help to create a favourable attitude and environment for adoption in Malaysian not-for-profit making organizations. Although there

has been significant' research on e-commerce drivers, existing empirical research focusing on not-for-profit making organizations like institutions of higher learning is lacking. Most studies concentrate on the marketing and bottom line benefit of e-commerce without much attention to a host of other factors that could be influential. In this research therefore, a broad spectrum of factors were investigated from IT drivers, to business needs, innovative needs, competitive position, environmental factors, economies of scale, to top management guidance, etc. Understanding the determinant structure of these variables will greatly push back the frontier of knowledge in the area of e-commerce application in not-for-profit making organizations, as well as help in technology management in these institutions, not to mention the immense benefits to systems designers and marketer, and policy makers, etc.

1.2 Objectives of The Study

One main focus of IT implementation research has been to determine why people accept or reject new technology. The current research will explore why non-business institutions will accept or reject e-commerce. The objectives of this study are therefore many fold: (1) to identify a comprehensive list of potential facilitators and inhibitors from prior research and practitioner literature, (2) to identify those facilitators and inhibitors that significantly determine e-commerce acceptance or rejection in non-business organizations in Malaysia, (3) to provide guidance to researchers and practitioners concerning the contingent factors and organizational processes that may facilitate or inhibit e-commerce development and diffusion in Malaysia, (4) to compare the drivers of e-commerce adoption in business organizations with non-business organizations, and (5) to understand the determinant structure of these key factors and e-commerce adoption in Malaysia.

1.3 Organization of the Study

The research is organized into nine sections. Section one introduces the whole idea about e-commerce for not-for-profit making organizations, followed by section two defines the research problems, section three, the objectives of the research, section four the theoretical framework and section five the hypothesis. In the section six concentrates on explaining the methodology adopted in the research, while section seven reviews existing literature on generic e-commerce since there is hardly any known work focusing on e-commerce in the context of not-for profit making organizations. List of IT usage drivers were also reviewed. The section eight holds the results of the analysis, and the remaining sections discuss the findings, implications of the findings, and concluding remarks.

1.4 Theoretical Framework

Based on the resulting dimensions from factor analysing the list of items adapted from previous works, the following factors were examined to understand their influence on non-business EC adoption in selected Malaysian public universities. They include; relative advantage, information-efficiency, network, innovativeness, and competitiveness. These factors are schematised as Figure 1 below.

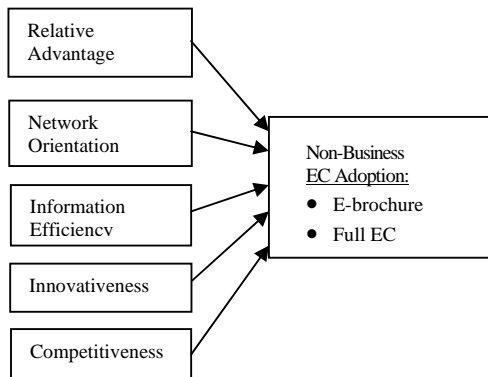


Figure 1: The Schema of the Research Model

1.5 Hypotheses

The following hypotheses are proposed for the research.

Hypothesis 1a: There is a positive relationship between the relative advantage of e-brochure and its adoption.

Hypothesis 1 b: There is a positive relationship between the relative advantage of full e-commerce and its adoption.

Hypothesis 2a: The greater the network of an organisation, the greater will be its adoption of e-brochure.

Hypothesis 2b: The greater the network of an organisation, the greater will be its adoption of full e-commerce.

Hypothesis 3a: Information efficiency is positively associated with e-brochure adoption.

Hypothesis 3b: Information efficiency is positively associated with full e-commerce adoption.

Hypothesis 4a: The greater the innovativeness of an organisation, the greater the likelihood of e-brochure adoption.

Hypothesis 4b: The greater the innovativeness of an organisation, the greater the likelihood of full e-commerce adoption.

Hypothesis 5a: The greater the need for competitiveness, the greater will be e-brochure adoption.

Hypothesis 5b: The greater the need for competitiveness, the greater will be full e-commerce adoption.

2.0 METHODOLOGY

2.1 Population of Study

Unit heads, directors of centres, deans of schools, and other senior administrators in public universities in Kuala Lumpur and Kota Kinabalu in Malaysia were surveyed to gain information on the extent of use of e-commerce in their various departments as well as the usage drivers. The earlier intention of this research was to investigate all the public and private universities in Malaysia, but the sponsor of the research reduced the scope. Nevertheless, the objectives of research were met. In all, 65 usable responses were received out of a total of 165 qualified respondents from five Universities in Kota Kinabalu and Kuala Lumpur.

2.2 Data Collection

In order to achieve the two main objectives of the research that is, to identify a comprehensive list of potential facilitators and inhibitors from prior research and practitioner literature, and to examine their impacts on non-business EC adoption, a list of facilitators for the use of IT was compiled from an extensive review of past literature. In compiling the list, we included all facilitators from previous work (see Table 1). A corresponding list of inhibitors can be identified as the absence of factors that make up the facilitators, for example, if strong market position is a facilitator for adopters, then the lack of strong market position may be considered an inhibitor for non-adopters (King & Teo 1996).

Clearly, the development of a list of inhibitors as the absence of facilitators may limit the range of applicability of the results. This approach is used because past research and existing literature do not treat inhibitors nearly as extensively as they do facilitators. This makes the list of inhibitors relatively short. In addition, it is felt that in deriving the list of inhibitors from the list of facilitators, one can directly examine whether the absence of a facilitator would necessarily function as an inhibitor. This would provide useful insight about the relative importance of each facilitator and inhibitor.

The initial list of facilitators and inhibitors was jointly reviewed by two of the authors in order to eliminate or combine repetitive items. From this list, a questionnaire was prepared using a five-point Likert-type scale ranging from "greatly inhibitive" to "greatly facilitative". The scale also had a column marked "not applicable" to allow for items that are not relevant to a particular company. In line with ICOLC (1998), adoption was measured based

on the number of job tasks undertaken with the e-commerce application. System usage for the sole purpose of promoting services is regarded as e-brochure (or partial adoption), and usage for promotion, reserving or ordering services, payment, and order fulfilment online or offline denote full adoption. The questionnaire was pre-tested with five deans of schools and directors of centres and modified appropriately.

3.0 DATA ANALYSIS

3.1 Demographic Profile of Respondents

The following is the profile of the demography of the respondents to the survey. The results in Table 1 show that various fields of academics are represented; deans of schools, directors of centres, unit heads, and other senior administrators participated in the survey; majority of the respondents have been on the job for more than five years; majority of the respondents have general computer experience of between five to thirty years; respondents are below sixty years old; two-third of the respondents are male; there is a large variation in the number of students/clients being served; and majority of the respondents employ between five to fifty staff.

3.2 Test of Relationships

Employing the multiple regression analysis, the study examines the presence of a statistical relationship among the construct's dimensions. As observable from Table 1, relative advantage, network orientation, information efficiency, innovativeness, and competitiveness contribute significantly ($F = 11.83$; $p < .001$) and predict 51 % of the variations in e-brochure adoption or web presence.

Table 1: Influences on E-brochure Adoption or Web Presence

Dimensions	Beta Coefficients
Relative advantage	.188
Network orientation	.399*
Information efficiency	.340*
innovativeness	-.034
Competitiveness	-.011
R2 = .509 F = 11.83 Sig. F = 0.000	
*p < 0.01	

Details of the results show that there is significant relationship between an organisation's orientation to its network of stakeholders (t-value = 3.48; p-value < 0.01) and information efficiency (t-value = 3.34, p-value < 0.01) and web presence or e-brochure adoption. There is no significant relationship between relative advantage, innovativeness, and competitiveness and e-brochure adoption at 5% significance level. This result goes to show that the three variables are not significant drivers of e-brochure or the use of website solely for presentation of services information.

The second regression analysis was done using the five independent dimensions above and full e-commerce adoption as the dependent variable. Full non-business e-commerce adoption in this study refers to the use of the application for all of the following tasks: (1) providing business and service related information (mere web presence or e-brochure); (2) on-line service ordering/reservation; (3) online payment; and (4) online/offline delivery.

The results of the second regression show that relative advantage, network orientation, information efficiency, innovativeness, and competitiveness contribute significantly ($F = 8.61$; $p < .001$) and predict 43% of the variations in full e-commerce adoption. Table 2 below shows the summary of the results.

Table 2: Influences on Full Non-business E-commerce Adoption

Dimensions	Beta Coefficients
Relative advantage	.249 ^m
Network orientation	.227 ^m
Information efficiency	.234*
innovativeness	-.027
Competitiveness	.153
R2 = .426 F = 8.61 Sig. F = 0.000	
^M p < 0.07 *p < 0.01	

Details of the results show that there is marginal relationship between relative advantage (t-value = 1.85; p-value < 0.07), network orientation (t-value = 1.84; p-value < 0.07) and full e-commerce adoption. Information efficiency is significantly associated with full e-commerce adoption (t-value = 2.15; p-value < 0.05). No significant relationship is observed between innovativeness, competitiveness and adoption at 5% significance level.

The subsequent chapter discusses the details of these results, implications of the findings, future research directions, and concluding remarks.

4.0 CONCLUSIONS AND IMPLICATIONS

This study has a number of implications. With regards to theory, the research identifies the facilitators of non-business e-commerce adoption by Malaysian universities. This is a big contribution to theory since there is no known study on the key dimensions of facilitators for e-commerce usage in not-for-profit-making organisations. The results of the exploratory factor analysis show five key dimensions (relative advantage, network orientation, information efficiency, innovativeness, and competitiveness) as the parsimonious set. These results should be of interest to both researchers and practitioners in identifying potentially important dimensions that may facilitate the use of e-commerce (partial or full) in educational institutions and other non-business settings.

The results suggest that non-business establishments that wish to enhance the usage of e-commerce should focus on its relative advantage, networking capability, information efficiency. Other factors that were identified from factor analysis, which, though they do not show significant relationship with adoption but might be of interest to consider by other non-business establishments not included in the present study are innovativeness and competitiveness. The fact that relative advantage is not a significant determinant of e-brochure adoption but is a full EC adoption determinant shows where real value lies in the use of the Internet technology. As presented earlier, full EC is an advance over e-brochure in that it additionally allows e-order, e-payment, and e-fulfilment.

Since the universities are more or less sure of their yearly quota of students with or without online promotion, the relative advantage of e-brochure may be blur because of such indulgence. This is not the case with full EC, which enables service ordering, payment, and fulfilment electronically. For example, the school or unit that allows students/clients to register, pay, and receive services online, will increase value and earnings faster than those which merely promote services online while the rest of the process is done offline.

Moreover, in this era of globalisation when universities around the world seek for students across the globe, real value may not lie in merely promoting services online (after all almost everyone does it), but real value creation lies in the ease and speed of actualising a transaction. Again those divisions or units which are capable of allowing customers/clients to order, pay and receive services online are more likely to enjoy the patronage of foreign students and/or clients. The salience of information efficiency in determining e-brochure and full EC adoption is evident. As mentioned earlier, the main product in online transaction is product -information, order information, payment information, and delivery information, therefore the speed and accuracy of transmitting these pieces of information to and fro will determine the perceived efficiency of the system and its adoption. This is an important finding for designers and marketers of non-business EC applications.

Systems designers and vendors may also capitalise on the influence of organisation network to promote products and training. Since usage is driven by the

size of the network of internal and external customers as well as the level of assistance provided by technical experts within the organisation, system vendors may design their marketing strategy with a focus on schools or units with larger clientele. They may also provide training in order to assist in increasing the skills of technical experts. It is also useful to vendors to know that adoption does not depend on the innovativeness of the adoption decision maker (see Ndubisi, Gupta, & Ndubisi, 2005). Both innovative and less innovative heads are equally likely to buy the application; therefore market targeting efforts need not be discriminatory.

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