

Electronic Commerce Adoption: A Critical Review of MICA

Didi Achjari

Gadjah Mada University

Abstract

A study by Cooper and Burgess (2000) introduced the Model of Internet Commerce Adoption (MICA) which argues on the evolution development of electronic commerce. This paper attempts to critically evaluate that study by examining their research methodology and offers alternative perspectives to approach electronic commerce adoption. To do so, some factors may be considered in future studies.

Keywords: electronic commerce, adoption, MICA, TRA, TAM

Background

The proliferation of electronic commerce has invited some authors to explore the way companies adopt such technology. For instance, Cooper and Burgess (2000) in "A Model of Internet Commerce Adoption (MICA)" has attempted to explore stages in electronic commerce adoption. Using samples from metal industry around the world, they found there were three stages of adoption: promotion, provision and processing.

In regard to Cooper and Burgess findings and their contribution to e-commerce research, this paper aims to critically analyze that study. It is argued that there are alternative ways to approach electronic commerce adoption rather than evolutionary process. Furthermore, research methodology issues are discussed.

MICA

Cooper and Burgess (2000) have introduced *Model of Internet Commerce Adoption* (MICA) in an attempt to describe the evolutionary process of electronic commerce adoption. Hence, the underlying assumption of MICA is that the evolution of electronic commerce adoption is function of time, complexity and functionality (see figure 2). The early adopter will use the static internet presence, and then evolve to complex and integrated functions.

There are three layers in the Cooper and Burgess model (figure 1). Firstly, stage 1 that is characterized by the (static) presence of company's homepage in the internet as a promotion tool. In other words, this is an additional channel of marketing strategies, offering the company's information online. Even though such web sites use sophisticated graphics and contain extensive information, still there is no value-added function. This finding is inline with the study of Ng et al. (1998) showing that a company's presence on the net mostly aims to provide information.

Secondly, stage 2 is a "dynamic" one that has more functions than the prior stage. This involves value added links, FAQ, e-mail, technical information and an online enquiry system. Customers or visitors can obtain much information and answers for their questions regarding products and prices. In addition, e-commerce enables a company to get feedback and response interactively using e-mail. Therefore, in this stage, the company uses electronic commerce in a broader area rather than just as a promotion channel.

Lastly, stage 3 is defined as "processing" stage. This is the broadest and most complex e-commerce application since it enables the

company to process multiple tasks such as online sales, online orders, online delivery (especially for digital products) and online payment. Thus, in this layer, the company creates an integrated function.

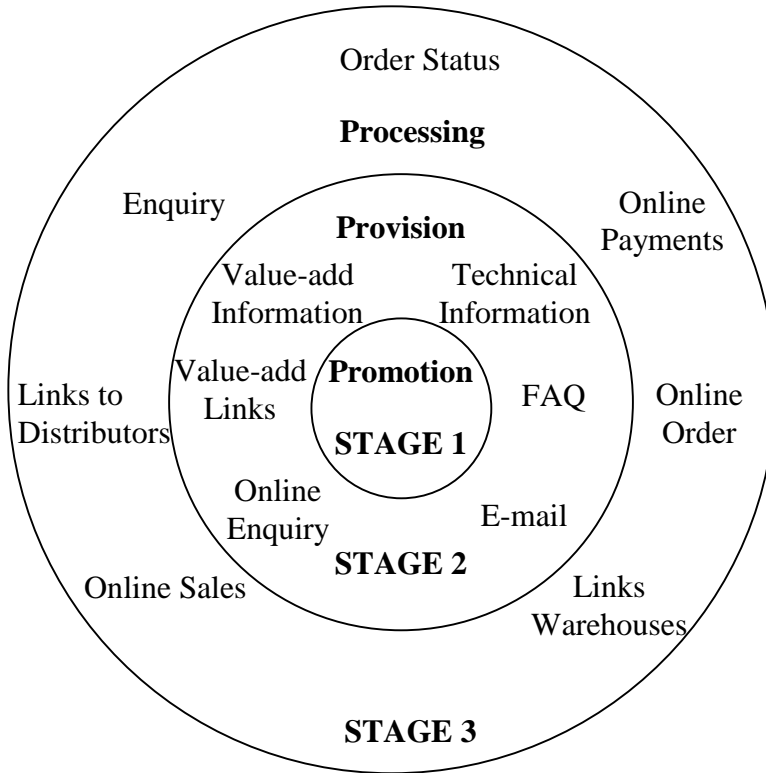


Figure 1
Model of Internet Commerce Adoption (Burgess & Cooper, 2000)

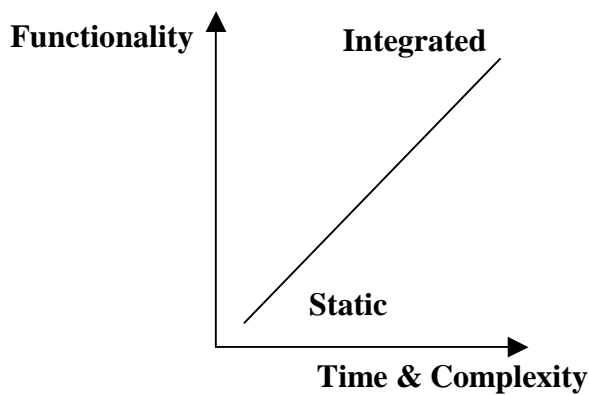


Figure 2
Internet Commerce Roadmap (Burgess & Cooper, 2000)

Adoption Theory

In explaining the adoption process, it seems that the Cooper and Burgess philosophical foundation follows Darwinian evolution paradigm, i.e. the organism evolves from a simple structure to more complicated ones with better ability to adapt to the environment. Using that metaphor, like an organism, in adopting electronic commerce, an organization starts with a simple and static internet presence. Then, the organization moves gradually to more complicated and integrated functions.

Adoption is defined as “the construction of first system, or development of a process, that is attempted by an individual, a unit or a department” (De’ & Mathew, 1999; p.430). According to that definition, adoption of e-commerce has both pre and post adoption events. However, using the evolutionary approach, the Cooper and Burgess adoption model inclines to the post adoption process of the internet commerce. What they discuss is all about incremental development or “evolution” of electronic commerce functions within a company rather than how e-commerce is adopted and diffused. Hence, it is understood that they do not touch pre-adoption issues such as factors that influence organization’s intention to adopt e-commerce. Therefore, it might be more appropriate if they use “evolution” word rather than adoption to name their model.

Alternatively, in exploring electronic commerce adoption (rather than evolution), it is possible to use or modify other diffusion theories such as Ajzen and Fishbein’s (1980) *Theory of Reasoned Action* (TRA) and Davis’ (1989) *Technology Acceptance Model* (TAM). The former originated from the field of psychology and is used by many other

fields. The latter which is derived from TRA, is widely used in specific technology-related areas.

Furthermore, TRA could be used to explain e-commerce adoption since it incorporates adopter beliefs which influence the intention to act in particular ways. The first belief has to do with attitude toward behavior and the second one relates to the subjective norms of adopter (Ajzen & Fishbein, 1980). The last factor is known in internet commerce as network externalities (Shapiro & Varian, 1999) meaning that the adoption of e-commerce is driven by other parties' involvement in electronic commerce.

Besides, TAM can be considered as an alternative framework in electronic commerce adoption study. TAM gives insights into e-commerce adoption from a different perspective. TAM which derived from TRA, assumes that a human tends to behave and act rationally. Therefore, the intention to use e-commerce could be influenced by its perceived usefulness and perceived ease of use factors.

Possible E-Commerce Adoption Factors

In e-commerce adoption research, TRA & TAM might need to be adjusted by incorporating some variables from other studies.

- **Privacy & Security**

Some authors consider privacy and security issues as the biggest concern in conducting business over the internet (Auger & Gallagher, 1997; Nath et al., 1998; Saunders, 2000). There are potential problems regarding privacy and security, for instance: hacking, virus, data intercepting, and misuse of credit cards.

- Foreign Direct Investment (FDI)

In some (developing) countries, the role of FDI in driving business activities and economic growth is very important. In some instance, foreign investors bring both cash and technology to be invested. This might occur in electronic commerce. In countries like Indonesia that impacted heavily by economic turmoil, this phenomenon is prevalent so that many dotcom companies are the foreign direct investment.

- Government Role

The government might have an important role in supporting e-commerce development. This can be done, for instance, by setting up an official body such as Australia's National Office for the Information Economy (NOIE). This institution will be a source for information on government policy toward electronic commerce. Another important role might be in regulating internet tax and developing adequate infrastructures so that e-commerce can be performed legally and conveniently.

Research Methodology Review

The Cooper and Burgess study could be categorized as exploratory research using qualitative methodology as seen in the absence of "numbers" in terms of hypotheses testing and statistical inference (Zikmund, 2000). Incorporating prior studies such as Ho (1997), Chang et al. (1997) and Timers (1998), Cooper and Burgess came up with a new model called MICA. They collected data by visiting the homepage sample companies in the metal industry. Based on web site functionality, each company was categorized according to MICA's layers.

Having analyzed the research methodology of Cooper and Burgess, there are some points to be discussed further:

- Sample

There would appear to be no strong grounds for deciding to use samples from the metal industry sector to introduce e-commerce adoption. Therefore, this tendency could be considered as sample bias (Zikmund, 2000). If we use the internet user as a proxy for e-commerce adoption, the study by Ng et al. (1998) and Greaves et al. (1999) may be seen as supporting the notion of sample bias. The business sector that mostly uses internet is service sectors such as financial service and computer & internet related business.

It was indicated in the findings of Cooper and Burgess (2000) that the metal industry was lagging behind others in e-commerce adoption, however there was no attempt to obtain sample from other sectors. In fact, a study by Greaves et al. (1999) revealed the truth regarding samples from the mining sector of which the metal industry a part, since it had the least presence in the internet. Therefore, it is difficult to say that samples from the metal industry are representative of the whole population of the e-commerce adopters.

- Cause-Effect Relationship

Some of the facts presented by Cooper and Burgess (2000) were gained from the other surveys such as Ho (1997) and the 1999 *Small Business Index*. Using that information compared to their findings, they attempted to conclude that there was a disparity in e-commerce adoption across business sectors due to logistics issues. Whether or not this might be true, however they could not come up with such a conclusion without using cause-effect typical of research. Indeed,

there were not enough information and analytic tool to support that notion.

- Evolutionary Process of Adoption

The basic premise of MICA is that electronic commerce adoption follows an evolutionary process. However, that assumption is questionable since there are possibilities that companies might jump over to stage 2 or stage 3 of MICA. Examples could be found in many sectors such as bidding sites (ubid.com.au or eBay.com.au) and internet shopping malls (dstore.com.au).

- Problem of Stage 1

This problem is related to the evolutionary process of adoption. The categorization of e-commerce adoption assumes that company will enter at the first layer (promotion stage) before moving further. This implicitly means that there is a "retail-shop" or physical form of companies. Therefore, they use the internet to promote their presence and as a complement for marketing channel. However, that is not always the case since some companies such as Amazon.com have no retail shop. In fact, they perform all business transactions over the net.

Conclusion

Cooper and Burgess (2000) have developed MICA in an attempt to explore electronic commerce adoption. The study reflects "Darwinian evolution" in that it reveals there are to be layers of functionality that companies will go through during electronic commerce adoption. Indeed, the use of Darwinian evolutionary process to describe e-commerce adoption is problematic since it only explores post-adoption events. In fact, some authors have argued on the importance of both pre-adoption and post-adoption events. To do so,

TRA and TAM may be considered as framework in studying e-commerce adoption. However, some factors such as government, privacy and security, and FDI may be included in future studies. Finally, there are some points to be underlined in regard to research methodology issues: the choice of samples, cause-effect relationship, evolutionary process of adoption and problems with stage 1 of the model.

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BIODATA PENULIS

Didi Achjari (didi.achjari@gsbmail.curtin.edu.au) adalah staf pengajar Fakultas Ekonomi Universitas Gadjah Mada. Gelar Sarjana Ekonomi bidang Akuntansi diperoleh dari Fakultas Ekonomi Universitas Gadjah Mada pada tahun 1993. Program study Master of Commerce diselesaikan di School of Accounting, University of New South Wales, Sydney, Australia tahun 1999. Saat ini penulis sedang menempuh program doktoral di Graduate School of Business, Curtin University of Technology, Perth, Australia. Bidang penelitian penulis adalah pengadopsian dan penyebaran inovasi teknologi informasi seperti internet dan electronic commerce.