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Using Technology, Organization, Environment Framework to Investigate the Determinants of the Adoption of Electronic Publishing Amongst Malaysian Publishers.

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ABSTRACT

Background: In the modern era of ICT revolution, the application of electronics to every aspect of human life has become remarkable. Electronic publishing has emerged as a major development in the media landscape and the adoption of this new media has become an important area of research. The continuance of electronic publishing depends on the adoption of this media by publishers and users. However, a research demonstrates that the rate of adoption of electronic publishing amongst Malaysian publishers is low. Therefore, this study will identify the contributing factors that have influenced that scenario. This paper is built on Tornatzsky' technological, organizational and environmental framework to investigate the determinants of the adoption decision. **Objective** The research questions will not only explore the technological, organizational and environmental contexts but will also solicit the problems faced by Malaysian publishers in embracing electronic publishing. **Result:** This study is currently at preliminary stage. Therefore findings of the study would not yet be discussed**. Conclusion:** It is hoped that the study would be able to provide new findings and contribute to the development of frameworks in electronic publishing industry by emphasizing the determinants of its adoption.

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INTRODUCTION

The term of electronic publishing covers widely on the use of technologies and the different types of technology in selecting, producing, transferring and disseminating of information to the wide range of audiences. According to Ramaiah, Foo, & Choo (2006), electronic publishing was the production and dissemination of information by publishers to the users through electronic means. Electronic publishing defines by Ng (2009) as a computer-based production of text and other interactive media. It includes a wide range of formats, such as text, structured data, image, animation, video and sound (Clarke, 1999). Electronic publishing also refers to the exploitation of electronics in conceiving, creating, capturing, transforming, disseminating, archiving, searching and retrieving academic and professional knowledge and information in cost effective way that could facilitate the publishing process (Wills, 1996). According to Ling, Yaacob, & Phang (1996) the distinction should be made to differentiate from desktop publishing which was concerned with the preparation of information on computers but often for final delivery on paper.

The rapidity of the changes in technology has created opportunities and challenges for the publishers to embrace electronic publishing. E-learning, e- commerce, e-book, and e-government were the examples of such applications that were using the electronic variation (Jasni, Wan Hussein, & Zaibon, n.d.). The usage of electronic publishing can be seen in daily and research activities, and teaching and learning purposes. In Malaysia, electronic publishing offers opportunities for more rapid communication and broader access to scholarly communication (Kling & Callahan, 2003). However, a number of scholarly communications such as journals and books are still published in printed form. Recent studies ,(Sanni, Zainab, Abdul Karim, Abdullah &Waheed, 2013) reported that an audit from 2011 journal in Malaysia revealed that 62.9% of Malaysian journals were still produced only in print format. Another study (Jamay'ah & Rowland, 2006) reported that a number of journals in Malaysia were published by not-for-profit organisations which concern less for profit and their financial positions, and a few of them were not available electronically yet.

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Switching from printed to electronic publishing raises a number of opportunities and challenges (Siddiqui & Duffuaa, 2004). Firstly, an ethical issues including credibility of published materials, preserving the peer-review system, copyright and licensing and preserving the intellectual property (Noorhidawati Abdullah & Gibb, 2008; Weiblw & Sullivan, 2012; Ozarslan, Balaban-Sali & Demiray, 2013). Secondly, the capital and financial associated difficulties such as publishers hidden costs for hiring skill staff, training for staff, and purchasing new software and hardware that compatible to the new technology. Finally, there were still a lot of problems facing electronic publishing due to the technologies associated with their use such as incompatible standards, incompatible authoring process, display incompatibilities, security concerns and portability limitation Martin (1994).

Since electronic publishing industry is still evolving, offering this new media might cause many implications for the publisher. Therefore in the current situation where the dependency on technology is dominance, and for the publishers to stay relevance in the industry, they have to redefine their roles parallel to the environment where information is now made available online. They must prepare to face challenges of the emergence of open access initiatives, ready to migrate to new high-tech information services and implemented different product strategy for the future development (Brown & Boulderstone, 2008). Thus, new information technologies not only changed the paradigm of publishing but also forces publishers to relook at every possible area in the traditional publishing in order to adding values and qualities to the current publishing activity. This situation needs to be addressed and publishers need to assess their current and future goals regarding the implementation of electronic publishing with the aim of moving Malaysia towards an information society.

Problem Statement:

A research indicates that the rate of adoption of electronic publishing amongst Malaysian publishers is low. According to A. N. Zainab & N. N. Edzan (2003) the number of journals being published electronically in Malaysia was increasing at a very slow pace. There were also minimal adoption of electronic publishing in Malaysia, whereby only 30% of publishers involved in the publication of newspapers, journals and periodicals in the form of prints and electronic products, while the rest still keen for print publication (Perangkaan Perkhidmatan Maklumat dan Komunikasi, 2009). It seems that electronic publishing has not penetrated successfully in the Malaysian markets.

A study (Scott, 2007) suggested that technological factors had driven the industry to start adopting new technology. She found that IT infrastructure competence postulated the adoption decision. However, despite of good ICT infrastructures in Malaysia, many publishers were still not adopting electronic publishing (Sanni, Zainab, Abdul Karim, Noorhidawati & Waheed, 2013). As Malaysian publishers perceived electronic publishing as complex and difficult to maintain and seem comfortable with print publishing, this, will delay the adoption of electronic publishing. Despite of positive perception on the relative advantage of electronic publishing by Malaysian journal publishers, it did not lead to the adoption decision, as many Malaysian publishers were still not adopting e-journal publishing (Sanni, Zainab, Abdul Karim, Noorhidawati & Waheed, 2013).

Uzoka & Seleka (2007) suggested that organizational factors were critical in organization's decision to adopt new technology. They found that management commitment, available funding, human resource competency and management vision had significant effects on the decision to adopt new technology. However, a study (Jama'yah & Rowland, 2007) on the prospect for publishing online scholarly journal in Malaysia revealed that the lack of necessary skills amongst personnel in the organization and the lack of support from senior managerial figures hindered the decision adoption.

Previous studies had shown that an environmental factor of an organization such as government regulatory was an important factor that affects the adoption of new technology (Alqahtani & Wamba, 2012). However, the situation in Malaysia was different. Although Malaysian government was committed to financially support the publishing industry (Sanni, Zainab, Abdul Karim, Abdullah, Waheed, 2013) and encouraging the widespread use of ICT, this did not support the adoption of electronic publishing (Jamay'ah & Rowland, 2006). This, indeed, attributes to the less urgency of adopting electronic publishing amongst Malaysian publishers. A study suggested that perhaps by making electronic publishing mandatory for the institution in order to get financial support would hasten the adoption of electronic publishing and able to modify the existing model that predicted the technology adoption (Sanni, Zainab, Abdul Karim, Abdullah, Waheed, 2013).

New technologies were not always immediately accepted and this adoption did not necessarily undergo a smooth process (Heck, 1996). Moreover, prior studies showed that there were a lot of problems and pressures on publishers to make a move towards electronic publishing such as the lack of awareness towards electronic publishing, barriers due to organization characteristics, change agent effort and peer influence, lack of necessary skills within the organization, lack of enthusiasm of for online publishing, and human factor limitation such as the reluctant of publishers to participate in electronic publishing (Holmberg, 2012; Martin, 1997; Sanni, Zainab, Abdul Karim, Noorhidawati, 2014; Clarke, 1999; Jama'yah & Roland, 2006; Tai, 2013; Zainab, Ang & Abrizah, 2005). The problems faced hindered the adoption of electronic publishing (Segur, 2006).

Based on the above scenario, there is a need to do the research to see the relevant factors that may potentially influence the adoption of electronic publishing in Malaysia. This gives the impressions that some delay factors exists behind the low uptake of electronic publishing. This may be due to several potential influential factors such as technology, organisation and environmental factors. Moreover, the threefold factor was posited to influence the organization's perception either to adopt or reject new technology (Pudjianto, Zo, Ciganek & Rho, 2011; Oliveira & Martins, 2010; Hsin & Hsiang, 2014; Jrjung, Yu, Hao, Hai & Yin, 2014; Alshamaila & Papagiannidis, 2012). Thus, in order for a publisher to be successful in bringing electronic publishing to the market, an understanding of the determinant factors in influencing their adoption decision is indeed important.

Scope and Limitations:

The scope of the study is limited to members of Malaysian Book Publishers Association (MABOPA) and members of Majlis Penerbitan Ilmiah Malaysia (MAPIM). The researcher felt that members of MABOPA and MAPIM are appropriate to be taken as a sample because they are an active association of publishers who published scholarly and scientific publications. Besides, its members are representing commercial publisher and university presses such as, from public institutions of higher learning (IPTA), research centres in Malaysia and Dewan Bahasa dan Pustaka (DBP).

This study will focus only on two types of electronic publishing that are e-book and e-journal. The researcher felt that these are vital to support e-environments initiatives in Malaysia especially in educational environment for instances, to support e-learning environment and the development of digital library. Furthermore, e-book and e-journal were getting attention from the publishers nowadays (Siti Ezaleila, 2013).

OPERATIONAL DEFINITION	
DETERMINANTS	"Factor or cause that makes something happen or leads directly to a decision" (http://www.vocabulary.com)
ADOPTION	According to Rogers (1995) adoption is a decision of any individual or organization to make use of an innovation. In this study, adoption refers to the decision of an organization to acquire and use new technology or innovation.
ELECTRONIC PUBLISHING	Electronic publishing refers to the exploitation of electronics in conceiving, creating, capturing, transforming, disseminating, archiving, searching and retrieving academic and professional knowledge and information in cost effective way that can facilitate the publishing process (Wills, 1996). In this study, electronic publishing refers to the application of computing software by a publisher to select, produce, transfer and disseminate information to the audience in an effective way that can facilitate the publishing process.
TECHNOLOGY	Technological context describes that the adoption on information technology depends on the internal and external technologies available in the market that relevant to the organization (Oleivera & Martins, 2011; Scott, 2012; Awa, Ukoha & Emecheta, 2012). This includes the characteristics of innovation such as availability, complexity, compatibility and relative advantage (Borgman, Bahli, Heier & Schewski, 2013; Oleivera & Martins, 2011).
ORGANIZATION	Organizational context describe the attributes of the organization that ensure the decision making towards technology (Yee, Keng & Lin, 2009).). Organizational context capture descriptive measures about the organization such as scope size and managerial structures, top management support, slack resources, organizational culture and organizational change (Oleivera & Martins, 2011; Yee, Keng & Lin, 2009, Awa, Ukoha & Emecheta, 2012; Scott, 2012; Tornatzky & Fleischer, 1990).
ENVIRONMENT	According to Rogers (1995) environment includes the structure of the industry, the presence or absence of technology service provider, and regulatory environment. Environmental context relates to the activities in which the organization conducts its business (Oleivera & Martins, 2011). In this study environment refers to the opportunities and challenges on electronic publishing adoption.

Organizational Adoption of Technological Innovation:

Today, information technology is globally recognised as an essential tool in enhancing the organizational competitiveness and performance. Advances in technology have significant effect on the productivity of organization. However, the usefulness of information technology to organizational progress and performance can be realized when and if the new technology is widely adopted and used (Oliveira & Martins, 2011). Thus, gaining insights from the potential customers and factors that may potentially influence the adoption decision of technological innovation is vital for the organizations to be successful in bringing innovation to the markets (Frambach & Schillewaert, 2002).

Adoption refers to a decision of any individual or organization to make use of an innovation (Rogers, 2003), whereas, in this study, adoption refers to the decision of an organization to acquire and use new technology or innovation. A number of studies on adoption of technological innovation (Nezakati, H., Noor Azman, Shaheen & Ang, 2011; Roman, 2003; Wan Nur Syahida & Azwadi, 2013; Pudjianto, Zo, Ciganek & Rho, 2011; Yu, Kuan, Chang & Hung, 2011) were conducted. The research were conducted in various fields including e-government assimilation (Pudjianto, Zo, Ciganek & Rho, 2011), cloud computing adoption (Borgman, Bahli, Heier & Schewski, 2013), RFID adoption (Al-Qahtani & Wamba, 2012), e-SCM adoption (Hsiu, 2014) and cloud computing adoption (Alshamaila & Papagiannidis, 2012).

Theoretical Background:

1. Technological-Organizational-Environmental Framework (toe):

The TOE framework was developed by Tornatzsky and Fleischer to study the adoption of technological innovations. The Technology-Organization-Environment Framework was described the whole process of innovation stretching from the development of innovations to the adoption and implementation of those innovations by users at a firm level (Hsin & Hsiang, 2014). TOE framework consist of three constructs namely Technology, Organization and Environment. Although this framework was consistent with Rogers's organizational innovativeness in term of individual and technological factors, he also introduced new factor that is, environmental factors. This factor could be both constraints and opportunities to the organizational adoption of new technology. Thus, the factors that influence the adoption decision might range from technological and institutional to personal, social and economic, human, organizational and environmental factors. TOE framework has been employed in various types of innovation adoption studies such as in e-government, cloud computing and e-maintenance (Pudjianto, Zo, Ciganek & Rho (2011); Scott (2007); Borgman, Bahli, Heier & Schewski (2013); Alshamaila & Papagiannidis (2012).

2. Diffusion of Innovation Theory:

Diffusion of Innovation Theory explains how innovations were taken up by an individual or organization (Rogers, 2003) and spread within and between communities (Valente & Davis, 1999). DOI Theory at organization level portrayed the adoption of information technology to involved three categories. They are individual (leader) characteristics, internal characteristics of organizational culture and external characteristics of the organization (Rogers, 2003; Oliveira & Martins, 2011). Therefore, innovativeness is related to three (3) independent variables and one (1) dependent variable that is organizational innovativeness. An individual (leader) characteristic explains the leader attitude towards change (Oliveira & Martins, 2011) and how an attitude towards change impacts the adoption of information technology (Norovouri, 2012). Internal characteristics of organizational structure include the centralization in a system, complexity of knowledge among organization members, formalization of rules and procedures, interconnectedness among organization members, organizational slack and size (Rogers, 2003). An external characteristic of the organization refers to system openness (Rogers, 2003; Oliveira & Martins, 2011).

3. Institutional Theory:

Institutional theory sees that institutional environment of organization such as organizational culture, social structure and competitive environment are vital for shaping organizational structure (Pishdad, Haidir & Koronios, 2012). Organizational decision is influenced by rational goal of efficiency as well as social and cultural factors and concern for legitimacy (Oliveira & Martins, 2011). According to institutional theory, the development and usage of technology by organization are subject to social, cultural, organizational, cultural and other institutional pressures such as pressure from external source namely, competition and customer, and government agencies (Pishdad, Haidir & Koronios, 2012). Thus, the institutional theory complements the environmental context of TOE framework by adding the external pressures which include pressure from competitors and pressure from trading partners (Khairina, Yeow & Siew, 2012; Oliveira & Martins, 2012).

4. Lacovou, et al. (1995) model:

Lacovou *et al*. (1995) developed this model in conducting research on the adoption of EDI systems. This model comprises of three constructs namely perceived benefits, organizational readiness and external pressure which are used to investigate the determinant factors of EDI adoption (van Heck & Ribbers, 1999). Perceived

benefits include perceived benefits of innovation. It is a different factor from the TOE framework. Organizational readiness relates to the financial resources and IT resources. It is the combination of technological and organizational context of TOE framework. Financial resource can be found in organizational context of TOE framework while, IT resources is one of the dimension in technological context of TOE framework. Similar to Lacovou *et al*. (1995) external pressure, the TOE framework also adds trading partner to the external environmental context (Oliveira & Martins, 2011).

Research Gap:

An extensive literature search was done utilizing indexes, abstracts, Online Public Access Catalogue, databases and local newspaper, however, there had not been many published information, research or official statistics on electronic publishing development in Malaysia that could be located. Although there had been a number of valuable studies on electronic publishing as a new innovation (Sanni S. A, Zainab, Noor Harun, Noorhidawati & Maheed (2013); Toufani & Montazer (2010); Ifeduba & Shoki (2008); Igun (2005); Bloor (2000); Malathi Letchumanan & Balakrishnan Muniandy (2013); Rao (2001); Noorhidawati Abdullah & Gibb (2008); Rosenita Ismail & Zainab (2005); Malathi Letchumanan & Rohani Ahmad Tarmizi (2010); Siti Ezaleila Mustafa (2013), it seems that no comprehensive study has been conducted to investigate the determinants of the adoption of electronic publishing amongst Malaysian publishers. Since this technology is still evolving with many implications for its key players, it is crucial to ascertain the issues of its adoption for its future development. Additionally, applying TOE as a research framework will fill up the gap because although this model is known to be useful in the investigation of a wide range of innovations and contexts, but it has not been used extensively to analyse the adoption of electronic publishing in Malaysia.

Expected Significance Contribution:

Contribution to the existing body of knowledge:

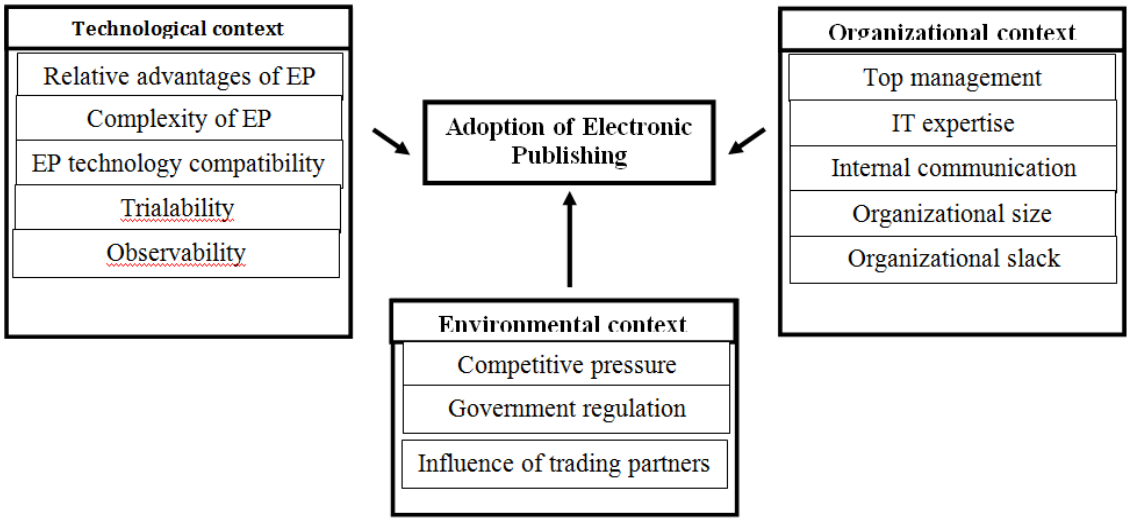
It is hoped that the study would be able to provide new findings and contribute to the development of frameworks in electronic publishing industry by emphasizing the determinants of its adoption

Support the development of electronic publishing industry:

The findings drawn from this study may be used as a tool to support the development of electronic publishing environment in Malaysia

Potential application to the publishers:

The result of this study may have implications for publishers who are interested in looking at the determinants of electronic publishing adoption and may be used as a foundation in making decision to engage in electronic publishing adoption



Conceptual Framework:

This study is primarily based on the on the Technology, Organization, Environment Framework (TOE). The TOE has been originated in the area of organizational psychology. It is a model which provides comprehensive understanding of a process by which organizations adopts and implements technological innovations and serves this research as the theoretical background. The Technology, Organization, Technology framework (TOE) was introduced in 1990 by Tornatzky and Fleischer's *The processes of Technological Innovation* (Baker, 2012). It

was adapted and proven useful in studying the adoption and assimilation of different types of information technology innovations (Olievera & Martins, 2011).

Technology:

Technology describes both the internal and external technologies relevant to the organization. Technological context refers to the innovation characteristics such as complexity, compatibility and observability (Rogers, 2003) and technology availability. Decisions to adopt technology innovation are determine by an organization's existing technology and an external technology that are not yet exist in the organization (Baker, 2012). The dimensions for technological context in this study include relative advantages of electronic publishing, complexity of electronic publishing, electronic publishing technology compatibility, triability and observability.

Organization:

Organizational context describes the descriptive measure about the organization such as scope, firm size and managerial structure, intra-form communication process and the amount of slack resources. The size and slack are among the most frequently discussed factors that affect the adoption of technology innovation within the organization (Baker, 2012). The dimensions for organizational context include top management commitment, IT expertise, internal communication, organization size and organization slack.

Environment:

Environmental context refers to the arena in which a firm conducts its business. It includes the structure of the industry, the presence or absence of technology service provider, and regulatory environment. These are also known as external pressure where organizations may respond to these pressures by conforming to technology mandates, or modifying their business practices to fit the technology (Pishdad, Haidir & Koronios, 2012). Environmental factors could be the opportunities or threat to the adoption decision of technology innovation (Awa, Ukoha & Emecheta, 2012).The dimensions for environmental context include competitive pressure, government regulatory and the influence of trading partners.

The justification for using three dimensions of TOE as a theoretical framework are that first, the research framework of the study which consists of meaningful constructs matched with three dimensions of TOE framework. Additionally, it provides useful analytical framework which appropriate to understand the important determinant factors that influence the adoption of electronic publishing of Malaysian publishers. Secondly, it remains among the most prominent and widely utilised theories of organization adoption since its development (Baker, 2012). Thirdly, although this model is known to be useful in the investigation of a wide range of innovations and contexts, but it has not been used extensively to analyse the adoption of electronic publishing in Malaysia.

Research Methodology:

Employing the quantitative method and a self-administered questionnaire will be utilized as the research instrument through both online and mail methods. The sample of respondents consists of 202 of Malaysian publishers who are members of The Malaysian Book Publishers Association (MABOPA) and Majlis Penerbitan Ilmiah Malaysia (MAPIM).

Although the methodology of this study is quantitative in nature, a qualitative data will also be included. This is called as quasi-mixed method design. According to Teddlie & Tashakkori (2006) quasi-mixed design is the method in which qualitative and quantitative data are collected, but there is no integration of the findings or inferences for the overall study. Although qualitative and quantitative data existed in this study, it is not a mixed-method because the quantitative data is the focus for this study and also the quantitative and qualitative results and inferences are not integrated in research findings.The data collection process started with preliminary interviews in order to complete the design of the questionnaires, followed by pretest, pilot study and the main survey.

Interviews in this study will be focused on interviewees' awareness of electronic publishing, the impact of TOE and any new factors that might influence the adoption decision. Interview questions will be, "Are you familiar with electronic publishing process? If yes, is your organization adopting electronic publishing? What barriers did you face during the transformation process? If no, why did your organization not adopting electronic publishing? What are the reasons that would facilitate you to adopt electronic publishing?

For the questionnaire, the respondents will be given the questions to:

1. Identify the technological context influencing the adoption of electronic publishing amongst Malaysian publishers.
2. Identify the organizational context influencing the adoption of electronic publishing amongst Malaysian publishers.

Identify the environmental context influencing the adoption of electronic publishing amongst Malaysian publishers.
3. Solicit problems faced by Malaysian publishers in adopting electronic publishing.

Conclusions:

The electronic publishing has evolved since the Guternberg era. However, this media is still not adopted by Malaysian publishers as a common media for publishing their publications. Thus, investigating the determinants factors that influence its adoption amongst Malaysian publishers is important. It is hoped that the study would be able to provide new findings and contribute to the development of electronic publishing industry in Malaysia.

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