

The Influence of Peer Network, Change Agents and Organization Characteristics in the Adoption of e-Journal Publishing

S. A. Sanni, A. N. Zainab, N. H. Abdulkareem, and N. Abdullah

Abstract—The paper examines the importance of peer network, change agents and organization characteristics in the adoption rate of e-journal publishing based upon responses from Malaysian journal editors. The sample comprises of 150 Malaysian journal editors who responded to a questionnaire distributed at a journal editor's conference. Analysis was based on 82 usable responses. Findings show that journal editors perceive a certain degree of influence from peer network but perceive a less degree of influence from change agents. Both peer network and change agents are not significant contributors to adoption rate of e-journals, however all the three organization variables: journal's age, publication size and editorial experience are significant contributors. We discuss the results and implication of the findings.

Index Terms—E-journal adoption, e-journal publishing, adoption of innovation, Malaysian journal publishers, peer network and change agents.

I. INTRODUCTION

When new technology innovations are introduced into a community of potential users, different factors play crucial roles in whether the new technology will be accepted or rejected and also on the time taken before potential users make decision on the new technology. Some of these factors are the perception of users about the attributes of the innovation; their rationale evaluation on whether the technology fulfill their need and expectation and if they perceive it as better than other alternatives [1]–[3]. Apart from the inherent attribute of a technology, decision as whether to adopt or reject an innovation can be influenced by the social system unit in which the technology is introduced and also the characteristics of potential adopters. All these factors can affect the adoption rate of a specified innovation in any social system. This situation similarly applies to the adoption of electronic journal publishing by scholarly journal publishers.

E-publishing technologies were introduced in the early 90s and the impact of e-journal publishing is growing without bounds, since users seem to enjoy unprecedented vantage in utilizing electronic journals over traditional print-only journals. However, there are still lot of challenges facing

e-journal publishing, owing to the realities that the technologies associated with their use require new roles, routines, values, attitudes and patterns of behavior [4]–[7]. These challenges bear upon the time taken and decision making in the adoption of e-journal publishing, and this was being reported in developing countries such as Malaysia, where the number of e-journals was small compared to print journals. One of the problems is that most scholarly journals in Malaysia are produced by not-for-profit organizations, academic institutions and professional societies with little concern for capital and returns [10]–[14]. Therefore accepting new technologies may be marred by uncertainties and risk as diffusion of new idea is a process of social change by which the structure and functions of a social system unit can be transformed.

With studies showing that the rate of adoption of technologies channeled through the Internet are moving faster than other media and the view that Internet usage in Malaysia is estimated to be over 17 million in 2012, with 60.7% population penetration rate [15], the slow transition from print to electronic publishing indicates a disconnect between technology availability and utilization. This barrier may be due to several factors such as organization characteristics, change agents effort and peer influence. Therefore this paper examines the influence of these factors in the adoption rate of e-journal publishing amongst Malaysian scholarly journal publishers.

II. LITERATURE REVIEW

Most social scientists have a keen interest in social change and research in innovation diffusion provides a forum to discuss and understand the process of change [2]. They seek to find out which attribute can best explain the adoption/diffusion of a particular innovation within a given social system to enable suppliers of innovations to market their new products more effectively [1]. For example [16] studied adoption of information technology using Rogers diffusion of innovation theory. The study by [17] identifies critical success factors (CSFs) for effective innovation diffusion in organizations. While that of [18] studied adoption of IM (instant messaging) in the workplace through the technology acceptance model and so forth.

E-journal publishing is considered an innovation because Malaysian publisher's social system under study perceives it to be new in their realm. Innovation has been defined by [2] as something new to a population or social system, a new process, which provides a better way of doing, making, and

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delivering things. There are four elements in innovation diffusion: 1) the innovation itself; 2) the communication channels used to spread information about the innovation; 3) time; and 4) the nature of the social system. In this study, we have decided to focus only on the social system elements because it has been reported in literature that it has a significance influence on innovation adoption. It has been observed by [19] that external pressure or social system factor is an influence to individual decision to adopt innovations. Similarly [20] have reported that social influence is very significant in explaining innovation adoption and even more effective than either coercive or non-coercive efforts. In the study of adoption of IM (instant messaging) in the workplace, [18] revealed that social influence factors (subjective norm and perceived critical mass combined), are more important than perceived usefulness and perceived ease of use in the adoption of technology in the workplace. Hence the social system variables that will be discussed are as follow.

A. Peer Network

This refers to a situation when people belong to the same social network, they usually have something in common and share information to create awareness about a new idea and stimulate discussion about it. Such a collaborating network as noted by [1] may either connect organizations within the industry or across different industries. The sharing of information about the innovation by the peer networks has a positive effect and increase the probability of adoption. Peer network becomes more important if there are opinion leaders in the network who tends to protect and support the values of the social structure, thereby influencing innovation adoption. Opinion leaders act like role models by providing advice and information about the innovation through interconnected peer network [21]. In the scholarly world, Scientist customarily identifies and associates with different professional bodies locally and internationally. The extent to which these scientific bodies share information amongst members can play a part in their awareness and acceptance of new scholarly communication technology innovations. Therefore, we seek to find out publishers perceptions about the influence of peer network on the adoption of e-journal publishing practices.

B. Change Agent

Change agents can influence adoption decisions as they may be able to describe and encourage the populace about the benefit of a new technology. Change agents can be specific individuals, private or government agencies that promote e-journal adoption. Therefore, we seek to find out if publishers have had contacts with change agents concerning e-journal publishing and examine what this influence have on their adoption decision.

C. Organization Characteristic

It has been observed that organizational characteristics or publishers characteristics such as organization age, years of experience and organization size can explain the adoption of an innovation [2], [22], [23]. Organization age can have an effect on rate of adoption of any innovation. Also the more experienced publishers might have the propensity to adopt

new innovations earlier than those with less experience. Additionally, journal publishers with larger publications run would more likely adopt e-publishing earlier than others in the social system as noted by [1] that organizations with large size will feel more need to adopt new inventions to aid their productivity. In this study we wish to examine the relevance of organization characteristics such as journal's age, publisher's years of experience and publication size as important variables in e-journal publishing adoption rate.

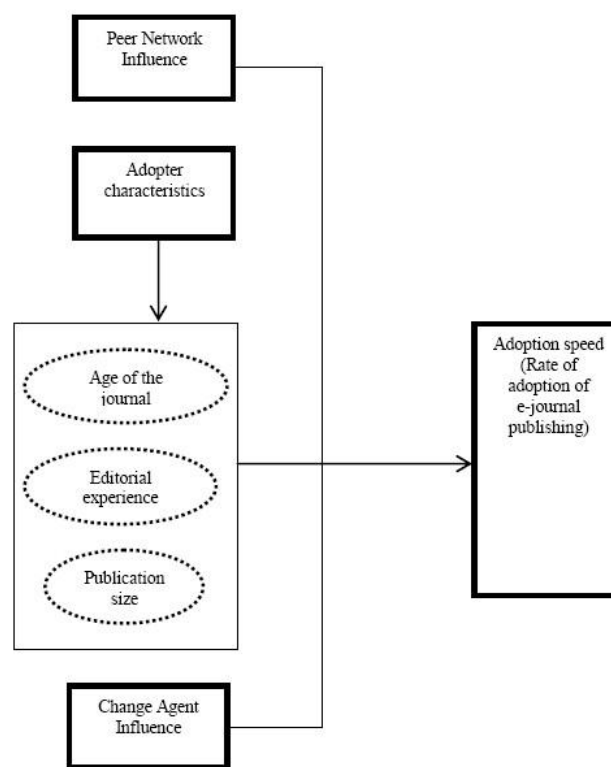


Fig. 1. Conceptual research model of the variables affecting the adoption rate of e-journal publishing.

III. METHODOLOGY

Quantitative correlational design method was the approach employed to for this study which included an elicitation study, design of a new instrument for data collection (questionnaire), data collection and analysis. The population for the study was journal editors in Malaysia. A random sample of 150 editors was drawn from a population of 225 journal editors. A response rate of 60% (90 returns) was achieved, out of which only 82 returns were usable. Table I shows the demographic profile of respondents.

The questionnaire was grouped into three parts and respondents were asked to responds to statements items on a scale of 1 – strongly disagree to 5 – strongly agree concerning (a) Perception about the influence of peer network on their publishing practices, (b) Perceptions about the influence of change agents on their publishing practices, (c) Characteristics of respondents and their Organization. The rate of adoption was measured by the length of time it required publishers to adopt e-journal. This is obtained from responses to the question: “If you have adopted e-journal publishing, in what year did you adopt?” For characteristics of respondent's and their Organization -- journals age was

obtained from response to the question: “In what year was the first issue of your journal published?” Years of experience was obtained from response to the question: “How many years have you been involved in journal publishing personally?” Publication size was obtained from response to the question: “How many issues do you publish in a year?” Table II represent the descriptive statistics of the two variables.

IV. DATA ANALYSIS

To answer the aforementioned research questions, statistical inferential test such as the Pearson Product Moment Correlation Coefficient and the Multiple Linear Regression Analysis were conducted. Prior to answering the research questions, an exploratory factor analysis using principal component analysis was performed to submit the relevant construct to a test of construct validity. The study seeks to know how much of the scale items can explain respondents perceptions of “peer network influence” and “change agents influence”. Therefore, the larger the recorded variance the better is the validity of the study. The result of running principal component analysis as well as Crombach’s internal reliability coefficient alphas revealed the construct to be not only valid but internally reliable as well. Each of the relevant constructs yielded coefficient alphas values of more than 0.70 as recommended by [24].

TABLE I: RESPONDENTS DEMOGRAPHICS

	FREQUENCY	PERCENTAGE %
Age		
< 30	14	17.10
30-39	20	24.40
40-49	24	29.30
50-59	9	11.00
> 59	6	7.30
missing	9	
Journal Affiliation		
Academic publishers	50	60.98
Government publishers	17	20.73
Society publishers	10	12.20
Research institute	3	3.66
Others	2	2.44
Area of Specialization		
All fields	4	4.90
Natural Science and Medicine	37	45.10
Engineering and Technology	10	12.20
Social science, Arts & Humanities	28	34.10
missing	3	

V. RESEARCH QUESTIONS

The study will answer the following research questions:

RQ1: Is there a relationship between peer network influence and adoption rate of e-journal publishing?

RQ2: Is there a relationship between change agent influence and adoption rate of e-journal publishing?

RQ3: Is there a relationship between organization characteristics and adoption rate of e-journal publishing?

TABLE II: DESCRIPTIVE STATISTICS OF THE TWO VARIABLES EXAMINED (N=82)

VARIABLE	SCALE ITEMS	FREQUENCY AND PERCENTAGE					MEAN	S.D
		Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree		
Peer Network	Information we share with other publishers helps us to incorporate new innovative ideas in our organization	0%	6 (7.3%)	9 (11.0%)	55 (67.1%)	12 (14.6%)	3.90	0.65
	The support we receive from other publishers helps us to incorporate new innovative ideas in our publishing practices	1 (1.2%)	4 (4.9%)	15 (18.3%)	54 (65.9%)	8 (9.8%)		
	Conferences, workshops or seminars organized by peer network have great influence on our publishing practices	0%	1 (1.2%)	8 (9.8%)	63 (76.8%)	10 (12.2%)		
	Overall, our peer network has a large influence on our publishing practice	0%	3 (3.7%)	9 (11.1%)	60 (74.1%)	9 (11.1%)		
Change agent	Contacts we had with specific individuals/organizations has an influence on our publishing practice	6 (7.3%)	13 (15.9%)	24 (29.3%)	34 (41.5%)	5 (6.1%)	3.07	0.93
	We have had contacts many times with change agents regarding our publishing practices	3 (3.7%)	23 (28%)	33 (40.2%)	22 (26.8%)	1 (1.2%)		
	The supports we received from specific individuals/organizations help us to incorporate innovative technologies in our publishing practices	4 (4.9%)	17 (20.7%)	34 (41.5%)	25 (30.5%)	2 (2.4%)		
	Recommendations made by specific individuals/organizations helped us in making decisions about our publishing practices	5 (6.1%)	14 (17.1%)	34 (41.5%)	28 (34.1%)	1 (1.2%)		

VI. FINDINGS

Respondents in this study perceive a certain degree of peer network influence in their publishing work (Table II). About 67% of the respondents agreed and another 12% strongly agreed that they share information with publishers in their

network and this information sharing helps them to incorporate innovative ideas in their publishing practice. Also, 65% of the respondents agreed and another 9.8% strongly agreed that they receive support from their peer network and this support help them in their publishing work. We asked respondents about the extent in which conferences,

workshops and seminars organized by peer network have influence on their work. About 76% agreed and another 12.2% strongly agreed that it has great influence on their publishing practice. Overall, a high percentage of respondents perceive positive great degree of peer network influence on their publishing practice. However this peer influence has no significance in the adoption rate of e-publishing as indicated in Table III.

Meanwhile result in Table II suggest that majority of the respondents are not sure about the impacts of change agents in their publishing work, with 15% disagreed that change agents have influence on their publishing practice, another 7.3% strongly disagreed that change agents have influence on their practice while 29.3% are not sure of the impacts of change agents. However 41% of the respondents do agree on the influence of change agents while 6.1% strongly agreed. In general, a high percentage of respondents are not sure of the support or influence of change agents on their publishing practice and many of them actually disagreed that they receive any support from change agents. However, there were a considerable number of respondents who agreed that change agents have influence on their publishing practice. As regards, result in Table II suggest that publishers do not perceive much degree of influence from change agents in their publishing work and this less degree of influence also has no significance in the adoption rate of e-journal publishing as shown in Table III.

TABLE III: CORRELATION ANALYSIS

CORRELATES	RATE OF ADOPTION
Peer Network Influence	0.056 n.s
Change Agent Influence	0.124 n.s
Journals age	0.54**
Publication size/run	0.386*
Editorial experience	0.507**

n.s Not significant

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Findings from the correlation analysis show that peer network influence ($r=0.05$, $p>.05$) and change agent influence ($r=0.124$, $p>.05$) are not significantly related to the adoption rate of e-journals. However, all the three organization characteristics variables, journal's age ($r=.540$, $p<.01$) editorial experience ($r=.507$, $p<.01$), and publication size ($r=.386$, $p<.05$) are good predictors of adoption rate (Table III). This implies that journal publishers who have been in the business for quite a long time are more likely to adopt e-journals publishing earlier than those who were relatively new. Similar results were obtained by previous studies [25], [26]. Also, journal titles with large publication runs were more inclined to adopt new technology than those with fewer productions and this findings is similar with studies such as [27], [28]. The findings imply that publishers of the more established journals would more likely adopt electronic publishing earlier than new journals.

VII. CONCLUSION

We have presented the result of an investigation on the role

of peer network, change agents and organization characteristics on the adoption rate of e-publishing amongst journal publishers. Our findings show that Malaysian publishers perceive a certain degree of influence from their peer network as related to their publishing work. Publishers share information amongst each other and also most often receive support from their peer network concerning journal publishing. As such we would expect that these information sharing and support will have a great effect on the adoption rate of e-publishing, but this is not the case. Reference [1] observed that the higher the degree of (informal) information sharing, the more likely organizations are exposed to new ideas and products. This implies that peer network has a great influence on individuals in a social system but it might not be a dominant predictor of behavioral change when people want to make decision as whether to adopt, delay or reject an innovation.

We also observe that majority of the publishers are not sure of the influence of change agents in their publishing work and many of them have not had contacts or receive support from specific organizations or agencies regarding their publishing work. This implies that there is less promotional effort for innovations in Malaysian journal publishing circle. Therefore, we suggest that there should be agencies or organizations that can help promote, give advice and support to publishers regarding new scholarly communication innovations like e-publishing as this can have positive effect on innovation diffusion.

This study also found that organization characteristics have the dominant influence on e-publishing adoption rate. Older journals with large publication runs and more experience publishers are more receptive to e-journal publishing than new publishers. This shows that experience, size and longevity are key predictors in innovation adoption amongst journal publishers. The more experienced the publishers the more likely they will adopt new innovations earlier than other members of the social system. Also the bigger the size of the publication the more likely they will adopt new innovations earlier to aid their publication runs and remain competitive in the social system.

The findings from this study are limited to publishers that attended the national conference held by the Ministry of Higher education Malaysia and as such it cannot be generalized. However, the study does highlight the influence of peer network, change agents and organization characteristics in the adoption of e-journal publishing in Malaysia.

REFERENCES

- [1] R. T. Frambach and N. Schillewaert, "Organizational innovation adoption: A multi-level framework of determinants and opportunities for future research," *Journal of Business Research*, vol. 55, pp. 163-176, 2002.
- [2] Rogers, *Diffusion of Innovation*, New York: Free Press, 2003.
- [3] J. W. C. Arts, R. T. Frambach, and T. H. A. Bijmolt, "Generalizations on consumer innovation adoption: A meta-analysis on drivers of intention and behavior," *International Journal of Research in Marketing*, vol. 28, pp. 134-144, 2011.
- [4] S. Akinci, S. Aksoy, and E. Atilgan, "Adoption of internet banking among sophisticated consumer segments in an advanced developing country," *International Journal of Bank Marketing*, vol. 22, pp. 212-232, 2004.

- [5] R. K. Johnson and J. Luther, "Are journal publishers trapped in the dual-media transition zone?," *ARL: A Bimonthly Report on Research Library Issues and Actions*, vol. 257, pp. 1-6, 2008.
- [6] J. H. Park, "Factors influencing the adoption of open access publishing," Syracuse University, 2007.
- [7] A. Zainab and A. Abrizah, "Scholarly Communication: Making Malaysian Research Available Through Electronic Journal Publishing," presented at the Conference on Libraries for the Future: Towards World Class Academic Libraries. Organized by Universiti Teknologi MARA Library, 25-26 April 2006, Grand Blue Wave, Shah Alam., 2007.
- [8] S. Jange and B. Kademani, "Metamorphosis of the scientific journal: past, present and future," *Malaysian Journal of Library & Information Science*, 1999.
- [9] K. J. Klein and A. P. Knight, "Innovation implementation overcoming the challenge," *Current Directions in Psychological Science*, vol. 14, pp. 243-246, 2005.
- [10] S. Islam and M. A. K. Chowdhury, "Organisation and Management Issues for Electronic Journals: A Bangladesh Perspective," *Malaysian Journal of Library and Information Science*, vol. 11, pp. 61, 2006.
- [11] S. Sanni and A. Zainab, "Evaluating the influence of a medical journal using Google Scholar," *Learned publishing*, vol. 24, pp. 145-154, 2011.
- [12] A. Zainab, S. Sanni, N. Edzan, and A. Koh, "Auditing scholarly journals published in Malaysia and assessing their visibility," *Malaysian Journal of Library & Information Science*, vol. 17, pp. 65-92, 2012.
- [13] J. Zakaria and F. Rowland, "What are the Prospects for Publishing Online Scholarly Journals in Malaysia? The Cultural Constraint," presented at the ELPUB2006 Conference on Electronic Publishing, June 2006, Bansko, Bulgaria 2006.
- [14] C. S. Yap and G. Walsham, "A survey of information technology in the UK service sector," *Information & Management*, vol. 10, pp. 267-274, 1986.
- [15] A. Salman and M. S. Hasim, "Internet Usage in a Malaysian Sub-Urban Community: A Study of Diffusion of ICT Innovation," *The Innovation Journal: The Public Sector Innovation Journal*, vol. 16, 2011.
- [16] G. C. Moore and I. Benbasat, "Development of an instrument to measure the perceptions of adopting an information technology innovation," *Information systems research*, vol. 2, pp. 192-222, 1991.
- [17] K. Higa, O. R. L. Sheng, P. J. H. Hu, and G. Au, "Organizational adoption and diffusion of technological innovation: a comparative case study on telemedicine in Hong Kong," 1997, pp. 146-155.
- [18] R. Glass and S. Li, "Social influence and instant messaging adoption," *Journal of Computer Information Systems*, vol. 51, pp. 24, 2010.
- [19] R. Agarwal and J. Prasad, "The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies," *Decision sciences*, vol. 28, pp. 557-582, 1997.
- [20] A. Hausman and J. R. Stock, "Adoption and implementation of technological innovations within long-term relationships," *Journal of Business Research*, vol. 56, pp. 681-686, 2003.
- [21] B. L. Yates, "Applying Diffusion Theory: Adoption of Media Literacy Programs in Schools," presented at the International Communication Association Conference, Washington, DC, USA, 2001.
- [22] D. Syzdykbayeva, "Analytical study on adoption of green computing by Malaysian organizations," Universiti Teknologi Malaysia, Faculty of Computer Science and Information Systems, 2009.
- [23] B. Wejnert, "Integrating models of diffusion of innovations: a conceptual framework," *Annual review of sociology*, pp. 297-326, 2002.
- [24] J. Hair, W. Black, B. Babin, R. Anderson, and R. Tatham, "Multivariate data analysis New Jersey: Pearson Education," 2010.
- [25] V. J. Massad, M. L. Brown, and J. M. Tucker, "The acceptance of electronic journals by business faculty: an adoption/diffusion approach," *Journal of Behavioral Studies in Business*, 2010.
- [26] S. D. Scott, R. C. Plotnikoff, N. Karunamuni, R. Bize, and W. Rodgers, "Factors influencing the adoption of an innovation: An examination of the uptake of the Canadian Heart Health Kit (HHK)," *Implementation Science*, vol. 3, p. 41, 2008.
- [27] P. J. H. Hu, P. Y. K. Chau, and O. R. L. Sheng, "Adoption of telemedicine technology by health care organizations: an exploratory study," *Journal of Organizational Computing and Electronic Commerce*, vol. 12, pp. 197-221, 2002.
- [28] N. Nordin, S. N. Othman, and R. Che Mat, "Technology implementation barriers in the Malaysian herbal industry: A case study," *Malaysian Management Journal*, vol. 12, pp. 79-88, 2008.



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