Factors affecting the adoption of technological innovation by individual employees: An Australian study

Majharul Talukder*

Faculty of Business and Government, University of Canberra, ACT 2601, Australia

Abstract

This paper investigates the determinants of the adoption of technological innovation by individual employees within an organizational context in Australia. In order for an organization to be successful in bringing innovation to the workplace, an understanding of potential adopters and the factors influencing their adoption decision is important. The study uses the theory of reasoned action (TRA) and the technology acceptance model (TAM) as a basis of the theoretical framework. Survey questionnaires were used to collect data from an Australian organization. The findings indicate that perceived usefulness and managerial support are the two dominant variables in explaining adoption. The results show that individual adoption of innovation is also influenced by two social factors – peers and social network. The results also indicate that individual adoption of innovation is influenced by demographic factors. The research model provides a valuable alternative and comprehensive theoretical basis for improving our understanding of individual users' acceptance of innovation. The study contributes to knowledge and has practical implications for organizations concerned with adoption of technological innovation.

1. Introduction

According to Rogers's [1] model of innovation adoption, innovation passes through a set of stages before it is implemented by people. Individuals develop the ability to formulate attitudes, make decisions, implement and confirm whether or not innovations should be practiced. Despite an organizational decision to adopt an innovation, its actual usage depends on how employees implement an innovation. Therefore, it is important to examine the adoption of innovations by employees within organizations because if there is no acceptance among employees, the desired benefits cannot be realized and the organization may eventually abandon the innovation. People, by nature will resist change unless they can be convinced that they can directly benefit from the change [2]. Designing an effective approach for increasing end-user acceptance and subsequent use of innovation continues to be a fundamental challenge that has not always provided straight-forward solutions. While advances in hardware and software

*Correspondence: Tel.: +61-2-6201 2702, fax: +61-2-6201 5239
Email address: majharul.talukder@canberra.edu.au

capabilities continue at an extraordinary pace, the problem of underutilized systems remains [3]. The current literature indicates that we know relatively little about the ways in which individuals adopt and the factors that influence individual adoption of innovation [4, 5, 6]. Hence, further research is required regarding the role of organizational, individual and social processes affecting individual adoption of innovation [5, 7]. This study is designed to fill that gap. The objective of the study is to investigate the impact of organizational, individual and social factors on individual adoption of innovation.

2. Theoretical Framework

The Theory of Reasoned Action theorizes that a person's attitude toward a behavior is determined by his or her salient beliefs about consequences of performing the behavior and an evaluation of the outcome of that behavior [8]. Subjective norms are also a function of beliefs, but beliefs of a different kind, namely the person's beliefs that specific individuals or groups think he or she should or should not perform the behavior [9, 7]. Individuals are more likely to perform an act if they perceive the existence of greater social pressure from salient referents to perform that act [10]. The Technology Acceptance Model postulates that two particular beliefs, perceived usefulness and perceived ease of use, are of primary relevance for computer acceptance behaviors [11,18]. TAM proposes that computer usage is determined by behavioral intentions. But it differs with TRA in that behavioral intention is viewed as being jointly determined by the person's attitude toward using technology and its perceived usefulness [8]. TAM does not include TRA's subjective norms as determinants of behavioral intention since this is one of the least understood aspects of TRA [8]. This study seeks to develop an innovation adoption model combining multiple sets of factors found in previous models in order to examine a broader perspective which will help in understanding individuals' adoption of innovation.

3. Factors that affect individual adoption of innovation

Studies have indicated that an individual's adoption of innovation not only depends on individual attitudes but also on organizational policies, approaches and actions [12, 19]. Organizations need to provide facilitating conditions, which include the extent and type of support provided to individuals that would influence their use of innovation. Facilitating conditions are believed to include the availability of training and provision of support. Organizational factors include training [13], managerial support [14] and incentives [4]. Organizational influences can motivate employees to adopt an innovation. According to Lewis, Agarwal and Sambamurthy [15], individual factors are one of the most important determinants of adopting innovation. It refers to individuals' cognitive interpretations of innovation and themselves. Several studies found that individual factors such as perceived usefulness, personal innovativeness, prior experience, image and enjoyment with innovation have stronger influence on an individual's adoption of innovation [15, 6]. Employees' adoption of innovation is driven by their social environment. Innovation used by others in employees' social environment is likely to play an important role in adoption of innovation. Social influence is the extent to which members of a social group influence one another's behavior in adoption [16]. Ajzen and Fishbein [9] refer to such influence as normative beliefs about the

appropriateness of adoption of innovation. According to this perspective, employees may adopt an innovation not because of its usefulness but because of perceived social pressure. Such pressure may be perceived as coming from individuals whose beliefs and opinions are important, including peers and people who are in social networks [14]. There have been conflicting opinions in regard to whether men use innovation more than women. Studies [17] found that demographic factors affect individual's adoption of technological innovation. Fig 1 shows the research model of the study.
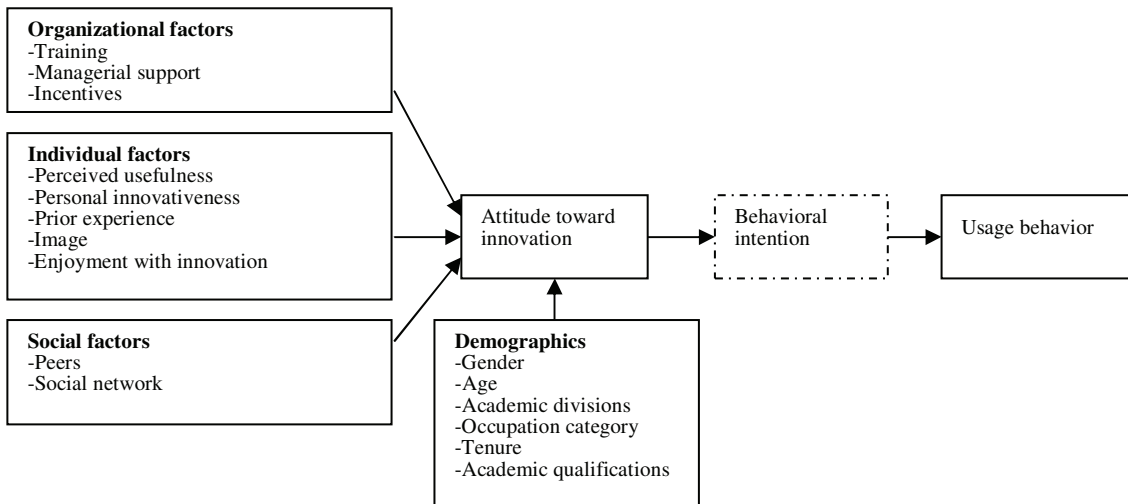

Fig. 1. Research model of innovation adoption

4. Methods

The study examined the use of selected advanced features of Microsoft Outlook (such as calendar applications). Microsoft Outlook will be a good test because it has been widely used for many years, and is the university's preferred email application but it has many advanced features beyond the core (email) function. There is a large variation in the usage of these advanced features, and the university is anxious to increase the use of them. Data were collected using survey questionnaire. The online questionnaire was available to 2270 full-time and part time academic and administrative (professional) staff of the University of South Australia. A total of 275 usable data were collected. Data were analyzed using correlation and multiple regressions.

5. Results

The results show that 53.1% of the variance in usage or the individual acceptance can be explained by training, managerial support, incentive, perceived usefulness, personal innovativeness, image, prior experience, enjoyment with innovation, peers and social network variables. The Durbin-Watson statistics shows that there is no problem regarding autocorrelation. The model is a significantly better predictor of dependent variable than intercept alone: $F_{(10, 264)} = 29.912$, $p < 0.001$. From the data it can be concluded that the model is highly significant ($p < 0.001$) in predicting the outcome variable. Table 5.30 shows results

of analysis of variance (ANOVA) tests. For this model, training (t (275) = -2.304, p<0.022); managerial support (t (275) = 5.035, P<0.001); incentives (t (275) = 2.041, p<0.042); perceived usefulness (t (275) = 4.213, p<0.001); and personal innovativeness (t (275) = 2.738, p<0.007) are all significant predictors of individual acceptance of innovation. From the magnitude of the beta-statistics we can see the perceived usefulness has a higher impact, followed by managerial support, incentives, personal innovativeness and training. It emerges that usefulness is a more important factor followed by managerial support, incentives and personal innovativeness. Results of regression analysis are shown in table 1.

Table 1: Results of the regression analysis

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta (β)		
	-.879	.320		-2.744	.006
Training	-.149	.065	-.122	-2.304	.022
Managerial sup	.401	.080	.299	5.035	.000
Incentive	.158	.098	.129	1.602	.110
Usefulness	.367	.087	.327	4.213	.000
Innovativeness	.180	.066	.130	2.738	.007
Experience	.039	.058	.032	.662	.508
Image	.102	.086	.077	1.186	.237
Enjoyment	.100	.089	.075	1.129	.260
Peers	-.072	.078	-.048	-.924	.357
Social Network	-.022	.091	-.015	-.245	.807

6. Conclusion and implications

The findings encourage organizations to develop training programs for employees so that they can use the innovation more effectively. Organizations need to design training and other educational programs that motivate employees to adopt and use of innovation. To implement and manage innovations that enhance human capabilities and performance, management must recognize the organizational, individual and social factors as well as demographic factors that influence individual employees. To increase the adoption rate of innovation in the organization, peers should provide continuous feedback, support and encouragement for such individuals so that they can master the innovation skills within a short period of time. Employees are influenced by their social network in adopting or at considering an innovation, since many employees do not want to be left behind. In short, the theoretical framework developed and utilized in this study provides a rich and potentially fruitful area for further research, and contribution to knowledge. It has practical implications for organizations, managers, administrators and the employees concerned with taking up innovation in the organization. This study is not without its limitations. This study encompasses a single Australian tertiary education institution. The same research carried out in another setting might generate a different result.

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