THE ACCEPTANCE OF VIRTUAL PLATFORMS FOR PROMOTING KNOWLEDGE SHARING BEHAVIOR – A REVIEW OF THE TECHNOLOGY ACCEPTANCE MODEL (TAM)

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ABSTRACT. Knowledge sharing is recognized as an important facet in the Knowledge Management (KM) process. As an essential tool for the successful implementation of KM, knowledge is considered the most important resource that an organization possesses. Presently, people are using virtual platforms and web-based technologies, including Internet, Intranet, social media and other online technologies, through which knowledge can be extracted, shared and distributed globally. Apparently, there are wide ranges of web-based platforms and technologies that can be utilized to support knowledge sharing initiatives. The purpose of this study is to evaluate the acceptance of virtual platforms to inculcate the knowledge sharing behavior for the selected respondents. Therefore, this study adopted Technology Acceptance Model (TAM) to investigate the key factors on this sharing behavior. The TAM model adopted in this paper is empirically tested on a sample of 510 respondents, and significant relationships among these constructs were found.

Keywords: Knowledge Management, Knowledge Sharing, Virtual Platforms, Web-Based, TAM

INTRODUCTION

Knowledge management (KM) has been widely initiated and practiced in various organizations around the world. The KM initiative comprises a range of strategies and approaches to identify, develop, acquire, transfer, share, and enable adoption of wisdom and experiences, by either individuals or organizations. KM's definition has been suggested by several academicians, including Argote et al. (2000) and Huber (1991), who refer to KM as how organizations create, retain, and share knowledge. Landoli and Zollo (2007) have described KM as the methods of developing, capturing, and adopting knowledge to enhance organizational performance. From the above definitions, the academicians have identified knowledge sharing as one of the important pillars in KM. Grant (1996) has asserted that knowledge sharing as an important focus in the KM field, where knowledge is seen as the most important resource an organization can possess. Argote et al. (2000) have defined knowledge sharing as the process through which a unit, group, or division is influenced by the experience or skill of another. These scholars also indicate that the sharing of knowledge can be observed through variances in knowledge or performance of recipient units. Recently, various organizations have developed strategies to ensure that KM is successful by embedding knowledge sharing practices in

their routine work processes. An organization experiences several advantages and benefits to performing knowledge sharing practices.

Promoting knowledge sharing behavior is a challenge for most knowledge-based organizations. Developing a behavior that values and practices knowledge sharing is an effort involving attention to social, technological, organizational, and user attitude or behavior. Previous studies have often assumed that implementing technology, such as virtual platforms, will be enough to promote knowledge sharing. While this intention has been revealed as an ineffective approach, frequently, most of companies' knowledge resources are assigned to technology and not to other factors that stimulate knowledge sharing (Davenport & Prusak, 1998). Based on previous studies, several gaps or barriers have been acknowledged by recent scholars regarding knowledge sharing, including functional silos, ineffective means of knowledge capture, inadequate technology, internal competition, and management gaps in the organization. In addition, Massey et al. (2002) have indicated other reasons, which include not realizing how useful particular knowledge is to others because the individuals might have knowledge used in one situation and do not realize that their colleagues might face a similar situation at a different venue or time.

Nowadays, people have been using virtual platforms and web-based technologies, such as Internet, Intranet, blogs, social media, and other online technology, for sharing knowledge and information. These are the media through which knowledge or information are acquired, transferred, shared, and disseminated using the recent network architecture and technology. In relation to this, previous scholars have identified virtual platform as an effective platform for knowledge sharing and collaboration. Previous scholars have defined the new mode: virtual community platforms in which members use Information and Communication Technology (ICT) as the primary media of interaction. Lin (2008) has proposed virtual communities as a cyberspace community that has several internet-based forms of chat and collaboration, such as discussion forums, chatting space, social media, or online bulletin boards. These online applications share several common features, including collaboration elements that support members in different time zones and areas. They create non-volatile data and record collaboration that is stored in text and enhanced by multimedia additions.

TAM AND RESEARCH MODEL

This model is introduced by Davis and Bagozzi in 1986 and is specifically made as an adoption of the Theory of Reasoned Action (TRA) to explain behavior related to Information System (IS) usage. In relation to this, TAM has modified the causal chain in TRA to explicitly predict the user's acceptance of IS. Technology Acceptance Model (TAM) has been adapted into various studies, and it is highly cited and dominant models for explaining the acceptance of technology for the past two decades (Lee et al., 2003). The purpose of this theory is to predict the acceptability of platforms and to analyze the adjustment which must be brought to the system in order to make it acceptable by users (Davis, 1989). In addition, TAM is developed to simplify TRA and provide a generalized model that possesses the theoretical foundation and parsimony and the tools that the user uses (Davis, Bagozzi & Warshaw, 1992). It also allows the user to use TAM to weigh the introduction of new technology, such as the virtual platforms and then predicts and explains the user's behavior of accepting the technology (Venkatesh et al., 2003). Furthermore, TAM is an intention-based model that is exclusively formulated by Davis (1989) for user's acceptance of Information Technology and system. Consequently, acceptance of any technology, such as KM system or virtual platforms depends on individual characteristics of users, technology and the organizations (Venkatesh et al., 2002). Various studies have been recently ongoing to identify these characteristics (Wang & Wang, 2012).
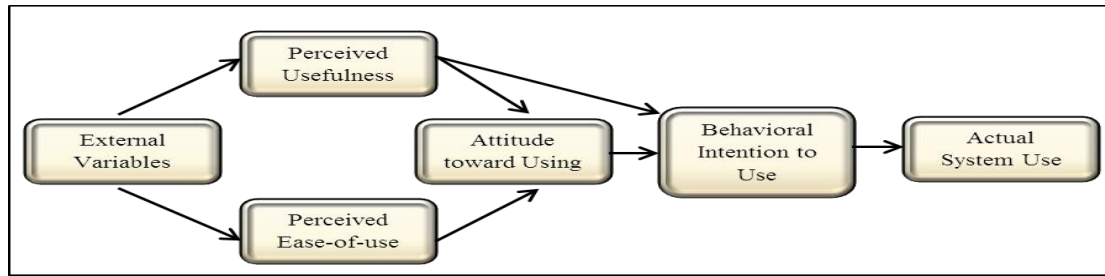
Figure 1: Technology Acceptance Model (Davis, Bagozzi and Warshaw, 1989, p. 985)

According to Davis, Bagozzi and Warshaw (1992), this model replaces several TRA's behavior dimensions with two technology acceptance measures – Ease-of-use (E) and usefulness (U). Based on Figure 1, there are three important components that have been described by Davis (1989), as follows:

a.   Perceived Usefulness (PU)

This component is defined as the level to which an individual believes that using a particular system would enhance his/her job performance within the organization (Davis, 1989). Moreover, Seddon (1997) has asserted this component as the extent to which a person believes that a specific system will augment his/her organizational performance. The significance of this component has been emphasized in the literature of technology acceptance and adoption (Venkatesh & Davis, 2000). Hence, perceived usefulness is the extent to which knowledge seekers believe that the contents of the virtual platforms are of the required quality for reuse in their work, as well as will increase virtual communities' performance in information exchange (Kankanhalli et al., 2005; Lin 2008).

b.   Perceived Ease-of-Use (PEOU)

As illustrated in Figure 1, this component is described as the amount of effort a person expects or need for using a particular system (Davis, 1989). Likewise, Lin (2008) refers this component as the level to which the virtual platforms are perceived to be easy to understand, learn and operate. On the contrary, if the virtual media provide better platforms for users to efficiently navigate, search or collaborate with others, then the possibility of acquiring the accurate information will be more than in a complex virtual platform (Lin et al., 2007).

c.   Attitudes (A)

This component describes the beliefs about a particular behavior weighted by evaluations of these attributes. Furthermore, Davis (1989) also proposed that perception of its outcome determines the attitudes towards the behavior beliefs. Likewise, an individual's subjective evaluation of the prospect of behavior might result in positive or negative feelings about a particular behavior (Fishbein & Ajzen, 1975).

Davis (1989) have proposed that both PU and PEOU are considerably related to the actual technology use. These scholars also indicate that the character of an individual is not the only attribute that determines the usage of the system, but it is also based on the impact it may have on his/her performance. Therefore, even if the individual is reluctant to utilize the system, the probability that he/she will use it is higher if the individual perceives that the technology would improve his/her performance at work. With the different system offering the same features, an individual will find more useful the application that he/she finds easier to use. According to Davis (1989), usefulness and ease-of-use in TAM will have a significant impact on a user's attitude toward using the system, defined as feelings of favorableness or

un-favorableness toward the system. Furthermore, behavioral intention to use the system is defined as a function of attitude and usefulness that will determine actual usage behavior. As revealed by Venkatesh et al. (2003), the ease-of-use strongly influences the intention to use and the major determinant of usage behavior. Davis (1989) have concluded that the usage behavior can be practically predicted from their intention to use the related system or technology, such as the virtual platforms.

On that note, this research uses the above theories as the foundation of the proposed hypotheses of this study. Eventually, the research hypotheses are shown below. All the constructs and hypotheses in the research model are adopted and adapted based on TAM model, but have been revised to suit the scopes and objectives of this study.

H1: User's Perceived Usefulness has a positive effect on virtual knowledge sharing behavior

H2: User's Perceived Ease-of-use has a positive effect on virtual knowledge sharing behavior

H3: User's Attitude has a positive effect on virtual knowledge sharing behavior

RESEARCH METHODOLOGY

This research used Quantitative approach for the collection and analysis of data by conducting surveys and questionnaires from related participants in the Research and Development (R&D) organization. This method focused on related variables or factors with the purpose of formulating a theory or conceptual framework at the conclusion of this research (Sekaran, 2006).

Population and Sampling

The participant of this study is the respondents from five R&D organizations which could assist in generating meaningful information and explanation to fulfill the objectives of this research. This research has distributed hardcopy of the survey to 150 respondents and uploaded the formatted electronic version of the survey to 360 participants.

Table 1: Total Respondents

No	R&D Organization	Total Population
1	Petronas	130
2	Tenaga Nasional Berhad	80
3	SIRIM	100
4	Nuclear Malaysia	150
5	Green Technology Malaysia	50
	TOTAL	510

DATA ANALYSIS

Multivariate Analysis

Multivariate analysis was the method for testing the research's hypotheses that includes Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). CFA and SEM are recognized to provide rigorous analysis of model power in relation to construct and content validity. CFA is a multivariate statistical procedure in research design stages that are used to test how well the measured variables represent the number of constructs. According to Raykov and Marcoulides (2008), the main objective in CFA lies in examining the pattern of relations among the factors, as well as those between them and the observed variables.

Confirmatory Factor Analysis (CFA)

    a.   Perceived Usefulness Factor

CFA for the independent variable – Perceived Usefulness is performed to analyze how well the measured variables represent the number of constructs. A CFA is conducted for this factor to determine whether the indicators measured the constructs and are assigned adequately. Empirical evidence in CFA is generally assessed using criteria, such as the Comparative Fit Index (CFI), Normed Fit Index (NFI), Goodness-of-fit index (GFI), Adjusted Goodness-of-fit index (AGFI) and Root Mean-Squared Error Approximation (RMSEA). As indicated by Bentler (1995), a CFI value greater than 0.90 indicates an acceptable fit to the data. An analysis for this study reveals that the CFI value (0.901) is acceptable, which suggests a good model fits. As for convergent validity, NFI values of 0.80 or greater indicate an adequate model fit (Bentler, 1995). Thus, the NFI value (0.89) indicates an adequate model fit for this study. In addition, a GFI value that exceeds 0.80 indicates a good model (Doll et al., 1994). As a result, the GFI value (0.89) indicates a good model for this study. According to Doll et al. (1994), AGFI values of 0.80 or greater indicates an adequate model fit. On the contrary, the AGFI for this study is below the threshold (0.74) and not indicates a good model for this study. As for RMSEA, a value of about 0.10 or less would indicate a close-fit of the model in relation to the degrees of freedom (Hair et al., 2010). On the other hand, the RMSEA for this factor is above the threshold (0.19) and not indicates a good model for this study.

Furthermore, to ensure that the measurement model fit and suitable for this study, Perceived Usefulness indexes are examined. Hair et al. (2010) have suggested that if three or four indexes are accepted, this measurement model is recommended for further analysis. Therefore, the model has three accepted indexes that indicate Perceived Usefulness measurement model is suitable for this study.

    b.   Perceived Ease-of-Use

CFA for the second independent variable (Perceived Ease-of-Use) is performed to analyze how well the measured variables represent the number of constructs. A CFA is conducted for these constructs to determine whether the indicators measured the constructs and are assigned adequately. As analyzed, CFI value (1.000), NFI value (0.89), GFI value (0.99), AGFI value (0.99) and RMSEA value (0.00) indicates adequate model fit and are acceptable for this study. In addition, to ensure that the measurement model fit and suitable for this study, the relevant indexes are examined. Hair et al. (2010) have suggested that if three or four indexes are accepted, this measurement model is recommended for further analysis. Thus, the model has six accepted indexes that indicate Perceived Ease-of-Use measurement model is suitable for this study.

    c.   User's Attitude

CFA for the last independent variable – Attitude towards knowledge sharing is performed to analyze how well the measured variables represent the number of constructs. A CFA is conducted for these constructs to determine whether the indicators measured the constructs and are assigned adequately. As revealed, CFI value (1.00), NFI value (1.00), and GFI value (1.00) indicates adequate model fit and are acceptable for this study. On the contrary, the AGFI and RMSEA values are below the threshold and not indicate a good model for this study. In addition, to ensure that the measurement model fit and suitable for this study, the relevant indexes are examined. Hair et al. (2010) have suggested that if three or four indexes are accepted, this measurement model is recommended for further analysis. Thus, the model has four accepted indexes that indicate Perceived Ease-of-Use measurement model is suitable for this study.

Hypotheses Testing

After the measurement model for all variables (factors) are analyzed using CFA and consider as significant, the next step is to analyze the model using Structural Equation Modeling (SEM). SEM is conducted to examine the possibility of achieving goodness-of-fit of the proposed model using Analysis of Moment Structures (AMOS) statistical software. Maximum Likelihood assumes that the underlying variables are normally distributed. For this study, the maximum likelihood estimates result as describe in Table 2 shows that the standardized residuals are technically fit index, and provide information about how closely the estimated matrix corresponds to the observed matrix and described how well the data fits the model.

Table 2: Maximum Likelihood Estimates Result

	Estimate	S.E.	P
Virtual Knowledge Sharing Behavior <-- Perceived Usefulness	3.417	3.475	.000 **
Virtual Knowledge Sharing Behavior <-- Perceived Ease-of-Use	1.743	1.955	.00 *
Virtual Knowledge Sharing Behavior <-- Attitude	1.000		.000 **

Note: Significant levels: * $p < .01$, ** $p < .001$

To determine the minimum loading necessary to include an item in its respective constructs, the general criteria is accepted items with loading of 0.50 or greater (Hair et al., 2010). As shown in Table 2, this model confirmed that Perceived Usefulness and Perceived Ease-of-Use constructs have a significant direct relationship with Virtual Knowledge Sharing Behavior (with path coefficient of 3.42 and 1.74), and justified that Attitude (with path coefficient of 1.00) have a positive relationship with Virtual Knowledge Sharing Behavior. The value of SEM lies in its ability in showing both the direct and indirect effects between the variables. In light of this, this analysis appears to indicate that Perceived Usefulness, Perceived Ease-of-Use, and User's Attitude factors have direct influences for Knowledge Sharing Behavior. As a conclusion, the overall analysis of SEM is significant to support the hypotheses of this research.

CONCLUSION

This research has empirically validated the TAM model in the context of knowledge sharing behavior through the virtual platforms. The findings of this study offer several significance implications for the research on antecedents of knowledge sharing behavior. Consistent with TAM, all independent variables — Perceived Usefulness, Perceived Ease-of-Use and Attitude — have indicated a positive association with virtual knowledge sharing behavior. On that note, this study has suggested that these factors to promote knowledge sharing behavior through virtual platforms for the respective research organizations. Eventually, based on TAM model, this research has investigated the antecedents of knowledge sharing behavior through the virtual platforms. This research has also focus on identifying gaps that would assist in effectively guide government and private sectors in Malaysia, to be more competitive and innovative. As recommendation for future research, it would be necessary to conduct study with similar objectives within companies of different sectors or countries, develop more respondents and eventually use other methods or models for data collection and sampling.

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