Towards An Effective KMS Usages:
The Role of Socio-Technical Antecedents in the Building of Autonomous Motivation to Use

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Abstract— **The willingness of Knowledge Management System (KMS) users to use the systems has been mentioned as one of the major factors determining effectiveness in the system's usage. Therefore, the development of autonomous (personal or volitional) motivation towards KMS use is conceptualized in this study to be dependent on factors inherent in the system and the cultural values that dominate the system's (KMS) environment. By relying on 306 responses from KMS users, linkage quality and knowledge richness of KMS are two characteristics found to be major predictors of autonomous motivation to use the systems, while cultural values for innovativeness also plays prominent role in developing autonomous motivation to system use. In retrospect, the developed autonomous motivation to use was found to be a high predictor of KMS usage.**

Keywords-Knowledge Management Systems; Autonomous Motivation; Culture; Socio-Technical Antecedents; KMS Use

I. INTRODUCTION

Utilizing Knowledge Management Systems (KMSs) as tools to facilitate knowledge management (KM) practices in organizations is becoming widespread because the systems are believed to be adding values to KM processes [1], [2], [3]. At the same time that the systems are believed to be adding value, studies have shown that few KMS implementations account for this belief. For example, Malhotra et al. [4] highlights that industry data suggests a failure rate of about 70% of KMS technologies implementation.

As a result, researchers have been clamouring for empirical investigations looking into the post-implementation usages of the systems [5], [6]. While literature points to the importance of technical factors (mainly: system and knowledge qualities) [7]; [8]; [9], the complimentary role of social factors have been given few attention [10]; [11], and the integration of social and technical factors in KMS usage processes have not been given much needed attention. According to [12], what is important about system implementation is what people do with the systems not just having the systems implemented. Therefore the type of willingness to use the system will determine whether the usage of the system will be sustained or not [4]. Similarly, [13] noted that KMS availability is not an assurance for its usage. Therefore, this study contends that building autonomous (volitional) motivation towards KMS usage is contingent on the availability of satisfactory socio-technical factors. Consequently, when autonomous motivation towards the system is developed, a sustained utilization of the systems is expected.

II. CONCEPTUAL FRAMEWORK AND HYPOTHESES

The conceptual framework in this study as presented in Figure 1 is established on exploring the influence of the integration of KMS technical factors and the cultural practice that emphasize on innovativeness on the development of autonomous motivation to KMS use and the actual KMS usage. The next sections explain the links among the variables of the framework.

A. System Quality and Autonomous Motivation to Use

System quality measures the ease, speed, and stability of the systems used for knowledge practices. With adequate system quality, KMS is expected to facilitate knowledge processes [14], and builds robust social capital in organization [3]; [15]. Empirically, mixed results have been reported on the role of system quality in KMS success models [8]; [16]. To understand the role of system quality the more, this study proposes that the influence of system quality in KMS usage could be mediated by the development of autonomous motivation. When users found that the functionalities of technologies are satisfactory, their personal motivation is expected to be developed. Therefore, a satisfactory KMS system quality is expected to influence the development of autonomous (volitional) motivation towards system use. Thus, the following hypothesis is formulated.

H1: The degree of system quality in KMS will be significantly related to the development of autonomous motivation towards system use.

B. Knowledge Richness and Autonomous Motivation to Use

The richness of knowledge in KMS is one aspect of the knowledge quality that focuses on KMS content quality [9].
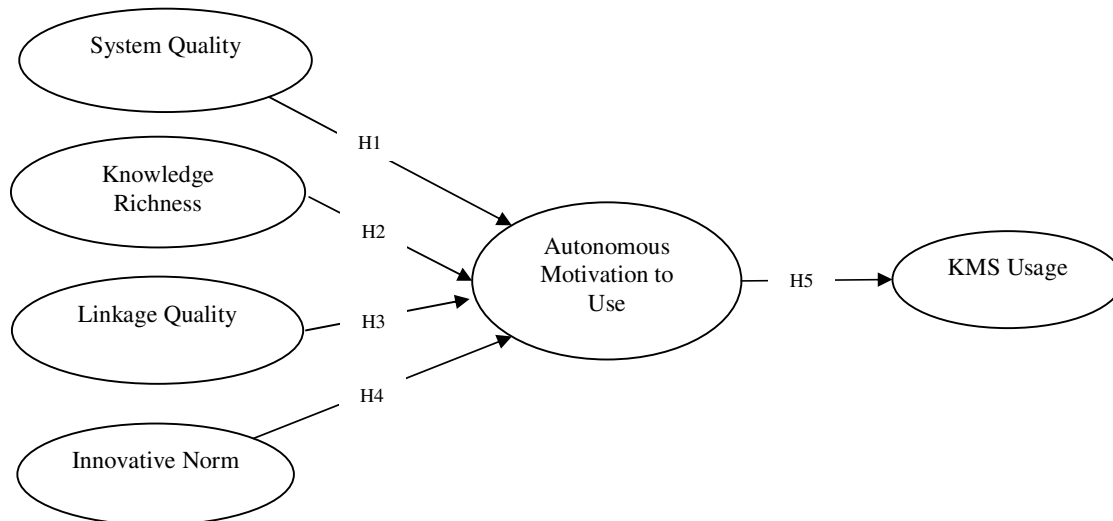
Figure 1. Conceptual Framework

Akin to information quality in Delone and McLean [17], [18] knowledge richness could be described as the accuracy, timeliness, completeness, relevance, and consistency of knowledge contained in a KMS [8]. When knowledge contained in KMS provides sufficient details applicable to job tasks, users of the systems are likely to be autonomously motivated to use the systems. Thus it is hypothesized that:

H2: The level of knowledge richness in KMS will significantly influence the development of autonomous motivation towards the use of the systems.

C. KMS Linkage Quality and Autonomous Motivation to Use

An added feature in KMS compared to information systems (IS) is that KMS provides the means to enable virtual networks among individuals, as well as knowledge maps of experts. While [8] as well as [9] made differentiation between knowledge richness or content quality and linkage quality of KMS, separating the two in an empirical investigation has never been attempted to the best of the authors' knowledge. When KMS enables adequate linkages, users who are willing to gain expertise and those interested in displaying their competence will be willing to volitionally utilize the systems. Against this background, it is hypothesized that:

H3: The degree of linkage quality of KMS will be significantly related with the development of autonomous motivation to use the systems.

D. Organizational Innovative Norm and Autonomous Motivation to Use

Culture has been identified as an important motivating source that could shape KMS users usage behaviour [11]. Specifically, [19] found cultural value for innovativeness to be socio-psychological motivational driver influencing human behavioural in KM processes. Innovative norm manifest in organizational practices when individuals have the freedom to explore alternative means and use personal judgement (autonomy) in their daily operations without the need to always wait for superior directives [20]. Recently, [21] found adhocracy culture which emphasizes on innovativeness and creativity to be influential on the usage of KM technologies. Therefore, it is hypothesized that:

H4: The existence of innovative cultural value in an organization will be positively related with the development of autonomous motivation to use KMS by knowledge workers.

E. Autonomous Motivation to Use and KMS Usage

Deci and Ryan [22] highlighted that inner psychological needs of humans are the main motivating factors determining their behaviour. They further assert that these needs have been categorized as the need for autonomy, competence and relatedness. By relying on Self Determination Theory (SDT) in [23], they contended against the dichotomy of extrinsic and intrinsic motivations and argued that motivation could be in continuum where autonomous motivation is a stage where motivations emanating either from individuals' external environment or within self could not be differentiated because the externally motivated behaviour has been integrated as personal values. According to [4], autonomous (volitional or endogenous) motivation accounts much for KMS usage behaviour. Therefore, beyond delineating between extrinsic and intrinsic motivations; which have been the main directions in many KM studies, this study contends that autonomous motivation developed towards KMS use will play significant roles in sustaining the actual usage of the systems. Thus, it is hypothesized that:

H5: The degree of autonomous motivation to use KMS among knowledge workers will be significantly related with the actual use of KMS

III. METHODOLOGY

A. Research Measures

Based on seven point likert scale, multiple items were used to measure all research variables. Four-item scale measuring system quality was adopted from [8]. These items explore the system's ease of use, user friendliness, stability and fastness in response to queries. Three-item scale adapted from [8] was used as measure for knowledge richness quality. These items look into ease of understanding of knowledge, availability of contextual knowledge that makes knowledge content easy to apply and the accuracy as well as up-to-date of knowledge content with respect to organizations tasks. Another three-item scale from the same source was used to measure linkage quality of KMS. The items ask about KMS support for collaborative work space, communication among employees and provision of knowledge maps of experts. A three-item scale measuring innovativeness was adopted from [19]. These items focused on the encouragement of innovative practice and risk taking propensity in organizations. Five-item scale used for measuring autonomous motivation gauged both the valued extrinsic reasons and intrinsic reasons that encourage the use of KMS and were adapted from [4]. Furthermore, four-item scale adapted from [8] is used to measure KMS use.

B. Sampling and Data Collection

Respondents of the study were sampled from executive MBA students from four top-most MBA schools in Malaysia according to eduniversal ranking of 2010 (www.eduniversal-ranking.com/business-school-university). With the location of these schools in the main business cities in Malaysia, a sample of 600 working class respondents with varying work background and good exposure to KMS were included in the study. Out of the 600 distributed questionnaires, a total of 311 questionnaires were returned and only 306 responses (51%) were usable. Table 1 present the summary of the respondents' profile.

IV. DATA ANALYSIS AND RESULTS

First, descriptive statistics were applied to analyze the profiles of the respondents. The majority of the respondents are female (63.9%). A good mix of responses based on respondents' job positions was also achieved with those on supervisor level constituting the most (34.4%), followed by middle managers (27.5%) and the rest are senior managers and executive level officers. In terms of industry type, most of the respondents are from manufacturing, service, software or IT, banking and finance and the education sector.

Secondly, the validity and reliability of the instruments were assessed via factor analysis and reliability tests [24]. The results of the of construct validity for convergent discriminant validity as well the variables reliability are presented in Table 2. As shown in the table, the standardized factor loading and the alpha values are above the minimum threshold of 0.7 [24]; [25], and the variance extracted are above the minimum value of 0.5 [25].

TABLE I. CONSTRUCT VALIDITY

Measures	Factor Item Loadings	Variance Extracted	Crobach alpha
System Quality		0.70	0.90
SQ1	0.88		
SQ2	0.90		
SQ3	0.78		
SQ4	0.77		
Knowledge Richness Quality		0.73	0.88
KRQ1	0.86		
KRQ2	0.91		
KRQ3	0.78		
Linkage Quality		0.69	0.88
LQ1	0.83		
LQ2	0.89		
LQ3	0.80		
Innovative Norm		0.51	0.75
INN1	0.79		
INN2	0.62		
INN3	0.72		
Autonomous Motivation to Use		0.68	0.91
AMV1	0.74		
AMV2	0.86		
AMV3	0.86		
AMV4	0.87		
AMV5	0.78		
KMS Utilization		0.70	0.90
USE1	0.74		
USE2	0.84		
USE3	0.89		
USE4	0.87		

Lastly, hypotheses testing were carried out using multiple regression analysis,. Multicollinearity effect was also assesed using the Tolerance value and variable Inflation Factor (VIF). The rule of thumb according to [25] is a threshold value of .10 and 10 respectively for Tolerance and VIF. The results are presented in Tables II AND III as well as in Figure 2.
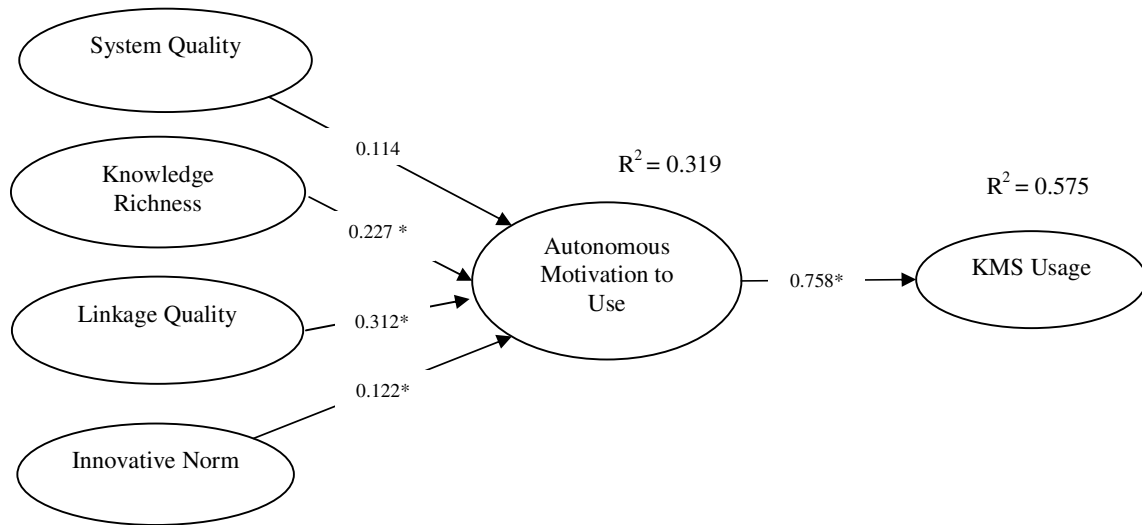
Figure 2. Hypothesis Testing Results

TABLE II. FACTOR INFLUENCING AUTONOMOUS MOTIVATION TO USE

Variable	βeta	t	Sig.	Tolerance	VIF
Linkage Quality	0.312	4.315	0.022700	0.430	2.325
Knowledge Richness	0.227	3.092	0.002	0.418	2.393
Innovative Norm	0.122	2.357	0.019	0.842	1.187
System Quality	0.114	1.563	0.119	0.423	2.365

*P < 0.05, R = .565, R^2 = .319, F = 47.149, Sig. = 0.000

TABLE III. THE INFLUENCE OF AUTONOMOUS MOTIVATION ON KMS USAGE

Variable	βeta	t	Sig.	Tolerance	VIF
Autonomous Motivation to Use	.758	20.282	.000	1.000	1.000

*P < 0.05, R = .758, R^2 = .575, F = 411.353, Sig. = 0.000

Hypothesis 1: As presented in Table 3, System Quality was found to have insignificant relationship (βeta of 0.114 and p-value = 0.119) with Autonomous Motivation to Use. Therefore, hypothesis 1 is rejected.

Hypothesis 2: As presented in Table 3 also, Knowledge Richness was found to have positive significant relationship (βeta of 0.227 and p-value = 0.002*) with Autonomous Motivation to Use. Therefore, hypothesis 2 is accepted.

Hypothesis 3: In addition, Table 3 shows that Linkage Quality of KMS have the most significant positive relationship (βeta of 0.312 and p-value = 0.000*) with Autonomous Motivation to Use. Therefore hypothesis 3 is accepted.

Hypothesis 4: As presented in Table 3, innovative norm as a cultural practice was found to have positive significant relationship (βeta of 0.122 and p-value = 0.019*) with Autonomous Motivation to Use. Therefore hypothesis 4 is accepted.

Hypothesis 5: As presented in Table 4, Autonomous Motivation to Use was found to be highly related with KMS use (βeta of 0.758 and p-value = 0.000*). Therefore hypothesis 5 is accepted.

V. DISCUSSION AND CONCLUSION

The hypothesis testing conducted unveils that Autonomous Motivation to Use has positive and high relationship with KMS usage. This finding is consistent with the findings of [4]. When individuals developed personal motivation based on the values believed to be inherent in the KMS systems, their utilization of the systems is expected to be efficient and remained sustained. Thus, implementing KMS in organizations need to be based on values that develop volitional willingness to use the systems.

Considering the factors contributing to the development of Autonomous Motivation to Use, all the factors with the exception of System quality demonstrate significant influences. Linkage quality of KMS which emphasize on how KMS enables interconnections among individuals contributed the most. By being able to facilitate effective interconnections

among knowledge workers, individuals will be able to benefit from others tacit knowledge and consequently develop their competence the more. According to [22], the desire to attain competence is one of the psychological needs that normally motivate individuals towards certain behaviour.

As expected, Knowledge Richness of KMS which emphasizes on knowledge content that can be easily applied to job and take decision was found as a predictor of autonomous motivation. Therefore, to make KMS usage appealing to users, its knowledge content must be up-to-date.

Lastly, Innovative norm existence was also found as a significant predictor of Autonomous Motivation to Use. Innovative norm emphasizes on the autonomy and ability to explore and exploit. Therefore, when innovativeness is a norm in organization, users of KMS will be more willing to use the system for additional knowledge acquisition.

In conclusion, this research contributes to literature by proposing and confirming factors promoting the development of autonomous motivation to KMS use. The study also established the linkage between autonomous motivation to use and actual KMS usage. The result shows that in promoting sustained usage of KMS, managers or organization leaders should focus on practices and strategies that make KMS user develop personal motivation towards the systems.

A major limitation to survey study is the issue of self report measure, thus a longitudinal approach could be employed to better understand the development of autonomous motivation and its influence on KMS usages.

As this study is limited to knowledge workers in Malaysia organization, the framework proposed could be tested in another country either to strengthen or refute the findings of the study.

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