Article

The Effect of Leadership and Organisational Culture with Information Technology as Mediator Towards Knowledge Management Among Top Management at Malaysian Public Universities

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Hasannuddiin Hassan (Corresponding author)
Mohd Ikhwan Aziz
Mohd Nazri Zakaria
Rooshihan Merican Abdul Rahim Merican
Department of business management,
Faculty of entrepreneurship and business, Universiti Malaysia Kelantan, Pengkalan Chepa, Malaysia
Email: hasann@umk.edu.my

Abstract – Knowledge management is a complex and critical task in institutes of higher learning. On the other hand, comprehensive research is relatively scarce in public universities for knowledge management. This paper aims to examine the effect of knowledge management from the perspectives of leadership, organisational culture, and information management. Thus, the quantitative method approach was used. Data were collected using self-administered questionnaires from 285 academic senate members. Data obtained were analysed using SPSS for descriptive statistics to describe the respondents' demographic profiles and inferential research using structural equation modeling with AMOS. Samples were drawn using a simple random sample, and the sample size was obtained using the Krejcie and Morgan formula (1970). The findings showed that all dimensions examined in the study strongly demonstrated a significant role in sustaining knowledge management practice. Moreover, the results generated have supported all of the study's hypotheses. Concurrently, it is proposed that higher education institutions should consider variables such as leadership, organisational culture, and information technology when boosting the effectiveness of knowledge management and preserving sound knowledge management practise. More importantly, information communication technology should be extensively utilised for management, mediation, decision-making, and knowledge exchange between individuals.

Keywords: Knowledge Management, Public University, Leadership and Organisational Culture, Information Technology.

1. Introduction

Data and information have become modern commodities for business, and knowledge management is crucial for organisations to develop value from intellectual capital in

knowledge (tacit or explicit). Because of this, colleges have taken on a more critical position in the knowledge economy, and how they organise their information has the potential to significantly impact the growth of organisations, society, and the economy as a whole (Money & Cohen, 2018).

Knowledge management has a variety of angles to look at this issue in previous studies. From social perspectives, scholars have taken on knowledge management in which leaders are the agents of knowledge management and engage with each other while participating in activities of information sharing (Kremer et al., 2019). It is common practice in universities to share knowledge, and this concept has been a major research area in public universities such as (Alavi et al., 2005; Nam Nguyen & Mohamed, 2011; Suppiah & Singh Sandhu, 2011) and remains relevant for current studies in light of the social and economic changes. In universities, which are referred to as "knowledge centres" effective management of organisational knowledge is critical for both academic and administrative objectives. Universities' management was needed for academics and students to carry out multiple work operations, including teaching and learning, research and innovation. Organisations can realise the benefits of excellent knowledge management by regularly reviewing their processes. Ranking systems for higher education institutions have impacted how a university's performance is evaluated. To satisfy the requirements for publication in peer-reviewed journals, for example, scholars depended on various databases to handle the extensive collections of academic publications' information (Hallinger & Hammad, 2019).

When a reliable academic database is readily available, it becomes the primary source of information since it contains reliable data. The researcher's personal experiences in information management at one of Malaysia's public universities sparked the concept for this study. The university had a significant challenge in compiling and reporting the university's performance success across roughly 40 departments and three campuses. The university had issues in adequately managing a large volume of information, and these issues were inextricably tied to knowledge management. Many reasons contributed to the development of universities' ability to manage their information in a crucial way to their performance systems. These universities needed social and technical infrastructure to expand their knowledge management capabilities (Abualoush et al., 2018). In order to properly manage knowledge, five organisations must focus on three components: people, process, and technology. Knowledge in an organisation is not only present in documents; it is also embedded in organisational leaders and cultures (Oyewunmi et al., 2017).

As a result, this study looked at three determinants of leadership at Malaysian public universities: organisational culture, information technology, and knowledge management Leadership, culture, and information technology use at these institutions are all likely to vary depending on their setting (Barley et al., 2018; Basit & Medase, 2019; Chong & Chong, 2009; Coelho et al., 2016).

2. Literature Review

2.1. Knowledge management

According to the research, the most appropriate approach to describe knowledge management depended on the environment in which it was being performed. In the context of information technology, for example, knowledge management was concerned with the administration of both soft and hard infrastructure, such as databases and software. However, the business context included higher educational institutions and managed knowledge was more focused on the individuals involved with the knowledge. It was viewed from social aspects, such as organisational culture, leadership, and other organisational issues, as opposed to the academic context (Wai & Chai, 2008).

The basis of knowledge management was concerned with the creation and exploitation of knowledge resources aimed at achieving the organisation's missions (Di Vaio, Palladino, Pezzi, & Kalisz, 2021). Knowledge management accumulates and connects the abundant knowledge available in the organisation that is created through work outputs and experiences (Bollinger & Smith, 2001). It was also referred to as inculcating knowledge culture and leadership to practice information sharing possible (Bhatt, 2001). Effective knowledge management was the fundamental goal of knowledge management that led to increased organisational performance and other advantages of knowledge management, such as facilitating organisations to be more innovative and effective (Okunoye & Bertaux, 2008).

2.2. Leadership in Knowledge Management

The existing literature had frequently associated leadership with other concepts such as motivation, strategic planning, including entrepreneurial behaviour (Stumpf, 1995; Van Wart, 2003). Indeed, there were critical skills that signified whether an individual had to be strategic in his or her leadership efforts. Strategic leaders in business, for instance, should know the market and customers' trends, manage conflicts, control threats, stay on strategy, accommodate adversity, and be an entrepreneurial force (Stumpf, 1995). However, leading non-profit organisations like public universities require different sets of skills and critically depend on knowledge-based strategic planning and decision-making skills for academic excellence (Rehman & Iqbal, 2020).

Many elements of leadership were relevant to knowledge management (Donate & de Pablo, 2015), including taking the initiative to deploy organisational knowledge capability for value creation. In this study, the operational definition for leadership was associated with elements such as idealised influence, intellectual stimulation, and inspirational motivation that increased the firm's relative knowledge acquisition and performance (Inkinen, 2016). According to Inkinen (2016), this participatory type of leadership was relevant for increasing knowledge application and learning, as well as speed promoting trust for knowledge exploration and exploitation.

2.3. Organisation culture in knowledge management

There was an association between organisational culture and knowledge management (Al Saifi, 2015), and from the knowledge management perspective, culture specifically referred to the collection of uniform values and beliefs that were shared by an organisation's members to drive organisational performance and ensure competitive advantage (Omotayo, 2015). The culture was a significant aspect of an organisation and must be driven by certain organisational vision and mission that were embedded within shared values and of employees. The study focused on examining the culture of higher education institutions concerning knowledge management.

Since knowledge management processes were linked with the social settings in which they were embedded (Corfield & Paton, 2016), the contrast between academic culture and corporate culture within universities offered interesting insights into knowledge management. Gumport and Sporn (1999) suggested that universities had a unique organisational characteristic that significantly influenced the organisation's belief and practical system and is known as the university culture. For example, the culture of a research-focused university was different from a teaching-focused university.

Organisations may have a mix of organisational cultures (Deshpandé & Farley, 2004) and (Denison et al., 2004) argued that organisational patterns shared values and were found to be different between organisations. Therefore, a knowledge that was shared by people within a similar culture (e.g. public universities in Malaysia) would determine certain actions and opinions that were considered normal and guided specific behaviours among the people (Omotayo, 2015). The next sections discussed the definitions of organisational culture, cultural types and factors from the Asian perspective, and the culture in an academic environment in the context of knowledge management.

2.4. Information Technology in Knowledge Management

Many researchers have insisted that the effectiveness and efficiency of knowledge management were facilitated by information technology (Alavi et al., 2005; Bolisani & Bratianu, 2018). Information technology is closely connected to knowledge management because it helps to distribute structural knowledge vertically and horizontally as well as makes it easily searched and used. Because of this, organisations need to implement knowledge management with information technology (Alavi & Leidner, 2001). According to Beckman et al. (1997), the components of information technology that primarily support knowledge management activities are the technological infrastructure such as computer systems and integrated knowledge databases.

Although many academic studies suggest that organisations have developed and implemented computer-supported working systems and educational information systems, there appears to be a lack of empirical findings that support the effective routine use of information and communication technology among faculty members (Thorn, 2001). In addition, few studies have been conducted to examine critical factors to the success of

knowledge management implementation in the various services sector and found that information technology was the second most commonly highlighted factor.

However, these findings still signified the critical role of information technology in knowledge management and presented a challenge to public universities because, according to McDermott and O'dell (2001), there was rather inactive support from both academic and non-academic staff to fully use information systems at the workplace. These lead to the increasing call for more research on how information technology can support the transformation of higher education institutions to become fully electronic campuses (Thorn, 2001).

In this study, the main theme for information technology implementation served as a mediating variable that supported effective knowledge management. As Mahdi et al. (2019) mentioned that the role of technology in communication was unlimited to enable the flow of knowledge, but also technology was responsible for mediating the process of participation in teamwork and knowledge sharing. The reason for suggesting information technology as a mediating variable in knowledge management is because some scholars argued that technology did not produce the creation, sharing, or transfer of knowledge and managing knowledge was more complex than simply purchasing the latest computer system or database (Bell DeTienne et al., 2004).

3. Methodology of Study

Research design proposes to use a quantitative method that consists of descriptive, explanatory, and confirmatory (Sekaran & Bougie, 2016). The simple random sampling method was used among university senate members as a respondent to the study (Hair, 2007). The sampling technique was used due to its probability characteristic and suites with structural equation modeling (SEM). There were 1,077 senate members in the total population of the study, and 371 respondents were selected to be unit analyses of the study as there is the implementer of knowledge management in institutions. The instrument of the research used a structured interview, which is a questionnaire to collect data from respondents that will be distributed among university students. There are four sections for the questionnaire consisting of A (Demographics), B1 (Leadership), B2 (Organization Culture), C (Information Technology), and D (Knowledge Management) with 10 points Likert scale (Hair et al., 2014). That scale is used for data-sensitive feedback by respondents and avoids a natural answer.

There are two types of tool analyses that propose to use, the first is IBM-SPSS, and the second is IBM-AMOS. Those two tools are meant to achieve two types of analyses, descriptive and inferential analyses. Factor analysis is employed to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables called factors. It'aims to find independent latet variables. Further, confirmatory analysis (CFA) is used to validate the measurement model of the construct and to test the stated hypothesis in the path model. The method employed in testing the path model of SEM.

It's the method to cater for limitations in the ordinary least square regression, focusing on dealing with latent construct in the model.

4. Result

A total of 371 respondents were questioned regarding their demographic profiles. Female respondents dominated the response in this survey at 69.2 % and became the major impact of this result. This result was also aligned with the domination of respondents aged 23 and above at 61 %, compared to those aged 22 and below at 39%. The data showed that most of the respondents matured in to respond to the survey.

Then, to begin with, the CFA testing first, we developed a latent construct for talent supply, talent demand, government support, and talent shortage development to assess the fitness level of the measurement model involved so that the quality of the model could be improved, eventually testing the relationship between independent and dependent constructs (Aziz et al., 2019). The fitness level can be improved by deleting items that carry lower factor loading. There are many rules of thumb to consider in the deletion of items when performing CFA, such as 0.40, 0.50, and 0.60 factor loadings. In this study, we retain items beyond the threshold level of 0.60 of factor loadings as counsel in a previous study (Afthanorhan & Ahmad, 2014; Awang, 2012; Hair et al., 2014). Generally, the lower factor loading can impair the assessment of convergent validity, such as average variance extracted (AVE), because the lower factor loading will capture lower variance that is explained by the respective latent constructs (Afthanorhan & Ahmad, 2013; Awang, 2015). There are two items that have been deleted under government support latent construct as they do not achieve above 0.6 factor loading value.

4.1. Assessment of Normality

After specifying the measurement model in order to ensure the model achieved the fitness level,

The normality assessment is made by assessing the measure of skewness for every item. The absolute skewness value of 1.0 or lower indicates the normal distribution of the data. However, for SEM using the Maximum Likelihood Estimator (MLE) like AMOS, it is fairly robust to keep skewness greater than 1.0 in absolute value if the sample size is large and the Critical Region (CR) for the skewness does not exceed 8.0. Normally, the sample size of 200 or more is considered as large enough in MLE even though the data distribution is slightly non-normal.

Another method for normality assessment (refer to Table 1)is by determining the multivariate kurtosis statistic. In this analysis, the result was -2.577, which is considered normal, where the acceptance value is between the kurtosis value of -3 to +3 (Hair et al., 2014) and the multivariate kurtosis value of below 50 (Awang, 2015). Thus, the researcher could proceed with further analysis. All Composite Reliability (CR) and Average Variance Extracted (AVE) exceed the threshold values of .6 and .5, respectively, indicating the convergent validity and composite reliability of all main constructs in the model (Awang, 2015).

Table 1: Normality Assessment

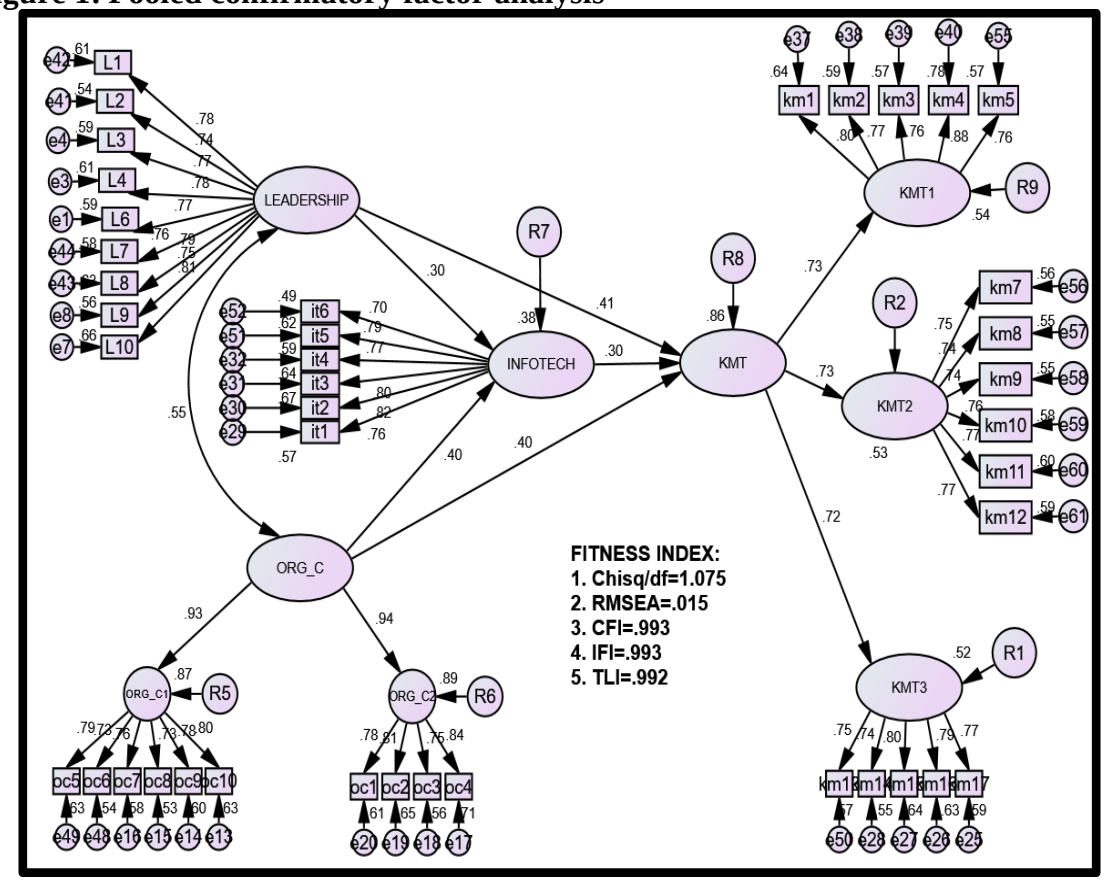
Variable	min	max	skew	c.r.	kurtosis	c.r.
Km13	3.000	8.000	.153	1.114	.029	.104
Km12	4.000	9.000	.025	.184	-.120	-.437
Km11	5.000	10.000	.030	.217	-.091	-.332
Km10	2.000	9.000	.067	.493	.144	.526
Km9	2.000	9.000	-.147	-1.073	.475	1.735
Km8	3.000	8.000	-.009	-.067	-.073	-.268
Km5	2.000	9.000	-.157	-1.144	-.201	-.735
it6	4.000	9.000	-.064	-.471	-.335	-1.225
it5	3.000	9.000	-.155	-1.135	.062	.226
km16	-1.000	5.000	-.119	-.867	.029	.104
oc5	2.000	8.000	.007	.050	.190	.695
oc6	3.000	9.000	-.053	-.387	-.155	-.567
L7	4.000	9.000	.190	1.384	.025	.091
L8	2.000	9.000	-.021	-.155	.314	1.146
L1	2.000	7.000	.224	1.639	-.170	-.622
L2	2.000	8.000	.080	.588	-.339	-1.236
km4	3.000	9.000	-.177	-1.294	.142	.519
km3	2.000	9.000	-.233	-1.699	.200	.732
km2	3.000	8.000	-.185	-1.353	-.137	-.499
km1	2.000	8.000	-.163	-1.190	.046	.168
it4	2.000	8.000	-.228	-1.663	-.261	-.953
it3	2.000	8.000	.115	.840	.188	.687
it2	2.000	9.000	.059	.428	.539	1.968
it1	3.000	9.000	.063	.460	-.006	-.021
km17	3.000	9.000	.052	.382	-.026	-.095

Variable	min	max	skew	c.r.	kurtosis	c.r.
km18	3.000	9.000	-.221	-1.611	.027	.099
km19	3.000	8.000	-.036	-.260	-.202	-.738
km20	2.000	8.000	.058	.426	.119	.435
oc1	3.000	9.000	.204	1.491	.281	1.027
oc2	2.000	9.000	-.022	-.159	.280	1.022
oc3	3.000	8.000	-.075	-.548	-.200	-.730
oc4	1.000	8.000	.240	1.753	.628	2.293
oc7	3.000	9.000	.020	.149	-.076	-.277
oc8	2.000	7.000	.139	1.017	-.135	-.492
oc9	3.000	9.000	.200	1.457	-.053	-.194
oc10	3.000	8.000	.045	.326	-.247	-.903
L9	2.000	7.000	.221	1.617	.029	.106
L10	3.000	8.000	.216	1.578	-.153	-.560
L3	1.000	8.000	-.140	-1.024	.734	2.681
L4	2.000	8.000	.010	.077	-.090	-.330
L6	1.000	7.000	.137	1.002	.258	.941
Multivariate					1.393	.210

4.2. Structural model

In the structural model, the researcher assembles the constructs involved in the study. It has a set of more dependence relationships linking the constructs in the hypothesised model with the construct of the structural model, which is useful to represent the interrelationship of variables between dependence relationships (Joseph F Hair, 1992; Joseph F Hair & Anderson, 1995; J. F. Hair et al., 1998). In addition, Information technology is a mediator construct, as shown in the unstandardised estimates in Figure 1.

Figure 1: Pooled confirmatory factor analysis



For models with good fit, chi-square normalised by degrees of freedom (Chisq/ df) should be less than 5.0 (Bentler, 1990; Bhattacherjee, 2001), Comparative Fit Index (CFI), Goodness Fit Index (GFI), Tucker-Lewis Index (TLI), and Normal Fit Index (NFI) should all be greater than 0.90 (Anderson & Gerbing, 1988; Awang, 2015; Gerbing & Anderson, 1988), and Root Mean Square of Error Approximation (RMSEA) should be less than 0.08 (Cunningham et al., 2001; Hooper et al., 2008). For the current model, it's achieved all the requirement indices (Chisq/df = 1.144; RMSEA = 0.020; CFI = 0.991; GFI = 0.991; TLI = 0.991; NFI = 0.936) and concluded it appropriate for the next step.

Table 2: The Regression Knowledge Management

			Estimate	S.E.	C.R.	P	Label
INFOTECH	<---	LEADERSHIP	.283	.063	4.501	***	Significant
INFOTECH	<---	ORG_C	.375	.066	5.700	***	Significant
KMT	<---	INFOTECH	.242	.051	4.704	***	Significant
KMT	<---	LEADERSHIP	.314	.050	6.268	***	Significant
KMT	<---	ORG_C	.305	.053	5.772	***	Significant

Table 2 shows the regression weight for each path analysis that has been proposed in the research hypotheses. From this table, it is clearly shown that three constructs have a significant contribution towards their respective endogenous constructs. By looking at the estimated value, Leadership (Beta = 0.314) has the highest positive contribution toward Knowledge Management compared to Organization Culture (Beta = 0.305) and Information Technology (Beta = 0.242). Specifically, there are five hypotheses testing that has been originated in this study that has been discussed in the earlier chapter. Nevertheless, looking at this output and the interpretation for each casual effect encompasses three hypotheses testing focusing on the direct relationship and direct effect between endogenous and exogenous.

4.3. Mediation Testing

Finally, the bootstrapping application is implemented to verify the mediation result. This analysis is available in AMOS software and the results are shown as follows:

Table 3: Standardized Direct Effects

	LEADERSHIP	ORG_C	INFOTECH	KMT
INFOTECH	.296	.402	.000	.000
KMT	.406	.405	.299	.000

Table 4: Standardized Indirect Effects

	LEADERSHIP	ORG_C	INFOTECH	KMT
INFOTECH	.000	.000	.000	.000
KMT	.088	.120	.000	.000

Information technology was potentially mediates the relationship between knowledge-oriented leadership and effective knowledge management.

Leadership → Information Technology → Knowledge Management.

Table 5: The result of Direct and Indirect Effect (Leadership, Information Technology, and Knowledge Management)

	Indirect Effect	**Direct Effect**
Bootstrapping Estimate	0.088	0.406
Bootstrapping P-Value	0.001	0.001
Result	Significant	Significant

Type of Mediation	**Partial Mediation**

Table 5 shows the result for the mediator construct. In this study, Information Technology was a mediator construct. Meanwhile, Leadership and Knowledge Management were examined as exogenous and endogenous constructs. The result for bootstrapping estimates and p-value was obtained by the application of Amos output. The regression weight estimate for indirect effect is 0.088. The probability of getting a bootstrap p-value for indirect effect is 0.001. What it means is that the regression weight for Information Technology as mediator construct is significant at a 0.05 level.

Information technology mediates the relationship between learning organisational culture and effective knowledge management.

Organizational Culture → Information Technology → Knowledge Management

Table 6: The result of Direct and Indirect Effect (Organizational Culture, Information Technology, and Knowledge Management)

	Indirect Effect	**Direct Effect**
Bootstrapping Estimate	0.120	0.405
Bootstrapping P-Value	0.001	0.004
Result	Significant	Significant
Type of Mediation	**Partial Mediation**	

Table 6 shows the result for the mediator construct. In this study, the Information Technology construct was a mediator construct. Meanwhile, Organizational Culture and Knowledge Management were examined as exogenous and endogenous constructs. The result for bootstrapping estimates and p-value was obtained by the application of Amos output. The regression weight estimate for indirect effect is 0.120. The probability of getting a bootstrap p-value for indirect effect is 0.001. What it means is that the regression weight for Information Technology as mediator construct is significant at a 0.05 level.

5. Conclusions

Overall, the project has met its goal of developing a model for the scarcity of skilled workers. The validity, normality, and fitness index of this model fulfil all of the SEM requirements in this investigation. Thus, this model has gained sufficient confirmation value for generalisation across the study's participants. The results show that the second and fourth objectives of the study were met and addressed. The second purpose was to study the interaction between leadership, organisational culture, and information technology with knowledge management in Malaysian public institutions. Knowledge management has been shown to be significantly influenced by factors such as leadership style, company culture, and technological infrastructure. The evidence points to a partly mediating influence of technology on leadership and organisational culture when it comes to knowledge management.

This study's contributions have theoretical and practical consequences for public university knowledge management. Successful knowledge management practices were found to have been influenced by leadership, which shaped organisational culture and managed information technology to maximise its usefulness while highlighting the university's role as the most significant knowledge management collection and dissemination centre, as revealed by these findings. Although on a more practical level, the findings of this study have aided Malaysian public institutions in formulating more effective methods of managing innovation and commercialisation. As a result of this study, university leaders, managers (Boards), and policymakers have three main takeaways (MOEs).

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