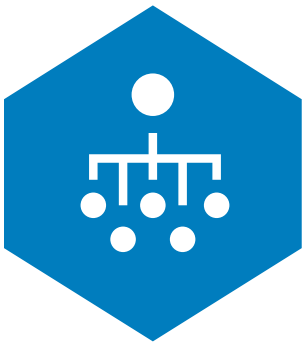

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Knowledge Management at Universities

The Roles of Leadership, Culture, and Information Technology

HASANNUDDIIN HASSAN, WEE YU GHEE, MOHD IKHWAN AZIZ, AINON JAMILAH RAMLI, AND ARBAIAH ABDUL RAZAK

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Knowledge Management at Universities: The Roles of Leadership, Culture, and Information Technology

Hasannuddiin Hassan, Universiti Malaysia Kelantan, Malaysia
Wee Yu Ghee, Universiti Malaysia Kelantan, Malaysia
Mohd Ikhwan Aziz, Universiti Malaysia Kelantan, Malaysia
Ainon Jamilah Ramli, Universiti Malaysia Kelantan, Malaysia
Arbaiah Abdul Razak,[1] Independent Scholar, Malaysia

Abstract: The influences of leadership, organizational culture, and information technology could be remedial factors for effective knowledge management at Malaysian public universities. Interactions between these factors are postulated to have significant impact on knowledge management that are worth investigating in an academic setting. Built on an integrative review of the literature, this paper offers insights into the potential roles of leadership, organizational culture, and information technology in sustaining effective knowledge management efforts. The drawbacks of existing knowledge management practices are highlighted and a conceptual framework for effective knowledge management at universities is proposed, where three interconnected factors are discussed: (1) leadership with knowledge orientation, (2) organizational culture to promote learning, and (3) information technology-mediated management. The proposed framework highlights the need for the sustainable effectiveness of knowledge management as public universities face rapid changes in education to accommodate shifting teaching and learning approaches. Current knowledge management issues are discussed to understand the current context of knowledge management in public universities. Finally, the proposed framework situates information technology as a mediator in the interactions, following which some future research directions on this topic have been recommended.

Keywords: Knowledge Management, Leadership, Organizational Culture, Information Technology, Public Universities

Introduction

Knowledge management in universities has been examined from various viewpoints. This study focuses on the determinants of knowledge management in universities from the top management's perspective and aims to provide a more comprehensive explanation of the influences of leadership, organizational culture, and information technology in managing knowledge at universities. The current literature emphasizes the importance of successful knowledge management (Ngoc-Tan and Gregar 2019). The benefits of knowledge management are proven, and more than 80 percent of large firms worldwide are implementing knowledge management practices in their organizations (Parlby 2000). A study conducted by KPMG Consulting among firms found that knowledge management plays a significant role in creating competitive advantage (79%), improving customer focus (72%), improving decision-making (68%), and promoting product innovation (64%), with further benefits for effective marketing, employee development, and organizational growth (Parlby 2000). A more updated knowledge management report presented by KPMG Consulting highlighted that the reasons for knowledge management failure in most organizations were unclear objectives for knowledge management (85%) as well as a misguided focus on people and not enough thought on technology (Armacost 2010).

Generally, knowledge management is essential for organizations to generate values from intellectual capital in the form of knowledge (tacit or explicit). This is the fundamental concept

[1] Corresponding Author: Arbaiah Abdul Razak, Independent Scholar, Malaysia. email: abrazak267@gmail.com

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of the knowledge economy, in which data and information have become modern commodities for business. In the context of the knowledge economy, the role of universities as knowledge producers becomes central, and how these universities structure their knowledge could influence overall organizational, societal, and economic growth (Cohen 2018). In Malaysia, the national aspiration of Vision 2020 to achieve a developed country status by the year 2020—which may be delayed to 2025—has emphasized the needs of knowledge workers. The former Malaysian prime minister, Tun. Dr. Mahathir Mohamad, said two values are needed for Malaysia to be a prosperous nation: hard work and excellent knowledge (Nation 2019). According to the former prime minister, expertise comes from hard work in chasing knowledge, and university students must nurture these values for individual, organizational, and social success. For leaders at higher learning institutions, the Malaysian Higher Education Blueprint for the years 2015 to 2025 has highlighted the significance of knowledge automation, and these leaders will be empowered with greater decision-making rights to support knowledge-related agendas, such as knowledge transfer programs, integration of knowledge, and the development of knowledgeable graduates (Ministry of Education Malaysia [MOE] 2015).

In terms of knowledge management research, previous studies have examined this topic from various perspectives. Scholars have investigated knowledge management from social viewpoints, in which individuals or leaders are the agents of knowledge management, who are related and interact during knowledge-sharing activities (Kremer, Villamor, and Aguinis 2019). Knowledge sharing is the norm in universities, and this concept has been a significant research area in public universities (e.g., Alavi, Kayworth, and Leidner 2005; Nam Nguyen and Mohamed 2011; Suppiah and Singh Sandhu 2011) and remains relevant for the current study in line with social, economic, and technological changes.

The universities—categorized as knowledge centers—are required to adopt good organizational knowledge management practices for both academic and administrative purposes. The proper functioning of universities' administration is crucial for academics and students to facilitate various work processes, such as teaching and learning, research, and innovation, that lead to excellent institutional performance. The benefits of good knowledge management practices for organizations provide a valid rationale for regular assessment of the practices.

In the context of higher education institutions, national and international ranking systems for universities have affected the ways in which universities' performance assessments are conducted. For example, criteria for publication require universities to publish their articles in refereed journals, and academics rely on several databases that manage the vast collections of academic journals (Hallinger and Hammad 2019). An efficient academic database provides highly credible data and becomes the main source of knowledge.

The idea to conduct this research study was triggered by the researchers' personal experiences in managing information at one of Malaysia's public universities. Thus, this study reviewed leadership, organizational culture, and information technology in knowledge management in a Malaysian public university context. One critical issue for the university was compiling and reporting performance achievement for the entire university, which comprises nearly forty departments across three campuses. There were difficulties in managing the substantial amount of information efficiently, and this is closely linked to knowledge management within the university. It was obvious that knowledge management has become an important tool in universities' performance system, and several factors are critical for creating this knowledge management capability. To develop knowledge management capability, these universities require both social infrastructure, in the form of leadership and culture, and technical infrastructure, such as hardware and software (Abualoush et al. 2018).

It is worth noting that knowledge in an organization is not only available in documents but also embedded in organizational leaders and cultures, so organizations need to focus on three components in order to manage knowledge efficiently—people, processes, and technology (Omotayo 2015). Therefore, this study will examine three determinants, namely leadership,

organizational culture, and information technology, with regard to knowledge management practices within the Malaysian public universities. It is expected that the patterns of leadership, culture, and information technology usage in these universities may differ based on the contextual background (Deshpandé and Farley 2004; Chong and Lin 2009; Ramachandran, Chong, and Wong 2013; Mahdi, Nassar, and Almsafir 2019).

Literature Review

Good management of knowledge resources is not a new agenda in private firms; however, various knowledge management issues are debated among scholars in academic settings. For example, public universities face the issue of finding a balance between exploration and exploitation, between publication and patent registration, and between knowledge sharing and consulting. A study conducted by Tasmin et al. (2010) among universities in Malaysia found that private universities engage in a higher level of knowledge management compared to public universities. Malaysian universities focus mainly on knowledge content, and more efforts are required to develop effective knowledge management. One of the significant findings was the contradictory perceptions among the staff and management team about the importance of knowledge management. Therefore, recent studies have suggested the need for future research to examine the impacts of leadership, organizational culture, and information technology on effective knowledge management in universities (Ngoc-Tan and Gregar 2019).

Contextual Background

A knowledge management survey conducted by the Technology Services Industry Association (TSIA) in 2017 found that nearly two-thirds (63%) of organizations with a low knowledge management culture indicated that their executive officers do not review any metrics related to knowledge management programs during operational reviews. A reverse phenomenon is seen for a high knowledge management culture, with 65 percent of executives reviewing knowledge management metrics during operational meetings (Technology Services Industry Association [TSIA] 2017). Obviously, corporate culture is driven from the top down. If executives and leaders of organizations do not think that knowledge management is important, and this attitude is directly or indirectly communicated to employees, then it is difficult to change individual mindsets or the whole departmental culture (TSIA 2017). The TSIA 2017 report cover also emphasized the message: "ignore culture's impact on knowledge management success at your peril."

A study conducted by Veer Ramjeawon and Rowley (2017) suggested that universities in developing countries, including Malaysia, were aware of the need for knowledge management. However, many universities face the challenge of inefficient knowledge management. There have been issues of knowledge loss mainly through inefficient documentation and operating procedures, which leads to delayed decision-making and poor organizational performance (Mvula 2018). In addition, there are certain barriers to successful knowledge management due to a lack of appropriate strategies and cultures, including a lack of time, a lack of understanding of knowledge management benefits, a lack of funding, and a lack of senior management support, including unclear strategy, weaknesses of information communication technology support, and being unsure of information demand (Singh and Kant 2008).

There has been an increasingly strong call for quality education in Malaysia, and one of the strategies to achieve this is by enhancing the performance of local universities through the application and implementation of an excellent knowledge management system (Massaro, Dumay, and Garlatti 2015). This is because universities as knowledge-intensive organizations require good knowledge management to evolve more smoothly and become highly effective in providing an excellent educational environment for overall academic performance (Ramachandran, Chong, and Ismail 2009). However, only a few educational institutions are

found to have full-fledged knowledge management systems in place (Ramachandran, Chong, and Wong 2013). By now, higher education institutions need to fully recognize the role of technologies in this fourth industrial revolution and organize the substantial knowledge resources they possess in a way that it could be shared with others through various communication media in an efficient way (Bolisani and Bratianu 2018).

According to Shamim, Chang, and Yu (2019), the performance of organizations is at risk when many employees avoid practicing effective knowledge management at the individual level, which subsequently leads to a loss of human and intellectual capital. For this reason, knowledge-oriented leadership is found to be significantly related to knowledge management behaviors among employees (Shamim, Chang, and Yu 2019). A systematic review conducted by Al-Kurdi, El-Haddadeh, and Eldabi (2018) on knowledge management in higher education institutions (HEIs) also revealed that there is limited academic literature dedicated to understanding knowledge management in the setting of HEIs compared to other corporate sectors. Based on the reviews, a few determinants are central to knowledge management, including technological, organizational, and cultural factors, which become the focal points of senior management at HEIs (Al-Kurdi, El-Haddadeh, and Eldabi 2018).

There is clearly a problem of inefficient knowledge management at HEIs, including Malaysian public universities. To address this problem, this research study hypothesizes that knowledge management is not only about managing knowledge resources but also about managing people (represented by leadership and culture) and information technology. Thus, this study explores the problem and proposes answers that could explain the phenomenon, leading to practical recommendations toward efficient knowledge management at Malaysian public universities.

Knowledge Management

In an organization, knowledge management is the systematic collection of data, information, expertise, and experience that staff members use when completing their jobs. According to Renshaw and Krishnaswamy (2009), knowledge could be created and stored in an individual's mind or recorded in organizational processes, documents, or systems. Thus, managing knowledge is a process that denotes the activities of organizing knowledge (either tacit or explicit), which include knowledge creation, transfer, and storage. An effective knowledge management system is imperative for any organization and ensuring that this knowledge flows efficiently is critical for sustainable competitive benefits (Girard and Girard 2015). Scholars have provided various definitions of knowledge management, and there are a few definitions that are widely accepted according to different perspectives. Generally, knowledge management covers the functions of managing data, information, and knowledge in the form of resources that are created, transferred, or stored in people's minds or recorded as documents in organizational guidelines, procedures, or systems (García-Fernández 2015).

In higher educational settings, there are at least two main types of knowledge: (1) the knowledge possessed by individuals in the form of academic expertise or experience, and (2) organizational knowledge in the form of culture. Academic expertise is mainly theoretical knowledge, which serves a primary function in higher education, while organizational culture refers to the knowledge embedded in all functions of the institution, which is a critical factor in organizational operation and success (Coukos-Semmel 2003). The organizational knowledge culture that is present in HEIs is related to the management structure of the university. Basically, the university management system is divided into three structures: (1) the leadership, which is responsible for giving strategic direction to the institution; (2) the faculty, as the core structure of a university to conduct academic activities; and (3) the administration, which comprises several units to govern and support the academic services in the institution.

The higher education sector is one of the main instruments for society to gain advanced knowledge and engage in continuous learning (Yeh 2005). Traditionally, colleges and universities have been recognized as knowledge producers and have the role of transferring knowledge to society, especially to students so that they have adequate knowledge to join the future workforce (Keramati and Azadeh 2007). HEIs are considered knowledge-intensive service centers because (1) the advancement of the teaching and learning system itself is about the generation and sharing of knowledge, and (2) every activity conducted within the educational system is knowledge-oriented (Oakley 2003). While explicit knowledge is common in educational institutions, implicit knowledge, which mainly resides in people's minds based on their experiences, is important as well for creating competitive advantages and ensuring the long-term sustainability of organizations.

Based on the contextual background, there are at least three reasonable gaps in knowledge management studies. First, there is a theoretical gap in understanding knowledge management from the epistemological perspective, which limits the actual presentation of comprehensive interactions between people, technology, and knowledge management processes. As the existing studies of knowledge mainly focus on types of knowledge (i.e., explicit and tacit) and its processes (i.e., creation, storage, transfer, and application), explanations of the interrelationship of knowledge with other components such as leadership, organizational culture, and technology among public universities in developing countries are scarce (Veer Ramjeawon and Rowley 2017). Furthermore, the literature shows that knowledge management strategies in universities are not well developed and are not internalized in most universities (Siadat et al. 2012).

Second, while the field of knowledge management is not new, the current challenges presented by globalization and the fourth data-driven industrial revolution provide a practical gap that can be potentially filled with knowledge-oriented leadership (Donate and de Pablo 2015), a strong organizational culture for learning (Heisig et al. 2016), and an effective implementation of information technology (Mariano and Awazu 2016). Sustaining effective knowledge management among top managers in public universities has not been the focus of previous knowledge management studies. The factors related to successful knowledge management as viewed from the perspective of public universities' top management in Malaysia have mostly been unexplored.

The third gap is the methodological limitation, as most existing studies on knowledge management adopt either a quantitative or a qualitative approach. Thus, it is valuable to examine this topic using a more pragmatic approach; Moradi et al. (2012) suggested investigating the association between knowledge and culture with a mixed methodology for the best results. A recent study also suggested investigating the mediating interactions of other concepts, such as culture, leadership, and technology in knowledge management (Chong et al. 2018). More importantly, Silva et al. (2019) argued that it is necessary to conduct an in-depth examination for sustaining effective knowledge management in line with a pragmatic view of knowledge.

Ideally, knowledge management is not a single discipline and requires the integration of various fields of study to govern the value of knowledge assets. An effective knowledge management system should integrate both human factors and technology to better address the interrelated knowledge flows and to better enable individuals to engage in knowledgeable behaviors.

Leadership in Knowledge Management

The existing literature has frequently associated leadership with other concepts such as motivation, strategic planning, and entrepreneurial behavior (Stumpf 1995; Wart 2003). Indeed, there are critical skills that indicate whether an individual is strategic in his or her leadership efforts. Strategic leaders in business, for instance, should know the market and customer trends, manage conflicts, control threats, stay on strategy, accommodate adversity, and be an entrepreneurial force (Stumpf 1995). However, leading nonprofit organizations such as public universities require different sets of skills and critically depend on knowledge-based strategic planning and decision-making skills for academic excellence.

Leaders in public universities face several challenges because of the dual responsibilities of meeting academic and community needs. While the academic needs are obvious, the community needs are more complex. One of the community responsibilities is to meet the industrial needs, for example, through commercialization activities, in which knowledge created in the university is shared with industrial counterparts for profit generation. There is also an increasing need for public universities to look for new funding sources and to generate their own income (Blackman and Kennedy 2009). To accommodate these needs, university leaders are required to develop skills that can stimulate a culture that optimizes knowledge assets and is more commercially driven (Collier, Gray, and Ahn 2011).

Many elements of leadership are relevant for knowledge management (Donate and de Pablo 2015), including taking initiatives to deploy organizational knowledge capability for value creation. In this study, the operational definition of leadership is associated with elements such as idealized influence, intellectual stimulation, and inspirational motivation, which increase a firm's relative knowledge acquisition and performance (Inkinen 2016). According to Inkinen (2016), this participatory type of leadership is important for increasing knowledge application and learning, as well as for promoting trust in knowledge exploration and exploitation.

One of the important factors that could influence the university culture to be more open and willing to share knowledge is leadership (Asmawi, Zakaria, and Wei 2013). A longitudinal observation conducted by Mir and Rahaman (2003) on research and development activities of a public agency in Australia concluded that leadership is a significant predictor of cultural change, which helps the agency optimize its organizational knowledge for innovation. In case studies of innovative firms such as Canon and Apple, it was found that the leader's role in such organizations acted as a catalyst and facilitator in generating innovation from the firms' knowledge bases (Nonaka and Kenney 1991).

According to Boal and Hooijberg (2000), leadership skills include making strategic decisions, creating and communicating a vision of the future, coordinating key competencies and capabilities, and supporting an active corporate culture. There is an increasing focus on new leadership styles for the fourth industrial revolution. New leaders at universities ought to be able to reposition their institutions in ways that maximize their ability to explore and exploit the existing big data and information to gain commercial advantages (Ab Aziz et al. 2012). Therefore, universities increasingly require managers with leadership skills that can make the organizational culture more open (Asmawi, Zakaria, and Wei 2013) and knowledge-oriented, by exploring and exploiting the organizational knowledge resources (Bakar and Ahmad 2010).

University leaders need to be aware that industries consider universities to be an important source of knowledge (Rasiah and Govindaraju 2009). In developed countries such as Australia, there is a strong research culture for commercially oriented knowledge, and their universities have become more strategic in aiding the transfer of knowledge to business and society (Harman and Harman 2004). Leaders at universities need to remove organizational barriers and

stop doing research in isolation so that the knowledge does not remain confined to academics, students, and research laboratories.

In summary, effective knowledge management requires a continuous top-down effort. In the context of HEIs, the efforts should come from the top managers in universities. The top managers and leaders have a critical role to play in developing a knowledge-based organizational culture, and a primarily knowledge-oriented leadership style would give an advantage in achieving effective knowledge management throughout the process of knowledge creation, storage, and transfer. This discussion on knowledge-oriented leadership leads to the following alternative hypothesis:

H1: Knowledge-oriented leadership at universities has a significant relationship with effective knowledge management.

Organizational Culture for Knowledge Management

There is an association between organizational culture and knowledge management (Al Saifi 2015), and from the knowledge management perspective, culture specifically refers to the collection of uniform values and beliefs that are shared by an organization's members to drive organizational performance and ensure competitive advantage (Omotayo 2015). Culture is a significant aspect of an organization and must be driven by certain organizational visions and missions that are embedded within the shared values of employees.

Since knowledge management processes are intricately linked with the social settings in which they are embedded (Corfield and Paton 2016), comparing academic culture and corporate culture among universities offers interesting insights for knowledge management. Gumport and Sporn (1999) suggested that universities have a unique organizational characteristic that significantly influences the organization's beliefs and practices, known as the university culture. For example, the culture at a research-focused university is different from that at a teaching-focused university.

A study conducted by Smart and St. John (1996) classified academic culture at HEIs as four types of organizational culture: clan, market, hierarchy, and adhocracy. These classifications could explain the organizational values, leadership styles, decision-making and knowledge development processes (Kezar and Eckel 2002), management approaches (Gumport and Sporn 1999), and internalization of knowledge (Bartell 2003).

Inspired by previous literature on the typology of organizational cultures, Smart and St. John (1996) provided a meta-framework model for viewing the four different cultural types of colleges and universities. The model consisted of horizontal and vertical lines that distinguished the dimensional properties of organizational cultures, for example, focusing on either internal emphasis or external positioning and characterized by either flexibility or stability.

The clan culture is characterized by flexibility, individuality, and spontaneity. The clan academic culture has an internal emphasis on human cohesiveness, and members of the organization are bonded by a sense of loyalty and tradition. This type of culture is highly compatible with the traditional university culture of a "community of scholars," which many faculty members and administrators subscribe to (Smart and St. John 1996; Deshpandé and Farley 2004). The clan culture is also characterized by a mentor or facilitator leadership style, an emphasis on human resources and strategic cohesion, and a focus on short-term orientation and facilitating activities.

The adhocracy culture, on the other hand, is characterized by flexibility as well as external positioning. The adhocracy organization emphasizes innovation, development, growth, and acquisition of new resources (Smart and St. John 1996). The organizational members are bonded by innovative inspirations and challenges (Deshpandé and Farley 2004). This culture is relevant to universities mainly because of the innovative property, which is associated with

research activities and efforts to adapt to changing environmental conditions. Adhocracy organizations are also characterized by an entrepreneur and innovator leadership style, an emphasis on long-term orientations, and achievement-oriented activities.

The market culture is characterized by stability as well as external positioning. These organizations value productivity, goal accomplishment, competitive actions, and achievements (Smart and St. John 1996). The long-term orientation binds the organizational members together (Gray and Densten 2005), and the members focus on activities that are achievement-oriented (Smart and St. John 1996). This market-oriented culture is consistent with an adaptive planning strategy and a political approach to decision-making in universities, which also values control and predictability and has a production-oriented leadership style.

The hierarchy culture is characterized by stability as well as internal emphasis. According to Smart and St. John (1996), these organizations emphasize documentation, stability, routinization, centralization, continuity, predictability, and control. Members of the organization are bonded by internal controls, rules, and procedures (Deshpandé and Farley 2004; Gray and Densten 2005). This culture, also known as "bureaucratic" culture, is highly compatible with public universities (particularly in Malaysia) and is largely seen in administrative activities. Other characteristics of this organizational culture include practicing a coordinator or organizer leadership style and emphasizing short-term orientation and facilitating activities internally.

Although universities as knowledge-based organizations might seem to have all the resources (i.e., knowledge creation and sharing activities, facilities, assets, and systems) for efficient knowledge management, a change of culture may be required (Rowley 2000). The forces of globalization and advanced technology have created a revolution that requires universities to transform and seek new ways to implement strategic knowledge management in the digital era (Sousa and Rocha 2019) and embark on a technology-oriented culture.

In summary, a group of individuals who continuously generate and share knowledge is characterized by an organizational culture that values learning. Universities as knowledge-based organizations have the primary role of knowledge generation and sharing through teaching and learning processes. Individuals who engage in learning processes influence the effectiveness of knowledge management by their willingness to learn and share information and by learning from mistakes. This discussion on the organizational culture of learning leads to the following alternative hypothesis:

> H2: The learning organizational culture at universities has a significant relationship with effective knowledge management.

Information Technology in Knowledge Management

Many researchers have insisted that the effectiveness and efficiency of knowledge management is facilitated by information technology (Alavi and Leidner 2001; Bolisani and Bratianu 2018). Information technology is closely connected to knowledge management because it helps to distribute structural knowledge vertically and horizontally and makes it easy to search for and use it. Because of this, organizations need to integrate knowledge management with information technology (Alavi and Leidner 2001). According to Beckman (1997), the components of information technology that primarily support knowledge management activities are technological infrastructure such as computer systems and integrated knowledge databases.

With regard to HEIs, the high impact of public university activities is dependent on the provision of knowledge transfer, and one of the major strategies to achieve this goal is to enhance universities' performance through excellent knowledge management systems (Massaro, Dumay, and Garlatti 2015). Central to this phenomenon is information technology, which acts as an enabler to improve universities' performance. However, applying information technology, which is expected to improve organizational impacts and capabilities, is inherently

risky, with many projects on information technology exceeding their budget and missing their completion deadlines (Thorn 2001). Nevertheless, the use of information technology is inevitable nowadays, and scholars have equated the knowledge economy with the existence of information technology. According to Bolisani and Bratianu (2018), information technology does not create knowledge, but it is the basic component that stores the data and contains information processing systems that contribute to efficient knowledge management.

Consider an example of a higher education service that is driven by information technology. In 1998, the chairman of the University of California's academic council discussed the "course articulation" concept, which refers to students being able to build an additive degree program by taking courses either at different institutions or at different campuses of the same institution. This concept is similar to the educational modularity system in Britain, in which flexibility in course articulation is essential because universities have moved into an era in which individual campuses are becoming part of a larger academic community, the so-called "global academic village." This concept is driven by information technology that makes comparable technology-mediated coursework across universities acceptable for transfer and challenges the traditional system of face-to-face contact between professor and student (Agre 1999).

Universities are now competing based on their unique programs and are regularly assessed and ranked by global and local ranking systems, such as the Times Higher Education World University Rankings (THES) and the Rating System for Malaysian Higher Education (SETARA). Due to internationalization, public university administrators have the academic autonomy to redesign their curriculum, hire prominent professors, and conduct innovative research to increase the university's reputation, and thus appeal to more students and funds (Stromquist 2007). With the advances in information technology, higher education has become more widespread, and the academic internationalization agenda is more feasible beyond the limitation of the physical university. Universities are "nearer" nowadays, and it is relatively easy to transfer people and knowledge between universities locally and globally.

Earlier, the most common goal of information technology usage in colleges and universities was to generate reports, mainly on students' academic records. Universities that consist of groups of experts, each of whom has a certain subject matter expertise are less likely to accumulate knowledge. They would rather share or transfer the knowledge physically through face-to-face meetings. Although information technology has proven to be an efficient enabler of knowledge management, it cannot substitute the people component (Bolisani and Bratianu 2018), which leaves a strong role for organizational leadership and culture. Thus, examining the actual role of information technology together with leadership and organizational culture as determinants for efficient knowledge management in public universities is crucial, particularly in this digital age. The role of information technology as the facilitator or mediator in these situational interrelationships is yet to be confirmed.

Fahey and Prusak (1998) have identified eleven extreme errors of knowledge management. One of the errors was totally substituting a face-to-face delivery system with online technological contact. Philosophically, knowledge is a primary function of the human mind and a consequence of the interactions between humans. The human dimension remains the source of knowledge generation. Although information technology is assumed to be a significant facilitator for data and information transmission, it could potentially impede knowledge management without human interactions.

HEIs, such as colleges and universities, are increasingly recognized to be in the knowledge business and, like other businesses, are facing market challenges which could impede the efficiency of knowledge management, such as a lack of information technology optimization. The most common uses of information technology in knowledge management among private companies are facilitating knowledge creation repositories, improving the access and transfer of knowledge, enhancing the knowledge environment, and managing knowledge as an asset (Rowley 2000). According to Rowley (2000), in traditional HEIs that are funded by the public

sector, the use of information technology for knowledge management is insufficient. Universities and their staff must be aware of their changing role in a knowledge-based economy and need to aggressively manage their knowledge assets and intellectual capital.

If universities are assumed to have a role as knowledge producers for the knowledge economy, university administrators need to better understand the necessity for efficient knowledge management. A review conducted by Charband and Jafari Navimipour (2018) on knowledge sharing has underlined several open issues in the education sector that are potential areas for future research. Among these issues is the uncertainty of the effectiveness of information technology usage (e.g., through web technologies) for learning and knowledge sharing, and hence further understanding of the role of these technologies is needed. In addition, learning in colleges and universities relies on the capability of academics and administrators to practice a knowledge-sharing culture, which requires further examination of knowledge management leadership (Charband and Jafari Navimipour 2018).

In summary, adequate implementation of technical infrastructure would support effective knowledge management. The technology is used to store information, to recreate more information, and to present the information to others. The overall role of information technology is to link people's knowledge inside and outside of organizations during work processes, which eventually helps individuals to work more effectively. Here, the people (an individual leader or a group of organized teams) participate in the processes of creating and transferring knowledge by using information technology. This discussion on information technology leads to the following alternative hypotheses:

H3: The implementation of information technology at universities has a significant relationship with effective knowledge management.

H4: Information technology can potentially mediate the relationship between knowledge-oriented leadership and effective knowledge management.

H5: Information technology can potentially mediate the relationship between the learning organizational culture and effective knowledge management.

Discussion

It is worth noting that knowledge management models are based on diverse viewpoints. Nevertheless, recent scholars have suggested combining people capabilities with the latest technology to support the effectiveness of any knowledge management model (Elezi and Bamber 2018). In real life, knowledge is necessary for every organization, and its management depends on several factors, including leadership, organizational culture, and information technology. This paper reviewed the existing literature on knowledge management theories and concepts, as well as old and new evidence for a preliminary conceptual framework for explaining the ineffectiveness of knowledge management at Malaysian public universities. The reasons for the poor levels of knowledge management are many, but this paper argued that the main reasons are poor organizational leadership and culture and ineffective usage of information technology in the implementation of knowledge management. In this knowledge-based economic environment, the contribution of universities to the business community and economic development is related to the management of knowledge processes toward more efficient and effective knowledge creation and application (Di Nauta et al. 2018).

A systematic review of the relevant literature was conducted to develop a conceptual framework with which the research problem is identified. The underpinning theories and concepts discussed thus far indicate significant interrelationships between concepts. The conceptual framework presented in Figure 1 outlines the estimated relationships. The framework illustrates that the factors leadership, organizational culture, and information

technology are potentially affecting the effectiveness of knowledge management at Malaysian public universities.

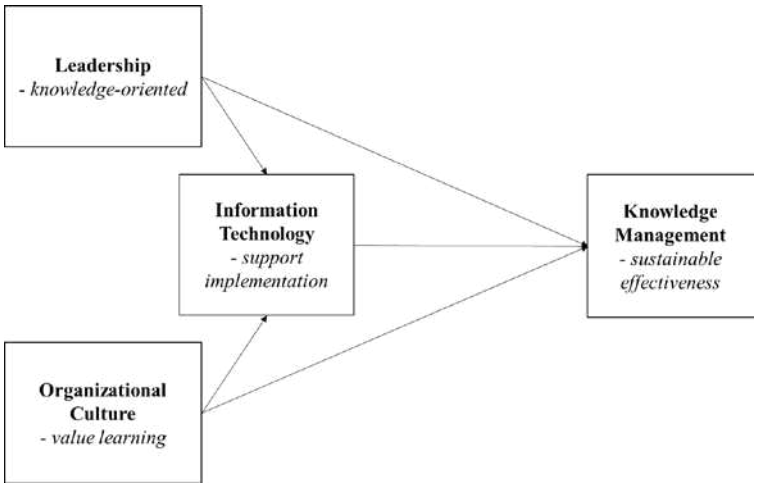

Figure 1: Conceptual Framework
Source: Hassan et al.

The concepts discussed in the previous sections were operationalized in order to develop the preliminary conceptual framework shown in Figure 1. The framework comprises four constructs, namely leadership, organizational culture, information technology, and knowledge management. Based on the review of the literature, it is predicted that all constructs have significant interrelationships.

Knowledge management is viewed as a set of processes used by organizations to collect data, information, and knowledge for helping the generation and application of intellectual capital (Marr et al. 2003). Most organizations invest in knowledge management because they want to sustain excellent performances and create competitive advantages. Thus, to ensure effective knowledge management for an organization, it is important to determine the roles of enabling factors presented by people, culture, and technology. Previous studies have identified strong relationships between several organizational capabilities and knowledge management effectiveness. A qualitative study conducted by Wen (2009) on knowledge management found that the quantity and quality of staff are recognized as the most important factors in effective knowledge management. This paper also highlighted that knowledge management is related to individual behaviors especially among the organizational leaders and that other organizational capabilities such as technology and culture must be considered in the management of organizational knowledge.

Effective knowledge management requires continuous top-down efforts from the people with authority in the organizations to make knowledge-based decisions (Gill 2009). Scholars have suggested examining the critical roles of leadership in HEIs in developing knowledge-based organizations, particularly to facilitate knowledge-sharing processes that are key to changing the organizational culture in line with socioeconomic trends. According to Gill (2009), a successful organizational shift in culture signifies an effective knowledge management process that is initiated from the top down. Previous studies have highlighted the negative implications of a lack of leadership in terms of ongoing support, training, and clear guidelines for knowledge management in universities (Tan 2016). The study further explained that insufficient knowledge-oriented leadership would become a barrier to effective knowledge management because there would be no administrative direction, a lack of participation, and a lack of encouragement or culture to share knowledge (Tan 2016).

A quantitative study conducted by Fullwood, Rowley, and Delbridge (2013) on the impact of leadership on knowledge-sharing attitudes among academics at universities in the United Kingdom found that the research respondents had an embedded knowledge culture. However, the culture is individualistic in nature, and the academics had relatively neutral perceptions of the way in which they are led in the universities. The study suggested that leadership plays a significant role in cultivating knowledge-oriented behaviors in terms of facilitating staff's experiential learning and providing opportunities and mechanisms for the staff to share or transfer their knowledge (Fullwood, Rowley, and Delbridge 2013). Other attributes mentioned by Fullwood, Rowley, and Delbridge (2013) about leadership in higher education are an emphasis on knowledge, professional expertise, personal qualities, team acceptance, and, in general, being committed to academic matters.

A previous study conducted by Devi Ramachandran, Chong, and Wong (2013) provided other empirical evidence on the significant relationship between leadership and knowledge management. The study held a survey among academics at four Malaysian technology-focused public universities and suggested that leadership was one of the key strategic enablers of knowledge management at the universities. The study, which measured knowledge management from the point of view of knowledge generation and transfer, used several leadership elements in terms of the importance of information for the universities' strategic plans, the potential income generated by knowledge assets, the strategy to sell knowledge assets, the creation of a position of chief knowledge officer, and having a vision for managing knowledge (Ramachandran, Chong, and Wong 2013; Inkinen 2016). In the study, a leader with knowledge-oriented leadership is viewed as a leader who guides people's knowledge management behavior by developing a learning organization culture and who demonstrates a willingness to share existing knowledge and seek new knowledge.

Effective knowledge management also requires a significant change of organizational culture, particularly a culture that values learning through knowledge generation and sharing. A quantitative study conducted by Omerzel, Biloslavo, and Trnavčevič (2011) among the teaching staff at HEIs in a small central European country found that the organizational culture had a significant relationship with knowledge management. Specifically, the culture in the university involved individual processes that were highly correlated with knowledge creation, storage, transfer, and application. The main function of academics at universities is to create and share knowledge. However, some individuals have no interest in knowledge and disengage from the learning process, which influences the effectiveness of knowledge management (Omerzel, Biloslavo, and Trnavčevič 2011).

Organizational culture that is specific to knowledge management refers to people's behaviors within an organization that are formed through learning to deal with changes and problems and to acquire and share knowledge, which could affect their thinking and decision-making (Abualoush et al. 2018). In addition, Abualoush et al. (2018) suggested that effective knowledge management would be strengthened by an organizational learning culture that is promoted by human resources at all levels and by personal experiences with creating new ideas from existing information. The study conducted by Devi Ramachandran, Chong, and Wong (2013) provided important empirical evidence on the significant relationship between the organizational learning culture and knowledge management in the context of Malaysian public universities. Among the cultural elements assessed in the study were the encouragement of knowledge sharing, a climate of openness and trust for learning, the value of individuals, and taking responsibility for one's own learning (Ramachandran, Chong, and Wong 2013).

Effective management of knowledge can create a conducive learning environment in the organization, which leads to improved performance and increased competitive advantages. It is believed that an organization's learning culture stimulates effective and sustainable knowledge management because a set of beliefs and values for learning provides an identity for an organization, which in turn defines how the organization operates daily. Certainly, results from

people's learning processes and knowledge-sharing culture can improve individual and organizational performance (Shamia et al. 2018). Among the elements of an organizational learning culture are an encouragement to participate in learning, a willingness to learn, learning from mistakes, a belief in continuous learning, and sharing information and views (Ghosh and Srivastava 2014; Ramachandran, Chong, and Wong 2013).

Effective knowledge management normally requires a good combination of managerial efforts and organizational components, along with the implementation of appropriate technology (Mohayidin et al. 2007). An empirical study conducted by Mohayidin et al. (2007) at both public and private Malaysian universities confirmed that both people and culture were the most challenging factors that influence the effectiveness of knowledge management. However, a good infrastructure comprising technical components such as communication, hardware, and software technology together with info-structure, consisting of formal rules governing knowledge exchange, would support knowledge management processes in universities.

There are several dimensions of information technology applied to knowledge management. A quantitative study conducted by Hamid and Zaman (2010) operationalized information technology for the knowledge society in Malaysia in terms of usage, electronic governance, application, content, adoption, provision, and skills. All these aspects are related to how information technology helps top managers in universities manage their knowledge effectively, such as linking members inside or outside an organization, making knowledge databases easily accessible, helping staff to work efficiently, and making decisions in a timely manner (Elayadom and Thirunavukkarasu 2018). A study conducted by Elayadom and Thirunavukkarasu (2018) on knowledge management at libraries in Kerala's universities confirmed that information and communication technology was the major tool that helped library professionals accumulate knowledge and provide better services to their users.

In this paper, the main theme is that the implementation of information technology serves as a mediating tool that supports effective knowledge management. As Mahdi, Nassar, and Almsafir (2019) mentioned, the role of technology in communication is not limited to enabling the flow of knowledge, but the technology is also responsible for mediating the process of participation in teamwork and knowledge sharing. On the same lines, Lee, Lee, and Kang (2005) suggested that knowledge management be supported by information technology so that organizational knowledge is managed effectively and will contribute to increasing management performance. The reason for suggesting that information technology play a mediating role in knowledge management is that some scholars argue that technology does not produce the creation, sharing, or transfer of knowledge and that managing knowledge is more complex than simply purchasing the latest computer system or database (Bell DeTienne et al. 2004).

Conclusion

Future research might confirm the relationships shown in Figure 1. Much more research is required to investigate the relationships between leadership, culture, technology, and knowledge management in higher education settings. Overall, this study proposes that leadership, organizational culture, and information technology are associated with knowledge management in universities (Ramachandran, Chong, and Wong 2013; Striukova and Rayna 2015; Muqadas et al. 2017). The propositions in this paper aim to explain the problems mentioned, justifying the need for further study. Based on reviews of the knowledge management literature, this paper hypothesizes the interrelationships between knowledge management, leadership, organizational culture, and information technology. The concepts reviewed are then used to develop a preliminary research framework that could be potentially corroborated using both qualitative and quantitative research.

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ABOUT THE AUTHORS

Hasannuddiin Hassan: Senior Lecturer, Faculty of Entrepreneurship & Business, Universiti Malaysia Kelantan, Malaysia

Wee Yu Ghee: Associate Professor, Faculty of Entrepreneurship & Business, Universiti Malaysia Kelantan, Malaysia

Mohd Ikhwan Aziz: Senior Lecturer, Faculty of Entrepreneurship & Business, Universiti Malaysia Kelantan, Malaysia

Ainon Jamilah Ramli: Senior Lecturer, Faculty of Entrepreneurship & Business, Universiti Malaysia Kelantan, Malaysia

Arbaiah Abdul Razak: Independent Scholar, Malaysia

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