Soft Systems Methodology

A Conceptual Model of Knowledge Management Systems Initiatives in Malaysian Public Universities

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Abstract: The implementation of knowledge management systems (KMS) initiatives is recognized by its highly complex situations and difficult to manage, involving a range of interrelated and overlapping components of technology, organization and people. The objective of the study is to demonstrate how the Soft Systems Methodology (SSM) approach can be applied to investigate the implementation of KMS initiatives in their natural setting. The study is carried out through four case studies within Malaysian Public Universities (MPUs) representing different characteristics of universities based on the year of their establishment. The findings reveal the process of KMS initiatives contains six different kinds of activity through the development of conceptual model. Furthermore, the analysis was conducted to identify factors influencing the activities within the proposed conceptual model. In this sense, the application of SSM recommends the advantage of a comprehensive analysis by integrating both the process and the factors influencing the implementation of KMS initiatives in the higher education context, especially in the MPUs.

1 INTRODUCTION

The higher education (HE) sector involves knowledge-based organisations where the role and function of institutions is based on the '*knowledge*' agenda (Oakley, 2003), (Cronin and Davenport, 2000). KMS initiatives should be implemented in the HE sector to change its classical paradigm to confront changes in the external environment change and provide effective services to meet market demand and enhance the organization (Serban and Luan, 2002). A variety of different approach of KMS initiatives can be introduced not only in the areas of teaching and learning, but also in the area of administration to support a wide range of business processes. In the last decade, an increasing number of HE sectors around the world have begun to introduce KMS initiatives. However, there is little knowledge on how MPUs implement KMS initiatives and what challenges they confront. Several studies that examine KMS initiatives in the higher education sector in Malaysia have indicated that public universities were slow to implement KMS initiatives and most were at the initial stage of

implementation (Mohayidin et al., 2007); (Suhaimee et al., 2005). The objective of the study is to demonstrate how the SSM approach can be applied to investigate the implementation of KMS initiatives, especially the development of conceptual model. Furthermore, the analysis identifies which factors in the surrounding environment are facilitating to the implementation of KMS initiatives and which may impede the effectiveness of KMS initiatives.

2 SOFT SYSTEMS METHODOLOGY

The SSM emerged in response to the limitations of the hard systems approach to adequately address complex real world problems that involve human issues. The emergence of a hard systems approach was influenced by systems engineering and system analysis, which use a systematic approach to problem-solving in relation to the design, development and operation of a machine to achieve

predefined objectives (Ingram, 2000). Thus, to solve a problem they use reductionists concepts that divide the problem into smaller pieces and manageable fragments, without emphasising human or organisational issues (Bennetts et al., 2000). This approach is highly appropriate in clearly structured and well-defined problems. In the early 1970s, the soft systems methodology was incorporated into a practical methodology by Professor Peter Checkland in collaboration with his colleagues at Lancaster University (Checkland, 1981). The approach used to apply SSM to research can vary, but the basic feature corresponding to the conceptual basis remains constants. In general, this means that SSM typically has three primary concerns in process of improving problem situations. First, SSM is concerned with examining complex problems involving the socio-technical system, which involves human intervention. A strong emphasis is placed on understanding the different perceptions of multiple stakeholders involved in the problem situations. Second, SSM highlights the importance of creating a purposeful human activity model relevant to the problem situations as a device to identify appropriate changes that could be made to improve the problem situation. Finally, SSM strives to create a learning system to identify methods for improvement by providing with one or more alternative solutions rather than an optimisation approach (Petkov et al., 2007). In this research we will focus on the particular strength of SSM in developing conceptual model that identify the necessary pattern activities in the process of KMS initiatives.

3 METHODOLOGY

This research adopts a multiple case study approach to investigate four MPUs representing two major characteristics of the higher education environment in Malaysia: the older universities established before 1990, where generally larger in size; the newer universities established after 1990, where commonly representing smaller in size. An interpretive approach is used as a mode of inquiry to allow the researcher to establish meaning from the complex problem of the real-world situation. Data collection came mainly from interviews and document analysis, and each of these methods offers important insights and understanding into the cases. First, the interviews were held with the KMS champions who were highly involved in major activities in the implementation of KMS initiatives at the university level. They included IT Directors, IT Managers,

Chief Librarians and other related administrative director. Second, relevant documents were collected from government publications, annual reports, institutional websites, business manuals and slide presentations. Data were collected on the issues related to (i) the champion of KMS initiatives; (ii) the process involved; and (iii) the influencing factors of the implementation of KMS initiatives.

4 FINDINGS

This section compares the findings of the four cases, highlighting the similarities and differences to find the common patterns of activities in a conceptual model for implementing KMS initiatives. The analysis revealed that this conceptual model has six related activities, as depicted in Figure 1.

The four cases were divided into two groups for the purposes of comparison and contrast. One group consists of University A(UA) and University B(UB), which are categorised as older universities. The other group consists of University C(UC) and University D(UD), which represent newer universities. In general, MPUs are slowly undergoing changes to embrace the challenge of the implementation of the KMS initiative. The cases differ in their priority and scope of bringing the KMS initiative to the university context. However, they have common activities that indicate they are operating in the similar context of MPUs.

4.1 Activity 1: Gain Awareness and Appreciation of KMS Initiatives by Top Management

This activity deals with the awareness of and appreciation for KMS initiatives by top management. In each case, the appreciation of KMS initiatives by top management was found to be crucial for creating more formal and conscious attempts to implement KMS initiatives at the university level. They were important instruments for bringing KMS initiatives to the forefront of the university agenda (Soliman and Spooner, 2000); (Singh and Kant, 2008). The universities' decision to implement KMS initiative is generally triggered by a specific event or circumstance, which they are taken place. In general, the summary of activity 1 is listed in Table 1.

According to the findings of the analysis, the primary factor influences for this activity is environmental Pressure. The external environmental context within the social contexts of the MPU
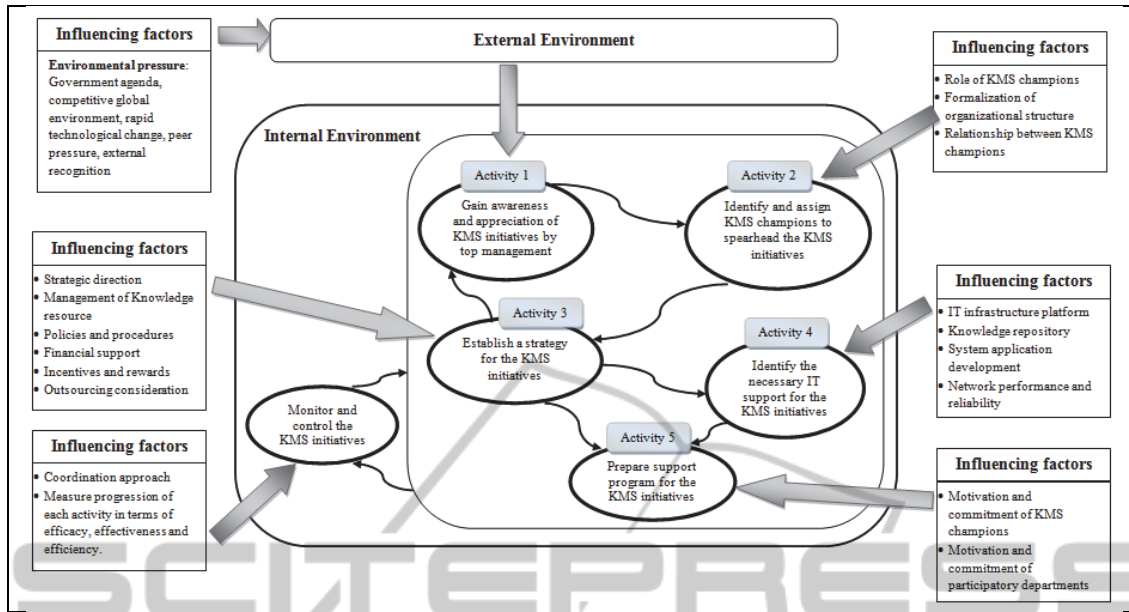
Figure 1: The Conceptual Model of KMS initiatives in MPUs.

represents the influence of various factors that contributed to the implementation of KMS initiatives. In all cases, the government agenda stood out as one of the most important external factors for bringing KMS initiatives into universities. Many respondents recognised the contribution of this factor in influencing top-level decision makers. Another external factor that emerged from the data analysis concerns advances in technology. All of the case universities struggle to keep pace with rapid rate of technological changes. In several cases, external recognition seems to be an effect of continuously maintaining the effective utilisation of technology for facilitating KMS initiatives. Awards and public recognition have been possible incentives for influencing the implementation of KMS initiatives. An example of external recognition is the government rewards for excellent utilisation of technology in improving business performance. The university's interest in the KMS initiatives also arises because of its desire to follow other MPUs that are already embarking on KMS initiatives.

Table 1: The summary of activity 1.

Influencing Factor	Key Issues Highlighted	Case
External pressure	Government agenda, competitive and global education environment, and rapid technological change	UA, UB, UC, UD
	External recognition	UB, UC
	Peer community pressure	UC, UD

4.2 Activity 2: Identify and Assign KMS Champions to Spearhead the KMS Initiatives

In activity 2, it is important to consider that the university's top management contributed strongly to the selection and assignment of KMS champions. The university's top management plays a critical role in identifying specific KMS champions with multidisciplinary expertise and representatives from the core business departments that would enhance the implementation. A summary of activity 2 is listed in Table 2. According to the findings of the analysis, the primary influences for this activity can be classified as follows:

a) Identification of KMS Champion. With regards to the characteristics of the KMS champions, an interesting element has emerged. In all of the cases, the two main domains of expertise have emerged in making the KMS initiatives successful: the technical professionals from the IT department and information management professionals from the library domain.

The KMS champions contribute their expertise to support KMS initiatives. The IT department is more strongly driven by their efforts in preparing for the advanced technical requirements of KMS initiatives. The library is concerned with upgrading traditional library services and information resources into a more digital environment. The selection of KMS champions should be based on expertise that can

Table 2: The summary of activity 2.

Influencing Factors	Key Issues Highlighted	Case
a) Identification of KMS Champion	Diversity of expertise domains (IT department and Library).	UA,UB,UC,UD
b) Formalisation of the Organisational Structure	Clear specialized department (KM center) and create new role(CIO/CKO).	UA, UC
	Lack of clear specialized department and create new role.	UB,UD
c) Relationship between KMS Champions	Close **collaboration between KMS champions**	UC,UD
	Lack of collaboration between KMS champions	UA,UB

effectively assist in ensuring better implementation. Many studies on KMS initiatives within the HE context have reported that either the library or the IT department indeed play a major role in the projects and activities of KMS (Cain et al., 2008); (Chan et al., 2005); (Chang, 2003), (Cronin and Davenport, 2000).

b) Formalisation of the Organisational Structure. The concern for this activity is to specify a clear role and responsibility of the KMS champion for KMS initiatives. The top management is in a position of authority to delegate responsibility and the setting of the organisational structure. The presence of an organisational structure setting by creating specific positions and structure would help to make KMS initiatives highly visible organization (McDermott and O'Dell, 2001), as demonstrated in the case of UA and UC. Daft (2007) argued that a lesser degree of formalisation of the organisational structure, such as creating a task force function and responsibility, seems to solve the short-term problem and lack of sustainability. However, the issue of a lack of a clear organisational structure emerged in the other two cases. These cases were concerned with establishing a taskforce to address KMS initiatives rather than adjusting their existing organisational structure.

c) Relationship between KMS Champions. The coordination of the relationship of KMS champions was another common issue that drew attention in the analysis of the four cases. From the findings, collaboration between KMS champions is critical to achieve a comprehensive and unified direction to support university-wide KMS initiatives. This need is often due to the normal practice of these KMS champions, which have different business practices and services. The close relationships among these key players were achieved by the skilful coordination and monitoring of the university's top management. The close relationship of KMS champions in the case of UC was able to contribute to the standardisation of the KMS project and initiatives;hence, they utilised the scarce resources available in the most efficient manner to support the project. This accomplishment is achieved through

coordination by top management (Cain et al., 2008), and without this formality, the management of collaboration is unlikely.

4.3 Activity 3: Establish a Strategy for the KMS Initiatives

This activity is considered to be very crucial that would serve as a platform to effectively guide the overall implementation of KMS initiatives. A strategy needs to be established to decide what important elements should be included in the KMS initiatives, as presented in Table 3.

According to the findings of the analysis, the primary influences for this activity can be classified as follows:

a) Knowledge Resource. The central issue for initiating KMS is to identify the types of potential knowledge resources that can offer strategic value and outcomes to the organisation. The essence of this activity is to make knowledge resources more accessible and available online. In all of the cases, priority was according to leveraging explicit knowledge resources that exist in terms of business documents and reports or reside in various resources, including in the core databases.

In addition, this knowledge resource is somehow lacking in a standardisation procedure to manage. To make this matter more problematic, knowledge is scattered across the university and exists in a variety of formats. However, most cases demonstrated less effort to leverage tacit knowledge sources from human experience and business activities. This tacit knowledge is usually considered to be more difficult to leverage than explicit knowledge, and there is poor understanding of the proper way to manage tacit knowledge.

b) Policies and Procedures. In most cases, the KMS champions are concerned with the lack of policies and procedures for clearly regulating and controlling the related activities. Furthermore, it is clearly stated that very little effort has been made by top management to put appropriate policies and

Table 3: The summary of activity 3.

Influencing Factors	Key Issues Highlighted	Case
a) Strategic direction	Lack of clear strategy direction	UA,UB,UD
	Clear strategy direction and comprehensive	UC
b) Management of Knowledge resource	Systematic procedure to manage knowledge resource	UC
	Lack of systematic procedure to manage knowledge resource	UA,UB,UD
	Less emphasis on leveraging tacit knowledge	UA,UB,UC,UD
c) Policies and procedures	Lack of clear policies and procedures	UA,UB,UD
	Clear policies and procedures	UC
d) Outsourcing consideration	Speed up project development	UA, UC
	Gain knowledge and skills	UA,UC
	Avoid bias decision	UA
e) Financial support	Insufficient financial support	UA, UB
	Sufficient financial support	UC
	Constraints in financial planning	UA,UB
f) Incentives and rewards	Lack of incentive and reward	UA,UB, UD

procedures in place to support KMS initiatives. It is particularly challenging for KMS champions to induce participating departments to participate in their KMS initiatives because the introduction of KMS initiatives somehow changes the current practice of business processes to encourage the adoption of IT applications and enhance knowledge-sharing activities. However, only the case of UC provided policies and procedures to guide all departments within the university to ensure the adoption of KMS initiatives. Notwithstanding, a number of studies have discussed the importance of creating well-documented policies and procedures to address core activities in the process of KMS initiatives (Ronald D. F and K., 2007); (Sharifuddin and Rowland, 2004); (Patricia Ordóñez de Pablos, 2004).

c) Outsourcing Consideration. The role of KMS champions is ultimately to be responsible for managing KMS initiatives according to the plan. Some of the cases naturally underestimated the complexity of preparing and managing KMS initiatives to be completed according to the project schedule and desired outputs. Unfortunately, these cases did not consider effective decisions in gaining the benefits of outsourcing (e.g., expertise, cost, and time). Among the four institutions, two cases stressed the importance of employing outsourced support. They believed that this approach might influence the process of KMS initiatives in a positive way. These two cases highlighted their conscious decisions to hire external consultants during the initial stage of introducing KMS initiatives. This effort was particularly considered to be a method for gaining the advantage of the specialised skills of the consultants and to accelerate project development.

d) Financial Support. The issue of financial support appeared to have an important influence on the selection and development of new technological and innovative solutions at the institutional level. The first primary concern brought up in all of the cases was the time constraint related to financial IT planning. The three cases agreed that to continue updating the system to keep abreast of rapid rate of technological change, they needed to upgrade the comprehensive archival systems and introduce new systems to keep them in compliance with their current technological functions. The problem of allocation financial support for KMS initiatives is many facetted, especially is in the long term and involved various interrelated projects. The allocation of financial support tended to be concerned with priorities need to be addressed. According to Wong (2005), decision maker(s) should develop a realistic scope of the project, according to available financial support.

Incentive and Reward. Reward and incentive are another important consideration for effective KMS initiatives. The focus of this activity is to encourage participation in KMS initiatives. One case identifies the importance of preparation incentives and rewards to KMS champions and staff participants which found that the incentives help individuals to increase their willingness to participate and feel appreciated for their contribution. Many studies have posited that the essence of incentives and rewards is to support changes to employee attitudes and behaviours such that they will contribute and participate in KMS initiatives (Sing and Kant, 2008).

Table 4: The summary of activity 4.

Influencing Factors	Key Issues Highlighted	Case
a) IT infrastructure and platform	Lack of coordination and standardization	UA,UB,UD
	Effective Coordination and standardisation	UC
	Complexity of maintaining the mixture of legacy and new technology	UA,UB
	Robust IT infrastructure	UC
b) Knowledge repository	Lack of coordination and standardization	UA,UB,UD
	Complexity of managing large amounts of databases	UA,UB,
	Large collection of resources involved in digitalising	UA,UB,
	Lack of information security control	UA,UB,UD
	Complexity of digital document categorisation	UA,UB,UC,UD
	Less complexity of managing a small amount of resources.	UC
c) System application development	Isolated development and focus on departmental needs	UA,UB,UD
	Integrated and interoperable	UC
d) Network performance and reliability	Extensive network security threats and poor performance.	UA,UB
	Lack of network interruption	UD,UC

4.4 Activity 4: Identify the Necessary IT Support for the KMS Initiatives

This activity concerns efforts to decide on and prepare the necessary IT solutions to support the desired KMS initiatives' objectives, as listed in Table 4. This activity is essential for effective implementation of KMS initiatives. In this activity, the IT professional provides a crucial role in identifying and guiding on the requirements for IT capabilities and functionality that can support and enhance the process for capturing, storing and disseminating knowledge (Tseng, 2008).

There are five major component issues that should be addressed for effective KMS initiatives.

a) IT Infrastructure Platform. In each case, IT infrastructure influenced the preparation of technology requirements for KMS initiatives. There are two major barriers experienced by several cases for moving towards the mission of preparing IT platforms for facilitating KMS initiatives. The first barrier is the lack of a standard and common IT infrastructure; current platforms are heterogeneous and controlled by different departments. Within this situation, the equipment and infrastructure are often poorly managed, which leads to inefficient use of resources. Another concern regarding IT infrastructure is the maintenance of insufficient technical requirements that are outdated or lack capable technologies. This issue reflects concerns about the challenge of preparing an appropriate IT infrastructure in which some components of the installation-based infrastructure are subject to upgrades or replacement. The other potential problem raised was incompatibility and complexity with the installation-based infrastructure. The well

preparation of IT infrastructure was especially apparent in the case of UC, especially with well-planned state-of-the-art technology in providing a coordinated and standardised approach. This factor seems to facilitate better technology management without much concern for the various conflicts of multiple standards of equipment and outdated technology. The development of a well-planned architecture of an IT infrastructure for the entire university environment is an important consideration to facilitate coordination, management, and connectivity among different departments(Zakareya Ebrahim, 2005).

b) Knowledge Repository. In all cases, database resources, with their various challenges and opportunities, were brought into play because they are considered to be at the heart of the knowledge resources that can be better utilised. There are six major barriers that were experienced by these cases in moving towards the mission of preparing technology platforms for facilitating KMS initiatives. First, a lack of coordination and standardisation of database resources has a negative influence on the complex process of data integration, data availability and data accessibility. The cause of the problem was identified as being either the incompatibility of heterogeneous platforms or that the database resources were placed at dispersed locations that often lacked common data definitions and poor data documentation. On the contrary, UC had an encouraging experience with enterprise database solutions and centralised data management for the entire knowledge repository.Within this scope, this university acknowledged that this database approach was designed to enforce consistency and facilitate database management

across different resources.

Second, the huge amount of database resources has also increased the complexity of managing a knowledge repository for the cases of UA and UB. These universities have undertaken the task of collecting their archive resources together with current data resources into a more manageable effort. Third, they also have large collections of databases resources and paper-based documents requiring effective electronic management to make them more accessible and available. Fourth, throughout the four cases, the lack of systematic categorisation of digital documents is widely recognised as one of the earliest and most crucial efforts in managing digital documents. Finally, the issue of information security was the most pressing concern in all of the cases. There is a crucial need for better information security in terms of user access control and document confidentiality.

c) System Application Development. According to the cross-case analysis, there is a significant difference between UC and the other three universities. In many cases, the continuing effort to develop multiple applications for different purposes in an uncoordinated manner worsens the lack of information shared and increases duplication efforts. UC attempted to take advantage of offering integrated and interoperable applications for business usage. The benefit of this approach is that it would tremendously streamline business processes, enhance information flow across departments, and reduce the usage of paper. Cain et al.(2008) suggested that universities should focus on applications for supporting the streamlining of business processes by understanding and developing integration to meet the range of business function needs. Furthermore, many cases focus on user-friendly applications but ignore the importance of customisation and personalisation of the user interface.

d) Network Performance and Reliability. The issue of network performance concerns the network speed and connectivity of system applications. The major current network issues emphasise the concern regarding threats from hackers, intruders or viruses. This focus is due to a lack of coordination in controlling fragmented server locations across the university and frequent service interruptions. Network performance is another concern that supports the effectiveness of KMS initiatives, particularly in the cases of UA and UB. Specifically, network connection problems, such as network failure or a slow connection, tend to erode the efficiency of information flow and decrease user

satisfaction. Centralised policy management and network interface provisioning are powerful strategies to regulate the network and control traffic load for performance, efficiency and security (Joshi et al., 2001).

4.5 Activity 5: Prepare Support Programs for the KMS Initiatives

The preparation of appropriate support programs is another important stage to address in the process of implementing KMS initiatives. Each case study has its own way to make not only KMS champions but also participating departments aware of the current KMS initiatives being conducted and to attempt to clearly spread KMS initiatives. The summary of the activity 5 is listed in Table 5.

a) Motivation and Commitment of KMS Champions. In the three cases, motivation emerged as an influencing factor that encouraged the key players to effectively implement the KMS initiatives. The motivating factors might be in terms of the sponsorship of required resources and leadership from top management in pursuing the wider scope of KMS initiatives across the university. For these KMS champions, the top management was fundamental in its position of authority to set the direction of KMS initiatives and to delegate resources to drive the KMS initiatives forward. Motivation and commitment of the KMS champions influences the effectiveness of KMS initiatives (Holsapple and Joshi, 2000).

This study found that the KMS champions perform an important role in distributing KMS messages and activities consistently across the university. In addition, the three cases also demonstrated that the KMS champions were motivated to spearhead KMS because they perceived that KMS initiatives would provide a new opportunity to enhance business processes and decision making. In the majority of the cases, it was clear that there was a problem with the process of firmly understanding the concept of KMS initiatives. Many studies have identified that understanding the concept of KMS plays a major role in preparing and identifying effective approaches to supporting KMS initiatives (Pieris et al., 2003); (Ajmal et al., 2010). Furthermore, the KMS champions need to be equipped with IT knowledge and skills that will help them make decisions or develop effective IT support. Several studies have revealed that public sector is confronted by a severe technology skills deficit, mostly in the form of a lack of proper training.(Moon, 2002); (Norris et al., 2001).

Table 5: The summary of activity 5.

Influencing Factors		Key Issues Highlighted	Case
a)	Motivation and commitment of KMS champions	Lack of clear understanding of the KMS concept	UA,UB,UD
		Lack of IT skills and knowledge	UA,UB,UC,UD
		Perceived benefit	AU,UB,UC
		Lack of top management support	UD
b)	Motivation and commitment of participatory departments	Lack of perceived benefit of the project	UA,UB,UD
		Prefer an individual department approach	UA,UB,UD
		Lack of trust and confidence	UA,UB,UD
		Perceived benefit of the project	UC
		Communication between KMS champions and business departments	UC
		Trust and confidence to share their information	UC

Table 6: The summary of management activity.

Influencing Factors	Key Issues Highlighted	Case
Coordination approach	Lack of standard coordination approach	UA,UB,UD
	Standard coordination approach	UC
Measure progression	Lack of performance measurement	UA,UB,UC, UD

b) Motivation and Commitment of Participating Departments. The key objective of this activity is to create awareness about KMS initiatives over the entire university and attract other departments' participation. The finding indicates that the involvement and participation of the business departments is crucial to give appreciation to their ideas and comments, including creating a sense of ownership and perceived benefit of the project. In many cases, they were concerned about the lack of a knowledge-sharing culture due to a lack of communication and connectivity among the various business departments because of differences in their operations and services. Furthermore, the KMS champion faces another problem concerning a lack of trust and confidence in the information security flow in the digital environment. This issue was partly due to the absence of a formal approach and procedural guidelines to deal specifically with this problem. Thus, it became difficult for KMS champions to stimulate and motivate the various departments to have a favourable attitude towards knowledge sharing. This finding is consistent with the literature on IT project development, which found that the key players of a project should not underestimate the stakeholder's capacity to influence either the escalation or failure of the project (Markus, 1983); (Walsham, 1993).

4.6 Management Activity: Monitoring and Controlling the Implementation of the KMS Initiatives

The management activity is also considered a very important activity in SSM, as it has become essential to monitor and control with the issues that prevent effective KMS initiatives. A summary of management activity is shown in Table 6.

This activity is very important, as once the process of implementing KMS initiatives is underway, it becomes essential to constantly monitor and control the progress and performance of KMS initiatives. It is interesting to note that the finding indicates that most cases do not have institutional monitoring and controlling mechanisms of the implementation of KMS initiatives at the university level. The central coordination of monitoring and controlling KMS would provide a more unified and collaborative approach. There is a need to develop a monitoring and controlling system that would constantly assess the implementation processes (Baudoin, 2003).

5 DISCUSSION AND CONCLUSIONS

The SSM is presented as a tool for analyzing and understanding unstructured problems that deal with the complexity of social, culture, and political issues in studying process of implementation of the KMS initiatives. This approach proved to be suitable for analyzing the KMS initiatives, since their implementation are not only concerned about IT, but also put emphasis on the contextual environment in with they are embedded. Based on this comprehensive analysis, the pattern of the common process in KMS initiatives together with the

influencing factors were identified and highlighted. It is clear that each activity has a different influencing factor that can be classified into multiple perspectives analysis. Activities 1, 2 and 3 and management activity were concerned with the influential factors of the organizational perspectives. Consequently, activity 4 was influenced by technical perspectives. Activity 5 was affected by personal perspectives. The age of the university indicated that the older MPUs have more challenging issues in dealing with the technical, organisational, and personal perspectives, compared to the newer MPUs. From the technical perspectives, the existence of several established technologies acts as a barrier for the older MPUs because they must be considered if they want to utilise newer technologies. In addition, the size of these old universities makes them more complex and more costly to maintain compared to newer universities. It is important for older universities to consider changing IT in a slow and incremental process rather than choosing a radical change (Ronnback and Holmstrom, 2007). The analysis of organizational perspectives shows that the older MPUs appear to be more challenging of developing unified strategic direction, managing of large knowledge resource, creating appropriate policies and procedures, and getting adequate financial support. The older the organisation, the more stable the structure and have a greater number of departments and thus generally exhibit greater complexity in managing change (Barnir et al., 2003); (Cranfield and Taylor, 2008). In many cases, the older MPUs were more strongly affected by personal perspective constraints than were newer MPUs. The factors for this trend were knowledge-sharing attitudes among KMS champions and business departments. The older organisations have more established organizational behaviour that has become institutionalised and business activities that have become routinised compared to newer MPUs (Hannan and Freeman, 1984) In this way, the proposed conceptual model of KMS initiatives can be used as an analytical tool to guide the analysis of the process of implementing KMS initiatives in higher education and can also be applied as a guideline to support the introduction of KMS initiatives, especially in the context of MPUs.

REFERENCES

Ajmal, M., Helo, P. & Keka, T., 2010. Critical Factors For Knowledge Management In Project Business. *Journal Of Knowledge Management,,* 14**,** 156-168.

Barnir, A., Gallaugher, J. M. & Auger, P., 2003. Business Process Digitization, Strategy, And The Impact Of Firm Age And Size: The Case Of The Magazine Publishing Industry. *Journal Of Business Venturing,* 18**,** 789-815.

Baudoin, P., And Branschofsky, M., 2003. Implementing An Institutional Repository: The Dspace Experience At Mit. *Science & Technology Libraries,* 24**,** 31-45.

Bennetts, P., Wood-Harper, A. & Mills, S., 2000. An Holistic Approach To The Anagement Of Information Systems Development:A Review Using Soft Systems Approach And Multiple Viewpoints. *Systemic Practice And Action Research,* 13**,** 189-205.

Cain, T. J., Branin, J. J. & Sherman, W. M., 2008. Knowledge Management And The Academy: Strategies And Solutions At The Ohio State University Are Changing How Expertise And Knowledge Are Documented And Shared. *Educause Quarterly,* 31**,** 26-33.

Chan, D. L. H., Kwok, C. S. Y. & Yip, S. K. F., 2005. Changing Roles Of Reference Librarians: The Case Of The Hkust Institutional Repository. *Reference Services Review,* 33**,** 268-282.

Chang, S.-H., 2003. Institutional Repositories: The Library's New Role *Oclc Systems & Services,* 19**,** 77-79(3).

Checkland, P., 1981. *Systems Thinking, Systems Practice,* Chichester, John Wiley & Sons.

Cranfield, D. J. & Taylor, J., 2008. Knowledge Management And Higher Education: A Uk Case Study. *The Electronic Journal Of Knowledge Management.*

Cronin, B. & Davenport, E., 2000. Knowledge Management In Higher Education. *In:* Bernbaum, G. (Ed.) *Knowledge Management And The Information Revolution Educause Leadership Strategies Series.* San Franciso, Ca: Josey-Bass Inc.

Daft, R. L., 2007. *Organization Theory And Design,* Ohio, Thomson Higher Education.

Hannan, M. T. & Freeman, J., 1984. Structural Inertia And Organizational Change. *American Sociological Review,* 49**,** 149--164.

Holsapple, C. W. & Joshi, K. D., 2000. An Investigation Of Factors That Influence The Management Of Knowledge In Organisations. *Journal Of Strategic Information Systems,* 9**,** 235-261.

Ingram, H., 2000. Using Soft Systems Methodology To Manage Hotels: A Case Study. *Managing Service Quality,* 10**,** 6-10.

Joshi, J., Ghafoor, A., Aref, W. & Spafford, E., 2001. Digital Government Security Infrastructure Design Challenges. *Ieee Computer,* 34**,** 66-72.

Markus, M. L., 1983. Power, Politics And Mis Implementation. *Communications Of The Acm,* 26**,** 430-444.

Mcdermott, R. & O'dell, C., 2001. Overcoming Cultural Barriers To Sharing Knowledge. *Overcoming Cultural Barriers To Sharing Knowledge,* 5**,** 76-85.

Mohayidin, M. G., Azirawani, N., Kamaruddin, M. N. & Margono, M. I., 2007. The Application Of Knowledge

Management In Enhancing The Performance Of Malaysian Universities. *The Electronic Journal Of Knowledge Management,* 5**,** 301-312.

Moon, M. J., 2002. The Evolution Of E-Government Among Municipalities: Rhetoric Or Reality? *Public Administration Review,* 62**,** 424-433.

Norris, D. F., Fletcher, P. D. & Holden.S., 2001. Is Your Local Government Plugged In? Highlights Of The 2000 Electronic Government Survey. Available: Www.Umbc.Edu/Mipar/Final_Draft/Pdfs/E-Gov.Icma .Final-4-25-01.Pdf.

Oakley, A., 2003. Research Evidence, Knowledge Management And Educational Practice: Early Lessons From A Systematic Approach. *London Review Of Education,* 1**,** 21-33.

Patricia Ordóñez De Pablos, 2004. Measuring And Reporting Structural Capital: Lessons From European Learning Firms. *Journal Of Intellectual Capital,* 5**,** 629-647.

Petkov, D., Petkova, O., T, A. & T, N., 2007. Systems Thinking Techniques For Decision Support In Complex Situations. *Decision Support Systems,* 43**,** 1615-1629.

Pieris, C., David, L. & William, M., 2003. Excellence In Knowledge Management: An Empirical Study To Identify Critical Factors And Performance Measure. *Measure Business Excellence,* 7**,** 29-45.

Ronald D. F & K., U., 2007. Knowledge Management Capability: Defining Knowledge Assets. *Journal Of Knowledge Management,* 11**,** 94-109.

Serban, A. M. & Luan, J., 2002. *Knowledge Management: Building A Comparative Advantage In Higher Education*, Jossey-Bass.

Singh, M. D. & Kant, R., 2008. Knowledge Management Barriers: An Interpretive Structure Modeling Approach. *International Journal Of Management Science And Engineering Management,* 3**,** 141-150.

Soliman, F. & Spooner, K., 2000. Strategies For Implementing Knowledge Management: Role Of Human Resources Management. *Journal Of Knowledge Management,* 4**,** 337-345.

Suhaimee, S., Abu Bakar, A. Z. & Alias, R. A.: Knowledge Management Implementation In Malaysian Public Institution Of Higher Education. *In:* In Proceedings Of The 2nd International Conference On Intellectual Capital, Knowledge Management And Organisational Learning, 2005 Dubai.

Syed Omar Sharifuddin, S. I. & Rowland, F., 2004. Benchmarking Knowledge Management In A Public Organisation In Malaysia. *Benchmarking: An International Journal,* 11**,** 238-266.

Tseng, S., 2008. The Effects Of Information Technology On Knowledge Management Systems. *Expert Systems With Applications,* 35**,** 150-160.

Walsham, G., 1993. *Interpreting Information Systems In Organizations,* Wiley, Chichester.

Wong, K. Y., 2005. Critical Success Factors For Implementing Knowledge Management In Small And Medium Enterprises. *Industrial Management And Data Systems,* 105**,** 261-279.

Zakareya Ebrahim, Z. I., 2005. E-Government Adoption: Architecture And Barriers. *Business Process Management Journal,* 11**,** 589-611.