Knowledge management in a public organization: a study on the relationship between organizational elements and the performance of knowledge transfer

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Abstract *Relatively little study has been performed on knowledge management and knowledge transfer in the public sector, and even less in the developing countries. This paper investigates the relationship between organizational elements and the performance of knowledge transfer. Five main independent variables were identified – organizational culture, organizational structure, technology, people/human resources and political directives – and these were tested against creation of knowledge assets and knowledge transfer performance using the Spearman rank test. Tacit and explicit knowledge were also tested against knowledge transfer performance. To achieve an in-depth empirical study, the Ministry of Entrepreneur Development of Malaysia was chosen for a case study. The findings are based on replies to a questionnaire survey done from September to December 2001. The results reveal that there are significant relationships between some of the variables and either the creation of knowledge assets or the performance of knowledge transfer. Therefore, it is necessary for organizations to consider some of the elements that show a relationship between the tested variables in implementing a knowledge management strategy in an organization. However, certain variables that did not show any relationship should not be ignored totally, as they are still very important for some organizations.*

Keywords *Knowledge management, Malaysia, Public sector organizations*

Introduction

The creation and transfer of knowledge in an organization has become a critical factor in an organization's success and competitiveness. Many organizations are now concentrating their efforts on how knowledge, particularly tacit knowledge that exists in the organization, can be transferred across the organization. In studies done in various organizations, Dixon (2000, pp. 17-31) found that the two main knowledge activities that need to be balanced are the creation of knowledge (referred to as common knowledge) and the transferring of knowledge across time and space.

What is knowledge transfer? Major and Cordey-Hayes (2002, p. 411) see a transfer of knowledge as a conveyance of knowledge from one place, person, ownership, etc., to another. It involves two or more parties and there has to be a source and a destination. Generally, when something is being transferred, someone will gain it and someone else will lose it. However, knowledge, which is regarded as an intangible asset, is different from tangible assets. Tangible assets tend to depreciate in value when they are used, but knowledge grows when used and depreciates when not used (Sveiby, 2001, p. 346). This means that knowledge will keep on

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growing whenever a person shares the knowledge that he/she has; when someone transfers their knowledge, they do not lose it.

Knowledge transfer requires the willingness of a group or individual to work with others and share knowledge to their mutual benefit. Without sharing, it is almost impossible for knowledge to be transferred to other person. This shows that knowledge transfer will not occur in an organization unless its employees and work groups display a high level of co-operative behavior (Goh, 2002, p. 25). Knowledge is transferred not only from individual to individual but also involves ''individual to a team or group, team or group to individual, or team or group to team or group'' (Bender and Fish, 2000, p. 130). According to Davenport and Prusak, knowledge transfer involves two actions which are ''transmission (sending or presenting knowledge to a potential recipient) and absorption by that person or group'' (Davenport and Prusak, 1998, p. 101). They further stress that ''transmission and absorption together have no value unless they lead to some change in behavior, or the development of some idea that leads to new behavior'' (Davenport and Prusak, 1998, p. 101).

Although knowledge transfer is very important in an organization, Jacob and Ebrahimpur (2001, p. 75) believe that the actual transfer of knowledge within organizations still remains a problematic issue for managers. Organizations should identify where tacit and explicit knowledge resides when designing strategies, in order to ensure that knowledge is created and transferred to the right individuals. However, knowledge, particularly tacit knowledge, is very difficult to transfer. Argote argues that one of the reasons why knowledge is difficult to transfer is because ''some of the knowledge acquired thorough learning by doing is idiosyncratic to the particular constellation of people, technology, structures and environmental conditions'' (Argote, 1993, p. 42).

Study of knowledge management in a public organization

Although knowledge management has been widely discussed by many academics and practitioners, there is relatively little information on knowledge management as found in the public sector. Examples of studies done in public organizations include benchmarking of knowledge management (Syed-Ikhsan and Rowland, 2004), knowledge sharing (Liebowitz and Chen, 2003), knowledge management initiatives (Shields *et al.*, 2000) and knowledge management practices, particularly in decision making and situation handling (Wiig, 2002).

In an empirical study in a public organization in Malaysia, Syed-Ikhsan and Rowland (2004) investigated and examined the availability of a knowledge management strategy in the Ministry of Entrepreneur Development of Malaysia. They also examined perceptions on the benefits, problems, responsibilities and technological aspects that are entailed in managing knowledge in an organization. Issues that encourage and restrict knowledge generation and knowledge sharing were also discussed. The study revealed that currently the Ministry does not have any specific knowledge management strategy. However, it showed that knowledge in the Ministry was available and embedded in the Ministry's procedures and policies, Job Manual Procedure, ISO 9002, Desk File, work flow and databases. Other pertinent conclusions were that most of the employees still felt that the head of the Ministry or the heads of the divisions/units were the ones who were responsible for managing knowledge in the Ministry. Only 48.3 percent felt that the responsibility to manage knowledge in the Ministry should be everyone's job. To be successful, particularly in providing services to the public, all employees should be responsible for managing all kinds of knowledge that are available in the organization.

Liebowitz and Chen (2003) conducted another study on knowledge management issues in public sector organizations. In their study, they investigated how knowledge management could build and nurture a knowledge sharing culture in an organization. Liebowitz and Chen (2003,

p. 422) found that knowledge sharing in government possesses some unique challenges. They discovered that government agencies are typically hierarchical and bureaucratic organizations that make sharing of knowledge difficult. Liebowitz and Chen argued that most people seem reluctant to share knowledge because they ''keep knowledge close to their heart as they move through the ranks by the knowledge is power paradigm'' (2003, p. 422).

Another research project on knowledge management in public sector organizations was carried out by Shields *et al.* (2000) from Carleton University in Canada. The research, funded by the Social Sciences and Humanities Research Council of Canada, made an attempt to analyze knowledge management initiatives in the Canadian Federal Services and the impact of the knowledge-based economy on work in the public services. One of the main findings in the research was that knowledge and information initiatives are inherently political and have an uneven impact on different civil servants and on different client groups and members of the public.

Wiig (2002) also made a comprehensive study on knowledge management in public administration. Wiig investigated how knowledge management could play important roles in public administration particularly in four main areas, which were (Wiig, 2002, p. 224):

(1) enhance decision making within public services;

(2) aid the public in participating effectively in decision making;

(3) build competitive societal intellectual capital capabilities; and

(4) develop a knowledge management work force.

Wiig argued that it is important to have comprehensive knowledge management within and in support of public administration. Having such an approach will allow ''the society to prosper and increase its viability by making its people and institutions work smarter'' (Wiig, 2002, p. 238), and furthermore give benefits and increase the citizens' quality of life.

Background of the study

To obtain empirical data, the authors chose the Ministry of Entrepreneur Development (MED) of Malaysia for the case study. The Ministry was formed on 8 May 1995, to assume the full responsibilities of the Ministry of Public Enterprise. The mission of the Ministry is to create and develop genuine entrepreneurs who will be of high quality, and are resilient, successful and competitive in all economic sectors. The Ministry is also responsible for cultivating an entrepreneurial culture among Malaysians. The Ministry employs about 550 staff, engaged in planning (policy) and planning development, commercial vehicle licensing, civil contractors services, project and program development, monitoring franchise and vendors program, entrepreneurship training program and entrepreneur development program (MED Annual Report, 1999).

For the purpose of this study, data was gathered through questionnaires distributed to 204 respondents from Grade One to Grade Six (under the new numerical system) in the headquarters and in both the regional and state offices. Over 75 percent of the questionnaires were returned and analyzed.

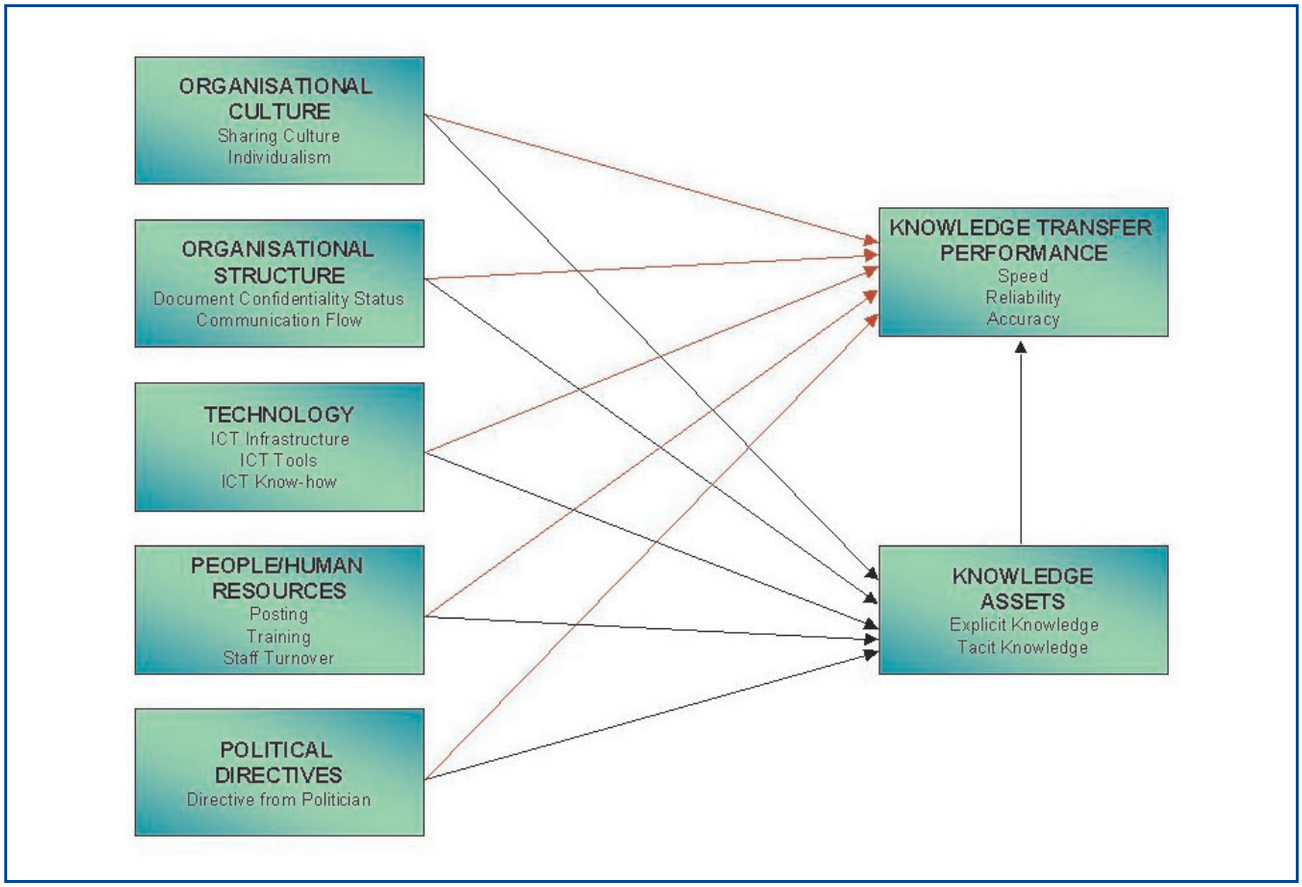
The research model

Two of the key factors that influence knowledge management programs and strategy are the creation of knowledge assets and knowledge transfer within the organization. To have an effective knowledge management strategy, an organization should ''encompass everything the organization does to make knowledge available to the business'' (Donoghue *et al.*, 1999, p. 48). Donoghue *et al.* stress that ''effective knowledge management requires a combination of many organizational elements – technology, human resources practices, organizational structure and culture – in order to ensure that the right knowledge is brought to bear at the same time'' (Donoghue *et al.*, 1999, p. 48). This is in line with the approach suggested by Rubenstein-

Montano *et al.* (2001a), who stress that a knowledge management strategy should include the entire knowledge management process, which is the people, technology infrastructure and culture of sharing knowledge. These factors assisted in formulating the conceptual frameworks underlying this study.

There is relatively little information on knowledge management in the public sector, particularly in Malaysia. With an increasing concern by the Government of Malaysia to create a knowledgeable society, it is critically important to understand the nature of such knowledge that is already embedded in the organization's business processes, and how that knowledge is used as an important component source of competitive advantage. Apart from understanding the embedded knowledge, no study has yet been found which reports how knowledge and information are created and are transferred between individuals in a public organization. Based on the organizational elements suggested by Donoghue *et al.* (1999) and Rubenstein-Montano *et al.* (2001), the present authors put forward five main groups of factors to explore the relationship between the particular variables and the creation of knowledge assets and explain the performance of knowledge transfer, specifically for application to the Ministry of Entrepreneur Development of Malaysia. Four of these are technology, people/human resources, organizational structure, and organizational culture. We have also identified another new element, also important for any public sector organization, namely, its political directives. The authors believe that it is very important to manage these five organizational elements accordingly, especially if the government wants to implement a knowledge management strategy in the public organization. If all the five variables can be managed efficiently and effectively, knowledge can be easily created and transferred in the Ministry. The schematic diagram of the conceptual framework is shown in Figure 1.

Figure 1 Conceptual framework



Dependent variables

The dependent variables in this study are knowledge transfer performance and creation of knowledge assets (refer to hereafter as ''knowledge assets''). However, knowledge assets are also identified as an independent variable from knowledge transfer performance.

Performance of knowledge transfer – the ability to transfer knowledge form one unit to another has been found to contribute to organizational performance. Sveiby (2001, p. 347) argues that knowledge that is transferred between individuals not only benefits the organization but also tends to improve competence in both the individuals that are involved in the process. For these purposes, knowledge transfer in an organization is defined as a ''process through which one unit (e.g. group, department, or division) is affected by the experience of another'' (Argote and Ingram, 2000, p. 151). Knowledge can be transferred in various ways. According to Sveiby (1997) knowledge can be transferred either indirectly through media or directly, from person to person (Sveiby, 1997, p. 49). To look into the performance of knowledge transfer in the Ministry, we have drawn out three main questions, which are:

(1) How fast is knowledge transferred in the Ministry?

(2) How accurately is the knowledge transferred?

(3) How reliable is the knowledge?

How fast knowledge can be transferred is the most important element that needs to be identified. According to Bloodgood and Salisbury (2001, p. 59) knowledge transfer may ''lead to advantage through speedier deployment of knowledge to portions of the organizations that can benefit most by it''. Davenport and Prusak (1998, p. 103) refer to speed as velocity in which knowledge moves through an organization. With a proper infrastructure, individuals in the organization are likely to obtain information faster and can make faster decisions.

However, speed alone will never solve the problem unless knowledge is transferred to the right person at the right time. Alavi and Leidner claim that the most important aspect of knowledge management in the organizational setting ''is the transfer of knowledge to the location where it is needed and can be used'' (Alavi and Leidner, 2001, p. 119). Teece (2000, p. 38) asserts that ''knowledge, which is trapped inside the minds of key employees, in the file drawers and databases, is of little value if not supplied to the right people at the right time''. If information and knowledge can be transferred faster but reach the wrong person, it will cause more problems to any public organization. Basically, knowledge assets in the organization normally do not flow efficiently to the target groups even in the same organization.

The third dimension that also needs to be considered is the reliability of the knowledge in the organization. Reliability of data, information and knowledge assets in the public-sector organization is very important, as inaccurate knowledge might cause problems to the government as a whole. Since public organizations are responsible for providing services to the citizen, they have to make sure that all weaknesses are minimized.

Knowledge assets – Knowledge assets are very important to all organizations as they play a major role in all decision making. However, very little attention is given to how knowledge is created and how the knowledge creation process can be managed. According to Teece, knowledge assets cannot be bought and sold and need to be built in-house by organizations, and ''they must also be exploited internally in order for full value to be realized by the owner'' (Teece, 2000, p. 36). He further argues that the nature of knowledge itself makes organizational knowledge difficult to transfer as it is embedded in the organizational processes, procedures, routines and structures (Teece, 2000, p. 36). According to Bloodgood and Salisbury, every organization needs to identify where knowledge resides in the organization. It is very important especially when designing strategies ''in order to ensure knowledge is being created, transferred and protected in the right way and with the right individuals'' (Bloodgood and Salisbury, 2001, p. 55). With reliable collections of knowledge assets, then knowledge can be transferred to the respective person at the right time and at the right place with great accuracy.

The performance of knowledge transfer depends more on the availability and the accessibility of the knowledge assets. Therefore, it is hypothesized that:

H1A. There is a positive relationship between knowledge assets and knowledge transfer performance.

Apart from testing the relationship between knowledge assets and knowledge transfer performance, it is important to test the relationship between tacit knowledge and explicit knowledge with knowledge transfer. Rubenstein-Montano *et al.* (2001a, p. 13) and Smith (2001, p. 313) argue that people possess different types of tacit and explicit knowledge ''there should be a distinction between tacit and explicit knowledge'' as ''each needs to be handled appropriately'' (Rubenstein-Montano *et al.*, 2001a, p. 13). Therefore it is hypothesized that:

H1B. There is a positive relationship between tacit knowledge available and knowledge transfer performance

H1C. There is a positive relationship between explicit knowledge and knowledge transfer performance.

Independent variables

Organizational culture

Two variables that are important to study under this area are sharing culture and individualism and how they affect the organization's knowledge assets and knowledge transfer performance.

Sharing culture – the main element considered is specifically how information and knowledge are shared among officers in the Ministry. Knowledge sharing culture is one of the most important elements that need to be understood before implementing any new strategies in public organizations. Culture is regarded as the key factor since it determines the effects of other variables such as technology and management techniques on the success of knowledge management. Stoddart (2001, p. 19) argues that knowledge sharing can only work if the culture of the organization promotes it. Any changes need to be developed in line with the existing organizational culture. Here, culture is defined as ''the shared values, beliefs and practices of the people in the organization'' (McDermott and O'Dell, 2001, p. 76) and knowledge sharing as ''activities of transferring or disseminating knowledge from one person, group or organization to another'' (Lee, 2001, p. 324).

According to Parker and Bradley (2000, p. 126), understanding the organizational culture of the organization will certainly ''help explain the outcomes of the reform process in terms of fit or absence of fit between public sector culture and the strategies and objectives of reform''. An organization that supports information sharing and knowledge creation among its members and is committed to including and reconciling multiple viewpoints is likely to establish effective and efficient processes as well as improve organizational life (Levine, 2001, p. 23). Ahmed *et al.* (2002, p. 59) argue that knowledge transfer can be promoted in the organization depending on the right norms that are widely held by the organization; they further argue ''if the wrong cultural norms exist, regardless of the effort and good intention of individuals trying to promote knowledge, little knowledge transfer is likely to be forthcoming as a result'' (Ahmed *et al.*, 2002, p. 59).

Therefore, it is hypothesized that:

H2A. An organizational member's knowledge/information sharing culture has a positive relationship with the performance of knowledge transfer.

H2B. An organizational member's knowledge/information sharing culture has a positive relationship with the creation of knowledge assets.

Individualism – attitudes/behavior are considered to be one of the important elements that could effect creation and transfer of knowledge in an organization. Nonaka (1999, p. 67) argues that there are not many individuals who can share their knowledge freely. Two main potential problems pertaining to attitude/behavior are how ready employees are to share their knowledge and how easily they can overcome the resistance to change and share their knowledge in the

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organization. McDermott and O'Dell (2001, p. 77) argue that ''in an organization with a knowledge sharing culture, people would share ideas and insights because they see it as natural, rather than something they are forced to do''.

However, in a big organization there is a tendency for individuals to use knowledge as their source of power for personal advantage rather than as an organizational resource. According to Goh (2002, p. 5) and Bogdanowicz and Bailey (2002, p. 127) most managers see critical knowledge as a source of power, as leverage, or as a guarantee of continued employment, and are reluctant to share it. In an article that appeared on the Internet, it is argued that ''public sector employees see information as an asset that needs to be protected and kept to themselves, not passed to other departments or agencies'' (*Industry Solution*, 1999). Lim and Klobas (2000, p. 423) argue that most knowledge is not shared and is held by individuals. People do not share knowledge without a strong personal motivation, and they would certainly not give it away without concern for what they may gain or lose by doing so (Stenmark, 2000-2001, p. 21).

Therefore it is hypothesized that:

H3A. There is a negative relationship between individual resistance to sharing knowledge and the performance of knowledge transfer.

H3B. There is a negative relationship between individual resistance to sharing knowledge and creation of knowledge assets.

Organizational structure

Organizational structure refers to the way people and jobs in an organization are arranged so that the work of the organization can be performed (*Encyclopaedia of Management*, 2000, p. 692). For the purpose of this study, the organizational structure will only be discussed in terms of its influence on the communication flows between departments, and proper documentation of policies, procedures and regulations imposed in the Ministry and how they help to create and transfer knowledge.

Document confidentiality status – one of the factors that influences the creation and transfer of knowledge in an organization is the status of information and documents. Certain items of information and documents are restricted to certain levels of employee, which prevents the flow of knowledge across the organization. In the Ministry, documents and information are classified into four classifications, which are ''open'', ''confidential'', ''secret'' and ''top secret''. The status of the documentation in the Ministry has an implication for the sharing of knowledge between individuals, divisions and organizations.

Therefore it is hypothesized that:

H4A. The status of the documents has a negative relationship with the performance of knowledge transfer.

H4B. The status of the documents has a negative relationship with the creation of knowledge assets.

Communication flows – in a traditional model, large organizations normally have many layers of managers where ''formal reporting structures are more detailed at the top than at the bottom'' (Davenport and Prusak, 2000, p. 73). Decision making flows vertically up and down this chain of command, and often communication also flows only up and down this chain of command. ''This kind of communication/decision making can significantly slow organizational processes, which can be very detrimental to the organization'' (Huczynski, 1989, p. 56). Formal organizational structures that constrain reporting solely within divisional channels limit each division's access to knowledge accumulated by other divisions of the corporation. ''Such

'vertical' structures raise barriers to knowledge transfers between different divisions because each division is operated largely as if an independent firm'' (Lord and Ranft, 2000. p. 579).

Most of the communication functions are ''top down'' and too slow to meet employee needs. It takes too much time for information to filter down through every level of the organization. According to Kluge *et al.* effective top-down and bottom-up communication is very important in making existing knowledge profitable to the organization (Kluge *et al.*, 2001, p. 77); however, effective communication across hierarchies is very tricky (Kluge *et al.*, 2001, p. 75) and they make knowledge very difficult to transfer. If an organization supports communication networks that operate freely, where knowledge providers and knowledge seekers can access information and knowledge through the shortest path, it will certainly enhance knowledge creation and knowledge transfer in the organization.

Therefore it is hypothesized that:

H5A. There is a positive relationship between communication flow and performance of knowledge transfer.

H5B. There is a positive relationship between communication flow and creation of knowledge assets.

Technology

Many factors have transformed the way organizations view knowledge and knowledge sharing, but perhaps most pivotal is the dramatically extended reach of knowledge through new information technology (*World Development Report*, 1998/1999, p. 138). However, most of the literature reviewed suggests that technology, particularly ICT, is not what knowledge management is. Technology is a key enabler in implementing a successful knowledge management program and strategy. Although technology is an enabler to knowledge management, it is still considered as the most effective means of capturing, storing, transforming and disseminating information.

ICT infrastructure – effective knowledge management depends on people sharing their knowledge through computer facilities that users throughout the organization have access to. Bloodgood and Salisbury argue that IT can be seen as embodying two general capabilities with respect to knowledge. First, knowledge may be codified into a decision support or expert system by making it explicit. Second, it helps to keep track of persons with particular expertise and enabling rapid communication between them (Bloodgood and Salisbury, 2001, p. 62). With regard to ICT infrastructure, up-to-date ICT infrastructure will help employees to create, share and transfer knowledge within the organization.

Therefore it is hypothesized that:

H6A. An extensive use of ICT infrastructure among organizational members has a positive relationship with the performance of knowledge transfer.

H6B. An extensive use of ICT infrastructure among organizational members has a positive relationship with the creation of knowledge assets.

ICT tools – the large size of many enterprises, their global reach, the importance of knowledge to competitiveness, the distributed nature of competence within the firm and the availability of tools to assist knowledge transfer have sharpened the competitive importance of accomplishing knowledge transfer inside the firm (Teece, 2000, p. 38). Smith (2001, p. 313) argues that the availability of information technology tools (software) play key roles in knowledge management.

Therefore it is hypothesized that:

H7A. An extensive use of ICT tools (software) among organizational members has a positive relationship with the performance of knowledge transfer.

H7B. An extensive use of ICT tools (software) among organizational members has a positive relationship with the creation of knowledge assets.

ICT know-how – an adequate training in ICT given to all employees has a positive relationship with the creation and transfer of knowledge. The more training given, the more knowledgeable

the person will be in using all the ICT facilities and the better is the creation and transfer of knowledge.

Therefore it is hypothesized that:

H8A. An adequate ICT know-how has a positive relationship with the performance of knowledge transfer.

H8B. An adequate ICT know-how has a positive relationship with the creation of knowledge assets.

People/human resources

People are another important element that needs to be considered in managing knowledge in an organization. There are many organizations that relate knowledge management with the implementation of new IT-based systems, neglecting organizational aspects such as human and social issues (Kautz and Thaysen, 2001, p. 359). People are said to be true agents in business where all tangible and intangible assets ''are results of human action and depend ultimately on people for their continued existence'' (Sveiby, 2001, p. 345). Lim and Klobas believe that having strong human resources policies in an organization will affect the ways in which the organization manages its knowledge (Lim and Klobas, 2000, p. 428). This view is supported by Rubenstein-Montano *et al.* (2001b, p. 300), who argue that the people and culture are the driving factors that determine the success or failure of knowledge management initiatives.

Posting – one of the main criteria that will be looked into in this area is the posting of staff to particular positions, undertaken by the Public Service Department (PSD) and other related agencies to the Ministry of Entrepreneur Development of Malaysia. According to Bogdanowicz and Bailey (2002, p. 126) employees bring to an organization their prior education, experience, knowledge and skills and will add value to the organization. This aspect is important, as knowledge is likely to be created easily if employees are placed in the right positions. Smith (2001, p. 313) argues that people have slightly different types of tacit and explicit knowledge and apply them in unique ways. With an appropriate qualification background, interests and experience, employees will be able to perform well in all areas.

Therefore it is hypothesized that:

H9A. Appropriate posting to the Ministry has a positive relationship with the performance of knowledge transfer.

H9B. Appropriate posting to the Ministry has a positive relationship with the creation of knowledge assets.

Training – another criterion is the training given to the employee either internally or externally. Zaharias *et al.* (2001, p. 7) argue that knowledge gained by employees through learning or training will enable them to translate their knowledge into organizations' routine, competencies, job descriptions and business processes, plans, strategies and cultures. Employees should be given constant training to improve their knowledge and capabilities. According to Smith (2001, p. 421) employees with a lack of adequate training, or explicit knowledge, struggle to keep up. Therefore it is important for the organization to have a proper training program to enable employees to gain knowledge and contribute to the creation and transfer of knowledge in the organization.

Therefore it is hypothesized that:

H10A. Adequate training internally/externally on new knowledge has a positive relationship with the performance of knowledge transfer.

H10B. Adequate training internally/externally on new knowledge has a positive relationship with the creation of knowledge assets.

Staff-turnover – in a case study of a knowledge-intensive company performed by Zolingen *et al.* (2001, p. 168) it was found that staff turnover is a problem to some organizations. Zolingen *et al.* argue that ''it happens regularly that employees with knowledge and experience, which in most cases is not recorded'' (2001, p. 179) leave the organization.

The problem of staff turnover also happens in all public organizations. Employees leaving the civil service pose a challenge to knowledge initiatives, because organizational knowledge assets may be lost as people retire or leave for other positions. It is necessary to have an appropriate procedure to ensure that information and knowledge can be kept in the organization.

Therefore it is hypothesized that:

H11A. An appropriate procedure to retain knowledge and know-how of officers who leave the Ministry has a positive relationship with the performance of knowledge transfer.

H11B. An appropriate procedure to retain knowledge and know-how of officers who leave the Ministry has a positive relationship with the creation of knowledge assets.

Directives from politicians

In a public organization, political influences have a great impact on the creation of knowledge assets. Sometimes there are unwritten policies or directions that need to be followed. We assume that political influence in a public organization has an impact to the effectiveness of knowledge transfer.

Therefore it is hypothesized that:

H12A. There is a positive relationship between directives from politicians and the ability of individuals to performance of knowledge transfer.

H12B. There is a positive relationship between directives from politician and the ability of individuals to create knowledge assets in the Ministry.

Relationship between variables

A detail schematic diagram of the conceptual framework and the predicted relationships with knowledge assets and knowledge transfer are shown in Figure 2.

Data source

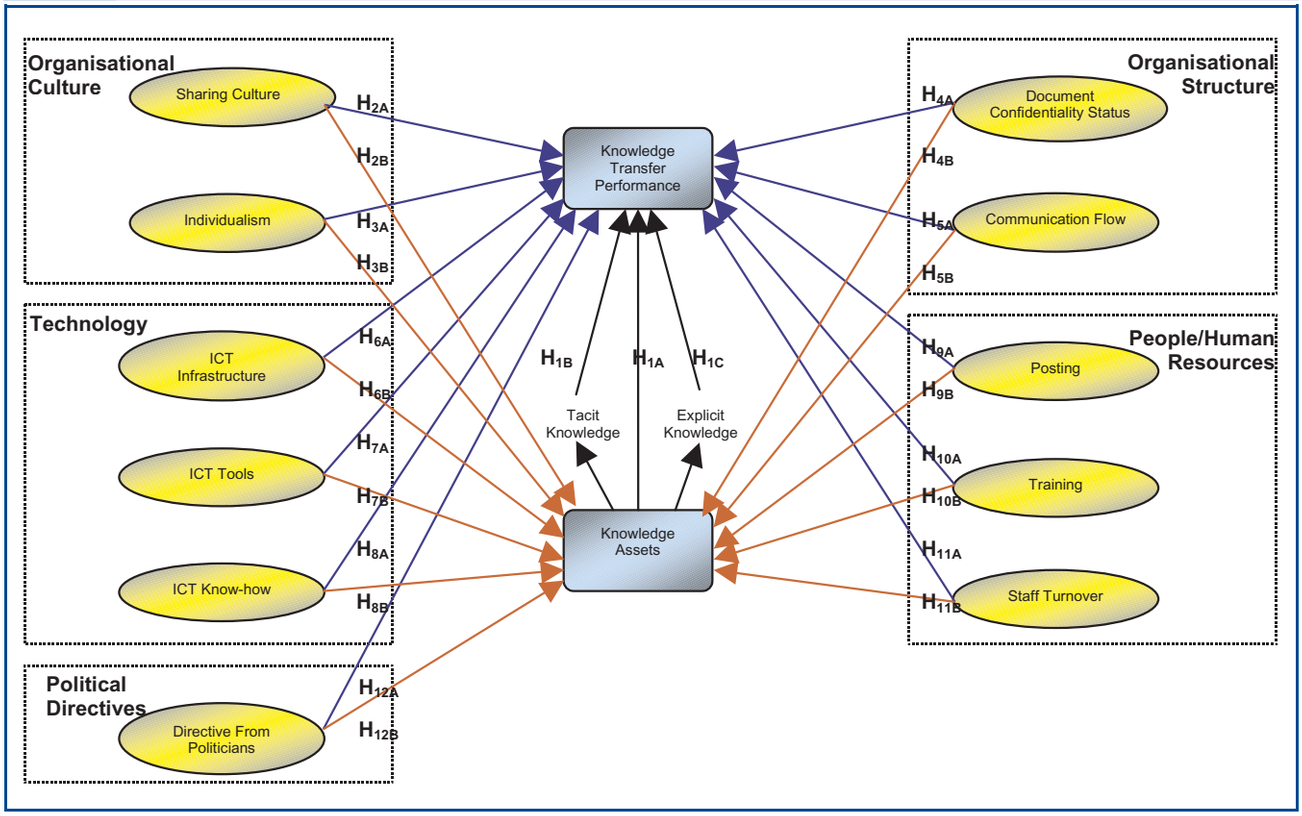
In gathering information for the study, a questionnaire was used as the main instrument for data collection. The details of the questionnaire are given by Syed-Ikhsan and Rowland (2003). A current list of employees' names obtained from the Human Resources Division of the Ministry of Entrepreneur Development was used as a guide when distributing the questionnaire. All respondents in the headquarters were given a questionnaire personally by hand; the respondents in the regional offices and state offices were contacted by telephone, and then the questionnaires were sent subsequently by mail. In the survey, out of 221 potential respondents, a total of 204 questionnaires were distributed to all officers from grade 1 to grade 6. These included officers in the headquarters in Kuala Lumpur, and officers in both regional and state offices. A total of 154 questionnaires (75.5 percent) were returned.

Data analysis and results

For this purpose, the researchers use bivariate analysis to test the hypotheses. Bivariate analysis is a test that either looks at the difference between groups or seeks to detect an association, correlation or relationship between scores on two variables (Fife-Schaw, 2000, p. 354; *Open University Research Methods*, 1981, p. 51). Since all the data are ordinal data, the Spearman's rank-order correlation test was used (Diamantopoulos and Schlegelmilch, 1997, p. 199; Greene and d'Oliveira, 1978, p. 71). All analyses were generated using the Statistical Package for Social Sciences (SPSS) version 10.0 for Windows. Figure 3 displays the correlation between the variables identified earlier.

H1A. The explicit knowledge that is created and stored either in paper or electronic documentation and the tacit knowledge from individuals have a significant positive relationship with the performance of knowledge transfer ($r = 0.416$, $p < 0.01$). The greater the availability of knowledge assets, the better the performance of knowledge transfer will be.

Figure 2 Conceptual framework and related hypothesis



H1B. The better the sharing of the tacit knowledge from individuals through formal and informal discussions/meetings, the better the performance of knowledge transfer ($r = 0.279$, $p < 0.01$).

H1C. Knowledge and information that are created and stored in paper and electronic documentation within the Ministry have a positive relationship with the performance of knowledge transfer ($r = 0.381$, $p < 0.01$).

H2A. There is a significant association between the organizational member's knowledge/information sharing culture and knowledge transfer performance ($r = 0.327$, $p < 0.01$).

H2B. There is a positive relationship between sharing culture and the organization's knowledge assets ($r = 0.464$, $p < 0.01$).

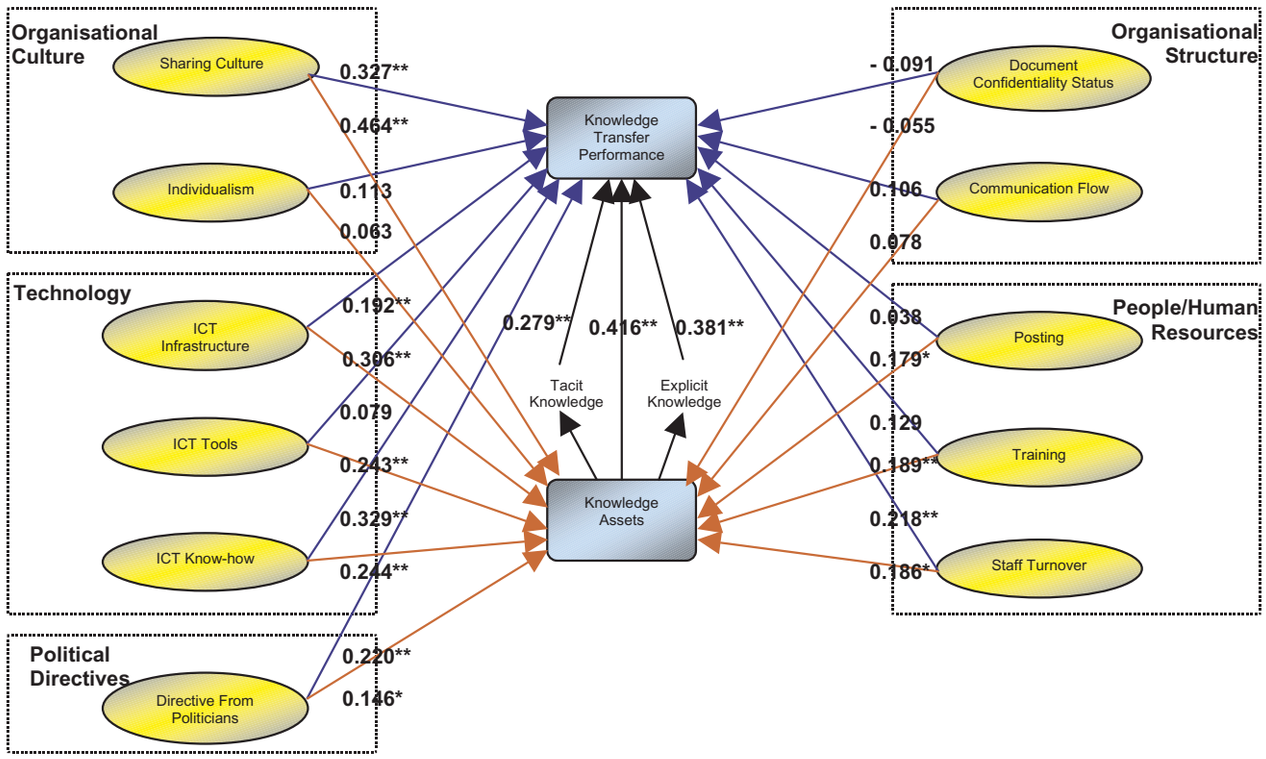
H3A. Although people do not share their knowledge with others without concern for what they may gain or lose by doing so (Stenmark, 2000-2001, p. 210), and sometimes employees see information as an asset that needs to be protected and kept to themselves (*Industry Solution*, 1999), there is no significant negative correlation between the two variables ($r = 0.113$, $p < 0.05$).

H3B. With regard to the relationship between individual resistance in sharing information/knowledge and knowledge assets, there is also no significant relationship between the two variables ($r = 0.063$, $p < 0.05$).

H4A. The hypothesis was that the more confidential the information/knowledge is, the more difficult it is to transfer it. Although the test shows a negative relationship between the two variables, it is not significant ($r = -0.091$, $p < 0.05$).

H4B. Although there is a negative relationship between the status of the document and the accessibility of knowledge assets, it is not significant ($r = -0.055$, $p < 0.05$).

Figure 3 Result of hypothesis testing between variables



Note: ** significant at 0.01 level, * significant at 0.05 level

H5A. Although Lord and Ranft (2000, p. 579) argue that organizational structures that constrain reporting solely within divisional structures raise barriers to knowledge transfers between different divisions, the survey indicates that there is no significant relationship between communication flow and knowledge transfer ($r = 0.106$, $p < 0.05$).

H5B. The test shows that there is no significant relationship between communication flow and knowledge assets ($r = 0.078$, $p < 0.05$).

H6A. An up-to-date ICT infrastructure certainly helps organizations to design and implement systematic capture, storage, indexing and dissemination of knowledge and information (Ahmed *et al.*, 2002, p. 103; Lim and Klobas, 2000, p. 422, Smith, 2001, p. 317), and hence increases the performance of knowledge transfer between individuals. There is positive relationship between ICT infrastructure and the performance of knowledge transfer ($r = 0.192$, $p < 0.01$).

H6B. There is a positive relationship between ICT infrastructure and knowledge assets ($r = 0.306$, $p < 0.01$).

H7A. There is no significant relationship between the use of ICT tools and knowledge transfer performance ($r = 0.079$, $p < 0.05$).

H7B. The more ICT tools are used, the more knowledge assets are created and stored ($r = 0.242$, $p < 0.01$).

H8A. There is positive relationship between ICT know-how and knowledge transfer performance ($r = 0.329$, $p < 0.01$).

H8B. The higher the level of ICT know-how, the better will be the creation of knowledge assets in the Ministry ($r = 0.244$, $p < 0.01$).

H9A. There is no significant relationship between posting to the Ministry and the performance of knowledge transfer ($r = 0.38$, $p < 0.05$).

H9B. There is a significant association between posting to the Ministry and knowledge assets ($r = 0.179$, $p < 0.05$).

H10A. Although training is said to be an important element in gaining new knowledge, there is no significant relationship between adequate training internally/externally and knowledge transfer performance ($r = 0.129$, $p < 0.05$).

H10B. With high levels of adequate training, the creation of knowledge assets is high and the relationship significant ($r = 0.189$, $p \pm 0.01$).

H11A. High levels of sharing knowledge from officers leaving the Ministry correlate with high levels of knowledge transfer performance ($r = 0.218$, $p < 0.01$).

H11B. The availability of procedures to retain knowledge from employees who leave the Ministry will help to retain the knowledge assets ($r = 0.186$, $p < 0.05$).

H12A. There is a positive relationship between political directives and knowledge transfer performance ($r = 0.220$, $p < 0.01$).

H12B. Directives form politicians have a positive relationship with creation of knowledge assets ($r = 0.146$, $p < 0.05$).

Discussion

The results provide quite strong support for the hypotheses. Out of 25, 16 receive sufficient support to prevent their rejection. Figure 3 provides evidence to support most of the postulated relationships.

Knowledge assets

The results indicate that the availability of knowledge assets in an organization has a direct influence on the performance of knowledge transfer in an organization. The findings suggest that all public and private organizations need to manage both tacit and explicit knowledge accordingly, especially in ensuring that the organization can take full advantage of the organizational knowledge. Management should identify where knowledge resides in the organization and design strategies that can promote the use of knowledge that they have. Management should allow employees to get access to all kind of knowledge, regardless of whether the knowledge is available in or outside the organization.

Organizational culture

The results indicate that there is a positive relationship between knowledge sharing culture and knowledge transfer performance and knowledge assets, with high levels of sharing culture correlating with high levels of both knowledge transfer performance and knowledge assets. This shows that sharing culture is fundamental for any organizations that are implementing knowledge management strategy. Deciding on what knowledge to share, whom to share it with and how to share the knowledge should be a major task to which an organization should give priority. However, the results show that there is no significant negative relationship between individualism and knowledge transfer performance and knowledge assets. The assumption that

“To be successful, particularly in providing services to the public, all employees should be responsible for managing all kinds of knowledge that are available in the organizations.”

high levels of individualism are correlated to low levels of knowledge transfer performance and knowledge assets is not supported. Although the result in this study does not show any significant relationship, management should always considered the tendency of individuals to use knowledge as their source of power. Management should promote a culture that encourages individuals to share their knowledge, rather than keeping it individually. Rubenstein-Montano *et al.* argue that people and the culture of the workplace are the driving forces that ultimately determine the success or failure of knowledge management initiatives (Rubenstein-Montano *et al.*, 2001a, p. 5).

Organizational structure

Neither document confidentiality status nor communication flow demonstrated a significant relationship with either knowledge transfer performance or knowledge assets. These results may be due to the survey setting or the selection of respondents involved in the survey. However, the results might be different if the organization had restrictions on accessing information or knowledge, had more hierarchies, or communication flows between divisions were not easily happening. The results might also be different if the research was done in a private organization. Since information and knowledge can and do exist in the organization, it is very important for them to be available to all employees without any restriction (except top secret documents). Management should always consider of improving this issue, especially in ensuring that the documents available in an organization can be accessed and shared.

Technology

The results indicate that almost all variables identified (except ICT tools with knowledge transfer) have a significant relationship with both knowledge transfer performance and knowledge assets. These show that technology plays key roles in managing knowledge in an organization and can be considered as an effective means in of capturing, storing, transforming and disseminating information. Although ICT is not the answer to the success of implementing knowledge management, ICT infrastructure seems to allow individuals in the organization to create and share knowledge effectively and contribute to the performance of knowledge transfer.

With regard to ICT tools, the test shows that there is a positive significant relationship between ICT tools and knowledge assets, but not a significant one with the performance of knowledge transfer. Although descriptive analysis shows that most respondents agreed that the use of various tools helps them in sharing knowledge, the test shows no significant relationship with the performance of knowledge transfer. Pertaining to ICT know-how, the test shows that there is a positive relationship between ICT know-how and both the performance of knowledge transfer and knowledge assets. The results indicate that giving adequate training internally on using computers and software will allow employees to contribute to the performance of knowledge transfer and the creation of knowledge assets. Management should invest substantial amount of money in providing adequate ICT infrastructure in their organization, as ICT still would allow employees to access, create, share and transfer the available information/knowledge faster across the organization.

People/human resources

The results indicate that not all variables identified in the study have a positive relationship with knowledge assets and the performance of knowledge transfer. With regard to posting or placement of officers, there is no significant relationship between posting and the performance of knowledge transfer; however, the test shows that there is a positive relationship with knowledge assets. Bogdanowicz and Bailey (2002, p. 126) argue that employees bringing to the organization their prior education, experience, knowledge and skill will add value to the organization. Although the placements in the Ministry were suitable with their experience, interests and qualifications, the result shows no significant relationship between this variable and the performance of knowledge transfer. On the other hand, the relationship between posting and knowledge assets shows positive significance.

Zakarias *et al.* (2001, p. 7) and Smith (2001, p. 421) claim that adequate training may enable employees to translate their knowledge into the organization's tacit and explicit knowledge, whereas those who lack training will have to struggle to keep up. However, the Spearman test

shows that there is no significant relationship between training and knowledge transfer performance but shows a positive significant relationship with knowledge assets.

The results also indicate that there is a positive relationship between procedures for staff turnover and knowledge transfer performance and knowledge assets. Although the results do not show a strong relationship between the variables, having adequate procedures to retain the knowledge and know-how of officers who leave the organization is very important. Lim and Klobas (2001, p. 421) and Bogdanowicz and Bailey (2002, p. 125) claim that organizations will lose an individual's tacit knowledge unless it can be transformed into organizational knowledge where it can be shared and transferred.

Political Directives

The results show that political issues are also important in managing knowledge in a public organization. The test clearly shows that political issues have a significant relationship with both the creation of knowledge assets and the performance of knowledge transfer.

Implications for future research

The study exposed a number of opportunities for further examination pertaining to organizational elements that influence the success of implementing knowledge management as a whole. One of the elements that need further research is the implication of organizational structure on knowledge transfer. Surprisingly, this research shows no significant relationship between document confidentiality status and communication flow with knowledge assets and knowledge transfer. Research in this area particularly in a private organization or in a public organization in a developed country could have different results. Another important area that we think needs to be explored more is political issues. We believe that the success of implementing knowledge management in a public organization has to be in line with the political aspects.

Conclusion

The study has revealed a variety of potent relationships between knowledge asset and organizational elements with knowledge transfer performance. To have a successful knowledge management strategy, organizations should always see it as a total. All these elements have to be analyzed and considered when implementing knowledge management. Although technology platforms play an important role in developing and sharing knowledge, without the attention to the cultural and organizational context in which people are encouraged to share their knowledge, technology may not be able to stimulate the flow of knowledge. Therefore, all transitional elements – organizational culture, organizational structure, technology, and people/human resources – should always be considered together. In addition, public organizations should never neglect issues on political directives when implementing knowledge management.

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