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Jyoti Choudrie
Brunel University

Mohamad Selamat
Brunel University

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Enabling Tacit Knowledge Diffusion through Meta-abilities for Organizational Learning

Jyoti Choudrie

Department of Information Systems and
Computing, Brunel University, Uxbridge,
Middlesex, UB8 3PH, UK
jyoti.choudrie@brunel.ac.uk

Mohamad Hisyam Selamat

Department of Information Systems and
Computing, Brunel University,
Uxbridge, Middlesex, UB8 3PH, UK
hisyam@uum.edu.my

ABSTRACT

The diffusion of tacit knowledge is pervasive in the organizational learning (OL) process. However diffusing tacit knowledge, a transparent and subjective form of knowledge, needs an individual's ability to externalize and sharing of this knowledge. To undertake this, a conceptual framework based on diffusion theory and meta-abilities is proposed. The framework suggests that meta-abilities create individual influencing skills and sharing attitudes, and, on the other hand, influencing skills and sharing attitudes externalize tacit knowledge through the medium of ideas, actions, reactions and reflection. Knowledge stewards' document externalized tacit knowledge thereby making it available to systems analysts for future information systems (IS) development. The framework is tested using a case study in Malaysia. It is concluded that the future focus when examining the diffusion of tacit knowledge should be toward an individual's meta-abilities development. There should also be an impetus towards creating the right organizational culture and infrastructure that promotes tacit knowledge sharing and externalisation within and between employees.

Keywords

Meta-abilities, Learning Organizations, Diffusion

INTRODUCTION

It has been found that the human aspects of knowledge creation are critical for sustaining the systems within learning organizations in order to facilitate inquiries based on divergence of meanings and perspectives (Courtney *et al.*, 1998). This is because an organization's knowledge comes in part from the organization's employees (Von Krogh *et al.*, 1994). To ensure the system is capable in promoting continuous learning within the organization, the current knowledge that resides in employee's brain (Churchman, 1971; Beveren, 2002) need to be externalized and then embedded into the system. This very current knowledge, on the other hand, results from the internalisation process in which the disseminated information (through the system) is transformed into employee's tacit knowledge. These processes are known as the diffusion of tacit knowledge (Haldin-Herrgard, 2000). However diffusing tacit knowledge, a transparent and subjective form of knowledge, needs an individual's ability to externalize and sharing of this knowledge.

The purpose of this paper is to propose a conceptual framework of tacit knowledge diffusion based on the concept of meta-abilities that is proposed by Butcher *et al.* (1997). Meta-abilities were selected as they consist of competencies that enable people to use their knowledge effectively (Butcher *et al.* 1997). The conceptual framework will be tested by using a case study. The task used to study the diffusion is IS development.

A theoretical overview of the OL, tacit knowledge diffusion, meta-abilities and the proposed conceptual framework are firstly dealt with. The research approach and the description of the case study are then presented. Thereafter the success and failure of the case are discussed in the light of the conceptual framework and the lessons learned are highlighted. In the final section, the conclusions and suggestions for further research are dealt with.

CONCEPTUAL FOUNDATIONS OF ORGANIZATIONAL LEARNING

To understand how the diffusion of tacit knowledge and meta-abilities can be used to support OL, it is useful to have a fundamental understanding of OL concepts.

Epistemology and Learning

Corporate epistemology is the theory of how and why organizations comprehend (Von Krogh et al., 1994). For this reason in the organizational member learning process there should no longer be a focus upon attaining a “right knowledge,” but the co-existence of at least three co-existing pieces of knowledge: syntactic knowledge, pragmatic knowledge and semantic knowledge. Syntactic knowledge pertains to grammar or structure. Pragmatic knowledge relates to the situated context within which learning takes place. Semantic knowledge deals with the meaning of words and symbols. The contest between different elements of knowledge continuously increases the complexity of the total knowledge conveyed (Von Krogh et al., 1994).

An organization’s knowledge comes in part from the organization’s employee. Von Krogh et al. (1994) found that: “Individuals have private knowledge that can be a basis for organizational knowledge.” Individuals have private knowledge that can be an advantage for organizations as knowledge from various sources contributes to meaning (White, 1990). Ultimately, knowledge is the assimilation and utilisation of some kind of integrated learning system to support “actionable learning” (Nevis et al., 1995).

Learning

Learning facilitates behavioural change, consequently leading to improved performance (Garvin, 1993). While learning can be improved through the use of lessons, they are prone to equivocality: the multiple, varied and conflicting interpretations arising from a single source of material (Courtney et al., 1998). Additionally learning occurs by improving actions through better knowledge and understanding (Fiol and Lyles, 1985), encoding inferences from history into routines that guide behaviour (Levitt and March, 1988) and developing insights, knowledge and associations between past actions, the effectiveness of those actions and future actions (Fiol and Lyles, 1985).

Discovery and affirmation (DiBella, 1995) may encourage learners to employ trial and error experimentation or searching mechanisms in order to gain new knowledge. However, structure and organization (Mayhew, 1992) must facilitate this learning process to ensure its success. Walsh and Ungson (1991) maintain that cultivating and expressly maintaining memory increases learning.

Many dichotomies have been used to describe learning styles. Learners can be considered as adaptive vs. generative or behavioural vs. cognitive. An adaptive learning style implies an ability to adjust and to correct a given situation. The emphasis in generative learning, however, is an attempt to expand capabilities. Focus on generative learning occurs in order to make transformational changes (Nevis et al., 1995). Learning characterized as behavioural development occurs by adopting new responses and actions while cognitive development occurs through deeper processing and understanding.

Having discussed the conceptual foundation of organizational knowledge and learning process to gain knowledge, the next subsection will offer brief descriptions and definitions of OL.

Organizational Learning

OL is the development of new knowledge and insights that have the potential to influence behaviour (Slater and Narver, 1995). When members of an organization share associations, cognitive systems and memories, OL is taking place. Therefore learning in organizations relies on the people and groups as agents that transfer knowledge. Over time, the learning is built into the structures, culture and memory of the organization. Lessons (knowledge) remain within the organization even though individuals change. Shanks and Olsen (1995) theorize that OL improves performance, enhances value and creates new beginnings. Further well designed learning programmes improve mental models, facilitate effective analysis, forge commitment and open senses to the real world.

THE CONCEPTUAL FRAMEWORK

The above discussion clearly illustrates that OL is the process of continued innovation through the creation of new knowledge (Quinn et al., 1996). OL is an ongoing process that takes place as employees engage in knowledge work (Davenport et al., 1998). Nonaka (1991) states that OL emanates from the iterative process of externalisation and internalisation. Externalisation occurs when an employee's tacit knowledge is captured as explicit knowledge and internalisation transpires when the captured explicit knowledge is transformed into another employee's tacit knowledge. Therefore, OL occurs at the intersection of tacit and explicit knowledge during the interaction of the various employees in an organization (Nonaka, 1991). Based on the diffusion theory proposed by Rogers (1983), this research argues that the iterative process of externalisation and internalisation can be termed as the diffusion of tacit knowledge. This is due to the diffusion of innovation requiring individuals to externalize and share the innovation, disseminate the innovation through technological means and other people requiring internalizing the innovation knowledge in their minds (Rogers, 1983). Therefore, to ensure the success of OL, the concept of tacit knowledge diffusion needs to be studied.

However tacit knowledge is not easily diffused due to its transparent and subjective nature (Augier and Vendelo, 1999). Difficulties appear in expressing or documenting knowledge that appears obvious and natural to one (Haldin-Herrgard, 2000). Further the difficulties in diffusing tacit knowledge are also linked to language, time, value and distance. Alternatively there are factors that prevent individuals from sharing their tacit knowledge including, lack of confidence, anxiety, unwillingness, confusion and being carried away by strong feelings (Harvey and Butcher, 1998).

On the basis of the aforementioned discussion this paper argues that systematic approaches of collecting individuals' tacit knowledge, such as interviews, metaphors or narrations, are inadequate. This is due to the nature of tacit knowledge being such that it will lead to the phenomenon where people often externalize and share it through creative and spontaneous conversations (Smith, 2001). Therefore, creative and spontaneous diffusion of tacit knowledge requires research. To achieve this, the role of meta-abilities is essential. Meta-abilities is also a novel concept to the IS area and thus warrants a critical understanding. The next subsection defines what, why and how meta-abilities will be utilized in the diffusion of tacit knowledge.

The Concept of Meta-abilities

The concept of meta-abilities was initially widely applied in the psychology area and defined as an emotional intelligence that guides the use of other kinds of intelligence and skills (Goleman 1995). As this concept has the potential to increase an individual's creativity and interpretivity, other areas begun to apply it. Within the organizational development area, meta-abilities were used as the premise for developing the organizational members' managerial skills. Since organizations are developed on the basis of people, this concept needed to be emphasized. Butcher et al. (1997) introduced meta-abilities in their research and found that meta-abilities are ground in the view that an individual's effective performance is inextricably linked to his or her psychological development or maturity. This is because an individual's psychology influences the judgement and consequently the formed decisions (Goleman 1995). For this reason, Butcher et al. (1997) defined meta-abilities as *"the underlying learned abilities that play an important role in enabling and making effective, a wider range of managerial knowledge and skills."* In other words, meta-abilities are those personal, acquired abilities that underpin and determine how and when knowledge will be practised within the organization. According to Butcher et al. (1997), initially the development of meta-abilities resulted in improved personal influencing skills, such as communication, assertiveness, dealing with conflict, persuading and developing others. This in turn contributed to astute and insightful individuals who were able to form better judgements and determine alternative actions. As such, they were better equipped to navigate the difficult and dynamic organizational reality and influences effectively within it. In this case, individuals were able to extend their personal sphere of influence and provide a more critical perspective. They provided greater insight and were more direct in focusing attention and asking significant questions. Consequently individuals could influence key people such as senior and middle management, serve as role models and become more challenging. They could then act as spurs to organizational development – questioning implicit assumptions, exploring new possibilities and directing energies toward higher standards.

Based on the above discussion, it can be understood that meta-abilities assist in the diffusion of tacit knowledge through two humanistic elements. First, meta-abilities create individual influencing skills. Second, meta-abilities develop individual sharing attitudes. By practicing these influencing skills and sharing attitudes – directly or indirectly – individuals generate creative ideas, actions, reactions and reflection (Selamat and Choudrie, 2004). The terms ideas, actions, reactions and reflection represent forms of activities within an organization. Documenting this externalized and shared tacit knowledge can develop synergistic inputs for continuous re-examination and modification processes of IS.

From Definitions to a Framework

Having understood the research area from a theoretical perspective, an understanding in the form of a conceptual framework is now proposed (Figure 1). In the framework it can be seen that meta-abilities create influencing skills and sharing attitudes. These in turn enable individuals to generate ideas (I), actions (A), reactions (R) and reflections (R). The I-A-R-R continuum contains tacit knowledge that has been externalized and shared by individuals. Documenting the externalized and shared tacit knowledge enables useful and relevant inputs to be provided for organizational IS development. This in turn ensures that organizational IS are subjected to continual re-examination and modification given the changing reality. Continuously challenging the current “company way,” such systems are expected to prevent the core capabilities of yesterday from becoming core rigidities of tomorrow. By internalizing this type of system content, individuals can improve actions through better knowledge and understanding.

After the above process, the externalized knowledge becomes information accessed by the organizational members. By gaining access to “best practices,” organizational members can undertake their tasks effectively and consequently reduce organizational operation costs. This in turn enables an organization to increase its competitive edge in a highly volatile market.

Stage 1: problematic situation

Situational problems that could occur as a result of internal or external pressures and are faced by an organization or individual are the first steps in highlighting the need for knowledge application. External pressures can be economic and political issues as well as changing technology. Internal pressures include information flow, human resource organizational power, politics and culture.

Stage 2: internal evaluation

Individuals examine the problem situation and determine the best solution using cognitive skills. These skills can also be used to understand and resolve problems. Self-knowledge enables individuals to use their knowledge flexibly, form better judgements for future actions and obtain a motivation that will allow them to obtain a range of behavioural options for themselves. An individual requires the emotional resilience to be able to retain an objective view of his or herself.

Stage 3: influencing skills and sharing attitudes

Individuals externalize the rational solutions to problems produced in stage 2 using two means; namely, influencing skills and sharing attitudes. Meta-abilities build positive characteristics such as a high level of confidence, willingness, resilience, good judgement and being motivated by strong feelings when using tacit knowledge (Butcher et al., 1997). These positive characteristics in turn develop an individual’s learning capability and helps individuals recognize when an acquisition of new skills is required. All the internal elements will encourage an individual to participate in the sharing of the active development of the organization. Implicit in these individual responses are an individual’s “influencing” and “sharing” activities within the organization. As a result, the process of externalizing tacit knowledge by an individual within the organization becomes effective and efficient.

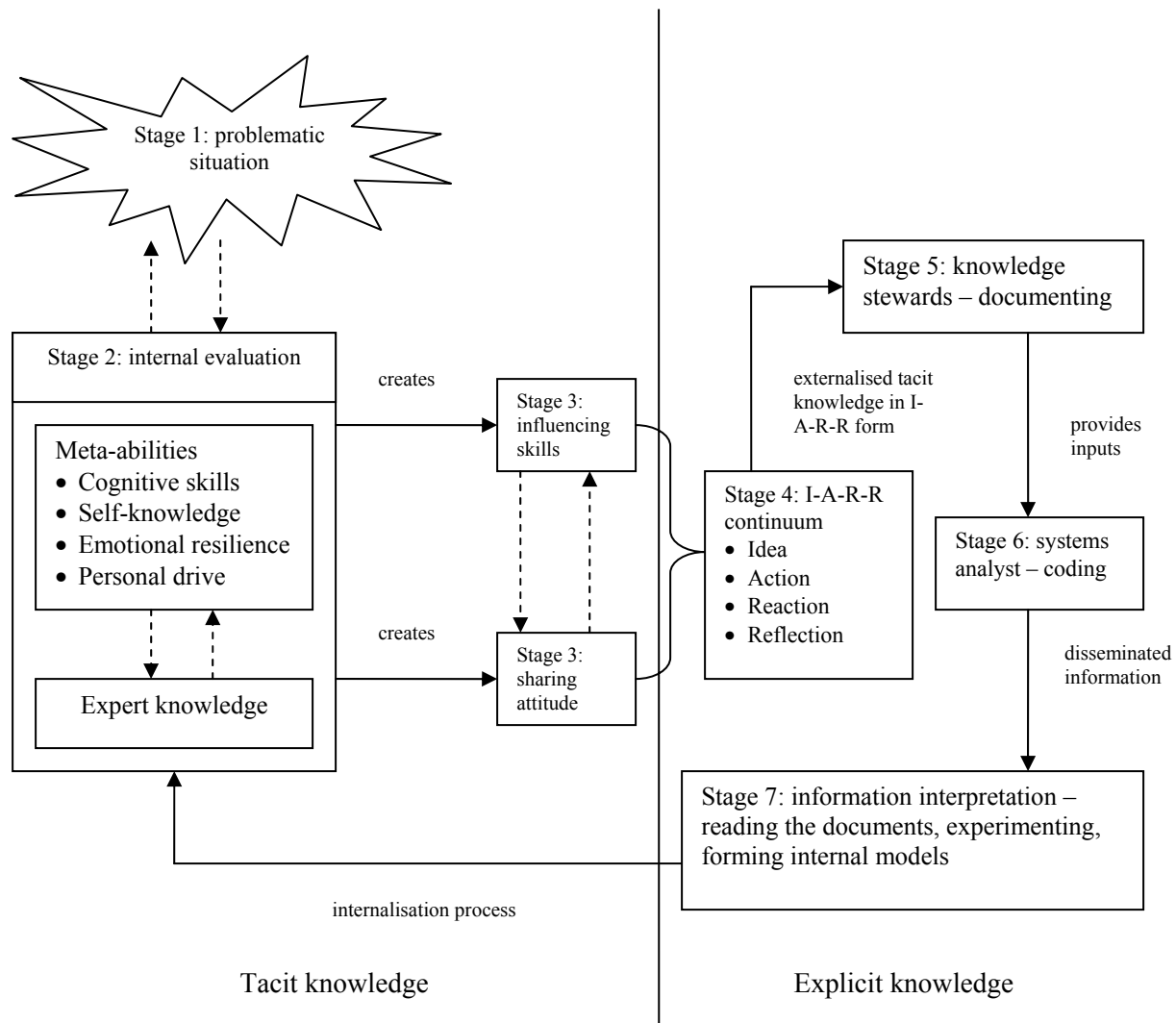


Figure 1. Meta-abilities for tacit knowledge diffusion
Source: Selamat and Choudrie (2004)

Stage 4: I-A-R-R continuum

When undertaking “influencing” and “sharing” activities, individuals implicitly express their tacit knowledge. This expression is either in physical form (body appearance) or verbal form (language). Examples of physical forms of knowledge expression are: action and reaction. Whilst those for the verbal form of knowledge expressions are: idea and reflection. These forms can be transformed into one iterative process, which begins with the idea followed by action, reaction and reflection. Therefore this paper proposes an I-A-R-R continuum to represent the externalization process of tacit knowledge.

Stage 5: knowledge stewards

The role of knowledge stewards is to document the externalized tacit knowledge (in I-A-R-R form), and transform them into explicit knowledge (eg. a business report), written descriptions and instructions. To fulfil this task, knowledge stewards attend meetings or rational discourse sessions that occur within the organization. To achieve good results trust and personal relationships between the knowledge stewards and other organizational members is necessary.

Stage 6: systems analyst

Systems analysts study the documented inputs provided by knowledge stewards and codify them. By the time the inputs are transformed into codified domain within the systems, they become information.

Stage 7: information interpretations

Organizational members can obtain access to the “best practices” in the operation of daily activities or solving problems by using information technology (IT). This process in turn enriches an individual’s understanding of the organization’s activities (tacit knowledge) and eventually provides a continuous I-A-R-R feedback for continuous IS re-examination and modification processes.

The conceptual framework for the diffusion of tacit knowledge presented in this section is the premise to the following discussions. In the following sections, the authors analyze the feasibility of the above conceptual framework in a real life IS development scenario.

RESEARCH APPROACH

The study was conducted using in-depth interviews and structured questionnaires. The respondents consisted of users at the top and middle levels of management. The questionnaires were sent to all departments in the headquarters and branches via the internal audit department in order to identify the respondents’ information needs. After the questionnaires were received and analyzed, interviews were conducted.

DESCRIBING THE CASE STUDY

The case study used for this research is a large Malaysian organization that developed its own in-house systems and is one of the healthcare management specialists in Malaysia. The organization is entrusted with providing non-clinical support services to government hospitals in the central and northern region of Malaysia. The services that are provided are: (1) biomedical engineering maintenance services (BEMS); (2) facility engineering maintenance services (FEMS); (3) linen and laundry services (LLS); (4) cleansing services (CS); (5) clinical waste management services (CWMS); and (6) workshop and fleet maintenance services (WFMS).

To achieve better operational efficiency, the company employs its own management information system, which is Radicare Integrated Information System (RINTIS). The system links all the company’s offices to the hospitals and the Malaysian Ministry of Health and allows authorized users from the company, hospitals and the health ministry to access the status of any service provided by the company at any time. With the implementation of this system, the company hopes to enhance its efforts in achieving ISO 9002 certification. It also helps them to realize their goal of delivering excellent services that will allow medical practitioners to concentrate on their primary responsibility of patient care.

A sole vendor was entrusted with developing RINTIS. The management entrusted the IS manager with the development of the system in conjunction with the vendor. The IS manager agreed the proposed features of the system without undertaking a preliminary study on the users requirements or the formation of a committee to monitor the development of the system. In other words, the vendor developed the system without fully understanding the operational and managerial requirements of the company. The vendor liaised only with the IS manager until the system was ready for implementation. Upon completion a demonstration of the system was provided and the event was attended by several top managers in addition to the IS manager. After the demonstration, these top level people arranged several training programmes for using the RINTIS for all the staff members involved in the information process. The deficiency of the system was reported to the IS manager who in turn communicated these to the vendor in order to solve the impending problems.

However, the rapid growth of the business experienced by the company during the last few years has beckoned calls for a more effective and efficient IS. After four years of the introduction of RINTIS in the company, there was dissatisfaction amongst the users with some of the features of the system such as, report generations, response time and stability of the system. Even the IS manager was not satisfied with the response time of the system. The vendor then recommended upgrading to the latest version of the system and was strongly supported by several top managers in addition to the IS manager. Since the investment into new IT, whether for implementation of a new system or upgrading of the existing system, incurred large amounts of money, the management appointed an independent body to conduct a study on RINTIS. This study is one of the tasks undertaken for the research of this paper and the purpose of the research is to identify the present and future information needs of the company, using meta-abilities and knowledge management.

DISCUSSION

The actions undertaken by the company to introduce RINTIS are presented in Table 1. It can be seen that the company did not form a committee to monitor the development of RINTIS or to provide a requirements analysis of the RINTIS to the vendor. Furthermore the company did not formulate an implementation plan to introduce RINTIS and selected only the IS manager to deal with the vendor. This also forms a bias since the opinion of only one person whose loyalty lies with the management is taken into consideration. Therefore, most of the decisions that were made were based on the jurisdiction of the top management and IS manager. The briefing session, on the other hand, was undertaken to enable the top management and IS manager understand the features of the proposed systems. The training programme was also undertaken and it is based on an ad hoc basis, that is, whenever the need arose.

Actions	Non-clinical support services
Formation of selection committee	-
Creation of an implementation plan	-
Briefing before acquiring RINTIS	*
Use of pilot project	-
Training before acquiring RINTIS	-
Training after acquiring RINTIS	*

Table 1. Actions Adopted to Introduce RINTIS

* exist; - not exist

All the actions that are illustrated in Table 1 involve an active knowledge sharing and influencing activity. This is because the involved members will communicate actively during the implementation process. Therefore each action consists of knowledge sharing and influencing activity. This is illustrated in Table 2.

Actions	Sharing of knowledge	Influencing activity
Formation of selection committee	-	-
Creation of an implementation plan	-	-
Briefing before acquiring RINTIS	*	*
Use of pilot project	-	-
Training before acquiring RINTIS	-	-
Training after acquiring RINTIS	*	*

Table 2. Sharing and Influencing Activities Adopted to Introduce RINTIS

* exist; - not exist

The briefing session and training programme enable the IS workers to communicate and to discuss actively during the RINTIS implementation process. This in turn enable IS workers to share their knowledge and to influence others within the organization. By sharing knowledge and influences individuals begun to improve their actions through the acquisition of better knowledge and understanding (Foil and Lyles, 1985), encode inferences from history into routines that guide behaviour (Levitt and March, 1988) and develop insights, knowledge and association between past actions, and the effectiveness of those actions on future actions (Fiol and Lyles, 1985). These phenomena illustrate an active learning process that occurs within the organization. As a result, the IS workers did not face any problem to operate RINTIS.

Table 2 also illustrates that the sharing and influencing activities are rarely adopted in the company. Most of the decisions made by top management and the features of the RINTIS were designed based on the jurisdiction of the vendor. The vendor only liaised with the IS manager in instances where a technical question relating to the company’s needs occurred. These actions resulted in an RINTIS that was not designed on the basis of OL. Subsequently when the company experienced rapid growth in business, RINTIS could not fulfil the users’ requirements as the IS was not updated according to the newly “new knowledge” or “best practices.” This was because there was no platform to enable the users to express their views such that an improvement to the system could occur. As discussed there were only particular groups of people authorized to be involved in the RINTIS analysis and design processes. All these situations illustrated that the performance of RINTIS in the company was decreasing because it was not designed to cope with the strategy of the learning process.

The effects of the above phenomena are illustrated in Table 3. The impacts highlighted the importance of sharing and influencing activities during the RINTIS adoption process.

Department	Reliance degree on RINTIS	Completeness of report produced by RINTIS	Additional report/data requirement
BEMS	High for operational functions Very low for managerial functions	High for technical report	Exist at executive level
FEMS	Low for operational functions Very low for managerial functions	Very high for technical report	Exist at top and executive level
LLS	High for linen module Laundry module malfunctioned Very low for managerial functions	Medium for technical report	Exist at top and executive level
CS	Low for operational and managerial functions	High for technical report	Exist at executive level
CWMS	Low for operational and managerial functions	High for technical report	Exist seriously at executive level
WFMS	Cannot utilize RINTIS due to no networking facilities	Not relevant	Not relevant

Table 3. RINTIS Performance in Processing Operational and Managerial Reports

From the above discussions, it is learnt that knowledge creation, sharing attitudes and influencing skills are critical for the learning process. The learning process in turn is critical in determining the success of the RINTIS adoption processes. However, all these factors are humanistic in nature. This research therefore proposes that, individual development should be the starting point of any IS development process. This is because sharing and influencing effectively within the organizational reality which is not logical, controllable or clear and requires abilities such as resilience, good judgement and clear thinking. The IS manager needs to be flexible and adept at valuing and managing the users changing requirements. By combining the aforementioned abilities appropriate knowledge and skills an IS manager is enabled to create best practices and inevitably change the development process.

However, it has to be realized that implicit in the creation of best practices in individuals are externalizing and sharing the creative I, A, R and R. This research refers to this process as the diffusion of tacit knowledge. Documenting this externalized and shared tacit knowledge enables continuous re-examination and modification processes of organizational IS. This in turn ensures that IS are subjected to continual re-examination and modification given the changing reality. Continuously challenging the current “company way,” such systems are expected to prevent the core capabilities of yesterday from becoming core rigidities of tomorrow. This feature enables the system to promote the learning process within the organization.

Individual development is also undertaken within the organization by utilizing education and training, which promotes the acquisition of new knowledge and skills. However, being equipped with the knowledge and skills of creativity, sharing attitude and influencing skill does not guarantee that the individuals will use them. There are many factors in existence-for instance, lack of confidence, anxiety, unwillingness, or confusion-that prevent individuals from using the possessed knowledge and skills. Hence development in organizations should involve increasing the self-knowledge, “unlearning” past habits and improving what Butcher et al. (1997) terms as “meta-abilities”—those personal, acquired abilities which underpin and determine how and when knowledge and skills will be used. Therefore the development of meta-abilities is central to the idea of individual development and becomes the starting point for IS development.

CONCLUSIONS

This research developed a conceptual framework based on the concepts of tacit knowledge diffusion and meta-abilities that provide the basis of a new perspective on promoting learning within the organization. The development of meta-abilities results in the individuals influencing skills and sharing attitudes. These in turn enable individuals to externalize their tacit knowledge in the form of creative ideas, actions, reactions and reflection. Knowledge stewards document the externalized tacit knowledge and transform them into explicit knowledge, such as, a business report. The systems analysts then study the documented inputs provided by the knowledge stewards and codify them.

The processes undertaken in the conceptual framework will ensure that the contents of organizational IS are subject to continual re-examination and modification given the changing environment. Continuously challenging the current “company way,” such systems are expected to prevent the core capabilities of yesterday from becoming the core rigidities of tomorrow. By internalizing a system’s operations individuals can improve actions through better knowledge and understanding. Therefore the main focus of IS for OL should be toward an individual’s meta-abilities development that develops creativity and interpretivity. There should also be an impetus towards creating the right organizational culture and infrastructure that promotes tacit knowledge sharing and externalization within and between employees.

The future directions for this research include the study of the concept of meta-abilities in other IS research areas such as IS effectiveness and implementation. Further areas where this can be used are human-computer interaction, issues pertaining to group coordination and communication and managing the impact of information technologies on organizations planning and control strategies.

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