

The Role of Meta-Abilities in the Diffusion of Tacit Knowledge and Information Systems

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ABSTRACT

Diffusing tacit knowledge, a transparent and subjective form of knowledge, needs an individual's ability to externalise and sharing of this knowledge. This paper proposes a framework for the diffusion of tacit knowledge by using the concept of meta-abilities. The argument of this paper is that meta-abilities develop individual influencing skills and sharing attitudes. These two elements in turn enable individuals to externalise their tacit knowledge in the form of creative idea, actions, reactions and reflection. Documenting these externalised and shared knowledge can provide a basis to keep Information Systems (IS) updated with relevant and reliable "best practices". From a discussion of this framework, it is concluded that the future focus for the diffusion of tacit knowledge should be toward an individual's meta-abilities development that develop creativity and interpretivity. There should also be an impetus towards creating the right organisational culture and infrastructure that promotes tacit knowledge sharing and externalisation within and between employees.

Keywords

Tacit knowledge; Meta-abilities; Influencing skills; Sharing attitudes; Action; Reaction; Reflection; Idea

1.0 INTRODUCTION

There are different levels of knowledge that can be recognised and understood in an organisation's knowledge resources (Gore and Gore, 1999). The easiest form of knowledge to understand is that of structured knowledge. This is one that can be obtained from databases and instruction books. Unstructured knowledge which is found in reports or discussion documents is possible to understand but this is not always the case. The hardest form of knowledge (in terms of understanding or detection) is tacit knowledge which is the most transparent and subjective form of knowledge (Augier and Vendelo, 1999).

An organisation's knowledge resources have pertinently been described as an iceberg (Haldin-Herrgard, 2000).

Structured, explicit knowledge is the visible top of the iceberg. This part of the knowledge resource is easy to find and recognise, and therefore easy to share. This is undertaken in organisations using different forms of technological and pedagogical methods. Beneath the surface, an invisible and hard to express form exists and this is the momentous part of the iceberg. This hidden part applies to the tacit knowledge resources in organisations. Polanyi (1966), when defining what is tacit knowledge, says that "we know more than we can express." Therefore this part of the knowledge resource can be difficult to share, and obtain.

The purpose of this paper is to provide a theoretical understanding on the framework for the diffusion of tacit knowledge which is developed using the concept of meta-abilities. The concept of meta-abilities is proposed because it consists of competencies that enable people to use their knowledge effectively (Butcher et al., 1997). In other words, this paper tries to understand: does the development of meta-abilities lead to a successful tacit knowledge diffusion and thereby provide relevant input for future IS development. This paper begins with definitions and knowledge background to the discussion area. Following that, the description of the diffusion of tacit knowledge is provided. Thereafter, a brief description of meta-abilities is offered. Before defining the framework that illustrates the relationship between meta-abilities and tacit knowledge diffusion, the rationale of the adoption of meta-abilities in the diffusion of tacit knowledge is presented. This is followed by the section that examines the implications of the framework on the IS area. In the final section, the conclusions and suggestions for further research are dealt with.

2.0 BACKGROUND TO THE DISCUSSION AREA

Currently, organisations are facing a turbulent business environment and need to develop all the resources they have (Stewart, 1997a). These resources include cash, plant, equipment, land and employees. One of the most important resources within an organisation are the employees (Saint-Onge, 1996; Stewart, 1997a). This particular group of resources have knowledge and the

knowledge that resides in the employees' mind is known as tacit knowledge (Nonaka, 1991; Nonaka and Takeuchi, 1995). Tacit knowledge is defined as "... being understood without being openly expressed" (Random House Dictionary of the English Language, 1971), or, knowledge for which people do not have words. It is obtained by internal individual processes such as, experience, reflection, internalisation or individual talents (Haldin-Herrgard, 2000). When activities are undertaken by employees, knowledge is externalised and shared in order to improve the performance and productivity of an organisation. This process of externalising and sharing tacit knowledge is known as the diffusion of tacit knowledge (Augier and Vendelo, 1999). The diffusion of tacit knowledge has been examined in the large amounts of knowledge management (KM) literature and is discussed in the next section. Further, diffusion is also one of the more important factors to be used in this paper and thus warrants a theoretical understanding.

3.0 TACIT KNOWLEDGE DIFFUSION

Saint-Onge (1996) has found that the importance of tacit knowledge rationalises the need to diffuse tacit knowledge in the organisation. This is because, it is argued, tacit knowledge implicitly develops an individual's perception and judgement. These perceptions and judgements in turn are instrumental in the organisational decision making process. Therefore understanding tacit knowledge is critical in establishing cohesion in the process of improving organisational performance. Trivialising tacit knowledge, as argued by Saint-Onge (1996), will lead to conflict between organisational members and inefficiency in an attempt to achieve organisational goals. All these justify the need to diffuse tacit knowledge in the organisation.

Other researchers have similarly stressed the importance of diffusing tacit knowledge in the organisation. Their arguments are summarised as follows:

- The explicit knowledge of "know-what" requires the more tacit "know-how" to put the "know-what" form into practice (Brown and Duguid, 1998).
- The efficiency of making decisions, serving customers or producing goods is improved by the use of tacit knowledge (Brockmann and Anthony, 1998; Bennett, 1998).
- The diffusion of tacit knowledge resolve the problem of "reinventing the wheel" which occurs when one staff leave the company (Srikantaiah and Koenig, 2000).
- Coded information is unusable without the augmentation of tacit knowledge (Brown and Duguid, 1998; Shariq, 1999).

However tacit knowledge is not easily diffused. This is due to tacit knowledge being transparent and subjective in nature (Augier and Vendelo, 1999). It is often difficult to express or document knowledge that appears obvious

and natural to oneself (Haldin-Herrgard, 2000). It is further argued that the difficulties in diffusing tacit knowledge are also linked with language, time, value and distance. On the other hand, Harvey and Butcher (1998) raise the factors that prevent individuals from sharing their tacit knowledge such as lack of confidence, anxiety, unwillingness, confusion and being carried away by strong feelings.

Since tacit knowledge is not easily measured and quantifiable, the ways of diffusing it are several. The proposed methods are examples such as, interview sessions (Brooking, 1998; Sveiby, 2001; Karhu, 2002), narrations or story telling (Stewart, 1997b; Wah, 1999; Linde, 2001), knowledge exchange protocols (Herschel et al., 2001), the repertory grid (Jankowicz, 2001), analogies or metaphors (Nonaka and Takeuchi, 1995, Stewart, 1997b) and the creation of concepts or hypotheses ("what if...") (Nonaka and Takeuchi, 1995). Basically, all these methods can only elicit the knowledge that is used to manage a person's or other peoples' tasks (Smith, 2001). Also employees have to think and articulate systematically the best actions to tackle a problematic situation.

From the understanding of the difficulty in diffusing tacit knowledge, this paper argues that systematic approaches of collecting individuals' tacit knowledge are inadequate. This is because the nature of tacit knowledge is such that it will lead to the phenomenon where people often externalise and share it through creative and spontaneous conversations (Smith, 2001). Therefore, creative and spontaneous diffusion of tacit knowledge needed to be studied. To achieve this, this paper proposes the concept of meta-abilities. Meta-abilities is also a novel concept to the IS area and thus warrants a critical understanding. The next sections defines what, why and how meta-abilities will be utilised in the diffusion of tacit knowledge.

4.0 META-ABILITIES

Meta-abilities, the concept was initially applied in the psychology area and was defined as an emotional intelligence that guides the use of other kinds of intelligence and skills (Goleman, 1995). Within the organisational development area, meta-abilities also began to be used. Since organisations are developed on the basis of people, this concept needed to be emphasised. Butcher et al. (1997) introduced the concept in their research and found that meta-abilities is grounded in the view that an individual's effective performance is inextricably linked to his/her psychological development or maturity. They defined meta-abilities as the underlying learned abilities which 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 which underpin and determine how and when knowledge will be practised within the organisation.

From Butcher et al's (1997) research, four main meta-abilities were identified:

- **Cognitive skills.** Includes the ability to notice and interpret what is happening in interpersonal situations; to entertain multiple perspectives and integrate them, to envision strategic futures, and to sort and analyse data. These skills allow organisational members to read situations, understand and resolve problems.
- **Self-knowledge.** Seeing oneself through another's eyes; knowing one's own motivations and values and distinguishing one's own needs from those of others. These skills allow organisational members to consider a range of options in their own behaviour and to make better judgements of what to do. They allow other skills and knowledge to be used more flexibly.
- **Emotional resilience.** Includes self-control and discipline, the ability to use emotion well to cope with pressure and adversity, and balance feelings about oneself. These skills allow organisational members the personal robustness to direct their energies, deal with intense situations and manage challenges healthily.
- **Personal drive.** This involves self-motivation and determination, a willingness to take responsibility and risks. This helps organisational members to persist, motivate others and meet targets.

The benefits of meta-abilities were also recognised when it was found that the initial development of meta-abilities results in improved personal influencing skills, such as communication, assertiveness, dealing with conflict, persuading and developing others. Further it was argued that meta-abilities contribute in important ways to individuals being more astute and insightful, being able to make better judgements and to see more alternative actions. As such, they are able to extend their personal sphere of influence and provide a more critical perspective. In addition, meta-abilities enable individuals to provide greater insight and are more direct in focusing attention and asking significant questions. As a consequence, they can influence key people such as the senior and middle management, serve as role models and become more challenging in the workplace.

In the aforementioned discussions, the nature of meta-abilities has been examined. However, this paper intends to examine how meta-abilities assist in the diffusion of tacit knowledge and in the following section, this is offered.

5.0 META-ABILITIES AND THE DIFFUSION OF TACIT KNOWLEDGE

Lester (1995) found that there are two views of professional practice. The first one is the technical-rational model. This professional work is seen as chiefly concerned with applying expert knowledge objectively to

analyse problems and provide the solutions. The second one is the creative-interpretive model. Under this model, the practitioner operates reflectively and intelligently in problematic situations to design and create desired outcomes rather than just solving problems. In a rapidly changing environment, individuals increasingly need to respond intelligently to unknown situations and go beyond established knowledge to create unique interpretations and outcomes. This means that there is an increasing need to shift from the technical-rational model to the creative-interpretive model in professional practice. The creative-interpretive model looks pertinent in understanding creative and spontaneous diffusion of tacit knowledge. This is due to creative, interpretive individuals have the capability to determine how and when knowledge will be practised.

Further justification for the creative-interpretive model is provided by Argyris and Schön (1974). It is argued that individuals tend to use formal or external knowledge to develop theories for rationalising and explaining their actions (espoused theories) which can differ markedly from the theories implicit in the same actions (theories-in-use). Adding to espoused theories is therefore no guarantee that theories-in-use (and therefore practice) will be modified. Indeed it may only lead to further rationalising and the apparent lesson that theoretical knowledge has little bearing on practice.

In order to obtain the creative-interpretive models, individuals need to be creative and interpretive. The dominant approach to develop individuals in general and within the 20th century is the technocratic model (Bines, 1992). It typically consists of three broad stages: (1) acquisition of the profession's fundamental knowledge-base; (2) relating this knowledge to cases and puzzles; (3) applying it through some form of supervised practice or internship. On the other hand, to specifically develop creative, interpretive individuals, Lester (1995) proposes the process of reflecting, enquiring and creating, but all within a professional practice and learning situation. Such a situation is obtained by acquiring education and training.

Education and training are primarily focused on the acquisition of new knowledge and skills. Butcher et al. (1997) argue that the importance of gaining knowledge is obvious but they are not sufficient in themselves. This is due to factors which keep individuals from using the knowledge and skills they have. For this reason they argue that individual development is much more demanding than just acquiring knowledge and skill. It involves increasing self-knowledge, unlearning past habits and improving meta-abilities. Drawing on Butcher et al's (1997) conception of meta-abilities, this paper argues that the development of meta-abilities can be used as a means of developing creative, interpretive individuals. Creative, interpretive individuals in turn have the capability to diffuse tacit knowledge in a creative and spontaneous manner.

How do meta-abilities assist in the diffusion of tacit knowledge? Butcher et al. (1997) argue that meta-abilities create two humanistic elements. The first is: meta-abilities create an individual's influencing skills and second, meta-abilities develop sharing attitudes. By practicing these influencing skills and sharing attitudes, directly or indirectly, individuals are generating creative ideas, actions, reactions and reflection.

The terms ideas, actions, reactions and reflection do present forms of activities within an organisation. Documenting these externalised and shared tacit knowledge enables continuous re-examination and modification processes of IS. Therefore, this paper sets out to conceptualise meta-abilities in the diffusion of tacit knowledge and to study its impact on IS development. Based on this conceptualisation, one framework will be offered.

6.0 FROM DEFINITIONS TO A FRAMEWORK

Having understood the research topic from a theoretical perspective, an understanding in the form of propositions has been formed and conceptualised. This section will now describe and discuss them.

- P1. Meta-abilities are positively related to influencing skills.
- P2. Meta-abilities are positively related to sharing attitudes.
- P3. Influencing skills are positively related to individual actions, reactions, reflection and ideas.
- P4. Sharing attitudes are positively related to individual actions, reactions, reflection and ideas.
- P5. Individual actions, reaction, reflection and ideas are positively related to tacit knowledge diffusion.

These propositions are illustrated in the form of a framework in Appendix 1. It can be contrastingly, seen that meta-abilities create influencing skills and sharing attitudes and, influencing skills and sharing attitudes enable individuals to generate idea (I), action (A), reaction (R) and reflection (R). This I-A-R-R continuum contains tacit knowledge that has been externalised and shared by individuals. Documenting and coding the I-A-R-R can provide useful and relevant inputs for organisational IS development. The main purpose of the framework is to establish an effective way to store "best practices" in dealing with problems or utilising resources that are available within one organisation. After the process of documenting and coding the I-A-R-R, the externalised knowledge will become information that can be accessed by all organisational members.

Using the hierarchy of IS as suggested by Laudon and Laudon (2003) (in Figure 1), the propositions that have been presented in diagrammatic form, as shown in Appendix 1, are now explained below.

Stage 1: problematic situation

A situational problem faced by an organisation or individual is the first step in highlighting the need for knowledge application and may come from internal or external pressures. External pressures can be economic and political issues as well as changing technology. Internal pressures examples are information flow, human resource, and organisational power, politics and culture.

Stage 2: internal evaluation

An individual will examine the problem situation and determine the best solutions. In order to make a decision of the situation, cognitive skills assist individuals. Further these can be used to understand and resolve problems. Self-knowledge enables individuals to use their knowledge flexibly, form better judgements for future actions and form an eagerness 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. Lastly, a personally driven ambition enables an individual to motivate ones self and others as well. All these internal processes will interact with the individual expert knowledge in order to produce rational solutions to problems.

Stage 3: influencing skills and sharing attitudes

An individual will externalise the rational solutions to problems that are produced in stage 2 using two means. Namely influencing skills and sharing attitudes. This is because, as argued by Butcher et al. (1997), meta-abilities build positive characteristics in using tacit knowledge such as a high level of confidence, willingness, resilience, good judgement and being motivated by strong feelings. All the internal elements will encourage an individual to take part in sharing of the active development of his/her organisation. Implicit in these individual responses are an individual's "influencing" and "sharing" activities within the organisation. As a result, the process of externalising tacit knowledge by an individual within the organisation becomes effective and efficient.

Stage 4: I-A-R-R continuum

When undertaking "influencing" and "sharing" activities, an individual implicitly expresses his/her tacit knowledge. This expression is either in physical form (that is related to body appearance) or verbal form (that is related to language). Examples of physical forms of knowledge expression are: actions and reactions. Whilst those for the verbal form of knowledge expression are: ideas 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 externalisation process of tacit knowledge.

Stage 5: knowledge stewards

The role of knowledge stewards is to document the externalised tacit knowledge (in I-A-R-R form), and

transform them into explicit knowledge (such as, a business report), written descriptions and instructions. To fulfil this task, knowledge stewards have to attend meetings or rational discourse sessions that occur within the organisation. Of course, trust and personal relationships between knowledge stewards and other organisational members is the basis of achieving goods results at this stage.

Stage 6: systems analyst

The role of a systems analyst is to 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 will become information.

Stage 7: information interpretations

The organisational members can get access to the “best practices” in running daily activities or solving problems by using information technology (IT). This process in turn will enrich an individual’s understanding of the organisation’s activities (tacit knowledge) and eventually provide a continuous I-A-R-R feedback for continuous IS re-examination and modification processes.

First and foremost, knowledge-based IS development should concentrate more on the creation of externalisation and sharing practice. Tacit knowledge resides in an individual’s mind and it is obtained through continuous individual learning and practical processes. Even the explicit knowledge such as instruction books, report and discussion documents can be argued to be the outcomes of tacit knowledge. Individual tacit knowledge can be in the form of skills, values, preferences and criteria. An individual will apply his/her tacit knowledge when undertaking a task. This process will slowly establish “best practices” in handling that task. To evade “reinventing the wheel” phenomena in doing that task, the need to create the right organisational culture and infrastructure in which knowledge can be shared and disseminated is important. Technology can certainly contribute in obtaining these environments by providing methods for the processing, delivery and sharing of valuable knowledge that is externalised by individuals. Therefore the focus of the people implementing knowledge-based IS might be to concentrate on providing appropriate skills to enable organisational members to make explicit their tacit knowledge. If this view is accepted then knowledge-based IS might have a more legitimate focus within human resources departments rather than IT departments.

Second, the externalisation practice is established through the individual influencing and sharing commitment and capabilities and is therefore founded on the growth of individual meta-abilities. Therefore a meta-abilities development programme can be used as a development strategy for knowledge-based IS in organisations. According to Butcher et al., (1997), initially the development of meta-abilities results in improved personal influencing skills, such as communication, assertiveness, dealing with conflict, persuading and developing others. Then, it contributes in important ways to individuals being more astute and insightful, able to make better judgements and to see more alternative actions. These internal qualities enable individuals to make explicit their tacit knowledge effectively and efficiently. This is evident from the idea, action, reaction and reflection produced when facing problems. In this paper, this is termed as the “I-A-R-R continuum”. The I-A-R-R continuum can be used as a basis of providing relevant and reliable information for continuous IS re-examination and modification processes.

Third, the framework implies the importance of IS committee members to attend the formal or informal meeting with organisational members in the organisation. The purpose of this meeting is to enable IS committee members to acquire inputs from the organisational members and to update the content of organisational IS accordingly. This situation illustrates that in order to maintain an effective and efficient IS operations, IS members must go beyond their office. It is argued that in managing organisational IS, it is not

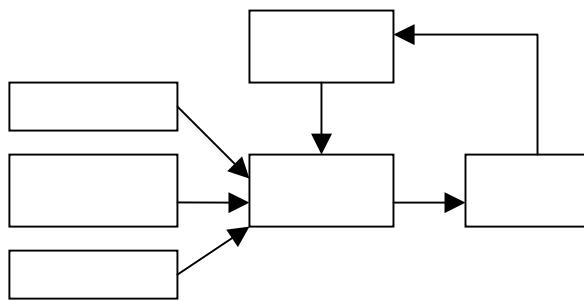


Figure 1: The hierarchy of information systems
Source: Laudon and Laudon (2003)

The conceptual framework for the diffusion of tacit knowledge presented in this section is the premise to the following discussions. In the following section, the authors intend to discuss its implications for the IS area.

7.0 IMPLICATIONS FOR THE IS AREA

The main goal of an IS is to provide information that is useful for purposeful actions within the organisation (Laudon and Laudon, 2003). Knowledge has been considered as one of the basic inputs for achieving this goal (Nonaka and Takeuchi, 1995; Stewart, 1997a; Srikantaiah and Koenig, 2000; Choo, 2001; Jarrar, 2002; Lee and Hong, 2002). What are the implications of the above framework in the development of knowledge-based IS? This will be discussed in the following paragraphs.

practical for IS members to just simply predict the answer for the following questions in their office: "What should happen if this is the case?" or "What will happen if...?". Instead they have to meet and interact with the users, build good relationships with them and obtain their feedback on IS performance. This cohesive style will develop synergistic inputs for continuous improvement of organisational IS.

Last but not least, the framework implies the importance of understanding of how to make an individual more accountable for the development of organisational knowledge-based IS. Previous literature on KM has highlighted the extensive role of individuals (Sveiby, 1997; Davenport and Prusak, 1998; Malhotra, 2000; Bhatt, 2001; Malhotra, 2002). However most of the literature discusses the role of human beings in a mechanistic and structural form without explaining how an individual can make explicit his/her knowledge. This paper attempts to shed the light on this matter by studying the role of meta-abilities in the diffusion of tacit knowledge within the organisation. In this case, meta-abilities develop an individual's commitment and capabilities to externalise and share his/her knowledge in the form of I-A-R-R continuum.

8.0 CONCLUSION

This paper has described the role of meta-abilities in the diffusion of tacit knowledge. Three main reasons for the need to adopt meta-abilities in the field of tacit knowledge diffusion are recognised: (1) tacit knowledge resides in an individual's mind; (2) the existence of factors which prevent individuals from using the knowledge and skills they have; (3) rapid changes in the business environment and organisational life. Due to the tacit knowledge residing in an individual's mind and its transparent and subjective characteristics, there is a need to develop an individual's commitment and capabilities to externalise and share them. There are also factors that prevent individuals from using the knowledge and skills they have. Therefore, there is a need to increase self-knowledge, unlearning past habits and improve abilities that underpin and determine how and when knowledge and skills will be used. Rapid changes in the business environment and organisational life are occurring and there is a need to respond intelligently to unknown situations and go beyond established knowledge to create unique interpretations and outcomes. All these highlight the need to understand the diffusion of tacit knowledge based on the situational context and orientation. The mechanistic and structural form of externalising and sharing tacit knowledge are inadequate to understand those intangible factors. Therefore the adoption of meta-abilities in the diffusion of tacit knowledge and a framework for these issues are suggested.

The framework for the diffusion of tacit knowledge is developed based on meta-abilities, tacit knowledge diffusion and professional practice literature. In the

framework, the development of meta-abilities results in the individuals influencing skills and sharing attitudes. Influencing skills and sharing attitudes in turn enable individuals to externalise their tacit knowledge in the form of creative idea, actions, reactions and reflection. Knowledge stewards will document the externalised tacit knowledge and transform them into explicit knowledge (such as, a business report), written descriptions and instructions. Systems analyst will study the documented inputs provided by knowledge stewards and codify them.

The whole process in the framework would ensure that the contents of organisational 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. Therefore the main focus of IS for KM should be toward an individual's meta-abilities development that develop creativity and interpretivity. There should also be an impetus towards creating the right organisational culture and infrastructure that promotes tacit knowledge sharing and externalisation within and between employees.

The authors of this paper are going to utilise an in-depth case study to examine the suitability of the aforementioned conceptual framework. The reasoning for this is that a deeper and meaningful appreciation of the characteristics, advantages and disadvantages of this conceptual framework can be obtained by examining theory in a practical situation.

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APPENDIX 1: META-ABILITIES FOR TACIT KNOWLEDGE DIFFUSION

