
EXPLOITING TACIT KNOWLEDGE THROUGH KNOWLEDGE MANAGEMENT TECHNOLOGIES

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Abstract: The purpose of this paper is to examine the contributions and suitability of the available knowledge management (KM) technologies, including the Web 2.0 for exploiting tacit knowledge. It proposes an integrated framework for extracting tacit knowledge in organisations, which includes Web 2.0 technologies, KM tools, organisational learning (OL) and Community of Practice (CoP). It reviews a comprehensive literature covering overview of KM theories, KM technologies and OL and identifies the current state of knowledge relating to tacit knowledge exploitation. The outcomes of the paper indicate that Internet and Web 2.0 technologies have stunning prospects for creating learning communities where tacit knowledge can be extracted from people. The author recommends that organisations should design procedures and embed them in their Web 2.0 collaborative platforms persuading employees to record their ideas and share them with other members. It is also recommended that no idea should be taken for granted in a learning community where tacit knowledge exploitation is pursued. It is envisaged that future research should adopt empirical approach involving Complex Adaptive Model for Tacit Knowledge Exploitation (CAMTaKE) and the Theory of Deferred Action in examining the effectiveness of KM technologies including Web 2.0 tools for tacit knowledge exploitation.

Key Words: Knowledge; Tacit knowledge; Knowledge Management Technologies; Organisational Learning; Web 2.0

1 INTRODUCTION

The era of knowledge economy has been increasingly transforming organisational working practices from a traditional management style into a new management role of using informal commitments and networks to set goals in order to meet customers' wants (Mullins, 2005; Miles et al, 1997). Macintosh (1999) posited that as marketplace becomes progressively more competitive and innovation increases, knowledge must correspondingly evolve and be assimilated by organisations at a faster rate so as to survive in dynamic business environments. Consequently, organisations could remain competitive in future if they embraced knowledge sharing strategies which would involve human and technological network capabilities for exploiting collective expertise and experience (Greengard, 1998; Drucker, 1998; Turban et al, 2006; Sharif, 2008).

In this respect, embedded knowledge localised in minds of individual workers or a group of employees within a particular department is potentially valuable to organisations but these unstructured, intangible, gut feelings and intuitions are usually difficult to capture and codify (Turban et al, 2006). In addition, early retirements and rising mobility of workforce can lead to loss of knowledge and at same time it takes longer to develop experience that would increase organisational knowledge (March, 1991; Macintosh, 1999). Further to the difficulty of identifying existing knowledge from outside the organisation, lack of time or reward precludes individuals from sharing knowledge in organisations (Turban et al, 2006, p. 373-374).

Similarly, while there are many technologies to support knowledge extraction, the design of some does not provide an enabling environment for members to freely communicate, share ideas and solve problems without information overload or reprisal (Chen et al, 2003; Nyame-Asiamah, 2009). Likewise, many knowledge management (KM) technologies are not fit for cognitive mapping particularly higher level learning (Chen et al, 2003; Firestone and McKlroy, 2004).

The question which unravels in the literature is: 'What KM technologies are more suitable for capturing tacit knowledge and how effective are these in knowledge creation?' As a result, the purpose of this paper is to examine the contributions and suitability of the available KM technologies, including the Web 2.0 in exploiting tacit knowledge. It proposes an integrated framework for extracting tacit knowledge in organisations, which includes Web 2.0 technologies, KM tools, organisational learning (OL) and Community of Practice (CoP).

This paper synthesises a comprehensive literature covering KM, KM technologies and OL to identify the current state of knowledge relating to tacit knowledge exploitation. It compares and contrasts previously published work as well as connecting empirically reported evidence to the issue of tacit knowledge exploitation. The paper is structured to cover a definition of knowledge, relationship between OL and KM, tacit knowledge and KM technologies, specific KM technologies for exploiting tacit knowledge, KM failure, complex adaptive model for tacit knowledge exploitation, and conclusion and recommendation.

2 KNOWLEDGE

Knowledge is very difficult to define and as a result, some scholars have tried to describe it as:

"Valuable information from human mind, includes reflection, synthesis and context" (Davenport and Prusak, 1997); "a body of facts and principles accumulated by mankind in the course of time" (Clarke, 1992); and "data and/or information that have been organised and processed to convey understanding, experience, accumulated learning, and expertise as they apply to a current problem or activity" (Turban et al, 2006, p.52).

In many instances, the definition of knowledge has been viewed from its taxonomical perspective and primarily, sources of knowledge are categorised into tacit and explicit forms (Polanyi, 1966; Nonaka, 1991). Tacit knowledge exists in the form of mental models, beliefs, values, assumptions and other know-how of individuals which are not easily conveyed (Polanyi, 1966; Nonaka, 1991; Bennet and Tomblin, 2006). On the other hand explicit knowledge resides in various forms of artifacts including procedures, texts, reports, memos and books (Nonaka, 1991; Bennet and Tomblin, 2006). In

correspondence with tacit and explicit classification, knowledge is similarly viewed as softer and harder (Hildreth et al, 1999); informal and formal (Conklin, 1996); unstructured and structured (Hahn and Subramani, 2000) and symbiotic and semiotic (Sharif, 2008).

Notwithstanding these classifications, many knowledge management writers agree that both tacit and explicit forms of knowledge are inextricably intertwined (Nonaka, 1991; McAdam et al, 2007). This interdependence of knowledge parts was represented as the duality of participation and reification (Wenger, 1998) and soft-hard duality (Hildreth et al, 1999). Yet another common agreement is the difficulty involved in exploiting softer knowledge (Polanyi, 1966; Nonaka, 1991; Hildreth et al, 1999; McAdam et al, 2007).

In economic sense, knowledge is an intellectual asset for organisations (Davenport and Prusak, 1997) but in the context of information technology, it is defined as: “Information that is contextual, relevant and actionable” (Turban et al, 2006, p. 368). In this regard, technologies for extracting, sharing and managing knowledge in a fast moving digital economy should be robustly useful for communication, collaboration, storage and retrieval of information.

3 ORGANISATIONAL LEARNING AND KNOWLEDGE MANAGEMENT

In looking at the issue of tacit knowledge extraction, Elliot (2004) proposed that KM techniques should involve the coordination of cognitive understanding of people and knowledge within a given organisation. This dimension of creating knowledge intensive organisations originated from the field of OL, which is defined as: “the capacity or process within an organisation to maintain or improve performance based on experience” (Navis, et al, 1995). In this respect, organisational knowledge obtained through learning processes, development and nurturing of new patterns of thinking are invaluable assets (March, 1991; Senge 1990; Navis et al, 1995; Davenport and Prusak, 1997). Similarly, Argyris and Schon (1978) formulated in their theory of OL that in a double loop learning, people learn to understand organisational environment, develop appropriate responses suitable for new requirements, test and evaluate learning outcomes and provide room for organisations to adapt.

From a holistic perspective, Tsang (1997) conceived that OL is an attempt to engage everyone in an organisation to learn in a conscious, systemic and synergistic way. In a related contribution, Burnes et al (2003) posited that OL and knowledge acquisition are new alternative approaches to managing organisations, as centralisation approach is no longer applicable in a complex and fast changing business environment, which requires immediate, wide and varied responses to addressing problems. From a technical point of view, Easterby-Smith and Araujo (1999) observed that OL is a way of processing, manipulating, deducing and reacting to information which is open to people through a public gateway. In his work on ‘CoP’, Wenger (1998) perceived learning as an everyday life experience in which members of common interests or ideologies interact and share knowledge on a topic relevant to a group. Members become actively engaged in a social learning environment in which they develop and spread new ideas in an attempt to improve professional practice.

On the other hand, KM is defined as: ‘the set of processes developed in an organisation to create, store, disseminate, and apply the firm’s knowledge’ (Laudon and Laudon, 2003, p. 317). In this regard, Davenport and Prusak (1997) outlined KM schemes aimed at making knowledge more visible, developing knowledge intensive culture and building a knowledge infrastructure in order to maximise the use of knowledge. Recent advancements in KM have been spearheaded through knowledge life cycle (KLC) framework in which problems in business processes arise and through which new knowledge is produced (Firestone and McElroy, 2004). To put it in another way, KLCs are mechanisms through which individuals in organisations learn new generalising and unambiguous problem-related knowledge including mental and cultural models, and find solutions for organisational adaptation (Firestone and McElroy, 2004). In other words, the connection between OL and KM is eminent, particularly in the area of double loop learning (Firestone and McElroy, 2004). Hence, OL and KM are recommended to be studied jointly (Bennet and Tomblin, 2006; Firestone and McElroy, 2004).

The issue is where do we implement OL and how should we do it? There is a reasonable agreement in the literature that the implementation should be carried out in an unpredictable environment where emergent change, task culture and network structures can be achieved (Burnes, 2003; Nyame-

Asiamah, 2009). However, opinion differs on the implementation methods (Burnes, 2003). Amongst these are: Senge's five inter-related disciplines consisting personal mastery, mental models, team learning, shared vision and system thinking (Senge, 1990), four step approach comprising knowledge acquisition, information distribution, information interpretation and organisational memory (Huber, 1991) and a three-dimension organisational learning framework (OLF) consisting mental systems, main/business processes, and individual and joint learning (Mets, 2002). Similarly, Nonaka (1991) propounded 'Knowledge Spiral Model'. Scarbrough and Swan (1999) and McCampbell et al (1999) proposed that knowledge exploitation and management strategies should include: Knowledge leadership support, knowledge friendly culture, knowledge strategy, organisational design, incentive systems and technology deployment. Likewise, Bhatt (2001) recommended five stages of harnessing knowledge, which are knowledge creation, knowledge validation, knowledge presentation, knowledge distribution and knowledge application. Firestone and McElroy (2004) further conceptualised at least nine processes of managing knowledge and these include knowledge production, knowledge integration and changing knowledge processing rules.

Despite differing views on the above approaches, these authors aim at generating new ideas, sharing them amongst individuals and groups, and using a new kind of collective thinking for institutional improvement or transformation. In effect, they all try to achieve agile organisations which exhibit the following features: Effective and efficient use of communication networks; easily accessible information and knowledge repositories; software for updating and integrating new information, systems and attitudes for improving managerial processes and business value chain; and ability to adopt renovations (Laudon and Laudon, 2003; Mullins, 2005; Turban et al, 2006).

4 TACIT KNOWLEDGE AND KM TECHNOLOGIES

Traditionally, tacit knowledge of individuals was extracted through storytelling techniques where people sat around fire camps and swapped stories in village communities (Denning, 2000). Storytelling unveils unseen tacit knowledge and generates meanings from sentences, which are told messily from narratives to reminiscence. Storytelling is therefore capable to connect knowledge with emerging context, introduce masterly skills, provide meanings for association and structures, create an environment for dialogue, explain adaptive changes, reveal the creativity of an individual and reconstruct authenticity (Denning, 2000). Storytelling is therefore an effective learning technique for persuading people to externalise their values and beliefs, to share their knowledge, to work together, to change and to lead them into the future.

In his 'Knowledge Spiral Model', Nonaka (1991) noted that knowledge creation is a continuous process of interaction between tacit and explicit knowledge of human activities which twirl around socialisation, externalisation, combination and internalisation stages. According to Nonaka (1991), socialisation involves discussions and sharing of implicit knowledge, experiences and observations amongst individuals with no intention of transferring such ideas into explicit knowledge. Externalisation involves various processes which translate tacit knowledge into explicit form while combination re-arranges existing explicit knowledge into a more structured form for an organisational use. Finally, internalisation converts explicit knowledge into tacit form by learning through codified knowledge and ascribe to it.

In relation to the above, March (1991) proposed a Model of Mutual Learning which examines how individuals and organisations learn to increase and utilise knowledge in his oft-cited publication on: 'Exploration and Exploitation of Organisational Learning'. March (1991) recognised that employees who are slowly socialised into the organisational procedures and beliefs are likely to increase the organisational code, and more importantly the knowledge they contribute remains in the organisation even after their departure. In the model, March (1991) assumed that:

- a reality which is independent of belief about it
- the continuous modification of individuals' beliefs resulting from organisational socialisation
- adaptation of organisational code to the beliefs of individuals

In this respect, tacit knowledge can be exploited through externalisation where as explicit knowledge can be acquired through internalisation.

Similarly, McAdam et al (2007) introduced an interesting model of knowledge which examines the boundaries of tacit knowledge and how it can be transcended into explicit knowledge. They postulated that tacit knowledge is a separable knowledge and at the same time an embodiment of all knowledge which can or cannot be converted into tacit knowledge. They maintain that through codification and conversion mechanisms, tacit knowledge can be externalised and shared within a social domain. In this respect, McAdam et al (2007) share a common view with Bennet and Tomblin (2006) on tacit knowledge exploitation. However, McAdam et al (2007) place emphasis on experience and social interaction rather than codification and externalisation of mental models.

Looking at the knowledge model from a different angle, Bennet and Tomblin (2006) examined knowledge including tacit knowledge from an input-output framework in which knowledge is considered as input and output of learning as well as a source of knowledge management. In addition to marrying KM and OL as a synergistic paradigm for managing organisations, Bennet and Tomblin (2006) incorporated information and communication technology (ICT) as enablement for individuals and groups' learning and knowledge processing tools. Similarly, Firestone and McElroy (2004) uphold the same conception of creating knowledge through a combination of OL and KM philosophies. In contrast to the inclusion of ICT in Bennet and Tomblin's knowledge creation model, Firestone and McElroy (2004) conceptualised that an organisation should be seen as an open enterprise with a distributed knowledge-processing environment which continuously adapts to its changing environment. In this regard, they proposed that knowledge exploitation process should be considered within a framework of KM, OL and complex adaptive system (CAS) perspectives.

KM technologies are built to support continuous improvement of business processes and they include communication, collaboration, and networking functionality to support knowledge capture, storage, structure and distribution (Scarborough and Swan, 1999).

Examples of the technologies are e-mail, the Internet, intranet, fax machines and telephones for communication; collaborative computing tools including groupware and electronic brainstorming capabilities; and databases including data marts and data warehouse for storage and retrieval of information (Turban et al, 2006, p. 377-381; Laudon and Laudon, 2003, p. 318-327). For instance, BP exploited knowledge stored in the minds of its employees through the use of communication technologies including e-mail, internal web and video conferencing, which linked employees in cellular forms (Brooks, 2000). Similarly, Dotsika and Patrick (2006) identified that proportion of corporate knowledge management systems often depend on Internet-based collaborative computing tools including corporate portals, knowledge management suites and intranets.

Likewise, Chen et al (2003) disclosed a number of technologies which have capabilities to support building and dissemination of individuals' shared mental models within organisations. These include executive cognitive support, expert systems, learning laboratory, collective and cognitive mapping systems and most of them have functionalities to represent, modify and share individuals and organisational members' personal convictions.

5 SPECIFIC KM TECHNOLOGIES FOR TACIT KNOWLEDGE EXTRACTION

In this section, we would examine some technologies used for exploiting tacit knowledge and how they relate to the models of OL and knowledge creation. These include executive cognitive support, learning laboratory, collective cognitive mapping systems, enterprise knowledge portals and personal information portals, knowledge management suites, emails, electronic discussion boards and brainstorming applications.

5.1 Learning Laboratory

This is a consultative technique of higher order learning where individuals' assumptions, beliefs and insights are brought into action in a simulated problem solving environment. According to Pourdehnad et al (2002), such environment is: "Neutral and non-threatening". Learning Laboratory is a form of a 'virtual world' often called a microworld system where individuals can examine the effects of their own decisions and share them with the other agents in a collaborated environment (Chen et al, 2003). Learning Laboratory helps participants to develop deeper understanding of their beliefs and discover inconsistencies in their mental models and that of their organisations (Pourdehnad et al, 2002). In this regard, an interactive experimentation and learning between members in the team allow the exploitation of individuals' tacit knowledge.

In a recent success story, United Parcel Service Inc (UPS) used Integrad Learning Laboratory comprising online learning, three-dimensional models, podcasts, videos, and traditional hands-on and classroom methods for exploiting new drivers and trainees skills on the task of carrying a package across a slippery surface without getting hurt (Ketter, 2008). UPS used focus group involving hundreds of UPS staff, eight professors and 16 students from Virgin Tech to design the Integrad Learning Laboratory; and the company has acknowledged that the safety performance of their drivers since the launch of the technology has exceeded their expectations (Ketter, 2008).

However, one major disadvantage of this tool is that people may not premeditate careful over their actions as simulated spaces are not reality (Chen et al, 2003).

5.2 Collective Cognitive Mapping System

This is an archetype system consisting four key functionalities for exploiting soft knowledge: An episodic memory representing a container of individual cognitive maps; organisational memory representing a reservoir of collective cognitive maps; a local cognitive map generator which translates individual mental models into graphical representations; and a central collective cognitive map generator which exploit cognitive maps of all members and use them for collective problem solving. Chen et al (2003) emphasised that collective cognitive mapping systems have capabilities to assist individual members in an organisation to articulate, share and synthesise their visions with their peers. In other words, collective cognitive mapping systems are tools for replicating the mental model discipline of Senge (1990), as it can support people to unearth their internal pictures of realities, bring them to surface and hold them thoroughly to examination. In this case, individuals' tacit knowledge become authentic for organisational use thereby confirming the applicability of storytelling technique (Denning, 2000) and, socialisation and externalisation processes of knowledge creation (Nonaka, 1991).

5.3 Executive Cognitive Support

This system helps higher level learning and knowledge creation, and provides opportunity for organisational executives to identify tacit knowledge and externalise it into graphical representation (Chen et al, 2003). This is often referred to as Executive Support System (ESS) and Laudon and Laudon (2003, p. 45) defines it as: "Information systems at the organisation's strategic level designed to address unstructured decision making through advanced graphics and communications". One great advantage of ESS is that they are tailored to meet the executive decision style and executives with minimum computer skills can use the user-friendly tools of ESS to generate graphic comparisons of data on business processes (Laudon and Laudon, 2003, p. 367). In addition, ESS provides easy and quick opportunities for managers to identify problems themselves instead of placing reliance on their subordinates (Leidner and Elam, 1995).

5.4 Enterprise Knowledge Portals and Personal Information Portals

Enterprise Knowledge Portals (EKPs) are information gateways which provide access to internal and external sources of information including web-browser interfaces, structured and unstructured content management, integrated data and applications, and collaborative work capabilities (Campos, 2008). In other words, EKPs include internet, intranet and extranet sites of organisations (Dfouni and Croteau, 2004).

Internet is defined as: 'International network of networks that is collection of hundreds of thousands of private and public networks' (Laudon and Laudon, 2003, p. 17). Thus, Internet provides tools for inter-group contact with advantages of creating a secure environment, minimising anxiety, removing geographical barriers, creating equal status and maintaining friendly atmosphere in such contacts (Amichai-Hamburger and McKenna, 2006). Intranets are corporate communication networks which are normally linked to the Internet technologies with restricted access to the internal users of organisations (Turban et al, 2006). Intranets provide platforms, especially emails for shared individual and corporate knowledge as well as improving creativity and innovation (Hills, 1997). Contrary, extranet is a private intranet which allows access to authorised third parties (Laudon and Laudon, 2003, p. 23).

Therefore, EKPs provide collaborative platforms for knowledge production and sharing which can be tested and incorporated into previously knowledge claims capabilities (Davenport and Prusak, 1997; Campos, 2008). In view of the above, the second generation of web technologies (Web 2.0) which include social network sites, wikis and audio podcasting, video sharing and collaborative tools, and online chat technologies are very effective for learning and knowledge creation.

Emergence of Web 2.0 technologies have provided opportunity for many personal information portals which contain knowledge confined to individuals to be migrated into EKPs. In this respect, some professional bodies and educational institutions are using web-based Continuing Professional Development (CPD) and Virtual Learning Environment (VLE) to enhance the transfer of tacit knowledge into explicit knowledge (Harris, 2008).

In relation to the above, Harris (2008) elicited the views of 200 business managers through personal and focus group interviews, and mail-based questionnaires to find an effective technique for CPD support within the University of Wolverhampton. The author established that a web-based portal would be an ideal KM technology to support an effective CPD delivery within the university. In addition, Harris (2008) concluded that smart phones like Blackberry support the conversion of Personal Digital Assistant (PDA) platforms into a Collaborative Learning Environment where learners could share ideas and experiences. Similarly, Arani (2008) established that mobile-based interactive learning tools like SMS and PDA are useful tool for classroom interaction, communication and feedback. In his research involving literature review and a survey of forty English for Medical Purpose students, he identified that over 90 percent of the respondents found 'SMS Feedback' very useful, efficient, interesting, interactive and preferred method of communication among learners.

However, the cost of using SMS as a learning tool was considered expensive (Arani, 2008). In a related argument, Dotsika and Patrick (2006) posited that a 24/7 technologically linked world throws information by bucket when only glassful is needed. In other words, the deployment of intranet on a firm's Internet site may lead to unproductive staff hours as some staff may be tempted to stay on the internet browsing some site for their own interest.

5.5 Knowledge Management Suites

These are complete KM solutions which integrate communication, collaboration and storage technologies into a unified package (Turban et al, 2006; Dotsika and Patrick, 2006). As a strategy to learn more about its customers and meet their expectations, Commerce Bank deployed a workflow-based knowledge management system which could offer immediate online solutions to staff and customers' queries. Thus, the collaboration and communication capabilities of this technology help employees to learn business processes, unlock their tacit knowledge and share them among their peers. In the case of Commerce Bank, the development of Knowledge Management Suite, Wow

Answer Guide proved very effective with a weekly cost saving of \$20,000.00 (Turban et al, 2006, p. 385).

5.6 Email

In his study involving the effective framework for CPD support within the University of Wolverhampton, Harris (2008) observed that email was highly ranked as an effective and most important method of knowledge conversion from one person to another. Similarly, Dfouni and Croteau (2004) identified email as a topmost socialisation tool for extracting and sharing unstructured knowledge. The authors used web-based Delphi survey to gather data on ten popular KM technologies from 150 Knowledge Leaders and mapped them against the Nonaka and Takeuchi's knowledge creation. Overall, email was ranked as third effective KM initiative tool but it attracted far higher rating than electronic discussion boards which was ranked eighth and also classified under tacit-tacit quadrant (Dfouni and Croteau, 2004).

5.7 Electronic Discussion Boards and Brainstorming Applications

Electronic Discussion Boards are virtual communication tools which allow individuals in 'CoP' to post questions and comments online and engage others in discussions. These virtual engagement environments are often called message boards, bulletin boards and discussion forums. As highlighted above, electronic discussion boards are useful KM tools for sharing beliefs and mental models of individuals (Dfouni and Croteau, 2004). Such virtual discussions resonate the patterns of primal narratives of storytelling and convey the potent meanings and implications behind assumptions for organisational transformation. To put in a different way, these technologies reaffirm the rationale behind Denning's storytelling techniques (Denning, 2000) and correspond to the participation and reification duality map postulated by Wenger (1988) in his work on CoP.

Brainstorming Applications are resourceful tools for sharing, recording, organising and evaluating ideas, and thereby useful for creating knowledge. These applications support creative thinking and translate tacit understanding into explicit knowledge (Offsey, 1997). In the context of Denning's storytelling technique, collective cognitive mapping tools repeal the conventional way of discussing ideas at the highest level and enact the order of interacting with people at the middle or lowest level for the needed information (Denning, 2000).

One potential disadvantage of electronic discussion is that some governments uphold stiff rules regarding people's conviction or what they may say (Tolley, 2008). In particular, Tolley (2008) indicated that the Italian government would shut down blogging servers and prevent people from articulating their views online if she could.

6 KNOWLEDGE MANAGEMENT FAILURE

Despite the effort being made by organisations to use technologies in their knowledge creation and management strategies, many publications have revealed evidence of KM failure in organisations (Ambrose, 2000; Desouza, 2003; Turban et al, 2005). The reasons for this include: Failing to communicate KM strategies well with staff, refusal of best employees to publish their good ideas on KM platform, staff showing lack of interest when KM systems become fully implemented, poor content management techniques and lack of incentives for KM system users (Turban et al, 2005; Barth 2000). Others maintain that Web 2.0 and social software developers usually base their design approaches on 'technology to the user' (Dotsika and Patrick, 2006) and this undermines the cognitive maps of individuals who will use the tools for knowledge extraction (Chen et al, 2003; Firestone and McElroy, 2004).

Expert System failed in 1980s because it was focused more on the harder aspect of knowledge at the expense of softer knowledge thereby making it inadequate for extracting tacit knowledge (Hildreth et al, 1999). In view of this, Patel (2005) postulated in his Theory of Deferred Action (ToDA) that KM systems and social software need to be designed in the context of a valid theory of organised action and this needs pursuing.

7 COMPLEX ADAPTIVE MODEL FOR TACIT KNOWLEDGE EXPLOITATION

Drawing from the inspiration of the above knowledge and learning models: Model of Mutual Learning (March, 1991); Knowledge Spiral Model (Nonaka, 1991), Model of Tacit and Explicit Knowledge (McAdam et al, 2007); KM, OL and ICT (Bennet and Tomblin, 2006); KM, OL and CAS (Firestone and McElroy, 2004) and Storytelling (Denning, 2000), we have proposed a new framework for tacit knowledge exploitation. Please see Figure 1 below. The Complex Adaptive Model for Tacit Knowledge Exploitation (CAMTaKE) combines KM technologies and Web 2.0 tools with the fundamental ideas of a Mutual Learning, CoP, Storytelling, OL and KM models in a CAS where individuals, teams and groups use multiple interactions to extract latent knowledge.

Within a CAS, various agents of learning exploit new knowledge and solve problems in sincerity as demonstrated in the funnel in Figure 1. Thus, there is a distributed knowledge-processing platform which creates equal opportunity and autonomy for participants' interaction without reprisal. Tacit knowledge is therefore exploited and shared between individuals, teams and groups, and transferred into all forms of explicit knowledge through externalisation. Reified knowledge is further developed to invigorate agents' cognitive maps for emerging knowledge and sharing of new experiences. The inclusion of the Web 2.0 collaborative tools makes the CAMTaKE more effective for creating knowledge at a faster speed.

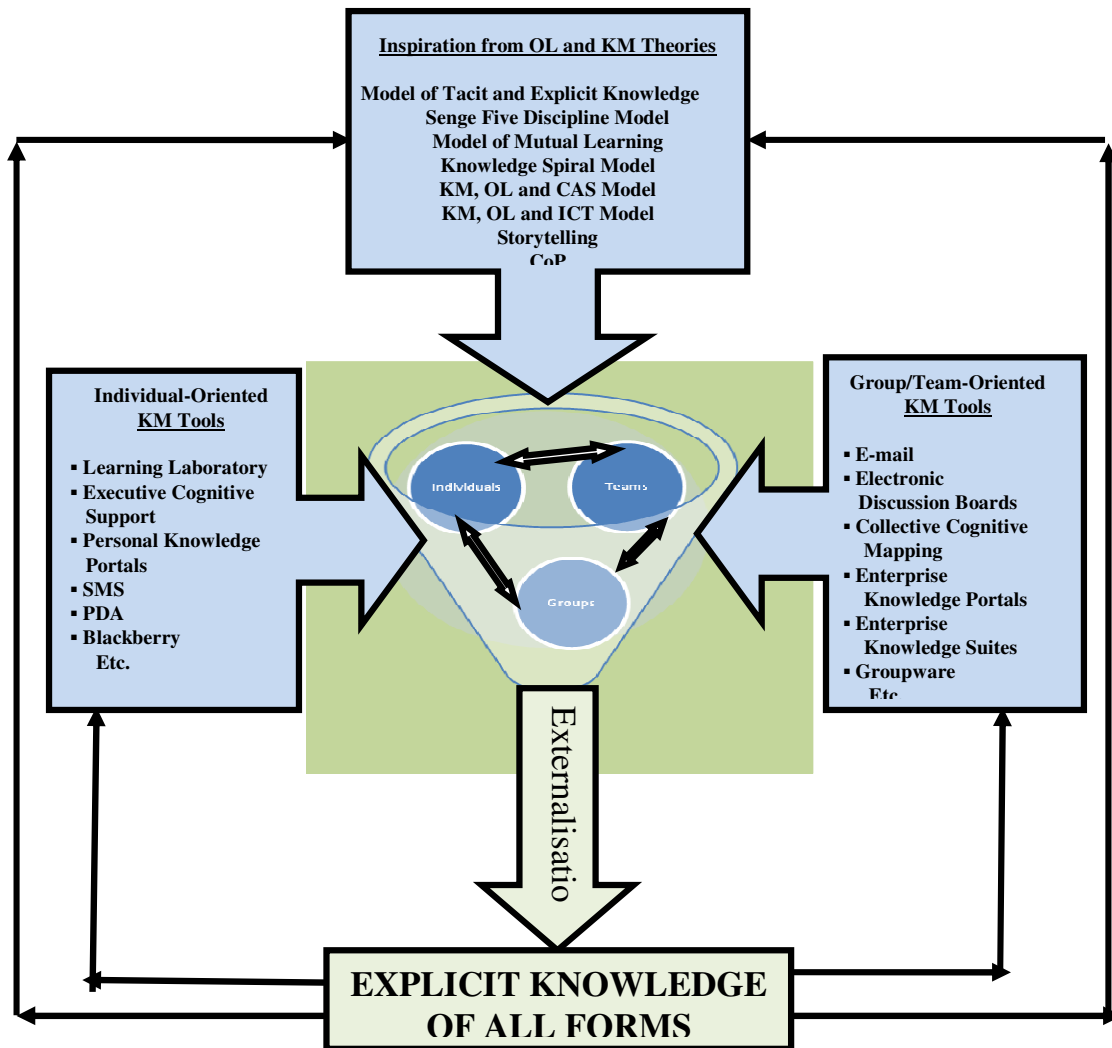


Figure 1: Complex Adaptive Model for Tacit Knowledge Exploitation (CAMTaKE)

8 CONCLUSION AND RECOMMENDATION

One key point of noting is that the above KM technologies provide enormous support for creating knowledge not previously known to a 'learning community'. Once hidden knowledge is reified and shared, organisations can further explore it for knowledge diffusion and management innovation. The overall knowledge powerhouse begins to expand. In this case, departure or retirement of knowledge workers will not have a huge negative impact on business processes. Therefore, we have to give credit to KM technologies and tools, especially the web enabled ones which readily support group learning, multiple collaborations and communication, to unearth tacit knowledge. It is evident from our discussion that these emerging technologies have brought huge improvements in many businesses and continue to support organisational transformation.

We have also established that technologies for extracting tacit knowledge should be designed in the confines of individuals' cognitive behaviour while human techniques should be formed around natural processes of individuals. In other words, extraction of soft knowledge should be considered in a dynamically real time environment where there is a continuous interaction among learners who harness user-friendly tools for learning. Evidence from this paper has revealed that Internet and Web 2.0 technologies have stunning prospects for creating learning communities for people and extracting tacit knowledge. However, the issues are: What happens if people refuse or stop sharing their ideas and experiences on these platforms? Should we use sanctions to enforce them or should we use more democratic working ethics to persuade these individuals? Can we still claim the possibilities of exploiting tacit knowledge through KM technologies in such circumstances? Thus, the effectiveness of these tools in tacit knowledge creation needs further empirical study, particularly in relation to human responses to emerging learning technologies.

Notwithstanding these, it is believed that the status quo of digital economy will not detract the world from using Internet and Web 2.0 technologies and as a result, organisations need to find as many channels as possible to attract their employees into learning communities. In this respect, the author recommends that organisations should design procedures and embed them in their Web 2.0 collaborative platforms persuading employees to record their ideas and share them with 'X' number of staff, depending on the size of a particular setting. It is imperative to stress that no idea should be taken for granted in a learning community where an organisation wants to exploit tacit knowledge for transformation.

As a consequence of the above, we recommend that knowledge creation and management strategies must encompass transparent and multiple interactions of organisational agents, shared mental maps, new generation of collaborative and distributed knowledge technologies including Web 2.0, absolute commitments of organisational members and self-organising attitude. We also propose that researchers and practitioners should consider the integration of these strategies (CAMTaKE) for tacit knowledge exploitation and management for organisational transformation. Design of KM technologies also needs to consider the application of ToDA.

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