REVIEW PAPER

Refocusing the Concept and Application of Knowledge Management

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ABSTRACT

In the present knowledge vibrant society, there is a need of new knowledge creation and knowledge sharing, storage as well as refinement. Knowledge is vital to any organization and its power. Knowledge management (KM) is a process consisting of the stages; storing, gathering, structuring, sharing, controlling, generating, distributing, codifying, using and exploiting. Knowledge management is not about managing knowledge for knowledge's sake; the overall objective is to create value and to leverage, improve, and refine the competences and knowledge assets to meet organizational goals and targets. Knowledge management is essentially about getting the right knowledge to the right person at the right time. It places a focus on knowledge as an actual asset, rather than as something intangible. In so doing, it enables the firm to better protect and exploit what it knows, and to improve and focus its knowledge development efforts to match its needs. Knowledge management therefore implies a strong tie to organizational goals and strategy, and it involves the management of knowledge that is useful for some purpose and which creates value for the organization. Knowledge and information are used interchangeably by so many people. Consequently, Knowledge Management solutions even today which are essentially nothing more than information or document management systems, that is which handle data, information, or perhaps even explicit knowledge, but which do not touch the most essential part of knowledge management - tacit knowledge. In addition, Knowledge management basically focuses on the knowledge, understanding, and wisdom and deals with the both codified and uncodified knowledge. Uncodified knowledge may be viewed as the most valuable type of knowledge which is found in the minds of practitioners and is unarticulated, context-based, and experience-based. Management of knowledge in agriculture is much needed in present scenario as there are various players in agriculture and allied sectors, serving the diverse needs of their clienteles on their level. The present paper reviews the knowledge management process and knowledge management cycle with its benefits and importance in organisation, agriculture and allied.

***Key word**: Knowledge; KM Process; KM Concept; KM Stages; KM tools;*

Knowledge is vital power and success or failure of any organization depends on how the knowledge is processed and utilized in its day to day and future operations. In the present e-era, knowledge is very important concept not only to utilize the available expertise but also to retrieve it as per the needs and situations. Knowledge is a familiarity, awareness or understanding of someone or something, such as facts, information, descriptions or skills, which is acquired through experience or education by perceiving, discovering or learning. It is generated and processed through a cyclic process which may be called as knowledge management process or simply knowledge management. Before discussing about the knowledge management process, it is good to know about the basic difference between Knowledge, Information and Data.

Data: Facts and figures which relay something specific, but which are not organized in any way and which provide no further information regarding patterns, context, etc. The definition for data presented by *Thierauf (1999)* is: "unstructured facts and figures that have the least impact on the typical manager."

Information: For data to become information, it must be contextualized, categorized, calculated and condensed (*Davenport and Prusak, 2000*). Information thus paints a bigger picture; it is data with

relevance and purpose (*Bali et al., 2009*). Essentially information is found "in answers to questions that begin with such words as who, what, where, when, and how many" (*Ackoff, 1999*).

Knowledge: Knowledge is closely linked to doing and implies know-how and understanding. The knowledge possessed by each individual is a product of his experience, and encompasses the norms by which he evaluates new inputs from his surroundings (*Davenport and Prusak, 2000*). The definition presented by *Gamble and Blackwell (2001)* is closely based on a previous definition by Davenport & Prusak:

"Knowledge is a fluid mix of framed experience, values, contextual information, expert insight, and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information. It originates and is applied in the mind of the knower's. In organizations it often becomes embedded not only in documents or repositories, but also in organizational routines, practices and norms."

Types of Knowledge

Understanding the different forms that knowledge can exist in, and thereby being able to distinguish between various types of knowledge, is an essential step for knowledge management (KM). There are two types of knowledge: Tacit Knowledge (informal knowledge) and explicit (formal knowledge) knowledge. Tacit knowledge represents internalized knowledge that an individual may not be consciously aware of, such as how he or she accomplishes particular tasks whereas explicit knowledge represents knowledge that the individual holds consciously in mental focus, in a form that can easily be communicated to others. (*Alavi and Leidner 2001*). According to *Boateng (2006)*, Knowledge is said to be explicit (formal) when it is based on scientific evidence, whose validity and reliability can be tested over a reasonable period of time. Tacit (informal) knowledge is experiential in nature and is acquired after an exemplary practice has been put to use over a period of time. Explicit knowledge encloses the words/ terminologies, diagrams like tables and graphs, or photographs/snaps *(Collins, 2001)* is scientific or intellectual facts or information that is expressed in proper language, like instruction manuals, arithmetical/ statistical expressions/terminologies, copyright and patents (*Smith, 2001*). Tacit knowledge is an individual type of knowledge, which acquire from through experience (*Augier, Shari and Vendelo, 2001*). Tacit knowledge can be competitive edge because it's tougher to specify, duplicate, and share (*Meyer, 1997*). There is another type of knowledge which is called as embedded knowledge. Embedded knowledge refers to the knowledge that is locked in processes, products, culture, routines, artifacts, or structures (*Horvath* 2000; *Gamble and Blackwell*, 2001). Knowledge is embedded either formally, such as through a management initiative to formalize a certain beneficial routine, or informally as the organization uses and applies the other two knowledge types. The challenges in managing embedded knowledge vary considerably and will often differ from embodied tacit knowledge.

Embedded knowledge is found in rules, processes, manuals, organizational culture, codes of conduct, ethics, products, etc. It is important to note, that while embedded knowledge can exist in explicit sources (i.e. a rule can be written in a manual), the knowledge itself is not explicit, i.e. it is not immediately apparent why doing something this way is beneficial to the organization.

Knowledge Management

Knowledge Management (KM) is a big motivation for organization (*Carrillo, 2000*) and is the one of the modern areas of research in the last decade (*Kalpic and Bernus, 2006)*. It has extensive significance because its explain administrators/ managers' concerns and builds attentiveness of knowledge as a cost- effective plus point (*Spender, 2002*). Knowledge management process consists of four processes including capturing, arranging, refining and shifting (*Awad and Ghaziri, 2004*). According to Alavi and Leidner (2001), KM process contains phases: make/create, store/retrieve, shift and use. KM conceptualizes through ideas, assumptions, perceptions and models (*Earl, 2001; Kakabadse et al., 2003*).

The term 'Knowledge management' consists of two term, knowledge and management. According to Webster's Dictionary, knowledge is "the fact or condition of knowing something with familiarity gained through experience or association". Management means, the function that coordinates the efforts of people to accomplish goals and objectives using available resources efficiently and effectively. In other terms, Management is the process of reaching organizational goals by working with and through people and other organizational resources.

Thus, Knowledge management (KM) is the process of capturing, developing, sharing, and effectively using organisational knowledge (*Davenport, 1994*). Based on available literature consultation, different author's views on defining KM is presented in following text.

According *to Metaxiotis et al., (2005)* KM can be understood as the exploitation and development of the knowledge assets within an organization, aimed at furthering the goals and objectives of the organization. *Kinney (1998)* also defined KM as 'the process, by which an organization creates, captures, acquires and uses knowledge to support and improve its performance'. Knowledge management is essentially about getting the right knowledge to the right person at the right time. Previously, KM was considered as the process of applying a systematic approach for capturing, restructuring, managing and disseminating knowledge within an organization to reduce cost, work faster. So, Knowledge management issues include developing, implementing and maintaining the appropriate technical and organisational infrastructure to enable knowledge sharing whereas Knowledge Management System (KMS) refers to a (generally IT based) system for managing knowledge in organizations for supporting creation, capture, storage and dissemination of information. Implementing knowledge management thus has several dimensions including:

- *Knowledge Management Strategy:* Knowledge management strategy must be dependent on corporate strategy. The objective is to manage, share, and create relevant knowledge assets that will help meet tactical and strategic requirements.
- *Organizational Culture:* The organizational culture influences the way people interact, the context within which knowledge is created, the resistance they will have towards certain changes, and ultimately the way they share (or the way they do not share) knowledge.
- *Organizational Processes:* The right processes, environments, and systems that enable KM to be implemented in the organization.
- *Management and Leadership:* KM requires competent and experienced leadership at all levels. There are a wide variety of KM-related roles that an organization may or may not need to implement, including a CKO, knowledge managers, knowledge brokers and so on.
- *Technology:* The systems, tools, and technologies that fit the organization's requirements - properly designed and implemented.
- *Politics:* The long-term support to implement and sustain initiatives that involve virtually all organizational functions, which may be costly to implement (both from the perspective of time and money), and which often do not have a directly visible return on investment.

Difference between Information Management and KM

Information Management	Knowledge Management
•Focus on data and information	•Focus on knowledge, understanding, and wisdom
•Deal with unstructured and structured facts and figures.	•*Deal with both codified and uncodified knowledge which is the most valuable type of knowledge - is found in the minds of practitioners and is unarticulated, context-based, and experience-based.*
•Benefit greatly from technology, since the information being conveyed is already codified and in an easily transferrable form.	• *Technology is useful, but KM's focus is on people and processes. The most valuable knowledge cannot effectively be (directly) transferred with technology; it must be passed on directly from person to person.*
•Focus on organizing, analyzing, and retrieving - again due to the codified nature of the information.	• *Focus on locating, understanding, enabling, and encouraging - by creating environments, cultures, processes, etc. where knowledge is shared and created.*
•Is largely about know-what, i.e. it offers a fact that you can then use to help create useful knowledge.	• *Is largely about know-how, know-why, and know-who.*
•Is easy to copy - due to its codified and easily transferrable nature.	•*Is hard to copy - at least regarding the tacit elements. The connection to experience and context makes tacit knowledge extremely difficult to copy.*

Usefulness of Knowledge Management : KM is useful because it places a focus on knowledge as an actual asset, rather than as something intangible. In so doing, it enables the firm to better protect and exploit what it knows, and to improve and focus its knowledge development efforts to match its needs. In other words:

- It helps firms learn from past mistakes and successes.
- It better exploits existing knowledge assets by re-deploying them in areas where the firm stands to gain something, e.g. using knowledge from one department to improve or create a product in another department, modifying knowledge from a past process to create a new solution, etc.
- It promotes a long term focus on developing the right competencies and skills and removing obsolete knowledge.
- It enhances the firm's ability to innovate.
- It enhances the firm's ability to protect its key knowledge and competencies from being lost or copied.

To sum up, it can be concluded that Knowledge Management (KM) is a term applied to techniques used for the systematic collection, transfer, security and management of information within organizations [*Gerhard,* 2006].

Implication of Knowledge Management in Organisation : In order to enhance organisational knowledge, KM must therefore be involved across the entire knowledge spectrum. It must help knowledge development at all levels and facilitate and promote its diffusion to individuals, groups, and/or across the entire firm, in accordance with the organization's requirements. KM must manage organizational knowledge storage and retrieval capabilities, and create an environment conducive to learning and knowledge sharing. Similarly it must be involved in tapping external sources of knowledge whenever these are necessary for the development of the organizational knowledge resources. To a large degree, KM is therefore dependent on the understanding and management of organizational learning, organizational memory, knowledge sharing, knowledge creation, and organizational culture.

Perspectives on Knowledge Management : A broad range of thoughts on the KM discipline exist; approaches vary by author and school (*Bray, David, 2013; Langton, 2006*). As the discipline matures, academic debates have increased regarding both the theory and practice of KM, to include the following perspectives:

- Techno-centric with a focus on technology, ideally those that enhance knowledge sharing and creation (*Alavi et al.*, 1999; *Rosner et al.*, 1998)
- Organisational with a focus on how an organisation can be designed to facilitate knowledge processes best (*Addicot et al.*, 2006).
- Ecological with a focus on the interaction of people, identity, knowledge, and environmental factors as a complex adaptive system akin to a natural ecosystem (*Bray; Carlson*, 2013).

Regardless of the school of thought, core components of KM include people, processes, technology (or) culture, structure, technology, depending on the specific perspective (*Spender and Scherer*, 2007). *Ruggles and Holtshouse (1999)* identified the following key attributes of knowledge management:

- Generating new knowledge
- Accessing valuable knowledge from outside sources
- Using accessible knowledge in decision making
- Embedding knowledge in processes, products and/ or services
- Representing knowledge in documents, databases, and software
- Facilitating knowledge growth through culture and incentives
- Transferring existing knowledge into other parts of the organization
- Measuring the value of knowledge assets and/or impact of knowledge management

Knowledge Management Technologies: Knowledge Management (KM) technology can be divided into the following general categories (*Gupta et al.*, 2004; *Andriessen*, 2004; *Rao*, 2005; *Calvin*, 2005);

- Groupware
- Workflow
- Content/Document Management
- Enterprise Portals
- e-Learning
- Scheduling and planning
- Tele-presence

Groupware refers to technologies that facilitate collaboration and sharing of organizational information. Workflow tools allow the representation of processes

associated with the creation, use, and maintenance of organizational knowledge. Content/Document Management systems are systems designed to automate the process of creating web content and/or documents within an organization. Enterprise Portals are web sites that aggregate information across the entire organization or for groups within the organization such as project teams. E-Learning technology enables organizations to create customized training and education software and include lesson plans, monitoring progress against learning goals, online classes, etc. e-Learning technology enables organizations to significantly reduce the cost of training and educating their members. Scheduling and planning tools automate the creation and maintenance of an organization's schedule: scheduling meetings, notifying people of a meeting, etc. Tele-presence technology enables individuals to have virtual meetings rather than having to be in the same place. Videoconferencing is the most obvious example.

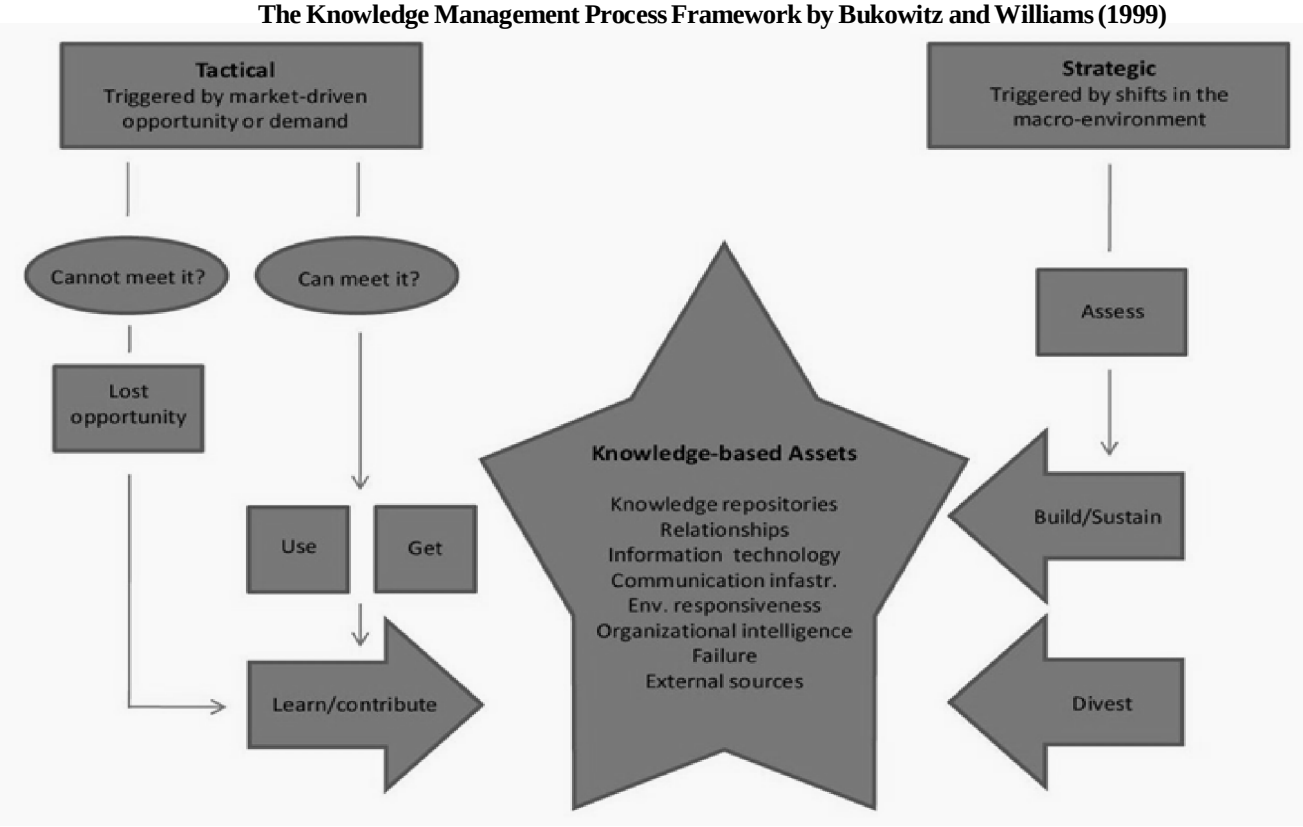
Knowledge Management Models: There are three basic models available in KM. These are KM process framework, KM matrix and KM process model.

This KM model depicts the process that defines the strategy for management to build, divest, and enhance knowledge assets. It is a model that emphasizes the "why" and "when" aspects. The strengths of this model rest on its strategic focus, which essentially puts knowledge management action into context. The model provides a great overview of the strategy behind KM but it does not include any deeper insight into what initiatives are suitable in a given instance.

The KM Matrix by Gamble and Blackwell (2001)

Type / Approach	Embodied	Represented	Embedded
Sense	Observe	Gather	Hypothesize
Organize	Contextualize	Categorize	Map
Socialize	Share	Disseminate	Simulate
Internalize	Apply, Decide, Act		

The Knowledge Management Process Framework by Bukowitz and Williams (1999)



This KM model presents a general theoretical framework, as well as specific guidelines for implementation. The KM process is split into four stages. First management must locate the sources of knowledge. Then they must organize this knowledge so as to assess the firm's strengths and weaknesses and determine its relevance and reusability. This is followed by socialization, where various techniques are used to help share and disseminate it to whomever needs it in the organization. Finally, the knowledge is internalized through use.

However, one limitation of this model is its focus. First of all, the overall strategic role outline by Bukowitz and Williams is not included. Secondly, KM's role here is limited to knowledge sharing, omitting the processes of knowledge acquisition/creation and divestment. This is a perfectly legitimate approach to KM where the focus is on the sharing and retrieval of existing knowledge.

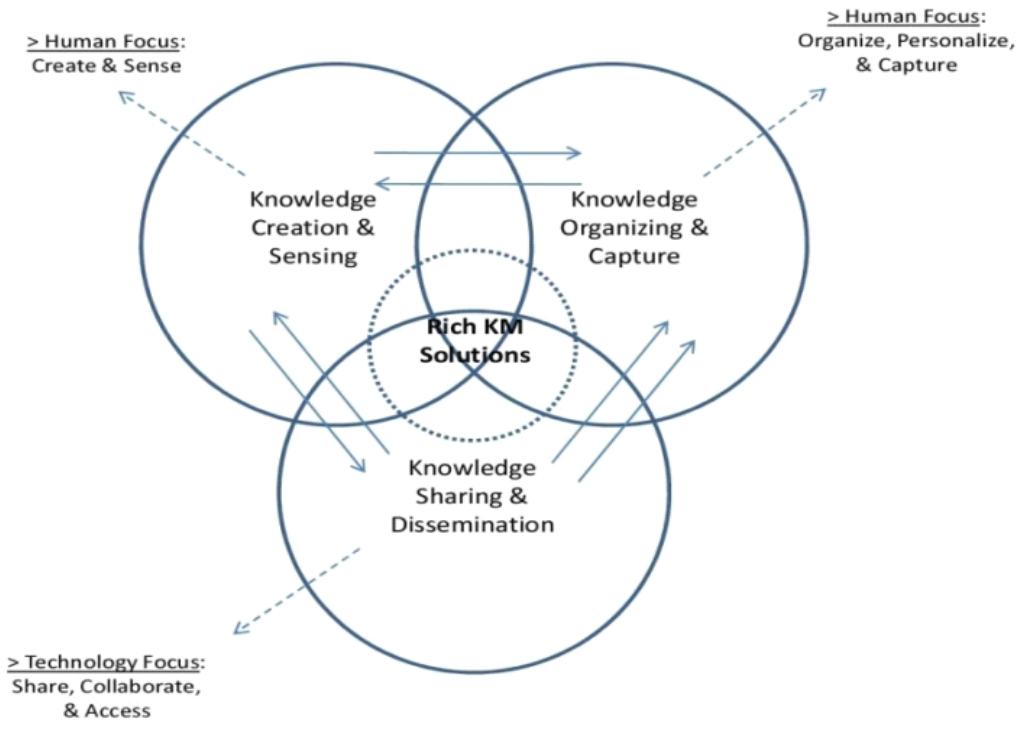
This model attempts to offer a more realistic overview of the KM process. The three broad categories overlap and interact with one another. Like Gamble & Blackwell, the focus is on managerial initiatives. Here too the strategic focus (the "when" and the "why" as opposed to the "what") is omitted. It is noteworthy that this model does include the creation of new knowledge as a specific KM initiative.

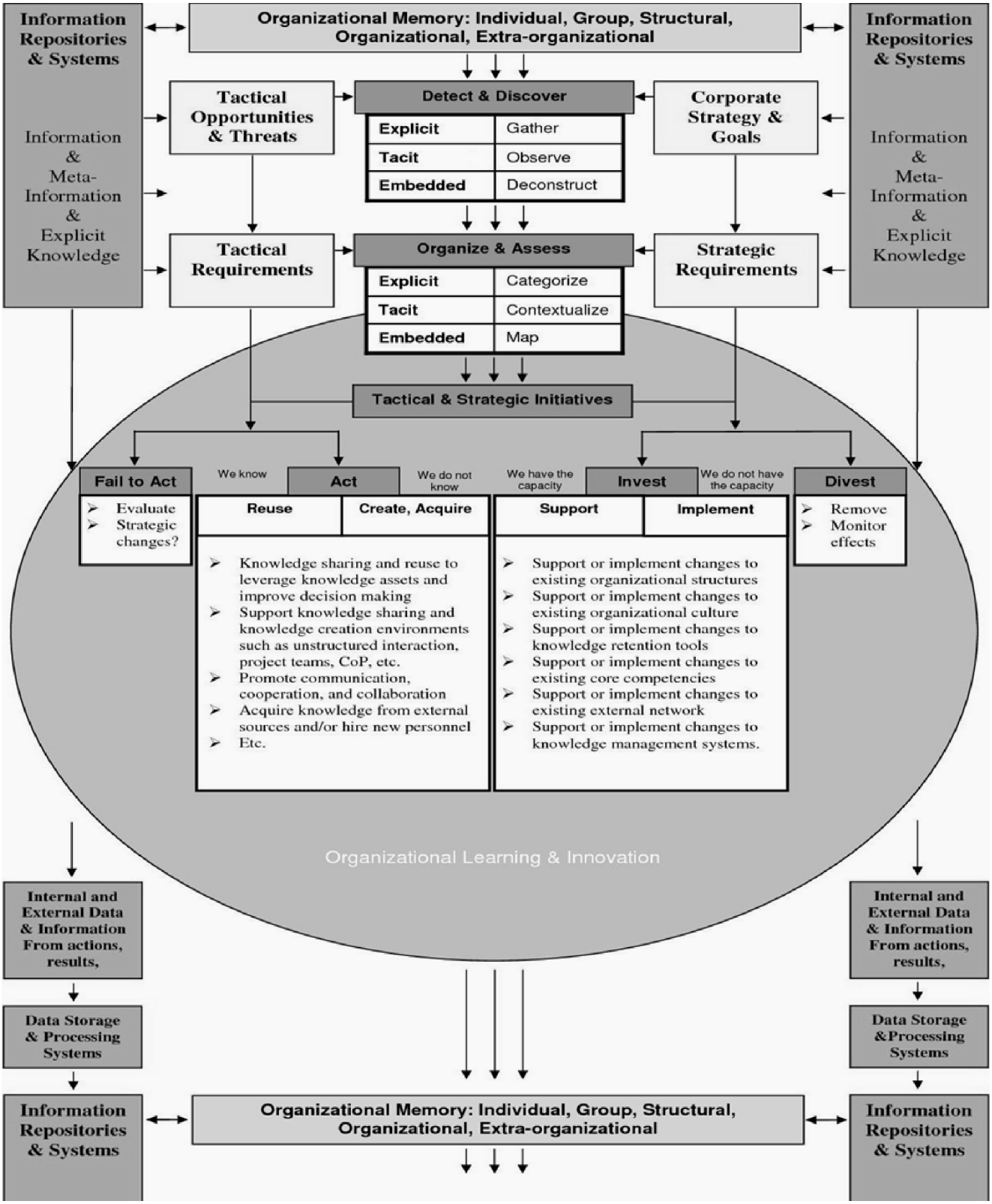
The model further shows which of the three categories are more people oriented and which are more technology focused.

Integrated Knowledge Management Model: The integrated knowledge management model attempts to link both process and strategy, while offering specific initiatives at different stages. The model also outlines the relationship of information and information management systems to knowledge management (KM).

The integrated knowledge management model draws upon elements presented by Bukowitz and Williams, Gamble and Blackwell, Botha *et al.*, and Nonaka and Takeuchi. The process is initiated from the tactical and strategic considerations, illustrating the way KM strategy goes hand in hand with corporate strategy. The non-bolded elements in the gray oval indicate the knowledge related processes that go on within the organization as it operates, and which management affects/enhances through its initiatives. The integrated knowledge management model is sequential, offering a simplified view for ease of understanding. The steps are as follows:

The Knowledge Management Process Model by Botha et al (2008)





Integrated Knowledge Management Model

- *Detect and Discover:* Search for existing knowledge as well as hidden knowledge within information and data.
- *Organize and Assess:* Organization and assessment of knowledge assets. Knowledge is categorized, evaluated, and made easier to access (by providing maps etc.).
- *Knowledge Management Tactical initiatives:*

→ Act - Reuse: If the firm can use existing knowledge to meet a tactical opportunity or threat, the role of KM is to identify this knowledge and enable it to be used. This means that if it is required by a different person/group, then KM is responsible for making it available to all relevant parties. Knowledge reuse thus combines the previous points on detection and organization with a new aspect: knowledge sharing.

→ Act - Create/acquire: If the right knowledge resources do not exist, the firm may create or acquire them, assuming the right processes and systems are in place to support this. For example, the knowledge may be acquired from partners if the right relationships are in place. Knowledge creation depends on the right internal environments that allow for combination and conversion of knowledge assets.

→ Failure to act: This is not really a KM initiative in itself, but it does have some implications. In the event that a firm fails to act there is still a lesson to be learned. Management must evaluate if this is something that needs to be addressed in the future. This decision is fed back into the loop, affecting future strategic choices.

- *Knowledge Management Strategic Initiatives:*

→ *Invest:* Support or implement. It refer to the organizational structures, culture, knowledge retention, competencies, external network, and systems that direct, affect, and/or enable the KM initiatives in the long term. Strategic initiatives may, for example, involve creating a knowledge sharing culture, restructuring the firm, establishing a beneficial partnership, or implementing a new IT system. If the right environment, system, etc. is already in place, management must make sure to continuously support it.

→ *Divest:* When knowledge assets become obsolete they need to be removed. KM is responsible for maintaining relevant knowledge assets.

The differentiation between tactical and strategic initiatives should not be seen as categorical, and in reality projects and initiatives will often have mixed goals. The integrated knowledge management model itself should be seen as continuously looping, with new or modified knowledge and information being fed into organizational memory and information repositories each time.

All processes are thus supported by information systems. They play an important role in tracking progress and feeding that information back into the system. This way, each time the integrated knowledge management model is run, it is based on different information, understanding, knowledge, and circumstances than the last time. Although this is called an "integrated" knowledge management model, it is not intended to be all-encompassing.

Knowledge Management in Agriculture : Knowledge sharing, exchanging and dissemination are elements of knowledge management. The central purpose of knowledge management is to transform information and intellectual assets into enduring value (*Metcalfe, 2005*). The basic idea is to strengthen, improve and propel the organization by using the wealth of information and knowledge that the organization and its members collectively possess (*Milton, 2003*). It has been pointed out that a large part of knowledge is not explicit but tacit (*Schreiber et al*., 1999). This is true for knowledge in agriculture where a lot of good practices are transferred without being well documented in books, papers or extension documents. In effect, there are many information technologies that can be used for knowledge management.

Management of knowledge in agriculture is much needed in present scenario as there are various players in agriculture and allied sectors, serving the diverse needs of their clienteles on their level. So, it becomes necessary that the knowledge of various players, involved in agricultural extension, should be processed and distribute among its stakeholders so that duplication of the information/knowledge can be avoided and knowledge of different field experts can be utilized better for the future use.

Need of Knowledge Management in agriculture:

- Demand driven agriculture

- Diverse and majorly small land holding farmers
- Introduction of recent approaches like ICTs in agriculture development
- Expert availability in public and private sectors
- Avoidance of duplication of knowledge
- Availability of right knowledge at right time at right place to right clientele

Role of Indian Council of Agricultural Research (ICAR) in Knowledge Management: The Directorate of Knowledge Management in Agriculture is committed to promote Information Communication Technology (ICT) driven technology and information dissemination system for quick, effectual and cost-effective delivery of messages to all the stakeholders in agriculture. Keeping pace with the current knowledge diffusion trends, Directorate is delivering and showcasing ICAR technologies, policies and other activities through print, electronic and web mode. Directorate is the nodal centre for design, maintenance and updating of ICAR website along with facilitation of network connectivity across ICAR institutes and Krishi Vigyan Kendras (KVKs). Besides, Directorate provides public relation and publicity support to the council and its constituents across the country.

CONCLUSION

In the changing scenario, knowledge is the power to reconstruct the society as a whole. The availability of knowledge in the society for all around development of the organisation is not an issue but proper utilisation and management of the knowledge for the ultimate stakeholders is the prime mover of development. In this perspective, knowledge management is playing a pivotal role to make the organisation and society much more knowledge intensive and knowledge vibrant. Not only knowledge management considers the creation and conceptualisation of knowledge but it also considers other perspectives of social and organisation development like internal knowledge management, knowledge dissemination, knowledge brokering and building knowledge capacity.

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