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“Strategies for implementing knowledge management”

Abstract:

The successful implementation of new technologies is dependent on many factors including the efficient management of human resources. Furthermore, recent research indicates that intellectual assets and resources can be utilised much more efficiently and effectively if organizations apply knowledge management techniques for leveraging their human resources and enhancing their personnel management. The human resources departments are well positioned to ensure the success of knowledge management programs, which are directed at capturing, using and re-using employees' knowledge. Through human resources management a culture that encourages the free flow of knowledge for meeting organisational goals can be created. The strategic role of the human resources department in identifying strategic and knowledge gaps using knowledge mapping is discussed in this paper. In addition, the drivers and implementation strategies for knowledge management programs are proposed.

Introduction

Knowledge is a critical factor affecting an organization's ability to remain competitive in the new global marketplace. Organizations therefore need to recognize it as a valuable resource and develop a mechanism for tapping into the collective intelligence and skills of employees in order to create a greater organizational knowledge base. Knowledge management accomplishes this goal.

Knowledge is thus seen as a company's key asset, or, as futurologists Toffler and Toffler (1993) put it: "The real value of companies like Compaq or Kodak, Hitachi or Siemens, depends more on the ideas, insights and information in the heads of their employees and in the data banks and patents, these companies control than on the trucks, assembly lines, and other physical assets they may have. Thus capital itself is now increasingly based on intangibles."

Knowledge management is discussed in a number of ways, including the economic level which predicts a knowledge age to follow, and an industrial age where knowledge becomes the limiting resource, rather than financial capital. The level of the firm with a knowledge-based view proposes a shift from a focus on resources, as in the resource-based view of the firm. The latter perspective focused at a strategic level on the notion of core competences which might give the firm sustained advantage over its competitors through their use in processes.

The meanings of knowledge and of organisational learning are aired, and measurement of knowledge as intellectual property or assets is advocated as an important component of management control systems for future organisations.

The process and the sub-process level develops in more detail the notion of knowledge within and around processes. It includes discussion about the role of technology and people. It raises issues of differences between a knowledge process and the use of knowledge in business processes. It defines by description those business processes which seem to depend more on knowledge, i.e. knowledge-rich processes.

The role of people within processes and where they will, and are able to, share knowledge with others is associated with the prevalent concept of the team.

A- Definition of knowledge

First we make a critical distinction between information and knowledge. Information is processed data and can reside within computers. Because of the far-reaching effects of globalization, it is increasingly available to everyone (Harari, 1997). Humans inherently possess knowledge (Malhotra, 1998).

We define knowledge as the understanding, awareness, or familiarity acquired through study, investigation, observation, or experience over the course of time. It is an individual's interpretation of information based on personal experiences, skills, and competencies.

To the organization, knowledge is defined as what people know about customers, products, processes, mistakes, and successes (Grayson and O'Dell, 1998). It resides in databases or through sharing of experiences and best practices, or through other sources both internal and external to the organization. Organizational knowledge accumulates over time, and enables firms to attain deeper levels of understanding and perception that lead to business astuteness and acumen, all characteristics of wisdom. Wisdom is acquired as organizations gain new knowledge through the transformation of collective experiences and expertise.

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B-Types of knowledge

There are two types of knowledge, explicit and tacit. Explicit knowledge is clearly formulated or defined, easily expressed without ambiguity or vagueness, and codified and stored in a database. Tacit knowledge is the unarticulated knowledge that is in a person's head that is often difficult to describe and transfer. It includes lessons learned, know-how, judgment, rules of thumb, and intuition (Grayson and O'Dell, 1998).

Joining tacit with explicit knowledge could be a very complex task and in some circumstances may not be possible. In other words, at present reconciling what is in employees' minds with what is stored in databases requires extensive research and, in spite of major advances in knowledge-based technologies, this task is still in its infancy.

It is widely accepted that human resources management requires a mix of skills in working with tacit and explicit knowledge. Knowledge in areas such as conflict resolution, employee appraisals, customer satisfaction, business intelligence and competitor information is a mixture of tacit and explicit and hence requires skills in handling both. The interaction between tacit and explicit knowledge can go in four different directions as the table1 shows:

Table 1: Kinds of interaction between tacit and explicit knowledge

	Into tacit Knowledge	Into explicit Knowledge
From tacit Knowledge	1 Socialize	2 Externalize
From explicit Knowledge	4 Internalize	3 Combine

Source :Nonaka and Takeuchi,1995.

With socialization we meant the exchange of experiences whereby personal knowledge is being created in the form of mental models(on-the-job-training, trial-and-error-policy, imitating others...etc).

The Externalization is a Personal or tacit knowledge made explicit in the form of

metaphors, analogies, hypotheses and models, for example in language.

In the Combination phase the Notions are synthesized into a knowledge system. People exchange knowledge, and this knowledge is combined through documents, meetings, telephone conversations and the exchange of information via media like computer networks.

Finally, the Internalization is a process in which explicit knowledge becomes part of tacit knowledge. This can happen through learning-by-doing, and documented knowledge can play a helpful role in this process.

However, since knowledge management is most useful as an integrated system, which brings together several disciplines and shows their connections, this paper looks at knowledge management from two perspectives:

- 1° the role of human resources management in an organization; and
- 2° the goals of organisations.

By focusing on the place of knowledge management in these two issues, it is hoped to provide new insights.

The spiral which goes from socialization to externalization to combination to internalization to socialization to externalization and so on, creates four different kinds of knowledge as the table2 indicates.

Table 2: Different kinds of Knowledge being created

	Into tacit Knowledge	Into explicit Knowledge
From tacit Knowledge	1 SOCIALIZE (sympathized Knowledge)	2 EXTERNALIZE (conceptual knowledge)
From explicit Knowledge	4 INTERNALIZE (operational knowledge)	3 COMBINE (system knowledge)

Source :Nonaka and Takeuchi,1995.

Table 3: Sources of learning in the knowledge infrastructure

Source of learning	Element in the knowledge infrastructure
Experts	Educational programme
Competition	Business intelligence
Customers	Helpdesk
Each other	Informal meetings
Organization	Knowledge counter
Shop floor	Suggestion box
Past	Archive
Research	R&D department

Source:Roelof P.uit Beijerse,1999.

C- Managing knowledge

Now we know what knowledge is and we know what management is. It is now time to look at what it means to manage knowledge. We defined management as the strategy-driven motivation and facilitation of people, aimed at reaching the organizational goals.

The organizational resources which can be used to reach these, consist of the organizational structure, the organizational culture and specific systems. Knowledge was defined as the capability to interpret data and information through a process of giving

meaning to these data and information. New information and knowledge are thus being created, and tasks can be executed.

This capability is the result of available sources of information, experience, skills, culture, character, personality, feelings, etc.

When we look at these two definitions it becomes clear that knowledge management is somewhat more specific than management as such. Whereas management focuses on motivating and stimulating people, knowledge management focuses on a certain aspect of people, i.e. their knowledge.

In trying to define knowledge management it is important to see what we regard as knowledge, because it is this definition which determines the way we look at knowledge management (Allee, 1997).

Table 4: Examples of knowledge management instruments.

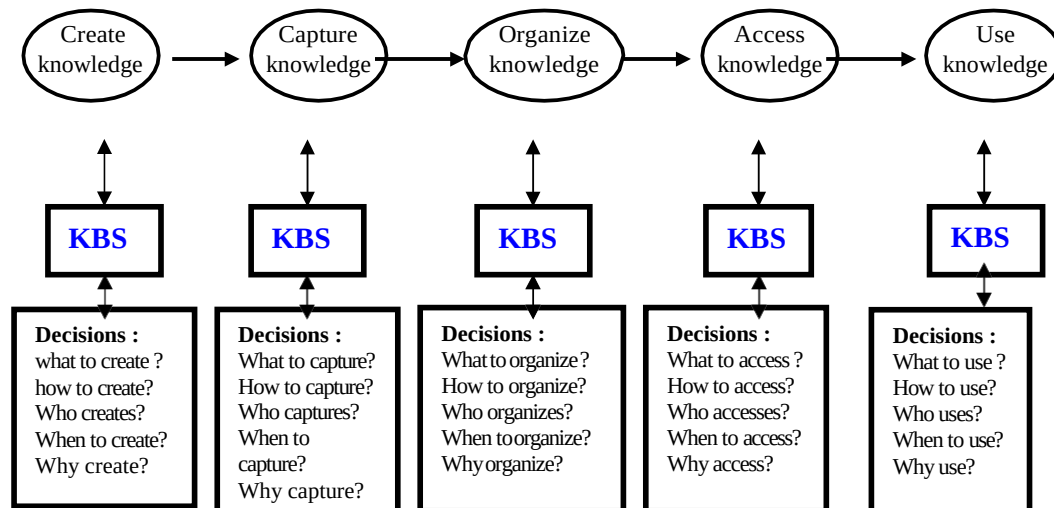
	Socialize	Externalize	Combine	Internalize
Determining knowledge gap	Management by Walking around	Intranet	internet	detachment
Developing/buying knowledge	Traineeship	electronic Boardrooms	R&D	External training
Knowledge sharing	project teams	Brainstorming	computer Networking	cooperation with others
Evaluating Knowledge	informal evaluation	debriefing	benchmarking	Reading Reports

Organizations are interested in managing knowledge for several reasons. Core competencies are based on the skills and experience of the people who do the work, and may not exist in physical form (Manville and Foote, 1996).

Therefore, it is important that organizations find a way to tap into this knowledge base in order to preserve and expand their core competencies. Some believe that knowledge is the driving force in today's economy. If this is true, then it becomes critical for an organization to find ways of accessing existing knowledge and creating new knowledge. Certainly, effective management of knowledge will enable an organization to provide better customer service.

Figure 2: Role of knowledge-based systems in the knowledge management chain

Source :Soliman et al.,1999.



There are many techniques and technologies currently being used to manage knowledge. Some organizations are concerned mainly with capturing explicit knowledge and others are attempting to collect tacit knowledge through the use of expert systems and artificial intelligence.

Knowledge-based systems (KBS) perform knowledge processing based on expert systems or deductive databases to help users find acceptable solutions to problems (Hayes-Roth and Jacobstein, 1994; Wielinga et al., 1997; Basu, 1998).

This approach allows firms to capture knowledge by culling it from experts. Limitations to implementation include the need to overcome cultural barriers related to giving up information and relatively high expenses.

Table 5: Computer information technology tools for knowledge management:

Tool category	Tool
Hardware technologies	Investment in information technology(IT) Networks Intranet
Software and database Tools	Knowledge-based systems (KBS). Collaborative hypermedia for documentation of discussions. Learned lessons databases. Data warehouses. Databases for classification,codification and categorization of Information Storage of email threads to create a repository of best practices.
Collaboration Tools.	electronic meeting systems. Video-conferencing. Groupware, electronic bulletin boards.
Intelligent tools.	Decision support tools using neural networks,virtual reality, intelligent Agents internet search engines, knowledge mapping

Collaborative hypermedia (Shum, 1997) is good for informal knowledge types and linking ideas without specifying relationships or roles. It is useful for documenting discussions and related documents for organizational memory.

Learned lesson databases involve articulation of the assumptions and processes that are followed when determining a solution to a particular problem, in a format that can be later retrieved. These types of systems are software and database tools that capture and codify tacit knowledge.

D-Organizational knowledge as a strategic asset

In the literature, employee know-how and organizational culture are said to possess the characteristics of strategic assets (Michalisin et al., 1997).

Employee know-how is one component of organizational knowledge and a crucial strategic resource (de Hoog and van der Spek, 1997). If the process of knowledge management is a function of the organizational culture and employees' collective knowledge, then it follows that organizational knowledge is almost certainly a strategic asset.

To be a strategic asset, the resource must possess four characteristics[1]. It must be:

- (1) valuable;
- (2) rare;
- (3) inimitable; and
- (4) nonsubstitutable.

Organizational knowledge meets the characteristics of a strategic asset in the following ways. It is:

- **Inimitable:** each individual in the organization contributes knowledge based on personal interpretation of information. Group interpretations and assimilation of knowledge are dependent on the synergy of the total membership of the group. In addition, organizational knowledge is built on the unique past history of the organization's own experiences and accumulated expertise. Therefore, no two groups or organizations will think or function in identical ways.

- **Rare:** organizational knowledge is the sum of employee know-how, know-what, and know-why. Since it is dependent on the knowledge and experiences of current and past employees, and is built on specific organizational prior knowledge, it is rare.

- **Valuable:** new organizational knowledge results in improved products, processes, technologies, or services, and enables organizations to remain competitive and viable. Being the first to acquire new knowledge can help the organization attain a valuable strategic advantage.

- **Nonsubstitutable:** the synergy of specific groups cannot be replicated. Thus the group represents distinctive competence which is nonsubstitutable.

E-Strategy for managing the knowledge

Implementing knowledge management programs within an organisation can be very costly, especially during the start-up phase. Therefore, looking at the business case for knowledge management is essential to ensure that the organisation has in place a set of strategies suitable for the implementation of the knowledge management effort. Guidelines for such a strategy set are discussed in the following sections:

- Alignment of knowledge management with business directions.
- Identification of the benefits of knowledge management efforts.
- Choosing the appropriate knowledge management program.
- Implement a know-how strategy.
- Creating supportive environments for knowledge management programs.
- Use of enabling technologies for the knowledge management program.
- Creating the knowledge management team.
- Creating knowledge management leadership.

F-Strategic knowledge management in operational processes

Previous work on business process management (Armistead et al., 1999) identified knowledge management as one theme from a research study.

Operational processes comprise processes concerned with the understanding of

markets, the development of strategic plans, the design of services and products, marketing

and sales, the production of goods and the delivery of services, invoicing and post-sales support.

Each of these processes is potentially knowledge-rich but the nature of the knowledge will be different.

What would seem to be the consequences for managing these processes if various propositions from the knowledge-based view of the markets and the firm are adopted? At the economic level, if knowledge is the limiting resource, how would it be measured, controlled and traded?

Will the experiments in a global knowledge exchange of the type being proposed by the NatWest bank be the way in which the value of businesses is measured? This all seems a little too far into the future to satisfy the pragmatic operational manager.

An exercise to understand competences as knowledge involves four steps:

- (1) Identify core competences at the level of the firm and the processes they are associated with.
- (2) Identify the resources which are associated with each competence.
- (3) List knowledge associated with each resource using, in the first instance, a tacit and explicit categorisation.
- (4) Make sure there are no other sources of knowledge which have been overlooked.

This analysis can be incorporated within a strategy process because it enables a number of other questions to be investigated.

- What knowledge is needed for the organisation to compete?
- Does the "inventory" of knowledge from the competences analysis match the market needs?
- Could other organisations get access to the mix of knowledge?
- Could the knowledge be lost?
- Can the knowledge be protected?
- Will the knowledge give sustained advantage?

This form of analysis moves us away from a financial assessment of value towards contributions that knowledge processes make to the outputs from operational processes, services and goods.

G-Knowledge management and operational processes

The strategic analysis of knowledge as a key resource is helpful as a starting point for a more detailed understanding of how a knowledge-based perspective of process management might lead to improvement in process capability in terms of practice and performance.

Now a more detailed assessment is needed. We need to start perhaps at a simple level. A common approach to a description of an operational process is to describe it as an input/output system with a transformation of conversion processes changing the state of some of the inputs.

There are three conversion processes, namely those concerned with improvement or a change of form, as in manufacturing; those which involved aspects of care and counter the effects which might cause harm, as with audience control; and processes which involve transfer or change of place, as with transport and telecommunications systems.

These conversion processes act on inputs which are a combination of physical materials, data information or knowledge and people as customers, clients or patients etc. Some resources are needed to carry out the conversion and these comprise material, facilities, equipment, people and information systems. Outputs from an operational process are products and services for customers at an internal or external interface.

The knowledge model addresses customer knowledge with an holistic approach to gain an understanding of the needs, condition and expectations of the passenger. The conversion process involves a physical knowledge process about preserving and embedding knowledge of the service in the customer. Outputs relate to knowledge of the condition of the passenger and their view of the service provided and whether they would use the service again.

Outputs could also be new knowledge about route approaches to the service which emerge from any conversation with the driver. The knowledge-based capabilities to provide the service are embedded in the technology of the vehicles and the knowledge of the drivers: data-based capture and organisation of customer knowledge from passengers used or predicted expectations from other profile indicators. This might appear very fanciful for a taxi service.

Gaining the level of knowledge indicated would be costly and could be regarded as intrusive by passengers, so it might be discounted on cost alone. If we were dealing with an executive taxi service the context would change and potential benefits of the knowledge model would be more apparent. It might be expected that the capability to perform well would be measured against service quality and customer service, dependability to keep arranged times and the ability to respond quickly to changes requested by customers.

This knowledge-based process approach corresponds with that suggested by Wijnhoven (1998) who considered a value chain of knowledge. The knowledge equivalent of a material supply chain, from supplier through a manufacturing production through into a distribution chain, is the basis of a model applied to a variety of operational processes in manufacturing, public administration and consultancy.

The details of the simple input-output model are incorporated at the higher level of the supply chain.

H- Drivers of knowledge management efforts

It is clear from the above that human resources departments play a significant role in driving knowledge management solutions. However, they face the difficult task of ensuring that employees are not misdirected people going through the "ritual dances" of knowledge management solutions when the problems of the organisation are really quite different.

It has been shown that many problems could be avoided through appropriate pre-employment screening of applicants, which includes checking reports, financial history, bankruptcy records, criminal records, educational history, credentials verification and employment history verification.

In addition to these roles, human resources departments could drive the knowledge management process through assistance in avoiding:

- poor recruitment and selection;
- confused or uneven organisational structure;
- inappropriate management philosophy;
- lack of control;
- poor training;
- low motivation and individual stress;
- unfair rewards and personal stagnation; and
- lack of succession planning and development.

Table 6: Technology /non-technology tools for knowledge management

Tool category	Tool
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Non-technology Mechanisms	formal mechanisms for sharing information research and development(R&D) management. Cross-functional project teams. Formal mentoring program
Mechanisms involving both	project management systems
Technology & non-technology	customer management systems Vendor management systems.

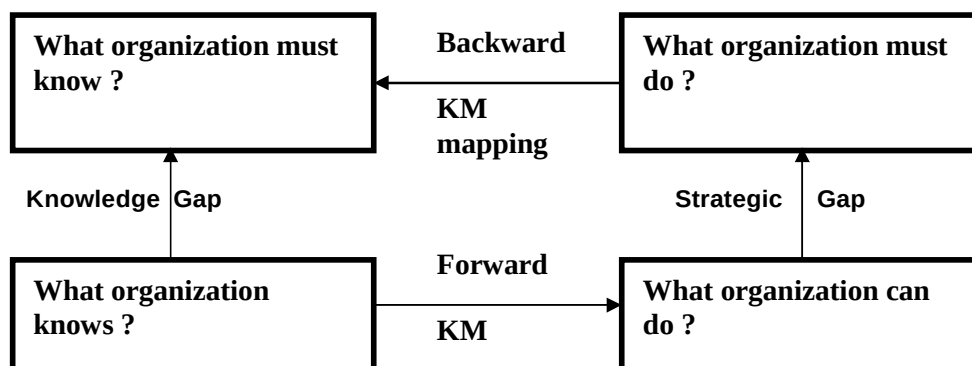
According to Soliman et al. (1999), additional roles for the human resources departments in driving the knowledge management interventions could be linked to assisting staff who are consistently experiencing difficulties such as:

- lack of progress towards goals;
- inappropriate leadership;
- failure to make sound decisions;
- interpersonal hostility;
- role confusion or alienation; and
- high turnover, absenteeism.

I- The strategic role of human resource management in knowledge mapping

In addition to being aware of the knowledge process and the three infrastructures within which it takes place, a knowledge mapping project should have a conceptual focus (Soliman, 1998). Ideally the focus will be the fundamental business issues of the organisation such as reducing errors or rework, or minimising cycle time in some manufacturing organisations. Then the mapping project will provide useful results that improve the organizational efficiencies.

Figure 3: Role of knowledge mapping (KM) in the identification of strategic and knowledge gaps



mapping

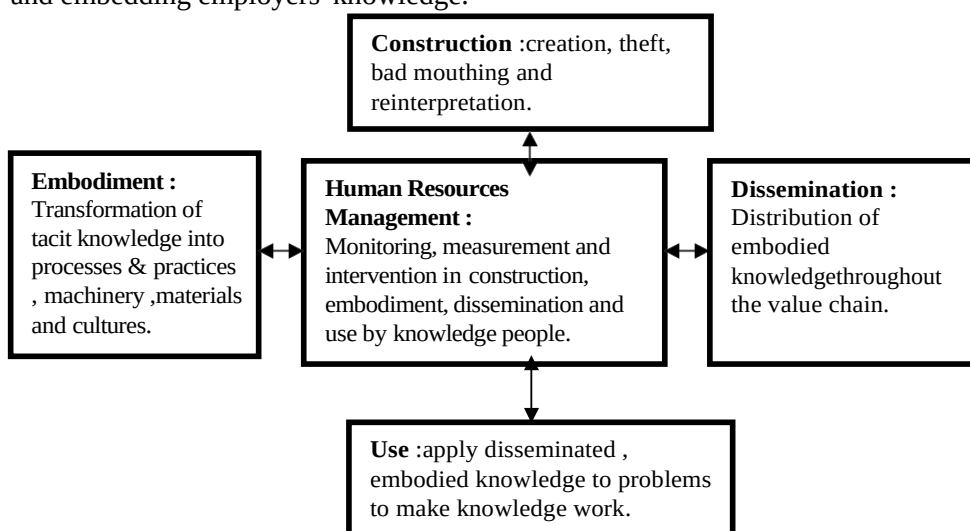
Source: Soliman et al., 2000.

Zack (1999) has advocated using the well known SWOT technique (strengths, weaknesses, opportunities and threats) as a tool to develop a knowledge mapping strategy specifically tailored to an organisation's needs.

Zack advises that knowledge-based SWOT analysis could lead to mapping knowledge resources and capabilities against strategy opportunities and threats, in order to understand advantage and weakness.

Human resources departments are better positioned than other functional units to create a link between strategy and employee knowledge. However, to do so, the organisation must articulate its strategic intent and then identify the knowledge required in executing it. The required knowledge should be compared to the actual knowledge (employee knowledge). The comparison is likely to lead to the identification of gaps, two of which are the strategic gap and the knowledge gap.

Figure 4: Model of human resources management role in constructing, disseminating, using and embedding employees' knowledge.



The role of forward knowledge mapping is to identify any strategic gap that might exist. Forward knowledge mapping identifies what organisations can do, while the backward knowledge mapping identifies what organisations must know.

The difference between what an organisation can and must do highlights the strategic deficiencies and here the human resources department can ensure that future recruitment is aligned with the strategic plan of the organisation.

Backward knowledge mapping identifies the knowledge gaps. Assessing what employees know against what they should know identifies training opportunities to overcome existing knowledge deficiencies. Again, the human resources department acts to ensure that the work force fits within the strategic plan of the organisation.

Clearly a major role of the human resources department is assisting in overcoming any strategic and knowledge shortcomings through recruitment and training as well as re-training the existing workforce.

According to Davenport (1999), categorising and organising knowledge should be a core competence for future organisations. Therefore human resources departments should contribute to:

- (1) deciding what knowledge is important;
- (2) developing a knowledge vocabulary, including a thesaurus;

- (3) creating indices and search tools; and
- (4) constantly refining knowledge categories.

Conclusion

Executives in large organizations know that they must develop better techniques to manage their greatest asset: knowledge. Organizations currently create and maintain knowledge in isolated systems targeted at specific workgroups.

For users outside the workgroup, that knowledge is virtually invisible. Vendors of all manner of tools, from intranet development tools to document management systems to search engines, are calling their products Knowledge Management systems, without regard to what that means.

Without new technologies to create revolutionary change in the way knowledge workers create, communicate and manage information, a Knowledge Management system has little chance of improving enterprise knowledge sharing.

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