

# DEVELOPMENT OF A KNOWLEDGE MANAGEMENT FRAMEWORK WITHIN THE SYSTEMS CONTEXT

Roberto Biloslavo<sup>a</sup>  
Max Zornada<sup>b</sup>

<sup>a</sup>Faculty of Management Koper, Slovenia  
roberto.biloslavo@fm-kp.si

<sup>b</sup>Adelaide Graduate School of Business,  
University of Adelaide, Australia  
mzornada@gsm.adelaide.edu.au

## Session H-3

### Abstract

Effectiveness of knowledge management depends on how knowledge management processes are aligned with an organisation's infrastructure and processes, in a manner that supports the achievement of an organisation's goals. To understand and represent these relationships a simple list of elements and processes is inadequate. We need a holistic framework where all are integrated into a dynamic coherent whole.

The proposed framework is particularly focused on dividing the identified organisational building blocks into their constituent elements along both time and content dimensions so as to define characteristics that these elements, and the relationships between them need to have to form a social ecology in which people effectively create, share and use knowledge. In this way the developed framework can assist management to understand the true nature of the relationships that exist between an organisation and knowledge management processes, and to exploit them for an organisation's success.

**Keywords:** knowledge management, knowledge management frameworks, strategic management, systems thinking.

## **Development of a Knowledge Management Framework within the Systems Context**

Roberto Biloslavo, Faculty of Management Koper, 5 Cankarjeva, 6000 Koper  
Max Zornada, Adelaide Graduate School of Business, 233 North Terrace, Adelaide  
E-mail: roberto.biloslavo@fm-kp.si

Effectiveness of knowledge management depends on how knowledge management processes are aligned with an organisation's infrastructure and processes, in a manner that supports the achievement of an organisation's goals. To understand and represent these relationships a simple list of elements and processes is inadequate. We need a holistic framework where all are integrated into a dynamic coherent whole.

The proposed framework is particularly focused on dividing the identified organisational building blocks into their constituent elements along both time and content dimensions so as to define characteristics that these elements, and the relationships between them need to have to form a social ecology in which people effectively create, share and use knowledge. In this way the developed framework can assist management to understand the true nature of the relationships that exist between an organisation and knowledge management processes, and to exploit them for an organisation's success.

*Key words: knowledge management, knowledge management frameworks, strategic management, systems thinking*

### **Introduction**

After a decade of intense interest, many different frameworks in the field of knowledge management have been developed by academics, consultants and practitioners. For example, Heisig (2002) described thirty different knowledge management frameworks, Rubenstein-Montano et al. (2001) twenty-six, and Holsapple and Joshi (1999) five broad frameworks. Yet at the same time, we don't have a generally accepted framework and existing frameworks need, at the very least, some refinement (Rubenstein-Montano et al. 2001; Holsapple and Joshi 1999). For this reason, some authors recommend approaching knowledge management using systems thinking (Rubenstein-Montano et al. 2001).

An evolved version of the systems thinking approach can be already found in strategic management, particularly in the so-called European management school. Probably the most famous representative of this school is the St. Gallen integral management model (Bleicher, 1995; Gomez and Zimmermann, 1993; Schwaninger, 1994; 2001) but similar ideas can be found also in the model developed by Tavčar (1999; 2003).

After a detailed analysis of the two mentioned strategic management models we identified three strategic pillars of an organisation and divided them along three time dimension. Identified strategic pillars are: assets, businesses, and orderliness. These were the elements that were linked to four knowledge management processes: creation, storing, transfer, and application of knowledge.

As systems theory suggests is not with a detached analysis of some particular elements that we can understand the true behaviour of a system, but with a comprehensive synthesis of them. As knowledge management processes and strategic pillars per se are not sufficient for an organisation's success, we need to align and integrate them with an organisation strategy.

On the other hand as the knowledge management literature suggests, an organisation needs to be focused on the right combination of people and technology to achieve the best results from its efforts. For this reason we added to the develop framework people and technology as the main building blocks of knowledge management, and two general knowledge strategies as exploitation and exploration. In this way we have gone beyond a simple list of elements to a representation of an organisation as a purposeful knowledge enabling system.

In the remainder of this paper we will first delineate the main conceptual ideas behind the proposed framework. On the basis of presented findings a systems framework of organisational elements and knowledge management processes will be developed including all relevant relationships that exist between them. In the last section we will present ideas for future research.

### **Knowledge in an organisation**

That knowledge is of fundamental importance for organisations of any size and industry is no longer a question (Martin 2000, 17). Even if knowledge is not the sole element for an organisation's survival, it is the most important one because it supports all others (Rastogi 2002). For this reason, it is not surprising that business and academic communities are very deeply involved in understanding knowledge, and developing knowledge management processes and systems to exploit opportunities that knowledge offers to organisations.

In spite of the increasing research of knowledge and related subjects, no unified definition of "knowledge" can be found in business and academic literature. Some definitions of knowledge that can be found in the literature are:

- Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. (Davenport and Prusak 1998, 5).
- Knowledge is the power to act and to make value-producing decisions (Kanter, 1999; Polanyi 1967).
- Knowledge is a justified personal belief that increases an individual's capacity to take effective action (Alavi and Leidner 1999, 5).
- Knowledge is information made actionable in a way that adds value to the enterprise (1999).
- Knowledge is things that are held to be true in a given context and that drive people to action (Bourdreau and Couillard 1999).
- Knowledge is a "capacity to act" (Sveiby 1997).

Even if we do not want to choose sides in the debate over how knowledge is best defined or what constitutes it, we wish to formulate a definition of knowledge that will be used in the continuation of this paper: *Knowledge is an individual or group capacity developed through formal learning and experience to evaluate and translate data related to the stated problem or objective(s) pursued into meaningful information which enables an effective action.*

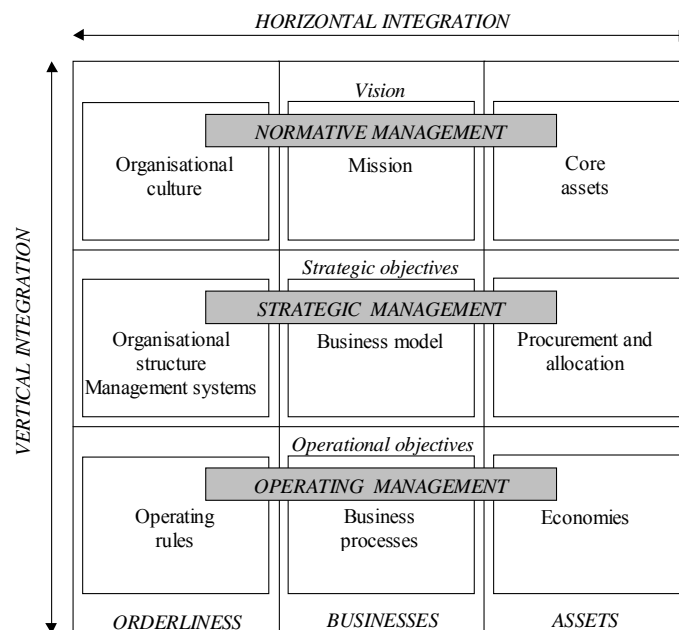
This formulation allows us to understand knowledge as an individual and group phenomenon that is intimately linked with action as past experiences influence and present activities. Also it transcends the linear hierarchical division between data, information and knowledge as it defines them as components of a loop – data that become information after evaluation and translation by knowledge, that will become data when transferred (here we take in consideration just explicit knowledge that can be expressed in "hard" form).

## Integral management model

In consideration of both the St. Gallen integral management model and Tavčar's model, a new strategic management model was developed (see Figure 1). For the purpose of this study, we want to present only the broad model without inclusion of details (e.g. time differentiation) not relevant to the knowledge management framework development.

The central position in the model is occupied by organisation's *vision*, which is the "vector" of stakeholders' interests and management philosophy, and represents the driver for organisation functioning. An organisation's vision can change if the conditions in the environment change to a significant extent or a new dominant coalition is formed. Change in the organisation's vision also means change in other elements of an organisation and they determine how radical and fast the change process can be.

Figure 1 Integral management model



*Employees* with the use of tangible and intangible *assets* carry out the organisation's vision through the main *business processes*, such as the supply chain management process, product development management process, and customer relationship management process. Through these processes, inputs are transformed into outputs and added value is created. The amount of the added value is determined by the quality of exchange relationship that exists between an organisation and its market environment. Because every organisation has limited resources and capabilities, it chooses the *business model* (product-market position and value chain) that enables the most efficient use of them (*exploitation*) in line with the organisation's vision and mission. At the same time, through learning (*knowledge exploration*), an organisation develops new competencies or capabilities that will enable it to change the present product-market position or to achieve better results inside it.

Within time, employees establish unique interest relationships, which define their roles inside an organisation. Exchange and interest relationships are maintained or changed through organisation processes (management, businesses and support processes) that take place in accordance with formal *operating rules* but first of all in accordance with organisation

orderliness. Organisation orderliness attempts to link together organisational culture, structure, management systems, and operating rules in a holistic pattern that brings order to organisation functioning (Biloslavo and Grad 2003). This order is indispensable to balance the natural predilection of an organisation to chaos.

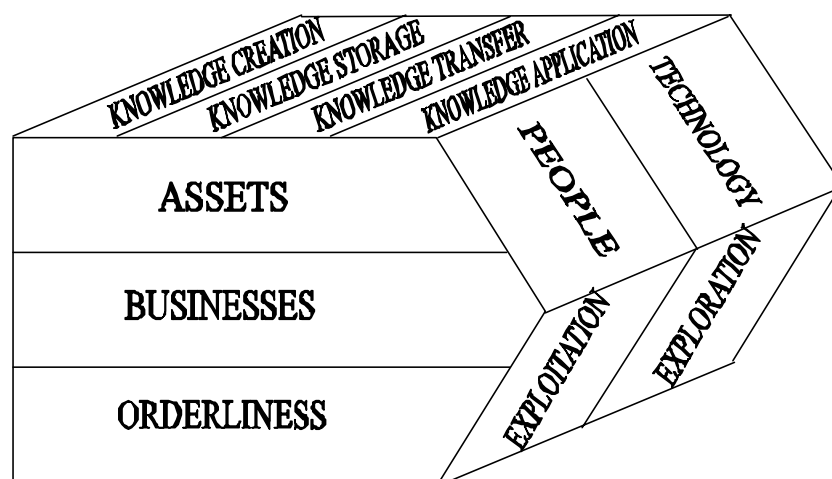
Because organisational culture is very difficult to change when is established, it is an element of normative management (Bleicher 1995; Tavčar 1999). As culture, through shared values, beliefs, and norms, shapes the way people in an organisation interact with each other and with the environment outside an organisation, it indirectly has influence on other elements of an organisation. Still this is not a one-way, but a two-way influence where organisation’s culture will slowly change if other elements of an organisation will change in a substantial extent (as we know from complexity theory in a dynamic complex system it is not possible to establish cause and effect).

In this way a stability of internal relationships is supported beside organisation culture also with organisation *structure*. Formal structure, which has its horizontal and vertical dimensions, links together different subsystems of an organisation (units and/or functions) that are developed after differentiation and specialisation of some organisation’s functions. Harmonious functioning of an organisation is finally secured through *management systems* that pervade all hierarchical and functional levels of an organisation to co-ordinate, direct, activate and control the activities of employees (Viljoen 1994, 458).

### System knowledge management framework

A system is a part of the objective or abstract reality with clear or fuzzy demarcation (e. g. virtual organisation), which is composed of different mutually interconnected elements that are oriented to the achievement of the common purpose. Their relationships conform to the group of system unique rules or/and natural laws. Because some dynamic properties of a system do not exist when a system is decoupled into smaller parts (Rubenstein-Montano et al. 2001, 6) and because to be effective a system requires that its elements fit together, we need a systems approach or systems thinking to understand its behaviour. As Gupta and Govindarajan (2000, 72) said “... *the social system should be viewed not as random collection of disparate elements but as a comprehensive whole in which the various elements interact with one another.*”

Figure 2: System knowledge management framework



As Figure 2 shows the proposed framework consisting of three strategic building blocks: assets, businesses, and orderliness, that represent both a static and dynamic view of an organisation as well the hard and soft part of it. These elements are permeated with four knowledge management processes that we have identified as knowledge creation, storage, transfer, and application. These processes are based on people and technology and follow one or a mix of both knowledge strategies represented by exploitation and/or exploration of knowledge.

Support for the selected elements can be found in the two described strategic management models and different knowledge management frameworks presented in Table 2.

Table 2 Identified influences on the knowledge management

	Culture	Leader-ship	Measurement	Structure	Reward and Incentive Systems	Information and Communication technology
Alavi and Leidner 2001	√			√		√
Booz·Allen and Hamilton 2001	√	√			√	√
Fouché and Botha 2002	√	√	√	√		√
Gold et al. 2001	√			√		√
Mertins et al. 2003	√	√	√		√	√
Holsapple and Singh 2001		√	√		√	
Gupta and Govindarajan 2000	√	√		√	√	√
Skyrme 1999						
Lai and Chu 2001	√	√	√		√	√

### ***Knowledge management processes***

The knowledge creation process inside organisation we understand as a dynamic interaction or “generative dance” (Cook and Brown 1999, 393) between knowing and knowledge at the individual and social level, in which new knowledge is generated within the process of learning. This process is composed of four distinctive processes as socialisation, externalisation, combination, and internalisation (Nonaka and Takeuchi 1995) that take place inside a micro-community or communities of practices.

New knowledge that is created in the knowledge creation process needs to be store for later used as an organisational memory. The processes of knowledge storage involves finding ways to convert documents, models, human insights and other artefacts into forms that make retrieval and transfer easy without losing the “true meaning” of the knowledge (Staples et al. 2001, 11). With the use of information technology, organisations try to develop vast repositories of organisation knowledge about customers, projects, processes, suppliers,

competition, technology, industry and organisation's knowledge itself that can be retrieved or transfer at any time anywhere.

Knowledge transfer occurs at various levels of an organisation, for example between individuals, between individuals and groups, between groups, between groups and an organisation, and between organisations (Alavi and Leidner 2001, 119). If we consider knowledge as an independent phenomena from the context where it is produced or used, then we can say that an organisation must try to transfer the right knowledge at the right time to the locations where it is needed<sup>1</sup>. This process can be supported mostly by information and communication technology as in an organisation that uses a codification strategy or by an extensive personal networks as in an organisation that uses a personalization strategy (Hansen et al. 1999).

Without knowledge application, all the aforementioned processes are useless. Only knowledge application can ensure that the organisation knowledge represents a viable source of competitive advantage. To be of value for organisation's stakeholders disposable knowledge needs to be transformed in a lower cost structure, a larger revenue stream or both.

### ***People and Technology***

Two basic elements of knowledge management are people and information and communication technology. Both of them often represent the basis of argument between so-called technology and human-oriented researchers. However, in our framework we consider both to be of equal importance. The reason for this stance is that knowledge is inseparably linked to people, therefore an organisation cannot create new knowledge without them. On the other hand, an organisation cannot efficiently use disposable knowledge without the right technology.

### ***People***

According to Churchman (1972) knowledge resides in the user and not in the collection of data; therefore an organisation needs to focus its knowledge management effort not on data, but on its people. This task is even more difficult if we consider that people are not only the key enablers in creating and using knowledge for competitive advantage, but they are also the major constraints.

The literature review focused attention on three different attributes of people as carriers of organisational human capital:

1. *Leadership* as a capability to develop a clear vision of the present and future organisation's needs for knowledge and being able to motivate people to learn and innovate.
2. *Adaptability* as a capability of people to be aware of changes in the outside world and to be prepared and competent to deal with them.
3. *Networking* as a capability of people to build and sustain a social network of colleagues and professional acquaintances that supports knowledge creation and sharing.

---

<sup>1</sup> In consideration of our definition of knowledge what can be transferred are data and not knowledge. Data can become knowledge in consideration of context and existing knowledge of the receiver (knowledge absorption capacity). Here we use the notion of knowledge just to be in line with a major part of the literature.

The literature supports the idea of leadership as one of the critical factors for effective knowledge management (Rastogi 2000; Kirrane 1999; Davenport, De Long and Beers 1998; Hasanali 2002; Halal 1998; Holsapple and Singh 2001; Skyrme 1999). The leadership of the organisation sustains the vision and mission of an organisation and supports organisational values by leading by example. Knowledge leaders encourage communication and collaboration; recognise and reward good ideas and innovations; put high emphasis on training and learning, and install performance-based promotion system to motivate people and build trust (Davenport, De Long and Beers 1998; Halal 1998; Skyrme 1999). Only leadership that understand that effective knowledge management can represent a source of competitive advantage in its own right and values trust among employees can build a winning organisation that knows how to balance the need for new knowledge with a need for efficient use of disposable knowledge.

Because knowledge can quickly become irrelevant in light of changes external and internal to the organisation, it is critical that individuals, who have unique bundles of competencies, can adapt their competencies to new situations as rapidly as possible. Employees' competencies that can be considered as essential in the conception of adaptability are (Boyett and Conn 1992; Katzenbach and Smith 1994, 47):

- Capability to learn: The employee should know what, how and where to learn best. Here we do not consider just single loop learning where people perform differently without changing their mental models, but also double loop learning that manifests itself when people are capable of reconsidering their own mental models (Argyris and Schön 1978).
- Task competencies: These refer to the job task competence, as well as the capability to utilise new technologies.
- Communicative competence: The employee should have the ability to express him/herself and to be able to acquire, interpret and filter information.
- Flexibility: The employee should be capable of thinking outside mainstream framework and to solve problems.
- Social competence and team capabilities: The employee should know how to negotiate effectively within groups and how to share task accomplishments.
- Autonomy: The employee should identify him/herself with an organisation and not just as an order recipient.

As communication theory suggests a network's potential benefit grow exponentially as the number of nodes expand (Evans 2003, 82). People that are capable to build a network can uncover more opportunities for knowledge creation and application and at the same time contribute to build trust inside an organisation. This capability is important in every organisation, but especially in a multinational global organisation where it can contrast the possible negative effect of cultural diversity. Within the whole knowledge creation process the ability to build a social network is not confined only to a socialisation process. It also plays a prominent role in justifying a concept when a micro-community or creative individuals need to persuade decision makers within an organisation to support the next phases of their work.

### *Information and communication technology*

Information and communication technology (ICT) has made it possible to preserve valuable explicit knowledge for the future and to share a huge amount of information unconstrained by the boundaries of geography and time. For an organisation, this means an opportunity to horizontally and vertically integrate task and data and in this way to shorten the length of the



transformation cycle. The transformation cycle includes not only transformation of tangible inputs into products/services but also transformation of intangible ideas and insights into tangible outputs. With regard to Hamel and Prahalad's (1995) claim that it is not the absolute level of knowledge a firm possesses which leads to competitive advantage, but the velocity with which it is circulated in the organisation, we can understand why ICT is so critical for knowledge management success in an organisation.

We divided information and communication technology into three groups:

1. *Technology for knowledge codification and storage* that includes different types of knowledge repositories and knowledge-based decision support systems. Software agents which can search for information across many repositories on behalf of the user and data mining tools that help to identify new patterns in large volumes of data also belong to this kind of technology.
2. *Communication technology* that supports knowledge transfer irrespective of its format, user operating system, or communication protocols. Communication technology also includes knowledge maps, which are pointers to knowledge providers inside or outside an organisation.
3. *Collaborative technology* that enhances person-to-person collaboration which can happen at the same or different time and in the same or different place.

Which of these technologies is the most important for an organisation depends on the organisation's context shaped by orderliness, businesses, and disposable assets as well as on the organisation's knowledge strategy. Anyway an effective virtual *ba* (Nonaka et al. 2003, 499) demands a congruent combination of all of them.

### ***Exploitation and exploration knowledge strategies***

Several issues must be considered in relation to an organisation's knowledge strategy direction. The first thing is that an organisation's decision to exploit disposable knowledge or to explore for new knowledge significantly impacts the type of knowledge that an organisation needs, the way knowledge is used, and the design of organisation's constitutive elements. To assess which strategy or mix of both strategies is better for an organisation's long-term success, the knowledge content of organisation's core assets must be identified and compared with the need of an organisation's vision and with competitors' knowledge. In this way, it is possible to estimate the knowledge gap that exists between what an organisation already knows and what it needs to know to exploit opportunities and avoid threats in the marketplace.

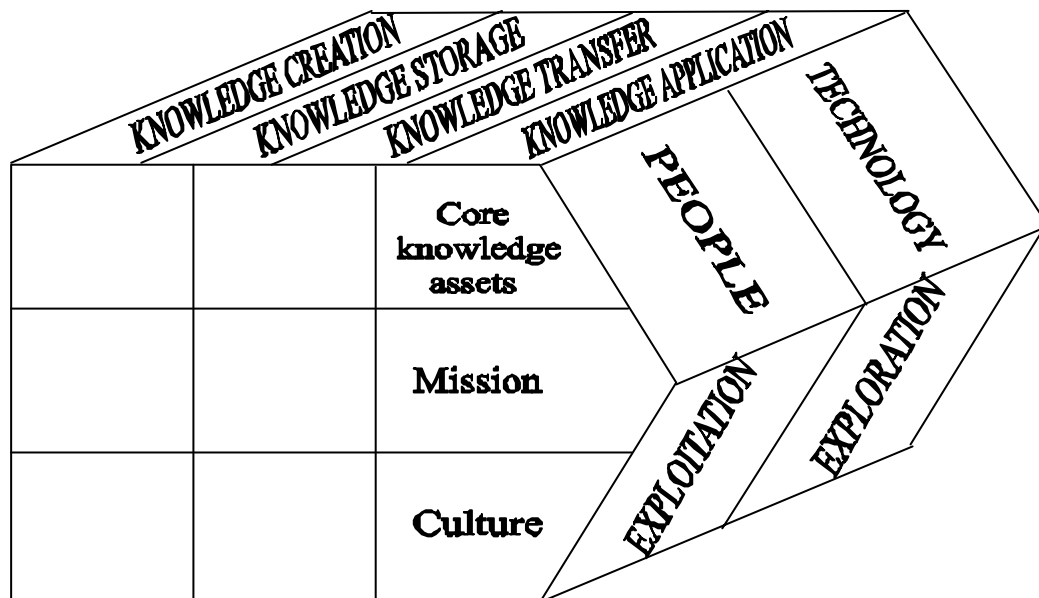
If an organisation is mostly oriented to exploitation of its internal knowledge then organisational culture is predominantly inside oriented with high use of information and communication technology to support internal knowledge creation, store, transfer, and application. Incentives are used to reward employees who efficiently exploit the organisation knowledge base and links that are part of a "hidden" layer of structure stay inside an organisation. Leadership supports efficiency and fitness between organisational and individual values is an essential internal characteristic. On the other hand, an organisation that is mostly oriented to exploration of external knowledge has an externally oriented culture where a "hidden" layer of structure is developed outside organisational boundaries. Information and communication technology is first of all used for identifying and solving new or unique problems. With leadership that supports innovations, new knowledge creation and

transfer of outside knowledge into an organisation are rewarded. A key characteristic of organisation's employees is adaptability.

### Normative management

As previously discussed, normative management represents the long-term framework that gives direction to organisation's activities. Normative management results from an organisation's vision that defines what kind of knowledge the organisation should create and in what domain (Nonaka et al. 2003, 506) or for what it must strive for in the long run. Without a clear knowledge vision an organisation is not in a position to align its constitutive elements and knowledge management activities, or to focus its knowledge management efforts. As a result, any action taken in consideration of an organisation's knowledge base development is almost certainly condemned to fail.

Figure 3: Elements of normative management in system knowledge management framework



Normative management consists of:

1. *Core knowledge assets* that consist of experiential, market, and systemic knowledge assets (adapted after Nonaka et al. 2003, 502).
2. *Organisation mission* that defines to who and how an organisation will serve.
3. *Organisation culture* that represents a tacit part of group knowledge developed through common shared experience.

### Core knowledge assets

Core knowledge assets are a totality of distinctive tacit and explicit knowledge at an individual and/or organisational level that represents the present source of organisation's competitive advantage, with the exception of tacit knowledge embedded in actions and practices as organisational culture and operating rules.

Organisation's core knowledge assets consist of (adapted after Nonaka et al. 2003, 501-503):

- *Experiential knowledge assets* that include tacit knowledge shared through common experiences as skills and know-how of individuals that are organisation-specific.

- *Market knowledge assets* that include explicit and tacit knowledge articulated through images, symbols, and language and embedded in product concepts, design, and brand equity.
- *Systemic knowledge assets* that include codified explicit knowledge embedded in documents, manuals, databases, patents and licenses.

Core knowledge assets are elements of the normative management because represent the starting point for formulation of the organisation's strategy. On the other hand they also represent the core rigidities of an organisation as formulated by Leonard-Barton (1995). For both reasons an organisation needs to identify them as to be able to exploit them for today's success and to change and improve them for future success through new knowledge creation.

### ***Organisation mission***

Organisation mission is a statement about sense of the organisation's existence. It defines a broad direction that an organisation wants to follow in consideration of its stakeholders and a broad framework for its market oriented activities.

Organisation mission is composed of the answers on three main questions:

- *To whom* do we as an organisation serve?
- *What are interests* that we as an organisation want to realise?
- *How* will we realise the added value on the market?

The first two answers are intimately linked with organisation culture, while the last one with core knowledge assets. An organisation mission is important (1) because it defines what knowledge will be important for an organisation in consideration of its stakeholders and their needs and (2) because it indirectly express what knowledge an organisation has about own identity and its environment. In this way an organisation mission directs a sense-making process inside an organisation (Weick 1995).

### ***Organisation culture***

Because organisational culture determines the kinds of knowledge sought and nurtured, and the kinds of knowledge-building activities tolerated and encouraged within an organisation (Leonard-Barton 1995), a significant proportion of the literature that was reviewed considers organisation culture as "the key" factor for success of knowledge management initiatives (Martin 2000 24; De Long and Fahey 2000; Rastogi 2000; Bock 1999; Holowetzki 2002). From a knowledge management point of point of view, a key issue for an organisation is to instil an organisation wide culture that encourages change and openness to new knowledge regardless of where this knowledge is developed.

Three major sub-factors of organisation culture that can be found in the literature are:

- *Readiness for risk taking* where risk and failures are recognised as organisational and individual learning.
- *Knowledge sharing* with a clear understanding of the mutual benefit in doing it and a climate of openness and trust.
- *Outside orientation* as represented by the urge to exploit and develop knowledge presented in collaborative joint ventures, alliances and partnerships.

To promote the learning process and new knowledge creation an organisation needs to sustain a culture where calculated risk of failures is acceptable and expected, creative solutions are always considered in addition to more conventional ones, and people are given time and resources to try new things. Readiness for risk taking changes in different contexts, but as a culture element it strongly differentiates innovative and visionary organisations from status quo organisations.

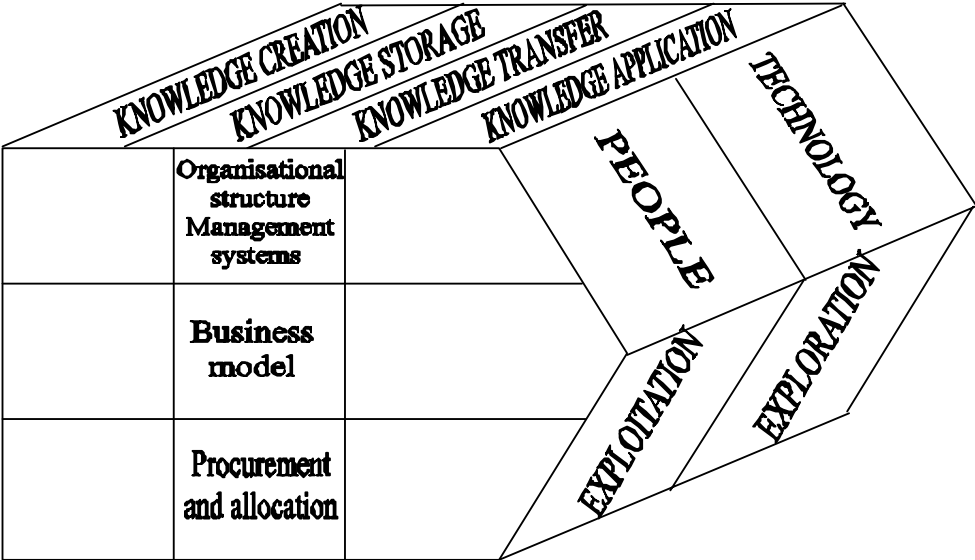
Without a culture of knowledge sharing, knowledge remains the property of an individual or a group inside an organisation and not available to the larger organisation. Such a culture does not promote communication between employees or reward the exchange of knowledge. In this way distrust between employees develops and an attitude where people are primarily concerned about their own benefits before anything else.

Outside or external orientation represents an attempt to go beyond traditional organisational structures and boundaries in favour of the establishment of symbiotic arrangements with external partners, which can provide a mutual advantage (Wigand et al. 1997, 209). Two reasons exist why outside oriented cultures are not often found in the organisations. The first is that an organisation may be unsure if it will be able to protect its own knowledge from leaking. The second reason, is an intimate fear to concede that something has changed outside an organisation in a way that an organisation is no longer the best or the only one in consideration of the matter involved (“not-invented here” syndrome).

**Strategic management**

Strategic management represents the link between the long-term normative management and short-term operating management. If the organisation’s vision represents an absolute or ideal standard that an organisation wants to achieve in the future and the operating management represents a historical standard that an organisation needs to improve if it wants to survive in the middle and long-term, then the strategic management represents an external standard of comparison with other organisations. The main goal of strategic management is to achieve and maintain the competitive advantage of an organisation.

Figure 4: Elements of strategic management in system knowledge management framework



## ***Organisation structure***

Organisational structure is in some way a result of organisational culture. However, as we stated earlier, the influence between these is not one-way and a restrictive structure could inhibit a knowledge enriching culture.

After Fouché and Botha (2002) we divided structure of an organisation into the three layers of “network forming devices”:

1. *Formal hierarchical structure* with reporting relationships, responsibilities and accountabilities.
2. *Flexible structure* that consists of ad hoc problem-solving teams, task forces, joint planning groups etc.
3. *“Hidden” (implicit) structure* that consists of informal peer groups, interest groups, professional groups and personal networks internal as well as external to the organisation.

In the literature, considerable evidence can be found that a formal hierarchical structure prevents effective knowledge management (De Long and Seeman 2000). An organisational structure that does not preclude communication and collaboration across hierarchical and functional boundaries must be permeable in the sense of a free flow of knowledge between employees regardless their job position, job function, or any other traditional boundaries (Symon 2000).

Because formal structure can inhibit knowledge flow in an organisation, it is very important how effectively the organisation employs flexible and hidden structures to facilitate the flow of knowledge. A flexible structure is composed of project teams and other task-oriented groups that can accommodate multi-disciplinary and cross-functional members. The role of a flexible structure is not just to promote more flexibility of the organisation, but also to motivate employees to develop and share their knowledge.

Hidden structures promote the exploitation of opportunities created by a workplace setting of open spaces where co-location and informal meeting places are part of daily organisational routine. This layer of structure represents the biggest share of the “social capital” of an organisation as a particular combination of networks that exist inside and outside an organisation. Hidden structure have achieved more popularity in the last few years with developed interest in communities of practice, which represent informal groups that interacted and collaborated regularly around work-related issues and challenges (Cross and Baird 2000). With the focus on communities of practice that exist in an organisation, it is possible for an organisation to promote knowledge sharing and creation, and in this way to secure a higher possibility of success.

## ***Organisation systems***

The purpose of organisation systems in relation to knowledge management is to enable effective and efficient application of the knowledge within an organisation. For promoting knowledge management in the organisation we need a performance system that uses tangible (financial) and intangible (non-financial) long-term oriented measures and a reward system that incorporates both extrinsic and intrinsic rewards (Davenport, De Long and Beers 1998). As contingency theory suggests, coherency between different kinds of organisation’s systems is absolutely critical for success of any knowledge management initiatives.

Organisation systems are composed of:

1. *Reward and recognition system* that needs to be broad enough to encourage people to learn and share knowledge with their co-workers and access knowledge that is available in organisation information system.
2. *Planning and performance system* that includes organisation's objectives and measures for both tangible and intangible aspects of an organisation.
3. *Information system* that supports store and transfer of data from outside or inside of an organisation and has clear rules for categorizing organisation's products and processes.

Because the possession of knowledge is thought to give a personal competitive advantage (De Long and Fahey 2000, 113), it is difficult without the right reward and recognition system to facilitate the sharing of knowledge between an individual – employee and an organisation. For this reason, knowledge management literature often emphasized that an organisational reward and recognition system needs to be made broader, encouraging people not to compete with one another but to share knowledge and to work together for creation of new knowledge (Habbel et al., 1998).

We believe an effective reward and recognition system needs to make equal use of extrinsic (tangible) and intrinsic (intangible) rewards. Extrinsic motivators are above all oriented to an assessment of achievement against knowledge management objectives such as (1) acquiring new knowledge; (2) undertaking new projects or responsibilities; (3) contributing to a community or team; (4) contributing to the development of another employee (Brelade and Harman 2000). On the other hand, intrinsic motivators are based on more informal, short-term rewards that give employees a feeling of accomplishment with regard to knowledge development, creation or sharing. If we consider that intrinsic motivators lead to solutions that are far more creative than do extrinsic motivators, and the former are the most immediately affected by the environment (Amabile 1998), we can conclude that in this area, a knowledge oriented organisation can make a significant positive difference compared to competitors.

In the last decade or more, attention has been oriented to the organisation's internal resources and capabilities and a major shift from top-down planning to bottom-up and middle-up-down strategy development has occurred (Nonaka and Takeuchi 1995; Floyd and Wooldridge 2000). Beside these changes that try to build and cultivate a more collaborative and participative environment inside an organisation, important changes have occurred with regard to performance measurement systems. These are now more future oriented and it try to take into account the intangible assets of an organisation such as knowledge. The literature already mentions different performance measurement systems which consider and measure intangible assets of organisation, like Skandia Navigator (Edvinsson and Malone 1997), Balanced Scorecard (Kaplan and Norton 1996), Intangible Asset Monitor (Sveiby 1997), IC-Index (Roos et al. 1997) etc. Despite these and other systems, we do not currently have a complete system for the measurement of intellectual or intangible assets (Bontis 2001). However, in consideration of a "paradigm shift" (Bontis 2001) it can be supposed that with the further development of the above-mentioned systems or with the development of new ones, organisations will eventually have a tool, to help better manage their core knowledge assets.

Information system encompasses much more than technology for facilitating data store and transfer. An organisation's information system is composed of technology, people and processes that need to be put together consistently if an organisation wants that the system is capable (1) of helping people inside an organisation to identify problems and opportunities,

and (2) of storing and transferring data that reside inside or outside an organisation in the way that ensure the optimal “intelligence density” (Gallupe 2001). In addition an effective information system identifies obsolete data and replaces it.

### ***Business model***

In consideration of the broader organisation’s mission, the organisation’s business model represent an explicit answer to three questions (Govindarajan and Gupta 2001, 3):

- Who are the organisation’s target customers?
- What value do we as an organisation want to deliver to them?
- How will the organisation will create it?

As consequence of the above-mentioned questions, we can say that the business model involves three main elements (Govindarajan and Gupta 2001, 4):

- *Customer base* that defines market segments where the organisation can exploit its competitive advantage.
- *Concept of customer value* that it goes beyond “hard” product or service to intangibles with a high proportion of knowledge transferred from the organisation to the customers.
- *Value chain architecture* that represents chain of activities that an organisation needs to perform to deliver value to the customers in the most efficient way.

The business model is the end result of the organisational intelligence activities linked with the organisation’s vision. In the process of business model development, an organisation uses its knowledge about the marketplace and its future development together with its knowledge about its own core knowledge assets. The knowledge that it uses is predominantly implicit in nature, especially if an organisation tries to change the existing rules of the game. How this knowledge is created, stored, transferred and applied will significantly impact the business model that an organisation will develop.

### ***Procurement and allocation***

To successfully procure and allocate “knowledge assets” an organisation needs to have a clear understanding of its disposable core knowledge assets and the requirements of its business model. Only after an assessment of the gap that exists between them will an organisation be in a position from which it can decide where and how it will procure and allocate needed assets.

Procurement and allocation as an element of the strategic management needs to consider three types of “knowledge assets”:

- *Knowledgeable people – experts* represent individuals outside the organisation that can bring important knowledge to an organisation if they are involved in its operation.
- *Knowledgeable products or services* represent products or services that an organisation at the moment for different reasons is not able to produce or developed, but if they are found in the marketplace at the right price and properly employed they can have a strong impact on competitive advantage of an organisation.
- *Knowledgeable organisations* represent competitors and other organisations that hold knowledge assets that an organisation does not have and it can not develop without incurring in disproportional costs.

When an organisation considers the acquisition of “outside” experts, it needs to think about some of the negative consequences that such a decision might bring:

- people inside the organisation (especially middle managers) can become disinterested in upgrading competencies,
- trust and loyalty inside the organisation can decrease,
- the organisation can lose an opportunity to capitalise on the knowledge of its veteran employees,
- newcomers can bring new knowledge, but they can also make serious errors because they are unfamiliar with the way to behave and work inside the organisation.

For these and other reasons it is very important that an organisation tries to balance promotion and development of its existing employees with the acquisition of experts from outside. It also needs to consider whether or not the expert fits with its core values, and if the knowledge really resides in the expert or in the environment where he/she works.

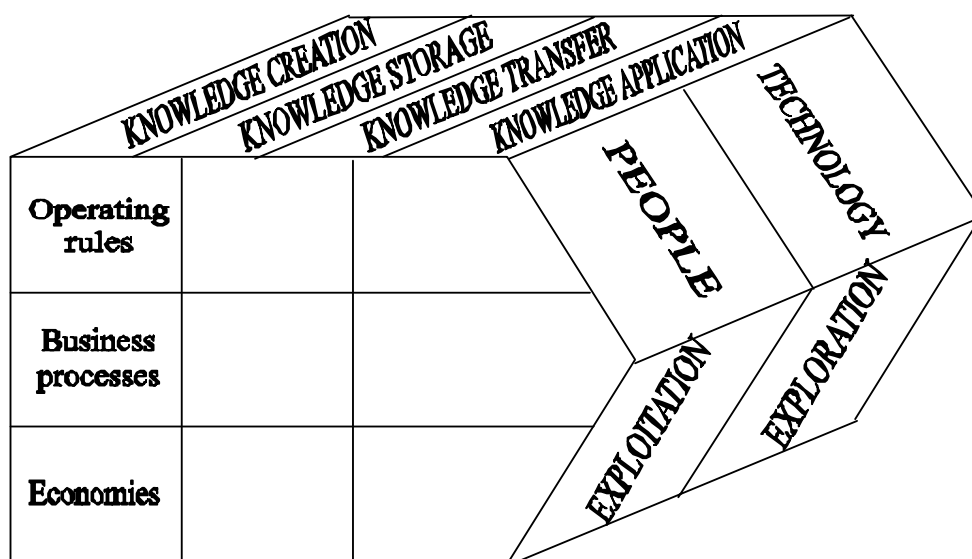
Knowledgeable products or services can often represent a unique opportunity for an organisation to strengthen its future sources of competitive advantage. To achieve this an organisation needs to take a proactive stance. This requires that it attempts to not only improve the acquired product or service, but to develop or at least contribute to the development of the second generation of it. For a lot of small and middle sized organisations this represents the only way for development and upgrading of its core knowledge assets.

With respect to knowledgeable organisations, we can say that an organisation has two main approaches it may use. The first is to acquire another organisation, the second is to build a partnership. Organisations need to decide which approach to use by considering the different internal and external contexts.

### Operating management

Operating management represents the front stage where an organisation produces and delivers value to its customers.

Figure 5: Elements of operating management in system knowledge management framework





Sadly, operating management is often neglected in the knowledge management literature with the exception of business processes. In our developed framework we also wish to contribute to a consideration of this level of management within the knowledge management literature.

### ***Operating rules***

As Eisenhardt and Sull (2001) pointed out well defined simple rules are essential for an organisation's success in today's unpredictable world. The optimal number of rules that an organisation uses can change over time as the business landscape changes (Eisenhardt and Sull 2001, 113). In a period of predictability an organisation uses more rules in order to increase efficiency. In a period of turbulence it uses less rules in order to increase flexibility.

After Eisenhardt and Sull (2001) operating rules are divided into three types:

- *Priority rules* help managers rank opportunities and problems that they encounter in day-to-day activities.
- *Timing rules* help managers to synchronise their activities and decisions with other parts of an organisation.
- *Exit rules* help managers to decide when is the right time to finish with the activities or projects that do not have prospects of success.

Operating rules are very rarely the result of careful thinking and analysis, more often they are results of experience, especially of painful ones. They are products of collective problem solving where organisational culture develops as social tacit knowledge and operating rules as social explicit knowledge.

### ***Business processes***

Organisations not only create knowledge, they also, and usually primarily, create goods and services. In accordance with Rastogi (2002, 234): "the test of value creation is whether customers are willing to pay for a firm's product(s) and or service(s) under conditions of competitive choices open to them." Knowledge management initiatives that do not consider the utility of knowledge for value creation are from an economical point of view completely useless and just destroy valuable organisational resources.

Operation level value activities are executed through business processes as an interrelated, sequential set of activities and tasks that turn inputs into outputs, and have a distinct beginning, a clear deliverable at the end and a set of metrics that are useful to measure performance (Pearlson 2001).

After Fahey et al. (2001, 894) business processes are divided in three main groups:

1. *Product development management process* that is oriented to the development of new customer solutions and/or to the improvement of existing solutions.
2. *Supply chain management process*, which purpose is the acquisition of inputs and their transformation into desired customer benefits.
3. *Customer relationship management process* that develops and nurtures relationships with external marketplace entities.

Knowledge integrates all three business processes into a coherent whole and adjusts them in response to external changes in order to better fulfil customers' needs. This can be achieved by transforming marketplace data into knowledge, by transforming primarily products or

services to knowledge-based ones, by changing a buy-sell attitude into a customer-supplier relationship, by changing the focus from an individual process to share understanding of a business model, and by reconsidering an organisational value chain as a dynamic value net.

### ***Economies***

In general an organisation can be oriented to exploit one of the three possible economies:

- *Economies of scale* exists when an organisation can reduce the unit cost by high production volumes.
- *Economies of scope* exists where the same equipment can produce multiple products more cheaply in combination than separately (Goldhar and Jelinek 1983).
- *Economies of substitution* exists when the cost of designing a new system through the partial retention of existing components is lower than the cost of designing the system afresh (Garud and Kumaraswamy 2002).

Economies of scale are the product of the industrial revolution, in the same way as economies of substitution are a product of information revolution. The type of economies that an organisation has chosen to exploit will direct type of knowledge that it will develop and use.

### **Conclusion**

For an understanding of relationships that exist between knowledge management processes and organisation elements, and their impact on an organisation's success we need more than just a list of key elements. What we require is an identification of relevant sub-dimensions of broad organisational elements and their analysis, to get a clearer picture of an organisation as purposeful system of knowledge creation and exploitation.

This paper presents the first phase of our research. In the future this research will be complemented with survey and analytical analysis of my hypothesis so as to discover how the proposed framework can be useful for management practice, especially for knowledge management audit and assessment of the impact that knowledge management processes and organisational elements can have on an organisation's success. Hopefully this framework can provide a right basis for future research and further refinement of identified elements.

### **References:**

1. Alavi, M., and D. E. Leidner. 1999. Knowledge Management Systems: Issues, Challenges and Benefits. *Communications of the Association for Information System* 1 (5).
2. Alavi, M., and D. E. Leidner. 2001. Review: Knowledge Management and Knowledge Management System: Conceptual foundations and research issues. *MIS Quarterly* 25 (1): 107-136.
3. Amabile, T. M. 1998. How to Kill Creativity. *Harvard Business Review* 76 (5): 76-88.
4. Argyris, C., and D. A. Schön. 1978. *Organisational Learning: A Theory of Action Perspective*. Reading: Addison-Wesley.
5. Bartlett, C. A., and S. Ghoshal. 1994. Changing the Rule of Top Management: Beyond Strategy to Purpose. *Harvard Business Review* (Nov.-Dec.): 79-88.

6. Biloslavo, R., and J. Grad. 2003. Fuzzy Expert System for Evaluating the Flexibility of an Organization: Theoretical Foundations and Field Study Research. *Issues in information systems* 1: 25-31.
7. Bleicher, K. 1995. *Das Kozept integriertes Management*. Frankfurt and New York: Campus Verlag.
8. Bock, F. 1999. Viewing K M in Terms of Content, Culture, Process and Infrastructure: The Intelligent Approach to Knowledge Management. *Knowledge Management Review* 2 (1): 22.
9. Bontis, N. 2001. Assessing Knowledge Assets: A Review of the Models Used to Measure Intellectual Capital. *International Journal of Management Review* 3 (1): 41.
10. Bourdreau, A., and G Couillard. 1999. System Integration and Knowledge Management. *Information System Management* 16 (4): 24.
11. Boyett, J. H., and H. P. Conn. 1992: *Workplace 2000: The Revolution Reshaping American Business*. New York: Penguin.
12. Brelade S., and C. Harman. 2000. Using Human Resources to put Knowledge to Work. *Knowledge Management Review* 3(1): 26.
13. Churchman, C. W. 1972. *The Design of Inquiring System: Basic Concepts of System and Organizational*. New York: Basic Books.
14. Cook, S. D. N., and J. S. Brown. 1999. Bridging Epistemologies: The Generative Dance Between Organizational Knowledge and Organizational Knowing. *Organizational Science* 10 (4): 381-400.
15. Davenport, T. H., and L. Prusak. 1998. *Working Knowledge: How Organization Manage What They Know*. Boston: Harvard Business School Press.
16. Davenport, T. H., D.W. De Long, and M. C. Beers. 1998. Successful Knowledge Management Projects. *Sloan Management Review* 39 (2): 43-57.
17. De Long D. W., and P. Seeman 2000. Confronting Conceptual Confusion and Conflict in Knowledge Management. *Organizational Dynamics* 29 (1): 33-44.
18. De Long, D. W., and L. Fahey. 2000. Diagnosing Cultural barriers to knowledge management. *Academy of management Executive* 14 (4): 113.
19. Edvinsson, L., and M. S. Malone. 1997. *Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower*. New York: Harper Business.
20. Eisenhardt, K. M., and D. N. Sull. 2001. Strategy as a simple rule. *Harvard Business Review* 79 (January): 107-116.

21. Evans, C. 2003. *Managing for Knowledge: HR's strategic role*. Amsterdam: Butterworth Heinemann.
22. Fahey, L. et al. 2001. Linking E-business and Operating Processes: The Role of Knowledge Management. *IBM System Journal* 40 (4): 889.
23. Floyd, S.W., and B. Wooldridge. 2000. *Building strategy from the middle: Reconceptualizing Strategy Process*. Thousand Oaks: Sage.
24. Fouché, B., and D. F. Botha. 2002. Knowledge Management Practices in the South African Business Sector: Preliminary Findings of Longitudinal Study. *South African Journal of Business Management* 33 (2): 13.
25. Gallupe, B. 2001. Knowledge Management System: Surveying the Landscape. *International Journal of management Reviewers* 3 (1): 61.
26. Garud, R., and A. Kumaraswamy. 2002. Technological and Organizational Designs for Realizing Economies of Substitution. In *The Strategic Management of Intellectual Capital and Organizational Knowledge*, edited by Choo, C. W., and N. Bontis. Oxford: Oxford University Press.
27. Goldhar J. D., and M. Jelinek. 1983. Plan of Economies of Scope. *Harvard Business Review* (nov.- dec.): 141-148.
28. Gomez, P. 1999. *Integrated Value Management*. London: International Thomson Business Press.
29. Gomez, P., and T. Zimmermann. 1993. *Unternehmensorganisation – Profile, Dynamik, Methodik*. Frankfurt, New York: Campus Verlag.
30. Govindarajan, V., and A. K. Gupta 2001. Strategic innovation: A conceptual Road Map. *Business Horizons* (July- August): 3-12.
31. Greenwood, R., and Hinings, C.R., 1993: Understanding Strategic Change: The Contribution of Archetypes. *Academy of management Journal* 36: 1052-1081.
32. Gupta, A. K., and V. Govindarajan. 2000. Knowledge management's Social Dimension: Lessons From Nucor Steel. *Sloan Management Review*. Fall 71-80.
33. Habel et al. 1998. *Knowledge management: knowledge-critical capital of modern organizations*. Booz Allen & Hamilton Insights.  
[[www.bah.com/viewpoints/insights/cmt\\_knowmanage\\_2.html](http://www.bah.com/viewpoints/insights/cmt_knowmanage_2.html)]
34. Halal, W. E. 1998. Organizational Intelligence: What is it, and How Can Managers Use it to Improve Performance? *Knowledge Management Review* 1(march-april): 20-25.
35. Hamel, G., and C. K. Prahalad. 1995. *Competing for the Future*. Boston: Harvard Business School.

36. Hansen, M. T. et al. 1999. What's Your Strategy for Managing Knowledge? *Harvard Business Review*, 77 (2):106- 117.
37. Hasanali, F. 2002. *Critical Success Factors of Knowledge Management* [http://www.kmadvantage.com/docs/km\\_articles/Critical\\_Success\\_Factors\\_of\\_KM.pdf](http://www.kmadvantage.com/docs/km_articles/Critical_Success_Factors_of_KM.pdf)
38. Holsapple and, M. Singh. 2001. The knowledge chain model: Activities for Competitiveness. *Expert Systems with Applications* 20 (1):77-98.
39. Holsapple, C.W., and K.D Joshi. 1999. Description and Analysis of Existing Knowledge Management Frameworks, *Proceedings of the 32nd Hawaii International Conference on Systems Science, 1999*.
40. Kanter, J. 1999. Knowledge Management, Practically Speaking. *Information Systems Management* 16 (4): 7.
41. Kaplan R. S. and D. P. Norton 1996 *The Balanced Scorecard: Translating Strategy Into Action*. Boston: Harvard Business School Press.
42. Katzenbach, J. R., and D. K. Smith. 1994: *The Wisdom of Teams*. New York: Harper Business.
43. Kirrane, D. E. 1999. Getting wise to knowledge management. *Association Management* 51 (8): 31.
44. Leonard – Barton, D. 1995. *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*. Boston: Harvard Business School Press.
45. Manz, C. C. and H. P. Sims. 1993: *Business without Bosses: How Self-Managing Teams are Building High Performing Companies*. New York: John Wiley & Sons.
46. Martin, B. 2000. Knowledge Management within the context of management: An evolving relationship. *Singapore Management Review* 22 (2): 17-36.
47. McDermott, R. 1999: Why Information Technology Inspired but Cannot Deliver Knowledge Management. *California Management Review* 41 (4): 103-117.
48. Mertins, K. et.al. 2003. *Knowledge Management: Concepts and best Practices*, 2nd ed. Berlin: Springer.
49. Meyer, C. 1993: *Fast cycle time: How to align purpose, strategy, and structure for speed*. New York: Free Press.
50. Nonaka, I. et al. 2003. *A Theory of Organizational Knowledge Creation: Understanding the Dynamic Process of Creating Knowledge*. In *Handbook of Organizational Learning and Knowledge*, edited by. Dierkes, M., A. Berthoin-Antal, J. Child and I. Nonaka. Oxford: Oxford University Press.

51. Nonaka, I., and H. Takeuchi. 1995. *The Knowledge Creating Company*. New York: Oxford University Press.
52. Polanyi, M. 1967. *The Tacit Dimension*. London: Routledge and Keoan Paul.
53. Rastogi, P. N. 2000. Knowledge Management and Intellectual Capital - The New Virtuous Reality of Competitiveness. *Human Systems Management* 19 (1): 39.
54. Rastogi, P. N. 2002: Knowledge Management and Intellectual Capital as a Paradigm of Value Creation”, in: *Human Systems Management*, V. 21, I. 4, 229-240
55. Roos, J. et al. 1997. *Intellectual Capital*. Basingstoke: Macmillan Business.
56. Rubenstein-Montano, B. et al. 2001. A systems thinking framework for knowledge management. *Decision Support Systems* 31 (1): 5.
57. Schein, E. H. 1985: *Organisational Culture and Leadership*. San Francisco: Jossey-Bass Publishers
58. Schwaninger, M 2001. System Theory and Cybernetics: A Solid Basis for Transdisciplinary in Management Education and Research. *Kybernetika* 30 (9/10): 1209-1222.
59. Schwaninger, M. 1994. *Managementsysteme*. Frankfurt, New York: Campus Verlag.
60. Skyrme, D. J. 1999. *Knowledge Networking: Creating the Collaborative Enterprise*. Woburn: Butterworth-Heinemann.
61. Staples, D. et al. 2001. Opportunities for research about managing the knowledge-based enterprise. *International Journal of Management Reviews* 3 (1): 20.
62. Sullivan, G. R., and M.V. Harper. 1996: *Hope is not a Method: What Business Leaders Can Learn from America's Army*. New York: Broadway Books.
63. Sveiby, K. E. 1997. *The New Organizational Wealth: Managing Measuring Knowledge-based assets*. San Francisco: Berret-Koehler.
64. Symon, G. 2000. Information and Communication Technologies and the Network Organization: A Critical Analysis. *Journal of Occupational & Organizational Psychology*, 73 (4).
65. Tavčar, M. I. 1999. *Razsežnosti strateškega managementa, 2 izdaja*. Koper: Visoka šola za management.
66. Tavčar, M. I. 2003. *Strateški management*. Koper: Visoka šola za management.
67. Vail, III. E. F. 1999. Knowledge Mapping: Getting Started With Knowledge Management. *Information Systems Management* 16 (4): 16.
68. Viljoen, J. 1994. *Strategic Management: Planning and implementing successful corporate strategies*. Melbourn: Longman.

69. Weick, K. E. 1995. *Sensemaking in Organizations*. Thousand Oaks: Sange.
70. Wigand, R. et al. 1997. *Information, Organisation and Management – Expanding markets and Corporate Boundaries*. Chichester: John Wiley & Sons