

Knowledge-Information Circulation Through the Enterprise: Forward to the Roots of Knowledge Management

Milan Zeleny

Fordham University, New York, USA

Tomas Bata University, Zlín, CR

mzeleny@fordham.edu

mzeleny@quick.cz

Abstract. The field of Knowledge Management (KM) has already completed its initiatory phase, characterized by operational confusion between knowledge and information, stemming from the tenuous notion of “explicit knowledge”. Consequently, the progress of KM has been much slower than would the significance of knowledge management in a modern enterprise indicate. Here we propose and discuss four cornerstones for returning to the roots of knowledge management and so moving forward towards a new phase of KM. We discuss the roots of reliable knowledge thinking and theory in economics, management and philosophy. Then we formulate clear, unambiguous and pragmatic definitions and distinctions of knowledge and information, establish simple and natural measures of the value of knowledge and propose the Knowledge-Information (KnowIn) continuum and its circulatory nature in managing knowledge of the enterprise. Autopoietic cycle A-C-I-S is elaborated to that purpose. We conclude the paper by discussing some implications of the new KM for strategy and strategic management.

1 Introduction

The field of Knowledge Management (KM) has already completed its initial cycle of relative euphoria and fashion with rather unimpressive practical results. This is because KM lacked reliable and self-confident definition and differentiation from information, information management and IT applications. This allowed an “easy entry” of a large variety of enthusiasts who were able to interpret “knowledge” in whichever suitable way. Such phenomenon is well documented by an unusual swell of thousands of KM books and articles. Opportunistic entries resulted in equally opportunistic exits. Consequently, the field of KM has lost its ways [8].

Yet, knowledge based strategy and therefore also KM undoubtedly represent one of the most significant advances in economics, management and business enterprise of modern era. The earliest expositions and formulations of Knowledge Management come from the 1980s, as for example in [12, 13].

At least four cornerstones have to be re-established before fully capitalizing on the KM promise of such import and magnitude:

1. Return to the firm *roots* of reliable knowledge thinking and theory in economics, management and philosophy.
2. Formulate clear, unambiguous and pragmatic definitions and *distinctions* of knowledge and information.
3. Establish simple and *natural* measures of the value of knowledge.
4. Propose the Knowledge-Information (*KnowIn*) continuum and its circulatory nature in the enterprise.

Other aspects, like strategy, technology, human resources and organizational environment are also important, but can be more or less *derived* from the above four cornerstones of conceptual foundations of KM. Observe that all four cornerstones are interconnected in a legacy progression, the next always based on the preceding one.

In this paper we concentrate on outlining the four cornerstones, with a short conclusion exploring the nature of strategy and strategic management from the vantage point of the new KM.

1 Forward to the Roots of Knowledge

Although we have to return *back* to the roots [3, 4], in the context of KM such move represents a step *forward*. This apparent contradiction is intentional.

A useful and practical philosophical foundation of knowledge comes from American pragmatists, especially from C. I. Lewis's system of *conceptualistic pragmatism* [5], rooted in the thought of Peirce, James and Dewey[2].

Pragmatist philosophical roots firmly established that knowledge is:

1. Action oriented
2. Socially established
3. Relatively interpreted

First, knowledge is action. This is also echoed in Polanyi's "All knowledge is tacit" [9]. There is no "explicit" knowledge, only information. Second, knowledge is consensually social and without a social context there can be no knowledge. Third, although the "given" of sensory data and experience remains absolute, its classification and *its relation to other things* is relative to a given context of experience *and* intended action.

Lewis captured the social dimension of knowledge through his term *community of action*. Congruity of behavior and *consensual* human cooperation are the ultimate tests of *shared knowledge*. The purpose of *communication* is coordination of action and behavior: It is therefore essential that all of its aspects remain consensual.

Knowledge cannot be separated from the process of knowing (establishing relationships). Knowledge and knowing are identical: *knowledge is process*.

What is meant when we say that somebody knows or possesses knowledge? We imply that we expect one to be capable of coordinated action towards some goals and objectives. Coordinated action is the test of possessing knowledge. Knowledge without action reduces to simple information or data. Maturana and Varela [6] put it very succinctly: *All doing is knowing, and all knowing is doing*.

Clearly, "explicit knowledge", repositories of data and information (data banks, encyclopaedias, expert systems) are only passive recordings, descriptions of

knowledge. Only coordinated human action, i. e., process of relating such components into coherent patterns, which turn out to be successful in achieving goals and purposes, qualifies as knowledge.

Among the myriads of possible postulated relationships among objects, only some result in a coordinated action. Every act of knowing brings forth a world. We "bring forth" a hypothesis about the relationships and test it through action; if we succeed in reaching our goal - we know.

Bringing forth a world of coordinated action is human knowledge.

Bringing forth a world manifests itself in all our action and all our being. Knowing is effective [i. e., coordinated and "successful"] action.

Knowledge as an effective action enables a living (human) being to persist in its coordinated existence in a specific environment from which it continually brings forth its own world of action. All knowing is coordinated action by the knower and therefore depends on the "structure" of the knower. The way knowledge can be brought forth in doing depends on the nature of "doing" as it is implied by the organization of the knower and his circumstance (working environment).

3 Definition of Knowledge

Clear, unambiguous and operational definition of knowledge is essential and without it the field of KM cannot progress in either theory or practice.

Based on the preceding philosophical foundations, we can advance the simplest possible definitions for the purposes of effective KM [14].

Knowledge is purposeful coordination of action.

The quality and effectiveness of achieved purpose is the evidence (and measure) of knowledge.

Information is symbolic description of action.

Any action, past, current or future, can be described and captured through symbols. All such descriptions are information. All those rules, formulas, frames, plans, scripts, and semantic networks are information, not forms of knowledge. It is not a set of rules or a formal representation of knowledge, i. e. information, that is critical to intelligence, but rather the mind's coordination of the body's experiences and actions, i. e. knowledge.

Knowledge is rooted in each individual's actions, behavior and experiences and therefore partially embedded in the process that is being coordinated.

The differences between knowledge and information are significant, qualitative and striking – as the differences between action and its description should be. I know because I do. I have information because I describe.

There can be *too much information* (information overload) but there can never be *too much knowledge*: There is no knowledge overload.

Information is only *one of the inputs* into the process coordination. Knowledge is coordination itself. There can be too many inputs, but coordination can only be better or worse. Information can be correct or incorrect, right or wrong, true or misleading. Knowledge can only be more or less effective.

Knowledge is *always gradual*, from less to more (effective). In this sense, it is not correct or incorrect: it is not an input.

Knowledge refers to the processing of inputs through coordination of action. The *rules of coordination* (sequences, patterns, levels of performance), derived from experience, observation, consensus or social prescription, are characteristic of knowledge, not of information. What are these rules and how are they followed are among the determinants of forms of knowledge.

Skills. If the rules are *internally* determined and controlled by the subject, we speak of skills. Skills can be validated by the action's outcome only. There is no need for social sanction or approval of the rules. Robinson Crusoe has skills as all autodidacts have skills. Neither have knowledge.

Knowledge. If the rules adhered to are established *externally*, in a social context and validation, then we can speak of knowledge rather than skills. Knowledge is recognized and validated socially. (One cannot say "I know" – unless one is an autodidact (amateur or dilettante) and thus self-exempt from the rules. Only others – family, community or society – can testify to one's knowledge.) One cannot claim knowledge without proper social validation.

Expertise. If the external rules are mastered and performed at a *socially respected* degree and if the actor can reflect upon the rules with respect to their improvement or change, then knowledge becomes expertise. An expert gains socially sanctioned power over the rules so that they no longer need to be obeyed. Expertise is an acquired ability to change the rules.

Observe that the difference between skills and knowledge is not based on the outcome. A skillful person can sometimes achieve a better outcome than a knowledgeable person, but it is not equally socially recognized and valued. Skill is based on the outcome only. Knowledge is based on both the outcome *and* the process leading to it. Expertise is masterful knowledge and cannot grow out of skills.

While skills, knowledge and expertise are all related to *know-how* – how to achieve a given or stated purpose, or to *know-what* – how to state or select a purpose to be pursued, the notion of *wisdom* is related to *know-why*.

Knowledge is related to both *efficiency* (know-how) and *effectiveness* (know-what) while wisdom is related to *explicability* (know-why). Having information is far from being knowledgeable. Being knowledgeable still does not imply wisdom.

One can be knowledgeable without being wise. Many use information and follow given rules efficiently: they acquire dexterity and become *specialists*. Others choose their goals and change the rules with the approval of others – and become *experts*. But even the masters of rules and purposes are not wise if they cannot satisfactorily explain *why* particular purposes, rules or courses of action *should* be chosen or rejected.

Wisdom is socially accepted or experience validated explication of purpose.

Enhancing human wisdom, pursuing practices and systems that are not only efficient or effective, but also wise, i. e., building *wisdom systems*, is the next frontier of the long and tortuous progression from data and information to knowledge and wisdom.

It is probably useful to expand on a definition of *communication*.

Communication is closely related to both knowledge and information. Conventional wisdom would weaken the usefulness of the concept of communication by including any *information transfer* in its domain.

We communicate with each other through language. Language is a system of symbolic descriptions of action. We exchange these symbolic labels (information) in order to coordinate our action and modify behavior. When such coordination or modification occurs, we communicate. When it does not, we just transfer information.

Communication occurs when the result of a particular exchange of information (e. g., linguistic labels) is the coordination of action (doings, operations) or modification of behavior.

Clearly, language is *not* a system of communication, yet communication occurs through language.

What is the difference between action and behavior? *Action* is the result of deliberate decision making [15] within new contexts and circumstances. *Behavior* is a habitual or automated response to repeating circumstances within a known context. Both are affected by communication.

Communication is consequential exchange of information.

4 Natural Measure of Knowledge

Knowledge must be measured in a simple, natural way, not through a complex artificial formula or construct.

Based on the definition of knowledge as purposeful coordination of action, one can derive a natural measure of knowledge as a *value attributed to coordination*.

Knowledge is neither intangible nor abstract and it is *not difficult* to measure. Knowledge produces very tangible outcomes of real value to the approving society. Information, as a *description* of action, may be difficult to measure – it has no tangible outcome per se. The value of information is intangible, unless it becomes an input into measurable action, i. e. knowledge. Action itself (knowledge) is eminently measurable because its outcomes can be observed, measured and valued.

Knowledge is measured by the value that our coordination of effort, action and process adds to inputs of material, technology, energy, services, information, time, etc.

Knowledge is measured by added value.

Value of any produced item, product or service, is a combination of purchased or otherwise externally or internally acquired inputs and work and labor (coordinated performance of operations constituting the process). This value have to be socially recognized and accepted: by the market, by the purchaser, sponsor, peer group, community, family and so on. If nobody wants my product then it is irrelevant how many inputs, how much time and effort have I expended. My knowledge has no value.

If somebody pays for my product (in money or in kind) then its market or social value has been established. To derive the *value of knowledge*, we have to correct the value of product by *subtracting all* (including information) external and internal

purchases (their market value) or used and otherwise valued acquisitions. In corporate setting, we also subtract operating cost and general administrative cost.

As a result we obtain added value (to inputs) or added value per hour or worker. Such conceived added value is due to action or process, its performance and coordination. There are three components to added value: labor, work and coordination.

One has to pay wages to labor (performance of externally coordinated operations) and work (internally coordinated operations). In addition, one has to pay salaries for any employed coordination services. Observe that both wages and salaries can only be covered from the added value. Labor, work and management are not (or should not be) inputs, but forms of coordination and performance of the process. If no value has been added, no payment of wages and salaries can be sustained.

“Work” can be defined as economically purposeful activity requiring substantial human coordination of task and action. “Job” designates the kind of work that is performed contractually, that is, explicitly for remuneration and in the employ of others. “Labor” (often used as a synonym for hard work or toil) can more properly be related to performing simplified work-components or tasks without engaging in their substantial coordination towards given purposes. Work often involves labor but not vice versa. Work involves coordination of tasks while labor relates only to their performance. After we subtract from added value the cost of labor (considered material input), what remains is the value of knowledge applied to the process.

Added value measures knowledge, the contribution of coordination of action through work and management.

The *relativity* of the value of knowledge is clear. The same expenditure of coordination effort, time, skills and work can have great value in one context and no value in another. The same level of knowledge can have great value in New York and no value in Prague – and vice versa. All knowledge is relative and its value is derived from the context of its application. This is why knowledge cannot be measured from inputs and through *a priori* expenditures of time, effort and skills. Knowledge is not primary but secondary, a derived category: derived from the value of its outcome. The amount of knowledge does not determine the value of its outcome, but the value of the outcome determines the value of knowledge applied.

No amount of information, duration of study, hard work or dedicated effort can guarantee the value of knowledge. All such effort has to be socially accepted and sanctioned, its value affirmed and validated. Otherwise it can be wrong, misplaced, unuseful and unvalued – regardless of the effort.

In education we mostly acquire information (description of action), not knowledge (action itself). We study cookbooks but rarely learn to cook. Information is necessary and potentially useful, easy to transmit. But *information is not knowledge*.

In a world of global communications and information sharing we are less and less going to be paid for having information and more and more for knowing, for being able to coordinate action successfully (pay for knowledge). The value of education rooted in information is going to decline, *education for knowledge* is going to rise.

In this context, it becomes apparent that confusing information with knowledge is rapidly becoming counterproductive. After reading hundreds of cookbooks, I am still not a viable chef. I still do not know how to coordinate action, my own or others.

After reading hundreds of textbooks on management, I am still not a manager. I still do not know how to manage enterprise, my own or of others.

One of the cruelest outcomes of education is instilling the feeling that information *is* knowledge in unexperienced novices. Studying description of action does not guarantee knowledge of action.

This is why even the oxymoronic connection “explicit knowledge”, implying that somehow a symbolic description is some sort of “knowledge”, is not only confusing and unscientific, but also damaging and fundamentally untrue.

Witness K. E. Sveiby [10]: “All knowledge is either tacit or rooted in tacit knowledge. All our knowledge therefore rests in the tacit dimension,” or M. Polanyi [9]: “Knowledge is an activity which would be better described as a process of knowing.” So it would be. To know is to do.

The field of KM has to abandon its initial cycle and leap forward to its roots.

5 KnowIn Circulatory System

It is important that knowledge and information become interconnected in an integrated, mutually enhancing system of autopoietic self-production cycle of *KnowIn* circulation.

Clearly, there is a useful connection between action and its description, between knowledge and information. While knowledge management should include information management, information management cannot include knowledge management. Process can include its inputs, but no single input can include its process.

Knowledge produces more knowledge with the help of intermediate information. The purpose is to produce more knowledge, not more information.

In order to do that effectively, we have to integrate knowledge and information (KnowIn) flows into a *unified system of transformations*. It is insufficient, although necessary, to manage, manipulate, mine and massage data and information. It is incomplete and inadequate to manage knowledge without managing its descriptions. It is both necessary and sufficient to manage integrated and interdependent KnowIn flows.

Purpose of knowledge is more knowledge, not more information.

Useful knowledge is codified into its recording or description. Obtained information is combined and adjusted to yield *actionable* information. Actionable information forms an input into *effective* coordination of action (knowledge). Effective knowledge is then socialized and shared, transformed into *useful* knowledge. In short, the cycle

Knowledge -> Information -> Knowledge

can be broken into its constituent transformations:

1. **Articulation:** knowledge -> information
2. **Combination:** information -> information
3. **Internalization:** information -> knowledge
4. **Socialization:** knowledge -> knowledge

These labels are due to Nonaka's [7] transitions of knowledge: tacit to explicit, Articulation; explicit to explicit, Combination; explicit to tacit, Internalization; and tacit to tacit, Socialization. They are not separate dimensions and should not be separately treated.

The above sequence **A-C-I-S** of KnowIn flows is continually repeated in a circular organization of *knowledge production*.

Every enterprise, individual or collective, is engaged in two types of production:

1. Production of the other (products, services), *heteropoiesis*
2. Production of itself (ability to produce, knowledge), *autopoiesis*

Production of the other is dependent on the production of itself. Any successful, sustainable enterprise must continually produce itself, its own ability to produce, in order to produce the other, its products and services. Production, renewal and improvement of knowledge to produce is necessary for producing anything.

Knowledge production (production of itself) has traditionally been left unmanaged and uncoordinated. The focus used to be on the product or service, on "the other". In the era of global competition the omission of knowledge management is no longer affordable. Knowledge production leads to sustained competitive products and services but not the other way around. Even the most successful products do not guarantee sustained knowledge base and competitiveness of the enterprise.

The A-C-I-S cycle is concerned with *autopoiesis* [18], the production of itself. Traditional management is focused on its products and services, while neglecting its own continued ability to produce requisite knowledge for their production. Therein lies the imperative for knowledge management in the global era: information is becoming abundant, more accessible and cheaper, while knowledge is increasingly scarce, valued and more expensive commodity. There are too many people with a lot of information, but too few with useful and effective knowledge.

A-C-I-S Cycle. We can now characterize all four essential transformations in greater detail:

1. **Articulation:** transformation (knowledge -> information) is designed to describe, record and preserve the acquired, tested and provenly effective knowledge and experience in a form of symbolic description. All such symbolic descriptions, like records, manuals, recipes, databases, graphs, diagrams, digital captures and expert systems, but also books, "cookbooks" and procedures, help to create *symbolic memory* of the enterprise. This phase creates the information necessary for its subsequent combination and recombination into forms suitable for new and effective action.
2. **Combination:** transformation (information -> information) is the simplest as it is the only one taking place entirely in the symbolic domain. This is the content of traditional information management and technology (IT). It transforms one symbolic description into another, more suitable (actionable) symbolic description. It involves data and information processing, data mining, data warehousing, documentation, databases and other combinations. The purpose is to make information actionable, a useful input into coordination process.
3. **Internalization:** transformation (information -> knowledge) is the most important and demanding phase of the cycle: how to use information for effective action, for useful knowledge. Symbolic memory should not be passive,

information just laying about in libraries, databases, computers and networks. Information has to be *actively* internalized in human abilities, coordinations, activities, operations and decisions – in human action. Only through action information attains value, gains context and interpretation and - connected with the experience of the actor – becomes reflected in the quality of achieved results.

4. **Socialization:** transformation (knowledge -> knowledge) is related to sharing, propagating, learning and transfer of knowledge among various actors, coordinators and decision makers. Without such sharing through the community of action knowledge loses its social dimension and becomes ineffective. Through intra- and inter-company communities, markets, fairs and incubators we connect experts with novices, customers with specialists, employees with management for the purposes of learning through example, practice, training, instruction and debate. Learning organization can emerge and become effective only through socialization of knowledge.

The A-C-I-S cycle is continually repeated and renewed on improved, more effective levels through each iteration. All phases, not just the traditional combination of IT, have to be managed and coordinated *as a system*.

Circular KnowIn flows are stimulated, coordinated and maintained by a *catalytic function* of Knowledge Exchange Hub (KEH). This KEH functions under the supervision of KM Coordinator who is responsible for maintaining the four transformations A-C-I-S.

For the first two transformations, Tuggle and Goldfinger [11] developed a partial methodology for externalizing (or articulating) knowledge embedded in organizational processes. Any such externalization produces useful information [1]. It consists of four steps. First, a process important to the organization is selected. Second, a map of the selected process is produced (by specifying its steps and operations and identifying who is involved in executing the process, what are the inputs and the outputs). Third, the accuracy of the *process map* needs to be verified. Fourth, we examine the process map for extracting the embedded information: What does the process reveal about the characteristics of the person executing the process? What about the nature of the work performed? What about the organization in which this process occurs? Why is this process important to the organization in question? What benefit (added value) does the process contribute to the organization?

There are two forms of information extracted from the process mapping. The first extraction produces information about process structure while the second extraction produces information about process coordination. By producing a map of the process, a symbolic description of action, one extracts information about the process. The second extraction works with the process map directly (extracting information from information), i. e. shifting into Combination of A-C-I-S. It describes properties about the agent conducting the process, insights regarding the steps carried out in executing the process, and revealed understandings about the communications going on during the execution of the process.

This methodology involves only the A-C portion of the A-C-I-S cycle. The all important stages of Internalization and Socialization are not yet addressed. This incompleteness is probably due to the Nonaka [7] induced habit of treating the dimensions of A-C-I-S as separate, autonomous and independent. *They form an autopoietic cycle and cannot be separated.*

A-C-I-S cycle has *autopoietic organization* [16, 17], defined as a network of processes of:

- 1) *Knowledge Production (Poiesis)*: the rules governing the process of creation of new knowledge through Internalization of information.
- 2) *Knowledge Bonding (Linkage)*: the rules governing the process of Socialization of knowledge within the enterprise.
- 3) *Knowledge Degradation (Information Renewal and Replenishment)*: the rules associated with the process of transforming knowledge into information through Articulation and Combination.

All three types of constitutive processes must be well *balanced* and functioning in *harmony*. If one of the three types is missing or if one or two types predominate (out-of-balance system), then the organization can either be heteropoietic or allopoietic, i. e., capable of producing only “the other” rather than itself.

Any self-sustaining system will have the processes of production, bonding and degradation concatenated in a balanced way, so that the production rate does not significantly exceed the replenishment rate, and vice versa. *Self-sustaining systems will be autopoietic in an environment of shared or common resources*; such a business enterprise would resemble a living organism rather than mechanistic machinery.

Autopoietic knowledge systems, in spite of their rich metaphoric and anthropomorphic meanings and intuitions, are simply networks characterized by *inner coordination of individual actions achieved through communication among temporary member-agents*. The key words are coordination, communication, and limited individual life span of members. Coordinated behavior includes *both cooperation and competition*.

So we, as individuals, can coordinate our own actions in the environment only if we coordinate it with the actions of other participants in the same, intersecting or shared network. In order to achieve this, we have to in-form (change) the environment so that the actions of others are suitably modified: *we have to communicate*. As all other individuals are attempting to do the same, a *knowledge network of coordination* emerges, and, if successful, it is being “selected” and persists. Such a network then improves our ability to coordinate our own actions effectively. Cooperation, competition, altruism, and self-interest are inseparable. *Business enterprise becomes a living organism*.

Any self-sustainable system must secure, enhance and preserve communication (and thus coordinated action) among its components or agents as well as their own coordination and self-coordination competencies. Systems with limited or curtailed communication can be sustained and coordinated only through external commands or feedback; they are not self-sustaining. *Hierarchies of command are sustainable but not self-sustaining*. Their organization is machine-like, based on processing information, not on producing knowledge.

We have established that consensual (unforced) and purposeful (goal-directed) coordination of action is knowledge. Self-sustainable systems must maintain their ability to coordinate their own actions – producing *knowledge*. Self-sustaining systems must be knowledge producing, not only information, labor or money consuming entities.

6 Knowledge Based Strategy

One of the main implications of the new KM is the realization that strategy should be based on knowledge rather than information and rooted in action rather than its symbolic description.

Traditionally, the organization executives prepare a set of statements, descriptions of future action: mission, vision, set of goals, plan or pattern for action and similar artefacts. Observe that all these statements are nothing but information. It all remains to be translated into action. That is where most organization executives stumble.

How do you transform information into knowledge? How do you carry out the Internalization phase of A-C-I-S? They can all write statements, but can they do? All the statements, from mission to plan are “above the cloud line”. They do not see from the high clear skies of information down into the confusing reality of knowledge. So, it does not work.

So, we have to start anew.

Strategy is about what you do, not about what you say you do or desire to do. Strategy is about action, not about description of action. Strategy is about doing, not about talking about it.

Your strategy is what you do. And what you do is your strategy.

All the rest is words.

All organizations do and so all organizations have strategy, whether or not they realize it.

Executives have to stop managing information through issuing statements and start managing knowledge through coordinating action. There are no strategic, tactical and operational levels: everything takes place below the cloud line, separating information from knowledge. Everything useful is operational.

First, one has to create a detailed map of corporate activities to find out what is company doing, reveal its own strategy. Remarkably, many corporations do not know what they do, do not know their own strategy. They only know what they say, their own statements.

Second, after creating activity map, one has to analyze the activities by benchmarking them with respect to competitors, industry standards or stated aspirations.

Third, value-curve maps are created in order to differentiate one’s activities from those of competition. *Differentiation, not imitation*, is the key to competitiveness and strategy.

Fourth, selected activities are changed in order to fill the spaces revealed by value-curve maps as most effective for successful differentiation.

So, we change our action, and thus our strategy, without ever leaving the action domain. Our strategy remains what we are doing, even though we are doing something else. No need to implement or execute our “strategy” (set of statements) – it has already been enacted.

Executives “execute” their strategic statements. Their strategies are hard to execute. They are probably created “above the cloud line”, far removed from the doing, and should not be executed at all. Their effective (forced) execution is likely to damage the corporation and its strategic resilience.

Once we have effectively changed our activities and differentiated our action, there is nothing to prevent executives from describing the newly created strategy: They can derive their missions and visions as a description of true action, from bottom up, reflecting a real strategy – and take them above the cloud line. Their company will prosper.

Strategic management is all about doing, producing and creating. How do we produce knowledge, capability, core values, alliances, and networks? How do we do?

Therein lies the new promise and challenge of Knowledge Management.

References

1. Desouza, K. C.: Facilitating Tacit Knowledge Exchange. *Communications of the ACM*, 46 (6) (2003) 85-88
2. Dewey, J. And Bentley, A. F.: *Knowing and the Known*, Beacon Press, Boston (1949)
3. Hayek, F. A.: The Use of Knowledge in Society. *The American Economic Review*, 35(1945) 519-530
4. Hayek, F. A.: Economics and Knowledge. *Economica*, February (1937) 33-45.
5. Lewis, C. I.: *Mind and the World-Order* (1929), 2nd ed., Dover Publ., New York, (1956)
6. Maturana H. R. and Varela, F. J.: *The Tree of Knowledge* .Shambhala Publications, Inc., Boston (1987)
7. Nonaka I.: The Knowledge-Creating Company. *Harvard Business Review* 69 (6) Nov. - Dec. (1991) 96-104
8. Prusak, L.: What's up with knowledge management: A personal view. In: Cortada, J. W., Woods, J. A. (eds.): *The Knowledge Management Yearbook 1999-2000*, Butterworth-Heinemann, Woburn, MA (1999) 3-7
9. Polanyi, M.: *The Tacit Dimension*, Routledge and Keoan, London, England (1966) (Peter Smith Publ., June 1983).
10. Sveiby, K. E.: Tacit knowledge. *The Knowledge Management Yearbook 1999-2000*, eds. J. W. Cortada and J. A. Woods, Butterworth-Heinemann, Woburn, MA, 1999, pp. 18-27.
11. Tuggle, F. D., Goldfinger, W. E.: A Methodology for Mining Embedded Knowledge from Process Maps. *Human Systems Management* (2004)
12. Zeleny, M.: Management Support Systems: Towards Integrated Knowledge Management. *Human Systems Management*, 7 (1) (1987) 59-70
13. Zeleny, M.: Knowledge as a New Form of Capital, Part 1: Division and Reintegration of Knowledge. *Human Systems Management*, 8(1) (1989) 45-58; Knowledge as a New Form of Capital, Part 2: Knowledge-Based Management Systems. *Human Systems Management*, 8(2) 1989) 129-143
14. Zeleny, M.: Knowledge versus Information. In: Zeleny, M. (ed.), *IEBM Handbook of Information Technology in Business*, Thomson, London (2000) 162-168
15. Zeleny, M.: *Multiple Criteria Decision Making*. McGraw-Hill, New York (1982)
16. Zeleny M.: *Autopoiesis, Dissipative Structures, and Spontaneous Social Orders*. Westview Press, Boulder, Co. (1980)
17. Zeleny M.: *Autopoiesis: A Theory of Living Organization*. North-Holland, New York (1981)
18. Zeleny, M.: Autopoiesis (Self-Production). In: Zeleny, M. (ed.), *IEBM Handbook of Information Technology in Business*. Thomson, London (2000) 283-290