KNOWLEDGE BASED MANAGEMENT AND VIRTUAL ORGANIZATION IN THE CONTEXT OF GLOBALIZATION

Professor PhD **Cătălin HUIDUMAC**
The Bucharest Academy of Economic Studies, Romania
Associate professor PhD **Rodica-Manuela GOGONEA**
The Bucharest Academy of Economic Studies, Romania
Professor PhD **Marian ZAHARIA**
Petroleum&Gas University, Ploieşti
Lecturer PhD **Iulian TĂNASE**
The Bucharest Academy of Economic Studies, Romania

ABSTRACT

The evolution of the concepts regarding Management science, from a materialistic approach to a sistemic and contextual one, gave birth to a new vision knowledge/based management.

The paper reveals a series of issues in connection with knowledge based management, as well as some solutions in order to solve these problems.

The authors emphasise the importance of revealing the main directions towards which Romanian education and scientific research must turn to, with the aim of achieving progress based on the knowledge domain regarding the management of economic systems, in the context of globalization.

I. Introduction

Maybe that the stocking preoccupation and the knowledge dissemination gathered by mankind should have the same priority with the cosmic space exploring ones.

The awareness of the facts given above, became possible along with the progresses registries by the artificial intelligence domain researchers. To this one are also being added the new orientation in the economical research field towards the knowledge based economy, of knowledge based organizational management and of knowledge management.

Knowledge bases of decision support system and expert system

In the main, a knowledge base is structured in three levels[6] presented in Fig.2. They are:

- Meta-knowledge; it contains knowledge about knowledge representation (frames, production rules, objects, semantic network, hyper-network, scripts)
- Knowledge; it contains specific knowledge pieces of the areas of expertise (ES' domain); in most cases in ES this level is represented by rules base (in ES based on production rules)
- Facts; it contain specific and necessary dates and information for solving the current problem; the dates and information from this level are not permanently.

Starting from Little J.D.S.' definition who defined DSS as a "model-based set of procedures for preparing data and judgments to assist a manager in his decision making", Turban[5] presents DSS as an interactive, flexible and adaptable computer-based information system, specially developed for supporting the solution of a particular management problem for improved decision making. A DSS is build by an iterative process, it supports allow the decision making, and it include a knowledge base.

In DSS the knowledge base contains strategic, tactic and operational models and also financial, accountings, management science or engineering models.

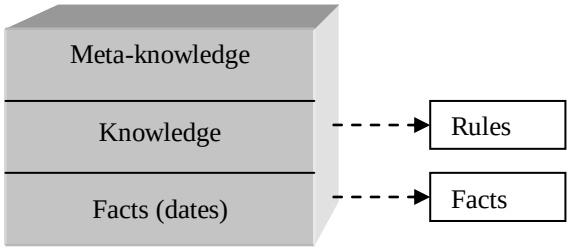

Fig.1 Main Structure of Knowledge Base

An important problem of DSS' using is that many unstructured and semi structured problems are so complex that they required experience for their solution. A solution of this problem is the integrating ES and DSS.

Expert systems are applied artificial intelligence technology based on the manner in which an expert or experts in a given area (area of expertise) have solve the same or similar problems that the user is facing. In ES the knowledge is a major resource. By comparison with DSS, expert systems can provide a direct means of applying expertise. It permits the knowledge and experience of one or more expert to be captured and stored in its knowledge base.

Main contribution of integrating ES and DSS to knowlwdge administration

Tabel 1

ES contribution	**DSS contribution**
o Improves model management o Helps in selecting models o Provide judgmental elements to model o Improves sensitivity analysis o Generates alternative solutions o Provides heuristics o Simplifies building simulation models o Making the problem structure incrementally modifiable o Speeds up trial-and-error simulation	o Provides initial problem structure o Provides standard models and computations o Provides facts (data) to models o Stores specialized models constructed by experts in the model base

Source: *Turban E., Decision Support and Expert System*, Macmillan Publishing Company, New York, 1993, p. 517

The integration ES with DSS represent a efficient modality to used the facilities of each of them in decision making process in virtual organizations. If we refer only to knowledge level of knowledge base the main contribution of integrating are presented in Table 1.

The place and advantage of simulation in developing knowledge base

The simulated models allow the identification and analysis of the system behavior under the most varied and unforeseen circumstances of the real world.

In developing the knowledge base of an intelligent economic agent (and not only there), simulation of the behavior examined system (process, situation) represents an important option, especially in the case when the system in question has no acceptable model /model system available and the decision-maker cannot afford to make decisions based on his/her experience and intuition alone.

What would be the advantages of using simulation models in the substantiating of an economic decision? Simulation models:

- ✓ allow the testing of processes that are otherwise impossible or uneconomical to test in real life;
- ✓ allow the testing of various strategies that cannot be formulated explicitly in the modulation;
- ✓ allow the testing of decision options' correctness, without endangering the development of the real system under analysis;
- ✓ allow the realization of flexible experiments;
- ✓ allow a good-structuring of the investigated problem;
- ✓ allow the testing of a great variety of situations;
- ✓ allow the identification of the functional links between the phenomena as well as their interdependence with the structure of the analyzed system.

In the knowledge based economic system the building and simulation models is a very important and efficient technique **to convert the implicit knowledge of the men of unusual knowledge, managerial know-how, into explicit knowledge** the more so as the implicit knowledge represents a semnificativ part of total knowledge of a knowledge based firm.

A study based on Delphi technique at Xerox Company[2] pointed out the fact that 58% of knowledge is implicit one and only 12% of it is storage in knowledge bases. On the other hand Botkin and Seedley[1] emphasize that only 20% of implicit knowledge are emphasized in an organization.

Building and simulation models a step of process of knowledge acquisition

Usually, the process o knowledge acquisition is structured in five stages each of them involving circular procedure of iteration end reiteration:

- ❒ *Identification* In the first stage the system (problem) is broken into subsystems (sub problems). Each subsystem is identified with this main attributes. If is necessary the subsystem is also broken and so on.
- ❒ *Conceptualization* The main objective of the conceptualization stage is the determination the concepts and relationships used. In POO there are defined the classes with their dates and procedures.
- ❒ *Formalization* The formalization and organization of knowledge depend of the method (methods) is used in knowledge representation. We can used production rules (the most utilized method), objects, semantic network, frames, scripts, hyper network (a method applied with favorable result for complex systems).

- *Implementation.* Implementation involves the programming of knowledge into the computer. Refinements of the knowledge are made with additional acquisitions or change
- *Testing* In the final stage the system is tested and is validated or is revised if necessary.

Now, let compare the stage of knowledge acquisition with the stage of the simulation process. A simulation process generally consists of five stages:

- *Defining the experiment* has the objective of identifying the components of the real system under analysis. At this stage, starting with the perspective from which the real-life system is being analyzed, follow: the analysis of the subsystems and elements with significant effect on determining the functions under examination, the definition of the system root and its limits, the quality analysis of the flows/fluxes among the sub-system's elements (components) as well as between them and the outside world (environment).
- *Modeling* is a complex stage, aimed at building the model of the real system under analysis. Model building starts with the qualitative evaluations performed during the previous, experiment-definition stage, with the analysis going further on in order to identify the quantitative inter-component relations, the sizes and directions of the flows both inside and outside the system model.
- *Model implementation* consists in either the building of a simulation program that would reflect the model and would ensure its operation, or the programming of the model based on a simulation language.
- *Validating the model*. The purpose of model validation is an assessment of the extent to which the behavior of the model is consistent with reality. This phase includes simulations and comparison of the model's behavior with the behavior of the real system under known given conditions. Based upon the assessments, the decision is made on whether the model can or cannot be used to study the behavior of the real-life system under analysis.
- *Collecting the results*. Result-collection is the stage where realized model is actually used to simulate and analyze the behavior of the real-life system.

The knowledge as a product factor of virtual organizations

The virtual organizations are aggregates of goods and services production companies which are placed in different locations and which cooperate within a distribute environment. The goal of such organization is to achieve – at a certain moment – a certain objective, having the capability of remodeling its activities according to the market opportunities (fig.1).

The organization's core is a cluster built up from selected partners, association contracts and a generic infrastructure; this core has the capability ("qualification") of adapting, developing and structuring in a such a manner that it's objectives are fulfilled.

The real time adapting capacity at the market opportunities is depending on the communications abilities between the partners and on the knowledge and information qualities, as well, no matter the distance between them it is.

Within the virtual organizations the knowledge are essential/important production factors which conditioned in a decisive way the long term companies' profit and sustainability assurance.

The knowledge capital of a virtual organization – for a certain market opportunity – have to offers answers at fore types of items:

- ❒ Know-what
- ❒ Know-why
- ❒ Know-who
- ❒ Know-how

Each of these knowledge types – in any organization – has two forms:

- o Explicit knowledge (an objective form) easy to be formalized and modeled into a knowledge base;
- o Implicit knowledge (a subjective form) from the human being minds difficult – but not impossible – to be objective, formalized and transformed in a knowledge based.

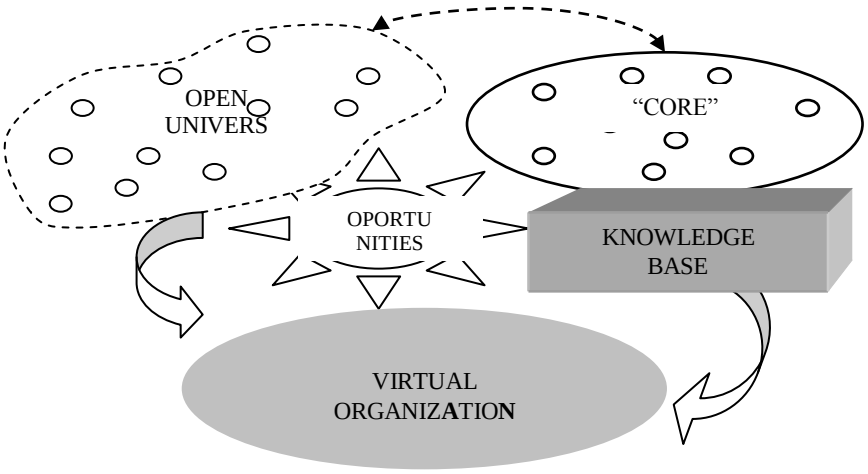

Fig.2 Knowledge, Product Factor of Virtual Organizations

The quality and the comprehensively of available knowledge are matters of life for any organization so much the more for virtual organizations.

Conclusions

Simulation is a useful tool in the study of complex system, especially where analytical models cannot be used with satisfactory results, due to either the examined phenomenon process complexity, or to the long time required to find a solution (even with highly-preferment PC's).

In fundamenting the economic decisions (and not only there), simulation of the behavior examined real system represents an important option, especially in the case when the system in question has no acceptable model /model system available and the decision-maker cannot afford to make decisions based on his/her experience and intuition alone.

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