Knowledge on Knowledge in Knowledge Portal

Zoltán Baracskai
Budapest University of Technology and Economics, Hungary
H-1111 Budapest, Műegyetem rkp. 9. T. bld. II. 28.
baracskai@imv.bme.hu

Jolán Velencei
Budapest University of Technology and Economics, Hungary
H-1111 Budapest, Műegyetem rkp. 9. T. bld. II. 28.
velencei@imvt.me.hu

Abstract. *Knowledge has become the most important producer of wealth in society and in organizations. Corporate success in today's economy comes from being able to acquire, codify, and transfer knowledge more effectively and with greater speed. Important aspect of knowledge management is extraction of the personal tacit knowledge and putting it into words and order, so that others can attain it and use it. Big enterprises need concept maps. In places where the knowledge workers are familiar it is a waste of money. Where more than 200 people use knowledge it is very time demanding to find requisite knowledge.*

Keywords. Knowledge Management, Cognitive Map, C-map, Knowledge Visualization

1. Introduction

This article focuses on the business decision maker's requisite knowledge. In some enterprises we have found that workers spend a lot more time for hunting information than for collecting data. With our DoctuS knowledge portal we support decision makers and foster quick decisions. For carrying out this conception we had to improve the access to existing knowledge. We realized that the classification principle in organization is hard to define. While making a prototype of C-map the first problem that occurred was the taxonomy. The applied decision conducted knowledge management means that decision maker has defined the needed terms for taxonomy. The second problem was finding the occurrences of the requisite knowledge. This puts focus and responsibility on the knowledge worker. Concept maps are simple at the end.

2. Doctus knowledge portal

The knowledge management is impracticable without cultural changes. To create a knowledge sharing culture we need to encourage people to work together more effectively. The most important elements of this e-culture that strengthen or weaken one another are:

- trust (the vital part of an organization, trust is the condition for collaboration)
- communication (open communication increases the trust and it leads to collaboration)
- learning (it is adopted that knowledge increase is expansion of doubtful knowledge)

One survey (see Fig. 1.) - in which we do not believe, though it is good for debate - shows that the respondent workers spend 25% of their time hunting for information.. In a world where we find only 20% of inner data to contrive a decision in half an hour, something is wrong with data warehousing.

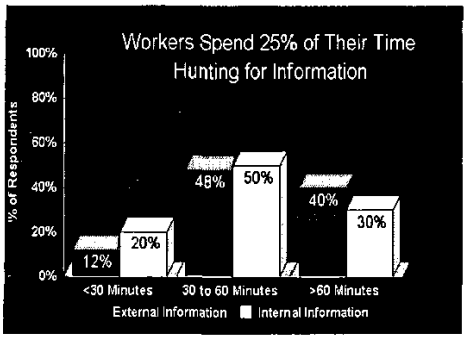


Figure 1. Hunting for Information

DoctuS knowledge portal (see Fig. 2.) will be useful only to organizations where creation and division of knowledge worker is present and needles for "plan-accomplishers" without empowerment. The organizations will have the following benefits:

- smart data mining (which data was used and what was it good for)
- smart knowledge angling (which relation was used, who knows the relations if no data is available and what kind of new knowledge can be assembled)
- smart experience fishing (which experience was used, who knows the leading experience and what can we use from the leading experience)

25 years ago we made our first program for business support. Our chief told us to make program for the processes that we know well and to wheedle the customer. Then we were able to program wage accounting. We did it. Now we are able to select data for the decision maker. Now we make intelligent portals.

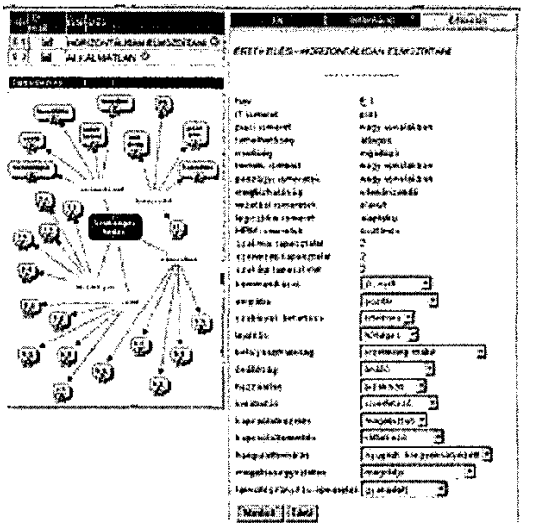


Figure 2. DoctuS Intelligent Portal

We use a well-known method, deduction. An expert gives the attributes and its values, and puts the attributes in a multi-step graph and articulates the "if... then" logical rules between the attribute values. For benchmarking cases we choose values for particular attributes. A knowledge engineer helps the expert to put in words that he/she knows. We call this process *knowledge acquisition. This is part of long,* complex process called knowledge engineering.

The impossibility of extracting the tacit knowledge is valid for the deductive reasoning, i.e. for a rule-based reasoning. Our solution: instead of acquiring rules, acquire the cases of experience, from which DoctuS Knowledge-based System software deduces the rules. This is called induction or case-based reasoning..[1]

If we use induction, the expert describes the cases, with values of attributes. For this we need cases that have well-known results. Through the process of knowledge acquisition the knowledge engineer supports the expert's work. The knowledge acquisition's output is a case-based graph and a set of rules.

[1] Originally the case-based reasoning was inherited from quantitative decision support. Its essence was — and in many software it still peeps out behind the symbolic solution veil — to define some metrics and distance built on it, which will be the *similarity. For a new case the nearest one — that means the most* similar — is searched from the case-base. In symbolic logic cases described with the same rules are similar.

3. Indispensable communication

The problem considering the majority of organizations is not that they have little knowledge; it is that they can not know exactly what is that they know. If we want to build a learning organization, we need to increase the extent of knowledge transmission and conversion. It is important to create the framework for free data flow. Free speech is indispensable. Chat reveals farther about a person than any conference. When we are communicating, we are not just putting ourselves into someone's position; we also manifest our point of view confronting it to various aspects. Different aspects recurrently have an unnoticed influence on us. Ideas put into words or written down help us to perceive and receive new concepts. It is important to accept that new knowledge is perishable. It devaluates. In enterprises where discussion – even in tea kitchens, or at bureau – is welcomed, it is easier to procure the utilized terms. Gossip at the office is self-maintaining knowledge network. Undermining its value can be dangerous. We have to develop a common language, set of terms in order to understand each other. It is facile to locate each term, if we put them in some order.

Knowledge management subsists in following:

- extracting the requisite knowledge for decision maker
- improving the access to existing knowledge
- enclosing the knowledge into process, and if necessary re-contemplating the process
- producing and accepting new, doubtful knowledge

What is our approach to knowledge management? We comprehended that the question is current. Guilds and family ventures have practiced this approach. The knowledge was passed on and developed through generations. However the success of guilds was mostly determined through occupancy of natural resources. Statement drafted in 90-ies - knowledge is power- emphasized this approach. It seemed evident that the possession of knowledge purports power. Many concluded as once our grandparents had, that possessions should be enclosed. People that preserved knowledge enclosed were actually looked up to.

The British Petroleum knowledge management budget's (20 million dollars), 20% was spent on hardware and software, 80% was spent on employee training and organizational culture changes.

4. Taxonomy

Let's return to well known topics. They are to be defined on basis of some order principle. On Harvard Business Online (see Fig. 3.) the "leadership" topic – for example – is divided in four other topics.

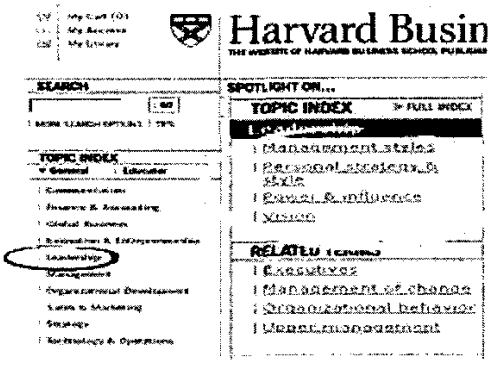


Figure 3. Topics

Maybe it is useful for studies, but by representing the relations individually we get to know little of topic inherences covering the whole subject. For that we need a map, the "visualization" of topics. Searching by Google we found 2300 links for "knowledge visualization". That is a lot. So, it is good to follow up if one cannot be the "first swallow". If we narrow it down (e.g."knowledge visualization" demo software -book -pdf -ppt), we get only 44.

For representation and for quick locating of resources, the knowledge elements should be defined primarily, then comes the description of their links and classification. It is similar to taxonomy of a museum. Let's accept the following simple definition. The taxonomy is a trick of classification, depictive systematization. The researchers of the living world are collecting living creatures systematically, examining, giving names and classifying.

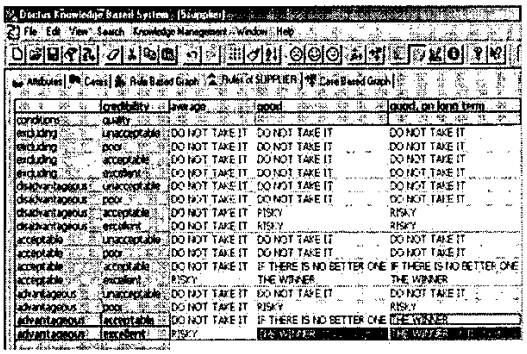
Let's introduce several specifications. As on

geographic map, we have to find the knowledge occurrence on concept map too. The starting point is always a requisite knowledge, from the decision aspect. Many emphasize that knowledge management should be introduced at once from above, from the top level of an enterprise. It is impossible to define the terms, if they are determined individually at different places. We do not disprove that collecting begins at occupants. The popular TM goals (comfort, knowledge share and transparency) are to be endorsed everywhere. This is possible only if we agree on purpose of the requisite knowledge. E.g. if we start the knowledge acquisition from IT, informatics terms can be determined, in human department the selection of employee, in production department the products. Essential is to define which knowledge is required in each department. Decision conducted knowledge management means that decision maker defines the needed terms.

Among terms on requisite knowledge and occurrence there cannot be more than two levels. This is important because the lowest level should be the occurrence, as we are on the third level. Considering the capacity of short term memory, on one level there can be 7±2 terms. If we put 5-9 terms on each level, then on third we will have more than 200. This would be valid if all knowledge has different occurrences. As this is not the case, namely one occurrence may have a lot of diverse knowledge. Name the levels. Here and now we use topic and keyword. Relations among requisite knowledge and topics as well as among topic-keyword and keyword-occurrence may diverse.

5. Cognitive model

Terms are displayed with cognitive maps which utilize "if...then" relations, while at concept maps the elements are related with verbs. Glance at the cognitive maps that are important for us. They show knowledge elements in human long term memory. Examine the links among knowledge elements in an outsourcing decision situation. Decision maker's reasoning (see Fig. 4.) can be described as: if conditions are "advantageous" and if quality is "excellent" and if credibility is "good or good on long term" then supplier is "the winner".



	credibility	over age	good	good, on long term
conditions	quality			
excluding	unacceptable	DO NOT TAKE IT	DO NOT TAKE IT	DO NOT TAKE IT
excluding	poor	DO NOT TAKE IT	DO NOT TAKE IT	DO NOT TAKE IT
excluding	acceptable	DO NOT TAKE IT	DO NOT TAKE IT	DO NOT TAKE IT
excluding	excellent	DO NOT TAKE IT	DO NOT TAKE IT	DO NOT TAKE IT
disadvantageous	unacceptable	DO NOT TAKE IT	DO NOT TAKE IT	DO NOT TAKE IT
disadvantageous	poor	DO NOT TAKE IT	DO NOT TAKE IT	DO NOT TAKE IT
disadvantageous	acceptable	DO NOT TAKE IT	RISKY	RISKY
disadvantageous	excellent	DO NOT TAKE IT	RISKY	RISKY
acceptable	unacceptable	DO NOT TAKE IT	DO NOT TAKE IT	DO NOT TAKE IT
acceptable	poor	DO NOT TAKE IT	DO NOT TAKE IT	DO NOT TAKE IT
acceptable	acceptable	DO NOT TAKE IT	IF THERE IS NO BETTER ONE	IF THERE IS NO BETTER ONE
acceptable	excellent	RISKY	THE WINNER	THE WINNER
advantageous	unacceptable	DO NOT TAKE IT	DO NOT TAKE IT	DO NOT TAKE IT
advantageous	poor	DO NOT TAKE IT	RISKY	RISKY
advantageous	acceptable	DO NOT TAKE IT	IF THERE IS NO BETTER ONE	THE WINNER
advantageous	excellent	RISKY	THE WINNER	THE WINNER

Figure 4. "If...then" rules

The content maps are relating knowledge elements with verbs. Relations on the maps may diverse. In other words, the relation verbs between requisite knowledge and topics can be described differently. Take a glance at the business sample! It may sound clumsy again, but we hope it helps to understand: There is a required knowledge on the occurrence about competitors' business plan.

6. Prototype of Concept Map

In our prototype we have determined five topics. (see Fig. 4.) There are competitors, technologies, customers, consulters and suppliers. On each topic we connected five keywords. Let's examine the supplier topic's keywords. Classification principle in organization is hard to define. It can be conducted by decision, human or money. In depicted prototype the principia were exactly themselves the supplier companies, from supplier-1 to supplier-2. It is unnecessary to explain how much problems would face the enterprise which would maintain 105 suppliers. Another reason for ranking the company of the suppliers into prototype is because the evaluated enterprise's quality management demands the constant evaluation of suppliers. They need a decision support system for evaluation of suppliers. On our prototype we show the requisite knowledge for supplier-5 evaluation. Requisite knowledge is divided in hard data, and soft knowledge. Soft knowledge should be linked to knowledge occurrence, namely decision can be fast only if we find fast the occurrence of the require knowledge.

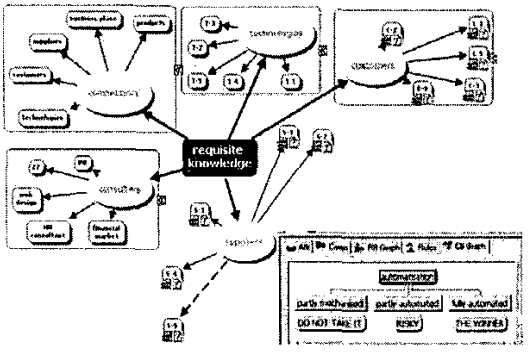


Figure 4. Requisite knowledge

Let's take another example. When the studied enterprise deals with outsourcing, and a decision maker has defined needed topis for outsourcing-decision, then one of the topics will be „task". Then each task will have an intelligent evaluation system acquiring hard data from the database, while the occurrences of soft knowledge are depicted on concept map. (see Fig. 5.)

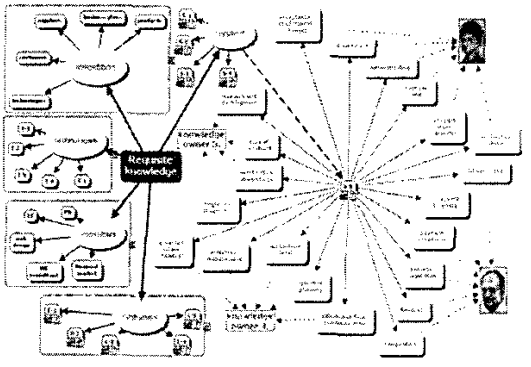


Figure 5. Occurrences of soft knowledge

So far we simulated reality so it fits different hierarchies. In real business terms impossible to define as simple relations than "parent – child – grandchild" relations. „As each scheme is a reference system too, every time we summon a scheme in our RTM, we modify our reference system. From this aspect it is not surprising how often we change our standpoints. It is rather amazing how we are able to be coherent for longer time. At the same time refined surviving-machines of schemes watch that not just any scheme comes to our mind, that is in our RTM. In our entangled hierarchies we do not notice when we are thinking on a meta-level, and when do we slide to more concrete level, or perhaps a higher meta-level.

The systematization of term depends on agreement. It means that a term can become topic, keyword or attribute.

It is easy as Chinese alphabet, of course for a literal Chinese. Concept maps are simple at the end. This does not mean that it is easy to reach the simplicity. Patience is utility for those who are able to systematize topics.