

## KNOWLEDGE SOCIETY AND SUSTAINABLE DEVELOPMENT

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### Abstract

Knowledge society is a society where knowledge is a major creative force. In knowledge society all spheres of human life depend on ability of people to create, distribute and share knowledge. Development of knowledge society initiated big economic, social and cultural changes. Among others huge interconnectedness of national economies, internationalization of life, growing importance of work and local communities, growing importance of knowledge workers can be mentioned. Knowledge society offers new views and approaches to sustainable development. Our knowledge society is not the first knowledge society of this type in the history. K. E. Sveiby and T. Skuthorpe describe a knowledge society developed by the Aboriginal people Nhunggabarra in their book *Treading Lightly*. Nhunggabarra created a knowledge society based on intense work with the knowledge that as historians and anthropologists suspect lasted and prospered for thousands of years. The article discusses the lesson learned from Nhunggabarra society and its potential for our reality, our knowledge society and sustainable development.

**Key words:** knowledge, tacit knowledge, explicit knowledge, knowledge society, sustainable development

### Knowledge Society

Knowledge society is a society where knowledge is a major creative force. In knowledge society all spheres of human life depend on ability of people to create, distribute and share knowledge. Development of knowledge society initiated big economic, social and cultural changes. Among others huge interconnectedness of national economies, internationalization of life, growing importance of work and local communities, growing importance of knowledge workers can be mentioned. Knowledge society offers new views on all aspects of society, economy and development including. It also requires new approach to these factors.

Industrial society that many of us still remember measured success by growth. The growth extensive or intensive was often achieved on account of interests of somebody else, another individual, organization, country, nation or the environment. The growth, success and victory of one often caused the loss of the other.

Important factor of knowledge society is its enormous interconnectedness. Global systems respond quickly to incentives and aftereffects of bad decisions hit back the decision maker in very short period. Current economic crisis serves as a good example. Of course knowledge society offers potential for growth. But growth in traditional extensive meaning, e.g. the more, the faster the better, quickly hits its limits. Intensive growth based on higher levels of innovations is more promising but it is also limited by ability to invent and innovate on the side of the supplier

and ability to accept new inventions and innovations on the side of the customer.

Due to interconnectedness of everything, global competition and cooperation and knowledge being the major creative force, the factor of growing importance in knowledge society is sustainability.

Our knowledge society is not the first knowledge society in the history. K. E. Sveiby and T. Skuthorpe [7] describe a knowledge society developed by the Aboriginal people Nhunggabarra in their book *Treading Lightly*. Nhunggabarra created a knowledge society based on intense work with the knowledge that as historians and anthropologists suspect lasted and prospered for thousands of years. The lesson learned from Nhunggabarra society may help us to avoid many mistakes and disappointments.

Knowledge society can meet the requirement of sustainability only when certain premises are met. Among that most important, adequate work with both dimensions of knowledge, proper knowledge management, principles of learning organization, double-loop learning and principle of cooperation should be mentioned.

### Knowledge Society and Knowledge

Major creative force of knowledge society is knowledge. Knowledge can be defined as a changing system with interactions among experience, skills, facts, relations, values, thinking process and meanings. It consists of two dimensions, explicit and tacit. Explicit dimension of knowledge is actually information. It can be expressed in formal and systematic language and

can be shared in the form of data, scientific formulae, specifications, manuals. Tacit dimension of knowledge is highly personal and hard to discover and formalize. Explicit knowledge and intuition, mental models, experience, crafts, skills, etc. create it. It is deeply rooted in action, procedures, routines, commitment, ideas, value and emotions. It is difficult to share and communicate [3]. Both tacit and explicit dimensions of knowledge are important in knowledge society. Explicit dimension is usually present in the form of data in some informational system; tacit dimension is in heads of employees [3].

Information and communication technologies we have at disposal these days offer tools for work with both dimensions of knowledge, explicit knowledge (information) and tacit knowledge. Our technology allows us to work with knowledge in complex and systemic way.

Knowledge as a major creative force of knowledge society can be fully exploited only if proper knowledge management is introduced. Knowledge management optimizes the flow, creation and exploitation of knowledge in organization and society. It must cover both explicit and tacit knowledge in relation to specific needs of organization or society and in relation to their culture, principles and habits.

As available resources (finances, human, and material) are usually limited, organizations try to specify their knowledge needs and decide between two basic knowledge strategies, strategy oriented on explicit knowledge or strategy oriented on tacit knowledge [2]. Of course the less dominant dimension of knowledge should not be forgotten.

Organizations that focus more on explicit knowledge are organizations with standardized processes and procedures. Their products and services are stable; customers do not require specialized solutions. Such companies create wide, high quality and reliable databases which allow the storing, generation, adapting and combining of huge volumes of explicit knowledge transformed to data. Such databases also allow creating statistics and various types of analyses. The reuse of knowledge saves work and reduces communication costs. We call such organizations database users.

Database users work mostly with explicit knowledge. This fact influences the profile of their human resources. Such company tends to hire people who finished a middle level of education or new university graduates. The major re-

quirement on people is the ability to work with databases and the ability to generate data from the database and to adapt them as required at the moment. People are rewarded for contribution to the company document database. Highly expert knowledge and creativity are not required. The strategy oriented on explicit knowledge is called a codification strategy [2].

Organizations that focus more on tacit knowledge provide solutions of special unique problems, high level advice and expert solutions. For such organization, databases have only the supportive role. Sharing of the tacit dimension of the knowledge happens through face to face contact or in special electronic environment (for example Second Life).

Human resources are top educated specialists and experts who often work only part-time for the organization. The most important asset is the knowledge owned by those experts. The company tries to provide experts with space and culture that supports the exchange and sharing of their tacit knowledge and develop human networks. Expert teams are part-time teams and are rewarded for knowledge sharing. The strategy oriented on tacit knowledge is called a personalization strategy [2].

### **Knowledge Society and a Learning Organization**

Knowledge society can be sustainable only when the society and its parts behave as a learning organization. The term learning organization is linked with name Peter Senge who identified and defined its five aspects in his famous book *The Fifth Discipline* [6].

Learning organization is an organization that works on similar principles as a living organism. As any living organism, learning organization is created from various parts. They are linked together with relations and bonds. Together all parts and relations create a bigger whole, a complex system. The difference between a learning organization and organization that does not learn is following:

- Learning organization can monitor its external and internal environment.
- Learning organization understands underlying principles of environmental dynamic.
- Learning organization can use these principles to address and initiate changes.

Five basic principles of learning organization are:

- Personal mastery;
- Mental models;
- Shared vision;
- Team learning;
- System thinking [6].

Personal mastery is the ability of individuals to learn and develop. It is influenced by their personal visions and objectives. Individual learning is basic prerequisite of organizational learning. Organization as a whole cannot learn unless its employees learn as individuals. Knowledge society cannot learn unless its members learn as individuals.

Mental models are unconscious deeply rooted personal images that influence how we understand reality and respond to external and internal incentives. They highly influence our behavior and our ability to learn. They can limit but also accelerate individual and organizational learning and learning of the whole society. Peter Senge offers advice how to identify and eliminate them in his book.

Shared vision is a vision about future development of organization shared by employees. It is a torch that ignites the light on the way to future. Fully accepted shared vision motivates employees. Shared vision also can support or limit learning of individuals and the organization.

Team learning represents interaction of individuals and teams and leads to acceleration of organizational learning. Team learning is based on similar principles as individual learning but requires, in addition, environment of trust and good relations among employees.

System thinking explains basic principles and two types of feedback that create system dynamics. It helps to analyze events around us and identify their essence. It is a basic prerequisite of so called double loop learning, important characteristics of learning organization [6].

Senge's five disciplines are a toolset of modern learning organization and knowledge society. System thinking enables the organization to understand its external and internal environment and its dynamics. Personal mastery, work mental models, shared vision and team learning initiate learning process necessary to address changes.

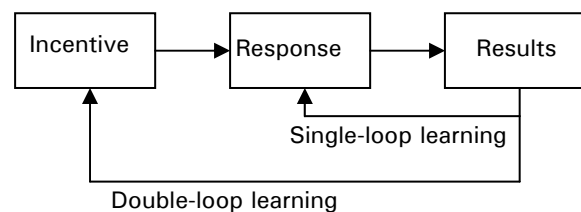
### Knowledge Society and Double Loop Learning

Learning can be viewed as a use, creation and transformation of knowledge. Quantity and quality of explicit and tacit knowledge that is at disposal at the moment of learning and ability of

individual or organization to use it and transform it influence success and failure in learning activities.

Development can be sustainable, only when systemic approach to knowledge is adopted. So called double loop learning, helps to identify complex relations structures of our environment. The cycle of monitoring, understanding, and responding (changing) is foundation of double loop organizational learning.

Argyris and Schön in their book „Organizational learning: A theory of action perspective“ [1] define two types of learning, single and double loop learning. By them, learning is a process of detection and correction of mistakes.



Source: [1]

Fig. 1. Types of learning

Single loop learning is learning by trial and mistake. Individual or organizations do something, e.g. respond to some incentive. This response leads to certain effects. If the effect differs from what was expected, individual/organization adjusts the response. This process of trials and mistakes may lead to expected results. Whether the individual or organization achieves their objectives is accidental.

Double loop learning starts similarly to the single loop learning. Individual or organizations search solution of some problem. But prior to acting they make analysis of the problem and its surrounding. They tailor their response to results of the analysis, e.g. the nub of the problem. The response is not accidental. In case the effect differs from what was expected, before responding back, they try to find the reason of failure through better analysis.

Double loop learning enables to identify nature of world around us and leads to better results than single loop learning.

### Knowledge society and Cooperation

Industrial society was based on the doctrine that the one who is better wins and the one, who is less good, loses. E.g. it was based on the doctrine of competition. Cooperation was

understood either as a weakness or as a thread (for example trusts are illegal in many countries). From the point of view of theory of games, win - loss strategy was preferred.

Theory of games models potential of competitive and cooperative strategies. In so called prisoner's dilemma two parties solve fix difficult situation. They (individual or groups) must decide how to behave without knowing the strategy of the other party. The model situation shows two men who committed the crime. The proofs are not conclusive and the police needs one of the arrested to confess. The prisoners have two basic strategies - co-operate or compete at disposal. Two strategies result in four possible outcomes.

- win - win;
- win - loose;
- loose - win;
- loose - loose.

When both prisoners decide for the competitive strategy, e.g. both blame the crime on the other men, both will be arrested. This dominant egoistic strategy outcome is loose - loose. When one prisoner decides for competitive strategy and the other for the cooperative, the one who competed will be released and the one who co-operated will be imprisoned. Only the fourth strategy a cooperative one, leads to success of both parties. If both prisoners decide not to tell anything, both will be released because of lack of the proofs.

As for the results of the situation (from the point of view of players, e.g. arrested men), the worst strategy is the one when both compete. The strategy in which one of prisoners cooperates leads to better results, because only one of game participants will be arrested. The cooperative strategy leads to the best result - both men are free.

In different cultures and different periods of human development, people preferred different strategies. For example, The Old Testament „Tooth for tooth, eye for eye“ was a most effective strategy in the eastern civilisation for very long time. Later on Jesus came with more cooperative strategy: „If someone slaps you on your right cheek, turn your other cheek to him as well“. Since Axelrod experiment (1980) the strategy when the certain type of behaviour is copied by the same behaviour, e.g. competition with competition, cooperation with cooperation was recommended.

Industrial society could work well on competitive strategies because it was less complex than our current reality. There was usually one, who was stronger than others and won. Competitive strategy often led to relatively long competitive advantage. Of course, in case of similarly strong partners the competition may have led to withdrawal of one or damage of both.

Knowledge society works on different rules. Major asset of knowledge society, knowledge is of intangible character. It is hidden in heads of people and can be used only when they cooperate. Huge interconnectedness and high speed of our world work against competitive strategies, the revenge may come much earlier and advantages last for shorter time. In the world jammed with information and buzz, misinterpretations of signals are quite common. Competitive revenge strategy may be very dangerous in such conditions. When this happens, the spiral of revenges even though based on misunderstandings leads to extremely bad results. That is why more merciful strategy (e.g. cooperation as a response to competition) is often more efficient and it is highly recommended these days [5].

#### **Nhunggabarra Knowledge Sustainable Society**

K. E. Sveiby and T. Skuthorpe in their book *Trading Lightly* [7] describe knowledge society developed by the Aboriginal people Nhunggabarra. Nhunggabarra lived on the border of south Queensland and northwest New South Wales. Their name was deduced from the name of the tree common in their area and covered few communities with common culture and similar language. Nhunggabarra created knowledge society based on intense work with knowledge that as historians and anthropologists suspect lasted and prospered for thousands years.

From what we know about Nhunggabarra communities, they developed and used all five factors P. Senge finds as crucial for learning organization. All Nhunggabarra people shared one vision, they have sophisticated system of development of personal mastery, and they actively worked with mental models and preferred community (team) work. As for system thinking their knowledge about their environment and interrelations between things, people, nature and the whole social and environmental system was so deep that their society sustained for very long time. They also had extraordinary system of sharing knowledge.

Nhunggabarra shared one very strong vision which influenced the behavior of all communities and individuals. The vision was: „Keep all alive“. Nhunggabarra felt responsible for their world, plants, animals, environment and for community members and their well being. They behaved as good gardeners and game keepers and kept their fragile environment in balance.

Personal mastery and development were linked to shared vision. Every Nhunggabarra men and women had clear social and environmental responsibilities. These responsibilities were inherited and made borders of what one could and could not do. The community paid huge attention to personal development of individual in his/her given field. They used various tools to share knowledge – learning by doing, observation and stories. As every of adults owned knowledge that was important for survival of others, all members of Nhunggabarra society were credited as important knowledge workers. All people had the same importance for the society, nobody was more important than others which prevented the rise of hierarchies and supported flat and equal structures.

The Nhunggabarra society paid great attention to mental images and creation of proper models of behavior that built the foundation of their system. Young men were obliged to leave birth place in early age and live with related communities who were responsible for their further education. Marriages were planned and young people from different communities were purposefully mixed. This system made young men busy during their most aggressive years and interlinked individual Nhunggabarra communities so much that any idea of war was absolutely unacceptable. Nhunggabarra shared their mental images through stories. Stories they told had four levels. The first level was explicit and explained natural features and animal behaviors. The second level explained relationships between people in the community, the third level relationship between the community and larger environment and the fourth one the spiritual knowledge. Higher levels were more tacit and they required special knowledge to be understood. They were available only for chosen and specially trained people. Anyway, the ownership of exclusive knowledge did not lead to higher social status.

Nhunggabarra lived, worked and acted in communities. The interest of community was prior to the interest of individual. All groups of

Nhunggabarra met regularly to share their knowledge and special tools were prepared to eliminate conflicts.

Deep knowledge of environment, sense for interconnectedness of everything that happens and awareness of principles of system dynamics helped Nhunggabarra to build sustainable knowledge society.

### **Fall of Nhunggabarra Knowledge Society**

Even though Nhunggabarra system was very sophisticated and worked well for very long time, the society disappeared. Over dependence on tacit knowledge is blamed for the end of Nhunggabarra flourishing society.

Nhunggabarra had special way of storing and sharing knowledge. As mentioned above, every men and women was responsible for certain knowledge or its part and had clear social and environmental responsibilities, Nhunggabarra had excellent educational system that used apprenticeship and storytelling. Being fully aware of fragility of human being, they backed their knowledge workers. When the person who owned certain knowledge died, there were always other people who had the same knowledge and same type of responsibility. Knowledge doubling and perfect health of the population led Nhunggabarra people to confidence that the system was protected against loss of knowledge. They developed something like a script but they used it only for some special pieces of knowledge, everything else was stored in tacit form.

Unfortunately this backing system, fully dependant on tacit knowledge, totally failed during the severe smallpox epidemic that hit Nhunggabarra people sometime around 1829-1831. Too many people died in very short period and it led to huge loses of knowledge. Loses in knowledge led to total confusion of those who survived because they suddenly missed important guidelines how to act and behave. The sustainable knowledge society disappeared.

### **Conclusions**

Nhunggabarra story shows that people can build sustainable knowledge society. It also shows that such society can last for very long time when supported by convenient style of work with knowledge. It also shows that knowledge society can diminish quickly if work with knowledge fails to address unexpected changes.

This is the reason why organizations and whole society are highly advised to pay attention

to both dimensions of knowledge. Too much focus on tacit knowledge leads to dependence on its owners, humans, too much focus on explicit knowledge leads to loss of important knowledge dimension.

**References**

1. Argyris, C., Schon, D. *Organizational Learning: A theory of action perspective*, Reading, 1978, Mass: Addison Wesley
2. Beer Michael, Nohria Nitin *Cracking the Code of Change*, Harvard Business Review, kveten 2000
3. Mladkova, L. *Moderni pristupy k managementu. Tacitni znalost a jak ji ridit*, C.H.Beck, Praha 2005
4. Polanyi, M. *The Tacit Dimension*, London, Routledge & Kegan Paul UK, 1966
5. Sedlacek, T. *Ekonomie dobra a zla*, 65. pole, 2009
6. Senge Peter M. *The Fifth Discipline* Doubleday NY, 1990
7. Sveiby, K. E., Skuthorpe, T. *Treading Lightly*, Allen & Unwin. Crows Nest, Australia, 2006