

SELF-ORGANIZATION AND KNOWLEDGE MANAGEMENT

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Whenever a system organizes itself, it produces information. Information is a threefold dynamic process of internal structuring (i.e. the structure of a complex systems is an internal storage mechanism that allows relating to the past and enables the future and hence reduces complexity), interaction, and synergetical behaviour of complex systems that results in the emergence of new qualities of the whole in such a way that the fluctuations that have caused these processes are reflected within the structure of this whole in a complex, nonlinear way. Information is a process of creative reflection.

Knowledge is the manifestation of information in society. It is neither purely a subjective cognitive attribute nor purely an objective entity, it is a process and relationship between active human agents that participate in a self-organizing social system and co-ordinate their subjective knowledge in such a way that objective knowledge emerges (Fuchs/Hofkirchner 2004). Knowledge is a manifestation of information in social systems that involves the interpretation, evaluation, and usage of data and can be found in various subsystems of society. It is a threefold process of cognition, communication, and co-operation (ibid.). Cognition refers to the individual dimension, that is, to the elements of social systems, communication refers to the interactional dimension, co-operation to the integrational dimension, that is, to the social system itself that is constituted by the interaction of its elements.

All social structures store knowledge about society, they contain a history of social relationships, reduce the complexity of society, and enable future actions. Hence all societies are knowledge societies. But not all societies are knowledge-based. This term is reserved to characterize a social formation that is shaped by a specific type of knowledge, scientific and technological knowledge, in all its realms. The emergence of the knowledge-based society (KBS) is a multi-

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dimensional shift that involves the rise of knowledge as strategic resource in all societal areas. All human labour is based on a dialectical interconnection of mind and body. Hence all labour is both mental labour and manual labour. But nonetheless there is a difference: mental labour mainly based on cognition, reflection, logical operations, etc., manual labour on the human production of physical energy. In the KBS knowledge in the sense of the cognitive foundation of mental labour (subjective knowledge) and the products of mental labour (objective knowledge) has become besides physical labour, capital, property, and power the central productive force of modern society. This manifests itself e. g. in a boom of service and knowledge industries, an increasing importance of innovation, universities, expertise, research, knowledge work, knowledge products. We today live in knowledge-based society in the sense that knowledge and computer-based technologies as forms that are an expression of mental labour have become immediate forces of production that influence and change all subsystems of society.

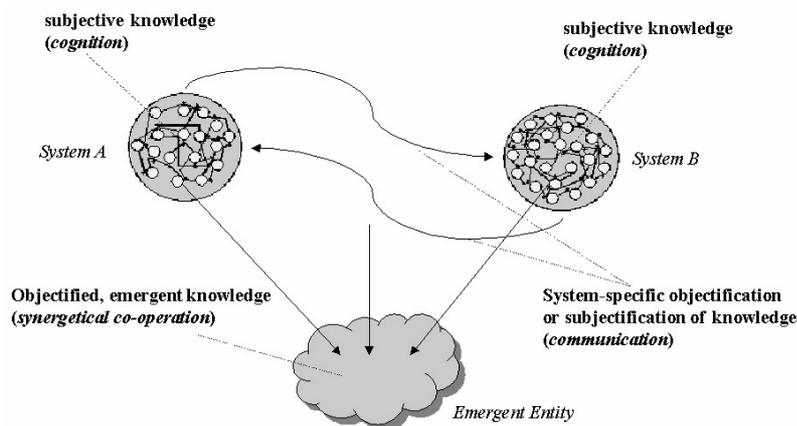


Fig. 1: A model of knowledge as a threefold process of cognition, communication, and co-operation in social systems

Some important basic characteristics of knowledge are:

- Knowledge is a manifestation of information in the human-social realm. Knowledge doesn't exist in nature as such, it is a human and cultural product.

- Knowledge exists both in the human brain and in social structures and artefacts. It has subjective and objective aspects that are mutually connected. Subjective and objective knowledge is constituted in social practices of active, knowledgeable human beings, knowledge is related to human practice.
- Objective knowledge is stored in structures and enables time-space distantiation of social relationships. It reduces the complexity of social systems, foundations of human existence don't have to be re-produced permanently due to this storage-function. Objective knowledge is a supra-individual structural entity, but is based on human agency, it is medium and outcome of social actions, it constrains and enables human practices.
- Individually acquired knowledge can be put to use efficiently by entering a social co-ordination and co-operation process. Synergetical advantages that can't be achieved on an individual basis can be gained by such a co-ordination of knowledge. Emergent knowledge and qualities show up and are due to the synergies produced by the co-operating efforts of knowledgeable actors. Intelligent organizations are based on the effective use and management of emergent knowledge.
- Knowledge must be permanently enhanced and updated
- Knowing is intrinsically coupled to not knowing.
- Knowledge has relevance for a system and is constituted within and part of human experiences .
- Knowledge is a social, common, public good that has a historical character. Knowledge production is a social process, in order to produce new knowledge one must refer to prior knowledge produced by others. Frequently knowledge production has a highly networked and co-operative character. Knowledge is a self-expanding resource, but can only be artificially transformed into a scarce resource (e. g. by Intellectual Property Rights).
- Public knowledge gains importance when its distributed freely in high numbers, proprietary knowledge loses importance when the same happens to it.
- Knowledge is a non-substantial good that is generally not used up by its manifold usage.
- Knowledge expands during its usage.
- Knowledge can be compressed.
- Knowledge can replace other economic resources.
- In fast networks knowledge can be transported at the speed of light.
- Purchasers of knowledge only buy copies of the original data.

- The costs of reproducing knowledge are generally very low and are further diminished by technological innovations and progress.
- In contrast to capital, knowledge appreciates with use, its marginal utility increases with its use.

Social systems in the KBS are characterized by:

- a high degree of flexibility and complexity
- a networked character
- an increasing global character
- dynamic communication
- complex knowledge patterns

The central question that arises is how one can cope with this increased knowledge-based character and complexity of organizations in order to guarantee the efficiency of an institution and the well-being of its members? Can knowledge systems be managed? And if so, what are basic guiding principles of knowledge management?

Scientists like Hayek and Luhmann have argued that human intervention into self-organizing social systems isn't possible and desirable because there can be no central control of their knowledge. Hence human beings would have to rely on competition and adaptation to systemic effects, human intervention would be harmful.

I consider participatory systems design as an attractive alternative to such a systemic fatalism. Social self-organization means the permanent production of knowledge by human beings, i.e. the permanent communication and co-operation in social systems is a dynamic process that human beings organize in social relationships in order to enable their own social self-reproduction and systemic self-reproduction. Hence knowledge management is a fundamental human process in the sense that human beings permanently have to co-ordinate their cognition, communication, and co-operation in social relationships.

Knowledge in social system is based on cognition, communication, and co-operation. These activities can only be achieved in social co-ordination processes of active, creative human subjects. Hence knowledge production can only be explained if we assume that human beings are creative and active beings that have the capability of permanently producing novelty in social processes as emergent results of social systems. If knowledge implies creativity and social

relationships this means that full creativity of a system can only be realized if active participation of all members of a social system is encouraged. Hence knowledge also has ethical implications, a fully knowledge-based society is a participatory society. Participation allows a effective usage of the knowledge of human beings in such a way that they can share and jointly co-ordinate their knowledge in order to produce new knowledge. Sharing and communicating knowledge in order to co-operate allows creative synergies between human beings that result in the emergence of new knowledge in a system. Sharing, partnership, and co-operation also seem to be ethical imperatives for a sustainable and participatory management of knowledge that allows benefits for all members of an organization.

Due to the increasing complexity of organizations, new strategies of coping with knowledge seem to be necessary. I suggest that participation and co-operation as aspects of social systems design are important mechanisms of knowledge management. Design is the bottom-up-initiation of change in social systems, it is a fundamental human activity that it is based on visions of a better future and anticipations of possible futures. Design is an evolving process that permanently integrates new knowledge about the world that is based on experiences in nature and society. It creates new emergent properties in social systems.

Participatory systems design is based on collective visions of a better future for a system. Hence the participants in an organization that should be improved should formulate common visions. Creativity is the ability to produce novelty that emerges from human co-operation, it is the innovative usage of knowledge. An ideal system can only be designed based on the collective, creative, anticipatory usage of the knowledge of all participants in a system. Co-operatively discussing problems and visions in a social system is the first step for solving these problems. Formulating visions means the production of new knowledge as possible solutions to problems. After formulating a collective vision, ways of trying to manage chaos with the help of these visions can be realized.

The top-down-steering of social systems doesn't realize the full potential of human beings. We individually and collectively have the right and responsibility to design the systems we live in. A system should be designed in such a way that all its members can adequately participate in it and can benefit from their participation. Participatory systems design doesn't aim at planning and controlling the future, but it fosters inclusion, communication, and co-operation because it believes that the future is conditioned by the past, and hence

is open in the sense that there are always several possible paths of development, and that the possibility that a desirable alternative can be realized can be increased by participatory communication and action.

Co-operation and participation allow the shared usage of the knowledge of a system's participants. Creative synergies can arise from interactions that result in novelty and innovation. Hence co-operation and participation are principles of knowledge management, i. e. of the management of cognition, communication, and co-operation in social systems.

Fayol (1949) defined management as »to forecast and plan, to organize, to command, to co-ordinate and to control«. If one employs such a limited notion, participatory systems design can't be considered a form of management. If one understands management alternatively as the initiation of change in a social system, one can distinguish between a hierarchic and a participatory form of management. Knowledge refers to dynamic communicative actions of humans in social systems that result in emergent systemic change. Hence the term »knowledge management« describes ways of how to best initiate change and communication in social systems. My main hypothesis is that participation and co-operation are the most democratic and efficient methods for managing knowledge.

Considering social systems as self-organizing means to acknowledge that order and knowledge emerge in bottom-up-processes of cognition, communication, and co-operation where the interactions of human beings result in create synergies. Such a concept is based on the fact that human beings are creative being and has ethical implication because it implies that all human beings have the ability to act responsibly and the need to realize themselves and develop their potentials, and hence should be provided with possibilities to participate in the design and management of social systems.

REFERENCES

- Fayol, H. (1949), *General and Industrial Management*, London: Pitman.
Fuchs, C./Hofkirchner, W. (2004), Knowledge and Self-Organization, in: *Kybernetes* 33 (forthcoming).