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THE INTELLIGENT REGION - KNOWLEDGE MANAGEMENT AS STRATEGY FOR REGIONAL DEVELOPMENT

Knowledge Society and Regional Development

Terms like "the learning organisation", "the learning region", "the city of knowledge" and "the knowledge based society" or even "the knowledge based economy" show the increasing importance of knowledge as a resource of social and economic development. The knowledge based society is characterized by different types, forms and levels of knowledge and stands for new processes of generation, production, handling and the use of knowledge (Matthiesen 2004, 11; Matthiesen/Bürkner 2004, 67; Pawlowsky 1998, 16pp.). Knowledge becomes a strategic factor: It stands for the transfer of knowledge and highlights the learning aptitude of regions to produce innovations in order to perform well in the worldwide politics of location (Schädlich 2003, 51).

Regional development approaches also are designed to achieve strategic competitive advantages compared with other regions. With regard to the developing knowledge based society the networking and linking of knowledge carriers like enterprises, universities, research and administrations becomes even more important. The inclusion of the local and regional knowledge carriers shows the importance of the spatial proximity to knowledge as location factor for regions to develop knowledge headstarts and to be competitive (Revilla Diez 2004, 68). Knowledge is always located to people, institutions and structures of the local or regional society, thus the generation and dissemination of knowledge is combined with the aspect of spatial nearness (Schädlich 2003, 52; Pohle 2003, 16).

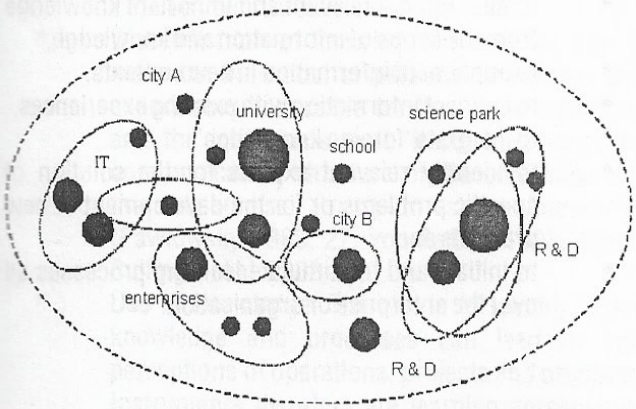

Figure 1: Distribution of innovation cores and knowledge carriers in regions

Therefore, regions consequently can be viewed as centres for the generation of knowledge and learning aptitudes. But up to now information and knowledge are not spread all over the region, are not available for every player and are prepared unsystematically (see figure 1). The uncoordinated allocation of knowledge or the missing accessibility to knowledge respectively, leads to an expensive acquisition, maintenance and analysis of facts, information and knowledge.

The access to and the allocation of knowledge thus is selective for sub-regions as well as for different regional players. A reason for that can be found in the fact that the knowledge carriers do not want to share their own knowledge with others as a result of the economic and sub-regional competitions. Furthermore knowledge carriers are not networked and used to transfer their knowledge. The selectivity of knowledge is increased because it often is difficult or even impossible to communicate for example implicit knowledge.

In order to stay competitive in a knowledge based society, the question of how to influence or even regulate these development processes becomes important for regions (Brake 2004, 117): How can they improve their strategic learning aptitude? How can regions generate a collective regional knowledge to use it for regional development? Regions in this context can be administrative defined regions or thematic cluster defined regions. The possible knowledge exchange depends on the chosen knowledge and information.

One proposed solution by the authors of this article is the elaboration of a common regional knowledge base model - the construction of a regional knowledge management. This instrument allows regions to organise and coordinate their development processes. However, prior to discussing the components of the regional knowledge management this article will describe how the processes of generating knowledge are organised.

What is Knowledge? The Generation of Knowledge

To better understand what knowledge is, it needs to be differentiated between data, information and knowledge. Data are facts which are encoded in numbers, speech or pictures (cp. Willke 1998, 7pp; Hendrichs 2002). Data is a kind of observed difference which requires the ability to see and recognize and to have instruments observing the data. Data therefore is caused by observing (Willke 2004, 29).

By means of combination, analysis and structuring, data becomes information (cp. von Felbert 1998, 122; Hanning 2002). Data is information if it is embedded in a context and has relevance. Information is only "information" in the same context or with the same frame of relevance criteria, i.e. its exchangeability is already limited (Willke 1998, 8). Knowledge is generated through the interpretation and application of information by individuals or organisations. It evolves if information is used in a certain context to accomplish a task or to find a solution for a problem (cp. Willke 2004, 33, von Felbert 1998, 122; Hendrichs 2002).

Knowledge consists of implicit and explicit parts which are complementary (Polanyi 1985, 13pp). Explicit knowledge (factual knowledge) is recordable and standardized. It can be structured and systematically deposited in databases and documents (cp. Hanning 2002; Hendrichs 2002). Implicit (tacit) knowledge on the other hand is characterized through abilities and processes which are subconscious and difficult to record. Implicit knowledge allows doing things without being able to describe how it functions. It is intuitive and personal/ organisational and therefore not easy to explain (cp. von Felbert 1998, 122).

Furthermore knowledge can be individual or organisational (collective). Organisational or collective knowledge is based in rules or regulating systems of a social system as organisations (Willke 1998, 16). Both forms are essential for knowledge management: the individual knowledge worker and the ability of a group or even region to solve a certain problem.

In the knowledge spiral Nonaka and Konno (see figure 2) show very descriptively the processes of conversions from individual to collective knowledge and conversely and also the conversion from implicit to explicit knowledge and conversely (cp. Nonaka/Konno 1998; Nonaka/Reinmöller 1998).

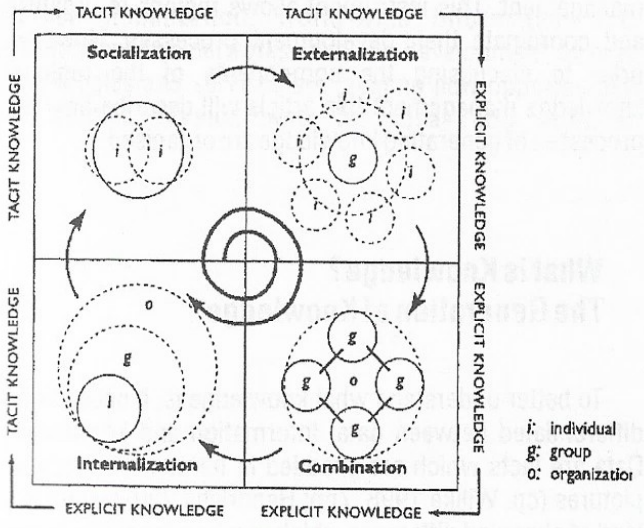

Figure 2: Spiral evolution of knowledge and conversion (Nonaka / Konno 1998, 43)

Knowledge emerges from interaction and communication and it therefore is socially constructed. This aspect is important for the generation of collective knowledge. It is not objective and a fact, but generated in a certain context. Knowledge is action oriented and only understandable in the special context of its application (cp. Renzl 2004, 36pp.).

Approaches for a Regional Knowledge Management - Knowledge Management in Enterprises and Organisations

One approach for the construction of a regional knowledge management can be found in enterprises and organisations. Enterprises and organisations face similar problems as regions: A bigger part of the individual knowledge of the employees is unknown, unidentified and unused. A knowledge management tries to use the potential of the knowledge carriers. An important component for a successful knowledge management is the transfer of implicit into explicit knowledge (Hendrichs 2002). It is the aim to get together certain information and knowledge and to establish an exchange of experiences based on knowledge. Information and communication technologies provide one opportunity for a systematic exchange and dissemination of knowledge by providing the technology and base for the knowledge management (Bullinger et al. 2002, 16p.). Basic aspects of a knowledge management besides technical infrastructure are the ability and willingness of members of the organisation to exchange knowledge. It needs to be a learning culture. Furthermore a toolbox of instruments and an overarching strategy of learning and knowledge management are necessary.

A knowledge kanagement supports the employees (Eppler 2002; Hanel 2002)

- to filter out the relevant and important knowledge from the scope of information and knowledge,
- to implement information in new contexts,
- to connect information with existing experiences,
- to integrate 'foreign knowledge',
- to identify relevant experts for the solution of specific problems or for the development of new products and
- to initiate and to stimulate learning processes all over the enterprise or organisation.

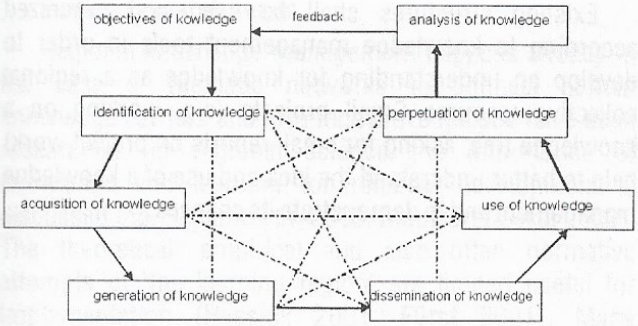

Figure 3: Elements of a knowledge management (knowledge cycle)

Knowledge Management bases on strategic and operative elements which are connected which each other (see figure 2). The strategic elements guarantee the selection and assessment of data and information, while the operative elements guarantee instruments for the use of knowledge and instruments for learning processes.

- Identification of knowledge: During this stage the main emphasis lays on the preparation and selection of facts, information and knowledge (Hanel 2002, 16). The aim is to make knowledge more available. Instruments of are document managements (online-libraries), content-management-systems, push services or change agents, search/information retrievals, skills management or yellow pages (Herrmann 2003; Willke 2004, 77pp.; Pawlowsky/Reinhard 2002, 6pp.; Christ 2002; Bullinger et al. 2002, 16).
- Acquisition and generation of knowledge: This happens through participation in other organisations or the development of new knowledge by information gathering or combination of unusual partners and other strategies. Therefore, enterprises have to arrange their organisational conditions in a way that new knowledge is developed and innovations are produced. Instruments are discussion forums, open-space-approaches and senior-experts-systems (Bullinger at al. 2002, 19pp.; Hanel 2002, 16; Herrmann 2003; Brake 2004, 119).
- Dissemination of knowledge: It has the aim to make the individual or personal knowledge and experiences accessible for the whole enterprise and the individuals in it. It depends from the communication structure of the enterprise and the willingness (trust) to share knowledge (Pawlowsky 1998, 27; von Felbert 1998, 139p.; Bullinger et al. 2002, 7).
- Use of knowledge: The aim is to identify which knowledge and processes can lead to new perceptions of operations, projects and products. Instruments therefore are learning agreements, mentoring programmes, senior-experts-systems and knowledge networks (Pawlowsky/Reinhard 2002, 25pp.; von Felbert 1998, 138).
- Perpetuation of knowledge: Once acquired knowledge is not always available in future. It requires a systematic storage, update and advancement of generated knowledge. Instruments for this stage are online-libraries, people oriented and non-people-oriented storage (Bullinger at al. 2002, 31pp.; Hanel 2002, 16pp.)

On the strategic level there are two components: objectives and the evaluation of knowledge. The objectives describe the strategic aims and its sub directions. The evaluation analyses the achievement of the objectives and defines proposals for more efficiency. The operative components thus are complemented to a management process (Hanel 2002, 17).

Draft of a regional knowledge management model

A knowledge management is not only important to enhance on the intra-regional level but also relevant for regions in the global competition. Regions, at the same time, need to use external impulses as well as to develop endogenous potentials. Knowledge as local and collective resource is an important component besides money, buildings or infrastructure that is available and applicable almost anywhere.

With regard to the contents of a regional knowledge management different aspects are relevant. A region can have a special know-how concerning certain types of industries such as solar energy (e.g. Freiburg, Germany) or microelectronics (e.g. Dresden, Germany). However, a region can also be knowledgeable concerning the use of methods and tools to handle issues and processes of regional development, e.g. the handling of conversion (e.g. revitalisation of brownfields) or the elaboration and implementation of innovative planning methods (e.g. Ruhrgebiet, Germany). To use advantages of these types of know-how, regions and regional actors should save and develop the existing knowledge base. Observing other regions in their development as well as the development of own fields of excellence combined with networking and the use of existing knowledge are central for a region's competitiveness. This becomes especially important against the background of fast development knowledge and short innovation cycles.

A regional knowledge management can be applied in every kind of region. It can be a region that is less institutionalised, a region defined according to a certain topic or a region which is defined by its administrative functions. This implies different forms of organisation and forms of knowledge management depending on the strengths and weaknesses of the institutional structure and also on the complexity and types of the participating regional organisations and actors.

The spatial dimension is another important factor for organizing a regional knowledge management, especially the structure of the region. Peripheral rural and spacious areas need another organizing effort for face-to-face contacts and virtual platforms than agglomerations.

A related question is: Who organizes a regional knowledge management? Regional actors such as regional planning institutions or other regional organisations like chambers of commerce are possible organizing bodies. This discussion is open to further development and will not be answered here.

The following aspects seem to be important for the development of a regional knowledge management:

- Combination and networking of decentralized knowledge carriers and resources considering appropriate forms of governance (cp. Matthiesen 2004, 13).
- Strategic selection and configuration of suitable data and information inclusive the building of criteria of relevance (visions, goals, strategies) for selecting the appropriate data, information and knowledge.
- Development of databases and documents for saving and organizing data.
- Instruments and methods for the conversion of implicit to explicit knowledge and reverse as well as the conversion from individual to collective knowledge and reverse (cp. von Felbert 1998, 136).
- Interaction between real and virtual levels of knowledge exchange. Face-to-face contacts are complemented by web tools for knowledge transfer (cp. Risak et al. 2003)
- Developing (innovative) fields of competence and building up a profile, networking of endogenous potentials, strengthening the competitiveness and observing the relevant developments in the fields of competence.
- Rules for communication and participation, culture of trust, joint visions (cp. Matthiesen 2004, 13).
- An organizing core for moderation and the maintenance of the virtual and real knowledge base.
- Implementation and project orientation to use and experiment with new knowledge and to apply information in the regional context (products, processes, etc.).
- Coordination of the knowledge management with the general regional management.

For the implementation of a regional knowledge management small steps are most appropriate because soon a huge amount of knowledge and work will come up. It is recommended to begin with a manageable information and knowledge exchange before addressing further steps.

Existing structures shall be used and organized according to knowledge management tools in order to develop an understanding for knowledge as a regional collective resource Small projects (e.g. working on a knowledge tree, asking for small reports on project work) help to better understand the idea and use of a knowledge management and to demonstrate its chances.

Summary and Conclusions

The following comments analyse the potentials and limits of a regional knowledge management and identify further needs for research.

Potentials and limits of a regional knowledge management

A regional knowledge management gets together various actors and knowledge carriers with similar and complementary interests, challenges or situations. It can ensure the access to new (external) information and knowledge via constant personal exchange and a technological knowledge platform.

The (virtual) knowledge platform is one component of a regional knowledge management and supports the transfer of knowledge through document management, online-libraries, yellow pages, skills management etc. The mentioned instruments allow the search for possible experts and cooperation partners to develop new products, methods and processes of the generation of (new) knowledge. It supports the exchange of implicit and explicit knowledge which a regional knowledge management can enable through the formation of metaphors and analogies in knowledge networks, discussion panels, senior-expert-systems and mentoring programs. A regional knowledge management can develop a certain knowledge milieu by personal contacts and interactions. This can be strengthened through the virtual community.

Strong individual interests can complicate the regional availability of knowledge. First of all it needs trust that individuals or collective actors share knowledge. So a regional knowledge management requires a culture of networking which make it easier for the regional actors to share knowledge and to develop an exchange system (Willke 2004, 68p.). First of all a learning culture is needed which considers the importance of individual and regional collective knowledge.

The construction of a regional knowledge management is linked with high temporal, organisational, technological and financial costs (Willke 2004, 42pp.). Regional actors and knowledge carriers have to be involved in the exchange and generation of knowledge which requires intensive face-to-face communication, the organizing of these processes and the financial construction and maintenance of the data collection and the virtual platform.

Further research needs

Regional knowledge management happens already in the case of thematic networks to connect certain knowledge carriers and also innovative milieus have been researched. In regional science the importance of knowledge and learning for regional development is discussed (cp. Schamp / Lo 2003; Moulaert / Sekia 2003). The theoretical, empirical and also often normative attempts of "the learning region" are limited useful for implementation (Hassink 2001; Fürst 2001). Many questions concerning the idea of a regional knowledge management remain:

- Methods and tools of converting implicit to explicit and individual to collective knowledge and the advancement are needed for the regional level (cp Güldenberg/Helting 2004, 530).
- The work on knowledge always has to imply the work with non-knowledge and what we do not know. Instruments and ideas are needed to deal with unsure developments and the unknown.
- Methods and strategies for the selection of the relevant data, information and knowledge need to be developed (cp. Güldenberg/Helting 2004, 531).
- Open in the discussion is, why certain regions are not able to learn and innovate. There needs to be more awareness concerning barriers are and how to overcome them.
- The application of knowledge management tools needs to be analysed concerning the possible use in regional development. Instruments need to be tested, analysed and advanced.
- EKnowledge seems to be charming but also can be a big trap concerning the overrating of technical possibilities. The virtual knowledge base needs to be designed within the real knowledge network.

Overall the ideas presented just try to be a first step in a concept of regional knowledge management, which needs to be designed in more detail.

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