Information Models of Man in Contexts of Information Society: Theoretical and Strategic Perspectives

Jela Steinerová, Associate Professor
Department of Library and Information Science
Comenius University
Bratislava, Slovak Republic
<EMAIL>

INTRODUCTION

Over the last decades information and knowledge have become global and traditional disciplines of humanities and social sciences have searched for new methodological models related to knowledge and information. Based on information science as social science I would like to investigate the role of human beings in creation, communication and use of information. Information problems of people are complex real-life problems which need new methods of solution. The methods should draw on relationships of human beings to information systems, information products, informations sources and information services. In central Europe it is necessary to stress the information empowerment of people as support of human beings in creative and productive use of knowledge for development of information society. New issues of information science should be dealt with in closer contact with social sciences and humanities. This paper should represent a contribution to the ongoing research agenda of information science from the human and social viewpoints. The background questions can be articulated as follows: *Which changes of information behaviour can we identify in a new "digitised" space? What are typical characteristics of user groups in information society, namely with regard to the use of internet and digital libraries?* I assume that understanding of human information seeking and use can enhance effective design of information services in information society.

This paper is aimed at examination of appropriate methodology of information science from the viewpoint of human and social principles. Library and information science is determined from the viewpoint of human beings in various situations and positions regarding the information creation and use. Based on this the methodological information models of man for information science research are developed.

METHODOLOGICAL TRADITIONS OF INFORMATION SCIENCE

Information science has always made use of wider methodological perspectives coming from different scientific disciplines. General scientific methods, e.g. analysis, synthesis, interpretation, modelling, abstraction, comparison, have been popular in combination with methods of social sciences and humanities, mathematical and logical methods. However, the traditional distinction between quantitative and qualitative methods is not sufficient any more, because it is impossible to comprise the needed complexity of knowledge, information, technologies and social framework of information systems.

Development of practice and theory of information communication and use leads to new requirements for methodological approaches to research. New methods should be open, holistic and situational. If we say that library and information institutions are more and more open within their social functions, then we have to think of new methods of research into complex societal problem of social communication, distribution and use of knowledge.

At present, the crucial problem of knowledge organization is connected with knowledge dynamics. As opposed to traditional ideas of static knowledge, which can be recorded and described, new methods should take into account especially changes in knowledge at any time, in the defined problem situations, and for the determined user groups. That is why we can see the shift from descriptive methods to *supportive, dynamic* methods which emphasize constructive nature of knowledge. Information science starts to seek alternatives to mono-dimensional traditional methods in polyrepresentational approaches. These methods develop towards the *support of creative human information activity and behaviour*. As an example we can think of the concept of a digital library which changes library as an institution, as well as objectives and values of library and information work.

Methodological development of information science is based on transdisciplinary principles (combining several disciplines to the defined problems of information use in social and cultural contexts). The global knowledge and information have grown recently and been applied to all societal activities. This has been proved by the attempts to create the concept of the information society at various levels of global or national information infrastructures. At the theoretical level, information science has answered by the transition from traditional positivistic methodologies to hermeneutic and phenomenological approaches.
I do not try to apply new methods to traditional descriptive (physical) procedures known from the traditional library practice. In search for new methods I would like to see the information processes as *human and social processes* which should be redefined in a new situation, when the intersection of technologies, knowledge and people becomes so complex.

Methodological traditions of information science are no more sufficient for human-centered information process as transdisciplinary real-life problem. The new situation of global communication is marked by complex intersection of technologies, knowledge and people. Information science and its new methods are needed to help reduce barriers of knowledge use. New methods should be based on the development of information philosophy of man in his cognitive, affective, social, cultural, and behavioural levels. Creative human and social knowledge activity will be at the centre of the proposed research. New methods and models should support the change, knowledge construction and interaction. The information models of man proposed in this paper could also help in understaning and articulating the strategical issues of information society.

I suppose that situated cognition and communication, as well as broader contexts of information use are connected with typical *human information styles* which refer to combination of cognitive styles, communicative styles, cultural, and organizational contexts. This hypothesis refers to the concept of information empowerment of people and to specific features of information use from central European perspective. In future these ideas should be proved by empirical research of groups of people in information institutions.

INFORMATION EMPOWERMENT - CENTRAL EUROPEAN PERSPECTIVE

Information empowerment means human support of information problems solving. The active, dynamic provision of information to users is at the centre of this process. It is based on dynamic, situated action, when information, knowledge and actions develop together in particular circumstances. When people become participants in social and work communities, they get their information empowerment. Moreover, the information empowerment is a *cyclic, socially based process* in which knowledge changes and develops. Information empowerment supports the problem solving processes both at cognitive and social interaction levels. In the past, the central European information users were not always used to the empowerment and their own active role with regard to the use of information. That is why it might be interesting to examine the present user needs in comparison to the past, passive attitudes to information. The patterns of information use are still influenced by deep traditions.
However, it is also necessary to take into the account the holistic principle of social and human systems, which combine "being" and "doing" (Sierhuis, 1996). In this context one can identify these *dynamic elements* of information empowerment:

- cognitive and personal (emotional) factors, their changes over a period of time
- environment (work activity, social activity, local context, cultural context)
- social context and behaviour (tasks, roles, interaction, etc.)
- content (documents, subjects, disciplines, problems, media and formats of information, textual patterns).

Based on combination of these factors the information empowerment in social interaction means the use of information by means of mutual collaboration, learning and evolution. If we cannot separate knowledge from people, we have to incorporate people into our models of information seeking and use. For knowledge representation we should know more about human activities in problem solving and constant re-construction of different interactions. In knowledge organization we can see *several ways of conceptualization and re-conceptualiazation* which change in time and add dynamics to the activity. As an example we can imagine a specific situation of information seeking dependent on different modalities of information processing and determination of information needs (use of e-mail, face-to-face communication, databases, etc.), or location-specific interaction (teamwork, meeting). The central European context of knowledge use is then determined by special models used in *work environment* (organizations, roles, collaboration in communities), but also by models of social knowledge (i.e. what people know about other people).

With respect to the information empowerment, the knowledge use in the central European region is also embodied in the factor of *uncertainty* in information seeking (Kuhltau, 1993, Wilson, 1996). This factor is regarded as a natural part of information seeking and forms the starting point of a new methodological approach in information science. Specific factors with regard to the cultural setting of the region include *different possible affective states* of human beings within information empowerment, e.g. sensing, recognizing, understaning, synthesizing, but also anxiety, engagement or boredom. We also have to think of different *cultural and circumstantial practices* at least at levels of organizations and social groups. These levels are based on special activities which do not have well-defined goals and can be reflected in models of practices (rather than procedures or policies). The models can cover modes of communication, learning, working and other habits linked to special kinds of information needs that evolve in time. Thus, information needs and empowerment are carried out through collaboration in groups and communities in practical activities. These contexts point to specific patterns of activities with regard to the region.

In contrast to global, common characteristics of dynamic elements of knowledge I would like to stress the specific *cultural factors* that influence the information use. By term "cultural" I mean wider concept of sociological differences in organizations, groups, nations determined by attitudes, values, orientations, relationships, norms, historical memory.

I assume that in culturally different settings there exist different ways of expressing knowledge based especially on *dynamic relationships of groups of people.* Cultural studies show that cultural differences are based mainly on time orientation, person-nature orientation, activity orientation, relational orientation. Traditional cultural polarities define dimensions of individualism and collectivism, high or low uncertainty avoidance (unpredictability), masculinity (assertivity) and femininity (supportivity), but also formality and informality, high or low impersonalism, universalism or particularism, neutral or emotional modes. Central European patterns of information use point to collectivistic traditions, rather high unpredictability, not too much assertivity. The information needs are marked by traditional formality and high impersonalism. From the viewpoint of information institutions in central Europe we still remember the universalism of knowledge organization methods and tendency of information science to neutral (objective) information provision.
However, at present it has been changed into more dimensions of knowledge organization and information use. Mutual coexistence of sharp forms of methodologically separated dimensions becomes real. For example, the coexistence model of individualism and collectivism can be mentioned. Some cultures can tolerate contradictions, the other are rather intolerant, and with respect to information and knowledge use empower individuals differently. In the Slovak setting, for example, we can see that the coexistence model of inidividualism and collectivism has been at present applied to information use in education (the combination of traditional libraries and internet).

The differentiation of information seeking behaviour can expand to cognitive evaluations of an individual's perceptions, into his participation in communication, into consensus change in groups, and into patterns of the systems use. In different cultures different kinds of information products dominate. I suppose that we can prove (in central European region) different patterns of information processing, different attitudes, and different degrees of satisfaction with information systems and products.

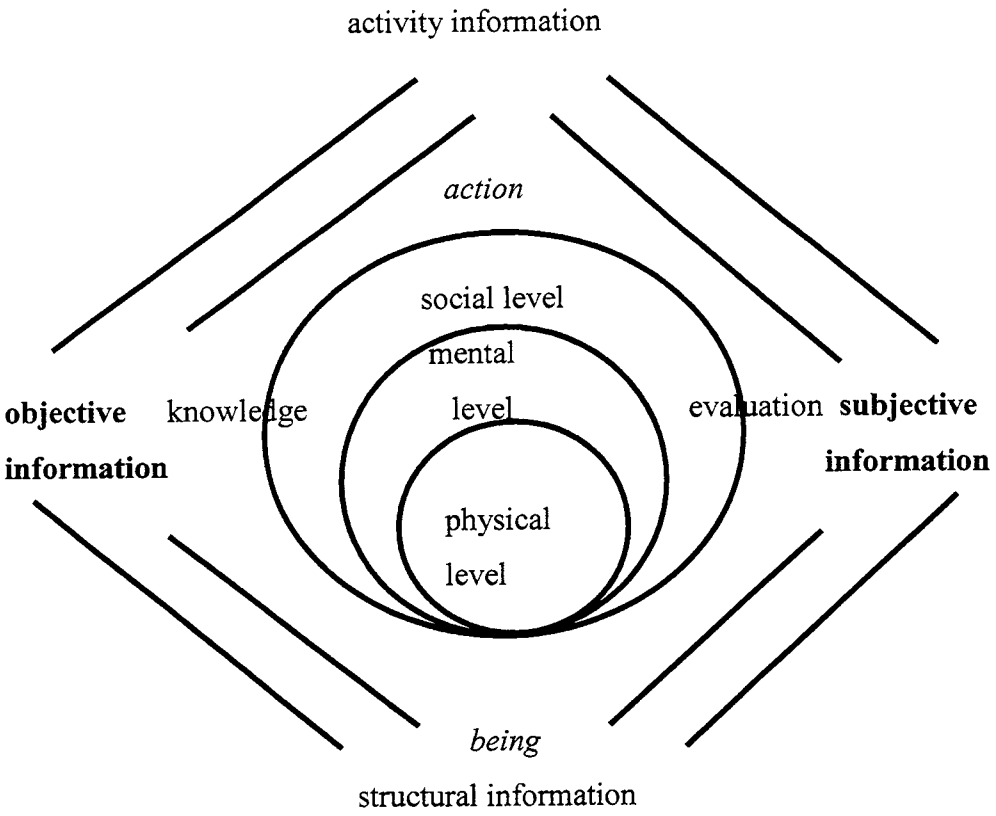
With regard to people as the primary "carriers" of knowledge, we should model their "knowledge" behaviour in action. Information science can make use of agent-based, holistic modelling systems which would be able to manage various levels of the activities that people engage in. That is why I call for a new methodology as a challenge for information managers. It can help reduce barriers of information use and information empowerment. Specific communication patterns and collaborative patterns in central Europe determine the context which leads to dynamic re-configuration of information provision and new patterns of information use.

METHODOLOGICAL FRAMEWORK AND INFORMATION MODELS

The proposed methodological framework for further research is based on empirical and conceptual levels. At empirical level questionnaires and interviews with selected groups of information users will be used (including empirical data about cognitive factors, social factors and content factors). At conceptual level the theory will be built including cognitive models, knowledge types, activity and behaviour models. In this paper I have developed *the information models of man* reflecting individual information users and social groups as the starting methodological point for the research.

The term information model means that we ask the question about human patterns of information use and the possible support of the information process. Based on the outlined methodological framework the information models of man are developed. They combine the empirical and conceptual levels together with individualistic (subjective, cognitive, affective) and objectivistic (social, environmental factors and activity-behaviour) approaches.

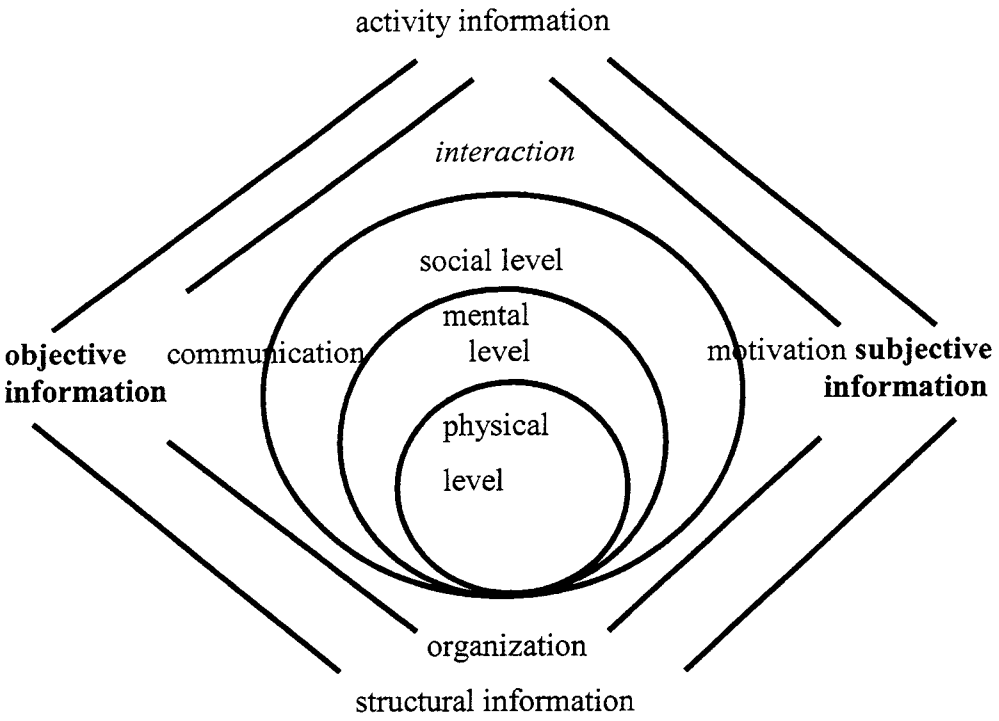
Information model of man, individual viewpoint



The *individual viewpoint* of the model is described as an interconnection of objective and subjective parts of knowledge together with existential (ontological) basis and human activity. Structural information means the constant inclusion of information into structures, seeking for common characteristics of objects in abstract concepts. It is based on ontological principles of "being". The other side of information process is represented by the activity information ("doing"), by the creation and use of information in action (in culture-specific processes, etc.).

In the model the emphasis is laid on mutual interconnections of subjective and objective influences in situated action and cognition. Communication of knowledge leads to objective information. Evaluation of objects and knowledge creates links to subjective information. The information model of man arises as a result of spiral movement of the three sets of factors (physical - action, mental - cognitive and affective, and social - environmental). Not only are these factors interconnected in mutual links, but they are intertwined through their spiral evolution (from physical factors to cognitive and affective factors and to social and cultural factors).
The model is divided into two methodological levels, that of empirical (represented by activity information and action) and that of conceptual (represented by structural information and being). The dynamic elements of the model cover such categories as time, change, evolution, different states of knowledge, viewpoints and situation-based actions, culture-specific communication patterns, etc.

Information model of man, social viewpoint



The *social viewpoint* of the information model of man shows the processes of interaction (based on the action modelled in the individual viewpoint) and communication of knowledge linked to the objective information creation. From the side of subjective information the emphasis is laid on motivation. And structural information is represented by the principle of organization (categorization, classification). This viewpoint selects the social being and social action as complementary to the individual cognition and evaluation in the first model.

The information models of man reveal the complex human nature of information processes and the need to develop special human and social background of the traditional basic categories of information science, e.g. the information system, the information service, the information product, the information resource.

Based on the models a new category of an information style emerges, representing the styles of access to information resources, styles of creation, communication and use of information. I define the category of the information style as the relatively stabile preferences of interaction with information. In future empirical research I would like to empirically prove this category. Information styles should be represented by a blend of prototypical user needs, presentation preferences, patterns of relevance evaluation, strategies of information seeking, personality types, communicative and learning preferences.

Other viewpoints of the information model of man can be developed in future. For example, I have developed a model of the cultural memory based on the information models of man (Steinerová, 2001). Further viewpoints can include cognitive, emotional, organizational, educational, and other factors. The emergent typology of information styles can be even more culturally specific (e.g. information styles of researchers in humanities and sciences, information styles of children, men, women, information styles of specific cultural regions, e.g. central European information styles, etc.).

CONCLUSION

The information models of man have been here just outlined and the methodological background has been developed in detail in my previous works (Steinerová, 2000). I suppose the presented models can help in better understanding of information society and its regional and cuturally-specific patterns of information use and knowledge organization.

The core skill of people in future information society will be that of knowledge use which can be supported by information science and its new social and human perspectives. If we could identify information styles of groups and individuals, we could help organizations in management of knowledge and support of information problems solution and in development of information policy for transitional societies.

REFERENCES

Allen, B.L. (1991). Cognitive Research in Information Science: Implications for Design. In Williams, M. (ed.) *Annual Review of Information Science and Technology* (ARIST), Medford, NJ: Learned Information, 26, 3-37.

Borgman, C. et al. (1996). *Social Aspects of Digital Libraries.* UCLA-NSF Social Aspects of Digital libraries Workshop: Final Report. Nov. 1996. http: //www-lis.gseis.ucla.edu/DL/UCLA_DL_Report.html

Hepworth, M. (1998). Investigating methods for understanding user requirements for information products. In: *Information Research*, Vol.4 (Oct. 1998), No.2. http: //www.shef.ac.uk/~is/publications/infres/isic/hepworth.html

Hjorland, B. (1997). *Information Seeking and Subject Representation. An Activity-Theoretical Approach to Information Science.* Westport, Cn.: Greenwood Press, 1997. 213 p.

Ingwersen, P. (1996). Cognitive perspective of information retrieval interaction: elements of cognitive IR theory. *Journal of Documentation*, 52 (1), 3-50.

Kuhltau, C.C. (1993). *Seeking Meaning: a process approach to library and information services.* Norwood, NJ: Ablex, 1993. 199p.

Sierhuis, M.,Clancey, W.J. (1996). *Knowledge, Practice, Activities and People.* Presented at the AAAI Spring Symposium on Artificial Intelligence in Knowledge Management. http://cogprints.soton.ac.uk/archives/...pers/199805/199805001/doc.html/146.htm

Steinerová, J. (2001). Kultúra a technológie v komunikačných a informačných procesoch. (Culture and technologies in communication and information processes). In: *Infos 2001.* Bratislava : CVTI, 2001, p.94-105.

Steinerová, J. (2000). Základy filozofie človeka v knižničnej a informačnej vede. (Basics of the philosophy of man in library and information science). In: *Knižničná a informačná veda na prahu informačnej spoločnosti : filozofický, systémový a historický pohľad.* Bratislava : Stimul, 2000, p. 9-55.

Steinerová, J. (1999). Conceptual Model for Case Studies in Integrating Knowledge Structures. In: *5th auDes Conference on Environmental Education. Case Studies on Environmental Education.* Abstracts of the conference. Hrsg. R. Scholz u.a. Zürich, Switzerland, April 15-17, 1999. Zürich : ETH-UNS, EAWAG, 1999, p. 83. - http: //www.audes-conference.ethz.ch/

Steinerová, J. (1998). Interpreting Knowledge in Information Science. In: *Knowledge Management und Kommunikationssysteme. ISI'98.* Ed. H. H. Zimmermann, V. Schramm. Konstanz : UVK, 1998, p. 143-153.

Wilson, T. (1996). Recent trends in user studies: active research and qualitative methods. http://www.shef.ac.uk/~is/publications/infres/paper76.html

Yetim, F. (1998) Cultural Aspects of Group Support Systems. In: *Knowledge Management und Kommunikationssysteme. ISI'98.* Ed. H. Zimmermann, V. Schramm. Konstanz: UVK, 1998, p.344-357.