Change of Paradigm in Knowledge Management - Framework for the Collaborative Production and Exchange of Knowledge

Rainer Kuhlen
Professor for Information Science in the Department of Computer and Information Science at the University of Konstanz,
Konstanz, Germany

E-mail: rainer.kuhlen@uni-konstanz.de

Change of Paradigm in Knowledge Management - Framework for the Collaborative Production and Exchange of Knowledge[1]

Rainer Kuhlen

Professor for Information Science in the Department of Computer and Information Science at the University of Konstanz, Germany

rainer.kuhlen@uni-konstanz.de

Contents

Abstract

We propose a paradigm shift in the understanding of knowledge management. This puts knowledge management in the broader context of communication. Knowledge management is

---

[1] This paper was presented in the Plenary Session, Sunday 03 August 2003, of the World Library and Information Congress: 69th IFLA General Conference and Council, Berlin 2003. Will be published in: Knowledge Management • An asset for libraries and librarians. Collected papers from LIS professionals / Edited by Hans-Christoph Hobohm. München: K • G • Saur, 2003 (IFLA Publications)

generally understood as a means of having better control over the production and usage of explicit and implicit knowledge in organizations of any kind, preferably commercial businesses, but also public administrations. The paradigm shift in the understanding of knowledge management (towards communications) has come about because knowledge and information are no longer considered as being simply there. Information is not just the result of a particular distribution or retrieval process, using and applying existing knowledge to new problems, but is also the result of communication processes. This can be called the network or communication approach to knowledge management. Knowledge and information in all areas and in all applications are increasingly produced, distributed and used collaboratively. We cover the following topics:

(a) The paradigm shift is quite obvious with respect to knowledge management from an organizational perspective. (b) The paradigm shift towards communicative knowledge management has also consequence from a political perspective and (c) will have consequences for the media. (d) The communicative paradigm of knowledge management is also increasingly relevant as a means of organizing learning processes as collaborative cooperative, knowledge sharing processes. (e) It is obvious that the paradigm shift towards communication processes also dramatically changes the way how the production and the exchange of knowledge is and will be organized in scientific environment. (f) The communicative approach has and will continue to have a strong influence on our understanding of the concept of authorship and, consequently, of ownership of intellectual property. (g) Finally, knowledge management in the communicative paradigm - at least with respect to the topic of generating and disseminating knowledge in the communicative, self-organizing paradigm - will have major consequences for librarians´ work and the structure and mandate of information transfer institutions.

1 A paradigm shift

This talk will be a surprise to most of you. You probably expect a talk about knowledge management – and the object of the talk **is** indeed knowledge management - , but what I will mainly doing is talking about communications and the right to communicate. In the process of my talk you will hopefully agree that communications is in the center of knowledge management.

> ➢ The right to communicate seems the most obvious thing in the world, in particular in a world where information and communication technologies are the driving force in all domains of modern society.

> ➢ The right to communicate seems a basic right, a natural right, so fundamental that the founders of the Universal Declaration of Humans Rights and most other Covenants, Conventions, Charters etc. did not feel compelled to mention it explicitly or to enshrine it in the canon of universal rights and values.

> ➢ The right to communicate can even be considered a distinctive characteristic of the human race.

But amazingly enough the right to communicate is one of the most controversial topics of international debate in the last 50 years. How can it be that a fundamental, universal and obvious right can be the object of controversial interpretations, can be the focus of such

heterogeneous, opposing interests, with the consequence, for example, that the USA government felt obliged to terminate its membership in the UNESCO some 25 years ago as a consequence of the debate about the New World Information and Communication Order (NWICO). Communications, this was the message of the early NWICO debate and is a major theme in the current preparatory process for the World Summit on the Information Society, is a highly controversial and political topic.

The subtitle of my talk is "Framework for the Collaborative Production and Exchange of Knowledge". This can be related to what I am going to call a paradigm shift in the understanding of knowledge management. And this puts knowledge management in the broader context of communication.

Knowledge management is generally understood as a means of having better control over the production and usage of explicit and implicit knowledge in organizations of any kind, preferably commercial businesses, but also public administrations. To put the objectives of traditional knowledge management in a nutshell: to know what an organization in principle knows and to make that knowledge available to the right people at the right time.

The paradigm shift in the understanding of knowledge management (towards communications) has come about because knowledge and information are no longer considered as being simply there. The classic view is that knowledge is produced by single authors, is published and stored in information containers (traditionally in printed books, journals, reports, today more and more in electronic forms such as data banks, knowledge-based-systems, non-linear hypertexts, and web sites), that knowledge is distributed to users or is interactively retrieved by end-users. This is the static view of knowledge management. We will call that the *knowledge warehouse approach*.

The dynamic or communicative view on knowledge management does not take knowledge and information as fixed, but emphasizes the ongoing growth and renewal of knowledge and information in a continual process of exchange and communication.

Information is thus not just the result of a particular distribution or retrieval process, using and applying existing knowledge to new problems – although this, of course will still be a major impetus for innovation -, but is also the result of communication processes. This can be called the *network or communication approach* to knowledge management.

This shift from the distribution and retrieval of existing knowledge to the interactive and collaborative production of new knowledge in the communication paradigm of knowledge management has been made possible by what I call the telemediatization of all areas of intellectual life.

 "Telemediatization" is a cover term for the potentials of telecommunication (electronic communication via networks), informatics (electronic information processing) and multi-/hypermedia (non-linear multi-modal knowledge representation and usage). Telemediatization is not simply a neutral, application-independent change in technology but causes changes in all areas of life, in particular with respect to our intellectual life, not deterministically, but nevertheless with far-reaching consequences. This is why the communication paradigm of knowledge management must be put in the broader context of a genuine revolution in our understanding of and our behaviour towards knowledge and information.

Knowledge and information in all areas and in all applications are increasingly produced, distributed and used collaboratively. Collaboration – this does not mean – as in German or in French - work with the enemy (these are collaborateurs!) but just the opposite: cooperating and sharing resources with others in an open, friendly, often non-competitive, but supportive way – collaboration is in general organized in networks, not in hierarchies.

Networks - as we know from organization and system theory - allow greater creativity and innovative power because they reduce barriers and constraints inherent in hierarchies. But networks need coordination. Coordination is another word for management. Knowledge production, enrichment, dissemination, and usage in the network need to be managed. The communication paradigm is therefore a great challenge for knowledge management, and not only in commercial and administrative organizations but in all environments where knowledge and information are at stake.

We mention only a few aspects of this enlarged understanding of knowledge management as a paradigm shift from a static, hierarchical to a dynamic, networked view of knowledge and information.

> The paradigm shift is quite obvious with respect to knowledge management from an organizational perspective. This is probably what most of you expected when reading the title of my paper. Consequently we will elaborate on the potentials of technical, computer-supported communication for the generation of knowledge in organizations

> and will concentrate on the value-added effects of electronic communication forums (fora).

> ➢ The paradigm shift towards communicative knowledge management has also consequence from a political perspective. Therefore we will elaborate in some detail the conflict about the New World Information and Communication Order (NWICO), which was in general a debate about the/a right to communicate. This is, of course, not intended to be a retrospective on the old NWICO controversy, with its dramatic consequences not only for the UNESCO. Instead NWICO revisited is of high relevance today, in particular with respect to the World Summit for the Information Society (WSIS) which will take place in its first part in mid-December of this year in Geneva (the second part will be held in Tunisia in 2005). Amazingly enough, one can experience 25 years later the same debate about dominance or repression of communications.

> ➢ At the end, we only very briefly will mention some of the consequences of this paradigm shift for the media. This is mainly a shift from the traditional distributional paradigm first to the interactive and second to the communicative paradigm.

> ➢ The communicative paradigm of knowledge management, and in this paradigm electronic communication forums are also increasingly relevant as a means of organizing learning processes as collaborative cooperative, knowledge sharing processes.

> ➢ And it is obvious that the paradigm shift towards communication processes also dramatically changes the way how the production and the exchange of knowledge is and will be organized in scientific environment. This will have and already has consequences for the way the whole publication chain from authors to readers is organized.

> ➢ And this has and will continue to have a strong influence on our understanding of the concept of authorship and, consequently, of ownership of intellectual property. Maybe we do not need such a concept of intellectual property in electronic environment any more which seems to be no longer an incentive or a guarantee for knowledge generation, but an obstacle to free and inclusive communication.

> ➢ Finally, I have been told that the talks of the plenary speakers do not necessarily need to refer explicitly to library topics. But it is obvious that knowledge management in the communicative paradigm - at least with respect to the topics of (collaborative learning and communication competence at universities and of generating and disseminating knowledge in the communicative, self-organizing paradigm - will have major consequences for librarians and library organization.

Knowledge management in the communication paradigm (and this means organizing and coordinating the processes of knowledge and information) will be one of the major objectives and tasks of modern libraries in the 21st century. We do not have time and space to discuss the last topics in greater detail but concentrate in the following on the paradigm shift of knowledge management from an organizational perspective and on the relation between knowledge management and the right to communicate form a political perspective.

2 Knowledge warehouses vs. knowledge networks

Knowledge management from a business perspective is to be seen as a reaction to the information or knowledge society concepts from the 70ies when Daniel Bell, Fritz Machlup, Peter Drucker, Marc U. Porat, Yoneji Masuda carried out their macro-economic studies and discovered that the cross national product depends highly on the production, distribution and usage of information and knowledge products and service.

It was in particular Porat with his distinction between the first information sector – this is mainly what we call the information markets where information goods are exchanged either with a commercial, proprietary or with a sharing, non-commercial interest - and the second information sector – this refers to all kinds of information processing within organizations – who raised awareness for the importance of knowledge and information as a major resource and factor for success in organizations of any kind.

If knowledge and information are major success factors, then it makes sense that they need to be organized according to management principles. This was the beginning of information management, mainly the coordination of internal and external information resources – hardware-, software- and brainware-based ones.
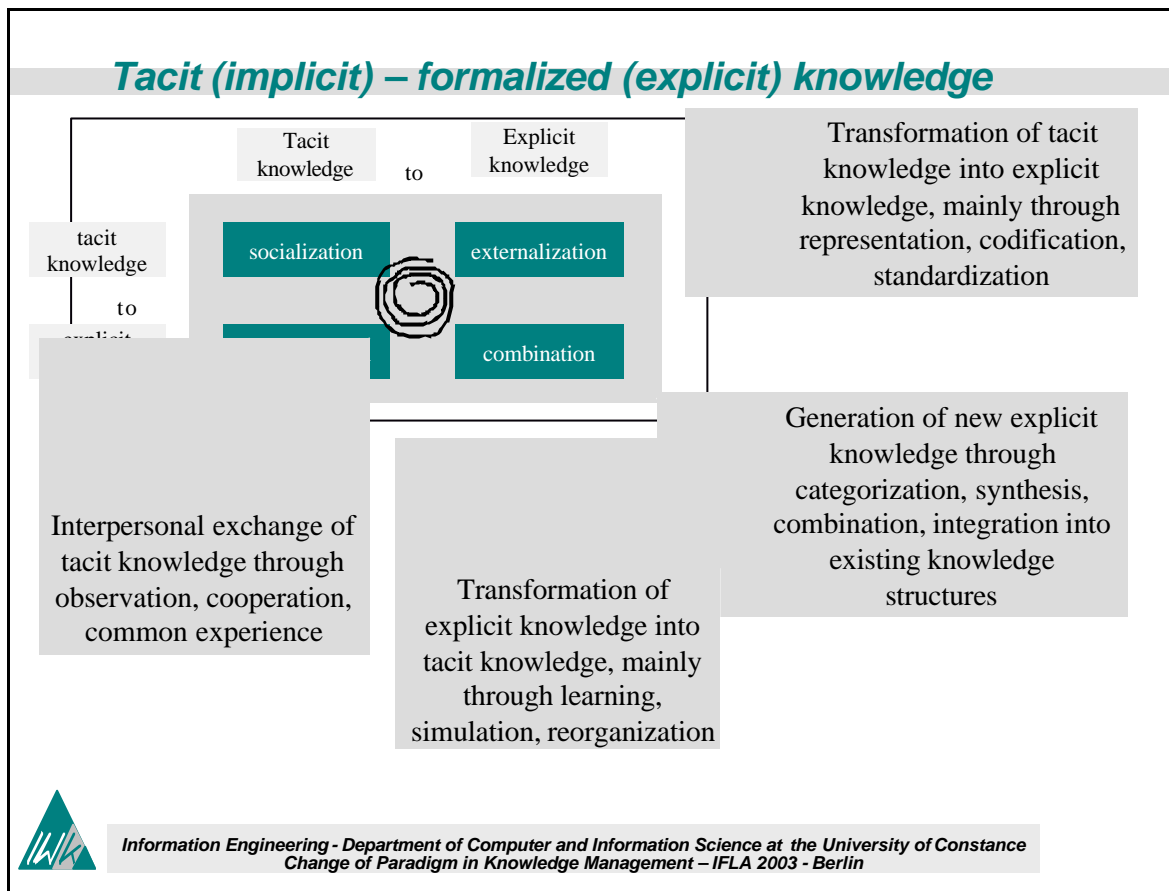
Information management and knowledge management are often used as synonymous concepts. We do not wish to go into the never-ending terminological debate about the difference between knowledge and information. But the argument makes sense that the carrier of knowledge management began when organizations discovered the value of their employees as the main means of success rather than relying predominantly on information machinery and internal and external information systems.

What people know is what an organization needs to know, information from machines and technical systems is only of additional value when people accept it, embed it into their already existing knowledge structure and when they, as people, use it.

Knowledge, an internal cognitive structure of human beings, cannot be managed, but the processes that support the creation and exchange of knowledge can be the subject of management, in particular those processes where many knowledge actors are involved.
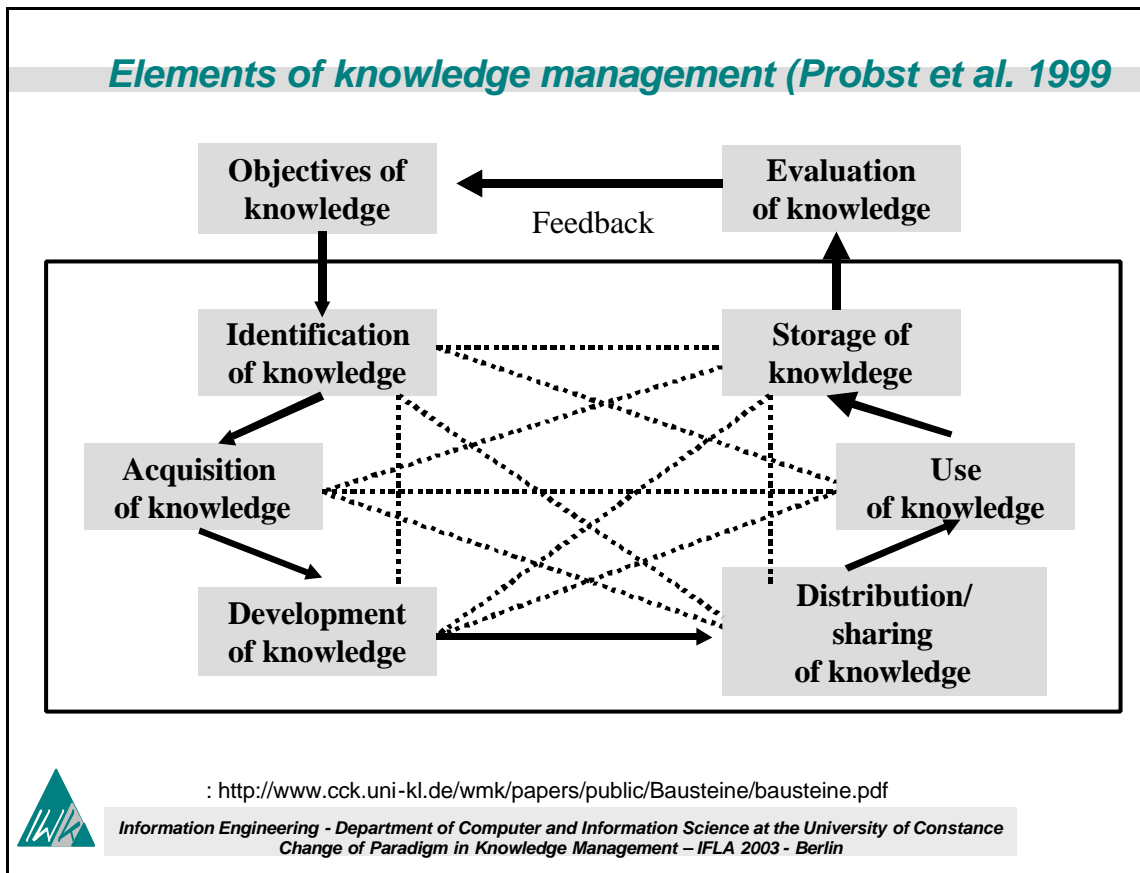
Without claiming to provide a comprehensive overview of existing knowledge management theories: in general there have been two major approaches of knowledge

management so far. One goes back to the famous book of Ikujuor Nonaka and Hirotaka Takeuchi: The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation (published 1995).

Tacit (implicit) – formalized (explicit) knowledge

	Tacit knowledge	to	Explicit knowledge	
tacit knowledge	socialization		externalization	Transformation of tacit knowledge into explicit knowledge, mainly through representation, codification, standardization
to explicit			combination	

Interpersonal exchange of tacit knowledge through observation, cooperation, common experience

Transformation of explicit knowledge into tacit knowledge, mainly through learning, simulation, reorganization

Generation of new explicit knowledge through categorization, synthesis, combination, integration into existing knowledge structures

IWK
Information Engineering - Department of Computer and Information Science at the University of Constance
Change of Paradigm in Knowledge Management – IFLA 2003 - Berlin

And the other approach is often associated, at least in Germany, with the work of Gilbert Probst and colleagues like Kai Romhardt, who introduced knowledge bricks or knowledge elements to describe the different components of knowledge[2].

---

[2] http://www.cck.uni-kl.de/wmk/papers/public/Bausteine/bausteine.pdf - translated by the author

Elements of knowledge management (Probst et al. 1999

Objectives of knowledge — Feedback — Evaluation of knowledge

Identification of knowledge — Storage of knowldege

Acquisition of knowledge — Use of knowledge

Development of knowledge — Distribution/ sharing of knowledge

: http://www.cck.uni-kl.de/wmk/papers/public/Bausteine/bausteine.pdf

Information Engineering - Department of Computer and Information Science at the University of Constance
Change of Paradigm in Knowledge Management – IFLA 2003 - Berlin

Karl Wiig, one of the most influential scholars on knowledge management, has reduced this complex view of knowledge structures to five stages in his "Institutional Knowledge Evolution Cycle" :

➢ Knowledge Development. Knowledge is developed through learning, innovation, creativity, and importation from outside;

➢ Knowledge Acquisition. Knowledge is captured and retained for use and further treatment;

➢ Knowledge Refinement. Knowledge is organized, transformed, or included in written material, knowledge bases, and so on to make it available and useful;

➢ Knowledge Distribution and Deployment. Knowledge is distributed to Points-of-Action (PoAs) through education, training programs, automated knowledge-based systems, expert networks,

➢ Knowledge Leveraging. Knowledge is applied or otherwise leveraged. By using (applying) knowledge, it becomes the basis for further learning and innovation.

These two models follow more or less what I have called the knowledge warehouse paradigm. Knowledge warehouses, today semantically controlled via organization-wide data dictionaries or ontologies,

➢ collect existing knowledge,

- ➢ transform tacit knowledge into explicit knowledge by representing and structuring it,
- ➢ store knowledge in data - or rather knowledge - bases,
- ➢ make knowledge available by providing access through traditional retrieval/query languages (according to the matching paradigm) and through more sophisticated data mining techniques and
- ➢ finally, make knowledge user-friendly and adaptable to heterogeneous user profiles by presenting the results in flexible sophisticated forms of visualization.

One of the problems with the knowledge management approach is that knowledge is retrieved out of context. Knowledge is normally produced under specific circumstances – as a result of specific experiments, as a generalization of empirical data, with specific applications or specific objectives in mind.

These contexts, the circumstances of production, the contingency factors of actual use – in general, the pragmatic factors associated with knowledge, the communication environment, cannot be maintained, at least not adequately, when knowledge is represented in an information-processing machine.

Computers are syntax machines, at an advanced stage they are semantic machines. But pragmatics, the ability to identify the validity and the relevance of knowledge (in machine reality data), is still the privilege, the knowledge competence of human being. Computers do not have what philosophers call "Urteilskraft" (the power of judgement).

Furthermore, the complexity of knowledge-dependent situations has increased dramatically in the last hundred years. Most problems to be solved, most decisions to be taken demand the competence and the cooperation of many people. This is true in business, in science, in software production, in government and administration, in art (what a complex process, for instance, the production of a single piece of music, or the performance of an opera).

The knowledge that is needed in critical or innovative situations is usually already lying around, stored in electronic repositories or known by human experts. What is needed is to bring together the resources and the experts who can relate the existing pieces of knowledge to new contexts and to new problems. This is the communicative challenge.

With the advent of communication technologies available on a large scale one can observe a shift form the more static view of the production, dissemination and usage of knowledge and information to a more dynamic collaborative view of these processes, in particular with respect to the generation and the exchange of knowledge. We have

labelled this new approach the network, the communication or the collaborative or maybe even the hyper-knowledge paradigm. We prefer in the following the term "communicative paradigm of knowledge management".

Knowledge management in the communicative paradigm also uses existing information resources and methods of recalling, but, in addition, emphasizes the value-adding effects of bringing people together with different backgrounds and with different levels of expertise. The result of communication processes – this is the main assumption of the communication paradigm – is different from the sum (joined set) of the single pieces of knowledge which are brought together in these exchange processes.

The main instruments of knowledge management in the communication paradigm are electronic asynchronous communication forums (fora) and virtual communities or communities of practice. Communication forums, in general asynchronously organized are the most influential and the most widespread means of computer-supported communication and are increasingly important tools both for internal knowledge generation and usage. Communication forums are also at the core of virtual communities which nowadays have become instruments of marketing, because they make it possible to gain knowledge about customers´ by letting them communicate in electronic forums as important parts of virtual communities.

Virtual communities in the early days of the Internet were not related to commercial marketing interests, but were established as a means of developing social relations in electronic environments.

Electronic communication forums, mainly used as a means for organizing communities of practice – job-related informal groups in organizations whose members are in general intrinsically motivated to exchange knowledge and produce new knowledge cooperatively - are in general goal-oriented – whereas chats normally serve entertainment interests.

Electronic communication forums can be characterized (among other things) by the following value-added features:

1. Electronic communication forums allow the exchange of information between people who in real life would normally never be in contact with one another.
2. Electronic communication forums bring together people with different (personal, professional, intellectual) backgrounds.

3. Electronic communication forums build continuous knowledge bases which are open to all members of the forum. Knowledge bases are normally enriched by links/references to external resources.

4. In electronic communication forums only what has been said counts. Reputation is not defined by one's position in an organizational hierarchy, but is a function of the contributions made by the forum's participants. It is therefore not stable but open to change.

The success of electronic communication for knowledge management depends highly on effective coordination mechanisms (the moderators of forums are extremely important) and on incentives for the members to participate actively in the exchange of knowledge, namely to share one's own knowledge with others.

3 New World Information and Communication Order – revisited – the political dimension of communicative knowledge management

It is hard to believe, but one of the strongest and most passionate controversies and even altercations is again, today, the debate about the right to communicate. Communication is a political and economic topic of power and global dominance. This puts the topic of knowledge management topic in a political perspective.

Is there a human right to communicate? This is not as simple a question as it might look and consequently there is no simple answer to this question.

We do no intend to expand our talk into a general debate on the status of human rights. There is the United Nations Office of the High Commissioner for Human Rights in Geneva which is officially responsible for the interpretation of human rights and which has the mandate to bring to court violations of human rights brought forward by states, organizations or individuals and which has also the mandate to start the complicated process of establishing a new right.

Anyone and everyone can claim a right to whatever. But this, of course, does not have any legal or moral consequences. Human rights with a universal scope of acceptance is the domain of the UN, and the UN system with its High Commissioner has developed a well-established procedure for the proposal and the introduction of new rights.

But the legal status of the/a right to communicate was not the main concern of the debate about the NWICO in the days of the cold war in the 70s and early 80s although people then and people now in the context of WSIS tried and are still trying to stop the debate on

a right to communicate by simply referring to existing globally agreed on declarations where a specific right to communicate does not exist.

For these people, in particular from press/media organizations such as the World Press Freedom Committee, the formulation in article 19 of the Universal Declaration of Human Rights (UDHR) is sufficient as a basis for free communication and need not be altered or replaced by new information and communication rights:

> "Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers."

It is still difficult to decide what the real underlying interests in the old NWICO debate were:

> ➢ The struggle of developing countries in the South to protect their national cultural identity, which is threatened by the predominance of Western cultural, information and media products?
>
> ➢ The protest against the ongoing process of commercialization of knowledge and information, the protest against the exploitation of indigenous knowledge and culture, which is the heritage of their national public sphere (what we today call the public commons)?
>
> ➢ The defence – from the Western perspective - of freedom of expression, a concern that the free press is threatened by governments which use their monopoly status in communication technology as a lever for corruption and patronage? State controlled media in those days (and still in many states today) were often little more than a propaganda arm of the ruling elite in its effort to protect privileges and prevent democratic upsurge.
>
> ➢ Or merely a fight for economic dominance in the global markets for information, communication and the media, which developed in the 70s in the form of online information markets, of globally operating information technology corporations, international telecommunication and commercial media organizations, all of them dominated by the countries of the West and the North, strongly under the leadership of US-based organizations?

The process of growing commercialisation in the media and its increasing control by powerful elites was criticized by the so-called McBride Report, named after the Nobel (and Lenin!) Peace Prize winner, Sean McBride who, in 1980, assembled a group of experts who issued this report. The McBride report made the ambivalence or multivalence of communication very clear:

> "Communication can be an instrument of power, a revolutionary weapon, a commercial product, or a means of education; it can serve the ends of either liberation or of oppression, of either the growth of the individual personality or of drilling human beings into uniformity. Each society must choose the best way to approach the task

facing all of us and to fund the means to overcome the material, social and political constraints that impede progress"[3].

The report insisted that

"communication is a basic individual right, as well as a collective one required by all communities and nations" (ibid. 236) … "Since communication is interwoven with every aspect of life, it is clearly of the utmost importance that the existing "communication gap" be rapidly narrowed and eventually eliminated" (ibid. 237).

There were other formulations in the report which were of grave concern to Western countries with their tradition of freedom of the press:

"preference should be given to non-.commercial forms of mass communication. Promotion of such types of communication should be integrated with the traditions, culture, development objectives and socio-political system of each country" (a.a.O.243). In particular the concept of "freedom and responsibility" was then and is still today highly controversial.

The NWICO debate was actually the first global debate about the management of knowledge and information, the first attempt to establish alternative communication models, as an alternative to the dominance of Western information and media markets. The world in those days failed to find a compromise, a balance between public and private interests when the USA rejected all claims from developing countries, supported by the UNESCO and by the Soviet bloc in its attempt to weaken the American dominance, to establish a right to communicate. The USA interpreted the right to communicate as a hostile attitude on the basic structures and values of open societies, in particular as an attack on free market principles and free media.

It is amazing to see how little progress has been made in the last thirty years with respect to communication rights. Under the main heading "human rights" the formulations of the McBride report could easily be used by some civil society groups at the beginning of this century in the context of WSIS in their attempt to establish a right to communicate as part of a fair, balanced, inclusive and sustainable information society:

"Communication needs in an democratic society should be met by the extension of specific rights such as the right to be informed, the right to inform, the right to privacy, the right to participate in public communication – all elements of a new concept, the right to communicate. In developing what might be called a new era of social rights, we suggest all the implications of the right to communicate be further explored" (ibid. 249).

---

[3] Communication and society. A documentary history of a New World Information and Communication Order seen as an Evolving and Continuous Process 19975-1986. UNESCO, p. 235

Today freedom of the press advocates are again concerned "that [the] governmental world summit [WSIS] could adopt content rules for cyberspace that would restrict Internet news, and possibly set precedents for limiting traditional news media." They criticize the fact that some NGO groups are urging the summit to revisit controversial ideas, such as a "right to communicate" and "the contribution of communication to the democratisation of society," both for media people code-word elements of the (for them) now-discredited "new world information and communication order."

And the same media organization also criticize the UNESCO's last General Conference proposal for a recommendation on universal access to cyberspace, which was originally intended as the main UNESCO submission for WSIS.

This recommendation was deferred but may come up again at the next General Conference

> "It would call on governments to implement measures that encourage...ethical behaviour and respect for community standards and values" in Internet content, presumably including the news. These are - for the media people - code words for controls."[4]

The World Summit for the Information Society has already reopened the debate about a universal right to communicate and the old conflicts are here again. On the part of civil society organizations it is suggested that the concept of communication rights can be used as a generic term and reference point to already existing rights which are enshrined in international declarations and conventions.

Rights do not fall from heaven and cannot be derived from metaphysics, religion or by reference to nature. All of these rights have been developed under specific circumstances and while these circumstances may change, mainly due to technological, media and societal paradigm shifts, they need to be constructively interpreted and enforced, taking into account the potentials and opportunities of contemporary information and communication technologies and services today.

---

[4]	Quotations	from	the	website	of	the	World	Press	Freedom	Committee: http://www.wpfc.org/index.jsp?page=Internet%20Press%20Freedom

The claim for communication rights cannot and will not replace existing rights but will focus public attention on a dramatic change in the way to seek, produce and exchange knowledge – and this is relevant for knowledge management. We mention only two:

> Knowledge production and exchange is no longer primarily an individual process, but is more and more a participative and collaborative process. To be able to take part in these collaborative processes can be considered a right of everyone, regardless whether this is already guaranteed by laws or official government bodies. It is a right that has developed in open communicative networks.

> Knowledge production and exchange is no longer dependent on primarily hierarchically structured and controlled institutions but is open for everyone. Everyone has the opportunity to participative actively and unrestrictedly in processes of producing and exchanging knowledge. What counts in open communicative networks is not status or position in hierarchies but competence and the willingness to share knowledge.

Communication rights do not challenge press freedom but *make possible new platforms for real community-based and people-centered communication devices such as communication forums and other forms of electronic communication.*

> Societies with open communication structures for everyone can challenge media concentration and media monopolies.

> Communication rights can enable access to information by those who often face exclusion from knowledge and information (people in developing countries, disabled people, young people, women)

> Communication rights if guaranteed for everyone can contribute to censorship-free societies and are the best means for building democratic and transparent government structures

> Communication rights and collaborative knowledge production are the basis for scientific development, new ideas and for economic innovation and growth.

So much for the political dimension of knowledge management as a right to communicate. This debate will continue to be at the center of the WSIS process till the end of the year. It is hard to tell which comprise will ultimately be achieved at the end of the year when a final Declaration and a final Plan of Action are agreed upon. The controversy may even continue till the end of the second phase of WSIS, in Tunesia in 2005.

We conclude our talk with some brief remarks about the role of the media, about e-learning, and about publishing in scientific environment taking into account the shift of knowledge management towards the communicative paradigm.

4 Sky-writing, sky-communicating – the role of the media in the communication paradigm

In the media field there is clearly to be seen, as a consequence of the ongoing telemediatization, a shift from the traditional distribution paradigm, first to the interactive paradigm and then to the communication paradigm. In the interactive paradigm people decide themselves which pieces of information they would like to recall and to pay attention to. In the communication paradigm they are the producers of information themselves and exchange their knowledge and their "news" with other people directly without interference or intermediation of professional media people.

This already has and will have increasing effect on the ways how public opinion is built, namely how the process of agenda setting is organized (which topics are subject to political debate and finally to decisions).

We only can pose some question about the role of the media in electronic environment.

> ➢ Is the opinion-building role of the traditional media, one of the major guarantors of democratic societies, still valid in an environment where everyone (at least in principle and so far only in the happy-few countries of the North) has the possibility of sky-writing and sky-communicating?
>
> ➢ Is there still a need for the media in the distribution paradigm when the Internet can be used as a means of making one's own knowledge available to others and of contacting other people to a degree unthinkable in the traditional media communication environment?
>
> ➢ Do we still accept the claim of professional journalists to be the knowledge managers of our daily life when we can manage it by ourselves?

5 Who owns knowledge in science?

The paradigm shift in knowledge management has and will continue to have a strong influence on our understanding of the concept of authorship and, consequently, of ownership of intellectual property; and this paradigm shift towards communication and autonomy in science will have and already has consequences for the way the whole publication chain from authors to readers is organized.

> ➢ is there still a need for a commercially exploitable right to intellectual property considered by many, in particular in the information/publishing industry, as the necessary incentive for the production of knowledge?

> ➢ and do we still need the intermediary role of commercial publishers who, in the currently enforced copyright paradigm are used to being the true and real owners of intellectual property rather than the authors themselves?

The communicative paradigm of knowledge management does not only refer to the production of new knowledge, but also to the publication and distribution of knowledge. Publication and distribution of knowledge in electronic environment can be and should be in the hands of the producers of knowledge or of the institutions in which they work or which represent their professional interests.

Organizational models which underlie initiatives such as the Public Library of Science, Sparc, Open Archive, Copyleft both for software and for texts are based on communicative concepts such as knowledge/file sharing, free and open access, knowledge as a public good, a commons rather than a commodity.

The traditional publication and distribution model – publishing companies collect manuscripts (shorter ones for articles in journals, longer manuscripts for books – both printed on paper) and keep the rights (the copyrights) for the publication of these intellectual products on a contractual basis protected by copyright laws – is based on completely different concepts.

These models consider knowledge a private intellectual good, access needs to restricted, products are proprietary commodities. In general, public knowledge is transferred into privately owned information goods. This is a transfer process which we have taken for a long time as granted. The commodification of knowledge is considered a natural law. In reality this is an artificial transfer process in which commercial companies such as publishers, today content providers, restrict free and open access to the public open sphere of knowledge.

Knowledge, at least in scientific environments is in general publicly financed and the production of new knowledge is considered the duty of those people (the authors) who get their salary from public resources. Knowledge should thus not be a private property of their producers.

The production and publication of knowledge is part of the contract between scientists/researchers and the public. Scientists are of course the authors of their ideas and findings and they must be referenced as authors but their products should not be considered private property. They should therefore not give away (mostly for free,

sometime authors have even to pay to get their work published) their work to other people who transform these intellectual products into commercial goods which can be sold and licensed on information markets.

It is only due to media restrictions that authors or the institutions in which they work are not able to organize the publication of knowledge and the distribution of knowledge products themselves. This will change in the communicative paradigm of knowledge management.

6 The role of libraries in the communication paradigm

Libraries – we refer in the following only to scientific libraries, but the communication paradigm is also valid for other library types, in particular for public libraries – are traditionally part of the infrastructure for knowledge and information, together with computer and multimedia centres.

The process of telemediatization also in universities makes is unavoidable that these three infrastructure units for information, communication and multimedia need to find new forms of cooperation which eventually will lead to a new coordinated knowledge and information infrastructure. We see five main components of such an infrastructure.

- ➢ Knowledge management
- ➢ Management of information and communication technology
- ➢ Multimedia-Management
- ➢ Communication Management
- ➢ Marketing/Rights-Management

Knowledge management has undoubtedly always been in the core of library activities and duties. This is obvious, what else can be the work of librarians if not the management of the knowledge work of others, which is represented in traditional and electronic knowledge containers.

Communication management will be a future task for libraries or of a university infrastructure for information, communication and multimedia, respectively.

---

5   Richard   Stallman: The   Free   Universal   Encyclopedia   and   Learning   Resource [http://www.gnu.org/encyclopedia/free-encyclopedia.html]

Communication management will be one of the new tasks of libraries when it is true – what is evident to us – that the efficiency of communication structures crucially influence the efficiency of knowledge production and usage in general.

Information and communication experts from the new information and communication infrastructure (whether they still call themselves librarians or communicators or knowledge managers)

- ➢ to monitor and coordinate the free flow of information,
- ➢ to be the moderators in communication fora,
- ➢ to provide people in fora with additional information from internal and external information resources,
- ➢ to secure the rights of producers/authors of knowledge piece (this is part of the rights management, mentioned earlier)
- ➢ to bind them together to new knowledge products, classify them and make them available for future knowledge workers, and they
- ➢ to organize local and remote networks of scientific virtual communities.

7 Conclusion

If there is a main message in my talk, then this one: communication, broadly enhanced by modern technology, is the basis for most if not for all processes in modern society. Communication is closely related to knowledge management if one sees the main challenge for knowledge management in the coordination of all processes of collaborative generation, enrichment, dissemination and usage of knowledge and information. Communication in electronic environment needs coordination and management. Communication and knowledge management have many facets and can be seen from many perspectives, we have concentrated essentially on the organizational and political consequences of this paradigm shift.

But it is obvious that the changes in the media, in learning environments, in the way how production and publishing processes in science are organized – to mention only these topics again – will have greatest impact of societies in general. And the communicative paradigm shift will change the profile of librarians. It will longer mainly provide information but rather be a part of communication processes. It is the duty of governments to guarantee the right to communicate to everyone. Information or knowledge societies only

deserve these labels when they are in reality inclusive and sustainable communication societies.