

Information Ecology of a University Department

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Summary

This paper presents a conceptual survey of information ecology. Information ecologies of university departments constitute the ecology of the university, but they cross borders of the university as a whole as well. University departments can thus be considered as peculiar units of a university's information ecology. After pursuing analysis of different concepts of information ecology, conceptualization of information ecology of university departments according to the analyzed concepts is introduced. Finally, appropriateness of the concepts to research of information ecology of a university department is considered.

Keywords

information ecology, information management, knowledge management, implementation of technology, information ecology of a university department

Introduction

Information ecology is an approach that is currently applied in an increasing range of different disciplines. Even though the contexts to which information ecology is applied differ, all of them aim at a description of an effective implementation of information and communication technologies with regard to human development and enhancement of human performance. The International Encyclopedia of Information and Library Science defines information ecology as “the study of the inter-relationships between people, enterprises, technologies and the information environment”.¹ However, contemporary literature con-

1 FEATHER, John – STURGES, Paul (Eds.) *International Encyclopedia of Information and Library Science*. 2nd ed. London : Routledge, 2003. ISBN 0-415-25901-0. P. 255.

tains several attempts to apply the approach of information ecology to the university environment.² The question remains whether it is necessary to create a new, specific concept of information ecology for the university environment, or whether the existing approaches may be applied to this environment. The aim of the present paper is to analyze basic approaches to information ecology, identify their purpose, structure and critically evaluate them. The final part of the paper delivers a description of information ecology of a university and a university field, which implies that information ecology concepts based in information management, knowledge management and the field of implementation of technologies into the working environment provide a suitable framework for the study of information ecology of university fields.

1 Information ecology as a philosophical concept

Delimitation: The notion of information ecology was first used in 1989 by Rafael Capurro in his contribution “Towards an Information Ecology” presented at the NORDINFO International Conference on “Information and Quality” in Copenhagen.³ Capurro understands information ecology as a balance between our thinking and action with regard to the nature of the technologies we use to communicate and disseminate knowledge in the information landscape. Information landscape is designed by Capurro in a three-dimensional perspective: in social dimension information is created and disseminated; historical dimension is linked with inserting information within “the richness of the past and the constraints of the present.” Linguistic dimension comprises theoretical or practical preunderstanding and therefore also a space for criticism, tacit aspects of information and the responsibility of the creator and user for directing and use of the information.⁴

Purpose: The main tasks of information ecology according to Capurro are harmonization of the relationship between humans and technology, preservation and protection of information and reinforcement of its social nature by conceptualization of opportunities, but also of the limits of interaction between different modes of organizing communication. The objective is to find such forms of representation of knowledge and its dissemination that will promote plurality of their use and interpretation, stimulate recycling of knowledge and re-use of free flow of information and contribute to overall optimization of the use of information and knowledge by humans. Capurro’s pragmatic concept of information ecology can be perceived as a kind of information hygiene meant to protect the society against incompatibility of systems and languages, against redundant information, obsolete data and inefficient or unethical use of information and technology.

Structure: Capurro connects information ecology with the notion of information pollution. As a negative side of information balance, Capurro distinguishes three types of information pollution of the environment: power pollution reduces the use-value of

2 PERRAULT, Anne Marie. The School as an Information Ecology: A Framework for Studying Changes in Information Use. In *School Libraries Worldwide*. 2007, Vol. 13, No. 2, p. 49–62. STEINEROVÁ, Jela. Informačná ekológia – využívanie informácií srdcom. In *ITLib. Informačné technológie a knižnice*. 2009, Vol. 13, No. 2, pp. 4–16.

3 CAPURRO, Rafael. Towards an Information Ecology [online]. In WORMELL, I. (ed.). *Information Quality. Definitions and Dimensions*. London : Taylor Graham, 1990. Pp. 122–139. [cit. 2010-08-02]. Available from: <<http://www.capurro.de/nordinf.htm>>.

4 Ref. 3

information for the society to its economic value, message pollution reduces the potential of knowledge technologies by ignoring the context of the origin of the messages; historical pollution is caused by blurring of judgment due to the abundance of futurological and utopian ideas disregarding the risks and opportunities implied by the possibilities of knowledge management design. From the perspective of global information ecology, information pollution concerns the problem of digital division of the world into the information rich and the information poor that Capurro suggests to resolve by creating “forms of generalized social access to electronic information (people’s systems), similar to the creation of public libraries during the last three centuries.”⁵

2 Information ecology as an ethical concept

Delimitation: The concept of infosphere introduced by Luciano Floridi can be viewed, along with Capurro, as a concept of information ecology.⁶ Infosphere is a neologism used by Floridi to refer to the information environment forming “the world of data, information, knowledge and communication.”⁷ Infosphere as such is defined as the “environment constituted by the totality of information entities – including all agents-processes, their proprieties and mutual relations.”⁸

Purpose: An ecological model of the infosphere allows Floridi to develop such universal ethical rules that will address the problems concerning handling, sharing and accessing of information. Adherence to these rules will in Floridi’s opinion lead to an ethical use of ICT and will promote sustainable development and an equitable information society. Thanks to that, infosphere may become a public and safe space open to communication, collaboration and freedom of speech accessible for all without distinction.

Structure: Floridi’s information ecology is not centered around human, but is ontocentric, oriented toward human- as well as object-being. Cyperspace is a subsystem of the infosphere, as well as the spaces where information entities and processes are processed in an analogue way. Broadly-defined infosphere comprises all three basic types of information and the corresponding spheres – physical, biological and social. Infosphere as an “atopic space of mental life”⁹ is an area in which millions of people perform all sorts of activities and face a whole range of dilemmas presenting a challenge for information ethics. These issues include environmental issues (e. g. the issue of energy consumption, electronic waste, etc.), but also the issue of digital divide of the world.

Criticism: Ecological model of the infosphere shares certain characteristics with Capurro’s model. Both emphasize the problems related to the information and the natural environment at the same time. Both authors stress the necessity to deal with the issue of digital divide of the world in a complex manner. Nonetheless, Floridi’s model is in its entire

5 Ref. 3

6 CAPURRO, Rafael. On Floridi’s Metaphysical Foundation of Information Ecology. In *Ethics and Information Technology*. 2008, Vol. 10, No. 2-3, pp. 167–173.

7 FLORIDI, Luciano. Information Ethics: An Environmental Approach to the Digital Divide. In *Philosophy in the Contemporary World*. 2002, Vol. 9, No. 1, p. 39.

8 FLORIDI, Luciano. Information Ethics: On the Philosophical Foundation of Computer Ethics. In *Ethics and Information Technology*. 1999, Vol. 1, No. 1, p. 44.

9 FLORIDI, Luciano. Information Ethics: An Environmental Approach to the Digital Divide. In *Philosophy in the Contemporary World*. 2002, Vol. 9, No. 1, p. 40.

scope philosophically controversial. Capurro objects to his ontological distinguishing between the material and the immaterial components of the world, which is known already from Descartes or Popper, and his disregard for Heidegger's ontological difference. According to Capurro, we should "de-ontologize the infosphere in order to weaken [our] demiurgic ambitions"¹⁰ that construe the infosphere as an autonomous hyperreality (Baudrillard) separated from the natural world instead of its integration within the natural daily routine of human activities and permeation of its influences into the physical component – the natural environment.

3 Information ecology management

Delimitation: Thomas Davenport and Laurence Prusak link the concept of information ecology with information management.¹¹ Information ecology focuses on organizational components of the information environment of a business in a holistic perspective in which the needs of people are in the forefront. According to Davenport and Prusak, information ecology is "the science of understanding and managing whole environments", which include "crisscrossing relations among people, processes, support structures, and the other elements of a company's information environment." The information ecology understood in this way can be designated as "human-centered", "holistic management of information" which "puts humans back at the center of the information world."¹² If technologies resolve as many problems as they themselves create, it is the same case with information. Information is not neutral. Quite within the intention of Capurro, information must be recognized as embedded in a particular context, without which information is merely data, a given without content. However, research into information behavior has revealed the emphasis that people place not only on immediate availability of current information¹³, but also on "rich in contextual cues."¹⁴

Purpose: Information ecology in Davenport and Prusak's concept is meant to help shift managerial practice towards effective use of information and at the same time facilitate the process of implementation of changes in organization of information in a business. Information should fulfill its actual function, that is to inform people and guide them to reach decisions appropriate for the situation or issue at hand and should not serve only as a tool of control and management of the structure of the business. A change in the perspective on information management will according to Davenport and Prusak lead to an effective deployment of an adequate technology and as a result to reduction of unnecessary costs and to support of effective information behavior of managers as well as stakeholders of a business by means of filtering and selection of relevant information. Effective use of in-

10 CAPURRO, Rafael. On Floridi's Metaphysical Foundation of Information Ecology. In *Ethics and Information Technology*. 2008, Vol. 10, No. 2-3, p. 171.

11 DAVENPORT Thomas H. – PRUSAK, Laurence. *Information Ecology: Mastering the Information and Knowledge Environment*. New York : Oxford University Press, 1997. 255 p. ISBN 0-19-511168-0.

12 DAVENPORT Thomas H. – PRUSAK, Laurence. *Information Ecology: Mastering the Information and Knowledge Environment*. New York : Oxford University Press, 1997. ISBN 0-19-511168-0. Pp. 10–11.

13 STEINEROVÁ, Jela. Informačná ekológia – využívanie informácií srdcom. In *ITLib. Informačné technológie a knižnice*. 2009, Vol. 13, No. 2, pp. 4 – 16; JONES, Peter H. Information Practices and Cognitive Artifacts in Scientific Research. In *Cognition Technology and Work*. 2005, Vol. 7, No. 2, pp. 88–100.

14 DAVENPORT Thomas H. – PRUSAK, Laurence. *Information Ecology: Mastering the Information and Knowledge Environment*. New York : Oxford University Press, 1997. ISBN 0-19-511168-0. P. 26.

formation leads to an increase in knowledge assets of the business and to a competitive advantage that will bring success to the business and enable it to remain at the forefront of current development. Holistic planning of the information environment within a business will enable the business to interpret the changes in the business environment correctly and to choose the right strategy to respond to them accordingly.

Structure: The holistic model of information ecology of a business developed by Davenport and Prusak is comprised of three environments arranged as modules – the information, organizational and external environment of the business. The information environment is comprised of “information resources, people and support technologies establishing more or less functional evolving complex.”¹⁵ The information environment of a business consists of six components – information strategy, information policy, information behavior within information culture, information staff, information processes and information architecture. Mutual interaction of these six components constitutes the core of information ecology moving around its central point – human being as a social agent. The information environment of a business is rooted in two broader environments with which it interacts – with the organizational environment consisting of business situation, investment in technologies and physical arrangement of the organization, and the external environment – the external world of an organization an adequate reflection of which enables the business to interact with this environment in such a manner that secures its survival and prosperity. The external environment is the broader ecosystem with which the information ecology of the business is interconnected by a network of information links. The external environment is formed by life niches created by the markets on which the business may realize its potential and develop. Basic characteristics of information ecology identified by Davenport and Prusak¹⁶ are:

- *Diversity* – expresses the diversity of information forms the processing of which manifests itself in information ecology as integration of organizational structures and the processes taking place within them;
- *Evolution* – constant change of arrangement of information needs and ecological relationships in the information environment requiring qualified decision-making and sufficiently flexible structure of the business;
- *Complexity* – information needs of a business dynamically change in interaction with the information environment. Understanding these needs is conditional on long-term processing and description of changes of the entire ecosystem in their full complexity;
- *Utility of the information* – accessibility, use and utilization of information by people; manifests itself in the information behavior of social agents of the ecosystem which subsequently shapes the information culture within a business.

Criticism: In the approach of Davenport and Prusak emphasis is placed on the use of information in organizations and in the business environment. The value of the information is determined by the strategic importance of the information for the organization. It is thus focused on the use of information reduced to its market dimension. Paradoxically, the emphasis on this orientation instead of orientation on social value of information results according to Capurro in imbalance in the information environment and an uneven distribu-

15 STEINEROVÁ, Jela. Informačná ekológia – východiská a princípy. In *Knižničná a informačná veda 22. Library and Information Science 22*. Bratislava: Univerzita Komenského, 2009. ISBN 80-223-1728-4. P. 8.

16 According to DAVENPORT Thomas H. – PRUSAK, Laurence. *Information Ecology: Mastering the Information and Knowledge Environment*. New York : Oxford University Press, 1997. ISBN 0-19-511168-0. Pp. 29–33.

tion of knowledge in society.¹⁷ Davenport and Prusak's approach is based on the assumption that the knowledge about what the correct arrangement of information ecology should look like is possessed by higher management. This approach builds on development of information ecology from the top management level¹⁸ without regard to social needs of ordinary social agents and their specific interaction with the information environment. Thus, what is missing in their holistic approach to information management is both the information whole and the social whole. Despite acknowledgement of dynamic variability of information ecology, Davenport and Prusak's approach focuses on its optimization, which hence brings a certain degree of rigid adherence to well-established techniques instead of adaptation to newly emerging changes by creation of new knowledge and its structural internalization.¹⁹

4 Knowledge ecology management

Delimitation: Pór defines knowledge ecology as an interdisciplinary field that “focuses on discovering better social, organizational, behavioral, and technical conditions for knowledge creation and utilization” based on “the best of current thought and action, including knowledge management; communities of practice; businesses as complex, adaptive systems; organizational learning; and the hypertext organization.”²⁰ In contrast to information ecology, knowledge ecology emphasises the ability of a business to promptly respond to strategic opportunities, enhancement of cognitive skills of social agents and application of working knowledge as a way of boosting competitive advantage.²¹ A different character of dynamic changes in the information environment requires focus on the turbulence of the environment with discontinuous dynamics of changes which replaces orientation on the complexity of the environment.²² Rather than on information, business management is focused on events that are based on reflection of feedback processes and learning performance.

Purpose: The main strategic objective of knowledge ecology is mobilization and development of collective intelligence and organizational wisdom. Partial goals are reduction of time cycles in production and commerce; heightened attention to strategic opportunities and threats; reduction of the cost of coordination of work and business processes by cultivation of the community of practice; building of a virtual community of the business for an intimate contact with customers and a more rapid distribution of innovative methods

17 CAPURRO, Rafael. Towards an Information Ecology [online]. In WORMELL, I. (ed.). *Information Quality. Definitions and Dimensions*. London : Taylor Graham, 1990. Pp. 122–139. [cit. 2010-08-02]. Available from: <<http://www.capurro.de/nordinf.htm>>.

18 According to LETICHE, Hugo – MENS, Lucie van. Dyslogistic Information Ecologies. In *Management Learning*. 2003, Vol 34, No. 3, p. 330.

19 MALHOTRA, Yogesh. Knowledge Management for Organizational White-Waters: An Ecological Framework. In *BRINT* [online]. 1999 [cit. 2010-03-09]. Available from: <<http://www.brint.com/papers/ecology.htm>>.

20 PÓR, George. Nurturing Systemic Wisdom Through Knowledge Ecology. In *The Systems Thinker*. 2000, Vol. 11, No. 8, p. 3.

21 PÓR, George. Nurturing Systemic Wisdom Through Knowledge Ecology. In *The Systems Thinker*. 2000, Vol. 11, No. 8, p. 1.

22 MALHOTRA, Yogesh. Information Ecology and Knowledge Management: Toward Knowledge Ecology for Hyperturbulent Organizational Environments. In KIEL, Douglas L. (Ed.). *Encyclopedia of Life Support Systems (EOLSS): Knowledge management, Organizational Intelligence and Learning, and Complexity*. Oxford : Eolss Publishers, 2002. ISBN: 978-1-84826-913-2.

within the business.²³ Knowledge ecology builds and develops self-organizing knowledge ecosystems in which new information, inspiration and ideas without temporal or geographical limits emerge. It strives to connect static repositories of knowledge with the natural system of people and their activities and therefore it draws attention to social networks supporting communication and knowledge sharing as a topic.

Structure: The elements of knowledge ecology are people, technologies and knowledge that are assigned a particular meaning and an appropriate interpretation in the activities. Knowledge ecology is comprised of a triple, intertwined network consisting of a network of the organization's stakeholders, their conversations, contacts, communities of practice and manners of organization of their cooperation, technological networks including telecommunications network and computer networks containing knowledge repositories and networks comprised of useful ideas produced by people in the course of their daily activities. People represent knowledge nodes connecting individual networks and using their infrastructure to establish a network of knowledge and for participation in the work and learning community. A community is a prerequisite of self-organization, enhancement of collective intelligence²⁴ and "cultivate relationships, tools, and practices for creating, integrating, sharing, and using knowledge."²⁵ Basic characteristics of knowledge ecology identified by Malhotra²⁶ are:

- *Social networking* – the chief role in creation of knowledge ecology is primarily played by social networks among people, instead of technological or information networks;
- *Adaptation* – the survival of a business is based on anticipation of changes and unexpected events;
- *Cooperative competition* – the dynamic evolutionary process of knowledge creation takes place in diverse contexts, which leads to creation of diversified forms of knowledge. Knowledge nodes (people but also business units) constantly compete to achieve a more effective use of the knowledge, while at the same time they also share it in order to complement their missing different characteristics through this cooperation.
- *Differentiation* – exchange of knowledge and the direction of knowledge flows in a business should take place between related but differentiated knowledge nodes.

Criticism: Strategic orientation of businesses on future which is based on an immediate "consumption" of knowledge and discontinuous change affects the entire structure of a business and hinders fulfilment of one of the main strategic goals of a business – mobilization of wisdom. The assumption of discontinuous change of the information environment does not take heed of the historical dimension of the information phenomena occurring in the information environment that can be according to Capurro characterised exactly by the fact that they are not discontinuous, but always placed in between the past and the present (see chapter 1.1.1). Wisdom emerges from systematic and long-term processing of knowledge with regard to its wider implications from which substantial principles as to how to

23 PÓR, George. Nurturing Systemic Wisdom Through Knowledge Ecology. In *The Systems Thinker*. 2000, Vol. 11, No. 8, pp. 1–5.

24 According to PÓR, George. Nurturing Systemic Wisdom Through Knowledge Ecology. In *The Systems Thinker*. 2000, Vol. 11, No. 8, pp. 1–4.

25 LI, Junjun – SUN, Jianjun – CHEN, Haimin. Organizational Knowledge Architecture: in the Perspective of Knowledge Ecology. In *International Conference on Wireless Communications, Networking and Mobile Computing (WiCom)*. Shanghai : IEEE, 2007. ISBN 978-1-4244-1311-9. P. 5420.

26 According to MALHOTRA, Yogesh. Information Ecology and Knowledge Management: Toward Knowledge Ecology for Hyperturbulent Organizational Environments. In KIEL, Douglas L. (Ed). *Encyclopedia of Life Support Systems (EOLSS): Knowledge management, Organizational Intelligence and Learning, and Complexity*. Oxford : Eolss Publishers, 2002. ISBN: 978-1-84826-913-2.

act for the benefit of everybody and hidden models revealing the real values can be extracted. Wisdom draws on experience and its nature is incremental.

5 Information ecology of the working environment

Delimitation: Bonnie Nardi and Vicki O'Day focused on social aspects of implementation and functioning of technologies at workplaces. For this purpose, they define information ecology as a "system of people, practices, values and technologies in a particular local environment."²⁷ A smooth implementation of innovations into the work process and an efficient use of technologies require that their users are provided with a space for expressing their own values, attitudes and preferences, a space of operation where these people are able to influence the design of technologies and technological systems. Information technologies in Nardi and O'Day's concept represent a map of this space, a map showing the places where an individual can influence the entire intricately interconnected system. Such approach to information ecology is aimed at opening up the space for the person using the technology in his/her decision-making and resolving his/her common and work issues.

Purpose: The aim of information ecology as understood by Nardi and O'Day is to present practical impulses and appropriate strategic questions leading to motivation to improve the given information ecology, to responsibility for the use of technology, to promotion and appreciation of social activities such as sharing and learning. The result of such support of participation of technology users in the construction of functional information ecology is reduced levels of confusion and frustration of people exposed to the effects of new technologies, as well as reduction of their fear and dissatisfaction. The final effect of partial goals is an effective implementation and subsequent use of technologies in line with ethics and stability of the particular workplace despite ongoing technological changes.

Structure: Information ecology according to Nardi and O'Day is comprised of four basic elements: people, practices, values, and technologies. People constitute, as in other information ecology concepts, the most important element. In order to understand their role in the particular information ecology, it is necessary to find out what attitudes towards technologies the people hold and what and how they routinely do. A successful implementation of new technologies into information ecology to a large extent depends on qualified people – the so-called keystone species that can quickly discover the potential of new tools, the method of their effective implementation into working activities and are able to provide support and assistance to other users of new technologies. The role of a librarian is mentioned by the authors as an illustration: most of their work is invisible for the user of library services, despite the fact that it is absolutely essential for its functioning.²⁸ A particular information ecology is characterized by specific practices used by people when dealing with the technologies and by the social patterns and conventions connected with them. Such practices include all working procedures, methods, the services provided, but also the tactics reflecting the values on which they are based, but also e. g. transfers between different places, going for lunch together, answering phone calls and writing emails, regular unofficial

27 NARDI, Bonnie A. – O'DAY, Vicki L. *Information Ecologies: Using Technology with Heart*. Cambridge : MIT Press, 1999. ISBN 0-262-14066-7. P. 49.

28 See NARDI, Bonnie A. – O'DAY, Vicki L. An Ecological Perspective on Digital Libraries. In BISHOP, Ann Peterson – HOUSE Nancy A. Van – BUTTENFIELD, Barbara P. (Eds.). *Digital Library Use: Social Practice in Design and Evaluation*. Cambridge : MIT Press, 2003. Pp. 65–82.

meetings, etc. During these activities, crucial and yet almost invisible events can often take place. The designer may ensure respecting these patterns by application of the methods of participative design. The third component of information ecology is represented by ethical values and related norms. Values form the ethical dimension of technologies affecting everything from social implications of technologies to the very identity of a person as a human being. Implementation of technologies opens up for instance the following questions: Whom will these technologies serve? Who will benefit from them? Who will control them? To what extent will they reflect the values of the group? What values will they assert? The last component of information ecology is formed by technologies as such. Our thinking is not only shaped by technologies, but it is directed and limited already by the way we speak about technologies, what metaphors we use to capture our technological concepts. Metaphors can bias our thinking, our approach to and our subsequent handling of them in an optimistic or pessimistic way. The metaphor of technology as ecology presupposes a creative role of the person in using it, the impact of local practices and procedures, as well as of his/her scale of values.²⁹ Basic characteristics of knowledge ecology according to Nardi and O'Day³⁰ are:

- *Diversity* – expresses the diversity of people, the diversity of their activities, professions and positions and also the diversity of tools and technologies taking part in the interaction in information ecology. The richness of forms is important for survival of continuous as well as of discontinuous changes. In a healthy information ecology these varied forms participate in a complementary manner;
- *Coevolution* – mutual influence of social and technical development in which the activities of people and the tools they use in them constantly adjust to one another. As the process of development of information ecology never ceases, mutual adjustment of social and technical aspects is never perfect and always requires new attempts at improvement;
- *Systemic nature* – internal interconnections of individual parts of the system and their mutual dependency cause changes of one part of the system affect continuously also all its other parts. Changes that are incompatible with certain parts of the system do not take roots in the system and disappear without a trace;
- *Locality* – interconnectedness of a technology and a particular place where it is used. In every particular environment the use of a technology differs depending on local practice and local arrangement of relationships. The inhabitants of different ecologies understand the role of technologies in their activities differently, depending on how the technology is accessible to them, how useful it is for them, what the rhythm of work and the patterns for its use are. Socially constructed identity of a technology differs in individual ecologies;
- *Keystone species* – the indispensable role of a particular profession or type of people bringing together other people, technologies and practices in a dynamic system. The keystone species fills and bridges over the cracks in information ecology whereby it prevents disintegration of the system.

Criticism: Nardi and O'Day's information ecology is, when the correct approach is applied, always aimed at convergence of technologies and harmonization of internal relationships. Information ecology in this conception gives the impression of being a trouble-free space in which all its inhabitants concordantly learn to cooperate with each other and build the system to general satisfaction of everyone. However, the metaphor of ecology is applied

²⁹ Ibid, pp. 65–70.

³⁰ According to NARDI, Bonnie A. – O'DAY, Vicki L. *Information Ecologies: Using Technology with Heart*. Cambridge : MIT Press, 1999. ISBN 0-262-14066-7. Pp. 51–56.

half-heartedly and in an idealized way. Bowker points out that nature is red in tooth and claw (quoting Darwin) and that parasites and viruses are part of ecosystems. And the inhabitants of an information ecology also often have to struggle for their survival and their own interests then prevail over the interests of the organization. Information ecology is plagued by various species that do not contribute to its flourishing, but these are ignored in Nardi and O'Day's concept. Little attention is also paid to the dynamics of power in an organization.³¹ The objections raised by Bowker have been also confirmed by the research undertaken by Hugo Letiche and Lucie van Mens. In their analysis of information ecologies, they identified such types of people whose aim is to gain individual advantages for themselves, to survive within the business at the expense of other people, and whose conduct is driven by self-satisfaction, egoism and the effort to exploit weaker individuals. These persons are an example of the fact that the system need not in each case work towards its own benefit, but that the desired coherence may be intentionally violated. Information ecologies are rather than "predictable rational structures, which the direct participants know and (in principle) control" structures emergent [...], unconsciously internalized [...], erratic and volatile."³² Harmonization of the process of implementation of technologies into the working environment presupposes that it is necessary to come to terms with the issue of optimal support of learning. However, not every inhabitant of an information ecology wishes to gain knowledge, to learn. Strategic action of certain inhabitants forms dyslogistic information ecology that can lead to a failure of the entire system.³³

6 University as an information ecology

The university can be seen as a classic example of information ecology. There is a wide spectrum of differently oriented or specialized persons who use in their work a broad range of scientific methods and procedures, modern technologies and information sources (text-books, journals, curricula, student lists etc.) involved in a university environment.³⁴ Activities at the university take place in an atmosphere of mutually shared values, dominated by the value of scientific truth and the value associated with the ethics of scientific work and the educational process. The keystone species is represented by teachers who, together with students, researchers and administrative staff, form the majority of inhabitants of the information ecology of a university. These properties correspond to the concept of information ecology of the working environment in which the university is explicitly included as an information environment. In their activities, people at universities use various information sources that they obtain through information processes of different degrees of difficulty and they produce new knowledge themselves in the form of information products and cognitive artefacts. Various information activities and values constitute information culture of a university. Information ecology of a university is subdivided into individual faculties enjoy-

31 BOWKER, Geoffrey C. Bonnie Nardi and Vicki O'Day, Information Ecologies: Using Technology with Heart – Book Review. In *Computer Supported Cooperative Work*. 2001, Vol. 10, No. 1, pp. 143–145.

32 LETICHE, Hugo – MENS, Lucie van. Dyslogistic Information Ecologies. In *Management Learning*. 2003, Vol. 34, No. 3, p. 339.

33 LETICHE, Hugo – MENS, Lucie van. Dyslogistic Information Ecologies. In *Management Learning*. 2003, Vol. 34, No. 3, pp. 329–347.

34 PERRAULT, Anne Marie. The School as an Information Ecology: A Framework for Studying Changes in Information Use. In *School Libraries Worldwide*. 2007, Vol. 13, No. 2, pp. 49–62.

ing a specific degree of autonomy. The fields taught at these faculties must adapt to the dynamics of the external environment that is specific for each field. A different configuration of information relationships may be identified for each field, which allows us to speak about sui generis information ecology. It is, however, necessary to distinguish between what is part of the information ecology of the field and what transcends it. Research and development of application solutions within a field take place simultaneously in two worlds: in the local environment of the faculty or university campus and within the network of unofficial relationships of the research community of the field which transcends the boundaries of the university.³⁵ The context of research practices moreover does not follow from information ecology, but is mediated by it. Research activities are directed and limited by external grants and research projects of the university itself; information services and sources are institutional services and sources³⁶ (e. g. a library does not belong to the information ecology of the field but to the information ecology of the institution as a whole). A field as an information ecology is firmly embedded within the system of the faculty and the whole university which form its organizational environment. Information culture of a field, despite being different from the culture of the institution, should not, however, conflict with it. The unique nature of an information culture of a field follows from the specifics of information behavior typical for individual fields, as well as from the emphases of information strategy. A field develops as a network of people engaged in learning communities and communities of practice, i. e. two worlds from which a great deal of new impulses and pieces of knowledge flows into the information environment of the field through conversations and records of discourses via social and technological networks, shaping its knowledge network. Even in case of the concept of information ecology within information management the concept described may be applied, however, with certain difficulties as we need to proceed with greater caution when classifying the components of information ecology into the information, organizational and external environment. The concept of information ecology within knowledge management appears to be more fitting as it is easier to analyze extensive communication networks of cooperating specialists and learning communities, i. e. by application of the methods of social network analysis, within this framework. Floridi's concept of infosphere and the philosophical concept developed by Capurro have a somewhat lesser application. The latter may be, however, employed in resolving the pressing issue of information overloading of pedagogical staff as a problem of information pollution of the university environment.

Conclusion

Application of the approach of information ecology to a selected study field can make the configuration of its internal structure in a holistic context more visible. As far as information and library science is concerned, this is a particularly convenient approach, since it allows for combination of its social-humanistic orientation with new technologies entering its practice and enables us to monitor the impact of their configuration on formation of an in-

35 According to JONES, Peter H. Information Practices and Cognitive Artifacts in Scientific Research. In *Cognition Technology and Work*. 2005, Vol. 7, No. 2, p. 89.

36 JONES, Peter H. Information Practices and Cognitive Artifacts in Scientific Research. In *Cognition Technology and Work*. 2005, Vol. 7, No. 2, pp. 92–93.

formation culture encouraging learning and adoption of appropriate work habits when handling information and knowledge technologies. Application of quantitative and qualitative methods enables us to describe both the structure and the orientation of the fields realizing the study program of information and library studies. On the basis of the analysis presented in this paper, the use of the concept of information ecology of the working environment in combination with the concept based in knowledge management, or information management, can be recommended as an optimal tool.

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