Information Ethics in the Context of Information Ecology of Environment

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Summary:

The article explains the basic principles of information ethics in information science. Information ethics is defined from the point of information behavior and information ecology. The author further analyzes the social, philosophical, and system- and technology- based approaches to information ethics. The article also presents the taxonomy of aspects of information ethics involved in the information process, and examples from the author´s studies on information ecology. The factors and value principles of information ethics in information practice are described and examples of ethical dilemmas in information activities are explained. The author emphasizes the importance of theoretical research, education and new models of information ethics.

Keywords: information ethics, information science, information ecology, information behavior

Introduction

Information ethics has been intensely examined in information science for over twenty years. Some of the first, more recent definitions were produced in the nineteen eighties. One of the first experts to use the term was director of International Center for Information Ethics (ICIE), Rafael Capuro, in 1987. In 1989, a conference sponsored by The Graduate School of Library and Information Science took place at the University of Illinois. Since the nineteen eighties, many new schools, magazines and conferences have institutionalized information ethics studies. For example, departments of library studies of the University of Pittsburgh and Kent State University were the first university programs to offer courses in information ethics. Generally speaking, information ethics is based on the ethical aspects of the information process in society, and on information behavior of individuals, groups and organizations. IN practice, information ethics is represented by a system of moral values and behavior rules in the context of various related factors of the information environment. Along with other experts (Capurro 2000, Carbo 2008, Fallis 2010, Floridi 2010, Froelich 2004, Rubin, Froelich 2010, Sturges 2009), we perceive information ethics both as art and science that facilitates sensibility and methods to detect moral values that apply when obtaining, processing and using information, and for information behavior.

Information ethics is a broad topic that not only surfaces from the basic principles of ethics and philosophy, that is disciplines examining human behavior values and choice-making, but has to do with other related areas of application, such as ethics of information systems, internet, business, medicine, biology (bioinformation ethics), media and politics. Different areas of ethics studies engage in different types of ethics, such as descriptive, normative, applied, general, special and analytical. Moral responsibility of many professionals (scientists in particular) for their work is regulated by various professional codes. Information ethics of makers, information ethics of agents, and information ethics of users are the basic divisions of information ethics. Of the many professional codes, the following are particularly worth mentioning: codes of ethics of IFLA,

ALA, ACM; regulations of ASIST and ALISE, and those of UNESCO. Many conferences on information ethics have taken place in the last ten years; sponsored by UNESCO, World Summits on the Information Society equally engage in information ethics issues. Moral responsibility of makers and users of information and of information professionals has once again become a current issue of information ethics, particularly since these two roles are rapidly interchangeable in the electronic environment. New knowledge concerning human information behavior makes it equally important now to build up a theoretical frame of information ethics.

Other perspectives on information ethics comprise ethics of information use, ethics of information systems and technologies, and ethics of information society and information strategies (Froelich 2004). In this broad sense, some experts view information ethics as a metadiscipline that generates a framework for the interconnectedness of different value aspects of work with information. It is the task of information ethics to explain the fundamentals of and to critically reflect on the moral values of information use as well as critically interpret and empirically examine ethical issues related to information.

This article presents a survey of approaches to theories and practical uses of information ethics in information science, with a particular view of the contexts of human information behavior and information ecology. Socio-philosophical approaches and approaches regarding systems and technology are also analyzed here. However, because of the length limitations of this article, we will not overview any general issues concerning philosophical ethics and historical development of ethics. New taxonomy of information ethics will be presented here, based on factors and value analyses of information ethics and on select examples from our studies. We stress the importance of further theoretical and empirical research, and of new models to support cultivation of ethics in information environment.

1 Defining the Framework of Information Ethics

Robert Hauptmann (editor of Journal of Information Ethics magazine published since 1992) defines information ethics as the ethics of all areas of information and production of knowledge and its dissemination, including library and information science, education, technologies, censorship, privacy, research reviewing, etc. (Froelich 2004). Two major aspects may be considered when defining the framework of information ethics: information (information behavior, information system, information in different contexts), and ethics. However, we need the particulars of the context of both of these general concepts in order to determine more precisely their content and concretization on real-life examples. The search for a universal approach is therefore closely linked to theories of information science and the way in which information is defined. One way to tackle this is by identifying the different levels of interaction between ethics and information (individual, group, organizational, societal). For the purposes of this paper, we define information as a structure that integrates cognitive, biological, social, physical and technological components of information environment when generating meaning. Information is constructed socially in concrete, real-life instances of information behavior. Context may be defined as environment and circumstances that ensue from and grant meaning to a given situation, event and entity. Since context is dynamic, it is contingent on personal characteristics, social circumstances and information space (Steinerová et al. 2010b).

Approaches to delineating the framework for information ethics are either microethical or macroetical. The macroethical approach concerns application of norms of ethical nature to work with information on societal and global levels. Some experts also distinguish between morals as ethics applied in praxis, and morals as a moral practice. In the Czech Republic, it is Karel Janoš

(Janoš 2002) and Jan Činčera (2002) who focus the most on information ethics. Similarly, there is a distinction between theoretical reflection on the one hand, and concrete information behavior and information systems on the other. However, the complexity of the issue ultimately necessitates an interdisciplinary approach (combining information science, philosophy, mew media studies, informatics, etc.).

Microethics defines information ethics as part of human information behavior. Information behavior presents important factors and contexts for information ethics. It is defined as a multileveled human activity of information-using, characterized by human adaptation to information environment, the determining factors being man, information sources, and information products in the contexts of information use and information generation. The contexts encapsulate ownership of information, authorized use of information, and information activities within the information environment.

On a global level, information ethics forms a part of information ecology. The macroethical framework expounds ethical dilemmas of the information society, particularly its digital divide, environmental ethics (man as part of information environment), and the ecological approach to the life cycle of information. It is a social framework for the moral values of information use and the interconnectedness of the social with the technological. Common discourse that probes information existence is formulated here, and issues of coexistence of information objects and man in the information environment are examined. Information ecology is defined as a set of relationships between people and the information environment mediated by information technologies on the one hand, and control of meaningful information interactions on the other (Steinerová et al. 2010b). Detailed analysis of information ecology is given elsewhere (Steinerová 2009).

Based on the above-approaches, we define information ethics from the point of information behavior as a type of information behavior of makers, users and information professionals based on the value system of choice-making and problem-solving in the area of information use. Information ethics is examined both at the level of theory and at the level of applied information ethics. In approaches to information science of the last twenty years, information science is dominated by the concepts of intellectual freedom, freedom of speech and press, and free access to information (particularly in electronic environment). As for a theory along the lines of traditional information science, we may distinguish between socio-philosophical and system-based perspectives on information ethics.

2 Socio-Philosophical Perspective on Information Ethics

This approach refers to the tradition of general studies of ethics; epistemology, ontology, and ethics rank among the most used philosophical categories in information science.[1] In Ancient Greek tragedy, “parrhesia”means freedom of speech and personal devotion to truth. This concept has recently been incorporated into research concerning information ethics and the ethical use of information. Capurr (2005) argues that new interpretations have surfaced in network-based electronic environments, while novel forms of information behavior during information use are being formed when new media are used.

In view of the history of ethics as a philosophical discipline, we may determine several theoretical perspectives. Teleological perspective links ethics with that which is useful, makes

[1] We cannot engage here in in-depth philosophical explanation of the fundamentals of information science. In short, we understand ontology and metaphysics as philosophical perspectives on being and objects of being, epistemology as philosophy of knowledge, and ethics as philosophy of values and correct behavior.

sense, serves order, and has a goal. Theological perspective represents normative ethics, deontological perspective emphasizes a basic moral imperative (ensuing from reason— Kant's categorical imperative), axiological perspective is based on value preference (N. Hartman), rationalistic perspective refers to societal consensus for the solution of practical conflicts, while utilitarian perspective, represented by the philosophy of J. Mill, emphasizes ethical values related to achieving happiness and pragmatism (Janoš 2002).

Interpretation of information ethics also depends on intercultural differences within the construction of the information society where distinction is made between the western tradition (of Christian philosophy) and traditions of eastern cultures. R. Capurro (2005) stresses the importance of information ethics in western tradition as regards structures of power and principles of accessibility, reliability of information, and completeness of information. The key is the use of information as part of intellectual freedom and truth-seeking. This has to do with norms of information behavior when information and information technologies are used to communicate information.[2] Western approach in theory refers to universal rationalistic (often Christian) values that apply to information use. Eastern (philosophical) approaches remove a universal representation of values, referring instead to moral values that reflect man as a part of his environment. In this respect, some authors speak of "moral horizons" of the information society determined by religion, traditions and cultures (Cornelius 2007). What matters is that value system works as the controlling ecological principle in social contexts of information use.

By looking at how approach and tradition affect moral behavior in individual cultures, Rafael Capurro formulated both the critical ontological principles of information ethics at work when social structures of power are examined, and the intercultural bases of information ethics.

Luciano Floridi (Floridi 2010) introduces a conception of information ethics related to his philosophy of information. He argues that information ethics is a part of environmental ethics. Information technologies and information systems are also incorporated into the environment via value systems. Floridi details the following three components of information ethics: information ethics when information is used (information as resource), information ethics when information is produced (information as product) and information ethics when the information environment is being affected (information as target). (RPT model —resource, target, product). Social agents set these relationships into motion in information environment. The ontological conception of L. Floridi ascribes information value to each object in the information environment. It is the objective of ecological control of the information environment to cultivate information objects and make them prosper with information science tools (systems, products, services, organization of information) in the information environment. L. Floridi's new environmental ethics also points out the way technologies affect people's moral and social lives. Onthocentric ethics is based on internal values that form different levels of moral respect not least when information is processed and used by subjects who take on different roles.

At the same time, information ecology represents attempts to orchestrate harmony among individual components of the information environment, that is information sources, people, products and systems. Use of information via information technologies is then the fundamental activity of information ecology in different contexts (e.g.; Nardi, O'Day 1999, Steinerová et al. 2012). An important role here is played by values that we have empirically detected in our research of academic information environment, and modeled in a pyramid diagram — from

[2] Capurro originally presented information ethics as part of communication ethics.

technologies, resources, community, and communication to effective support of people's creativity. We have defined information ethics as being part of information ecology, such as principles, values, and rules of use of information products of individual agents in the information environment. Analyses of interviews with information managers also showed that as regards regulation of intellectual ownership of the university and the creators and innovators in the academic environment, information ethics is one of the important prerequisites when fashioning new community models of work with information in an electronic environment (Steinerová et al. 2012). Our analysis of relevance has evidenced predominance of value of trust of experts (cognitive authority) as the basis for further models of relevance in an electronic environment (Steinerová 2008).

Ethics of information as a resource refers to moral values when presence or absence of information resources is being secured. Moral values concern accessibility, safety, reliability and exactness of information resources. What matters is protection of anonymity, support of fair treatment and disinterested evaluation.

With regards to ethics of information as a product, social agent is the producer of information within the restrictions and possibilities of the information environment. Responsibility concerning creation is the most important value, as is compliance with rules (legislative), or, as the case may be, issues such as plagiarism, propaganda, advertisement and misinformation.

Ethics of information as target negotiates the effects of moral judgment on the information environment; for example, intentional disturbance of the information environment, including negative activities such as "hacking" (unauthorized access to information systems), infringement of privacy, and piracy on the one hand, and securing of private ownership freedom of speech, censorship, filtering and content control on the other.

Within the conception of information philosophy, many ethical dilemmas ensue from the interaction between microethical and macroethical environments, such as monitoring and control of the environment, ownership and copyright ownership, filtering of information, and censorship. The ecological approach to information ethics perceives information both as a formula and an entity of environment and the world (Floridi 2010). If any object of the information environment may be considered an information object, then we may also take into consideration a global view of the entire life cycle of information belonging to ecological information ethics.

While both Capurro and Floridi formulate an ontological approach to information ethics, they differ in the ways they view the origins of value systems for information use. Floridi proposes an environmental approach, linking the value of an information object to its existence. Information entities ought to flourish; hence, prevention of pollution of the infosphere is the task of information ethics. Some authors criticize Floridi for neglecting the social aspects of information ethics. Capurro, on the other hand, identifies information ethics pursuant to the values of existence of digital objects, while digital existence in itself (digital ontology) and the very information environment also have ethical value in a social and intercultural context. Information ethics is also linked to ecological, political, economic and cultural domains (Capurro 2005). Therefore, information ethics ought to be applied to the intercultural issues of digital divide or when changes of behavior and moral values of life become affected by developmental changes of the infosphere and internet.

3 Information Ethics from the Point of View of Systems and Technology

Many recent issues concerning information ethics of information society have emerged from the related areas of digital and computer ethics. Broad availability of information in digital forms has generated many concrete issues concerning ownership of digital records and digital

information. Ethical issues in the area of information ethics are often grouped in the following categories: **P (privacy)**, **A (accuracy)**, **P (property)**, **A (access)** (Zwass 2010). These principles also relate to development and use of information systems.

Computer ethics examines values concerning the use of information technologies for social communication processes. It is electronic communication in the forms of scientific research communication and daily praxis that generates issues concerning privacy, trust, power, plagiarism and copyright (intellectual ownership).[3]

Privacy is the right of individuals to maintain any kind of information about themselves private, and protect it from unauthorized access. Privacy is also examined by information scientists when interpreting information science as a fundamentally social science (Cibangu 2012). The greatest concerns surface during manipulation of digital records in different databases for which both ethical and legal measures have to be applied. Some of the basic principles are formulated as, for example, principles of authorized information use (OECD) — individuals ought to be informed about the information gathering practices of any agency that collects information. However, this is where many ethical dilemmas occur in relation to personalization of products, online profiles, and integration of personal data scattered in different databases where the data may be integrated in unsuitable contexts, or, as the case may be, when large-size files of social statistical data (e.g.; population census data, etc.) are manipulated. Problems with click monitoring are often related to abuse of data for marketing purposes. The ACM ethical code, for example, binds professionals to respect privacy in a relatively general sense, and so many companies consider these issues a matter of self-regulation.

Exactness of information relates to securing high quality and security of information systems. Exact information must be complete, error-free, and relevant. Examples of problematic instances might range from incorrect medical records to weather information. Ethical aspects of exactness of information concern the fact that exactness of information is a fundamental expression of professional integrity of information systems. The principle of “do no harm” and prevention of abuse of one’s expertise at maintenance of information systems also concerns checking and audits to verify information exactness.

Ownership rights are to a large degree secured legally. However, intellectual property is a matter of ethics precisely because we talk about immaterial ownership as the result of creative activity of an individual or a group. The expansion of internet services, however, has forged an inviting environment for infringement of this right. Despite legal mechanisms such as copyright, patent and trade secret, and technological services such as digital rights management (DRM), many ethical conflicts concerning the principle of “recognition (reward) of intellectual property” occur in the area of intellectual property.The question is to what extent are digital products, for example, individual property. Both the legislation and the ethical rules for decision-making on author rights infringement therefore need to be current.

In terms of access to information mediated via information systems, differences remain on global, national and individual levels. These inequalities are related to access to technology, intellectual know-how, and access to digital media. In the majority of cases, technology plays a supportive role when securing access (e.g.; they make access to information easier for the disabled). Inequalities of access, however, remain in spite of measures and movements, such as

[3] Even though many relevant terms are used, such as network ethics, digital ethics or internet ethics and netiquette, we shall use the term computer ethics as the basic term for the sake of simplification.

"open access, " prompting an ethical approach when building trustworthy virtual communities and when accessing governmental electronic services and systems. Examples of these instances may be observable in transaction communication systems (e.g.; banks), employer email communication monitoring, (it is recommended to monitor effectiveness rather than personal behavior and characteristics), and in cases of introduction of malfunctioning and unfinished systems into daily use. (Zwass 2010).

Computer ethics overlaps with information ethics, the difference being the focus of computer ethics on standards of information in system designing, management of system security, integrity and exactness of data and protection of privacy, or, as the case may be, competition ethics (Froelich 2004). Some ethical dilemmas are embedded in issues regarding *who the owner of the data is, how their use can be regulated, and how to build trust in digital services*.

Paradoxically, ecological characteristics of digital libraries (Steinerová et al. 2010a), namely repeated use of information in new contexts and products, may generate ethical issues when services and systems are used, such as conflict of interest as regards intellectual ownership, misuse of information, and plagiarism on the one hand, and information overload and cybernetic criminality on the other. Summaries of codes of conducts called netiquette have spread throughout the internet, ranging from rules of respect, privacy, and authorship rights to non-abuse of power, non-circulation of incorrect information, and publishing of no other than one's own work.

4 Taxonomy of Information Ethics Concepts

Regarding theory, Don Fallis (2007) identified four basic groups of information ethics theories as follows: theories based on consequence where the best result is considered ethical as defined in the utilitarian theory of ethics (J. S. Mill), theories based on duty (referring to Kant's categorical imperative, it is necessary to fulfill ethical duties), theories based on law (referring to human rights, ethics based on codes), and theory based on virtue (principle of a virtuous man that include courage, peace, and friendship as a metaphor for information services).

Some conceptual issues of information ethics relate to the problematic definition of information and contexts. Information ethics may be determined on methodology levels of cognitivism, within which information ethics forms a part of cognitive and constructive development of the mind, and of socio-cognitive approach dominated by ethical building of concepts in shared information spaces, such as concepts from science disciplines. On a practical level, we speak mostly of legal and security conditions of authorized use of information resources and information services. The fast-evolving electronic information environments present new challenges for information ethics modeling and conceptualizing. Floridi's and Capurro's models and approaches seem to suggest that search for better models and interconnectedness of philosophical, social and system- and technology- based approaches might prove useful also for the further development of information science and interdisciplinary collaboration.

Pursuant to these analyses, stratified concepts of information ethics are presented in Table 1. Facets of information process are conceptualized on the left while concrete principles of information ethics are presented on the right-hand side. Individual facets on the left have been inferred from analyses of ecological information process — from information obtaining, use, organization of knowledge, social networking and education to creation and online interaction. The broad nature of the theme suggests overlapping of theory, information interaction, information behavior and praxis of information institutions and professionals.

Obtaining information	access to information, selection, codes, verification of correctness of information, prediction of consequences, information needs— contexts: task, issue, digital divide, information scarcity
Use of information	accessibility, free access to information, intellectual freedom, censorship, copyright, legal use, commercial use
Organization of nowledge	exactness of information, structures of knowledge, reliability, quality of information, filtering
Social networks	community, protection, power structures, power, responsibility, manipulation, communication
Information sharing	privacy, collective wisdom, management of knowledge, freedom of speech, confidentiality, data protection
Generation of information	ownership, responsibility, rules, intellectual freedom, plagiarism, copyright, principle of least effort, morality
Online interaction	security, protection, authenticity verification, antisocial behavior: piracy, cyber crime: flaming, trolling, spamming

Tab. 1 Taxonomy of concepts of information ethics in information process

All facets in the left part of the table may be interpreted on different levels of information definition (individual, organization, society). In addition, social agent may be realized in the roles of creator, mediator and user of information, member of community and agent in varying, dynamically changing information interactions. On the level of information environment, the following play an important role: rules and regulations and safety of conditions of information process, information society and information services (monitoring, censorship, information policy). On the level of information behavior of man, there is information overload, information anxiety, and even information evasion. Ethical problems surface with information rights (intellectual freedom, information literacy), duties and restrictions on creativity and use of information (responsibility, citation ethics, availability, reliability, exactness of information privacy, security).

5 Factors and Value Principles of Information Ethics

Ethical tension often occurs when professionals and information institutions are at work due to the large volume of written and unwritten rules and institutionalized and individual professional principles. There are, for example, the effects of an employer's ethical code, ethical codes of professional companies, customer pressure regarding provision of services, personal ethical convictions, and ethical societal norms (Rubin, Froelich 2010). Among ethical factors affecting library and information studies, there are the factors of social usefulness, survival, social responsibility, and respect of man's personality. Even though the primary values of information institutions usually side with services supporting knowledge and societal advancement, there often occur ethical dilemmas of economic survival of the institution on the one hand, and

provision of services useful to society. Other dilemmas concern contradictions between services provided and respect for human dignity (different individual interests and needs). Some principles of the ALA code, for example, stress the highest quality of services on the one hand, and the rights of users to privacy and protection of intellectual ownership.

Both on an individual and institutional level, information profession values relate to access to information resources and social usefulness of services. Some of the values are, for example, value of truth when providing space for accessing knowledge and expertise, and the related value of tolerance of diverse opinions and resources that supports the flow of knowledge. Value of individual freedom means support of improvement of life of individuals and society, and support of access to information resources. Value of fairness means equal access to library services and information resources, and securing of rightful use of information. Lastly, there is the value of beauty, which means respect for works and objects that generate pleasure, and facilitate educational and aesthetic experience. (Rubin, Froelich 2010). In this context, value principles of information profession are related to services of enhancement of knowledge, education, public good, justice and truth-seeking (Bawden, Robinson 2012).

Information professionals ought to maintain ethical and ecological environment via emphasizing the value aspects of information in society. At the same time, ethical environment as part of information ecology is cultivated on the basis of examples (e.g.; in education and also in organizations). This may be facilitated by written codes of ethics and organization policies, and also via discussions, training and orientation workshops, and general educating in the area of information ethics.

Education in the area of information ethics is gradually becoming a part of many programs of library and information science, and professional organizations, such as ALA, ASIST an ALISE.[4] Many university courses are designed on the conjunction of a theoretical basis with case studies when tackling practical ethical dilemmas regarding information activity. Our current course of information ethics presents the subject as a complex interdisciplinary area of information science, encompassing information resources, information products, and information ecology. The majority of foreign experts agree that courses of information ethics ought to be among the core courses of the study program of information science.

6 Examples of Ethical Dilemmas When Using and Processing Information

Citation ethics is frequently listed among examples of information ethics. This is related particularly to ease of access and use or abuse of electronic information. Issues of plagiarism have therefore been more closely monitored in student works, while citation ethics is included in courses of information literacy.

Other examples encompass issues of protection of intellectual property, also related to new models of information use in digital science, so-called “creative commons.” The dilemmas are also caused by tension between the right to information and freedom of speech, particularly as regards censorship and filtering of information. Restrictions may apply particularly to dissemination of malignant information (content unsuitable for children, etc.)

Some other examples of applied information ethics in libraries concern selection of resources, provision of reference services, cataloguing and document processing, information search and competition reporting, the “classic” example being the dilemma of whether information

[4] For example, ALISE (The Association for Library and information Science Education) points out that special attention to information ethics ought to be paid via ALISE Information Ethics Special Interest Group.

concerning suicide ought to be made accessible to a depressed underaged user. Other dilemmas are formulated in the following fashion: *Should the librarians equip all public library computers with filters? Should the librarians inform the police about the content of the readers' reading? Should extreme books on racism and religion be included in the collections? Should public libraries charge for special services? Should information workers in pharmaceutical companies be providing marketing managers with literature promoting their products as opposed to the competition? Should encyclopedias contain warnings that their medical information is inaccurate?* (Bawden, Robinson 2012).

Many ethical dilemmas originate on the level of use of information systems and technologies, such as digital divide, provision of electronic information services in governmental areas, cybernetic crime. The majority of solutions to ethical dilemmas is contingent on existing regulations (laws, codes) on the one hand, and on the formation of information policies and information literacy that underpin man's information behavior on the other.

Information ecology may serve as a befitting framework for interpreting issues of information ethics (Capurro 2005, Floridi 2010, Steinerová et al. 2012). It is becoming a part of interpretation of relationships between man, information and technologies, placing emphasis on the positive values of the cultivation of information environment and services for advancement of knowledge in society.

Conclusion

Information ethics remains a big challenge for information science research. In this article, we concentrated primarily on general theoretical issues of definition and identification of basic socio-philosophical and system- and technology-based approaches to and taxonomies of information ethics. The issues of research are also interesting from the point of view of development of theories of information behavior and information theories. Socio-philosophical and system- and technology-based approaches are brought together in common ethical issues regarding privacy, security, authorized use of information, responsibility when using systems and the internet. The taxonomy of the concepts of information ethics may be used for further research and information science studies.

Because of the complexity and broadness of the subject, we were unable to detail all the issues regarding information ethics, namely in the area of professional codes.[5] Rather, we intended to point out the importance of the theoretical foundations of information science, particularly methodologies of information interpreting, context, and values related to ethical information behavior of different social agents in different information environments. These foundations and the taxonomy of information ecology point to new possibilities of approach to modeling as regards theories of information ethics.

With regard to the near future, issues of importance are regulations concerning intellectual property, ownership, plagiarism, negative phenomena and spam dissemination on the one hand, and issues of securing equality of access, such as digital divide, and censorship, on the other. At the same time, new convergent technologies (biotechnology, nanotechnology, cognitive technologies, genetic information, robotics, etc.) generate ever more ethical dilemmas and questions that challenge both the theory and practice of information science.

[5] A reference list of the most important, select codes is provided at the end of this article.

Research of information ethics and related ethics, such as computer ethics and bioethics might head in the direction of value-oriented designing of information systems and services, and protection from pathological phenomena in information behavior and information society. More recent models of information ethics ought to increase sensibility to social and moral values of information behavior and information practice, helping to find balance between information rights and obligations, consequences and rules of information behavior, and accessibility, truthfulness and reliability of information.

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List of Abbreviations:

IFLA – International Federation of Library Associations

ALA – America Library Association

ACM – Association for Computing Machinery

ASIST – Association for Information Science and Technology

ALISE – Association for Library and Information Science Education

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