World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 34, May, 2024
ISSN: 2749-3628,

DEVELOPMENT OF MANAGEMENT SCIENCES, INFORMATION SCIENCES, COMPUTER SCIENCES

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Article history:

Received: 6th April 2024
Accepted: 4th May 2024

Abstract:

A description of the characteristic features of this area of knowledge, which is the scientific basis for the development of the future generation of information technologies, is given. Development of management sciences, information sciences, computer sciences were also analyzed. In addition, the basics of development of informatics and management control were studied.

Keywords: information science, computer science, informatics as computer and information science, future generation information technology

INTRODUCTION

Information is an increasingly important and indispensable asset, and it's not hyperbole to say that information is the lifeblood of organizations. HR finds new opportunities to increase employee engagement using productivity data. Marketers refine campaigns based on target audience behavior. The finance department uses analytics to make projections. Outreach departments are able to identify underserved segments of their communities. And information sharing fuels collaboration across departments. he theoretical foundations of the development of the next generation of information and converged technologies has become one of the key preconditions for establishing computer and information science as a field of general scientific knowledge. The analysis of the training of specialists for the development of new technologies conducted by Marc Snir showed that the education program should integrate computer and information sciences . In the second half of the 20th century, the need for their integration was foreseen by Saul Gorn and Yuli (Julius) Shreider. Currently, the ideas of Gorn and Shreider have become very popular. This is indicated by the conceptual and policy papers on the development of future generation information and communication technologies discussed in this article, as well as by convergent technologies included in 2011 in the competition of the Russian Foundation for Basic Research (RFBR) focused on basic research. In this paper, we present one of the possible options for the development of the ideas of Gorn and Shreider.

Some organizations assume their analysts or business intelligence specialists will take care of information management, but managing, organizing and improving access to the vast quantity of data organizations collect is a more complex and all consuming task. Many organizations are only just beginning to realize how much they neglect when no one manages the information life cycle. Currently, most only use about half of the data available to drive decision-making. The rest goes unused, and organizations still rely on gut feel rather than data to make nearly 50% of business decisions.

However, most organizations now grasp how much they risk when the information life cycle isn't appropriately managed. According to the U.S. Bureau of Labor Statistics (BLS), demand for qualified information management and information systems managers is increasing. However, because information management is an emerging field, it's still rare to find professionals with high-level expertise.

LITERATURE REVIEW

The emerging field of information management is concerned mainly with the process used to collect, store, manage, distribute and preserve information. It also involves the valuation of data as an asset, the practical application of information to achieve organizational objectives, and the strategic planning of information-focused activities. This includes how information is used and the social and ethical implications of its use. The Information Management Body of Knowledge describes information management as encompassing six knowledge areas: business benefits, business information, business processes information, business strategy, information systems and information technology. While the term business is embedded in this framework, these knowledge areas are critical to all types of organizations public, private and not-for-profit. The field also includes four process areas: business change, business operations, performance management and project management.

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Strategically managing the interplay between people, technology and information is a complex undertaking and the core focus of the IM field of study. The answer varies across programs because institutions have unique curriculum and admissions requirements. The University of Washington MSIM, offered online, attracts early- and mid-career professionals who want to advance in their careers into managerial roles, deepen or augment their expertise, or change their career path into the IM field. Master's of information management candidates at the UW do not need an academic or professional background in technology or management — the MSIM program welcomes individuals from all backgrounds and supports a variety of career goals. While some students have computing, information systems, management or data analytics experience, they might lack strategic leadership skills; others want to complement their undergraduate degree with a STEM credential or to switch careers entirely.

MATERIALS AND METHODS

For the MSIM programs with a work experience requirement, intake occupations may include IT roles such as business analyst, database designer, software developer, product managers, information systems specialist, etc. The degree also attracts folks from all types of occupations outside of IT such as functional area specialists and managers in marketing, finance, accounting, human resources, administration and social work. MSIM applicants work across all industry sectors such as health care, biotech, finance, marketing, agriculture, education, technology and commerce. Some work for nonprofit, research or public organizations.

Table-1

COMPUTER AND INFORMATION SCIENCE

The title of Gorn's paper	Year of publication	Citation according to the Web of Science (as of March 2012)
The computer and information sciences: a new basic discipline	1963	16
The individual and political life of information systems	1965	2
Computer and information sciences and the community of disciplines	1967	53
Computer and information sciences: their fundamental semiotic concept and relationships	1968	3
Informatics (computer and information science): its ideology, methodology, and sociology	1982 (the first journal publication), 1983 (the second publication)	12 (citation of the first (1) and the second (11) publication)

RESULTS

After the distribution of one-nature terms by media, two successive stages of knowledge representation in the digital electronic medium in the form of computer code were described. The first stage of knowledge representation refers to the boundary between the mental and social and communication media. Semiotic signs, as concepts that are two-nature, belong to this particular boundary on which the associative correlation of concepts and forms of their presentation using semiotic signs is carried out. Figure 1 illustrates a situation where in the system of human knowledge several planes of content can be selected according to the number of languages or sign systems that a person knows and uses to represent the knowledge in the detached form. In the used system of terms such forms are by definition sign information.

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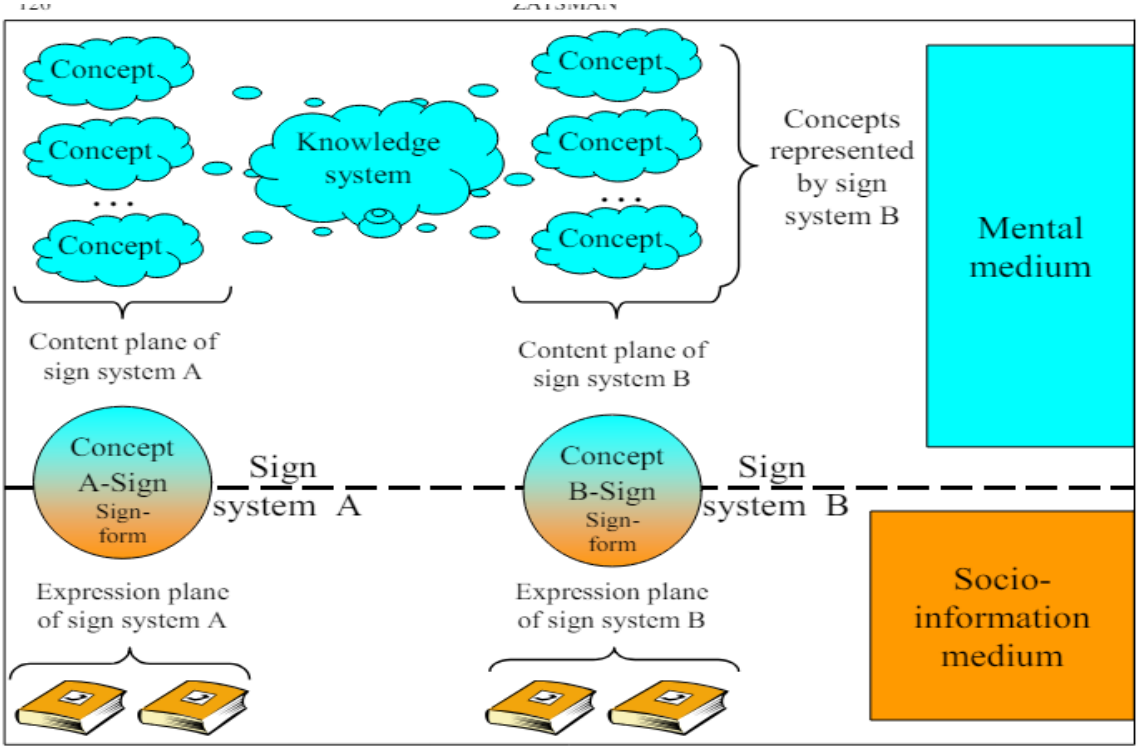

Fig. 1. Two media, the planes of content and expression, and signs.

Figure 1 shows two content planes in the mental 2 Here we use the dyadic model of the sign. medium (designated as A and B) corresponding to two different sign systems. For example, in order to describe the same knowledge the Russian language (the content plane A) and English (the content plane B) can be used. Then each of these content planes derived from the division of the same knowledge system will correspond to its own content plane in the social and communication medium. Each plane of the expressions in Fig. 1 is indicated by two books (two books in Russian and their translations into English). The boundary between the mental and social communication media is indicated by a dashed line. At this boundary associative links are set between concepts of mental knowledge and texts as detached forms of representation of concepts in social and communication medium.For example, in the problems of neuroinformatics it is necessary to include into consideration the totality of the objects of the other four media, i.e., mental, social and communication, digital and electronic, and neurophysiological (neurobiological). Accordingly, in general, the objects of study of the subject area of neuroinformatics can belong to the four media. In addition, during the study, concepts can be used that belong to the following six boundaries that lie between (1) Mental medium of human knowledge and social communication medium. (2) Social-communication and digital electronic media. (3) Mental and digital electronic media. (4) Neurophysiological and social communication media. (5) Neurophysiological and digital electronic media. (6) Mental and neurophysiological media. For the first boundary a traditional example of such concepts is semiotic signs. For the second and third boundaries similar concepts, i.e., formcode and semcode, were defined in. Currently the pressing issue is how to define similar two-nature terms for the remaining three boundaries. If in the problems of neuroinformatics it is necessary to further consider the medium of material objects and phenomena (external to the person), then the average number of media of its subject area increases to five. Currently, there is no general description of the division of the domain of computer and information science into media taking into account its other sectoral components, i.e., geoinformatics, cognitive informatics, bioinformatics, etc. This does not make it possible to determine the total number of media that covers the subject area of computer and information science. However, if we add the analog electronic medium reviewed in to the referred five media, it can be assumed that the total number of its media will be not less than six.

CONCLUSIONS

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The fundamental reconsideration of the system of theoretical, applied, methodological, and technological principles, approaches, and concepts used today in the field of ICT and its integration with cognitive techniques has become a key prerequisite for the development of computer and information science as a field of general scientific knowledge. At present, the need to build its theoretical foundations as a fundamental science is recognized and has been made explicit (scientific, technological, and educational positions). The earliest approaches to the description of computer and information science were proposed by Gorn and Shreider. We have proposed a possible approach to the construction of its theoretical bases as the development of their ideas. The proposed approach includes the division of the subject area of computer and information science into media, the use of two classes of concepts and terms (one- and two-nature), distribution of one-nature terms between media and distribution of two-nature terms by boundaries between media, and the use of two interrelated stages of representation of concepts in digital electronic medium in the form of computer code. In the proposed approach one-nature terms can to belong to at least six different media, i.e., mental, social communication, digital electronic, analog electronic, neurophysiological (neurobiological), and the medium of material objects and phenomena external to the person. The domains of other areas of knowledge rarely include such a variety of media and, accordingly, a variety of natures of study objects. The only exception is semiotics. In the Frege semiotic triangle, denotation is one of its vertices and can be of any nature (mental, social communication, digital electronic, neurophysiological, etc.). If the task of semiotics is the study of signs and sign systems used in all fields of knowledge, but only on one boundary between the mental and social communication media, then the task of computer and information science is to create the theoretical foundations of the development of ICT in all areas of knowledge and wide range of practical activities. In this case, the next generation ICT should be able to cover five or more media, as well as a lot of borders between them. The study of such a broad range of one- and two-nature notions can indicate the special role of computer and information science in the system of scientific knowledge. On the one hand, it is difficult to determine the place of this area of knowledge within the classical paradigm of "two cultures," the natural sciences and humanities . On the other hand, the variety of media and natures of the objects of study makes it possible to develop a hypothesis about the formation of computer and information science as a "third culture" [49] that contributes to the fundamental reconsideration and harmonization of relationships of natural sciences and humanities.

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