Information Management in Context of Scientific Disciplines

Ladislav Burita
University of Defense in Brno
Czech Republic
Ladislav.Burita@unob.cz

DOI: 10.20470/jsi.v9i1.314

Abstract: The paper aims to analyze publications with the theme of information management (IM), cited on Web of Science (WoS) or Scopus. About the frequency of publishing about IM was reached the linear growth; from some articles in the period 1966-1970 to one hundred at the WoS and six hundred at Scopus in the period 2011-2015. From the selected publications was subject of the analysis 21 most cited articles od WoS and 21 most cited articles on Scopus, published in 31 different journals, oriented to informatics and computer science; economics, business and management; medicine and psychology; art and humanities; and ergonomics. The diversity of interest about IM in various areas of science, technology, and practice was confirmed. The content of selected articles was analyzed in its area of interest, in relation the text of article to IM, and whether the definition of IM was mentioned. One of the goals was to confirm the hypothesis that the IM is included in many scientific disciplines that the concept of IM is used loosely and mostly mentioned part about data or information processing; and part about the application of information and communication technologies. The hypothesis was confirmed. In analyzed articles was used concept of IM in the broader context of activities, with focus on various aspects of IM. The most frequent area of IM application was business support. The article explains the definition of IM; describes the research methodology, presents results of analysis selected articles. In detail is described the focus on the term IM and understanding it.

Key words: Information management, analysis, Web of Science, Scopus, scientific disciplines system integration.

1. Introduction

The topic of Information Management (IM) is frequently used in informatics as well as in management. IM is a concept of information activities in the company. It is operating in a special department to support the acquisition, processing, reporting and distribution information within an organization. The aim of IM is to provide the quickest and the best support for workers of organization with information requirements for the quality performance of organization.

According to this concept are information activities parts of management functions: planning, management, administration, and control; and part of the working with data and information: acquisition, storing, retrieval, processing, and distribution. The main task of information activity is not only the preparation of information as such, but more often to prepare information systems (IS) and knowledge resources, to support the information work.

One of the goals of the paper is to confirm the hypothesis that the concept of IM is used in analyzed articles loosely and mostly includes part about data or information processing; and part about the application of information and communication technologies (ICT).

The article is a response on discussion after the presentation of the paper (Buřita, 2017) at the International Conference on Military Technologies that was oriented to analysis of the IM in papers indexed on Web of Science (WoS). The paper was updated on analysis papers indexed on Scopus and added the correlation between the both sources.

The article describes and compares definitions of IM; explains the research methodology; presents statistics of analyzed papers; shows the focus of selected articles in relation to other scientific disciplines and their understanding of the IM; presented the detail analysis of the selected articles using software Tovek; follows conclusion.
2. **Definition of Information Management**

Information management (IM) is a term often cited; there are many definitions as “IM includes the planning, budgeting, control, and exploitation of the information resources in an organization. The term encompasses both the information itself and the related aspects such as personnel, finance, marketing, organization; technologies, and systems. Information Managers are responsible for the coordination and integration of a wide range of information handling activities within the organization. These include the formulation of corporate information policy, design, evaluation, and integration of effective information systems and services, the exploitation of information technology (IT) for competitive advantage and the integration of internal and external information and data”. (Free Online Dictionary of Computing at foldoc.org).

The discipline of IM is oriented to information as a source of the company or organization. Functions of the information processing include creating or acquisition of information, storing it in relevant structure, updating, and processing them to hold it in actual state, retrieval, and using it by different users.

The interesting context of the IM means a value of information. Information in itself has no value, but the value depends on its purpose; depends on that, how many is willing a decision maker to pay for it prior accepting a decision.

According to source (Robertson, 2016) is “IM an umbrella term” involving all systems and processes within the company and organization participate in creating, using, and distribution information. In the paper states that IM encompasses people, processes, technology, and content. There are discussed the principles of success IM and challenges for implementation and developing high-quality IM.

In a review article (Wilson, 2016) are explained various aspects of IM: source and connection with other disciplines; are mentioned elements of IM; the economics of information; access to information, its privacy and security; information systems and education for IM.

The role of IM is mentioned in (Mildeova & Brixi, 2012). “IM is shown as activities focused on managing of all information assets used by an enterprise. Management plays a leading role in the guiding and enforcement of innovation; on the other side, thanks to innovation within ICT, some activities in information management are performed by machine, creating additional spaces for management's own creativity (and further innovations). IM is also important for maintaining close contact between ICT manufacturers and their customers on the part of the enterprises. Successful implementation of innovations is not possible unless ICT manufacturers are well acquainted with their customers and theirs needs as well as their changing demands on technology.”

3. **Methodology of Research and the Statistical Results**

The research methodology includes first selection of publications, indexed on WoS and Scopus. The selection criterion is the phrase “information management” in the title of the publication, only journal articles, issued to the year 2015. The result of the selection was arranged according to the year of issue in five years interval: 741 articles on WoS and 2450 on Scopus; see Fig. 1. The trend in the number of publications is linear on both servers, but on Scopus is growth steeper. The next step of the research is statistical analysis of the selected papers and results are in this chapter.
From the selected articles will be the object of detail analysis the first 21 articles on WoS and 21 articles on Scopus, with the maximum quotes. Nearly one half of the selected articles (10) was the same in both sets, see „References of analyzed papers, indexed on WoS and Scopus”; the rest are individual indexed articles, see “References of analyzed papers, indexed only on WoS” (11); respective “References of analyzed papers, indexed only on Scopus” (11).

In the group of papers indexed on WoS was most (148 times) cited article (Anand, Manz & Glick, 1998), the same article was cited on Scopus 222 times. In the group of papers indexed on Scopus was most (345 times) cited article (Franklin, Halevy & Maier, 2005), but the same article was cited on WoS 142 times. The articles on Scopus are more cited (2895 times together) than on WoS (1460). The citation of the selected articles on the WoS and Scopus is depicted in Fig. 2. At the vertical axis is the number of articles whose citations are at the horizontal axis.
The 32 selected articles were published in 31 journals (Tab. 1); 2 articles were published in Journal of the American Medical Informatics Association. The subject areas of journals are oriented to informatics and computer science (12); economics, business, and management (10); medicine and psychology (7); and to other disciplines (2) as art and humanities, and ergonomics. The interesting insight in the Tab.1 is that the both servers (WoS and Scopus) refer differently to the subject area of the same journal (in 6 cases).

The content of the selected articles was analyzed from the area of interest - main theme of the article (Tab. 2) and relation the text of article to IM - which part of IM was mentioned (Tab. 3).
The third step of the research includes the detail analysis of the selected papers and investigates context and content of the articles using software Tovek; results are in the chapter 3. The last step of the research is oriented to understanding of the term “information management”; results are in the chapter 4.

4. The Detailed Analysis of the Selected Articles

The context of the articles was discovered using Tovek module InfoRating and content of the articles was analyzed using Tovek module Harvester. Context of scientific disciplines in articles is depicted in Fig. 3 (the context query) and Fig. 4 (context matrix).

The context matrix contains nodes with the number of the articles that are in context of the relevant disciplines. The computer science and economics occurs in 3 documents (see Fig. 5) and economics and medicine in one document.
We extend and adapt the computer technic (CT) model of group memory to organizations. Using this extended model, we identify information management challenges of the next century and suggest that organizations can address these challenges by locating a large portion of their information-processing activities outside their formal boundaries, by adopting novel socialization tactics, and by focusing on the management of soft knowledge forms (e.g., tacit knowledge, judgment, and intuitive abilities). Whereas current theories increasingly equate information management with the management of information technology, we argue that information technology needs to be complemented by organization-level processes related to organizational memory.

The content analysis displays the connections of words in documents. The relation of words to the term “information management” is depicted at the Fig. 6; to the word “system” and “integration” at the Fig. 7 and Fig. 8.
The term “system integration” does not occur in analyzed articles, but the words “system” and “integration” are used in 4 articles, see the query in Fig. 9.

5. Explanation the Term of Information Management

The definition of IM is mentioned in the article (Whittaker, Bellotti & Gwizdka, 2006) and involves information processing and management functions that should deliver the right information to the right people in the right time. In the same paper refers the Personal IM (PIM) about the people activities with information processing in their various tasks and roles as organization or company employees; as community of interest or family members. The definition of PIM is authors’ contribution and refers to the role of person that is interesting about other people.

Article (Franklin, Halevy & Maier, 2005) specifies IM as a data sources processing or information processing in article (Whittaker, Bellotti & Gwizdka, 2006). Some articles explain functions of IM as the ICT for business support (Mithas, Ramasubbu & Sambamurthy, 2011), for administration support (Lansdale, 1988), for HR support (Affifi & Weiner, 2004) or for medical practice support (Moen & Brennan, 2005).

In the article (Moen & Brennan, 2005) is explained the term “Health information management in the household (HIMH)” as a complex of the 5 elements (see Fig. 10):

1. Individuals that are in the center of the HIMH with their knowledge, perceptions, and experiences.
2. Organizations that form the social context, rights, and responsibilities.
3. Tools & Technologies that help to work in HIMH.
4. Environment thru that are connected all other elements.
5. Task that constitutes the set of activities of the individuals work in the organizations.

The definition HIMH is more complex than the previous ones mentioned in this paper and could be basis for the following investigation of IM in general.

![Fig. 10: The Balance model of the HIMH (Moen & Brennan, 2005)](image-url)
1. Data sources or information processing procedure of the organization (Franklin, Halevy & Maier, 2005), (Whittaker, Bellotti & Gwizdka, 2006).
2. Handling activities with information sources and using IT for competitive advantage of an organization (Mithas, Ramasubbu & Sambamurthy, 2011).
5. PIM that specifies IM in human resource area (Jones, 2007), (Whittaker, Bellotti & Gwizdka, 2006), (Barreau, 1995), (Lansdale, 1988).
6. HIMH that is a complex involving individuals, tasks, organizations, environment, tools and technologies (Moen & Brennan, 2005).
7. Motivated IM, as a 3-phase process in interpersonal encounters, emphasizes the role of efficacy, and brings attention to the interactive nature of IM (Afifi & Weiner, 2004).
8. Lean thinking to IM that includes the need to characterize the nature of waste and establish the five principles of: value, value streams, flow, pull, and continuous improvement in the context of IM (Hicks, 2007).

The goal of IM, having regard to the above definitions; is to get, analyze, and to process the data sources; to prepare and distribute information within organization or company for support its effective work and competitive advantage.

6. **Conclusion**

One of the goals of the paper was to confirm the hypothesis that the concept of IM is used in analyzed articles loosely and mostly includes part about data or information processing; and part about the application of ICT. The hypothesis was confirmed, the concept of IM was used in the broader context of activities (Tab. 2), with focus on various aspects of IM (Tab. 3). The most frequent areas of application were "ICT for business support" (10 articles) and "ICT for medical practice" (7 articles). The diversity of interest about IM in various areas of science, technology, and practice confirms the list of journals (Tab. 1).

In the article is discussed the term IM on the basis of selected publications indexed on WoS and Scopus. The criterion for their selection was putting the phrase "information management" in the title of the publication. The result of the query was analyzed and was father selected the 21 most cited articles on WoS and 21 most cited articles on Scopus. From the selected set of publications was subject for detailed analysis only 32 articles (not 42), because 10 articles were indexed on both servers. The number of citation of the articles confirms the quality of publication and therefore the resulting analysis can be considered relevant to an understanding of the topic IM, and to meet the objectives of the article, despite their relatively small number (32).

The interesting was how the concept of IM understands by the selected publications and the improvements to the definition of IM. It was presented the results of an analysis of articles, their publication frequency (Fig. 1), number of citations (Fig. 2), list of journals (Tab. 1), overview of the articles topics (Tab. 2), and their relationship to IM (Tab. 3).

The author's vision of the future of IM is in correlation with the findings in the paper as a concept of information activities in the company, connected with operating in a special department to support the acquisition, processing, reporting and distribution information within an organization.

**Acknowledgment**

The article presents the results of the research in IM as a part of the project [28] at the University of Defence, Faculty of Military Technology, Department of Communication and Information Systems and presents the education experiences in IM at the Tomas Bata University in Zlin, Faculty of Management and Economics, Department of Industrial Engineering and IS.

**References of analyzed papers, indexed on WoS and Scopus**


Ferrucci, D. & Lally, A., 2004: Building an example application with the unstructured information management architecture. IBM Systems Journal, Volume: 43, Issue: 3, pp. 455-475
Franklin, M., Halevy, A. & Maier, D., 2005: From databases to dataspaces: A new abstraction for information management. ACM SIGMOD Record, Volume: 34, Issue: 4, pp. 27-33

References of analyzed papers, indexed only on WoS
Davenport, TH., 1994: IT’s Soul: Human-centered information management. Harvard business review, Volume: 72, Issue: 2, pp. 119-131
Heimbinger, D. & McLeod, D., 1985: A federated architecture for information management. ACM transactions on information systems, Volume: 3, Issue: 3, pp. 253-278

References of analyzed papers, indexed only on Scopus


**Other References**


ZRO209, 2016: *Project for development of organization in 2016-2020*. Brno, University of Defence

**JEL Classification:** M15