VISUAL REPRESENTATION OF RESEARCH IN THE AGE OF INDUSTRY 4.0: GRAPHICAL ABSTRACT

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The rapid growth in information flow is called "information explosion". Most of the information is presented in the text format, therefore, to solve the problem of "information explosion", it is necessary to use the methods of automatic text processing. Computer text processing helps to solve many problems, such as machine translation of a text, automatic summarization, information search, and classification of documents, etc. Despite the fact that the problem of increasing the amount of information has been interested for a long time, the ways of solving this problem are still being actively studied.

Computer processing of a scientific text is of particular interest to researchers. At present, the processes of scientific information flow have changed significantly, the role of scientific genres are evolving and, in a broader context, the tasks and format of the expert reports of scientific and technical results are changing. The promotion of information and the authors' result is the task of the authors themselves.

The digitalization of publication culture, the trend towards open access and the need to automate the search and processing are changing the existing approaches in the sense that a modern researcher should be more focused not only on the text in its lingua-pragmatic, hermeneutic understanding of the meaningful concepts and structure, but on the technology of information representation. And it is fundamentally important that this technology should be considered only as a derivative of the previously accepted view of the text as a structure (Belyaeva & Chernyavskaya, 2019).

A new approach to the exchange of information in industrial production is characterized by the recently introduced terms *Industry 4.0* and *Information 4.0* (Gollner, 2016). In fact, the Fourth Industrial Revolution (or Industry 4.0) is the trend towards automation and data exchange in manufacturing processes which include

cyber-physical systems, Internet of Things, cloud computing, cognitive computing, and artificial intelligence. Information transparency afforded by Industry 4.0 technology provides operators with comprehensive information to make decisions. Inter-connectivity allows operators to collect immense amounts of data from all points in the manufacturing process and identify key areas that can benefit from improvement to increase functionality.

Information 4.0 is characterized as: 'molecular', which is formed not from structurally completed documents, but from information 'molecules'; dynamic, i.e. continuously updated; offered rather than delivered; ubiquitous, interactive, accessible and easy to search; spontaneous and profiled automatically. The development of algorithms for extracting information from texts in terms of its automated processing and transfer is considered now to be a new research task (Belyaeva & Chernyavskaya, 2019).

The flow of information (scientific, special, media) is so great that its fast and high-quality processing turned out to be really difficult for those who need this information (for specialists whose task is to extract and process data). Content analysis of the text became widespread with the development of automation of information search as early as the 1970s. The task of this search was to select texts from a pre-created or constantly updated array of texts, determined by the user's request or extracted from a pre-recorded set of topics, by the presence of specific factual information, etc. So, today there are a number of methods for classifying information search, e.g. cluster method and linguistic text analysis (statistical analysis, feature analysis, etc.).

Within the Information 4.0 approach, the concept of structured content authoring becomes the main concept, which means structuring content into parts called topics. They are then automatically collected using maps to create the final content for a specific function and a specific type of documentation. Thematic sections should strictly correspond to the topics. Then 'information molecules' can be marked algorithmically and become the basis for creating texts of different types, the use of which, in turn, can be automated (Belyaeva & Chernyavskaya, 2019).

One should mention here the peculiarities of the information perception from the computer screen. Reading the Internet texts forms certain habits. According to Jacob Nielsen, the head of the research organization Nielsen Norman Group, netizens scan texts rather than read them: they skim through individual fragments, select key facts, try to assess the potential importance of information, and easily switch to hyperlinks and related materials (Pavperov, 2015). When analysing eye movements of Internet users, Nielson found that web pages are viewed in the form of the Latin letter 'F': after a horizontal movement along the top of the content, there is another horizontal movement and a vertical shift from the top edge of the screen to the bottom. In contrast, while reading a paper text, the eyes move horizontally along each line.

The need to quickly process large amounts of information on the monitor gave rise to the so-called superficial reading – viewing text by keywords, the ability to read diagonally and determine whether it is necessary to read it at all (Pavperov, 2015). It is believed that users do not like reading long texts on the Internet, feeling tired after reading 6-10 thousand words. Scientific texts are certain to make readers feel tired faster. At present, some innovative journals come up with new ways of scientific publishing to satisfy multiple readers. And although the canonical accepted formula IMRAD (introduction, method, results and discussion) is considered a reference model for the construction and perception of a scientific and/or technical text/article, these publishers demand from authors to prepare a graphical abstract (GA) besides the written abstract.

The goal of GA is twofold: the perception of such abstracts by readers and possibility to increase journal visibility and publication impact. Although a GA is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the content of the article in a concise, pictorial form designed to capture the attention of a wide readership, make readers choose a particular article from a huge amount of literature. Such an abstract becomes the advertisement of the authors' findings, the marketing message. However, to achieve these goals it is necessary to provide a well-designed and informative visual representation of research. Unfortunately, some authors simply compile some of the

most important figures from their manuscript (Cox, 2016). What is important to consider when creating a GA is the use of visual semiotic mode to convey meaning (layout and visual entities, originality and the nature of images), which, by nature, uses a totally different lexicon (shapes, volumes) and grammar (angles, framing, etc.) based on a logic of space rather than time to represent content.

It is worth mentioning here that the effectiveness of GA for attracting attention to publications is frequently claimed by publishers and in Web-blogs. However, there is not enough research on this topic. For example, the only empirical study (Pferschy-Wenzig et al., 2016) did not confirm that manuscripts with GA are more visible on the Internet than those without GA, but this study is only restricted to one journal and covers only one year. It is the effectiveness of graphical abstracts for increasing publication impact in different fields of study that is the subject of our further research.

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