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THE ROLE OF DIGITAL MEDIA IN A DIFFUSION OF INNOVATIONS: METHODOLOGICAL REMARKS

Abstract. A methodological approach is proposed to evaluate potential impact of digital media publications on a diffusion of scientific and technical innovations. The approach is based on five factors, which E. Rogers defined as main for adopter when deciding to use innovation or not.

Keywords: diffusion of innovations, mass media, digital media, methodology.

The mass media can become a significant factor in the scientific and technological development of society by appropriate use of the potential. But the question arises, according to which criteria to evaluate, how effectively information is disseminated for innovation. The role of the media in the dissemination of scientific and technological innovations is studied in terms of sociology, economics (marketing), health care, education, agrarian sciences (T. Valente [7], J. Darley and J. Benigger [2], D Miyers [4], T. Telloffsen and H. Takada [6]). However, these studies did not pay enough attention to the content opportunities of the impact of mass media publications on the diffusion of innovations, especially as specifically scientific and technical.

The purpose of our study is to propose an approach to evaluate a potential impact of digital media publications on a diffusion of scientific and technical innovations.

It would not be correct to claim that mass media coverage of science adequately reflects the real situation of the field. As Hansen and Dickinson have shown, it is a complex process of construction which depends on lots of factors determining what topics will be chosen, what aspects of these topics will be highlighted, and how it will be presented. These factors are «the economic constraints of media organizations, the professional ideologies of journalists and other media personnel, 'news values', the editorial policies of media, the nature of the subject matter, the nature of relationships between media professionals and their sources, and the publicity practices and general media orientations of sources" [3, 365]. For these reasons, the media does not always aim to promote diffusion of innovation, the more so that not all innovations deserve the attention of the public and not all can be useful.

In intellectual terms, the development of innovation depends on scientists and professionals, they use information from scientific publications, discuss the development of professional meetings (seminars, conferences). Scientists rely more heavily on traditional media to make a general idea of scientific "horizons" [1]. Thus, mass media does not play a significant role in scientific communication. Then the question arises as to the meaning of news about science and technology innovations to lay audiences. We identify four goals that may

persecute the media when informing about scientific and technical innovations:

1. Searching for investors. There need financial support to conduct research, the withdrawal of innovations in the market. Therefore, the purpose of covering such information in the media may be the search for financial support for the development, because among readers may be entrepreneurs or patrons.

2. Searching for public support. There are also possible state-political obstacles: for example, the lack of a legislative framework for the introduction of innovation, excessive bureaucratization of the process. In such cases, a civil society that is familiar with the problem can put pressure on the government, demanding to take the necessary measures for the implementation of an innovation.

3. Outreach activity. Messages about innovations can be submitted to the mass media simply for the general familiarization of the audience with the problems that are being developed by scientists.

4. Creation of a front-pager. Some innovations attract audiences' attention to spectacle, controversy, scandalous ideas, and more. Publications of this type are aimed not only at informing people but to bring a quick profit to the publication.

Therefore, in certain situations (lack of funding, political obstacles) mass media can be useful for diffusion of innovations.

The theoretical basis of our research is the theory of diffusion of innovations (E. Rogers). Its purpose is to explain why, how and what rates new ideas and technology enter in a culture.

According to the theory, innovation is "an idea, practice or object that is perceived as a new individual or other assimilator" [5, XVIII]. This definition does not refer to the sphere of origin and distribution of innovation, the consequences of its implementation. The criterion of innovation is only a subjective perception, and the innovation itself is interpreted in a broad sense.

E. Rogers understands "diffusion" as "the process in which innovation is discussed through certain channels for some time among members of the social system" [5, 5]. The peculiarity of this communication is that within its framework all appeals are devoted to new ideas. Communication is understood as a two-way process, the exchange of information between the participants.

The diffusion of innovations theory is sociological. Although, as E. Rogers noted, it was formed under the influence of research not only on sociology, but also on anthropology, education. The communicative aspect of the theory lies in the fact that, according to it, the spread of a new idea or technology depends on four factors: innovation, channels of communication, time and social system [5, 16–28]. Two types of communication channels are described in the theory,– mass media and interpersonal communication.

E. Rogers argues that in the process of making a decision on the use of innovation, the assembler passes several stages: knowledge, belief, decision, implementation and confirmation. Mass media and interpersonal communication play different roles at each stage. Mass media are more suitable for familiarizing the general public with the fact of existence of innovation (stage of knowledge), and interpersonal communication has a great importance at the stage of persuasion [5, 18]. In modern social media, these functions can be combined. For example, when discussing innovation in private correspondence, users can send links to mass media about innovation. Also, users can discuss it in the comments below the post.

In general, according to E. Rogers, regardless of the channel, technological information can be disseminated by two types of information, needed for potential adopters: software information (it answers the questions: what is it? how does it work? why does it work?) and evaluative information (what are the consequences of using the innovation? what are the advantages of using it in my specific situation?) [5, 13–14]. We believe that the dissemination of innovations is significant not only channels and the presence of two types of information but also the

form and content of communications through these channels. In particular, how it is clear to the audience disclosed the above questions, were there any means of presentation, whose comments are used in the publication, its volume, etc. The attractiveness of innovation can also be influenced by the technical capabilities available to modern Internet publications (infographics, video, animation, 3D-modeling).

In the theory of diffusion of innovation it is noted that at the third stage of the introduction of innovation – the stage of making decision – the individual takes into account the most important characteristics of innovation, which determine, if he will grasp innovation or reject. E. Rogers calls five characteristics: observability (if the innovation is visible in itself or apparently changes a person's life, it stimulates discussion and, thus, facilitates the diffusion); relative advantage (if the innovation favorably differs from previous developments, it accelerates diffusion); compatibility (how innovation "embeds" into the lifestyle of the individual, meets his needs, interests, values, and experiences), complexity / simplicity (how difficult it is to understand the innovation and use it), trialability (trial period, it helps people in practice to check beforehand, how the innovation fits them) [5, 16].

According to E. Rogers, these factors are inherent to the innovation, but mass media can convey information about them in both textual and figurative means. It is natural that for the dissemination of innovation it is important that the potential assimilator gets information about each of these factors. However, the five conditions for successful diffusion of innovation need to be clarified with respect to online media mediation.

Observability. Today, to observe the work and usefulness of innovation one does not need to contact with it in "real" life. The user can see the operation of the technology personally with photos and videos posted on the Internet. In addition, from a close distance in good quality, with innovator's comments. Multimedia technologies allow you to show an innovation from the inside, for example, using an interactive schema, infographic, 3D animation.

Relative advantage. It is also not difficult to explain the relative superiority of the mass media. There are possible visual explanations here, comparisons with previous analogues, in addition to verbal.

Compatibility can be understood form the very essence of innovation (for example, if it goes about a device for economical heating in a country with high tariffs for housing and utilities). If compatibility is not obvious, it can be explained by innovators, experts, or early adopters in their comments.

Complexity / simplicity. Mass media can lessen the complexity of understanding the innovation due to clear and logical explanations which depend on journalists' ability to understand the background knowledge of their audiences, and to use technologies of visualization. The complexity of using media innovation can not be affected, unless it depends on how the learner understands the principle of work.

Trialability. Mass media can provide information about the institution in which the development and surnames of the authors of innovations are carried out, which will enable the interested persons to address them. Though, more specific data (contacts, links) may look like a hidden advertisement. At the same time, if development is at the testing stage, it is possible to provide information for those who want to take part in the experiment (for example, in the case of drugs for serious illness).

There is an important factor that digital media provide an opportunity to discuss innovations in post comments. Thus, digital journalism becomes important for diffusion not only in its first stage, but also in the second and third ones. The study of mass media publications for each of the refined points will enable to assess how effective these materials can be for diffusion at each stage.

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