Citation of Mass Media Resources in Social Network

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The role of social networks in the formation of collective behaviour and a sustainable point of view/position regarding the information events or facts is studied herein. The purpose of the study is to analyse the reaction of the users of popular social networks, expressed in quotations and responses to the messages of mass media resources. A statistical measure of interest in the media news is identified through unique messages from queries on the topic. The approach used is aimed at improving the scientific argumentation on the assumption of a direct relationship between these phenomena. The empirical evaluation is carried out according to the data obtained from the Russian segment of social networks. The trends in the distribution of media content in social media and social networks are revealed using structural and correlation analysis. It is determined that the publications in online media correlate directly with the activities of social networks and are caused by the release of one or another information event. The results of the study also convincingly point out that the importance of the media resources, expanding due to the integration of social networks, increases, while the classical model of online media (media edition as own website) is gradually losing popularity and audience.

Keywords: Media resources, social networks, citation index, mass media, media content

Communication is one of the basic human needs (Sarvaiya, 2013; Fletcher, 1966; Adler et al., 2012). Many Internet portals, including social networks, have been created for the purposes of virtual communication by now. The in-depth understanding of the specifics of social behavior and, as a consequence, the formation of tools for self-expression and information exchange can be deemed a sustainable trend in the development of social networks as a socio-cultural phenomenon (Boyd & Ellison, 2007). Network users communicate, exchange emotions and news, cite media resources, and express their views on any issues. The introduction of new information and communication technologies has changed the configuration of the media space. This resulted in a tougher competition in the current media market for the user/reader of the media content.

The role of the media in the formation of public opinion, their use as one of the main levers of social management can hardly be overestimated. Performing the informing and influencing functions, a media text widely uses citation to give credibility of the transmitted information (Volynets, 2015; Gusev, 2005; Kemova, 2011). The active use of mass media in

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the ideological and political struggle made obvious the impossibility of neutral orientation of media texts (Terentyeva, 2016). Depending on the point of view of the source, its priorities or tasks, a media text makes it possible to predict the response of the recipient of the information and to achieve the desired result –controlled behavior– using various methods (Terentyeva, 2016).

Currently, a huge number of scientific studies related to different types of communication between people focus on social networks and communication features (Merkulova & Kononova, 2009; Lymperopoulos & Ioannou, 2016; Vaca Ruiz et al., 2014; Bao et al., 2015 and others). The text content mainly consists of messages from the participants in social networks. At the same time, social networks usually act as informal media. Each user can post a news event. This creates an antagonistic problem, because a social network is able to generate media content independently. Chadwick & Howard (2009) reasonably describe this process, noting that the networks of participants, most of which are amateurs, are able to create an information product using the simplest tools for information production. The fundamental nature of this problem is determined by the general difficulties of studying of the large social groups and is associated with the underdevelopment of the methodological basis for studying the social networks.

Another important feature is the importance of the Internet, which is obvious when analysing the share of time in public life. According to the Public Opinion Foundation in Russia, 63.8 per cent or 74.7 million people browse the news media content at least once a day (Public Opinion Foundation, 2017). At the same time, Russia ranks first in the vastness of Internet users among European countries and ranks sixth in the global coverage. According to ComScore (Agency ComScore, n.d.), every user in the world spends an average of 5.9 hours a day to communicate in social networks.

This is why the analysis of information from social networks is gaining more and more relevance. The studies in this field are conducted regularly. The most common approach is to determine the popularity of media resources by counting the number of links to the media, placed in the user messages. Our research follows this approach and aims to clarify the citing of media resources in the social media. The objectives of the work are revealed in establishing the relationship between the messages of participants in the social network and relevant topics, as well as in determining the dynamics of citations, analysing the intensity of the responses of the users of social networks.

Literature Review

In the context of the globalization of modern society, the study of informal (horizontal) social links, which are a substitute for the vertical channels of power, has become especially relevant, according to Castells (1999). The central concept of his theory is the "network structure", revealing itself as a "complex of interconnected nodes", while "the specific content of each node depends on the nature of that particular network structure in question". Granovetter (2009), taking into account the intensity (force) of interactions carried out at the expense of the network, allocates strong and weak links that form the basis of the network.

Of all types of networks, social networks have the longest history of study (Hägerstrand, 1966; Jackson, 2008; Watts, 2004; Schenk, 1983). The very term "social networks" was introduced in 1954 by the sociologist Barnes (1954). He developed an approach to the study of relationships between people using sociograms. However, since that time the content of the concept has changed. Currently, the social network is understood

as a kind of platform on the Internet, through which people can communicate with each other. The specificity of the Internet network is also in the distribution of roles in communications. A user, being an active individual, forms his or her identity, finding himself/herself in the focus of behavioral research and within the social networks.

The review of scientific publications shows that there are several types of social networks, depending on their characteristics. A number of works indicate the existence of a targeted and personal social network. In the first case, attention is paid on the relationships of all members of a community (association), whose boundaries are formally delineated (Burt, 1980). In the second case, the focus is primarily on the actor and the connections that he or she has with other actors; the boundaries conditionally outline the zone of informal communication of the actors (Radaev, 1997).

Considering mass communication as a socially-oriented communication, Leontiev (2003) defined it as the impact of one part of society on another part of it, pursuing the goal of improving or worsening the activities of the society. Particularly interesting is a similar study in the context of political action, because social networks are a poorly controlled area for agitation, expression and exchange of opinions, and the dissemination of various information. News media can be classified as media texts with both language and media characteristics. Varchenko (2012) notes that a modern media text is a creolized text intended for the mass audience on different media. The primary function of a media text is to inform the public and form public opinion, and secondary—entertainment, educational, advertising, and ideological. All cited texts can be divided into two categories. On the one hand, these are socially significant and relevant texts for a certain moment of time, and on the other hand, the so-called precedent texts that are reproduced repeatedly in this community.

Interesting patterns in social networks were found in small groups of friends and acquaintances. It turned out that in the networks of friends the law of three degrees of influence operates. At the next step, this influence is already negligible (Christakis & Fowler, 2009). The reverse is also true when our friends and friends of our friends exert the greatest influence on us. The first studies that showed the importance of the network structure of friends and acquaintances, and their role in communicating information with changing collective behavior, were conducted in the United States (Lazarfeld et al., 1944). Subsequently, the clustering in social networks was justified based on political preferences (Huckfeldt & Sprague, 1995). Hoggart (1982) studied the problem of "controlled impact" in the field of public communications. He believed that the audience needs the ability to personalize the selection and individualization of information consumption.

Nowadays, the research on social reactions of people is realized mainly within the framework of the Internet environment. The interest is caused by a decline in the activity of consumers using traditional media. Data from social networks is widely used by specialists from research centers and companies to simulate the socio-economic and political processes, as well as to search for the mechanisms of impact. Personal information of users of Internet portals is also used to develop managerial solutions.

Let us consider the research, aimed at determining whether Twitter users are a representative sample of the whole society (Mislove et al., 2011). The data on the content of tweets for quantitative analysis and prediction of certain processes were considered in sufficient detail. This information was used to build a revenue forecast (Asur & Huberman, 2010), changes in stock prices and commodities on the exchange market (Bollen et al., 2012), to evaluate the results of elections (O'Connor et al., 2010), determine the degree of influence of weather on the mood of people (Hannak et al., 2012), etc. Finn G. conducted an

analysis on the reaction of Twitter users. He singled out a certain group of people with high activity, which accounted for about 20 to 30 per cent of all users of the social network. These people were the connecting link of all interactions. The author singled out the main actions on the basis of which he substantiated the idea of active users—subscriptions, tweets, messages, comments, re-tweets, etc. ComScore conducted a study which showed that 27 per cent of Twitter users view the newsfeed and the homepage of the social network, 21 per cent open their friends' accounts, and 17 per cent view photo content (ComScore[,n.d.]).

At the same time, according to Gartner analytical agency, the methods of Big Data and Social Analytics are at the "peak of high expectations" (LeHong & Fenn, 2012). When working with social information, the nature and quality of the content thus obtained should be taken into account–there is a large amount of spam and a significant percentage of false accounts. Approaches to the study of Internet content do not always coincide with the methods that are widely used in the study of traditional media. For example, the legitimacy of field research in cyberspace, the methodology of Internet research, the variation in the study of groups in the network, and the influence of Internet resources on practices outside the network (Jones, 1999).

In the future, a gradual expansion of the user model and the capabilities of social networks can be assumed. In this regard, the solution of tasks, which are mainly related to the processing of social data, will be carried out at a higher level (Aggarwal[, 2011]). Our research makes an attempt to conduct a structural and correlation analysis of the impact of media news media messages on the users through the citation rate in social networks. The approach used does not imply a new methodological solution, but is aimed at improving the argument in the hypothesis of a direct relationship between these phenomena.

Methodology

In accordance with the recommendations of AMEC (n.d.), the International Association of Measurement and Evaluation of Communication, the process of popularization of the content in social media is analysed using a set of metrics, from which the special mention should go to: citation, audience (coverage) and involvement.

Within the framework of the development of the media assessment direction, Brand Analytics (n.d.) developed an analytical system Media Citation Index in Social Media (CI MM). With its help, it is possible to trace the level of virality and the relevance of the published material of a particular publication outside the source site. In addition to the aforementioned metrics, the Index also allows taking into account the weight of the publication in a particular publication at the stages of media planning and evaluating the efficiency of the posted materials. The IC MM reflects the number of links in the social media to the available publications of a particular publication, calculated for the previous calendar month. The calculation takes place through the analysis of all the links placed in social media.

The research is based on the audited information, confirmed by the links from all popular Russian-speaking social networks. The analysis of the interest and demand for news media in social networks is carried out by compiling a semantic core and determining the recurrence rate of key phrases, expressions or words in the messages. The calculation of the importance of repeated words is carried out using the statistical measure , $tf \times id[TF-IDF]$ which makes it possible to estimate the frequency of word usage in the source document, which in turn is a component of the media news collection.

The ratio of occurrence of a specific word (TF) is calculated by comparing the frequency of use of a specific word with the total number of all words in the documents. This approach made it possible to determine more accurately the importance of keywords:

$$tf(t,d) = \frac{n_1}{\sum_k nk} \tag{1}$$

Where k is the number of occurrences of words from all documents. IDF is a frequency inversion that occurs with some word in the base documents:

$$tf(t,D) = \log \frac{|D|}{|(d_1 \supset t_1|} \tag{2}$$

Where $|D|$ is the number of documents in the collection; $|(d_1 \supset t_1|$ is the number of documents in which t_1 occurs. The measure [TF – IDF] is the product of the factors under consideration: $\qquad if \times id(t,d,D) = tf(t,d) \times idf(t,D) \tag{3}$

In the framework of the study, a number of news items were downloaded for a certain period of time (in evaluation, the period of one day is the calculation period) and the stop words were eliminated. Then the phrase was selected by three keywords with the largest tf x idf. Each of these words was compiled with a list of topics in which they were mentioned. This list was also analyzed with a re-selection to verify the results.

If the second group of keywords coincided with the first, then it was believed that for this day there was one significant incident, which was described by these words. Otherwise, a new topic of the news field was created. This set of words was used as a search query. At the same time, the requests were made through equal time intervals. From the list of messages, only those that were received for the first time were selected. The database was created from the unique messages to process the collected information.

The measure of interest in the news from the media in social networks was determined by counting the number of unique messages that were received from the requests for this topic and the number of their citations. The index of citations in social media equals the number of links to the Internet resource for a certain period of time. When calculating the final rating, the period of the calendar year is used, to compare the dynamics of the values of this Index for the month. A potential area of application of the method used is the search and compilation of a brief description of the response of social network participants to certain events.

The empirical evaluation was carried out on the basis of data from the Russian segment of popular social networks. The results obtained make it possible to draw a number of interesting conclusions.

Results and Discussion

Citing of MM media Resources

The dynamics of citing the publications by the users of social media is a remarkable confirmation of the quality and relevance of the media content. Currently, the virality of the content in social media has become one of the key indicators of media resource impact on the general information field. The editorial staff of the leading media considers virality in social media as an indicator of the effectiveness of their work in society. However, the traditional indicator for the media – citing of the publications by other media – is still

relevant. The analytical representation of the trend is Brand Analytics, the rating of media resources, based on the citing of media resources in social media.

The dynamics in the rating for 2017 is defined by the comparison of the Index of Citation with its average annual value. The total number of references to media resources in Russia in 2017 reached 30.4 million. For example, RIA Novosti citations in 2017 exceeded 4.4 million links. The share of a particular publication is represented as the proportion of the virality of the information field formed by the resources, expressed in percentages with a step of 0.1 per cent. At the same time, the number of references to each resource is normalized for a period of 30 days. The results of the generalization of the 30 most popular media resources are represented in Table 1.

Table 1. The share of media resources citations in Russia as of 2017-2018

Media resource	June 2017	July 2017	Aug 2017	Sept 2017	Oct 2017	Feb 2018	Paired correlation*
RIA Novosti	5.3%	5.5%	5.8%	5.7%	6.1%	6.1%	0.99
RT	4.1%	4.0%	4.1%	4.0%	3.5%	3.4%	0.94
Komsomolskaya Pravda	2.5%	2.9%	2.7%	3.1%	3.1%	2.9%	0.94
TASS	2.8%	2.7%	2.9%	3.0%	2.9%	2.6%	0.95
Novosti@Mail.ru	2.0%	1.6%	1.7%	2.2%	3.0%	2.5%	0.88
Lenta.Ru	2.9%	2.9%	2.9%	2.8%	3.0%	2.3%	0.87
Life	3.6%	3.2%	2.7%	2.6%	2.6%	2.3%	0.47
RBC	2.3%	2.3%	2.4%	2.3%	2.2%	2.2%	0.99
Ekho Moskvy	1.6%	1.9%	1.6%	1.6%	1.8%	1.8%	0.96
Medusa	2.7%	2.6%	2.1%	2.1%	2.1%	1.8%	0.56
Vesti.ru	1.8%	2.1%	1.9%	1.8%	1.6%	1.8%	0.91
Kommersant.ru	1.4%	1.5%	1.7%	1.7%	1.6%	1.7%	0.97
Sports.ru	2.1%	2.0%	2.3%	2.1%	1.9%	1.6%	0.84
REN TV	1.2%	1.1%	1.2%	1.2%	1.4%	1.4%	0.99
Kont	1.2%	1.2%	1.4%	1.5%	1.7%	1.4%	0.86
Moskovskiy komsomolets	1.5%	1.8%	1.5%	1.5%	1.5%	1.4%	0.94
Gazeta.ru	2.1%	2.1%	2.1%	1.9%	1.6%	1.4%	0.29
Yandeks.Novosti	3.6%	3.6%	3.8%	2.9%	2.8%	1.4%	-0.89
Radio Svoboda	1.2%	1.2%	1.1%	1.1%	1.2%	1.3%	0.99
Site of the President of Russia	0.4%	0.3%	0.3%	0.4%	0.4%	1.3%	0.97
Rossiyskaya gazeta	1.8%	1.6%	1.4%	1.7%	1.8%	1.3%	0.68
Obozrevatel	1.8%	2.0%	1.8%	1.8%	1.3%	1.3%	0.19
Svobodnaya Pressa	0.8%	0.7%	0.8%	0.8%	0.8%	1.2%	0.99
Blog Alekseya Navalnogo	1.0%	0.7%	1.0%	1.1%	0.9%	1.2%	0.96
Tsargrad	0.5%	0.5%	0.6%	0.7%	0.7%	1.2%	0.99
Sport-express	0.6%	0.6%	0.8%	0.7%	0.7%	1.2%	0.97
Stikhi.ru	1.2%	1.0%	1.1%	1.1%	1.3%	1.2%	0.95
NTV	1.3%	1.5%	1.1%	0.8%	0.7%	1.1%	0.55
Izvestiya	0.7%	1.0%	1.1%	0.9%	1.2%	1.1%	0.90
Rambler/Novosti	1.2%	1.1%	1.2%	1.3%	1.3%	1.1%	0.92
TV channel Zvezda	1.9%	1.6%	1.6%	1.8%	1.5%	1.1%	0.13
Other media resourses	32.7%	33.8%	33.8%	33.9%	32.9%	30.1%	
Total volume of citations, thous	6,185	5,541	5,833	6,179	6,707	9,131	

Note: *Correlation with the total number of messages (the volume of citations)

The top five most cited by participants in social networking sites included RIA Novosti, RT, Life, Lenta.Ru and TASS. It should be noted that RIA "Novosti" traditionally occupies the leading position in social media. "RT" occupies the second place of the rating – the participants in social networks not only quote the information of the channel, but also actively discuss the news. As for TASS, this media resource is increasingly rejecting the image of classical news agency and is working to increase the indicator of the presence in social media. The table below shows the first ten media positions with the maximum number of transitions (Table 2).

A sharp rise in citation was shown by "Komsomolskaya Pravda" with a highly developed regional distribution (+ 40.1 per cent of citations), Novosti@Mail.ru (+ 21.5 per cent of citations). In addition to the appearance in TOP-100 local news, the activation of blogger-pages became a long-term trend. Negative dynamics of the Index in comparison with the average annual level was observed in the news aggregator Yandeks.Novosti (-38.4 per cent), the TV channel RT and Life – each of them showed a slightly more than 17 per cent drop in citations.

Table 2. Rating of citations for 2017

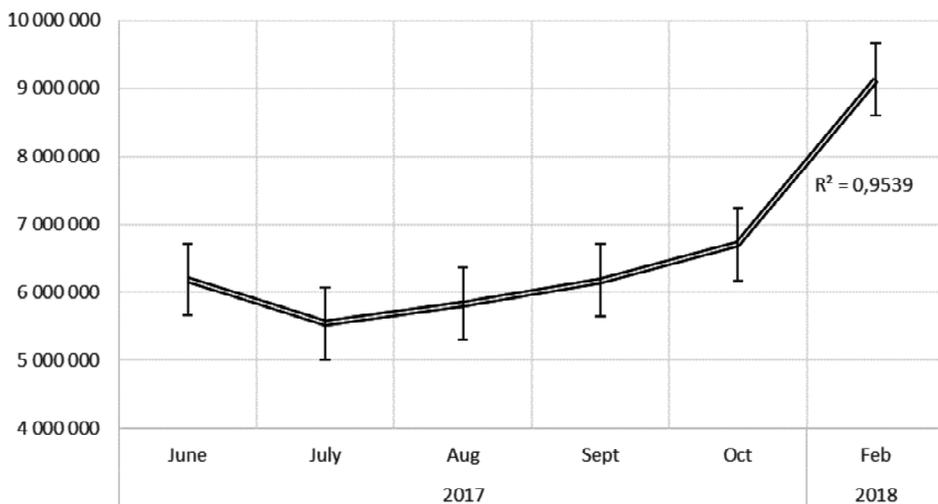| Rang	Media Resource	URL	CI as of 2017
1	RIA Novosti	ria.ru	4,427,489
2	RT	russian.rt.com	3,322,325
3	Life	life.ru	2,700,605
4	Lenta.Ru	lenta.ru	2,358,996
5	TASS	tass.ru	2,343,579
6	Yandeks.Novosti	news.yandex.ru	2,303,961
7	Komsomolskaya Pravda	kp.ru	2,029,558
8	RBC	rbc.ru	1,989,907
9	Novosti@Mail.ru	news.mail.ru	1,872,185
10	Medusa	medusa.io	1,827,644

Figure 1. Trend of changes in citations of Russian media for 2017-2018

The main trends of early 2018 include the growing popularity of Yandex.Dzen in Russia, which rose in the ranking of citations to the second position, previously occupied by RT for a long time. Moreover, Yandex.Dzen got 206 thousand links to the Internet resource, against the 2nd place in absolute growth of RIA Novosti, plus 179 thousand links. The actual growth of the Yandex.Dzen blog platform and the continued growth of the Telegram ecosystem (+ 10 per cent of quotation in February 2018) fix the author's content as the main trend in the media. Thus, based on the data in Tables 1 and 2, for the sake of clarity, a diagram can be constructed showing a direct correlation between the growth of media news reports and the growth of their citations (Figure 1).

This situation is due to the fact that publications in online media directly correlate with the activities of social networks and are caused by the release of one or another information reason. The joint analysis of two parameters - the level of media confidence and the degree of involvement in the information field - confirms that the interest in news broadcast by media is weakly correlated with the general attitude of respondents to media as a social institution (trust in media in general) (Zadorin et al., 2000).

Response of Social Networks Users to News Messages

Let us analyse user response to the news in social networks. On the basis of the results of the research presented above, as a source of citation, let us take the media resource of RIA Novosti as the most popular news source with a substantial base. As a social network for assessing the frequency of responses, the Twitter network was chosen. The evaluation was carried out in several stages: the first period covers November-December 2017 (135,379 messages, of which 57,233 are news sites and 69,257 messages from participants in the social network); the second - January-February 2018 (159,286 messages, of which 49,901
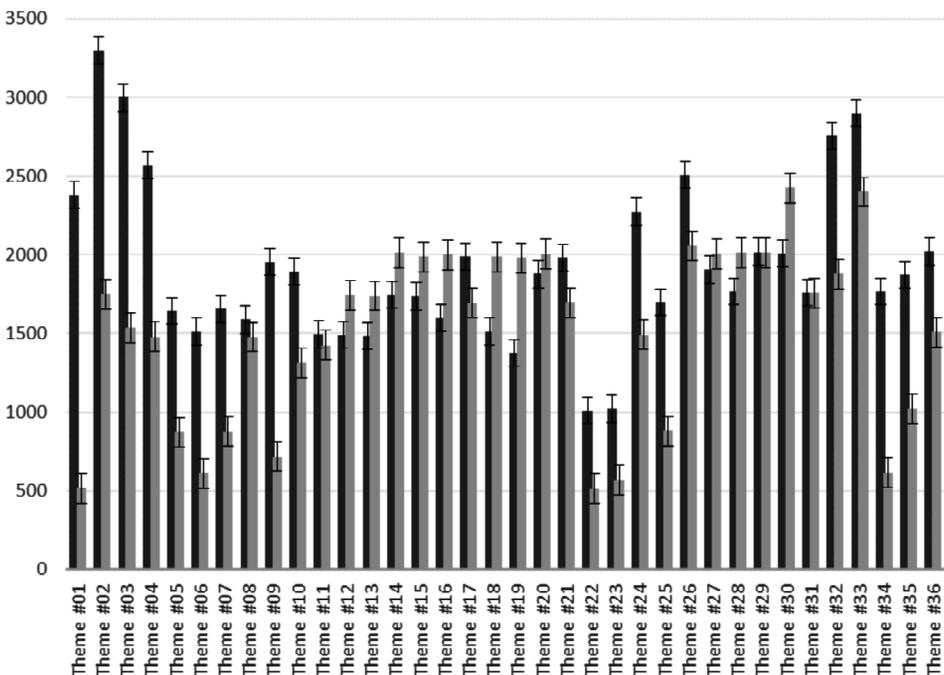

Figure 2. Dynamics of responses of social network users to news reports (citations)

are messages of newsagents, and 90,396 are messages of the participants in the social network).

The received data are presented in the form of a diagram, where the red column diagram displays the number of messages, the authorship of which belongs to the media resources of the media; a column chart of blue color shows the number of messages that were created by users of the social network and are essentially the citation of news messages.

In Figure 2, the sharp fluctuations can be observed. For example, since the beginning of November 2017, users have discussed the news related to the events in Syria. By December 17 of 2017, the number of interested users has increased to 2,400 people. The period from December 22, 2017 to December 31, 2017 reflects the active discussion on the network of news related to crypto-currencies. According to the dynamics of messages, it can be concluded that this topic was rapidly gaining popularity - on December 28, the number of tweets increased to 4,000, which is 2 times more than the number of newsagents' messages. Later, there is a decrease in the trend; most likely the reason for this was the New Year holidays.

The analysis of the citations of media resources made it possible to clearly conclude the following: the importance of agencies that expanded due to the embedding of social networks increased (the experience of RIA Novosti, TASS, etc. clearly demonstrates this); while the classical model of online media (media edition as a website) is gradually losing its significance. Shifting the assembly points of the audience into social networks and messengers requires the media to apply the adaptive solutions.

Conclusion

As the review of literature has shown, in recent years increased attention of researchers has been drawn to the role of MM media resources in social networks. This is seen as a peculiar phenomenon in connection with the attempts to understand the social management mechanisms. The results obtained in the course of our research give strong arguments in favor of this assumption.

Publications in online media directly correlate with the activities of social networks and are due to the release of one or another information reason. The joint analysis of two parameters (the level of confidence in media and the degree of involvement in the information field) made it possible to confirm that the interest in news broadcast by media is weakly correlated with the general attitude of the respondents to media as a social institution. Media consider virality in social media as an indicator of the effectiveness of their work in society. Another important trend is to increase the importance of MM media resources, which have expanded through the integration of social networks, while the classic model of online media (media edition as a website) is gradually losing popularity and audience. This forces the media to adjust to the users who are more interested in social networks and messengers - in the collection points of users.

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