Communications and Networks: Covid-19 on Social Media

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Keywords: social media, neural network approach, user-generated content, actors, digital platforms, perception.

Abstract: The paper deals with the analysis of the reaction of society, of the perception by various groups of social media actors of the beginning of Covid 19 in the Russian-language media landscape. Neural network texts analysis of content dedicated to the beginning of the pandemic and study of digital footprints of actors showed that the audience was divided into two groups - metropolitan and regional. Moreover, the perception of the pandemic, the spread of infection, the assessment of methods to combat the disease, the consequences, etc., differed significantly in both groups of actors.

1 INTRODUCTION

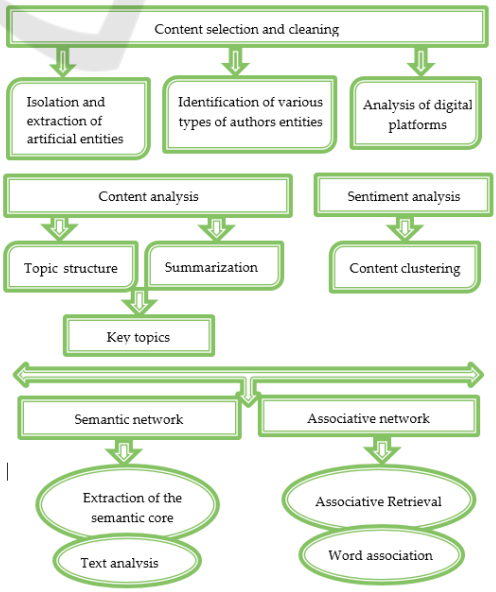
The impact of Covid-19 on various aspects of society has already been covered in numerous scientific studies. researchers pay special attention artificial intelligence technologies which were actively used in the fight against the spread of infection and in the search for effective treatment protocols. In particular, scientific studies have been published that address: the use of artificial intelligence to solve the Covid-19 problems, including forecasting, decision-making to support health care, etc. (Santosh et al., 2021); artificial intelligence to deal with the Covid-19 consequences (Hassanien et al., 2020); the use of intelligent systems to stop the spread of the pandemic (Joshi et al., 2020); neural network technologies for the fight against the coronavirus (Fong et al., 2021); technological solutions to stop the Covid-19outbreak and minimize the risk (Khosla et al., 2021); data mining in the fight against the Covid-19outbreak (Niranjanamurthy et al., 2020); epidemic forecasting models, surveillance and tracking systems (Raza, 2021). In addition, the use of nanotechnology to prevent the spread of infection is explored in (Devasena, 2021). Diseases associated with coronavirus and their consequences caused significant changes in perception, required new research on how people in an extraordinary situation perceive and evaluate their reactions, react to the environment and interact with each other (WHO, 2020; Horesh, 2020).

The aim of the study: the analysis of reactions and concerns of social media actors during the start of of the pandemic in Russia, the perception of social media actors of the consequences of the spread of the coronavirus.

2 METHODS

To analyze the content was applied neural network texts analysis, as well as sentiment analysis and analysis of word association. Digital footprints were explored using content analysis. Neural network technology Text Analyst 2.3 was used as a tool. A detailed description of the methodology is presented in (Kharlamov & Pilgun, 2020).

The study design is presented in the flowchart:



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The procedures are detailed in (Kharlamov et al., 2021; Pilgun et al., 2022).

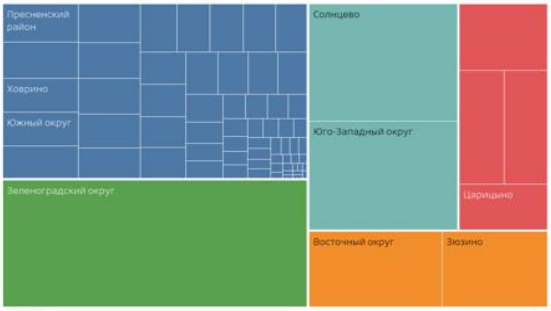
2.1 Data

The dataset of the study was social media data (social networks, blogs, videos, podcasts, forums, instant messengers, reviews) dedicated to the discussion of Covid-19. The material was collected between March 1, 2020 and March 30, 2020.

In Russia, the spread of coronavirus infection began in the capital; in the regions, the pandemic began later. In Russia, the spread of coronavirus infection began in the capital; in the regions, the pandemic began later. Analysis of the semantic network made it possible to identify the most significant assessments and opinions of actors, as well as allowed the content was divided into two groups. The first group consisted of actors with geolocation from Moscow and the Moscow region, the second actors with geolocation from other regions of Russia, as well as Russian-speaking actors from other countries (Table 1; Figure 1, 2). In addition to various regions of Russia, the geolocation of regional actors covers the following countries: Ukraine, Belarus, USA, Israel, Kazakhstan, Germany, Great Britain, Switzerland, Azerbaijan, Moldova, Czech Republic, Fradnce, Australia, Spain, Italy, China, Latvia, Netherlands, Canada, Georgia, Uzbekistan, Estonia, Lithuania, Armenia, Poland, Greece, Cuba, Sweden, Bulgaria, Serbia, Tajikistan, Thailand, Kyrgyzstan, Brazil, Kyrgyzstan, Uruguay, Japan, India, Cyprus, Angola, Vietnam, Fiji, Austria, Albania, Lithuania, Mongolia, Denmark, Egypt, Ireland, Nigeria, Argentina, South Korea, Belgium, Iran, Luxembourg, Mexico, Nepal, etc. (Figure 2).

Table 1. Quantitative data

Regional actors	Data	Moscow actors	Data
Number of messages	157 006	Number of messages	4 535
Max. number of messages per day	10376	Max. number of messages per day	274
Number of authors	47 186	Number of authors	388
Activity (posts per author)	3,33	Activity (posts per author)	11,69



Район					
Зеленоградский округ	1 072	Мещанский район	41	Нагатинский затон	7
Солнцево	484	Митино	41	Южное Бутово	7
Юго-Западный округ	447	Молжаниновский район	39	Очаково-Матвеевское	6
Восточный округ	282	Хорошевский район	39	Северный округ	6
Зюзино	223	Вешняки	38	Троицкий округ, Новомо..	5
Северо-Западный округ	165	Кузьминки	35	Дмитровский район	4
Новомосковский округ	143	Тимирязевский район	35	Кунцево	4
Центральный округ	138	Восточное Дегунино	34	Ярославский район	4
Царицыно	112	Аэропорт	29	Лефортово	3
Пресненский район	80	Соколиная гора	22	Сокольники	3
Null	76	Выхино-Жулебино	18	Дорогомилово	2
Ховрино	71	Новокосино	18	Красносельский район	2
Южный округ	71	Арбат	15	Таганский район	2
Северо-Восточный округ	68	Ясенево	15	Тропарево-Никулино	2
Войковский район	66	Люблино	14	Черемушки	2
Басманный район	61	Метрогородок	13	Алтуфьевский район	1
Хорошево-Мневники	61	Троицкий округ	12	Братеево	1
Хамовники	57	Замоскворечье	10	Бутырский район	1
Крылатское	52	Бибирево	9	Капотня	1
Юго-Восточный округ	49	Богородское	9	Нижегородский район	1
Гольяново	44	Бескудниковский район	8	Раменки	1
Тверской район	44	Измайлово	8	Свиблово	1
Савелки	43	Северное Тушино	8	Теплый Стан	1
Можайский район	42	Марьина роща	7		

Figure 1. Geolocation of the Moscow

Страна					
Null	91 671	Канада	17	Колумбия	5
Россия	63 117	Грузия	15	Россия, Испания	5
Украина	578	Узбекистан	13	Уганда	5
Беларусь	307	Эстония	13	Фиджи	5
США	174	Литва	12	Австрия	4
Россия, Украина	128	Армения	11	Албания	4
Казахстан	94	Польша	11	Зимбабве	4
Германия	91	Греция	10	Литва, Украина	4
Израиль	44	Куба	9	Монголия	4
Великобритания	39	Россия, Израиль	9	Ангилья	3
Швейцария	32	Швеция	9	Андорра	3
Азербайджан	29	Болгария	8	Афганистан	3
Финляндия	27	Сербия	8	Багамские остр..	3
Молдавия	25	Таджикистан	8	Британские Вир..	3
Чехия	25	Таиланд	8	Буркина-Фасо	3
Ватикан	23	Бразилия	7	Дания	3
Гондурас	23	Киргизия	7	Египет	3
Франция	22	Острова Кука	7	Ирландия	3
Австралия	20	Уругвай	7	Нигерия	3
Испания	20	Япония	7	Россия, Беларусь	3
Италия	20	Индия	6	Россия, Гондурас	3
Китай	20	Кипр	6	Россия, Руанда	3
Латвия	18	Ангола	5	Россия, Узбекис..	3
Нидерланды	18	Вьетнам	5	Россия, Эстония	3

Figure 2. Geolocation of the regional active actors.

3 RESULTS

In the content of the regional actors, the peak of generated messages falls on March 27, 2020 (the total number of messages is 10 376), although the dynamics of views has 2 peaks: on March 24, 2020 (6 448 541) and March 28, 2020 (6 362 129). The dynamics of the regional actors' activity demonstrates a gradual increase in interest in the spread of the coronavirus infection, the peak of which also falls on March 27, 2020 (5 471). These peaks depend on the official information on the distribution of Covid 19 in Russia. (Figure 3, 4 and 5). As for the Moscow actors, the largest number of messages is observed on March 25, 2020 (245) and on March 27, 2020 (274), the dynamics of views had peaks value on March 16, 2020 (1 090 578) and on March 18, 2020 (1520161); the dynamics of actors' activity begins to grow from March 12, 2020 (68) and reaches a peak already on March 23, 2020 (93). The reason for the fluctuation of peaks determined by the messages of the mayor of Moscow S. Sobyanin about the situation with the spread of Covid 19 in the capital (Figures 6, 7 and 8).

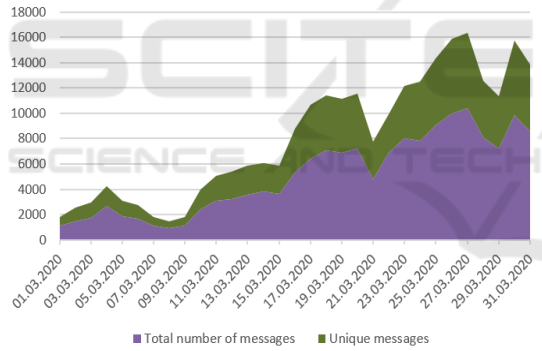


Figure 3. Dynamics of the total number of messages and unique messages of the regional actors.

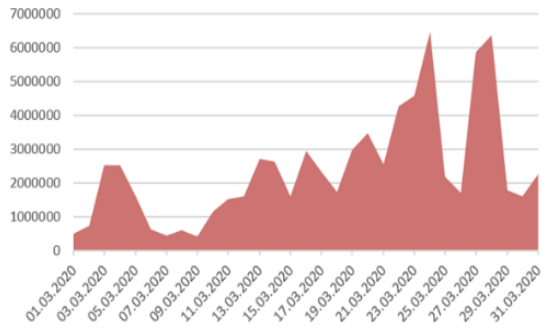


Figure 4. Dynamics of views of the regional actors.

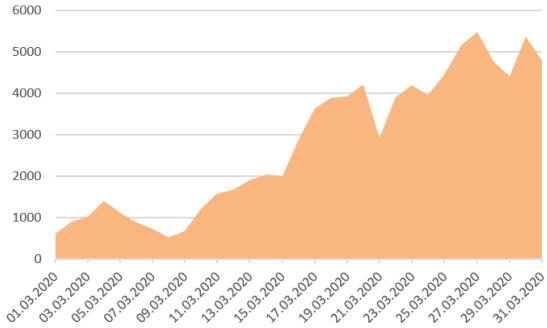


Figure 5. Dynamics of the regional actors' activity.

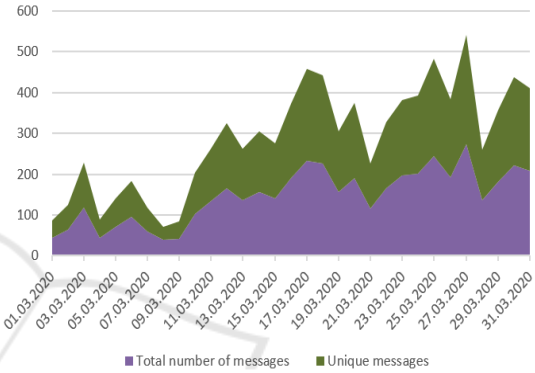


Figure 6. Dynamics of the total number of messages and unique messages of the Moscow actors.

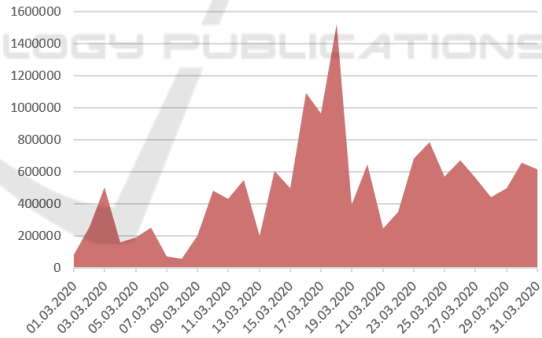


Figure 7. Dyamics of views of the Moscow actors.

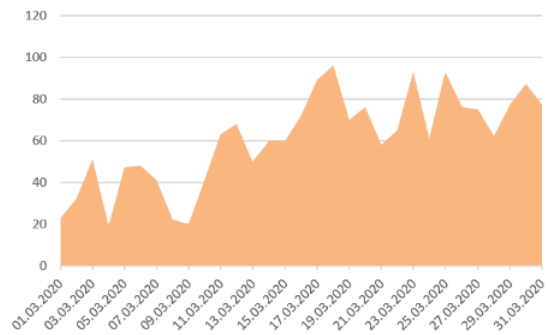


Figure 8. Dynamics of the Moscow actors' activity

In the database of both groups, a neutral cluster prevails; meanwhile, in the Moscow content, the negative cluster accounts for 18,24 %, and in the regional content - 5,04 %. The positive cluster is represented by insignificant data, practically absent. (Figures 9, 10). The sentiment analysis of digital footprints confirms a higher degree of negative reactions in the Moscow group compared with the regional group (Figures 11, 12).

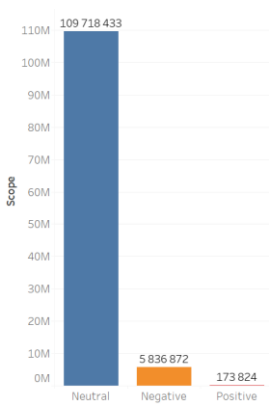


Figure 9. Tonality of the regional actors' messages.

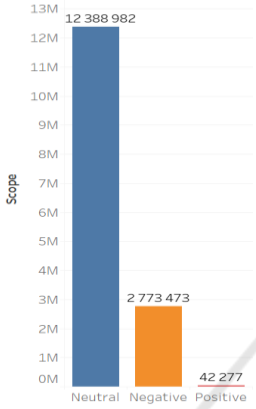


Figure 10. Tonality of the Moscow actors' messages.

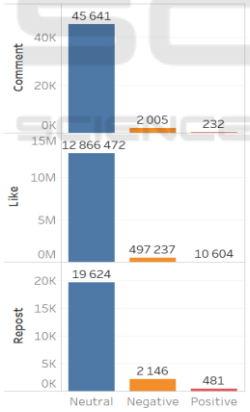


Figure 11. Tonality of the regional actors' footprints.

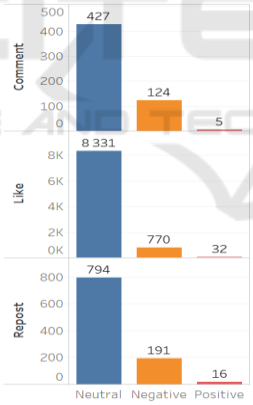


Figure 12. Tonality of the Moscow actors' footprints.

The topic structure of the zonal content dedicated to Covid 19 is exclusively related to the problems of the infection attack in Moscow and then in the Moscow region and further in Russia, as well as the discussion of ways to prevent the spread of a new disease (Figure 13).

In the content of Moscow' actors, along with health problems, a significant portion is taken by political issues, criticism of the authorities' actions, both in relation to the organization of the fight against the c Covid 19, and in relation to other issues, for example, amendments to the Constitution (Figure 14).

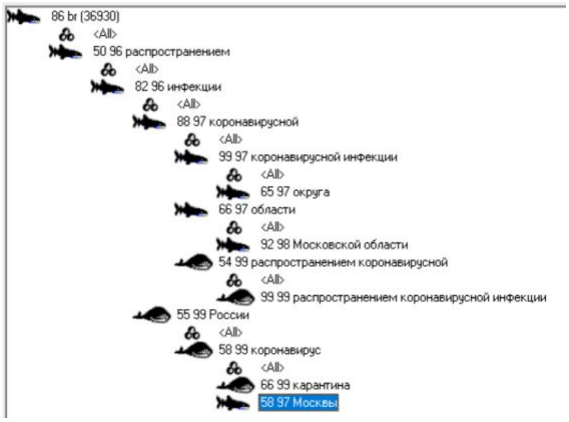


Figure 13. Topic structure of the regional actors' content.

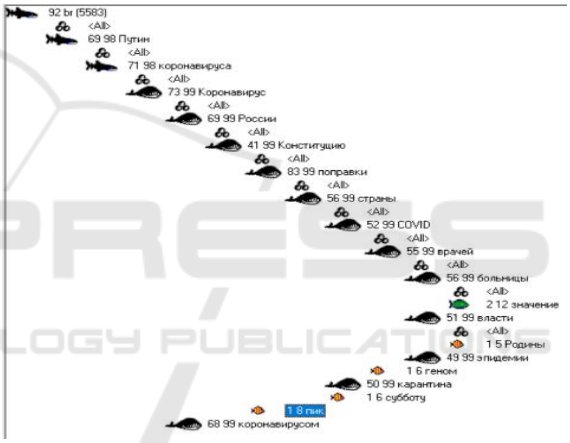


Figure 14. Topic structure of the Moscow actors' content.

The most interesting are the results of the analysis of the core of the semantic network, which make it possible to reveal the hidden assessments and opinions of the actors (Figures 15 and 16).

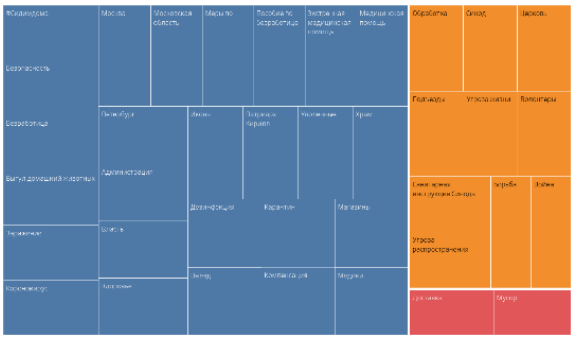


Figure 15. The semantic network of the content of province actors.

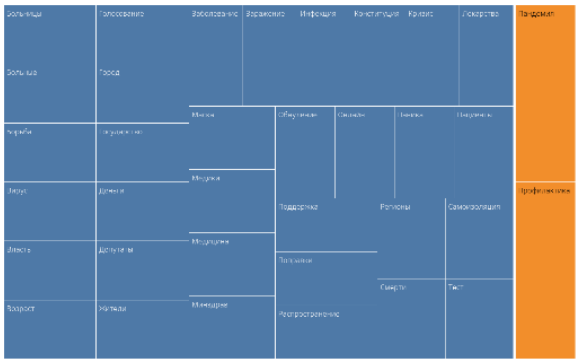


Figure 16. The semantic network of the content of Moscow actors.

3 CONCLUSIONS

Analysis of the data on the beginning of the pandemic in Russia showed that the perception of Covid-19differs significantly in the Moscow and regional group of actors. The impact of the pandemic has mostly affected the inhabitants of the metropolis. The discussion of the coronavirus topic in the Russian-speaking media space was begun by the Moscow actors; their intensity in the generation and the negative connotation of the content prevail over the regional data. The regional content is devoted to the problems of the infection spread in Moscow and then in the Moscow region and further in Russia, as well as the organization of life in the new conditions, the consequences of the pandemic: unemployment in the first instance. The Moscow actors focused primarily on the problems of the pandemic in the capital, and also paid great attention to the rise of the coronavirus in China, Europe and the USA. The coronavirus topics in the Moscow content are closely related to political and economic issues.

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