Sentiment analysis for identifying the political inflection point in Putin's war

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Abstract

Sentiment analysis is a tool used in many areas (marketing, management, sociology) and its effectiveness depends on the quality of sources and the volume of data gathered. The authors present procedures that allow the collection of large volumes of text data and the processing thereof, the result of which is a quick (practically in real time) assessment of emotions and their changes. In the example analysis Russian sources are given (in the Russian language, creating a system of media monopolised by the authorities). The analysis was between week 1 and 17 of 2022 - before and during the conflict between Russia and Ukraine. The results obtained, trends of changes in sentiments pertain to Presidents Joe Biden, Andrzej Duda, Aleksandr Lukashenko, Emmanuel Macron, Volodymyr Zelensky and Vladimir Putin - the results are emotionally charged figures of presidents created for the internal purposes of Russia and provide significant information for analysts of the ongoing conflict. Obtaining similar results without the use of information technology is practically impossible. Sentiment analysis of large resources makes it possible to detect the change dynamics that are difficult for a human being to capture (a person analysing source materials). Concurrently, the cost and time of obtaining results recommends the described method as supporting analytical work.

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Sentiment analysis is a tool used in many areas (marketing, management, sociology) and its effectiveness depends on the quality of sources and the volume of data gathered. The authors present procedures that allow the collection of large volumes of text data and the processing thereof, the result of which is a quick (practically in real time) assessment of emotions and their changes. In the example analysis Russian sources are given (in the Russian language, creating a system of media monopolised by the authorities). The analysis was between week 1 and 17 of 2022 - before and during the conflict between Russia and Ukraine. The results obtained, trends of changes in sentiments pertain to Presidents Joe Biden, Andrzej Duda, Aleksandr Lukashenko, Emmanuel Macron, Volodymyr Zelensky and Vladimir Putin - the results are emotionally charged figures of presidents created for the internal purposes of Russia and provide significant information for analysts of the ongoing conflict. Obtaining similar results without the use of information technology is practically impossible. Sentiment analysis of large resources makes it possible to detect the change dynamics that are difficult for a human being to capture (a person analysing source materials). Concurrently, the cost and time of obtaining results recommends the described method as supporting analytical work.

Introduction

The sentiment analysis related to political support is an issue explored in recent years by many research centers around the world. The available technologies for collecting and analyzing data generated by internet users represent a technological change in the field of political and strategic analysis and information management. Information management is becoming a key and strategic challenge in digital economies. The use of sentiment analysis and information sources – social media, blogs and press comments can be a good source of knowledge allowing the formation of effective predictions of crisis situations.

The armed conflict unleashed in Ukraine by Putin's Russia has been going on for several months and its impact on the political support for Putin's cabinet, the chief director of the Russian invasion, is a highly interesting issue. Despite the fact that the Russian media, including Internet media, are largely controlled by the Kremlin, opinions and comments posted by Internet users penetrate the public space and allow assessment of the sympathy and antipathy of the Russian public towards the president. The analysis of comments based on the technology of sentiment analysis allows conclusions to be drawn about the identification of the inflection point in which negative comments, and therefore - as we assess – political support for Putin's regime began to weaken, and the predominant negative content to become dominant.

Research based on sentiment analysis in political science uses the media. Not only are the internet and the textual forms used for analysis. An example is the Cochrane study, which not only analyzed textual data, but also transcribed data expressing emotions (Cochrane et al., 2022). His team, analyzing the dataset of annotated texts and videos from the Canadian House of Commons, concluded that leading approaches performed reasonably well but dictionaries created using word embeddings are sensitive to the choice of seed words and to training corpus size. He emphasized that transcripts - of course - capture sentiment, but not emotional arousal. In fact, properly interpreting social media posts is not easy. Posts in social media are often treated like in the public sphere, when it should not be. For example, the content of speeches and tweets is programmed - it is produced by algorithms. Such programmed texts have important consequences both - for the forms of speeches and for the content (Dillet, 2022). Moreover, there are some different quantitative calculation methods of sentiment polarity intensity based on video image sentiment recognition and speech sentiment recognition functional modules (Hongmei, Songlin, 2021).

Media analysis in terms of political preferences and support for programs, activities and political leaders themselves has been subject to many approaches and is based on many different sources. Twitter is commonly used for this purpose - mainly because politicians themselves

treat it as a platform for expressing opinions, and tweets spread quickly and gain numerous comments. One of the first research-based analyses of Twitter entries was conducted by Siegel and his team in the winter of 2015/16. Their research was based on the assumption that Twitter is often used for political discussions and therefore Twitter data seem to be well suited for automatic sentiment analysis. The crawler and sentiment analysis in Python has been implemented and collected data was compared to results with the "ZDF-Politbarometer", a monthly TV opinion analysis (Siegel, 2017).

Some researchers, using Twitter more widely, enriched the methodologies used with new approaches to collecting information and analysis. One example is research by Sufi and Alsulami (Sufi, Alsulami, 2022), who proposed a novel approach in automatically processing the real-time social media messages of political leaders. They used artificial intelligence (AI) - based language detection, translation, sentiment analysis, and named entity recognition (NER). Their method allows more accurate geospatial and location intelligence using popular internet map services.

In terms of political support for Putin in the time of war in Ukraine, the analysis of sentiments has additional justification. In post-Crimea Russia, factors having a potential impact on political support for Putin's policy were already analyzed. Sharafutdinova dealt with issues of nationalism and identity politics, nuances in the conceptualization of politics, the uniqueness of Putinism, and the concept of political myth. The issue of collective identity politics and state of emergency in post-Crimea Russia that constitute Putin's regime (Sharafutdinova, 2022). Divisions among Russian elites seems to be more likely as a real power to end the regime. Putin has been taking legal, as well repressive actions to control the mass media to secure the political stability of the regime. Despite the instrumentalization of social media, the urban middle class seems no longer to be its social clientele. The war in Ukraine is causing discontent. Putin's appeals to the values of Imperial Russia and patriotism are losing traction (Heinemann-Grüder, 2021). The lives of the generation born in the post-Soviet era are immersed in the Internet and focused on shiny material goals. Youth does not choose open street protests as a common method of political expression and street protesters are still rare, but emotions are beginning to be expressed in comments in the Internet media. The collapse of Imperial Russia in World War I, and again (as the Soviet Union) in the late 1980s ending the Cold War was due to its lack of internal strength. The current actions of the Russian government point to the same problem (USA Today Magazine 150 (2923): 8–9, 2022). Modern Russia is a country in which the political support for Putin's power is necessary to maintain the status quo not only of the

political class associated with the Kremlin, but also for a large group of Russian oligarchs. Maintaining the status quo and securing interests requires Putin to act in the sense of Russian autocracy – including planning armed conflicts that are aimed at consolidating society around new goals and against specific enemies. Actions in this area allow the maintenance of power and protect the stakeholders of Russian tsarist-style autocracy (Russian: самодержавие).

The popularity of qualitative methods with literature studies using big data methods and text data mining method is growing. Qualitative research prioritizes extracting, discovering and explaining the explicit and tangible meaning from the data collected, but the validity of the findings is narrowed by the weakness of the keyword-based intrinsic bibliometric analysis (Syaifuddin et al., 2021).

The tool we used for sentiment analysis is based on supervised and unsupervised machine learning-based techniques for social media, mainstream internet press and blogs. The tool is dealing with the limitations and incorrectness of many previous methods. We integrated the sentiment towards a particular object. We emphasize that many of opinions in Russian internet were or may have been censored (or self-censored), but the statistical analysis we applied identifies the trend and deviations from it of different origins.

Data collection methodology

Jazon, a proprietary system was used to collect data. The first version of it was launched in May 2015. Since that time, Jazon has incessantly, 24 hours a day, 7 days a week and 365 days a year, been collecting data from open sources of information. Over the span of seven years, over 60 million records from over 38 thousand sources have been collected. The collected materials include primarily dispatches from press and news agencies, blog articles with readers' comments, academic articles and publications. Jazon has been designed for directed collection of text information. The data set collected in the base is a result of a series of research works which were carried out using the system. In the past, Jazon was used for basic, industrial and commercial BRI research and for the purposes of B.A., M.A. and Ph.D. theses. Owing to its functions, Jazon proves useful in research, where unstructured text data are used as raw material. Each research follows the same pattern, the first step being the identification of the sources of information the system will extract data from. This is for the system to collect as much data regarding a specific research issue as possible. This translates into lower system maintenance and operation costs. Concurrently, the lower amount of data makes the time

needed for processing optimal. An advantage of the system is that it collects only the data indicated by the researcher. Jazon relieves the researcher of the tedious and time-consuming process of gathering research data.

The basic input format for the Jazon system is an RSS file which contains basic data necessary to collect information such as the link to the source information and date of publication. If a specific source of information does not have an RSS feed, the researcher must use ready-made, proprietary modules which generate a quasi-RSS feed on-line. It is also possible to use ready-made commercial solutions as well as based on free software. Therefore, it is possible to feed text content from various data sources in various formats into the Jazon system's database. In the event of inputting non-text data, the system attempts to recognise the data format and convert it into text format

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A defined RSS feed - a source of information, regardless of how it is generated, comprises a single source of data which may contain any number of links to content the system is supposed to collect.

For RSS feeds in which data are generated on-line, as well as for news services, the Jazon system collects data all the time, until it is stopped by system operation or until the broadcaster stops publishing new information. This means that the system may collect data for a long time. The process of data collection itself has been designed so as not to interfere with the operation of services from which data are collected. This means that the process of retrieving data from external systems is, by definition, slow. When preparing for the research, the researcher must take this aspect into account. It is worth mentioning at this point that some research requires collection that is spread over time. This feature is particularly useful when the research consists in time series data analysis. For research, wherein the time series plays an important part, content from news of press agencies which publish news at specific intervals is particularly useful. For example, after starting a collection from a new source with the above characteristics, in order to retrieve data covering a period of one month, the collection process must take one month. As a rule, the Jazon system does not collect archive news that had been published in the past. It is rather a system for collecting data coming in on a regular basis. For this reason, among others, the research presented here has to take a certain, rather long, time. Archive data collection is technically possible, but it requires proper preparation of a dedicated quasi-RSS feed. Some sites provide data in the form of SITEMAPS, which greatly facilitates the

preparation of a quasi-RSS feed for downloading the site's archive data[1]. In other cases, software dedicated for a specific site should be developed, which will be able to return the quasi RSS containing links to archive documents with the dates of actual publication. The structure of such a dedicated module is not always trivial, as it largely depends on the structure of the site.

The basic research material for the Jazon system, apart from data identifying the source of data, is a text document. In addition to the actual content, each text document also contains a set of metadata identifying the source, scope and time of publication, data related to the retrieval process (date, modification time etc.), author and the language of the record.

The system comprises the following modules: data gathering, data collection, monitoring, reporting and backup.

The data collection module contains a set of agents responsible for the retrieval of data from sources indicated by the researcher. In the current version of Jazon, each agent may retrieve data from one or more RSS feeds (sources). Each agent has an internal, simple database, wherein information on documents previously retrieved are stored. This ensures that subsequent launch of the agent for specific information sources does not unnecessarily retrieve the same documents. Depending on the information source, the agent launches cyclical data collection at specific intervals. The frequency at which a specific source may be monitored in order to retrieve new data ranges from one minute to one year. On average, each source of information is checked for new information with a frequency ranging from 2 to 8 hours. The agents of the data gathering module transfer the retrieved information to the collection module. The data gathered by the agents are recorded in the database consisting of a number of servers, wherein a data replication mechanism is established between servers.

The monitoring module oversees the whole structure. It is responsible for ongoing control over the operation of individual system elements. Any irregularities occurring are signalled to the administrator within a few minutes. System monitoring covers not only the control of correct operation of server hardware components, resource consumption, software updates, but also the correctness of processes carried out in the system. The monitoring system is also used to control the expiry dates of external services without which the system will not operate properly. Such external services include such elements as the Internet and expiry dates of certificates. Monitoring makes it possible not only to extensively observe the proper operation of the system, but also the correctness of the research process.

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[1] The description of the design and operating principle of SITEMAPS is described at: Sitemaps.org webiste [at:] https://www.sitemaps.org/pl/index.html, date accessed: 24 August 2018

Case study - the Russia - Ukraine war

The data gathered by the JAZON system come mainly from RSS channels fed by information providers. These channels contain mainly content in the html format. The source data are cleansed of html tags only, hence the texts, apart from the content directly related to the researched topic, also contain fragments unrelated to it and fixed elements of the website (menus, navigation labels, headers or footers, advertising content etc.).

The query was run on 510 identified sources including texts in the Russian language. In the first stage, text files regarding Ukraine (the term 'Ukraine' occurred at least once) were selected from the data set. The files were aggregated according to the order of the weeks over the analyzed period (from week 1 to week 22 of 2022). In subsequent weeks a sentiment analysis was carried out for Joe Biden, Andrzej Duda, Emmanuel Macron, Aleksandr Lukashenko, Vladimir Putin and Volodymyr Zelensky. The analysis was performed using the Phyton and R software and a Russian dictionary of sentiments The dictionary included categorised emotions: *anger, anticipation, disgust, fear, joy, negative, positive, sadness, surprise and trust.* Further on, only negative and positive evaluations for each of the studied presidents (PN, PP) and expressed as percentages of all emotions for the subsequent presidents (n) in the following weeks (i) are included:

$$I^N_{(n,i)} = \frac{N_i}{\sum S_i}$$

$$I^P_{(n,i)} = \frac{P_i}{\sum S_i}$$

I – sentiment value

S – marked expression – sentiment (unsigned, any)

P – positive sentiments

N – negative sentiments

n – president "x"

i – i[th] week

The calculated percentage values of negative and positive sentiments are summarised in table 1.

Table 1: Values of sentiments for selected presidents from week one to seventeen

Week	Joe Biden	Andrzej Duda	Emmanuel Macron	Aleksandr Lukashenko	Vladimir Putin	Volodymyr Zelensky
			Negative			
W2022-01	20.40	14.81	15.67	19.77	22.80	17.07
W2022-02	19.89	21.43	22.22	16.31	20.51	18.53
W2022-03	21.27	11.54	13.16	20.14	20.73	21.44
W2022-04	21.24	20.44	20.48	17.66	18.96	18.81
W2022-05	21.65	13.58	14.23	21.68	20.77	19.46
W2022-06	18.77	14.29	17.04	18.00	19.21	18.84
W2022-07	18.13	18.18	18.27	19.52	20.33	19.86
W2022-08	19.20	19.58	13.97	19.22	20.70	21.30
W2022-09	19.38	18.87	20.82	16.87	19.89	18.68
W2022-10	21.50	22.92	17.37	23.42	18.87	19.05
W2022-11	18.40	11.76	20.43	29.58	20.11	17.90
W2022-12	21.20	8.96	17.78	17.07	21.95	18.36
W2022-13	18.92	15.59	28.57	13.64	24.56	21.54
W2022-14	23.83	22.22	18.24	21.05	24.18	21.41
W2022-15	21.88	21.95	21.20	20.47	20.82	19.96
W2022-16	21.32	30.00	20.56	17.20	20.49	19.46
W2022-17	22.56	33.33	18.02	14.75	21.34	20.63
			positive			
W2022-01	17.87	22.22	19.35	18.98	17.10	20.86
W2022-02	18.93	15.31	17.36	21.46	15.79	19.96
W2022-03	19.36	32.69	27.63	18.76	16.41	18.26
W2022-04	18.82	16.06	22.29	21.23	19.36	20.61
W2022-05	18.41	19.75	26.33	17.58	17.25	19.23
W2022-06	20.56	27.62	22.45	18.55	17.00	20.58
W2022-07	21.32	25.00	21.73	21.13	18.07	19.51
W2022-08	21.37	19.58	24.86	20.19	15.89	17.27
W2022-09	20.46	21.70	21.19	25.46	18.04	18.36
W2022-10	19.39	25.00	24.55	18.02	18.06	18.18
W2022-11	21.01	23.53	17.87	8.45	16.80	19.59
W2022-12	19.80	23.88	20.00	17.07	16.03	22.64
W2022-13	27.03	23.05	21.43	40.91	12.43	18.46
W2022-14	16.82	22.22	20.95	14.91	14.16	16.21
W2022-15	17.33	31.71	18.40	21.26	16.89	17.04
W2022-16	16.24	40.00	18.95	21.51	18.39	19.95

| W2022-17 | 17.68 | 25.00 | 19.77 | 19.67 | 17.03 | 17.04 |

The graphical analysis of sentiments reveals their clearly changing trends before and after the Russian invasion of Ukraine (Figure 1). Over the first seven weeks of 2022, Joe Biden was presented in the Russian media increasingly rarely with negative and more positive opinions. The tense relationship between Russia and the US did not translate into building a negative image of Joe Biden, and even from week five onwards positive sentiment prevailed. A drastic change in the narrative occurred upon the Russian invasion – the trends of emotions switched direction and from week 12 onwards negative sentiments started to predominate. There is an obvious rationale behind the changes, and it stems from the USA's involvement in helping Ukraine.
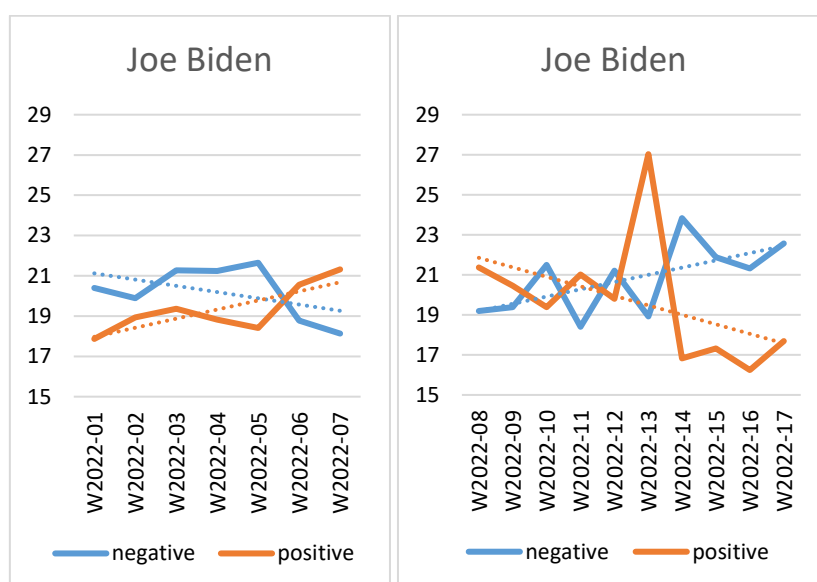

Figure 1: Trends of sentiment change around Joe Biden (source: own research)

A similar change occurred in sentiment trends regarding Vladimir Putin (Figure 2). Until the attack by Russian troops on Ukraine, negative opinions were more frequent than positive ones, but demonstrated a decreasing trend. On the other hand, the positive sentiments trend grew. Similarly as in the case of Joe Biden, the invasion changed emotions – from week 8 to 17, the frequency of negative sentiments displayed a growing trend, whereas positive sentiments decreased. That is where analogies no longer apply. Joe Biden is a party to the conflict and the USA is perceived as an ally of Ukraine, whereas the emotions associated with Vladimir Putin come from the internal sources of a state at war. From the perspective of Vladimir Putin, the president of Russia, such a situation is unfavorable. It requires action, which may, firstly, force

Putin to undertake measures to improve his image (and these depend on subjective assessment) or may even lead to a change forced by the surroundings – undoubtedly, "something" will happen in Russian domestic policy.
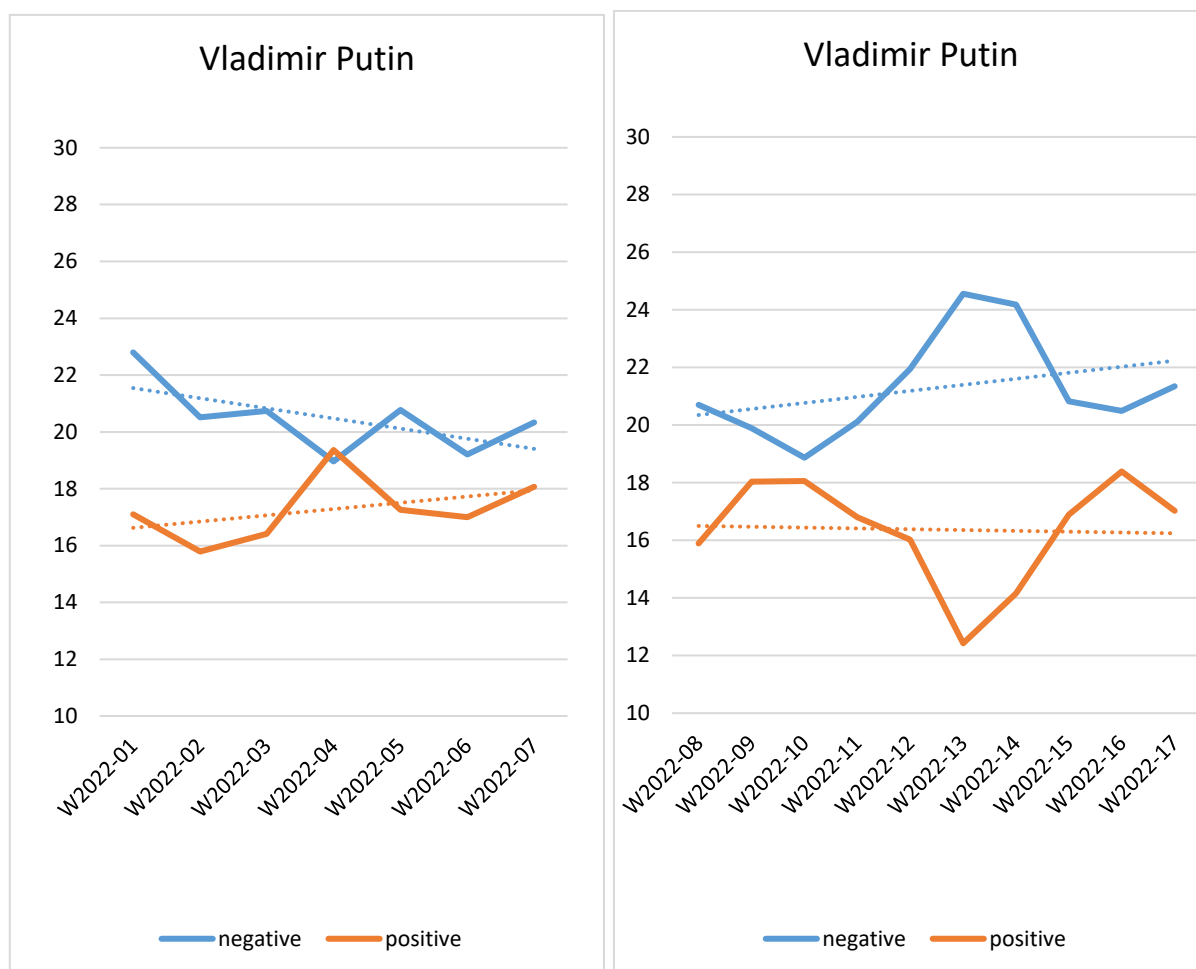

Figure 2: Trends of sentiment change around Vladimir Putin (source: own research)

In the case of sentiments around Volodymyr Zelensky, trends continue to demonstrate similar tendencies before and after the invasion (Figure 3). The negative sentiment trend, although initially below the positive emotion trend, has maintained its upward direction and is now dominant. Positive emotions continue to decrease consistently– this situation is intuitively expected and corresponds to the dynamics of the conflict.
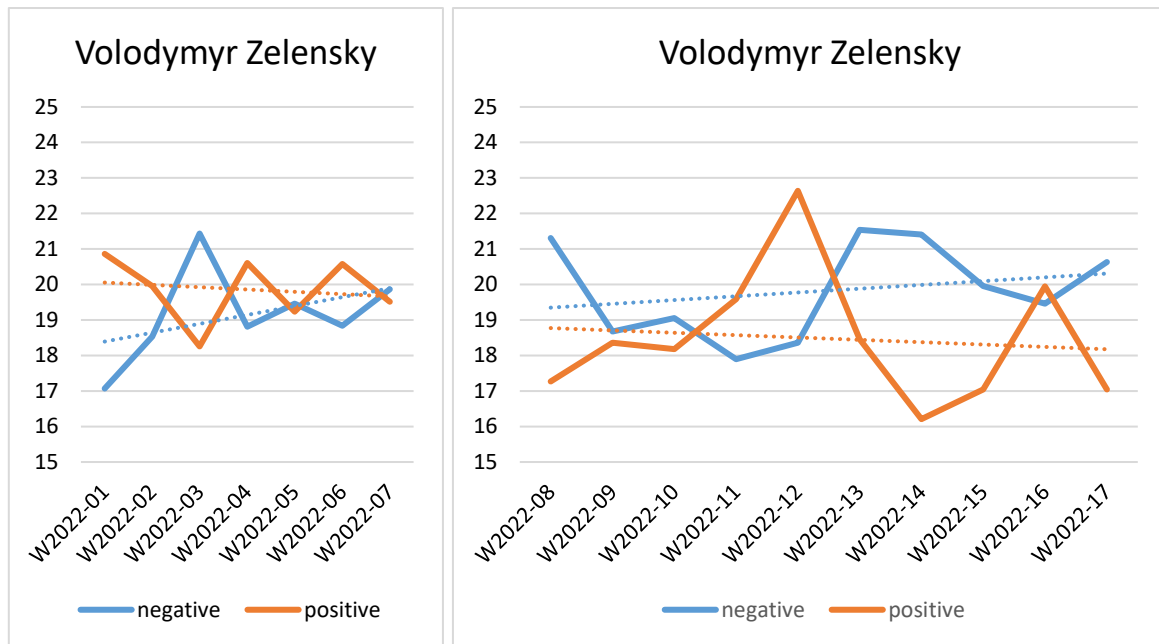
Figure 3: Trends of sentiment change around Volodymyr Zelensky (source: own research)

Using the slopes of trend lines determined based on the values described in Table 1, we can determine the trend of change which is the difference between the trends of positive and negative opinions (overall assessment). In consequence, the result will show the direction of the change in emotional assessment of the analyzed presidents. The higher the number, the more positive the assessment. Table 2 summarises the values of trend slopes and the overall assessment from week 1 to 7 of 2022 (until the invasion of Ukraine). The strongest negative trend of changes related to president Volodymyr Zelensky (-0.315). Emotions regarding Aleksandr Lukashenko demonstrated a similar, decreasing trend (-0.165). Positive ratings increased the fastest for Andrzej Duda (0.792), Joe Biden (0.762) and Emmanuel Macron (0.624). The moderate rank of Vladimir Putin is surprising, although the positive opinion demonstrated an upward trend, however the strength of the increase was the lowest among those analyzed.

Table 2: Sentiment trends regarding presidents from week 1 to 7 of 2022

	Negative	**Positive**	**overall assessment**
Volodymyr Zelensky	0.2502	-0.0652	-0.315
Aleksandr Lukashenko	0.1439	-0.0207	-0.165
Vladimir Putin	-0.3563	0.2203	0.577
Emmanuel Macron	-0.0527	0.5714	0.624
Joe Biden	-0.3095	0.4521	0.762
Andrzej Duda	-0.0765	0.715	0.792

(source: own research)

11

After the Russian attack on Ukraine, considerable changes in emotions accompanying the presidents occurred (Table 3). In that period the highest downward trend was recorded for Emmanuel Macron, with general assessment maintaining a decreasing trend (-0.852). An upward trend related to positive sentiments toward Joe Biden has also turned into a downward one (-0.837). The downward trend in positive opinions also affected Andrzej Duda (-0.178) and Volodymyr Zelensky (-0.173), although in the latter case the trend is not as negative as it was initially. The sole president who enjoys an upward trend of good emotions is A. Lukashenko. Growing negative emotions related to Vladimir Putin (-0.238) came as a surprise. The war brought this change. Negative view are growing around Vladimir Putin.

Table 3: Sentiment trends regarding presidents from week 8 to 17 of 2022

	Negative	**Positive**	**overall assessment**
Emmanuel Macron	0.3525	-0.4996	-0.852
Joe Biden	0.3619	-0.4747	-0.837
Vladimir Putin	0.2095	-0.0284	-0.238
Andrzej Duda	1.4234	1.2453	-0.178
Volodymyr Zelensky	0.1067	-0.0663	-0.173
Aleksandr Lukashenko	-0.4948	0.1639	0.659

(source: own research)

Conclusions

The result of the analysis of sentiments regarding presidents is a contribution to qualitative research and political science analyses. The qualitative analyses conducted identify the trends of changes, as well as their directions and strength. The study presents sentiment analysis as an effective method of identifying inflection points in the context of changes in political sympathies caused by a military conflict. The number of analyzed source documents reveals directions which are difficult to discern from the perspective of an analyst employing traditional methods, i.e. reading physical sources. The incorporation of tools that allow exploration of large data sets into the analysis, in particular sentiment analysis based on supervised and unsupervised techniques rooted in machine learning for social media, not only allows a reduction in analysis time (and therefore bringing the process closer to real-time analysis methods), but also a more accurate assessment of situation using non-obvious conclusions free from errors caused by the subjectivity of the researcher.

Despite the fact that many opinions in the Russian Internet are or may potentially be censored (or self-censored), the adopted methodology allowed clear identification of trends and indication of the inflection point for the analyzed politicians.

The study helped identify a surprising change which has taken place around Vladimir Putin, i.e. a change in the perception of the Russian leader among Russian Internet users. Taking into consideration the nature of the sources and their specifics (a practically undifferentiated media system and media representing the official position of the authorities), the negative trends we identified around Vladimir Putin correspond to the slow erosion of his authority. The tradition of succession in Russia (Stalin, Khrushchev) suggests the interpretation of our research results as a potentially quick change of president.

We realize that the course of events ultimately verifies the credibility of the method we presented. However, one should take into consideration the enormous complexity of the political and military situation on the sentiments we analyzed. The dynamics of the processes currently taking place in Russia and the complexity of human behavior as well as responses to them make an unambiguous assessment of the situation a huge challenge not only for researchers studying the subject and relying on modern methods of analysing large data sets, but also for political scientists and prominent specialists in Russian domestic politics. The method we have proposed, however, has a positive trait, namely it allows a closer look at the current (practically in real time) situation and how it is perceived by potential voters. The up-to-datedness and cost of acquiring data recommend the procedure described above for use in analytical works.

References

- Chen, Boyu, and San Hwang. 2015. "Senkaku/Diaoyu Islands Dispute and Taiwan's Netizens' Sentiments Toward Japan and China." *East Asia: An International Quarterly* 32 (4): 385–99. doi:10.1007/s12140-015-9245-3.
- Chung, Wingyan, and Daniel Zeng. 2020. "Dissecting emotion and user influence in social media communities: An interaction modeling approach." *Information & Management*. Jan2020, Vol. 57 Issue 1, doi: 10.1016/j.im.2018.09.008.
- Cochrane, Christopher, Ludovic Rheault, Jean-François Godbout, Tanya Whyte, Michael W.-C. Wong, and Sophie Borwein. 2022. "The Automatic Analysis of Emotion

in Political Speech Based on Transcripts." *Political Communication* 39 (1): 98–121. doi:10.1080/10584609.2021.1952497.

- Dillet, Benoit. 2022. "Speaking to Algorithms? Rhetorical Political Analysis as Technological Analysis." *Politics* 42 (2): 231–46. doi:10.1177/0263395720968060.

- Georgiadou, Elena, Spyros Angelopoulos, and Helen Drake. 2020. "Big data analytics and international negotiations: Sentiment analysis of Brexit negotiating outcomes." *International Journal of Information Management*. Apr2020, Vol. 51. doi: 10.1016/j.ijinfomgt.2019.102048.

- Heinemann-Grüder, Andreas. 2021. "Will Putin's Regime Survive?" *Russian Analytical Digest*, no. 266 (April): 11–12. doi:10.3929/ethz-b-000477859.

- Hongmei, Wan, and Tang Songlin. 2021. "Sentiment Analysis of Students in Ideological and Political Teaching Based on Artificial Intelligence and Data Mining." *Journal of Intelligent & Fuzzy Systems*, May, 1–10. doi:10.3233/jifs-219047.

- Ильин, Владимир Александрович, and Михаил Владимирович Морев. 2019. "Национально Ориентированная Ротация Элит - Важнейшее Условие Реализации Национальных Проектов." *Economic & Social Changes: Facts, Trends, Forecasts / Economicheskie i Sotcialnye Peremeny: Fakty, Tendencii, Prognoz* 12 (4): 9–25. doi:10.15838/esc.2019.4.64.1.

- "Russia and Ukrain: What Is at Stake?" 2022. *USA Today Magazine* 150 (2923): 8–9. https://search.ebscohost.com/login.aspx?direct=true&db=f5h&AN=156666959&lang=pl&site=ehost-live

- Sharafutdinova, Gulnaz. 2022. "Is Politics Always the Same? Response to Comments on The Red Mirror: Putin's Leadership and Russia's Insecure Identity." *Nationalities Papers* 50 (3): 624–27. doi:10.1017/nps.2021.98.

- Siegel, Melanie, Jennifer Deuschle, Barbara Lenze, Marina Petrovic, and Sascha Starker. 2017. "Automatische Erkennung von Politischen Trends Mit Twitter - Brauchen Wir Meinungsumfragen Noch?" *Information -- Wissenschaft Und Praxis* 68 (1): 67–74. doi:10.1515/iwp-2017-0009.

- Sufi, Fahim, and Musleh Alsulami. 2022. "A Novel Method of Generating Geospatial Intelligence from Social Media Posts of Political Leaders." *Information (2078-2489)* 13 (3): 120–N.PAG. doi:10.3390/info13030120.

- Syaifuddin, Muhammad, Suswanta, and Misran dan Syamsul Bahri Abd. Rasyid. 2021. "Mapping Political Theory Using Bibliometric Analysis." *Jurnal Wacana Politik* 6 (2): 163–73. doi:10.24198/jwp.v6i2.31870.