

Effects of the Russo-Ukrainian War on the Editor Activity of the Ukrainian, Russian, and English Wikipedias

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Abstract

Wikipedia is for many users a key information source for recent events and background information regarding them. However, as a collaboratively created knowledge source, the editor activity might be affected by critical events such as disasters or war, potentially limiting the ability of Wikipedia to provide reliable and up-to-date information. In this study, we focus on the ongoing war between Russia and the Ukraine and study its effects on the editor activity in the Ukrainian, Russian, and English Wikipedias. Through our analysis, we establish, for example, for the Ukrainian and Russian Wikipedias a short-term decrease in the number of edits that dissipates a month after the invasion but an overall increase in the average size of the individual edits.

Keywords: Wikipedia, online activity, behavioral analysis, Computational Social Science, Difference in Difference analysis

Introduction

The Russo-Ukrainian War, also known as the Russian invasion of Ukraine, leaves significant traces on the internet, which has been used as a tool to spread information and propaganda, shape public opinion, and mobilize support. During the crisis, a sudden interest in social media and other online platforms such as Twitter which exhibited a high daily volume of activities has been noticed (Shevtsov et al., 2022). Wikipedia, as a leading resource of reliable information, plays a key role in the spread of information in many forms, such as news, events, updates, and social movements. However, during times of crisis, the volunteer-based model may be impacted since Wikipedia’s volunteer contributors (and readers) might be preoccupied with other tasks. On the other hand, contributing to Wikipedia could also be seen as a way to contribute to a good cause with limited means available. Thus, the overall net effect on Wikipedia contributions is non-trivial to predict. Previous works in-

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vestigated Wikipedia in other crisis situations, e.g., by studying view and edit counts in different Wikipedia languages during the Covid-19 pandemic (Ribeiro et al., 2021; Ruprecht et al., 2021). In this context, a significant increase in the edit volume and the number of newcomers could be shown. To the authors’ knowledge, the effects of the recent conflict between Russia and Ukraine on the edit community have only been investigated for specific articles (Roberts and Xiong-Gum, 2022) but not in a quantitative way. At the same time, while Wikipedia’s editing policies aim to ensure a neutral point-of-view, the nature of the conflict could also lead to a disruption of the editing process by strongly dissenting viewpoints on the conflict, leading to edit wars.

In this work, we focus on studying the behavior of the Ukrainian, Russian, and English Wikipedia editor community directly after the escalation of the conflict with the Russian invasion in February 2022. Overall, we approach with this study the following research questions:

- RQ1: How does the activity change for editors and viewers during the war?
- RQ2: How does the collaboration between editors change?

Datasets and Methods

To answer the first research question, we investigate the impact of the war through the use of various metrics. In this extended abstract, we specifically focus on the edit volume (i.e., the number of edits) and the amount of contributed information in bytes. We closely follow the methodological approach from previous work (Ruprecht et al., 2021) on the Covid-19 pandemic. The data for our study was obtained from Mediawiki history dumps of the English, Russian, and Ukrainian Wikipedias to provide a diverse range of perspectives on the war (global and localized). While we focus on the period of time directly after the start of the war, we also obtained data for 2020, 2021, and 2022 as a baseline for the analysis, acknowledging also potential effect of the Corona pandemic in these years. The collected data was then converted into multivariate time series. Subsequently, we conducted a difference-in-difference

(DiD) analysis of the data. In direct analogy to previous work, we study consecutive 7-day rolling windows of the data after the invasion day, using a 30-day window of data prior to the invasion day as a point of comparison, see (Ruprecht et al., 2021) for methodological details.

To answer the second research question, we investigated for all three studied Wikipedias three groups of articles: (a) the most viewed articles, (b) articles related to the war, i.e., the respective main article on the war and all articles that have been linked from there, and (c) a random sample of 500 articles. For those articles, we obtained hashes of all revisions in **Sha1** format. Based on those, we computed the number and rate of reverts by comparing the hashed revisions of each article.

Results

Our main results can be summarized as follows:

RQ1: Regarding the number of edits, a similar trend can be observed after the start of the invasion for both Russian and Ukrainian Wikipedias. As depicted in Figure 2, there is a significant decrease in activity near the date of the invasion in Russian and Ukrainian Wikipedias, followed by a recovery. For the Ukrainian Wikipedia, the level ultimately surpasses pre-invasion activity. The observed recovery in activity for both Russian and Ukrainian Wikipedias after the invasion date is a positive indication of the resilience of the communities contributing to Wikipedia. Regarding the amount of contributed information, see Figure 3, we observe a sharp increase that begins 10 days after the invasion for both Russian and Ukrainian Wikipedias. This increase persists for an extended period, resulting in a higher level of contributed information compared to the values observed in 2021 and 2020. By contrast, the English Wikipedia does not show any noticeable change in contributed information during this time period. This can indicate that the editors' attention has likely been focused on fewer but larger edits.

RQ2: Regarding the revert rate, we find a significant increase in the revert rate, see Figure 4, immediately following the invasion. The increase in the revert rate for both languages suggests disagreement and lack of consensus in the early days after the invasion, with a tendency towards greater consensus being achieved after 15 days, possibly due to stricter regulations. In particular in articles related to the war itself, i.e., the articles linked from the respective main war article, we see a substantial spike in the revert rate, see Figure 1.

Conclusions

In this work, we have shown changes in editor activity in the Ukrainian, Russian, and English Wikipedias in the period following the Russian invasion of Ukraine in February 2022. We found a short-term decrease in the

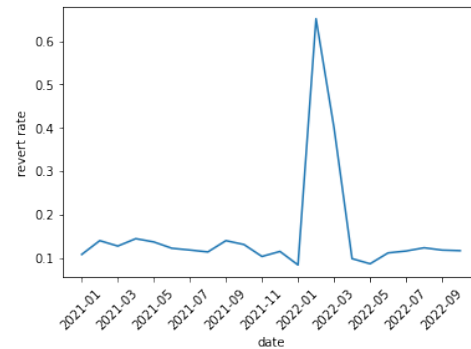


Figure 1: Revert rate of the Russian Wikipedia for articles related to the Russo-Ukrainian War

number of edits but a much smaller decrease (if at all) in the aggregated contributed information in bytes for the Ukrainian and Russian Wikipedias. In the mid-to-long term, the contributed information increases compared to the pre-war period. This suggests that the Wikipedia editor communities are overall resilient in times of war. Furthermore, we found indications of a polarized community specifically in the Russian Wikipedia after the escalation of the conflict. In additional parts of our analysis (not further described in this extended abstract), we also investigate the number of newcomers to the editor community, readership data regarding the number of pageviews of different article groups, and the toxicity in the edit comments.

References

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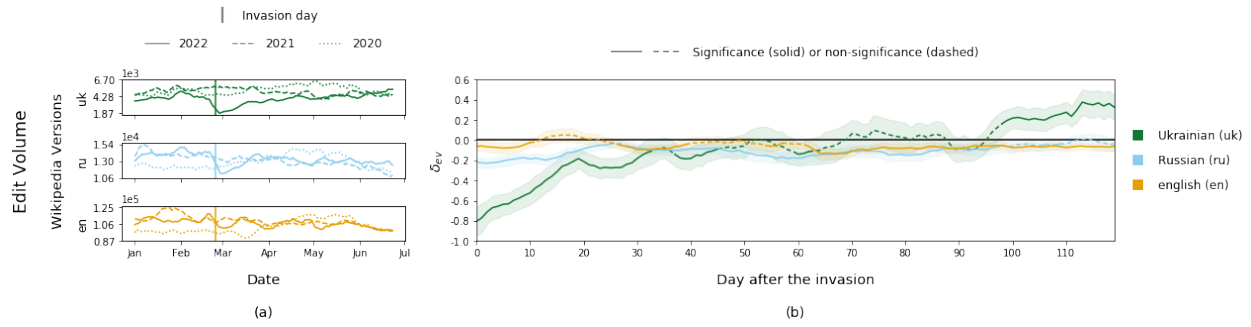


Figure 2: Edit volume (number of edits) during the Russo-Ukrainian War. The left part (a) illustrates the weekly average of the edits of human users in the years 2020, 2021, and 2022 in absolute numbers. We observe a drop in the edit volume near the change point in all the versions. Just after a few days, the edit volume increases and reaches previous values. The right part (b) shows the results of a difference-in-differences analysis between the post and pre-change periods of the treatment set in 2022 compared with 2021 and 2020. We notice a significant (indicated by a solid line) increase in the Ukrainian Wikipedia by the end of the studied period.

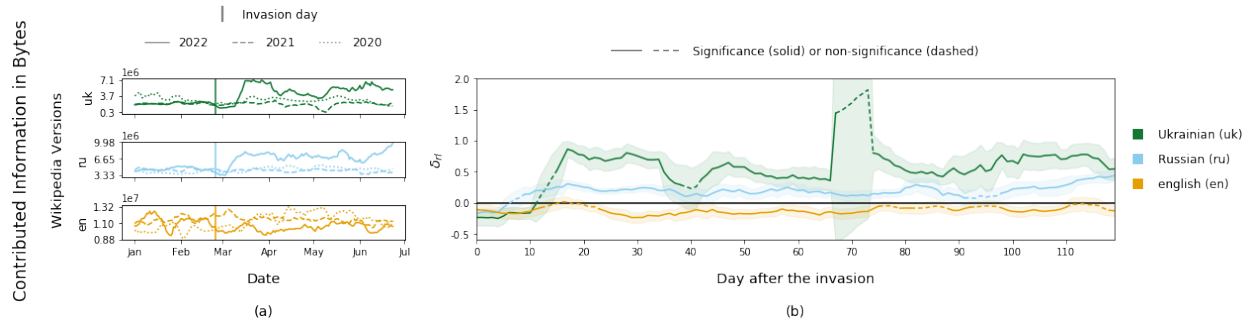


Figure 3: Contributed Information (in bytes) during the Russo-Ukrainian War. The left part (a) illustrates the weekly average of the contributed information in the years 2020, 2021, and 2022 in absolute numbers. We detect a spike in the contributed information for both the Russian and Ukrainian Wikipedia. The right part (b) shows the results of a Difference-in-Difference analysis between the post and pre-change periods of the treatment set 2022 compared with 2021 and 2020. We observe a significant increase in the change for the Ukrainian Wikipedia

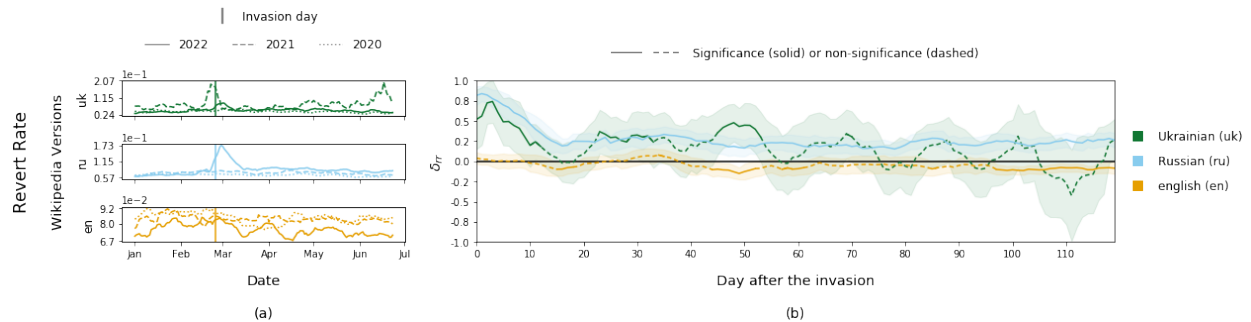


Figure 4: Revert Rate during the Russo-Ukrainian War. The left part (a) illustrates the weekly average of the revert rate in the years 2020, 2021, and 2022. We observe a considerable development that started a few days before the invasion and reaches its peak for both Russian and Ukrainian Wikipedia after 10 days. The right part (b) depicts the results of a Difference-in-Differences analysis between the post and pre-change periods of the treatment set in 2022 compared with 2021 and 2020. We observe a significant increase in the revert rate of both Ukrainian and Russian versions that dissipates over the next weeks.