Messaging strategies of Ukraine and Russia on Telegram during the 2022 Russian invasion of Ukraine

by Piyush Ghasiya and Kazutoshi Sasahara

Abstract
The popularity of the instant messaging app Telegram in Ukraine and Russia was already high before the still-ongoing Russian invasion of Ukraine. However, since 24 February 2022 (when the Russian invasion began), it has seen huge increases in subscribers and has even become the primary communication and news source in Ukraine. In this exploratory research, we analyzed Telegram channels from both Ukraine (@UkraineNow — the official channel of the Ukrainian government, and @V_Zelensky_official — the official channel of Volodymyr Zelenskyy) and Russia (@rt_russian — the official channel of the news network RT) to understand communication patterns in the Ukraine-Russia conflict. Our analysis of 37,172 posts showed that while @UkraineNow is being used in particular to communicate invasion-related news, @rt_russian is working as a mere extension of RT, which is part of the pro-Kremlin propaganda and disinformation ecosystem. However, Zelenskyy has opted for a completely different approach: he is using his Telegram channel to encourage Ukrainians and to garner support from the world. Thousands have lost their lives and millions have become refugees in this war that has now gone on for more than a year. Our timely research seeks to determine how both countries’ governments utilize Telegram as a weapon in an information war and the impact of this information war on the ground.

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Introduction

2022 Russian invasion of Ukraine: The present situation

On 18 March 2014, Russia illegally annexed Crimea — a peninsula in eastern Europe — from Ukraine. After that, Russia focused its attention on the Donbas, the southeastern region of Ukraine: in April 2014, Russian separatists supported by Russia established the Donetsk People’s Republic and the Luhansk People’s Republic in that region. By 2020, the conflict in Donbas had claimed about 14,000 lives (Pifer, 2020). Then, in the early months of 2021, Russia began amassing thousands of soldiers and military equipment near its borders with Ukraine and Crimea (Shuster, 2022). On 24 February 2022, in a televised address, Russian President Vladimir Putin officially announced a “Special Military Operation” in the Donbas, thus beginning a full-scale invasion of Ukraine (Bloomberg News, 2022).
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Figure 1: Map showing the situation on the ground in Ukraine as of 9 April 2023.

Note: Larger version of Figure 1 available here.

Figure 1 shows that Russia and pro-Russian separatists are in control of the south-eastern region of Ukraine. On 30 September 2022, Putin announced the annexation of the Donetsk, Luhansk, Kherson, and Zaporizhzhia provinces of Ukraine (Kremlin, 2022). The invasion caused the largest refugee crisis within Europe since the Yugoslav War in the 1990s (Rutter, 2022). According to United Nations High Commissioner for Refugees (UNHCR) data, more than 8.16 million Ukrainians fled Ukraine to find safe havens elsewhere in Europe (UNHCR, 2023). While both sides have admitted to suffering significant numbers of combat-related casualties, the exact number of deaths is difficult to confirm, as both sides are downplaying their own losses while inflating their enemy’s numbers. In terms of civilian casualties, according to the Office of the UN High Commissioner for Human Rights (OHCHR), from 24 February 2022 to 20 March 2023, 8,317 civilians were killed and 13,892 civilians were injured (OHCHR, 2023).

Telegram and its role in the ongoing conflict

Created in 2013 by the Russian-born technology entrepreneur Pavel Durov, Telegram is a messaging app that enables private and public groups of up to 200,000 users wherein individuals can send messages and interact, as well as channels that allow one-way broadcasting to the channel’s subscribers. The data of both private and public communications on Telegram is stored in an encrypted form in the cloud and distributed across multiple data centers throughout the world (although none in Russia); however, contrary to popular belief, it is not an end-to-end encrypted app. It offers the option of “secret chat”, which when enabled encrypts end-to-end the communication between two users (Alazab and Macfarlane, 2022). One aspect that has increased Telegram’s popularity in recent years, especially among far-right and other extremists groups, is its (lax) moderation policies. While other social media platforms regulate or censor content, de-platform users, and submit to government pressures, Telegram — like Parler and Gab — is considered a “dark platform”. Dark platforms can be characterized by content liberation, exile congregation, and infrastructure ostracism; they can be used to host content that may not be tolerated by their more mainstream counterparts (Zeng and Schäfer, 2021; Cinque, et al., 2021). Because of its dark-platform features, Telegram is not only heavily used by far-right groups and extremists but also by common citizens in conflicts and war. An example of the latter is visible in the ongoing Ukraine-Russia conflict, where Telegram is used by individuals, media, political and social groups, and even the Ukrainian government, making it the most popular tool of mass communication in Ukraine.

In March 2020, the Ukrainian government designated the COVID-19 Telegram channel @COVID_Ukraine, established by the Institute of Cognitive Modeling (a Ukrainian technology agency), as the official Telegram pandemic service; thereafter, thousands of Ukrainians used it to obtain the most up-to-date pandemic-related news, such as number of cases, deaths, vaccine-related information, and government advice. After Russian troops marched across Ukraine’s borders, the @COVID_Ukraine Telegram channel changed its name to @UkraineNow and has shared war-related news and updates 24 hours a day (Burgess, 2022). A survey result showed that of all social media platforms, Telegram was the most used (65.7 percent) for receiving news updates in Ukraine (OPORA, 2022). At the individual level, Ukraine’s president Volodymyr Zelensky created his personal Telegram account.
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Since then, Zelenskyy has used his Telegram channel to not only provide Ukrainian citizens with war-related updates but also broadcast his speeches and share pictures and videos. As a result, his subscriber base — which was around 65,000 on 23 February 2022 — reached its all-time high of 1.5 million on 10 March.

The context of Telegram use in Russia is a bit complex. After years of trying to compel Telegram to provide users’ encryption keys to the Federal Security Service (FSB) under Yarovaya Law (Evgeni and Tabuchnik, 2021), Russia banned the platform in 2018 (Antoniuk and Peterson, 2022). However, in June 2020, Russia lifted the ban, as it was ineffectual due to Telegram’s rerouting of messages outside of Russia as well as the ingenuity of its users, who evaded Russian authorities by utilizing VPNs. Thereafter, the Russian government and several state-sponsored and affiliated media (such as RT and Sputnik) joined Telegram, setting up channels to provide pro-Kremlin narratives (Stokel-Walker, 2022), propaganda, and misinformation.

For Russian citizens interested in news from independent sources, Telegram is a symbol of freedom on the Internet. Russians use Telegram to share not only eyewitness accounts of war but also Russia’s economic situation (product shortages, high inflation) amid sanctions. Telegram’s popularity in the current conflict can be seen in the fact that within the first month after the initial 24 February announcement, 187 Russian-language news channels saw a 48 percent jump in their Telegram subscribers (Bergengruen, 2022).

While platforms such as Twitter, Facebook, Instagram, and TikTok are either banned or facing accessibility difficulties in Russia, Telegram (along with YouTube, in addition to ‘home-grown’ platforms such as Vkontakte and Odnoklassniki) has thus far escaped the crackdown (Bond and Allyn, 2022). This shows Telegram’s significance in terms of both popularity and accessibility, which makes the present study vital and necessary to understanding communication strategies in the ongoing conflict. To this end, we collected data from the @UkraineNow, @V_Zelenskyy_official, and @rt_russian Telegram channels and analyzed their contents to understand what messages have been conveyed, what differences can be observed in their messaging strategies, what topics they are discussing, and what kind of emotions are presented the posts. Thus, we ask:

RQ1: What are the primary themes or topics found in the collected posts on both sides during the ongoing Ukraine-Russia conflict?

RQ2: What sentiments can be observed as dominant in the text messages, and what insights do these provide into the messaging strategies employed by both Ukraine and Russia?

RQ3: How do these three channels differ in their semantic and social interactions in their messaging strategies, as approximated from their usage patterns of hashtags and mentions?

Literature review

Telegram’s lax moderation policies, privacy (especially its ‘secret chat’ option), and capacity for large public groups makes it a go-to communication app for far-right extremists, conspiracy theorists, criminals, and extremists (including the Islamic State); consequently, issues such as misinformation, propaganda, conspiracy theories, radicalization, and hate speech are widespread on Telegram. Several researchers have analyzed Telegram data from the perspective of these groups and these issues (Herasimenka, et al., 2023; Willaert, et al., 2022; Urman and Katz, 2022; Krona, 2020; Rogers, 2020). However, all these features of Telegram also benefit citizens during times of dissent (protest movements), conflicts, and wars. As these latter themes are more relevant to the subject matter of our research (i.e., the Ukraine-Russia conflict), this literature review focuses in detail on previous research dealing with these specific themes.

In 2019, Hong Kong witnessed a protest movement of unprecedented scale in opposition to the 2019 Extradition Law Amendment Bill. Urman, et al. (2021) showed that protesters’ citation network on Telegram was highly cohesive, ensuring efficient diffusion of information among local and city-wide communities. The study’s text-analysis results also demonstrated that Telegram was predominantly used to distribute information about police presence, protest-related actions, and deliberation, as well as confirmed a previous claim (Ting, 2020) that the protests were de facto leaderless. Finally, through a time series analysis, the study showed that the introduction of the National Security Law in July 2020 triggered a significant decrease in Telegram activity.

Similarly, Belarus saw mass protests in August 2020, when President Alyaksandr Lukashenco claimed victory in the presidential elections with 80.1 percent of the vote. This figure was challenged by the opposition candidate, which led to protests that spread to more than 100 cities and towns by the end of first week (Mateo, 2022). Wijermars and Lokot (2022) proposed a conceptual framework for analyzing platform actors and applied it to Telegram in the 2020 Belarus protests; they found that Belarusian citizens formed affective connections to the platform and perceived Telegram as an ally in their struggle against repression and digital censorship.
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Understandably, in the context of the current Ukraine-Russia conflict, available literature is still virtually non-existent. In a short essay, Nazaruk (2022) discussed Telegram and his team’s archiving initiative and reported on Telegram’s role in alerting Ukrainians about Russian air strikes and missile launches, disseminating personal information (especially in searches for missing relatives), mobilizing volunteer groups to coordinate cyberattacks on Russian Web sites, and operating as a platform for crowdsourcing intelligence. Furthermore, Nazaruk also explained his team’s Telegram archiving initiative and its significance in the historical context.

Our research is one of the first attempts to empirically and analytically investigate the Ukraine-Russia war by using Telegram data from both Ukraine and Russia.

Methodology

Data collection

The objective of this research is to understand and analyze the official government narrative of the war on both sides. With this in mind, we selected the channels @UkraineNow — the official Telegram channel of the Ukrainian government — and @rt_russian — the official Telegram channel of the news network RT. At the individual level, the Telegram channels of presidents, prime ministers, and other high-ranking officials can also be crucial in understanding the official war narrative. Therefore, we searched for leaders in both countries who are active on Telegram. We found @V_Zelenskiy_official, the official Telegram channel of Ukraine’s president Volodymyr Zelensky, but on the Russian side, no equivalent officials have an individual channel.

The initial intended audience for both channels on the Ukraine side (@UkraineNow and @V_Zelenskiy_official) were Ukrainian citizens. @UkraineNow was started as a channel to provide COVID-19-related updates to Ukrainians, and when the war started it was converted into a dedicated war-related information channel. As for @V_Zelenskiy_official, the initiative was political: Zelenskyy started the channel soon after becoming Ukraine’s president. Using social media to share moments of everyday life and have interactions with constituents is globally becoming a customary practice in current times. However, as soon as Putin declared the “Special Military Operation” in Ukraine, the channel’s objective was changed (as Zelensky mentioned in his post on 24 February) to updating citizens with reliable war-related information. Since the war started, the objective of @UkraineNow has remained the same; hence, posts are in Ukrainian. However, @V_Zelenskiy_official changed his communication strategy and started posting in both Ukrainian and English a few months into the conflict, probably to reach out to the global community for support. In contrast to these two channels, @rt_russian is the official Telegram channel of the Russian mainstream news media network RT. Created in 2016, this Telegram channel is the oldest of the three channels analyzed in this study. Several previous studies (Carter and Carter, 2021; Moore and Cooley, 2022; Elswah and Howard, 2020) demonstrated that RT is a Russian state-controlled propaganda news network. It has several sister channels catering to audiences of different countries and regions, including RT France, RT Arabic, and RT America. The Telegram channel analyzed in the current research (@rt_russian) is the channel catering to Russian people (posting in Russian). In terms of content format, @V_Zelenskiy_official primarily posts either pictures or video (55 percent of his posts), while both @UkraineNow and @rt_russian have text in almost every post.

To collect the posts from these three Telegram channels, we used Telegram API and Telethon python library [4]. We found that @UkraineNow and @V_Zelenskiy_official used the word ‘invasion’ for the first time on 12 February and 14 February 2022, respectively, while posts mentioning a ‘coup’ and ‘martial law’ in Ukraine were posted on @rt_russian as early as 26 November 2021. Consequently, the starting date of data collection is 26 November 2021, for @rt_russian, 12 February 2022, for @UkraineNow, and 14 February 2022, for @V_Zelenskiy_official. The end date of our data collection was 10 October 2022. First, we collected all the messages in this time period; then, we excluded all messages without text; then, in further filtering, we excluded messages unrelated to war. In this last step, @V_Zelenskiy_official and @UkraineNow did not have any unrelated messages because once the war started, these channels dedicated themselves to war-related communication. However, because @rt_russian is the Telegram channel of the RT news network, it included all kinds of news, leading to a high number (21,134) of messages that were unrelated to our present topic (the Ukraine-Russia war) that we excluded from our text analysis corpus. In terms of language, @V_Zelenskiy_official posted messages both in Ukrainian and English (though not always), while @UkraineNow and @rt_russian corresponded in Ukrainian and Russian, respectively. Table 1 shows the number of excluded posts. As shown in this table, @V_Zelenskiy_official posted the most content without any text; these messages (1,624) were either pictures or videos. @UkraineNow also posted messages without any text, but not in large numbers (3,710). In contrast, @rt_russian has only messages that include text. In total, our final corpus — i.e., only war-related textual posts — has 37,172 posts.

Table 1: Filtering criteria and numbers of posts.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Language</th>
<th>First post related to present</th>
<th>Last date of data collection</th>
<th>Total posts</th>
<th>Posts without text (excluded from)</th>
<th>Post unrelated to Ukraine-Russia war (excluded)</th>
<th>Posts with text (main corpus for)</th>
</tr>
</thead>
<tbody>
<tr>
<td>@UkraineNow</td>
<td></td>
<td>12 February 2022</td>
<td>10 October 2022</td>
<td>37,172</td>
<td>3,710</td>
<td>21,134</td>
<td>1,624</td>
</tr>
</tbody>
</table>
Subscriber engagement-related statistics (views and forwards) and post frequency are shown in Table 2 and Figure 2, respectively. One interesting pattern is visible in Figure 2: the posting frequency was highest for @UkraineNow in the first few months, but since June 2022, @rt_russian has increased its number of posts per day, outstripping @UkraineNow. For @V_Zelenskiy_official, the number of posts has remained consistently very low (five posts per day on average). The distribution of posts is shown in Figure 2.

Table 2: Engagement-related statistics in final corpus.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Subscribers</th>
<th>First post related to present conflict</th>
<th>No. of posts (text)</th>
<th>Language</th>
<th>Views</th>
<th>Views per post (avg.)</th>
<th>Forwards</th>
<th>Forwards per post (avg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>@UkraineNow</td>
<td>922,012</td>
<td>12 Feb 2022</td>
<td>14,107</td>
<td>Ukrainian</td>
<td>4.74 billion</td>
<td>336,539</td>
<td>5.29 million</td>
<td>375</td>
</tr>
<tr>
<td>@V_Zelenskiy_official</td>
<td>1,007,107</td>
<td>14 Feb 2022</td>
<td>1,293</td>
<td>Ukrainian, English</td>
<td>2.06 billion</td>
<td>1.59 million</td>
<td>2.54 million</td>
<td>1972</td>
</tr>
<tr>
<td>@rt_russian</td>
<td>588,647</td>
<td>26 Nov 2021</td>
<td>21,772</td>
<td>Russian</td>
<td>2.8 billion</td>
<td>128,782</td>
<td>4.09 million</td>
<td>188</td>
</tr>
</tbody>
</table>
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Data analysis

To answer RQ1, we applied topic modeling. To this end, we used BERTopic (Grootendorst, 2022), one of the most advanced topic modeling techniques, which takes advantage of pre-trained transformers-based language models (Devlin, et al., 2018). For RQ2, which addresses the sentiment(s) present in posts, we used VADER python library (Hutto and Gilbert, 2014). The sentiment analysis in our research differs slightly from the usual genre-based practice for understanding public emotions on certain issues, due to how communication patterns on Telegram differ from those on Twitter or Facebook. On Telegram, there are three ways to connect: 1) user to user; 2) in groups of up to 200,000 users; and, 3) channels (introduced in September 2015). Channels — the focus of our present research — are a form of one-way messaging where admins are able to post messages but other users are not; the users (subscribers) of these channels can view, forward, and react (with emojis) to the messages.

From the viewpoint of sentiment analysis, these reactions could be helpful to understand subscribers’ sentiments toward specific issues or messages. However, the collected Telegram data did not include reactions, and so only two statistics — views and forwards — could be collected as proxies of reactions, using Telegram API. We explore and analyze these two statistics in detail in our discussion section (Figures 13 and 14). The other aspect of sentiment analysis was understanding the sentiments in the messages (text) of the channel’s admin. To this end, we performed sentiment analysis on text messages posted by the admins of these channels, using the VADER python library.

Hashtags and mentions play different but important roles in social media communication. The main role of hashtags is to make the post searchable for anyone interested in a specific topic, while mentions (tagging) are generally used when one wants to attract someone’s attention or to include other related entities (people or organizations) in a post. As hashtags and mentions play an important role in messaging strategies, RQ3 was concerned with understanding patterns of hashtags and mentions in the selected channels. To answer RQ3, we utilized the co-occurrence networks of hashtags and mentions, the former for semantic interactions and the latter for social interactions. We created co-occurrence networks of hashtags (hereafter called the hashtag network) that were included at least one time in @UkraineNow (141 hashtags), @rt_russian (56 hashtags), and @V_Zelenskiy_official (14 hashtags). We visualized the network using Gephi (Bastian, et al., 2009). To filter out small components and to remove isolates, we kept the nodes with a degree of ≥3 in @rt_russian and a degree of ≥2 in @UkraineNow; however, @V_Zelenskiy_official had very few hashtags, so we kept all of them. We also created co-occurrence networks of mentions (hereafter called the mentions network) for each channel. The mentions network for @rt_russian included those that were cited more than 10 times. The use of mentions in @UkraineNow was much lower, so we kept all mentions. However, as @V_Zelenskiy_official had only two mentions, we did not create a mentions network for this channel. For visualization of the mentions network of @rt_russian, we kept the nodes with a degree of ≥3.

Results

Dominant topics and analysis (RQ1)
Individual topic modeling of each of the three Telegram channels resulted in several interpretable topics. The dominant topics for @UkraineNow and @rt_russian were completely different. The biggest topic in @UkraineNow contained two words — ‘anxiety and region (Topic 0)’ — which summarized the general mood in Ukraine. The other dominant topics, seen in Figure 3, included ‘news about shelling in Luhansk region (Topic 1),’ ‘raids and alerts (Topic 2),’ ‘valorization of Ukrainian soldiers (Topic 4),’ ‘child casualties (Topic 5),’ ‘humanitarian corridors (Topic 7),’ and ‘safety of nuclear power plants (Topic 8).’

In contrast, on @rt_russian, news related to ‘the aid (particularly military) given to Ukraine by European countries and the US’ makes up the biggest topic. As shown in Figure 4, other topics widely discussed on @rt_russian were ‘shelling in Donetsk region (Topic 1),’ ‘Putin’s meetings with world leaders (Topic 3),’ ‘grain and fertilizers export crisis (Topic 6),’ ‘Putin’s partial mobilization order (Topic 7),’ and ‘energy crisis in Europe (Topic 8).’ The topics discovered in @rt_russian posts illustrated and confirmed a well-documented Russian propaganda strategy of “whataboutism.” Whataboutism is a deflection tactic wherein important information is obscured by diverting attention to some other unrelated or less significant issue(s) (Zelenkauskaitė, 2022). For example, the main story should be Russia’s “special military operation” in Ukraine, Russian military advancement, etc.; however, we noted that the largest topic (Topic 0) was about the West’s assistance (in military aid) to Ukraine. When we investigated posts related to this topic, we found that they could be divided into two main subthemes: 1) reporting the amount of Western aid to Ukraine; and, 2) allegations that pointed toward misuse of military aid by Ukraine. The sample below (translated from Russian using Google cloud API) shows posts related to the second subtheme.

<table>
<thead>
<tr>
<th>Date</th>
<th>Views</th>
<th>Forward</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Exclusive to RT The EU and the USA, due to the growing...</td>
</tr>
</tbody>
</table>

Figure 3: Dominant topics in @UkraineNow posts.
Note: Larger version of Figure 3 available [here](#).
problem of smuggling of weapons supplied by the West to Kyiv, a center will be created in Moldova to combat it. RT found out that the relevant structures of the European Commission and the US State Department are already placing tenders for the supply of equipment for Moldovan border guards. Thus, the Frontex agency is going to buy toilet modules worth about €250,000 for the Moldovan border guards, while the US authorities are going to buy off-road vehicles, thermal imagers, ground-based detection devices and walkie-talkies. In the West, for a long time they refused to acknowledge the facts of the distribution of military aid to Kyiv in countries neighboring Ukraine, but now even Interpol Secretary General Jurgen Stock expresses concerns about this. Earlier, RT found out that Ukrainians are trading NATO military aid on the darknet, and for relatively little money you can buy Javelin anti-tank systems or the German Panzerfaust 3.

@rt_russian

Figure 4: Dominant topics in @rt_russian posts.

Note: Larger version of Figure 4 available here.
By highlighting the amount of Western aid (first subtheme), Russia tried to divert attention from the reality on the ground in order to further the Russian counter-argument that the West was conspiring against Russia. In discussing the alleged misuse of aid, they tried to portray Ukraine in a bad light.

Similarly, the grain export crisis (Topic 6) — which, in fact, originated due to Russia’s special military operation in Ukraine — was framed in a way that laid blame for this crisis squarely on Ukraine. The sample posts below (translated from Russian using Google cloud API) show Putin’s statement in which he alleged that Ukrainians were deceiving the international community by not sending grain to needy Africans and other developing countries, instead exporting it to Europe.

<table>
<thead>
<tr>
<th>Date</th>
<th>Views</th>
<th>Forward</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022-09-07</td>
<td>94,914</td>
<td>119</td>
<td>“It’s just a scam. A boorish and impudent attitude towards those partners for whom this was allegedly done. They just cheated”; Putin at the WEF — that ships with Ukrainian grain went to Europe, instead of delivering the resource to regions in need of food: “We promised to do everything in order to ensure the interests of developing countries ... Everyone talked about this when it was discussed. What we see is another blatant deception. And it’s not about us: this is a deception of the international community, a deception of partners in Africa, in other countries that are in dire need of food.” According to the President of the Russian Federation, a month ago, out of 21 ships that left, only two were sent to developing countries: “Now there are already 80 ships, and the amount of food is not increasing.” @rt_russian</td>
</tr>
</tbody>
</table>

These results clearly show the differences in the priorities and concerns of the two sides. On the Ukrainian side, @UkraineNow fulfills its objective by informing and updating Ukrainians about the latest situation on the ground. On the Russian side, @rt_russian is a ‘news channel’ extension that spreads Russian propaganda.

For @V_Zelensky_official, the topic model produced only two topics: 1) the world’s support for Ukraine and Ukrainians in this war; and, 2) concern about the safety of nuclear power plants (Figure 5). This result shows how focused Zelenskyy was in his Telegram communication, where he not only encouraged Ukrainian soldiers and people but also requested global support for Ukraine in the crisis.
The overall sentiments expressed in the posts of both @UkraineNow and @rt_russian show similar trends, as the number of negative and highly negative posts was very high on both channels. Moreover, on both Telegram channels, highly negative posts had the highest incidence. Given the war environment, this result was not surprising. However, the sentiment analysis of @V_Zelenskiy_official shows unexpected results: Figure 6 shows the overall sentiments, where it can be seen that more than half of Zelenskyy’s posts were highly positive, indicating a strategy of positive messaging.

In order to further understand Zelenskyy’s messaging strategy on Telegram, we visualized the most frequently used positive and negative words on @V_Zelenskiy_official. We found that ‘support,’ ‘thank,’ ‘freedom,’ ‘peace,’ ‘glory,’ and ‘grateful’ were some of the most frequently used positive words, while in terms of negative words, Zelenskyy most often used ‘war,’ ‘fight,’ ‘no,’ ‘destroy,’ ‘aggression,’ and ‘terrorism’ (Figure 7). The sentiment analysis results clearly demonstrated that, in contrast to both @UkraineNow and @rt_russian, President Zelenskyy was following a unique approach: he was encouraging his people and gave them hope, not only through his actions but also through his words.
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Hashtags and mentions co-occurrence networks (RQ3)

We analyzed the hashtags and mentions in the posts of each Telegram channel in order to understand their messaging strategies. Specifically, the hashtag network shows the themes, topics, or ideas that these Telegram channels tried to spread, and the mentions network shows which communities that they were targeting or connecting with.

In terms of hashtags, we found that @UkraineNow and @V_Zelenskiy_official used the greatest and least number of hashtags, respectively. Table 5 shows the top hashtags on all three channels. @UkraineNow used #heroes (259) the most; some of the other top hashtags included #good (139), #fighting (71), #crime (66), and #worldukraine (54). The top hashtag (#heroes) clearly indicates the kind of narrative @UkraineNow that wanted to spread, to both Ukrainian and global audiences: the bravery of the Ukrainian people in general and Ukrainian soldiers in particular during the conflict. For @rt_russian, we found that even though it had approximately 7,000 more posts than @UkraineNow, it used significantly fewer hashtags. The top hashtag for this channel was #informationpromobilization, which was used 54 times; other top hashtags include #main_on_rt (20) and #notoneonone (17). The hashtag #informationpromobilization was related to Putin’s partial mobilization order on 21 September 2022, which provoked angry reactions from Russian citizens, and within one week of the order, at least 200,000 Russians left the country (Bloomberg News, 2022). In response to this reaction, @rt_russian started posting this hashtag to create a more favorable environment (i.e., promote propaganda) around this mobilization order. Lastly, we found that @V_Zelenskiy_official used an extremely low number of hashtags: the most-used hashtag was #braveukraine, used only six times, and #armukrainenow (5) and #stopwar (3) were the other two top hashtags.

Table 5: Top hashtags on @UkraineNow, @V_Zelenskiy_official, and @rt_russian.

<table>
<thead>
<tr>
<th>Hashtags</th>
<th>Count</th>
<th>Hashtags</th>
<th>Count</th>
<th>Hashtags</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>@UkraineNow</td>
<td></td>
<td>@rt_russian</td>
<td></td>
<td>@V_Zelenskiy_official</td>
<td></td>
</tr>
<tr>
<td>#heroes</td>
<td>259</td>
<td>#informationpromobilization</td>
<td>54</td>
<td>#braveukraine</td>
<td>6</td>
</tr>
<tr>
<td>#good</td>
<td>139</td>
<td>#main_on_rt</td>
<td>20</td>
<td>#armukrainenow</td>
<td>5</td>
</tr>
<tr>
<td>#fighting</td>
<td>71</td>
<td>#notoneonone</td>
<td>17</td>
<td>#stopwar</td>
<td>3</td>
</tr>
<tr>
<td>#crime</td>
<td>66</td>
<td>#ukraine</td>
<td>16</td>
<td>#advantageukraine</td>
<td>1</td>
</tr>
<tr>
<td>#worldukraine</td>
<td>60</td>
<td>#russia</td>
<td>15</td>
<td>#ourdaysofcourage</td>
<td>1</td>
</tr>
<tr>
<td>#stopruussia</td>
<td>54</td>
<td>#ministry</td>
<td>9</td>
<td>#weareofonebravery</td>
<td>1</td>
</tr>
<tr>
<td>#fightingspirit</td>
<td>51</td>
<td>#historical</td>
<td>7</td>
<td>#strivingtogether</td>
<td>1</td>
</tr>
</tbody>
</table>
### Messaging strategies of Ukraine and Russia on Telegram during the 2022 Russian invasion of Ukraine

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#goodnews</td>
<td>39</td>
<td>#unforgottenstories</td>
<td>7</td>
<td>#united24</td>
</tr>
<tr>
<td>#добріновищидляукраїни (#goodnewsforukraine)</td>
<td>25</td>
<td>#heroesz</td>
<td>5</td>
<td>#thepoweroffreedom</td>
</tr>
<tr>
<td>#бойовийдух (#fightingspirit)</td>
<td>23</td>
<td>#ancestorsworthy</td>
<td>4</td>
<td>#standupforukraine</td>
</tr>
</tbody>
</table>

The hashtag network for @UkraineNow (Figure 8) revealed that the main hashtag clusters were: #stoprussia, #infoterror, #infoteror (purple cluster); #norussianowar, #norussianocrime, #norussianocry (black cluster); #worldukraine, #stopwar, #buchamassacre, and #bucha (green cluster); and #heroes, #fighing, and #we (red cluster). The hashtag network for @rt_russian (Figure 9) has three clusters: a purple cluster, with #russia, #ukraine, #ancestorworthy, #ancestors, and #heroez; a green cluster, involving Donbas region hashtags such as #donbass, #dnr, #lhr, #donetsk, and #shelling; and a blue cluster, with #public, #rgm, #rossotrudnichestvo, and #russiandom. The hashtag network used by @V_Zelenskiy_official is simple, with #braveukraine, #weareofonebravery, and #ourdaysofcourage in the purple cluster, and #stoprussianaggression and #standwithukraine in the blue cluster, as shown in Figure 10. In all three figures, cluster (color) is determined by modularity class, node size is determined by weight, and ForceAtlas 2 layout was used.

**Figure 8: Co-occurrence network of hashtags for @UkraineNow.**

Note: Larger version of Figure 8 available [here](#).
Figure 9: Co-occurrence network of hashtags for @rt_russian.

Figure 10: Co-occurrence network of hashtags for @V_Zelenskiy_official.
Note: Larger version of Figure 10 available [here](#).
A reverse trend was found in the mention behaviors of @UkraineNow and @rt_russian, while the usage of mentions by @V_Zelenskiy_official was similar to its hashtag usage (i.e., extremely low). Since the @rt_russian Telegram channel is an extension of the RT news network, the majority of posts (more than 90 percent) originate from RT news, so it cites (mentions) @rt_russian after almost every post; consequently, @rt_russian has the most mentions (19,559). Other related mentions, such as @rt_special (427), @rt_stream (204), and @rttv_sports (185), are also among the top cited mentions. Some of the other top mentions (unrelated to RT news) include @milchronicles (496), @ruptlynews (253), @marlavladimirovnazakharova (204), and @sledcom_press (118). Of these four, while @ruptlynews has only 353 subscribers, the other three have significant numbers of subscribers (@milchronicles: 233,484 subscribers, @marlavladimirovnazakharova: 520,021 subscribers, and @sledcom_press: 25,931 subscribers). @marlavladimirovnazakharova is the official Telegram channel of Maria Vladimirovna Zakharova, the Director of the Information and Press Department of the Ministry of Foreign Affairs of the Russian Federation since 2015. On February 23 (just one day before Russia’s invasion of Ukraine), she and other prominent Russian media figures were sanctioned by the EU specifically, placed on a no-fly list and had her assets frozen — due to her role as “a central figure of the government propaganda” (Rettman, 2022). @sledcom_press is the official channel of the Investigative Committee of the Russian Federation, which has been the main federal investigative authority (anti-corruption agency) in Russia since 2011 [5]. @milchronicles was only created in March 2022, and it has solely posted and shared pro-Russian war propaganda.

With respect to @UkraineNow, @u24_gov_ua was the top mention (16 times). Other top mentions were mostly bots: @evorog_bot (12), @stoprussian_war_bot (4), @saveua_bot (2), @volunteershotlinebot (2), and @poshukditei_bot (2). @u24_gov_ua was Zelensky’s initiative to collect charitable donations in support of Ukraine, and Zelensky’s own channel cited this channel the most (24 times). However, other than this mention, @V_Zelenskiy_official only mentioned @firstladyofukraine (the official channel of Olena Zelenska, Zelensky’s wife), and only eight times. Table 6 shows the top mentions of all three channels. @cincafu, which was mentioned three times by @UkraineNow, is the official Telegram channel of the Commander-in-Chief of the Armed forces of Ukraine (CINCAFU). @motolkohelp, also mentioned three times, is a channel located in Belarus that provides news, insights, and opinions from and about Belarus.

![Table 6: Top mentions on @UkraineNow, @V_Zelenskiy_official, and @rt_russian.](image)

<table>
<thead>
<tr>
<th>Mentions</th>
<th>@UkraineNow</th>
<th>Mentions</th>
<th>@rt_russian</th>
<th>Mentions</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>@u24_gov_ua</td>
<td>16</td>
<td>@rt_russian</td>
<td>12,559</td>
<td>@u24_gov_ua</td>
<td>24</td>
</tr>
<tr>
<td>@evorog_bot</td>
<td>12</td>
<td>@milchronicles</td>
<td>496</td>
<td>@firstladyofukraine</td>
<td>8</td>
</tr>
<tr>
<td>@stop_russian_war_bot</td>
<td>4</td>
<td>@rt_special</td>
<td>427</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@cincafu</td>
<td>3</td>
<td>@ruptlynews</td>
<td>253</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@motolkohelp</td>
<td>3</td>
<td>@marlavladimirovnazakharova</td>
<td>204</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@saveua_bot</td>
<td>2</td>
<td>@rt_stream</td>
<td>204</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@volunteershotlinebot</td>
<td>2</td>
<td>@rttv_sport</td>
<td>185</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@libkos</td>
<td>2</td>
<td>@sledcom_press</td>
<td>118</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@poshukditei_bot</td>
<td>2</td>
<td>@rkadyrov_95</td>
<td>117</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@hotovyi_do_vxioho_bot</td>
<td>1</td>
<td>@vysockygovorit</td>
<td>113</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is important to note here that Telegram has a popular and transparent ‘Telegram bot’ (or automated software) program that offers functions and automations that users can integrate into their chats, channels, or groups [5]. Analysis of @UkraineNow mentions demonstrated that Ukrainians were actively and explicitly using this feature to spread anti-war messages (@stop_russian_war_bot, @saveua_bot) and to set up a volunteer hotline (@volunteershotlinebot). However, among the large number of mentions of @rt_russian, we did not find any channel that could unequivocally be categorized as a ‘bot’.

Figures 11 and 12 show the mentions networks for @rt_russian and @UkraineNow, respectively; here too, cluster is colored by modularity class, node size is proportional to weight, and ForceAtlas 2 layout was used.
**Figure 11:** Co-occurrence network of mentions for @rt_russian.

Note: Larger version of Figure 11 available [here](#).
The mentions network of @rt_russian (Figure 11) shows that only three clusters can be seen in this network. Unsurprisingly, @rt_russian created the central node of the whole network and was part of the biggest cluster (purple). Although @milchronicles was connected to @rt_russian, it was part of a different cluster (green) with nine nodes: when we inspected the profiles of the eight other nodes in this cluster, we found that all channels belonged to foreign correspondents of the RT news network. For @UkraineNow (Figure 12), the mentions network was simple, with bots connected to each other to create a single cluster (purple).

**Discussion**

Russia’s invasion of Ukraine has been described as “the world’s first TikTok war” (Chayka, 2022), “World Cyber War 1” (Brown, 2022), and “the first Social Media War” (Suciu, 2022). The position of digital media as the common denominator in all of these descriptions points to its indispensability in the current conflict. Social media has had a profound impact on how war has been reported, particularly in the ongoing Ukraine-Russia conflict. The rise of social media has allowed individuals to share their experiences and report on events in real time, with accounts like @V_Zelenskiy_official leading the way by broadcasting speeches, sharing videos and pictures of ground-zero visits, and alerting citizens about bombings. On an organizational level, accounts such as @UkraineNow and @rt_russian use social media as an additional source to traditional news outlets, like newspapers and TV, to spread war-related news.

Although Russia is known for its sophisticated influence operations (or information warfare), in this situation, it appears to be losing the information war to Ukraine (Aral, 2022; Adams, 2022). This paper attempted to understand how both Ukraine and Russia were utilizing Telegram — which has emerged as one of the primary modes of communication in Ukraine — and the sort of results their efforts generated in terms of user engagement.
The exploratory analysis of the Telegram messages of @UkraineNow, @V.Zelenskiy_official, and @rt_russian demonstrated that all three follow different approaches. @UkraineNow provided Ukrainian citizens with war-related information, such as bombing alerts, shelter locations, and other crucial updates. Table 7 shows three of the most-viewed posts on @UkraineNow: the first post in this table ‘gives information about mobile SIM cards,’ the second post is ‘an appeal to Europe’ to save Ukraine, and the third post ‘provides the latest update on Russian actions.’

<table>
<thead>
<tr>
<th>Date</th>
<th>Translated message</th>
<th>Views</th>
<th>Forwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>04-03-2022</td>
<td>‼ Kherson‼ Those who do not have Vodafone and Kyivstar in Kherson have the opportunity to register and connect e-sim from LifeCell via WiFi, you can do it through Monobank. This will work for phones that support e-sims (iPhone and new Android models). Link: <a href="https://monobank.ua/r/Gmzz">https://monobank.ua/r/Gmzz</a></td>
<td>1,425,442 (1.42 million)</td>
<td>9,232</td>
</tr>
<tr>
<td>11-03-2022</td>
<td>Do you think that does not apply to you? Today Ukraine, tomorrow - all of Europe. Russia will stop at nothing. Where are the guarantees that tomorrow it will not destroy your home or kill your loved ones? If we lose, so do you. #ifwefallyoufall</td>
<td>1,333,149 (1.33 million)</td>
<td>8,075</td>
</tr>
<tr>
<td>01-03-2022</td>
<td>‼ Attention‼ The Russian occupiers got into the TV tower. The channels will be down temporarily. In the near future, backup power will be turned on to restore the channels. You can now follow the radio stations. Please pass this information to everyone‼ The enemy is acting insidiously, but we will resist.</td>
<td>1,306,286 (1.3 million)</td>
<td>8,460</td>
</tr>
</tbody>
</table>

@rt_russian is the Telegram extension of the RT news network, which is part of Russia’s state-controlled propaganda ecosystem. As shown in Table 8, all three of its most-viewed posts presented pro-Kremlin narratives: the first one declared the ‘Bucha massacre’ to be fake, the second one compared the ‘Ukrainian armed forces’ strategies with Nazis,’ and the third one sought support for the ‘annexation of the four regions.’

<table>
<thead>
<tr>
<th>Date</th>
<th>Translated message</th>
<th>Views</th>
<th>Forwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>27-09-2022</td>
<td>The former French special forces soldier Adrian Boke @adrienbocquet, who has been covering the events in the Donbas in recent months, was attacked in Istanbul. As Boke told RT, he was followed: “They were on guard from the evening.” And yesterday he was attacked by two men with a knife. Boke suffered several cut wounds. In the spring, Adrian spent three weeks in the territory controlled by Kyiv. He was in Bucha and claims that he saw how the Ukrainian military brought the bodies of the dead and laid them out on the street. After that, Boke went to the Donbas. There, in particular, he filmed for RT the consequences of Ukrainian shelling of Donetsk from the French self-propelled guns CAESAR. @rt_russian</td>
<td>3,00,8667 (3 million)</td>
<td>13,234</td>
</tr>
<tr>
<td></td>
<td>Battle reconnaissance of the positions of the Armed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Forces of Ukraine near Peski. Soldiers of the assault battalion of the 11th regiment of the NM DPR are working. They find out how quickly the Armed Forces of Ukraine deliver resources to their own. The enemy uses so-called fox holes. It is difficult to knock them out with artillery. From these frames it becomes clear why the Nazis managed to hold their positions for a long time. RT military commander Andrei @FilatovCorr Filatov showed what these trenches look like inside: “It should be noted that they quite competently make ‘fox holes’ by the road and burrow under the canvas, and this is asphalt, gravel — good shelter is obtained. They’ve dug in well here”; both Soviet and Western weapons remained in abandoned positions. The Ministry of Defense of the Russian Federation reported on the capture of the village of Peski under the control of the allied forces on August 13. These shots already were taken a few days ago outside of it. @rt_russian

“We were civilians. I never knew how to use either ATGMs or RPGs — they learned everything.” Alexander Agranovich, commander of one of the companies of the Sparta battalion, spoke at a rally on Manezhnaya Square in Moscow. He told how he volunteered for the front in the Donbas: “They told us: ‘Think Ukrainian.’ They said: ‘Bandera is your hero.’ They wanted to make mankurs [unthinking slaves] out of us. Then, on May 2, they started killing people, burning them in Odessa. I returned home from work (I worked at the factory as an engineer), my daughter was crying to me: ‘Dad, what is happening?’ I got into the car, went to Slavyansk to fight.” The action “We do not abandon our own” in support of the referendums is taking place throughout the country today. Voting on the entry of the LPR, DPR, Kherson, and Zaporozhye regions into Russia will last until September 27. @rt_russian

In contrast to these two channels, Zelenskyy used his personal Telegram channel @V_Zelenskiy_official to communicate his resolve to fight to the end, to encourage Ukrainian soldiers, to give Ukrainian people hope, and to appeal to the world to support Ukraine. Table 9 shows three of the most viewed posts on @V_Zelenskiy_official, all of which garnered more than six million views and showcase his communication style. In these posts, he exhibited ‘his appreciation to the soldiers after the successful special operation,’ ‘his resolve to stay in Ukraine,’ and ‘his gratefulness to the soldiers.’

<table>
<thead>
<tr>
<th>Date</th>
<th>Translated message</th>
<th>Views</th>
<th>Forwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-04-2022</td>
<td>A special operation was carried out thanks to the SBU. Well done! Details later. Glory to Ukraine!</td>
<td>6,219,074 (6.21 million)</td>
<td>92,245</td>
</tr>
<tr>
<td>07-03-2022</td>
<td>I am staying in Kyiv. On Bankova. Not hiding. And I’m not afraid of anyone. As much as it takes to win this war!</td>
<td>6,129,899 (6.12 million)</td>
<td>13,114</td>
</tr>
<tr>
<td>04-03-2022</td>
<td>We continue to fight. We will protect our state. We will</td>
<td>6,114,794 (6.11 million)</td>
<td>13,546</td>
</tr>
</tbody>
</table>
As yet, it seems that Zelenskyy’s leadership and communication strategies have proven to be effective; the fighting is still going on after more than a year, and in some cases Russia has had to retreat, such as when Ukraine regained control of Kherson (Krever, et al., 2022). As for Zelenskyy’s communication strategy, data on Telegram user engagement shows similar trends: Zelenskyy’s popularity has risen dramatically, and his posts have been getting millions of views and are being forwarded several thousand times, creating a favorable environment for Ukraine. The temporal changes in numbers of views and forwards for all three channels are shown in Figures 13 and 14, which clearly demonstrate Zelenskyy’s influence. However, when it comes to @UkraineNow and @rt_russian, it seems that for the first time, the latter is catching up with the former.

**Figure 13:** Temporal changes in views per post on @UkraineNow, @V_Zelenskiy_official, and @rt_russian.

Note: Larger version of Figure 13 available here.
Figure 14: Temporal changes in forwards per post on @UkraineNow, @V_Zelenskij_official, and @rt_russian.

Note: Larger version of Figure 14 available [here](#).

The analysis of dominant topics and emotions (RQ1) showed that @V_Zelenskij_official opted for a different approach than the other two channels. Zelenskyy’s focus has been on encouraging Ukrainians, gathering global support for Ukraine, and expressing concern about nuclear disaster (Figure 5). Furthermore, his attempt to inspire hope in his people in this time of crisis has been reflected in the incidence of highly positive sentiments in his posts (Figure 6). In contrast, the dominant topics from @UkraineNow clearly indicated the critical role that they played in providing real-time war-related information (raids, alerts, humanitarian corridors) (Figure 3). Meanwhile, @rt_russian — a part of the pro-Kremlin propaganda ecosystem — focused on themes such as support for Ukraine from Western countries and mobilization-related propaganda (Figure 4). When it comes to emotions, both @UkraineNow and @rt_russian show similar trends, with high numbers of highly negative and negative posts (Figure 6).

Our results from the analyses of hashtags and mentions (RQ2) again showed that Zelenskyy had taken an altogether different approach than the other two channels. Compared to @UkraineNow and @rt_russian, @V_Zelenskij_official used significantly fewer hashtags and mentions (Figures 10 and 12). We speculate that since he has a large subscriber base, he is (either consciously or unconsciously) relying on his subscribers to spread his messages to more people rather than trying to do so himself; this postulation is supported by the comparatively high number of forwards per post, as seen in Table 1 and Figure 14. For @UkraineNow, the high number of hashtags (especially the hashtag #heroes) demonstrated an objective to promote a narrative of the ‘bravery’ and ‘courage’ of the Ukrainian people and soldiers (Figure 8). @rt_russian did not use many hashtags (Figure 9) except #informationpromobilization. This important finding indicates the negative reaction of Russians vis-à-vis Putin’s mobilization order: to counter this reaction and to create a favorable environment, state-controlled media (in our study, RT) started a #informationpromobilization campaign. In terms of mentions, @rt_russian used a high number, including (among others) Maria Vladimirovna Zakharova, the Director of Information and Press Department of Russia’s Foreign Ministry, and Russia’s anti-corruption agency (@sledcom_press) (Figure 11).

We identified Zelenskyy’s communication style: his strong leadership is not only reflected in his actions (not fleeing Ukraine, frequently visiting soldiers on ground) but also in the way he communicates with his people and the world. Communication scholars and leadership experts call him a ‘strategic communicator’ and a ‘strong leader’ on the basis of his communication style. Anne-Marie Søderberg, Professor of Cross-Cultural Communication and Management, has pointed out how Zelenskyy uses different communication strategies in various contexts, such as calmness and dignity when addressing Russians, evocation of compassion when talking to Ukrainians, and straightforwardness when addressing global leaders and communities (Søderberg, 2022). Harry Kraemer, Clinical Professor of Leadership, identified self-reflection, balance, self-confidence, and genuine humility in Zelenskyy’s leadership, which makes him a value-based leader (Momot, 2022). We found some of these aspects in our analyses, particularly in the presence of a large number of highly positive posts or the use of words such as ‘freedom,’ ‘grateful,’ ‘glory,’ ‘peace,’ and ‘heroes’ to encourage Ukrainians and to boost soldiers’ morale.

Thus, our analysis shows that Ukrainian government channel (@UkraineNow) kept citizens up-to-date with the most crucial life-saving information, and its leader (@V_Zelenskij_official) motivated their soldiers and citizens. We believe that this strategy of allocating responsibilities is one reason why Ukraine is winning the information war, as determined by experts.
Conclusion and limitations

Telegram has emerged as one of the most popular communication platforms in the ongoing Ukraine-Russia conflict, and its analysis can help us understand the communication strategies of these two countries. With that in mind, we analyzed the channels @V_Zelenskiy_official, @UkraineNow, and @rt_russian. Our first finding (RQ1) showed that @rt_russian merely operates as an extension of the RT news network and is proven to be simply another source spreading Russian propaganda. In contrast, @UkraineNow mainly provides critical and authentic information to Ukrainians. How war looks in the time of social media is clearly exemplified by @V_Zelenskiy_official, with his posts informing and encouraging Ukrainian citizens as well as gaining the support of the global community. Our focus on sentiment (RQ2) led to our discovery that the posts of @UkraineNow and @rt_russian show a similar trend (high number of negative and highly negative posts), but 62 percent of the posts of @V_Zelenskiy_official were either positive or highly positive. Our findings related to RQ3 further confirmed the uniqueness of Zelenskyy’s communication style, as he barely used hashtags and mentions to spread his posts, as the work of spreading his message to a wider audience has been done by his one million subscribers. While @UkraineNow used a large number of hashtags, @rt_russian (as part of a larger media network) tags/mentions several entities from its own network, RT. Our findings not only shed light on the communication styles of official and authoritative figures and entities during this conflict but also provide insights into how war coverage may look in the age of social media.

This study has some limitations. In this research, we only focused on textual analysis; however, all three channels, especially @V_Zelenskiy_official, have shared many videos and pictures. The analysis of such content forms is crucial to determining the complete picture of how war communication has changed in the time of social media. In addition, the unavailability of a corresponding Telegram channel to @V_Zelenskiy_official (i.e., a channel for a similar figure in Russia) can also be seen as a limiting factor for this research. Furthermore, we only investigated official government-linked Telegram channels, which helps us understand the war from the perspective of governments. However, to understand the perspectives of common citizens in both Ukraine and Russia, we need to analyze channels owned and maintained by ordinary people. This is especially true for Russia, as independent channels can give us a glimpse into the problems that Russians are facing, their opinions about this war, and more.

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Notes

1. This map was obtained from Wikimedia Commons: https://upload.wikimedia.org/wikipedia/commons/4/4f/2022_Russian_invasion_of_Ukraine.svg.
2. This post is translated from its original Ukrainian. In this research, we used Google Cloud Translation API (https://cloud.google.com/translate) to translate all the collected posts from their original language (Ukrainian or Russian) to English.
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