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SWARM COMMUNICATION IN A TOTALISING WAR: MEDIA INFRASTRUCTURES, ACTORS AND PRACTICES IN UKRAINE DURING THE 2022 RUSSIAN INVASION

Kateryna Boyko and Roman Horbyk

During the first weeks of the Russian invasion of Ukraine, part of the Russo-Ukrainian War continuing since 2014, the Ukrainian resistance and victories fascinated external observers. One of these unforeseen victories has been successful communication. This chapter aims to give an empirical overview of shifts in the Ukrainian mediascape during the first year of the invasion, focusing on three principal sites of analysis: media infrastructures, actors and practices. We observe collaborative communication between different actors, involving a synergy of top-down, bottom-up and horizontal actions, where hyperlocal reporting, lobbyism via social media, media activism, folklore and art have played important roles. Ukrainian society compensated for its lack of resources through the media and communication equivalent of a *levée en masse* (mass mobilisation), yet in a decentralised, networked way based on swarm communication paralleling the swarming tactics used by the Ukrainian military.

Our analysis is based on three kinds of data obtained in the following ways: a systematic review and scraping of war-related hashtags on Facebook, Twitter and YouTube; following official, professional and semi-professional Telegram

channels (the primary source of information for Ukrainians since the invasion [Opora 2022]); and episodic monitoring of Ukrainian news media, TV channels and publications about the media. The data collection lasted from 24 February 2022 until February 2023, accumulating an archive of 15,000 social media postings as the documentary basis for our analysis. The authors also conducted interviews with six Ukrainian media professionals: a deputy chief editor of an online news media publication, a journalist covering the media market, two media experts, a military administration press officer and a strategic communication professional. Unstructured online interviews in Ukrainian occurred between March 2022 and December 2022. Two follow-up sessions with those interviewed during this period were organised in December 2022, focusing on editorial work during power outages. We also used supplementary interviews with five civilian refugees, conducted in March–April 2022 onsite in Lviv.

From limited to total(ising) war

We follow Käihkö (2021) in interpreting the 2014 annexation of Crimea and war in Donbas as examples of limited war, where adversaries set a smaller military aim to which they do not commit all their resources. The 2022 invasion marked an expansion towards total war, whereby (ideally) all resources are committed to the adversary's defeat. Total war also legitimises targeting civilian infrastructure and populations. It is possible to apply the perspective of total war to this war, but with some reservations. While Russia has used the principles of total war (attacking Ukrainian civilians and infrastructure), the characteristic full mobilisation has been lacking. Simultaneously, Ukraine has involved its civilians more than Russia, but it has never attacked civilian targets on Russian territory. There have also been certain restrictions on how weapons have been used. Russia may have started the invasion as another limited war, albeit with a grand aim (regime change or occupation); however, upon the initial failure, it required expansion towards total war. Certainly, we can observe that the principles of total war are being asymmetrically employed by the belligerents. At most, we can speak of a new type of war, occupying the middle ground between limited and total. We call this a 'totalising war', as it is transitioning from a limited to a total war, although the total aims are still constrained by the belligerents' limited military capacity.

Another fundamental aspect is the role of technology. Recently, modern warfare has been defined as *digital war* (Merrin 2018), as it is increasingly reliant

on digital technologies, and even participatory war (Boichak and Hoskins 2022). It is possible to speak of a rollback to pre-industrial forms of total war, conceptualised by Clausewitz based on the *levée en masse* during the French Revolution:

Suddenly war again became the business of the people – a people of thirty millions, all of whom considered themselves to be citizens. (...) The people became a participant in war; instead of governments and armies as heretofore, the full weight of the nation was thrown into the balance. (Clausewitz 2008: 238)

What makes this current iteration special is its networked, mediated character, whereby mobilisation and its consequences are wired by communication that combines both legacy and networked media in a hybrid media system (Horbyk 2023). Here, the concept of mediascape as a combination of infrastructure and content (Appadurai 1990) is especially productive. The concept of collaborative communication also appears important in explaining the mechanics of participatory war. This concept, which originated in marketing studies, is characterised by high frequency, reciprocal feedback, mutually beneficial information sharing and the use of rationality in persuasion (Joshi 2009: 134; Mohr and Nevin 1990).

The three periods of war communication: Mobilisation, plateau and blackout

We cannot approach the Ukrainian mediascape during the first year of the invasion as a static snapshot. Since 24 February 2022, it has been changing rapidly at the levels of infrastructure capacities, practices of media outlets and media consumption patterns. We suggest the following mediacentric periodisation of the first year of the war:

1. *Total mobilisation* (from 24 February to the de-occupation of Northern Ukraine in early April). The Russian offensive from multiple directions and missile strikes all over the country led to shock, the destruction of everyday routines and massive displacement of Ukrainians around the country and abroad as well as mobilisation and resistance. According to representative polls, 81 per cent of Ukrainians donated to the Armed Forces of Ukraine (AFU), 63 per cent provided refugees with clothes, and 60 per cent donated to humanitarian efforts (NDI 2022). Thus, we

- can state that most of Ukrainian society became participants in the war effort. This period was characterised by the media system's transition to martial law conditions, obsessive news consumption (largely on social media) and robust content production and circulation. It ended with Ukraine's victory in the Battle of Kyiv and the revelation of the atrocities committed by Russian military personnel in the occupied territories.
2. *Plateau* (early April to October). War became an established part of life. New war-induced media practices and rituals became routine, including air raid smartphone alerts, daily publication of Russian losses, minutes of silence and crowdfunding initiatives in the media. Many businesses reopened, some people returned from evacuation, and children restarted school offline. This period also saw frontline victories and losses, from the sinking of the cruiser *Moskva* and the liberation of the Kharkiv region to the tragic fall of Mariupol and Russia's limited success in Donbas.
 3. *Blackout* (starting on 10 October and ongoing as of February 2023). Russian strikes on critical energy infrastructure throughout the country led to massive power outages as well as mobile and internet disconnection. This disrupted the already established media production and consumption routines. The gaps in content posting after strikes became noticeable for smaller outlets, and consumption was restricted by blackouts (evident from the sharp drop in YouTube channel views, according to one interviewee). TV viewing decreased significantly, down by 44 per cent during the week of 31 October in Kyiv (Biloskurs'ky and Serhienko 2022). During the blackouts, analogue and non-electronic media, such as books, have become more popular.

Summing up, we identify three periods between February 2022 and February 2023: total mobilisation, plateau and blackout. Each can be characterised by radical changes in media production and consumption, from the breaking of established routines to the formation of new routines to a new disruption. These changes have been shaped by, on the one hand, the external logic of the totalising war and, on the other hand, by infrastructural turmoil. What, then, have been the key developments in media infrastructures?

Media infrastructures: Ravage and resilience

Media and communication are determined by their underlying materiality. In particular, broadcast media and digital communication depend on the network

of transmitting and receiving devices and the power grid that feeds them. In this section, we focus on the infrastructural transformations since the invasion. While Ukraine has a historically weak newspaper culture, its television network is robust, with up to 30 channels via digital TV and hundreds via over-the-top (OTT) services. Internet penetration is also rather high: 71 per cent of Ukrainians used the web in 2019 (Ukrinform 2019), and 60 per cent were registered on social media platforms (Kondratenko 2021). The country is covered with dense mobile networks of varying quality: 3G and 4G from six GSM and two CDMA operators are available in major population centres and along important roads, while connection in the countryside can be poor.

This infrastructure, which is vital for Ukrainian society's cohesion, already came under attack during the annexation of Crimea and the limited invasion of Donbas in 2014, when Russia aimed at securing control first over TV transmitters and later over mobile towers and internet cables. The occupied territories were severed from the Ukrainian grid, and new physical networks were created, wired via Russian traffic nodes (Horbyk 2022). When the Russian armed forces invaded Ukraine in 2022, they sought to destroy infrastructure. On 1 March, the main TV centre in Kyiv was targeted by a missile killing five people and causing (ostensibly limited) damage to the equipment (Zharovs'ky 2022). In this context, the destruction of many television transmitters in the contested areas and deep inside the country can also be considered deliberate.

Thus, TV channels were forced to reorganise their production routines and move studios to secure compounds. This became a factor in the TV centralisation and the establishment of the United News (*Yedyni novyny*) broadcast. In the occupied areas, such as Kherson, occupation administrations took control of broadcasting facilities and replaced Ukrainian TV channels with Russian ones. Before 24 February, Ukrainian TV channels were present on commercial satellites, but they were made available for free thereafter – partly to mitigate this forced disconnection.

Russian forces similarly attacked mobile communication infrastructure. As previous research has shown (Horbyk 2022), the AFU have been using regular mobile telephony since 2014 to compensate for gaps in their communication systems. This arguably motivated the Russian Army to disrupt mobile communication. According to the interviewed civilian refugees from Bucha, Irpin, Kherson, Mariupol and Sumy, mobile connection was lost during the Russian attacks, partly due to damage to power supplies, but also to the physical destruction of masts that some witnessed. Russians actively employed radio electronic warfare, particularly Leer-3 devices designed to jam mobile signals.

This imposed a communication blackout on people in the frontline and occupied areas. Both receiving information from the outside world and providing information about local developments became hard or even impossible.

By the plateau phase, Starlink satellite internet terminals became a vital infrastructure element, and 22,000 terminals were operative in Ukraine by September (Markquardt 2022). Initially, these entered military use as relatively secure frontline communication options. As Ukraine reclaimed more ground at the places where mobile sites had been destroyed, the military provided their Starlinks to civilians (who had to come to designated sites with a terminal installed). Ukraine also established domestic mobile roaming, whereby a user can connect to the network of an operator other than their own. Due to increasing damage to the electricity and communication infrastructure, more civilians and businesses invested in Starlink, power generators, industrial batteries and other support devices. These developments also elevated the role of radio as a source of information, especially in the blackout phase.

The government and local authorities started developing a network of the so-called “Invincibility Points” (*punkty nezlamnosti*), which are heated shelters with electricity, television broadcasts and mobile and internet connections. This pinpoints an interesting infrastructural centralisation/decentralisation dynamic. As the communication hardware is decimated, the media texture thins out, and media use – previously compartmentalised and privatised via individual devices – becomes locally centralised at nodes where the texture of signals and connectivities is thicker. By virtue of this, media use also becomes a shared, communal activity.

Actors and their practices

In this section, we explore the entanglement of practices by the state, media and audiences that are the main actors in the wartime mediascape. These collective and individual actors have been collaborating according to a blended military/media logic. During the invasion’s first days, trust between the state and society was the major asset contributing to mobilisation and resistance. The need for cohesion immediately posed two challenges for communicators. First, in terms of the balance of informing, how should they communicate to keep people updated and safe but not supply the foe with information that could be used to harm? Second, how could they prevent society from succumbing to panic or euphoria?

This blended logic implied constraining some information flows and amplifying others by way of information management (Bolin and Ståhlberg 2023). Unlike in peacetime, official content is generally accepted as truth during war, as our interviews with the journalists revealed. Because of the presence of fabricated news, misinformation and enemy psy-ops, searching for and disseminating alternative sources of information were not encouraged by the social contract.

The state institutions and support networks

The full-scale war increased the visibility of the state institutions, the military, their press-services and individual spokespersons. However, the Ukrainian state is far from a homogenous vertical apparatus: its system is very much decentralised, and content production is not very coordinated. As was evident from our research interviews, there is no single message box, and official spokespersons have a lot of autonomy.

Apart from President Volodymyr Zelensky, who is perceived in the West as the leader of Ukrainian resistance, other official voices are prominent in the wartime information field. These include presidential advisors such as controversial and eventually dismissed Oleksii Arestovych, who was notable during the total mobilisation period due to his outreach to Russian audiences and the use of his voice – commonly perceived as hypnotically soothing – in war update videos, and ministers such as Iryna Vereshchuk, who deals with prisoner-of-war exchanges and civilian evacuations. Local authorities, bestowed with more powers by the decentralisation reform of 2014, have also achieved prominence in cities and regions, such as Kyiv mayor and ex-boxer Vitalii Klychko and the head of the Mykolayiv region, Korean–Ukrainian Vitalii Kim, whose optimism and hipster socks have made him a protagonist in memes.

Apart from prominent individuals, there are also state agencies that all maintain their presence on social media, have press officers and regularly create newsworthy content. These include the Security Service of Ukraine, the Centre for Countering Disinformation and the State Emergency Service of Ukraine. They can be represented even by fictional and non-human characters (Horbyk and Orlova 2022). This was exemplified by Patron, the mine-sniffing Jack Russell terrier, which became a personification of Ukrainian deminers, and the Ukrainian Air Force's fictional Ghost of Kyiv. The military, of course, is represented first of all by the very real Commander-in-Chief of the AFU Valerii

Zaluzhny and Minister of Defence Oleksii Reznikov. However, most content is produced and disseminated at every level of the military structure: starting from the Ministry of Defence and Commander-in-Chief headquarters, then going down all the branches of the AFU, and ending with separate units' and even individual soldiers' milblogs.

However structured and well-coordinated the communication from the state appears, it is a network of institutions and groups of influence that communicate independently. A common denominator was often found at the level of intuition: 'There is a lot of improvisation and haste in the conditions of war (. . .). We just feel what needs to be done and how,' said a military administration press officer. Another important aspect is the collaboration between the state and civil society. Much official communication is outsourced to creative agencies and non-governmental organisations (NGOs), including the wartime nation branding campaign 'Brave', developed by the advertising agency Banda (Kaneva 2022). According to one interviewee from such an NGO, this is a two-way collaboration: sometimes NGOs approach state institutions with a project idea, and sometimes vice versa. Civil society engagement legitimises such projects and prevents power games within the state sector, as officials are more open to ideas from the outside than from other institutions because the latter raises issues of subordination. In general, state institutions conduct a policy of internal non-confrontation: even rivals are united in the face of the common threat and avoid opposing one another publicly. However, as our interviewee stated, the President's Office is very sensitive to competition and tries to influence other actors to limit their celebritisation potential.

Information management

What are the functions of the state with regard to wartime communication? The first function is the regulation of information flows. Ukraine never followed the same template as Russia, where censorship was de jure imposed in March 2022 (Gosudarstvennaya Duma 2022). Even if Ukrainian martial law legislation enables military administrations to regulate the work of internet providers, mass media and printeries (Verkhovna Rada 2015), no such restrictions were implemented during the total mobilisation phase; instead, the containment of information was based on a social contract with journalists and civilians. The government had recommended not disseminating addresses and photos of recent missile strikes and movements of Ukrainian military

and foreign weapons supplies. However, as new missile strikes followed disclosures that were made despite this recommendation, penal legislation was later adopted.

The AFU likewise regulates journalists' access to the frontline. The presence of journalists on the frontline is not necessary for connecting the army and the rear, stated the military administration press officer, because content from the frontline nonetheless proliferates via soldiers' and locals' social media posts. Journalists' presence seems beneficial if instructions are followed – 'to film what is needed; not to film what is not' – since news can be used for reconnaissance and intelligence. A deputy editor-in-chief of a prominent online publication complained that the military reluctantly granted frontline accreditation to journalists, especially Ukrainian journalists. The interviewee explained this through the prevalence of military logic over media logic: 'It's less important what we will write in our publications than to win with the least losses,' including losses among journalists.

Direct official and military communication

The state has become an important source of exclusive information thanks to control over frontline access. State institutions frame the strategic narrative of national resistance by using professional and citizen content, formal and informal language, serious messages, and entertainment. Daily addresses by Zelensky, in which he talks to the 'free people of a free country', provide a point of stability. Other genres used by the state institutions are speeches to international organisations and democratic parliaments and appeals to Russian civilians (to protest the invasion) and soldiers (to surrender).

The official army sources provide systematic updates, appropriated by internet users to create memes and viral content. Yet not all information is disclosed, especially regarding Ukrainian losses. To avoid damaging morale, casualties are usually presented as individual stories of heroism but not in terms of numbers. Sometimes, as in the Kharkiv counter-offensive or the Crimea Bridge explosion, Ukrainian officials have kept a significant silence, letting unofficial versions from both sides fill in the vacuum.

Apart from official websites, social media platforms form important state communication channels. On these platforms, the AFU disseminates not only many drone videos of combat victories but also professional features about soldiers, semi-official milblogs, captives' interrogations and intercepted phone calls where Russians discuss their failures and atrocities. During the total

mobilisation phase, when fierce resistance was crucial, the military disseminated videos and infographic manuals on the use of Molotov cocktails and Javelin/NLAW anti-tank missile launchers, as well as recommendations on what content should not be disclosed, how to be updated without a connection and how to act if the enemy seizes one's smartphone – in other words, wartime media literacy training.

Russian disinformation was countered by a combination of humour, debunking and prebunking (Lewandowsky and Linden 2021). Making people aware of upcoming disinformation and provocations proved to be a successful prevention technique. For example, deep fakes with Zelensky 'urging' Ukrainians to surrender were received with mockery after the warning from the Security Service of Ukraine (Mishchenko 2022). Another way to engage with the audience has been entertaining content, such as memes, dark humour jokes, music and songs. Given the outburst of grassroots participatory culture, the Ministry of Defence commissioned songs praising Ukrainian soldiers, new weapons and civilian resilience. Some of these songs became national hits, including the much-remixed and -covered 'Bayraktar' by Taras Borovok, which was named after Turkish-made attack drones successfully used by Ukrainian forces.

Apps, chatbots and gamification

The collaborative aspect of communication between the state and the public is reflected in multiple chatbots. Some of these were used for participatory reconnaissance, collecting information from locals about the position of enemy vehicles and troops, saboteurs, collaborators and explosive objects (e.g. *yeVoroh* [a pun on *eEnemy* and *here's the enemy*] and *@stop_russian_war_bot*). Some 433,000 Ukrainians had contributed to *yeVoroh* as of 7 December 2022 (ZN.UA 2022). Other bots were used for helping families find missing relatives, acquire information about Ukrainian POWs and gain advice about first aid or relocation. Some of the bots were used for collaboration between state institutions and the public against disinformation (Kravchenko 2022; Vogue 2022).

It is important to note that the *Diya* e-governance app, in particular, used daily by millions of Ukrainians to obtain state services, was partly converted to wartime use, hosting the chatbot *yeVoroh* along with a game. Computer games are well-known tools for civic engagement (Kahne et al. 2009). Several games commissioned by the Ukrainian state and military are simple shooters with a patriotic message that can be played offline or that use a small amount

of internet traffic. One of these, *yeBayraktar*, was already developed by March 2022 for *Diya* by the Ministry of Digital Information. The gamer acts as an operator of the Bayraktar drone and prevents enemy tanks from breaching the checkpoint (Brovko 2022). Another game, *Azv vs Zombies*, was issued in the AppStore on behalf of the Azov Regiment – a symbol of resistance in the siege of Mariupol. In the post-apocalyptic landscape of the ruined Azovstal ironworks, the gamer–soldier shoots zombies who unequivocally resemble the Russian military (NoWorries 2022). These games are not only *digital sedatives* (Brovko 2022) and time killers for people in bomb shelters; they are also digital tools for performing a shared media ritual (Couldry 2005). By enabling people to be together when spatially separated and to feel involvement in the common fight, these games ultimately maintain an imagined community.

Media outlets and media professionals

In May, Ukrainian journalists received a collective Pulitzer Prize. However, such appraisal has come at a price: 39 local and foreign journalists were killed during the first seven months of the full-scale invasion (Antonyuk 2022).

The changes in the media market and work conditions for reporters have been unprecedented. Before the invasion, the main Ukrainian media, particularly the commercial TV channels, were directly or indirectly associated with certain oligarchs, such as Renat Akhmetov, Viktor Pinchuk, Dmytro Firtash and Valerii Kolomois'ky, who used media ownership to gain political weight and further their economic interests (Riabinska 2017; Dutsyk and Dyczok 2021). None of the major TV channels were profitable. After February 24, Ukrainian TV sank into crisis because of the advertisement market collapse and the losses that the oligarchs suffered. This and anti-oligarch legislation led to the closure of Akhmetov's large Media Group Ukraine, with the subsequent dismissal of all the employees (Dan'kova 2022d). Other TV channels were also cutting losses at the expense of staff. According to our journalist interviewee, some channels initiated layoffs, while others reduced salaries by 50–70 per cent or sent staff on unpaid leave. Regional media were on the verge of extinction because of the advertisement breakdown, infrastructural damage and paper price increase. Newspapers sought survival strategies such as the integration of editorial teams, slashing page numbers or completely going online (Dan'kova 2022a).

On the invasion's first day, TV channels changed their programming, abandoning entertainment shows and turning to the format of marathons, where newscasts alternated with interviews (Dan'kova and Zhuk 2022). In late

February, five TV channels from three media groups united with Public TV (*Suspil'ne*) to launch the United News marathon, where every editorial team received a several-hour slot to broadcast news around the clock. It is unclear who initiated this – the authorities or the TV channels themselves. It may have been a common initiative because it solved certain challenges for both sides by creating a unified official information flow and easing the burden of 24-hour news broadcasting for the channels that had not previously been news channels per se. United News became ‘the point that assembled all information systems of the state, that conveys Ukraine’s stance (. . .) [through the] unity of media, authorities and the army’, as one of the marathon hosts stated (Dan’kova 2022c).

This centralisation did not occur without controversy. Two oppositional channels – 5 Channel and Espresso TV – from the orbit of ex-president Petro Poroshenko were not invited to United News despite expressions of interest. Instead, they launched their own marathons and were subsequently excluded by the regulator from the digital television package. Although they continued to broadcast on YouTube and via satellites, this case raised concerns regarding the independence of United News. While the journalists involved in the marathon denied any allegations of pressure from the authorities, they mentioned self-censorship when reporting unofficial information that could potentially harm the cause (Dan’kova 2022c). Avoidance of political debates led to the prevalence of guests from Zelensky’s party (70.4 per cent of all guests in May–September) (Kulyas 2022).

United News has become a powerful tool for demonstrating the unity of the nation, but it is simultaneously hazardous for freedom of speech and pluralism. It also undermines the successful reform of the formerly state-owned TV into a public service broadcaster. As the journalist interviewee said, ‘[a]lthough its existence is justified during the war, the marathon creates a temptation for the authorities; they get used to owning a media resource. The question is how the authorities will act afterwards.’

Personal anecdotes about journalists sleeping on the sofa in the office (Dan’kova 2022c) or broadcasting radio from the bathroom during air raid alerts (University of Manitoba Archives 2022) are indicative of the drastic changes in working conditions for the media. Reporting and thus contributing to the war effort has been a coping strategy. ‘On the first morning, I stayed restless in bed, didn’t know what to do. So, I went to our website and started to post news’, recalled a journalist from a Kyiv-based online publication. Editorial teams became virtual since the journalists were dispersed in space: some stayed

in their cities, while others evacuated to Western Ukraine or abroad. This imposed technical challenges, but it made the teams resilient to wartime disruptions such as air raid alerts and electricity outages. In a virtual newsroom, journalists are backing each other up, substituting for those who cannot perform their duties. However, when Russia's missile strikes started to cause massive outages, this approach started to unravel. Sometimes no Ukraine-based journalist in the team could work, and the flow of news remained uninterrupted only because of those colleagues who had evacuated abroad.

War questions journalistic standards. The journalists we spoke to stated that the invasion had not changed editorial policy: they continued to report on events important to society. However, they also mentioned the priority of civic and military logic over the urge to recount everything. This applied to recent missile strikes, leaks from the military, filming Russian victims and government critique. As a military photographer said, '[m]y filter is not to harm Ukraine and not to harm my people. I am Ukrainian; I want us to win as soon as possible with minimum victims' (Dan'kova 2022b).

Despite the crisis induced by economic and infrastructural challenges, Ukrainian media outlets proved resilient and capable of adjusting to the new circumstances. Media communities, traditionally parallel to different political camps, demonstrated unprecedented solidarity, mutual assistance and collaboration between journalists, state institutions and civil society. The war increased the consolidation of information flows due to United News and journalists prioritising military logic, but at the same time, it introduced decentralising trends with virtual editorial teams. A new and long-debated media law was adopted in December 2022 and went into effect on 31 March 2023. This law is seen as simultaneously overdue and controversial by the public and our interviewees, as it expands the state regulator's powers, particularly with respect to online media. Most agreed that much will depend on its application and that amendments may be needed.

Audiences and their media practices

The war has led to tectonic shifts in content consumption and media practices. United News is watched by 32 per cent of media consumers, according to a representative poll from late 2022, and it is vastly trusted as an information source (USAID-Internews 2022). The consumers are also satisfied with the decreased pluralism, which is perceived as overcoming polarisation and media manipulation. About 13 per cent still use Russian sources, mostly to check

on the Russian narrative, and only 2 per cent are unhappy with the available Ukrainian sources (Opóra 2022). While the audience of United News is older (it is the main information source for people above 60), younger audiences are flocking to social media. Overall, 59 per cent receive information mainly from social media, whereas TV is the number one source for 43 per cent (Opóra 2022), compared to 67 per cent before the invasion (Detektor media 2022).

Social media are the main sources of information for most Ukrainians today. This can be explained not only through technological and generational changes but also through increased mobility. While TV consumption is home-bound, social media cater for news on the move, and moving is what millions of Ukrainians have been doing since 24 February. As the interviews showed, most consumers valued social media for speed, short news and videos.

The leading platforms are Telegram and YouTube: Ukrainians spend about 40 per cent of their social media time on each, followed by Facebook with 12 per cent (Opóra 2022). Use of Telegram has exploded in particular during the invasion. Another poll showed that 60 per cent of respondents used Telegram as a news source in 2022, compared with only 20 per cent in 2021 (USAID-Internews 2022). The most popular channels include the news channels Trukha (2.7 million followers), TSN (932,000) and UNIAN (876,000), but there are also smaller channels with audiences in thousands. The media market has completely transformed, with an extremely fragmented and niche audience, for whom a host of smaller Telegram channels has replaced several of the most-watched TV channels. However, established media organisations tend to have a strong presence on Telegram too (e.g. UNIAN and TSN).

This restructuring has completely redrawn the map of audience media practices. First, news consumption has moved from TV to smartphones, becoming more personalised. Second, it has become more intimate because of the public/private ambiguity built into the app's design as a messenger-cum-news channel. News consumption is combined in one app with private conversations with friends and family, and sharing information in a private chat becomes easier. News consumption is thus integrated into networking and organising. As over 80 per cent of Ukrainians participate in the war effort in some form, social media and messenger apps are key platforms for the creation and coordination of robust horizontal networks. This has ushered in a new type of active audience, for whom news forms only some of the building blocks necessary for their own social practice. The shift from consumption to media participation has been especially pronounced.

It is because of this greater emphasis on smartphone-mediated information and participation that the Russian attacks on mobile and power infrastructure have been so disruptive. Another disruption has come from the Western tech giants, especially Meta, which, in March 2022, softened its moderation policy for Ukrainians by allowing calls for the destruction of the Russian military (Vengattil and Culliford 2022) before limiting this three days later and decisively ruling out any anti-Russian statements (Vengattil 2022). In practice, social media companies often ban posts and block users and news organisations for violation of rules and hate speech when they share photographic evidence of Russian massacres or express outrage at them. The major mainstream online media publication, *Ukrainska Pravda*, received five red status warnings, which automatically meant an end to monetisation and decreased organic reach (Mel'nyk 2022). The Ukrainian government sent an official letter to Meta, urging it to stop censoring Ukrainians, ostensibly to no avail (Media Sapiens 2022). As one example among thousands, in February 2023, Facebook deleted a post by the mayor of Kramatorsk, Oleksandr Honcharenko, telling about a Russian artillery strike on a local cemetery; it contained no hateful or graphic content, only pictures of destroyed graves and a brief matter-of-fact condemnation of the deed without any slurs (Espresso 2023). This has led the Ukrainian public to condemn social media policies as censorship or even foul play in Russia's favour. It raises issues of what community standards are or should be, especially for a nation resisting an invasion. This situation has also contributed to Telegram's success (where moderation is minimal).

Decentralised strategic communication at the sites of production and circulation is complemented by participatory communication merged with activism, often in a non-binding, hop-on/hop-off form that we call 'hop-on/hop-off activism'. Such activism does not always require systematic commitment. One example is condo chats in messengers, where neighbours inform one another about important developments in their area. This spontaneous hyperlocal citizen journalism is vital in the frontline and occupied areas.

Social media have become spaces for informing, speaking out, coordination, recording history and creating myths, and the shift between an ordinary citizen and an activist is as easy and instant as the shift between two chats in Telegram. Possible activities include sharing memes and jokes, launching petitions, informing foreign audiences through Twitter storms and hashtag fights, blocking malicious groups and trolls, and creating and disseminating songs and artworks (Boyko forthcoming). Users collaborate on complex tasks such as fundraising, coordination of DDoS attacks, logistics, etc., or even on

illegal (i.e. in peacetime) activities such as false bomb warnings about Russian infrastructure or scamming Russians online to donate to the AFU. New and unusual audiences are often involved: children ridicule Russian propaganda on TikTok and participate in troll blocking or DDoS attacks.

We propose the concept of ‘swarm communication’ to capture this and similar future situations. This also parallels the apparent use of combat swarming tactics by the Ukrainian military. Like a swarm, Ukrainian civilian participatory networks are non-vertical and fluid (albeit not completely without a central core and a vague, diffuse hierarchy). They can quickly disengage from issues that are solved or lose relevance and reassemble around new problems; and they are characterised by individual chaotic movements that nonetheless have the same vector – victory – on the larger scale.

Conclusions

The Russian invasion changed the Ukrainian mediascape instantly and dramatically, yet this process has been far from homogenous, as can be seen in the three stages we have identified. The mediascape saw contradictory tendencies, both centralising and decentralising. On the one hand, the ownership of large media holdings by financial–political groups (oligarchs) was undermined, and the dominance of TV was shaken by a constellation of Telegram channels and other social media, blurring public and private communications and meshing them together in participatory media practices. On the other hand, the state claimed a much larger role than ever before, managing and controlling information flows, especially around combat. Yet the state itself is a diffused actor, a networked rhizome of institutions whose interests can often overlap and contradict one another. This networked state is augmented by the robust support of NGOs that have situationally collaborated with the government during the war. Even though chaotic at first sight, this system is guided by a common goal and is flexible due to the autonomy it provides.

This makes Ukraine’s strategic communication collaborative and allows for the creation of open-ended transmedia narratives (cf. Bolin and Ståhlberg 2023) that can include contributions from all sorts of actors – state, non-state, private and even the enemy – whose communications are recontextualised as an element of Ukraine’s own story. Such diffusion and decentralisation challenge the presumption of a systematic and centralised process that is at the heart of all definitions of propaganda from Lasswell (1928) to Jowett and O’Donnel (2019). From a traditional perspective, the lack of a single communication

centre and voice is seen as a weakness. For example, Lasswell attributed the German defeat in the First World War to such disorganisation. In a mediated society, however, centralisation seems less applicable. The diffusion of actors and production also questions the utility and adequacy of applying the concept of propaganda to Ukraine's wartime communication. Instead of this centralised activity, it can rather be characterised as strategic collaborative communication founded on the dialogical and symmetrical public relations models.

Apart from disruption, the work of media organisations also saw the decentralisation of work routines. Simultaneously, the constraints on journalistic work often led to internal contradictions. While journalists tried to follow both military logic and media logic, the two often conflicted. As a result, media logic often finds itself overridden by military logic. When the opposite happens, the triumph of media logic often creates security vulnerabilities.

Finally, the audience's consumption also underwent simultaneous decentralisation and personalisation via smartphones, as well as a new recentralisation thanks to the communicative nodes of connected shelters during the blackout phase. Overall, the audience experienced a greater integration of public information and personal communication, which enhanced networks of solidarity and mutual support. Collaborative communication between the state, the media and citizens acquired the characteristics of a swarm, as the audience's media practices were determined by hop-on/hop-off activism and swarm communication. These are the principal tools of civilians' self-mobilisation in a totalising war, and they fit well with Ukraine's swarming military tactics and diffused state hierarchies.

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