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Information Resilience and Information Security as Indicators of the Level of Development of Information and Media Literacy

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Abstract

This paper analyzes the use of the terms 'information resilience' and 'social resilience' in the context of national resilience strategies. It is shown that information resilience reflects transformations in the system of international relations and the domestic policies of different countries, as well as prospects for the development of information-and-communications technology and its impact on social processes.

Based on the results of a research project implemented as part of this study, a hypothesis was formulated which stated that the majority of the Ukrainian people are not aware of the reality of information threats at this time. This hypothesis was supported based on an analysis of empirical data collected for the study.

The study helped identify gaps between government and society in Ukraine in the following five key areas: values, goals, capabilities, motivation, and communication. It is shown that these gaps have had a significant impact on the overall level of information and national resilience in Ukraine.

The information resilience of Ukrainian society was analyzed at the local level (through the example of Ukraine's eastern and southeastern regions).

It is suggested that the issue of social and information resilience is of particular relevance in the context of information and media literacy amongst the population, especially within small communities.

In this context, an analysis was conducted of the information space of Ukraine's eastern and southeastern regions. The resulting conclusion was that the level of media culture in Ukraine, determined by a number of both subjective and objective factors, is relatively low at this time.

Keywords: resilience, information resilience, information literacy, media literacy, propaganda, sustainable development, education, corruption, cybercrime, democratic institution, political decision-making, democratic deficit, democratization.

1. Introduction

The subject of resilience owes its relevance to the significant transformations in how we see today the role of social institutions in safeguarding the security of the State. The State can no longer count solely on the security and defense sector, as it has traditionally done, but has to engage active members of society in creating resilient social establishments. National, social, and information resilience are increasingly becoming in-demand as concepts through which

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researchers try to express the changing reality in the socio-political and military spheres, on one hand, and bring out a novel perspective for assessing the impact of information-and-communications technology on social reality, on the other.

Information security and information resilience are directly linked with the level of development of information and media literacy in society. In Ukraine, the concept of national resilience is being gradually cultivated as an alternative to the traditional approach to managing national security. At present, the people of Ukraine are inclined to trust civil society organizations more than government, although the concept of national resilience implies building relations of trust between government and civil society (Teperik et al., 2018: 6-8). Without question, it is in the regions, at the level of local self-government, that a source of national resilience ought to be sought and developed.

Central to national security and resilience are information security and information resilience, determined by the level of development of information and media literacy.

Currently, there are gaps in national resilience in Ukraine across the following key areas:

- 1) cognitive environment;
- 2) communications;
- 3) digital environment;
- 4) information environment (Teperik et al., 2021: 2).

At the level of regulatory documents adopted in Ukraine, there is an insufficient level of development of media culture in today's Ukrainian society. In this context, one of the key objectives to be achieved under Ukraine's Information Security Doctrine (adopted in 2017) is "to develop the media culture of society and foster a socially responsible media community" (Doktryna, 2017).

Thus, there is a need in this regard to both monitor and assess the level of development of information and media literacy in Ukrainian society and cultivate and develop knowledge and skills relevant to this area.

2. Materials and methods

Use was made of both qualitative and quantitative strategies of inquiry. A desk study was carried out to investigate and summarize existing research that surrounds the topic of resilience, including analytical research, surveys, reports, etc. The research reviewed as part of this study tends to investigate social resilience at the following key three interrelated levels: global, national, and local (regional). With this in mind, the study involved exploring the key aspects and mechanisms of resilience at the different levels.

Based on the results of the desk study, the following steps were undertaken:

- 1) analysis of key factors in the solidarization and consolidation of Ukrainian society, with a focus on the characteristics of how they manifest themselves in Ukraine's regions;
- 2) analysis of existing scholarly models for fostering and ensuring social and information resilience, including in a climate of transformations in particular spheres of life;
- 3) formulation of the hypothesis and the task for a quantitative study focused on identifying potential risks and threats to social resilience in the context of information resilience and information security.

To identify and explore the factors influencing the process of fostering social and information resilience at the level of particular communities, field research was conducted, which included the following:

- 1) focus groups;
- 2) expert interviews;
- 3) analytical workshops;
- 4) sociological survey;
- 5) analysis of public information.

The data collected helped identify a set of relevant vulnerabilities and gain an insight into the population's assessment thereof. This helped come up with a prediction of the risks to information security at the regional level with the factors influencing social and information resilience in mind.

The analysis of public information and monitoring of social networks and media outlets helped determine the nature of the latest information flows and gain a better insight into current patterns of information resilience and into how it is being ensured in Ukraine at present.

The study was inspired by a hypothesis that, amid current global challenges to security (e.g., COVID-19, economic turbulence, increasing number of cyber-attacks, etc.), people tend not to interpret information threats as a real threat. The pandemic, material difficulties, and poverty are

having an immediate and obvious effect on physical space, with the consequences of these threats being felt by just about any person on the planet. By contrast, information threats are latent in nature. Their destructive effect is delayed in time. That, however, does not make them less dangerous.

In this context, of particular importance is boosting the level of information and media literacy to ensure social and information resilience in Ukrainian society.

3. Discussion

In the literature, the term ‘resilience’ is used in a number of contexts. The concept has already become multidisciplinary, although there is still some variation among researchers in how it is construed depending on the context and area of focus. The term was first used in research on ecosystems. Specifically, C.S. Holling construes resilience as “the measure of the ability of an ecosystem to absorb changes and still persist” (Holling, 1973: 2).

The term is also popular in psychology, where it is generally viewed as the capacity for successful adaptation to adversity and stressful life events (Sonn, Fisher, 1998: 3). S.W. Gilbert defines resilience as “the ability to minimize the costs of a disaster, to return to a state as good as or better than the status quo ante, and to do so in the shortest feasible time” (Gilbert, 2010: 2).

Academic interest in resilience as a concept grew after the September 11 attacks in the US. According to researchers B. Allenby and J. Fink, “developing enhanced resiliency is a rational strategy when the probability and specifics of a particular challenge are difficult to define” (Allenby, Fink, 2005).

Researchers S. Spilerman and G. Stecklov argue that “systems experiencing one catastrophic event exhibit different adaptive behaviors as opposed to systems that try to cope with chronic stressors” (Spilerman, Stecklov, 2009: 169).

In the US, Israel, and the UK, an active component of antiterrorist campaigns is law enforcement agencies enlisting the help of citizens. In Israel and the US, a great deal of attention is given to the psychological aspects of the development of society’s resilience to terrorist threats, which is aimed at minimizing the anxiety and vulnerability associated with the direct or indirect impact of terrorist attacks. Estonia is actively developing mechanisms of social resilience to destructive influence through information and communications (Reznikova, 2019).

A concept that has taken on particular relevance in recent years is social resilience, which tends to be associated with the resilience of individuals or groups. The term was first used by W.N. Adger, who defines it as “the ability of communities to withstand external shocks to their social infrastructure” (Adger, 2000: 361).

Some researchers have focused on exploring human systems in terms of the ability to not only react to relevant threats but anticipate and predict them – “the capacity to absorb ... change – the ability to deal with surprises or cope with disturbances” (Glavovic et al., 2003; 291).

In terms of the possibility of utilizing the experience of overcoming crises in the past to minimize losses in the future, social resilience can also be construed as “the capacity of actors to access capitals in order to – not only cope with and adjust to adverse conditions (that is, reactive capacity) – but also search for and create options (that is, proactive capacity) and thus develop increased competence (that is, positive outcomes) in dealing with a threat” (Obrist et al., 2010: 289).

Researchers M. Ganor and Y. Ben-Lavy have identified several key components of social resilience, which include the following:

- 1) communication, meaning the need to inform people of the situation, threats, risks, and available support services;
- 2) cooperation, meaning being responsible on a local level, i.e. relying on ourselves rather than waiting for outside help;
- 3) cohesion, meaning being sensitive and mutually supportive of one another;
- 4) coping, meaning the ability to take action in a consolidated manner using various mechanisms designed to deal with threats;
- 5) credibility, meaning there is a greater need for grassroots leadership.

The researchers argue that “community resilience does not have to be specifically created [as] it grows by itself”, but, at the same time, “resilience cannot be achieved overnight” (Ganor, Ben-Lavy, 2003: 105-108).

Social resilience can also be viewed triunely – as the ability of individuals or groups to cope with difficulties, adapt to challenges based on historical experience, and effect transformation, i.e. create institutions designed to ensure individual wellbeing and safety.

There is a study suggesting that community resilience emerges from the following four primary sets of networked resources:

- 1) economic development (level and diversity of economic resources; equity of resource distribution; fairness of risk and vulnerability to hazards);
- 2) social capital (social support; social embeddedness; organizational linkages and cooperation; citizen participation; sense of community; attachment to place);
- 3) community competence (community action; critical reflection and problem solving skills; flexibility and creativity; collective efficacy; political partnerships);
- 4) information and communication (narratives; responsible media; skills and infrastructure; trusted sources of information) (Norris et al., 2008).

Thus, social resilience engages the internal resources and capabilities of society (e.g., skills, relationships, assets, values, norms, etc.) that have been accumulated over a long period of time and in areas that may seem to have little to do with resilience. Social resilience is often viewed as society's resources and capabilities.

Given the need to analyze the resources that social resilience relies on, it may be worth taking account of the key components of resilience in investigating issues relating to information literacy in the context of information resilience and information security.

Social resilience ought to be viewed in the context of national resilience. Research in this area has produced numerous approaches to and methodologies for defining this concept. Specifically, according to a team of researchers led by G. Ben-Dor, national resilience, as a crucial component of national security, "comprises four major components – patriotism, optimism, social integration, and trust in political and public institutions – which should be retained in times of intractable conflict" (Ben-Dor et al., 2002).

In addition, national resilience is viewed as a dynamic construct that "changes in response to contextual changes" (Fletcher, Sarkar, 2013) and as a phenomenon that depends directly on the sociocultural characteristics of a community; national resilience is positively correlated with community resilience and is predicted by level of religiosity, age, and level of community cohesiveness (Kimhi et al., 2013).

The rapid development of information-and-communications technology signals a need to conceptualize information space and its security. In this respect, information resilience could be defined "as the process of reducing the vulnerabilities affecting information quality through the identification of capabilities and requirements" (Gunderson, 2000).

Information resilience, "as the ability of a network to provide users with continued access to information in the face of various faults and challenges to normal operation", is, alongside a few other forms, a crucial component of social resilience and national resilience in general (Rak et al., 2017).

What is particularly crucial in terms of ensuring information resilience is "the assurance that the communication system will enable the user to access and exchange the relevant information regardless of the failure scenario" (Avizienis et al., 2004).

According to researcher O.O. Reznikova, who has investigated the fundamental difference between national security and national resilience, "within the system of national resilience, the line between the terms 'subject' and 'object' is thin" (Reznikova, 2018: 172). Government, civil society, and business institutions cease to be the object of threats – they will have the qualities and capabilities needed to counter adverse phenomena and processes thanks to their own resilience.

It is important to note that resilience and resistance are two different concepts. Resistance is often construed as a system's capacity to contain the immediate effects of a stressful situation and recover to a state that is similar to the one before the disturbance (Maru, 2010). Resistance can cause a prolonged dysfunction of a system in a changed environment. For its own part, resilience is "the ability to find unknown inner strengths and resources in order to cope effectively with long-term pressures", and is, therefore, "the ultimate measure of adaptation and flexibility" (Ganor, Ben-Lavy, 2003: 106).

4. Results

While they are interrelated spatially, the difference between national security and resilience is obvious. Security is preventive and proactive, whereas resilience is a combination of proactive and reactive measures directed at minimizing the effects of a threat rather than avoiding them.

The present study employs a broad interpretation of 'resilience', which it defines as the ability to withstand external shocks without loss of integrity and functionality.

As part of this study, in association with the International Center for Defense and Security (Tallinn, Estonia) and the Research Center for Regional Security (Sumy, Ukraine), a research project, entitled ‘Resilient Ukraine’, was carried out to explore the influence of civil society’s institutions on Ukraine’s national security (Teperik et al., 2018; Teperik D. et al., 2021).

The project helped identify gaps between government and society in Ukraine in the following five key areas:

- 1) values;
- 2) goals;
- 3) capabilities;
- 4) motivation;
- 5) communication.

These gaps are hindering the achievement of unity of effort and precluding work in synergy aimed at countering hybrid threats to Ukraine’s national and information security. In this regard, a set of recommendations were brought forward to address the need to invest in the development of social and human capital, cultivate grassroots leadership, foster cooperation between communities, and develop new approaches to coordinating relationships at the level of state and local government.

A key focus was on information resilience at the local level (at the level of territorial communities).

Once again, social resilience is about the ability of citizens to self-organize at the local level, adapt to external challenges, and build vertical and horizontal relationships. The issue of social resilience is of particular relevance in the context of information and media literacy amongst the population, especially within small communities.

The level of information resilience, based on the level of development of information and media literacy, was assessed as part of this study in the following seven regional centers of Ukraine: Sumy, Odessa, Zaporozhye, Kherson, Nikolaev, Kharkov, and Mariupol.

A key objective was to monitor the concerns and vulnerabilities of Ukraine’s citizens (Table 1).

Table 1. Vulnerabilities. Perception of threats, %

	Sumy	Kharkov	Mariupol	Zaporozhye	Nikolaev	Kherson	Odessa
Worsening economic situation	67	71.2	81	61.8	68.5	71	83.9
Epidemics	53.7	45.7	60.3	60.3	56	41.2	58.8
Environmental issues	18.5	15.4	33.3	47.2	20.8	13.5	25.1
Cultural and educational restrictions	17.8	12.6	11.6	33.2	24.2	14.8	17.1
Crime and corruption	32.2	38.6	20.2	47	41	38.8	55.3
False information in the media	19.5	16.2	16.3	23.2	14	15.2	16.6
I am not frightened of anything	7.2	2	2.2	17	10.8	3.2	4

As evidenced in Table 1, the people of Ukraine are primarily concerned about the economy, health amid the pandemic, and the levels of crime and corruption in the country. What is worrying is the relatively low level of critical perception of information provided by the media – only 15.6 % of Ukraine’s citizens were found to see danger in that. This is a very low figure, which is testimony to the fact that many Ukrainians readily succumb to propaganda and manipulation nowadays. It also attests to an overall low level of information resilience in Ukrainian society.

On the other hand, this result was conceptualized in the context of the more “vital” issues, i.e. the ones that the respondents were concerned about the most. Of importance in this respect is the issue of one’s critical perception and conceptualization of what is going on, which, in a sense, also predetermines the factors influencing the making of decisions, including political ones.

With this in mind, an index of social resilience was computed (Table 2).

Table 2. Resilience parameters

	Material resources	Professionalism	Motivation	Communication	Index
Sumy	14.4	14.4	16.9	18.3	16
Kharkov	16.8	11	10.5	10.2	12.1
Mariupol	9.7	12.6	12.5	10	11.2
Zaporozhye	30	12.5	14.6	15.5	18.1
Nikolaev	30.1	9.2	9.8	8.5	14.4
Kherson	5.9	4.8	7.1	9.2	6.8
Odessa	13.8	10.7	9.1	9.2	10.7

The study's methodology for computing social resilience parameters was based on a set of indicators grouped into the following four categories: (1) material resources (e.g., investment in the region, average pay, capital investment and projects, etc.), (2) professionalism (e.g., professional workers per unit of population, availability of research institutions, laboratories, etc., stability and predictability in staffing, development of business and entrepreneurship, etc.), (3) motivation (e.g., level of trust in local and state government, development of horizontal and vertical social relationships, etc.), and (4) communication (e.g., degree of development of civil society, activity of civil society's institutions, collaboration between local authorities and civil society, etc.).

Based on an analysis of open data and public information, the index was computed for each parameter, and an overall index of social resilience was derived (using a 100-point scale). As evidenced in [Table 2](#), the index of resilience varies significantly across the regions. The figures attest to an overall low level of development of social resilience in Ukraine, which may be attributed to the idiosyncrasies of the development of the Ukrainian state and society.

In assessing the level of information literacy, and, as a consequence, the level of information resilience, in Ukraine, it may be worth taking a look at the sources of information that generate content consumed by Ukraine's citizens ([Table 3](#)).

Table 3. Population coverage by TV channels in Ukraine, %

TV channel	Sumy	Kharkov	Mariupol	Zaporozhye	Nikolaev	Kherson	Odessa
Inter	34.4	25.8	35.6	18.1	27.5	31.2	17.9
1+1	36.9	20.8	15.3	36.3	36.5	35.2	23.5
Priamyi	4.7	5.8	2.2	4.3	4	4.3	6.3
STB	17.7	17.3	13.3	22.7	9.5	16	13.6
Novyi Kanal	10.7	6	4.7	10.6	4.3	6.8	3
ICTV	14.7	17.5	6.9	23.7	15.2	21	16.7
TRK-Ukraina	18.5	10	14.3	12.6	18.2	17.2	11.6
Ukraina-24	5.2	9.3	6.4	7.8	15.5	8.8	11.4
Pershyi Nezaleznyi	5.7	4	13.1	1.8	3	1.3	4.3
Nash	2.2	13	13.8	2.8	5.2	2	7.8
ESPRESSO	2	3.8	0.5	2.5	0.5	0	4.5
K-1	2.5	1.5	1.2	0.3	0	0.5	0.3
NTN	3.7	4	2.2	0.5	1.5	2.2	1.5
5-Kanal	7.2	2.8	1.5	1.3	0.7	1.3	3.3
Rehionalnyi Kanal	0.2	3	10.4	0.8	0.7	0.2	1.5
Rossiya-24	1.5	1.5	6.9	1.5	0	1	2.8
RTR	2.2	2.5	1.2	0.5	0.5	0	1.8
Pervyj Kanal (Russia)	0.7	3	1.7	1	0.5	0	2
I give preference to none	15	11.8	12.8	8.3	10.2	11.5	13.1
I do not watch television	14.5	29.3	22.7	29	24.2	14	31.3

Television and social networks were found to be the most popular information sources among Ukrainians at this time (80% and 40%, respectively). The high level of trust that the Ukrainian people have in information from TV channels (and the websites run by them) is an illustration of their current information preferences, especially given the latest news topics in the media (Moshniaha, Tymchenko, 2020).

In this respect, one should keep in mind the issue of the spread of false information, information of a manipulative nature, post-truth, etc. Of note is the fact that currently the overwhelming majority of TV channels in Ukraine belong to business establishments and oligarchical groups, which own media holdings and media groups (Kuznietsova, 2020).

Based on the study's findings, 2021 has seen an increase in the use of targeted journalism on TV channels in Ukraine (a rise of 39% compared to the first quarter of 2021). That said, a trend that continues is for commercial materials of a targeted nature, not political, to prevail, which may be attributed to the interelection period. There is an increase of almost double in materials of a targeted nature in favor of the companies, interests, and image of Ukrainian oligarch Rinat Akhmetov (from 8% in the first quarter of 2021 to 20.8% in the third quarter). The largest share of targeted journalism in Ukraine has been aimed lately at boosting the ratings of current President Vladimir Zelensky (IMI, 2021). Table 3 illustrates the preferences of Ukraine's citizens in terms of their trust and confidence in the country's major TV channels (Table 3).

The average figures in terms of population coverage by Ukraine's major national TV channels are as follows: Inter – 27.2 %, 1+1 – 29.2 %, STB – 15.7 %, ICTV – 16.5 %, and TRK-Ukraine – 14.6 %. Ukraine's top national TV channels, which together currently hold the largest audience share in the country, are controlled by Ukrainian oligarchs or persons affiliated with them (e.g., 1+1 media – by Igor Kolomoisky, Inter Media Group – by Dmitry Firtash and Sergei Levochkin, StarLightMedia – by Victor Pinchuk, and the Ukraine media group – by Rinat Akhmetov) (Kuznietsova, 2020). This fact may suggest that media content on these channels is politically and commercially motivated with a clear orientation toward manipulation and targeted journalism. This, in turn, impacts on the structure and form of consumption and assimilation of this kind of information, as well as the way it is conceptualized and evaluated.

An analysis of the information space of the region under examination indicates that it is conservative and is characterized by a certain degree of stagnation in terms of dealing with contemporary risks and challenges, which has determined its somewhat chaotic and sporadic reaction to changes and transformations currently taking place in socio-political life. At the same time, the region's media space is characterized by an inhomogeneous structure.

Its essential characteristic is that the dominant media resource in the region today is, as mentioned earlier, television, which is the primary source of information for nearly 80 % of its population. At the same time, just one-third of the population trusts information provided by national TV channels, and two-thirds are convinced that television has a negative impact on most people in Ukraine, turning them into zombies.

The determining factor in the choice of the traditional mass media is impartiality and neutrality – this indicator is viewed as decisive by residents of Ukraine's southern and eastern provinces (37 %). The decisive factor for another one-third of respondents was “the closeness of views voiced in the media” to their own beliefs, attitudes, and expectations.

The second most popular information channel in Ukraine is social networks: YouTube (especially among youth) – 59 % and Facebook – 47 %. Facebook and Instagram appear to be less popular in the east and south of Ukraine. At the same time, one is also witnessing a decentralization of social networks in Ukraine, with regional YouTube channels, Telegram channels, blogs, and websites increasingly performing in the top nationally in population coverage.

Based on the survey findings, a large portion (over 80 %) of the population in Ukraine's Zaporozhye, Nikolaev, and Kherson provinces views social networks as the main source of anxiety-producing information, which indicates a high degree of vulnerability to consuming unverified and false information, and, as a consequence, a low degree of information resilience. It is to be kept in mind in this context that social networks act today as one of the key resources for information-psychological influence on people's minds.

A telling fact in terms of information resilience in Ukraine is that 80 % of its citizens do not consume information content provided by TV channels, video blogs, and other sources dealing with issues of combating manipulation and fake news within information space. On top of that, nearly two-thirds of respondents were found to see no point in doing so. Only about 5 % of respondents

were found to deem this type of activity important and monitor media space from time to time for false information, propaganda, manipulation, and targeted journalism.

Thus, an essential characteristic of media consumption in the region at this time is the presence of vulnerabilities at the information, cognitive, and digital levels associated with an overall high level of trust in unverified and manipulative information. Based on the study's findings, this situation is in large part predetermined by the following two key factors: 1) the quality of media education and the level of information and media literacy (both low); 2) the thematic structure of media consumption.

The vulnerabilities of the population in Ukraine's eastern and southern provinces at the information, cognitive, and digital levels (e.g., misinformation, manipulation, propaganda, information-psychological influences of a destructive nature, etc.) are, in a sense, the consequence of unsystematic communication with central government, which determines the development of vulnerabilities at the communication level too. This signals a need to step up strategic communication in the region.

5. Conclusion

The hypothesis proposed in this research study stated that the majority of the Ukrainian people are not aware of the reality of threats communicated through various information channels and sources. At the very least, such threats are not perceived by most people in Ukraine today as high-priority. The majority of respondents to a survey conducted as part of this study chose to give priority to threats arising from material issues, challenges associated with the pandemic, issues facing the justice system, etc.

From the results of a research project implemented as part of this study, the following inferences were made:

- 1) present-day Ukrainian society is characterized by an insufficient level of development of media culture, which is particularly the case in small communities;
- 2) the low level of media culture in Ukraine is due to a number of both subjective and objective factors;
- 3) the key subjective factor identified is Ukrainians' individual preferences for source of information (with television still being a preferred source of information among the majority of respondents, despite Ukraine being a developed Internet market);
- 4) there are a high level of trust among Ukrainians in information they receive, a lack of practice and experience verifying it, and, as a consequence, a tendency to consume false information, to be vulnerable to manipulation, and to be easily susceptible to propaganda;
- 5) many in Ukraine have a poor idea of how the media sphere operates and how media content is distributed;
- 6) Ukraine has an oversimplified prioritizing scheme when it comes to information channels and sources, which mainly relies on unsubstantiated subjective concerns;
- 7) the key objective factors behind the low level of media culture in Ukraine today include the nation's information space being monopolized by oligarchical establishments, its media space having a highly inhomogeneous structure, and a lack of systematic strategic communication.

This state of affairs can be viewed as an inevitable consequence of the generally low level of information and media literacy among Ukrainians and of many of them having the disposition to consume viral media content due to a lack of critical thinking skills, fact checking skills, skills for working with open data, etc.

In the overall context, this is what is behind the low level of information resilience in both the social and personal dimensions, with the latter posing a particular concern given the psychological and other idiosyncrasies of how information is taken in at the level of individual consciousness.

The solution to this problem lies in the adoption by the State of a sound policy designed to ensure information resilience and information security via the mechanisms of an efficient and effective system of strategic communications; development of mechanisms for interaction between government and civil society's institutions; provision of integrated support for the development of mechanisms for media self-regulation based on the principles of social responsibility; enhancement of information and media literacy in society; facilitation of the training of a highly competent workforce for the media sphere.

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