Understanding the Ukrainian Migrants Challenges in the EU: A Topic Modeling Approach

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ABSTRACT

Confronted with the aggression against Ukraine in 2022, Europe faces one of the most important humanitarian challenges - the migration of war refugees from Ukraine, most of them women with children and the elderly. Both international institutions such as the European Union and the United Nations, but also national governments and, above all, local governments, which are the main providers of services and resources for refugees, are taking a number of measures to meet the needs. The extraordinary nature and extensive humanitarian needs pose exceptional challenges for both governments and Non-Governmental Organizations (NGOs) as well as civil society. The European countries adopted distinct reception procedures to accommodate war refugees in their territories. The purpose of this paper is to examine the challenges of war refugees from Ukraine and gain an understanding of how they vary across selected European countries. Using a text analytics approach such as BERTopic topic modeling, we analyzed text messages published on Telegram channels from February 2022 to September 2023, revealing 12 challenges facing Ukrainian migrants. Furthermore, our study delves into these challenges distribution across 6 major European countries with significant migrant populations, providing insights into regional differences. Additionally, temporal changes in 8 narrative themes in discussions of Ukrainian migration, extracted from official government websites, were examined. Together, this research contributes (1) to demonstrating how analytics-driven methodology can potentially be used to extract in-depth knowledge from textual data freely available on social media; and (2) to a deeper understanding of the various issues affecting the adaptation of Ukrainian migrants in European countries. The study also provides recommendations to improve programs and policies to better support the successful integration of Ukrainian migrants in host countries

CCS CONCEPTS

• **Social and professional topics**; • **Information systems** → **Information retrieval**; • **Information retrieval** → **Artificial intelligence**; • **Applied computing** → **Document management and text process**;

KEYWORDS

Migration challenges, Social media, Ukraine, European countries, Topic Modelling

1 INTRODUCTION

The Russian invasion of Ukraine in Ukraine in February 2022 compelled millions of people to flee their homes, seeking safety, protection, and assistance in neighboring countries. Following the United Nations High Commissioner for Refugees (UNHCR), only in the EU, there are 5,953,500 people[1]. The conflict in Ukraine in 2022 led to a substantial influx of refugees into Central and Eastern European countries, including Poland, Germany, Slovakia, the Czech Republic, Lithuania, Romania, and other countries. This rapid increase in migration has posed a formidable challenge to governments in these regions, requiring effective strategies to deal with the multifaceted issues arising from the crisis. According to the UNHRC[2] over 1 million individual refugees were registered in Germany, 976.414 in Poland, 348.710 in Czechia, 177.768 in Spain, 164.930 in Italy,133.312

[1]Information as of December 31, 2023 - Source:https://data.unhcr.org/en/situations/ukraine
[2]Information as of December 31, 2023 - Source:https://data.unhcr.org/en/situations/ukraine

in Romania, and 103.409 in Slovakia at the end of 2023. Only in Poland, 96% of all refugees were women, while 51 were traveling in groups, including 4035 thousand children and 915 elderly persons[3].

The host country governments, the EU, and the UN are working to include refugees in line with international standards, ensuring full access to their rights and providing essential protection services and humanitarian assistance. However, due to the emergency nature and the extensive humanitarian needs resulting from the significant Ukrainian migration, the attainment of this objective poses exceptional challenges. Consequently, the systematic monitoring of trends in the genuine needs and requirements of this group of people, alongside their alignment with authorities' regulations and rules, becomes an important part of societal stability. The topic of migration of war refugees from Ukraine has dominated social science works since the war began [16, 39]. Most of the existing literature sources are based on consideration of the migration situation in relation to individual countries [8, 29], of which works on the situation of Ukrainians in Poland are dominant [7, 16, 32]. Only a few studies address the challenges in cross-country terms and they are survey-based [13, 20].

Based on the above motivation, this study *aims* to provide insights into the challenges faced by migrants from Ukraine in European countries as a result of the Russian invasion of Ukraine. The research questions guiding this study are as follows: RQ1: *What challenges do migrants from Ukraine encounter?* RQ2: *How do these challenges vary across European countries?* Analyzing text messages posted from February 2022 to September 2023 on Telegram channels created to provide information support to Ukrainian migrants in European countries, our research identified 12 main challenges faced by migrants from Ukraine. The distribution of these challenges within the top 6 European countries, which hosted a significant number of migrants, was also analyzed. In addition, the study examined temporal changes in 8 topics related to Ukrainian migration, extracted from news articles and reports that were published on official government websites over the same period. Our study *contributes* to demonstrating how text analytics-driven methodology can potentially be used to extract in-depth knowledge about migrant issues from freely available information on official governmental websites and Telegram channels. From the practice perspective, this work contributes to a deeper understanding of the issues affecting the adaptation of migrants from Ukraine in European countries and can serve as the basis for the building of recommendations for improving relevant policies and programs.

The structure of this paper is as follows. Section 2 provides a theoretical background on the Ukrainian migrants' challenges. Section 3 includes the methodology adopted in this study. Section 4 presents the results. Section 5 provides a discussion, while Section 6 concludes the study.

2 BACKGROUND

2.1 Migration Challenges

Migration issues have become a contentious topic in recent years, attracting considerable attention in both Europe and the United States. Various stakeholders, including all levels of government,

[3]https://dtm.iom.int/reports/poland-ukraine-response-2022-crossing-ukraine-end-year-fact-sheet-12-april-31-december-2022

social movements, non-governmental organizations, and media, are actively engaged in addressing migration concerns. However, the management of asylum remains intricate and is not consistently effective in upholding human rights standards. The existing literature identifies several perspectives on asylum and migration policy. The "venue shopping" approach [4, 23], as the first perspective, assumes that control over borders and related decisions shifts from the national level towards (1) intergovernmental bodies; (2) local authorities; and 3) private actors. This approach put emphasis on national borders in response to security needs and external threats, embracing various forms of digital control [15]. The second perspective, Multi-level governance (MLG) conceptualizes migration and asylum policy as a multi-faceted process involving both institutional and non-institutional stakeholders [40]. MLG challenges the conventional central role of the state, redistributing responsibilities to local governments and leaving space for non-institutional actors. This approach analyses two dimensions of interaction: (1) vertical - supranational, national, and subnational public authorities; and (2) horizontal - public and non-state actors [10]. According to [3] tensions and divergencies between levels and actors shape negotiation outcomes. Conversely, discrepancies at the national and local levels are put forward as part of the decoupling strategy [40]. Criticism of the multi-level approach includes a lack of adequate focus on actors, networks, conflicts, and the role of civil society. The third approach, the humanitarian one, recognizes non-governmental actors as pivotal in responding to migration crises. Therefore, NGOs play a vital link in mitigating the most severe consequences of migration policies. In the paper [4], authors highlight the importance of civil society and identify four types of humanitarian civil society actors: (a) NGOs; (b) associations, trade unions, and religious institutions; (c) social movements and activists; and d) citizens. This approach accentuates the significance of joint efforts involving different sectors to address the complex challenges of migration.

The effective integration and support of refugees heavily hinge on the proactive involvement of cities and municipalities, which serve as crucial entities in facilitating the assimilation process Local authorities bear the responsibility for facilitating housing, employment, education, service provision, and fostering meaningful interaction with public administration. According to the study of [9], cities and municipalities exhibit diverse attitudes toward refugee reception, ranging from local authority closure and institutional intolerance, shifting the responsibility for the implementation of migration policy to social activism, through tolerance, and finally to institutional activism and collaboration with local and national stakeholders. This finds confirmation in various studies providing examples of cities conflicted on both acceptance and rejection of migration policy with state government [11, 14, 35].

The EU Temporary Protection Directive (TPD) serves as a response to the war in Ukraine and reflects the collective solidarity of EU member states in providing refuge to Ukrainians. The Directive is a foundation for a coordinated approach among EU members vehicle allowing each country to autonomously determine the procedures for granting refugee and asylum status. The TPD constitutes the right to temporary protection for Ukrainians granted asylum. This right is particularly significant as it exempts Ukrainians from the constraints imposed by 90/180 rule, which had previously restricted travelers to a maximum of 90 consecutive days in the EU.

Under temporary protection, Ukrainians and their family members are afforded rights akin to those enjoyed by EU residents, including social services, the right to work, and education. The temporary protection further endured the issuance of a residence permit and associated rights. However, as noted by [5] the problems faced by Ukrainian citizens during and after obtaining temporary protection in EU Member States include the high level of bureaucracy in the EU (long waiting period for temporary protection), inconsistent approaches by Member States to *regulating temporary protection* (e.g. obtaining a national identification number in Poland, a tax number in the Netherlands), *non-recognition of documents* by countries when returning to Ukraine for a short period. Challenges experienced by cities and municipalities on migration policy implementation vary. The study of [7] indicates the limited capacity of urban institutions to handle the influx of Ukraine migrants both in terms of *organizational* and *legal* aspects. The authors outline the critical role of social media in facilitating both the identification of the needs of Ukrainian migrants and communication, serving as a catalyst for a broad civic movement focused on welcoming Ukrainian migrants at the railway station in Wrocław. However, the paper [28] highlights that the requirements of Ukrainian migrants undergo an evolutionary progression. Initially, refugees prioritize addressing fundamental human needs such as *housing*, *communicable diseases*, and *access to healthcare*. As time elapses, their focus shifts towards *mental health*, *non-communicable diseases*, and *security concerns*.

The inclusion of Ukrainian migrants in the *educational* system of the host country is a *crucial aspect*, encompassing access to education, *language acquisition*, remedial classes, the right to learn their mother tongue and culture, as well as free transport to educational institutions [19, 21, 43]. To address these needs, both central and local authorities are actively implementing diverse institutional solutions and policies. This aims not only to facilitate the integration of Ukrainian refugees into the legal system of the host country but also to enhance the educational offerings in alignment with the specific requirements of Ukrainian migrants.

The situation of Ukrainian migrants in the *labor market* presents numerous challenges, notably affecting mothers with young children, individuals lacking appropriate *professional qualifications*, those grappling with post-war trauma or other health issues, and those who lack proficiency in the domestic language [16]. The study of [27] points to the need for comprehensive measures to integrate foreigners on both economic and socio-cultural levels. Proposed measures include developing career counseling, mentoring programs, and vocational courses that enable immigrants to adapt or change their professional qualifications, support the development of entrepreneurship, and facilitate the recognition of their qualifications and diplomas obtained outside the country. Regarding health, governmental efforts must address the systemic stabilization of primary healthcare services, ensure translator support for medical professionals, and effectively address the impact of war trauma [16].

The *housing challenges* faced by Ukrainians are multifaceted, extending across various spatial and governance scales. One of the primary hurdles is the issue of access and affordability, which becomes a fundamental need for their integration into new communities. the temporariness and insecurity associated with the housing situation further compound the difficulties [24]. Housing is essential for migrants to rebuild their lives and access essential services such as work, education, childcare, healthcare, and social interaction. Cities, municipalities as well and local communities face that challenge. However, housing is considered a structural problem that is to be addressed by the cities and municipalities to avoid temporal and ad hoc solutions, mostly dependent on civil society. Although the collaboration with non-state actors in navigating the housing challenge transformed collaboration [25], the dependence solely on the public housing sector proved to be insufficient [24].

2.2 Social Media in Governance

The rapid development of digital technology contributes to the expansion of channels used by e-government for information dissemination and communication with citizens, ranging from e-government websites and service portals to social media (Facebook, YouTube, Flickr, LinkedIn, Reddit or Twitter), and smartphones apps [2, 42]. In the context of government, social media could be defined as a group of technologies that enable government institutions to promote information to the public [12], and build one-way and two-way communication tools with citizens [2, 22, 26, 44], to increase citizen engagement and trust [34, 37], provide an opportunity for co-production and crowdsourcing of solutions and innovation [34], as well as tools to improve policymaking, public service delivery and knowledge management [6].

According to Eurostat, the official website of the European Union, 72% of internet users in the European Union now get their news online, as per the latest EU statistics[4]. Another survey reveals that more people are accessing news through social media rather than news websites[5]. Among EU Member States, the highest percentages of internet users reading news online were registered in Finland (93%), Lithuania and Czechia (both 92%), and Croatia and Greece (both 90%). The lowest usage was reported in Romania (59%), Germany (62%), France (63%), Italy (64%) and Belgium (67%).

In 2023, there were 26.70 million social media users in Ukraine, accounting for 74% of the total population. As a main social media platform were used Facebook and Twitter. But, back in 2021, only 20% of Ukrainians used *Telegram* as a source of news and information exchange. After the full-scale Russian invasion in 2022, this number sharply increased to 60-78%. In recent years, Telegram has begun to be identified as a distinct platform for supporting open public dialogue [18, 30, 31]; a secure cloud-based messaging application that prioritizes encryption and privacy [1, 41]: a communication channel for e-governance systems [36]. Telegram provides an opportunity for governments, public organizations, and communities to create broadcast tools known as "channels" that allow instant dissemination of information and discussion, potentially reaching a wide online audience [38], becoming an effective information support tool, especially in times of crisis [33].

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[4]https://ec.europa.eu/eurostat/en/web/products-eurostat-news/-/ddn-20220824-1
[5]https://www.pewresearch.org/journalism/fact-sheet/social-media-and-news-factsheet/

3 METHODOLOGY

This section aims to describe the research methodology adopted in the current study. Section 3.1. provides information on the method of the data collection. Section 3.2 describes the data analysis process.

3.1 Data Collection

In our study, we aim to identify key topics discussed in social media concerning Ukrainian migrants issues, two main data sources were used: (1) *official governmental* social media resources such as websites of migration services, ministries of foreign affairs, embassies of Ukraine in countries experiencing refugee migration, and YouTube channels of state structures; (2) *Telegram channels* that were created by both governments and public organizations to support Ukrainian refugees.

To collect data from *official governmental social media* resources, three main methods were applied: (1) Web scraping of web-pages texts, which is commonly used for sites without parsing blocks. The Python library BeautifulSoup[6] web scraper was chosen; (2) Parsing PDF files. Python library PyPDF2[7] library was chosen. Then, wordninja[8] libraries were used to process raw data from files and the langdetect[9] library to determine the text's language. (3) Audio files transcription. For this purpose, Sonix[10] web service was chosen. Our search for relevant data was limited to a query: "migration OR "migrants" OR "refugee" AND "Ukrain*". The period for data suitable for parsing was selected from February 2022 to September 2023. The text preprocessing steps are performed including text cleaning and words lemmatization. Python libraries pymorphy[11] and NLTK[12] were applied. As a result, a final set of 444 documents (691,588 tokens) extracted from HTML website pages, PDF files, and transcribed YouTube videos was obtained.

Table 1 presents the summary of collected data from official governmental social media sources. As we can see, the main source shared information about the Ukrainian migration turned out to be the repository of Displacement Tracking Matrix reports from the global data institute of the International Organization for Migration (IOM). Founded in 2022, the IOM Global Data Institute is dedicated to enhancing the accessibility and utilization of data for improved governance outcomes and positive impacts on migrants and societies, aligning with the IOM Data Strategy. Operating in 174 countries, the organization gathers data from diverse regions worldwide. Its extensive repository encompasses a wealth of information on global migration, covering topics such as the movement of Earth's population, including insights into Ukrainian refugee situations. The number of texts collected from this source is 131. The second most important source of official government information on migration issues was the website of the IOM, which publishes news, blogs and reports on refugees around the world. Founded in 1951, the organization became a part of the United Nations in 2016 as the UN Migration Agency. It stands as the primary intergovernmental body in the field of migration, collaborating closely with governmental, intergovernmental, and civil institutions and organizations. The number of texts collected from IOM is 130.

During the selected period, also a substantial amount of information (57 texts) regarding issues related to the migration of Ukrainian migrants was gathered from the official government website of Poland. This website includes a dedicated section for the Office for Foreigners, offering information for migrants in Polish. Moreover, there is a separate section tailored for Ukrainian refugees, presented in the Ukrainian language. The State Migration Service of Ukraine's website, featuring a dedicated press service publishing news and information about refugees and the service's activities, provided 50 texts. Additional texts from government websites were sourced from the United States Immigration and Citizenship Services website (9 texts) and the Canadian Refugee Council (2 texts). Transcriptions of 39 texts were obtained from the official YouTube pages of the State Migration Service of Ukraine, the Migration Service of Poland, the US Migration Service, and the International Organization for Migration.

To collect data from *Telegram channels*, the Telethon[13] Python library was chosen. The period for data suitable for data scraping was from February 24 to November 30, 2023. The text preprocessing steps are performed including text cleaning, removing emojis, encompassing emoticons, symbols, and icons, and word lemmatization. The same Python libraries were used for official government data. About 10.5% of messages, including empty or duplicate entries, were removed from the initial dataset. As a result, 1,872,966 text messages from 103 channels[14] representing 40 countries, where Ukrainian refugees have temporarily relocated. Table 2 presents a summary of the data collected from Telegram channels for the top 14 European countries, selected based on the number of refugees from Ukraine recorded in Europe according to UNHCR Data Portal[15], as of December 31, 2023.

The final dataset SOMTUME (SOcial Media Trust: Ukrainian Migration into Europe)[16] merges data collected from two sources - official governmental social media and Telegram channels.

3.2 Data Analysis

To derive the main findings of the study, a comprehensive qualitative and quantitative analysis of text data was conducted in two main stages.

First, to address RQ1, the topic modeling algorithm was employed to uncover latent topics in public messages from *Telegram channels* related to Ukraine migrant's challenges faced in European countries, along with their respective proportions. Using the BERTopic[17] library, which supports 50 languages, including Ukrainian, English, and Russian, simplified the implementation of the multilingual-MiniLM-L12-v2[18] transfer model. This model maps sentences and paragraphs into a 384-dimensional dense vector space. For the Telegram-related dataset, an optimal model with 20 topics was determined based on the average semantic coherence of models and

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[6]https://www.crummy.com/software/BeautifulSoup/bs4/doc/
[7]https://pypi.org/project/wordninja/
[8]https://pypi.org/project/langdetect/
[9]https://pypi.org/project/langdetect/
[10]https://sonix.ai/
[11]https://pypi.org/project/pymorphy/
[12]https://www.nltk.org/

[13]https://docs.telethon.dev/en/stable/
[14]https://shorturl.at/frIY4
[15]Information as of December 31, 2023 - Source:https://data.unhcr.org/en/situations/ukraine
[16]dataset SOMTUME (SOcial Media Trust: Ukrainian Migration into Europe)
[17]https://maartengr.github.io/BERTopic/api/bertopic.html
[18]https://www.sbert.net/docs/pretrained_models.html

Table 1: Summary of data collected from official governmental social media

Link	Language	Documents number	Tokens number number
https://dtm.iom.int/reports	English, Ukrainian	131	551,125
https://www.iom.int/	English, Ukrainian	100	74,104
https://www.gov.pl/	English, Poland, Ukrainian	52	19,899
https://dmsu.gov.ua/	Ukrainian	51	11,686
https://www.youtube.com/	English	39	15,306
https://www.bamf.de/EN/Startseite/startseite_node.html	English, Ukrainian	16	5, 758
https://twitter.com/	English	14	581
https://germany.mfa.gov.ua/	English, Ukrainian	12	4,677
https://www.uscis.gov/	English	9	3,982
https://slovakia.mfa.gov.ua/	English, Ukrainian	6	1,093
https://igm.gov.md/	English, Ukrainian	4	1,017
https://www.mzv.sk/en/home	English, Ukrainian	4	819
https://ukraine.iom.int/uk	English	3	1,008
https://ccrweb.ca/en	English	3	447
https://www.prezident.sk/en/	English, Ukrainian	1	86

Table 2: Summary of data collected from Telegram channels

Country	Number of Ukrainian migrants	Number of messages
Germany	1,086,365	235,737
Poland	968,390	235,108
Czech Republic	368,300	173,607
Italy	167,525	169,560
Ireland	93,810	157,858
Sweden	41,055	139,560
Netherlands	94,415	113,071
Slovakia	107,415	94,691
Moldova	116,615	63,122
United Kingdom	210,800	60,631
Spain	186,125	43,569
France	70,570	40,765
Belgium	73,095	28,452
Romania	86,810	3,248

minimal topic overlapping[19]. This resulted in 20 latent topics, each accompanied by its most significant keywords and a set of messages closely associated with each topic. To interpret the results, an iterative topic labeling process was executed: (1) three experts independently conducted deep reading and coding to generate an initial version of labels based on the highest-weight keywords; (2) experts discussed refining topic labels through careful examination of comments on the most representative topics; (3) experts deliberated on the semantic closeness between topics and the potential need to merge topics. The proportions of merged topics were aggregated, following preliminary normalization of the numbers; (4) experts also assessed the presence of meaningless topics and topics unrelated to the research focus; (5) a final set of topic labels

[19]https://maartengr.github.io/BERTopic/getting_started/visualization/visualization.html

was collaboratively agreed upon. Subject matter experts in text analytics, linguistics, and e-government were involved at all stages, resulting in 12 topics reflecting the problems discussed in Telegram channels.

The same topic modeling and labeling procedure were applied to extract the topics that describe narratives regarding Ukrainian migration in the data from *official government social media* sources. Ten (10) latent topics were initially identified, reviewed, and partially merged. As a result, eight (8) topics were derived, shaping the narrative of discussions on the topic of migrants in the space of governmental social media.

Second, to address RQ2, we analyzed the topic proportion distribution in the messages written by Ukrainian migrants located in a particular country. This analysis aims to enhance the understanding of European governments regarding the actual needs and problems of migrants in the context of concrete countries, thereby assisting in prioritizing the development or improvement of public policies. Within the scope of this paper, the results are presented for six (6) European countries characterized by the highest number of messages collected from Telegram channels, which strongly correlates (0.75) with a number of Ukrainian migrants recorded in these countries.

4 RESULTS AND FINDINGS

This section presents the main results of this study. The results include an analysis of narratives regarding Ukrainian migration in official government social media sources (section 4.1); a determination of challenges that are discussed in Telegram channels specially created for information support of Ukrainian migrants in European countries (section 4.2); analysis of variation of these challenges across different European countries (section 4.3).

4.1 Narrative on Ukrainian's Migration in Government Social Media

We started our research by identifying the topics that shape the narrative of discussions on Ukrainian migrants in the space of the government's social media. In total, eight topics are identified. Analysis of articles, reports, announcements, and other information published on official government social media sources (see Table 1) during the period from February 2022 to September 2023, allowed us to identify eight main topics discussed/raised. Table 3 presents the identified Topic Labels, Topic Descriptions, and respective Topic Proportions (%). We can see that 75.3% of all discussions (information) shared include challenges related to travel, displacement, and refugee status (24.1%), war's inclusion and impact on various aspects of Ukrainian citizens' lives (21.5%), and documentation and procedural aspects (15.9%) and strategic mechanisms for providing humanitarian support to individuals displaced from Ukraine (13.8%).
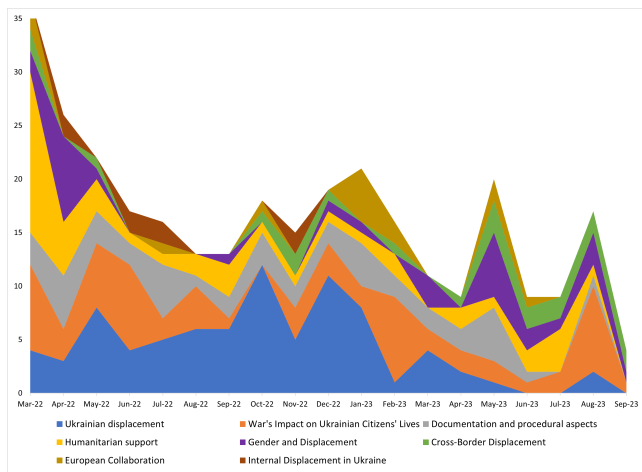

Figure 1: The trends in attention to Ukrainian migration challenges in governmental social media

Then, we explored the changes in attention to Ukrainian migration issues *over time* (see Figure 1). It is obvious that the largest amount of information comes from the first months of the war (February-April 2022). Predominant topics during this period include *Humanitarian Support* aspects (40.5% of all topics) and general discussions related to the *War's Impact on Ukrainian Citizens' Lives* (21.6%). The topic related to challenges related to *Travel, displacement, and refugee status* dominated on average during the first year of the war, occupying from 66.7% to 22.2%. Issues of *Internal Displacement* in Ukraine were discussed only during the first half of the 2022 year, occupying a maximum of 12.5% of the total narrative. Discussions around *Documentation and procedural aspects* practically do not subside throughout the entire analyzed period, becoming less relevant only in the last three months (July-September 2023). An interesting fact is that *Cross-Border displacement* problems become more discussed only in the second half of 2023. The most rarely discussed topic (found only in 4 months out of 21 analyzed) is the topic of *Internal displacement* in Ukraine. The problems of

European Collaboration became particularly relevant in January and February 2023. Figure 1 encapsulates the predominant topics during distinct temporal moments.

4.2 Challenges of Ukrainian Migrants in European Countries

This section provides an answer to the research question RQ1: *What challenges do migrants from Ukraine encounter?* The answer deepens our understanding of the main challenges discussed in Telegram channels specifically created for providing information support to Ukrainian migrants in European countries. Totally 12 topics were identified. Table 4 presents Topic Labels and the context of each topic (Topic Descriptions). About 73.5% of all challenges are occupied by the following Top-5 topics: (1) *Hosting and apartment rent issues* (19.72% of all discussed problems) (2) *Passport and visa issues* (16.46%); then (3) *Refugee Status and support from IOs* (15.89%); (4) *Relocation and travel* (11.33%) and (5) *Communication and Information Retrieval* (10.1%).

An in-depth analysis of the extracted topics also allowed us to answer an answer to the research question *RQ2: How do these challenges vary across European countries?* Table 5 provides detailed information about Topic Labels and the distribution of respective Topic Proportions (%) within six selected countries with the highest number of Ukrainian migrants (see also Figure 2).

The distribution of topics by country allows for the prioritization of problems in the context of individual countries. For *Germany*, the most significant issues include Hosting and apartment rent (28.29%), Refugee Status and support from IOs (21.05%), and Passport and visa issues (17.97%). In *Poland*, the issue of Relocation and travel stands out as significantly important (40.12%), followed by Healthcare and children's education (17.62%) and Hosting and apartment rent (16.74%). An interesting case is the *Czech Republic*, where problems related to Hosting and apartment rent are practically absent (less than 0.9%), and the issues of Police and law enforcement are noteworthy (5.67%). The top three problems for the Czech Republic are Passport and visa issues (25.56%), Communication and information retrieval (25.37%), and Relocation and travel (19.51%). In *Italy*, the most crucial problems for migrants are Hosting and apartment rent (26.36%), Refugee Status and support from IOs (24.68%), and Communication and Information retrieval (1.25%). *Italy* and *Ireland* are the only countries where the problem of Finances and money transfers (6.44%) was identified. Irish migrants primarily discuss problems with Passport and visa issues (29.25%), Refugee Status and support from IOs (25.69%), and Hosting and apartment rent (10.70%).

Regarding the distribution of individual topics across analyzed countries, in addition to the already mentioned topics of *Finances and money transfers*, which are typical only for Italy and Ireland (6.16%), the topic of *Healthcare and children's education* is most pressing in Poland (13.62%) and is also characteristic of Germany (11.65%) and, to a lesser extent, the Czech Republic (4.42%). Additionally, problems associated with *Job search and employment* are more often discussed among immigrants located in Poland (13.6%) and, to a lesser extent, in Ireland (4.82%) and Germany (3.56%)

Table 3: Topics that shape the narrative about Ukrainian migrants in official governmental social media

Topic Label	Topic Description	Topic Proportion (%)
Ukrainian displacement	The challenges related to travel, displacement, and refugee status	24.1
War's Impact on Ukrainian Citizens' Lives	IOM and other organizations highlight the war's inclusion and impact on various aspects of Ukrainian citizens' lives	21.5
Documentation aspects	The documentation and procedural aspects: the required forms, passport procedures, and the role of government offices	15.9
Humanitarian support	The strategic mechanisms for providing humanitarian support to individuals displaced from Ukraine	13.8
Gender and Displacement	The related to gender variations within the context of Ukrainian migration %	8.8
Cross-Border Displacement	Cross-border displacement and the factors influencing individuals to return to Ukraine	7.6
European Collaboration in the migration context	Collaborative efforts of the political figures for migration problems decision	4.7
Internal Displacement in Ukraine	The mass movement of people within Ukraine, involving millions of internally displaced individuals, the challenges faced by these internally displaced individuals	3.5

Table 4: The description of topics discussed by Ukrainian migrants in Telegram channels

Topic name	Topic description
Hosting and apartment rent	Searching for apartments or rooms, dealing with landlords, lease agreements, deposits, and housing programs as well
Refugee Status and support from IOs	Challenges individuals face in obtaining refugee status, and the support from international organizations like UNICEF, IOM, and the UN
Communication and IR	The diverse aspects of communication, including interactions on communication channels and chat platforms, addressing various challenges related to information retrieval
Cultural integration and adaptation	The cultural integration of Ukrainian migrants, especially women, into a new environment, engagement in social events and celebrations that embrace both Ukrainian and local traditions
Passport and visa issues	The challenges related to passport, the embassy or consulate procedures for visas and its extensions
Finances and money transfers	The issues pertain to financial aspects, money transfers, and currency exchange, involving various currencies such as euro and dollar, and utilizing Euronet services and ATMs
Relocation and transportation	The challenges of physical movement and transportation for Ukrainian migrants involve logistics, including border crossings, transportation infrastructure, and travel-related amenities
Healthcare and children's education	The problems encompass healthcare and medical services, along with children's education, schools, and educational modules
Job search and employment	The challenges associated with job searching and employment, including aspects such as finding vacancies, part-time jobs, and job offers
Police and law enforcement	The challenges and interactions related to police and law enforcement, involving address changes, and filling out forms
Learning Swedish Language	The challenges and experiences related to learning the Swedish language, including participation in Swedish language courses
Taxation and Declaration	The challenges and processes related to taxation and declaration, involving aspects such as filing tax returns

The *Swedish* experience presented particularly interesting insights. Firstly, for Ukrainian immigrants in the country, we identified only four discussed problems, one of which is unique for the entire corpus - *Learning the Swedish Language* (25.70%). The remaining three topics concern *Hosting and apartment rent* (30.64%), *Communication and Information retrieval* (23.40%), and *Taxation and Declaration* (20.24%). A closer analysis of the problems of Ukrainian immigrants in Sweden provided us with (1) a temporal analysis of changing trends in the topics discussed (see Figure 3); and (2) their relationship with *Swedish government regulations* addressing

Table 5: The distribution (%) of topics discussed by Ukrainian migrants in Telegram channels (Top-6 countries)

Topic name	Germany	Poland	Czech Republic	Italy	Ireland	Sweden
Hosting and apartment rent	28.29	16.74	<0.9	26.27	10,7	30.64
Refugee Status and support from IOs	21.06	<0.9	5.8	24.68	25.69	<0.9
Communication and IR	<0.9	6.41	25.38	11.26	9.76	23.41
Cultural integration and adaptation	13.15	<0.9	13.64	10.84	7.58	<0.9
Passport and visa issues	17.97	5.45	25.56	8.45	29.26	<0.9
Finances and money transfers	<0.9	<0.9	<0.9	6.44	6.17	<0.9
Relocation and transportation	4.32	40.43	19.51	11.95	6.02	<0.9
Healthcare and children's education	11.65	17.62	4.42	<0.9	<0.9	<0.9
Job search and employment	3.56	13.64	<0.9	<0.9	4.83	<0.9
Police and law enforcement	<0.9	<0.9	5.68	<0.9	<0.9	<0.9
Taxation and Declaration	<0.9	<0.9	<0.9	<0.9	<0.9	20.24
Learning Swedish Language	0.0	0.0	0.0	0.0	0.0	25.71

Figure 2: Issues discussed by Ukrainian migrants in Telegram channels

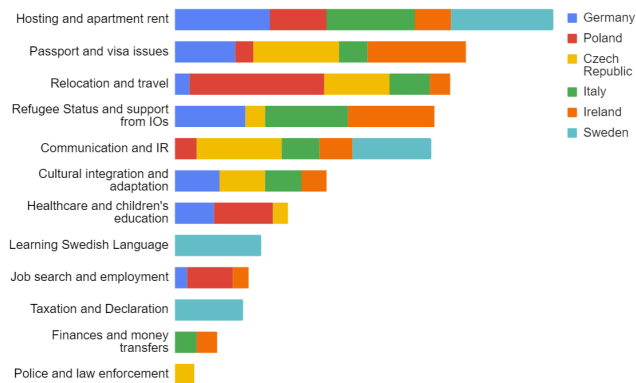Figure 3: The temporal distribution of issues discussed by Ukrainian migrants residing in Sweden

identified challenges. For example, despite the increase in the number of migrants from Ukraine in Sweden from April to December 2022, starting from July 2022, there has been a gradual decrease in the activity of discussing the problem related to Hosting and apartment rent. This trend can be attributed to the positive impact of legislation aimed at achieving a fairer distribution of housing for persons in need of protection[20], introduced on July 1, 2022. An analysis of fluctuations in the volume of discussions related to Learning the Swedish Language shows a gradual decrease in this problem after March 2023. This trend can be explained by the direct influence of the Swedish government's decision[21] to allow persons protected by the so-called Mass Migration Directive to participate in specialized Swedish language courses (Swedish for Immigrants - SFI). This decision was officially announced on March 28, 2023.

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[20]https://skr.se/skr/krigetiukraina.62117.html?fbclid=IwAR1mDAccEJjZ6KhpRtH-U5uIczr4VplbxaSVsBRScJPYeW-gNuWh8mkaTuQ

[21]https://www.regeringen.se/pressmeddelanden/2023/03/regeringen-foreslar-100-miljoner-kronor-for-sfi-for-ukrainska-medborgare/?fbclid=IwAR1HWjPcFo294KFreqcgD8RfsmnKz9xKvH-A_DHRYStXa8UVyhh5rBATjzc
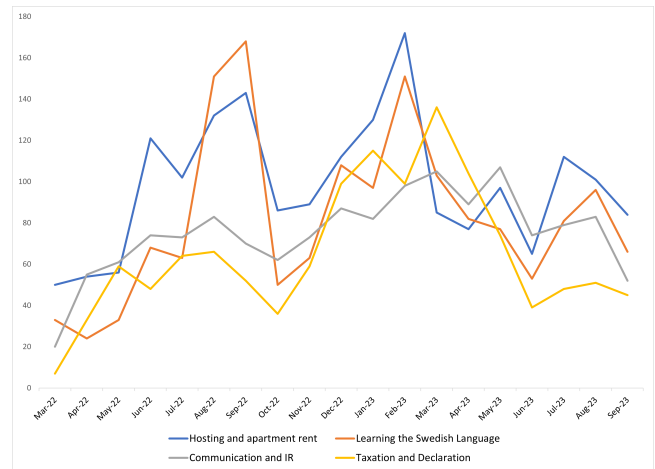
5 DISCUSSION

In response to the RQ1, our research contributes to a nuanced understanding of the evolving *needs of Ukrainian migrants*, shedding light on temporal aspects and guiding migration policy objectives toward addressing challenges identified through our investigation. Our findings align with [19, 25, 27, 28] existing literature, substantiating the previously established patterns regarding the nature and extent of challenges faced by Ukrainian war migrants. Notably, housing emerges as the predominant challenge for migrants in most European countries, excluding the Czech Republic. This underscores the structural nature of housing challenges, reinforcing the importance of formulating targeted policies in this domain for migrant populations. Our study results also highlight the persisting difficulties in obtaining refugee status across various European nations, pinpointing specific areas where administrative procedures and information policies can be enhanced, notably in countries such as Germany, Italy, and Ireland.

Contrary to prevailing survey results [17], our study challenges the widely perceived significance of healthcare within the general

catalog of migrant challenges. Our findings suggest a nuanced perspective that calls for further exploration and consideration when formulating comprehensive policies addressing the diverse needs of Ukrainian migrants. The topics discussed in Poland are special, as they do not follow the trends observed in the other countries described. There is little interest in protecting their refugee status and a general predominance of the topic of transit among the most discussed topics in the studied Telegram groups. This is most likely due to the close interaction between Poland and Ukraine before the war, such as seasonal migration of workers, emigration, and economic and cultural relations. Therefore, it is possible to assume that the main activity of Polish Telegram groups consists of emigrants, seasonal migrants, and transit travelers. Most likely, the main flow of refugees has shifted over time to Germany and neighboring countries due to the larger economy (and consequently more vacancies) and social welfare programs.

Addressing the RQ2 on how these challenges *differ across the EU countries* our study identifies predominant challenges associated with the management of war migrants. Findings show that Germany, having received the highest influx of Ukrainian refugees to date, grapples primarily with challenges related to housing, granting of refugee status, and issues related to the issuance of visas. A parallel scenario unfolds in Italy and Sweden. these results fall in line with. In contrast, the challenges faced by the refugees in the Czech Republic are mainly oriented around visa-related complexities and deficiencies in information policies. As previously highlighted, Poland emerges as a distinctive case, where the foremost challenge lies in the relocation and transportation of migrants, followed by concerns related to healthcare, housing, and job search. This study falls in line with [28] underscoring the evolving nature of challenges faced by Ukrainian refugees in Poland, emphasizing the impact of close cultural and linguistic ties. The results of our study confirm the migration policy challenges posed by adopting the MLG approach both vertically and horizontally [4, 40].

Based on the achieved result we can formulate *recommendations* for the migration policy in the EU such as: focusing on formulating housing policies that address the structural nature of this challenge and involve affordable housing initiatives, community integration programs, and measures; streamlining refugee statute procedure; improvement of communication channels and provide accessible information, particularly on visa processes, rights and available resources. Acknowledging the unique dynamic observed in Poland the information exchange and international collaboration between countries may result in improving the administrative processes, reducing administrative burdens, and formulating good practices for migration policy.

6 CONCLUSION

Our study *contributes* in demonstrating how text analytics-driven methodology can potentially be used to extract in-depth knowledge about migrant issues from freely available information on official government websites and Telegram channels to complement data obtained from well-designed surveys. From a practical perspective, our study provides a scientific understanding of the challenges faced by migrants from Ukraine in European countries. Adding to existing literature, it explores the diversity of these challenges across

European nations, identifying common issues and unique features specific to individual countries. Common challenges faced by immigrants in all analyzed countries include issues with housing and apartment rentals, passport and visa matters, refugee status and support from international organizations, relocation and travel, as well as communication and information retrieval. Notably, (1) healthcare and children's education emerged as particularly pressing concerns in Poland, Germany, and the Czech Republic; (2) problems associated with job search and employment were more frequently discussed among immigrants in Poland, Ireland, and Germany; and (3) Italy and Ireland were the only countries where issues related to finances and money transfers were identified. Our research also underscores the dynamic nature and evolution of the narrative surrounding Ukrainian migration globally. Prominent topics continue to revolve around humanitarian support aspects and general discussions related to the war's impact on the lives of Ukrainian citizens.

Our study has several *limitations*, namely: (1) the in-depth analysis of topic distribution by country was confined to the only selected six European countries, chosen based on receiving the highest number of migrants. While this provides valuable insights, recognizing the uniqueness of each country's experience suggests the need for a broader analysis. Future research will aim to expand this analysis by incorporating data from Telegram channels across a wider range of European countries and other nations worldwide that have received Ukrainian migrants during the conflict with Russia; (2) drawing from the analysis of the Swedish experience, our study highlights the need to examine appropriate policy and regulatory measures in addressing issues and their potential impact on acceptance and adaptation of Ukrainian migrants. Given the diverse effectiveness of particular State Members, future studies will leverage these insights to share best practices. Additionally, forthcoming research will extend its focus to analyze information from various channels beyond official government sources. This will enable the identification of shifts in public discourse on emerging challenges in different countries, capturing perspectives from migrants, governments, and the broader public, while tracking reactions to implemented solutions.

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