Telegram bot for the spatial assessment of cultural ecosystem services in Kremenchuk

Cultural Ecosystem Services (CES) are the non-material benefits people get from nature, such as recreation and aesthetic enjoyment. In crisis situation of the Russian invasion, these services become especially important for mental health and community resilience. However, gathering data on CES is challenging, especially limited opportunities for social media data mining. This study presents an innovative approach to Public Participation GIS (PPGIS) by using a Telegram bot to collect spatially explicit data on how people value time spent in the waterfront area in Kremenchuk.

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1 Introduction

The Russian invasion of Ukraine motivates various ‘green recovery’ projects for Ukrainian cities. However, most of them focus on the most urgent economic or housing aspects, overlooking the dependency of people’s well-being on the environment and the use of CES.

The lack of data on CES use makes it impossible to calculate the landscape losses of CES provision potential resulting from the war. Social media archives for Ukraine are limited, while surveys are time- and cost-intensive. In these circumstances, we initiated the Ukrainability project, which addresses the challenge of CES assessment in Ukraine both conceptually and methodologically. We propose using Telegram as a participatory mapping tool and Kremechuk as a case study in collaboration with Ro3kvit - Urban Coalition for Ukraine.

2 Objective

To introduce and validate a novel PPGIS methodology using an open-source, messenger-based bot (Telegram) for the rapid collection of CES data in data-scarce environment.

3 Concept

Our approach shifts the quality of subjective time from measuring cultural experiences like listening to the music or watching films, to nature. We argue that ecosystems, like art, are generators of quality personal time.

4 Methodology

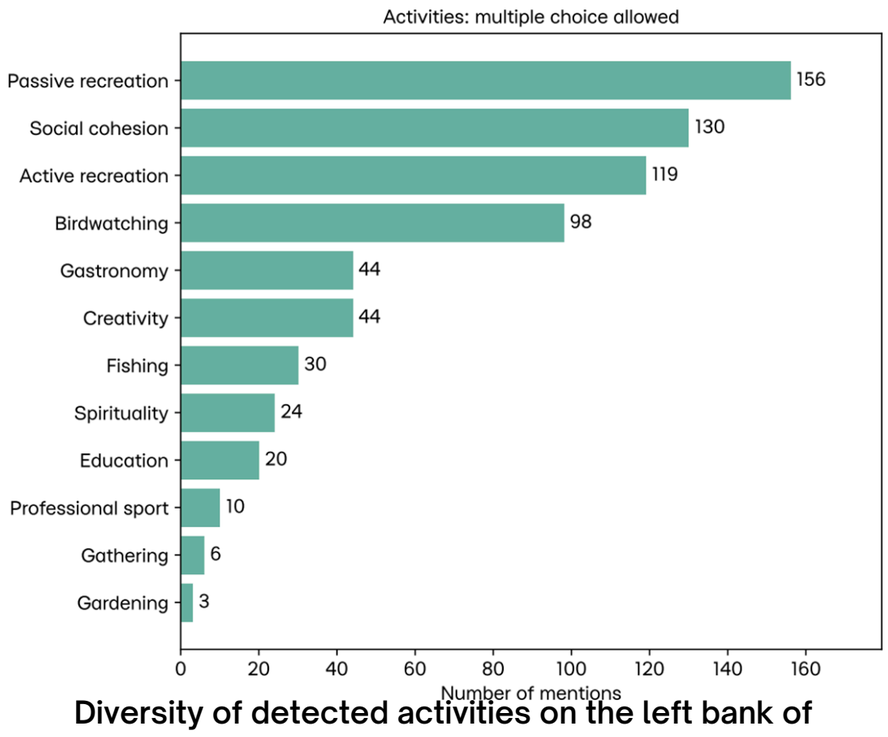
We developed the bot using Telegram API. Telegram was chosen as a primary communication platform in Ukraine. The bot guided users through a simple, conversational interface to map one or more locations. In collaboration with Ro3kvit, information about the survey was disseminated through local communication channels. A total of 225 residents participated.

For each mapped point, the bot collected data on:

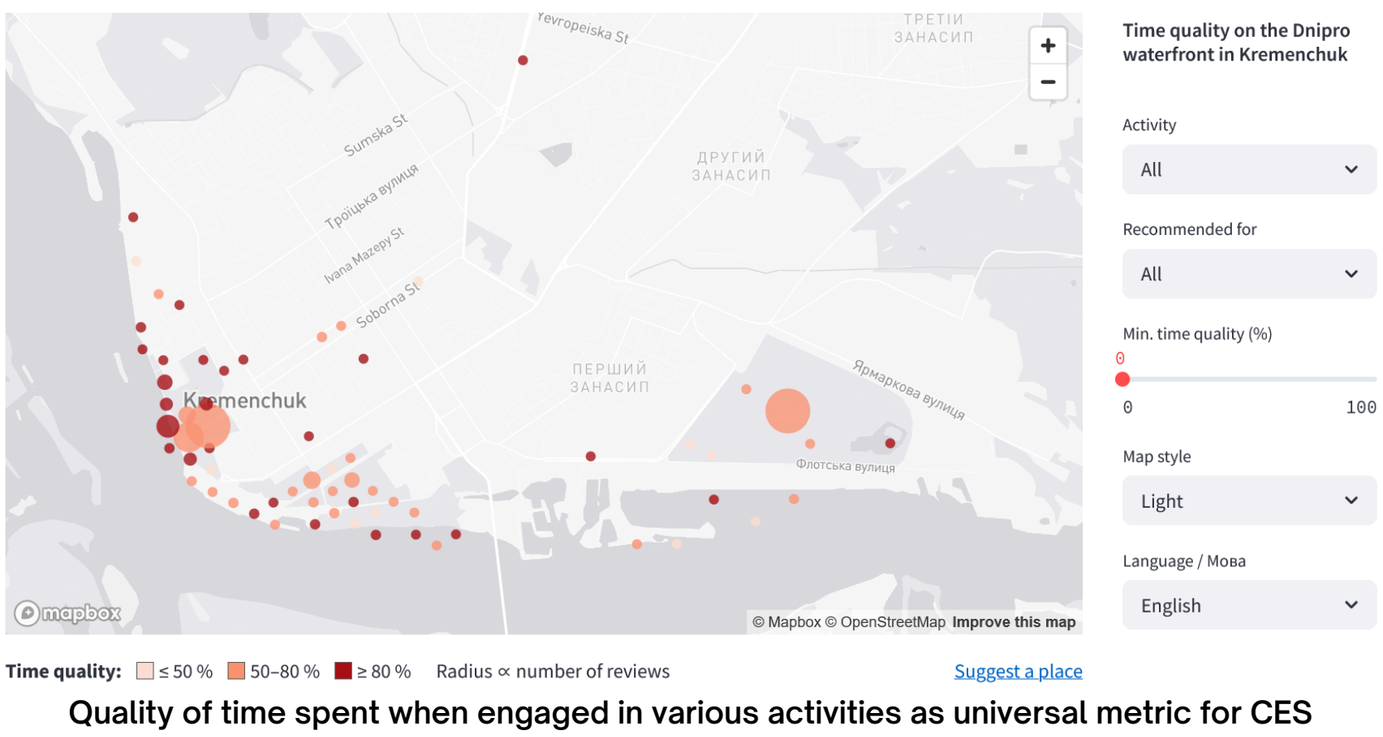
- Activities: What users were doing at the location.
- Subjective experience: A rating of their "quality of time."
- Accessibility: how the place was reached and how much time spent
- Noticed changes after 2022: Environmental and social aspects
- Demographics and needs: User demographics and specific suggestions for improving the space (optional)

5 Results

The core practical result of this study is the successful application of Telegram for participatory mapping. This approach lowers the barrier for public participation and enables the rapid collection of rich, geo-located data. We found that the highest quality of time (80%+) was experienced in the central, more developed parts of the waterfront, while lower-quality experiences were reported in less-developed peripheral areas. Most users arrived by foot or public transport, and spent there 1-2 hours, expressed the need for summertime cooling and cleaner water, followed by safer pedestrian zones. However, user demographics is biased towards women.



Diversity of detected activities on the left bank of Dnipro river in Kremenchuk



Quality of time spent when engaged in various activities as universal metric for CES experiences by groups of citizens - explore interactively on https://ukrainability.space

6 Conclusion

In an era of increasing data scarcity, messenger-based bots represent a highly effective and resilient PPGIS tool. Our application of a Telegram bot in Kremenchuk demonstrates a low-barrier, rapid, and scalable approach to collecting experiential data on cultural ecosystem services use.

The concept of personal time quality proved to be a transformative and intuitive metric. It effectively bridges the gap between subjective human experience and the quantitative data needs of urban planners, allowing for the spatial mapping of non-material benefits without resorting to purely economic valuations. The positive ratings from over 81% of participants in Kremenchuk underscore the vital role of urban green and blue spaces in supporting community well-being.

Telegram bot

ukrainability.space dashboard

Climate Resilience Strategy for Kremenchuk

Conceptual framework preprint

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