An overview of digitalization initiatives in Ukraine implemented on different financial arrangements

Introduction

The information about different digitalization initiatives in Ukraine was gathered by means of attended conferences, presentations, consultations with developers of the digital tools, and communications with stakeholders as well as through open source materials. The content of this document is a summary of collected and analyzed materials and to some extent may reflect the value judgments of the authors.

Since the beginning of russia's full-scale invasion of Ukraine, the progressive numbers of fully or partially destroyed civil infrastructure includes hundreds of thousands of units[1] across the country. That has provoked various attempts to use digital technologies in collecting, systemizing, analyzing, and visualizing information, especially on the de-occupied since the 24th of February 2022 territories of Ukraine.

Taking into account the direction of the project, namely the research on the possibility to involve technologically advanced digital planning tools in Ukraine's long-term rebuilding process based on Lithuanian experience and expertise, the overview of corresponding initiatives and platforms was conducted. As Digital planning tools (DPT) may vary in their content, consequently the range of referred digitalization initiatives was not limited to a particular topic, but rather reviewed through the prism of possible collaboration.

Overall, there are no systematic and integrated DPT projects being implemented or developed for a particular city in Ukraine yet. Most digital initiatives are aimed at

- digitalizing data on damage caused by warfare (*Register of Damaged or Destroyed Real Estate, Chernihiv city center by ANARCHYTECTS BUREAU, Mapping war by Japanese initiative*)

  ↪and/or following urban analysis (*Restart Ukraine, Rebuild UA*),

  ↪connecting with international donors *(Ukraine Housing)*

- or 3D scanning of monuments and other heritage objects that will aid future rebuilding efforts in three-dimensional reconstructions of the last (*Skeiron*, *Pixelated Realities*).

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[1]https://kse.ua/about-the-school/news/the-total-amount-of-damage-caused-to-ukraine-s-infrastructure-due-to-the-war-has-increased-to-almost-138-billion/

Among the mentioned above digitalization initiatives there are projects funded by international donors and developed by the Ukrainian government or Ukraine-based companies, and those implemented *pro bono* by the private sector.

Detailed overview

Register of Damaged or Destroyed Real Estate

The aim of the Register is to store information about residential buildings and other infrastructure objects that were destroyed during the russian invasion in order to develop compensation and state reconstruction policies.[2] Register of Damaged or Destroyed Real Estate is possible to access through the Unified State Web Portal of Electronic Services (Diya Portal) or through the Diya mobile application.

Developed by: the Ministry of Digital Transformation of Ukraine and the Ministry of Infrastructure of Ukraine

Funded by: USAID / UK aid

Release date: August 26, 2022.

Rebuild UA

The RebuildUA project aims to analyze and visualize the destroyed infrastructure of Ukraine and share the results with stakeholders as well as collect the evidence base of the crimes of the aggressor countries.[3] The initiative is being financially and technically supported by the United Nations Development Programme in Ukraine.

Within the project, 63 locations in Kyiv, Chernihiv, and Sumy regions were digitized, including the most affected by occupation cities such as Irpin, Borodyanka, Hostomel, Bucha, and many others. For damage modeling and mapping out demolished infrastructure developers use data from UAVs and satellites as well as analyze geospatial data. The results are presented in form of analytical reports. financially and technically supported by the United Nations Development Programme in Ukraine.

Developed by: VKURSI ZEMLI,[4] SMART FARMING[5] and partner companies

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[2] https://www.kmu.gov.ua/news/v-ukraini-prezentuvaly-reiestr-poshkodzhenoho-ta-znyshchenoho-maina

See also Resolution of the Cabinet of Ministers No. 380 of March 26, 2022 "On the collection, processing and accounting of information on damaged and destroyed real estate as a result of hostilities, terrorist acts, sabotage caused by the military aggression of the Russian Federation

Register of Damaged or Destroyed Real Estate is possible to access through official application DIA

[3] https://eng.rebuildua.net/

[4] https://www.zemli.vkursi.pro/

[5] https://www.smartfarming.ua/

Funded by: UNDP in Ukraine

Release date: 2022.

Ukraine Housing

This is a digital platform of destroyed and damaged housing at the community level.[6]

The main purpose is to facilitate the administration of all stages of reconstruction of the housing to reach the ultimate goal, which is to search for donor organizations and provide them with a transparent instrument for tracking the process.

The pilot project is implemented within the framework of the grant provided by the Council of Europe project "Internal displacement in Ukraine: development of durable solutions. Phase II" in [Ivanovsk municipality,](link) Chernihiv district of Chernihiv region. Further funding is expected to be developed in partnership with the RED ROSE organization.

The platform is a close-type resource that allows prioritizing housing assistance based on vulnerability criteria and needs assessment; allows making a damage assessment and accounting of provided assistance, etc.

Developed by: NGO Housing Ukraine

Funded by: a pilot project - Council of Europe; further developments - RED ROSE

Release date: November 11, 2022.

Chernihiv city center by ANARCHYTECTS BUREAU

The interactive 3D map[7] of the center of Chernihiv gives an understanding of the level of destruction and includes about 1.5 thousand high-rise and public buildings and more than 2 thousand private ones, indicating which parts of the building were damaged, along with the address of the building. The classification of destruction, which was divided into 5 degrees, was developed by ANARCHYTECTS BUREAU[8] itself and reflected in its own shade of color on the map. The data was provided by the city administration and added by implementors to the open free-access map.

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[6]https://www.coe.int/uk/web/kyiv/news-event/news/-/asset_publisher/m9nDZlgeFMpW/content/the-presentation-of-the-digital-platform-for-destroyed-damaged-housing-at-the-community-level-and-recommendations-to-national-partners?_101_INSTANCE_m9nDZlgeFMpW_viewMode=view%2F&fbclid=IwAR1WC4rgBCVnXyciR9aq8ypiDXNSFZ2mpzQ4VGrJZ5ubnd8tlzMcphVSpy8

[7] https://sketchfab.com/3d-models/che-model-0707-aca59b57270d48228c442c3a252e99dd

[8] https://www.anarchytects.com.ua/

It is a practical tool for the visualization of factual data, however, the proposed classification does not correspond to state regulation on the collection, processing, and accounting of information on damaged and destroyed immovable property as a result of hostilities.[9] The map was expected to develop into a more complex one with a full range of infrastructural objects and, possibly, an open-type platform for attracting donors interested in aiding in rebuilding for the most affected by war families.

Developed by: ANARCHYTECTS BUREAU

Funded by: developed *pro bono*

Release date: July, 2022.

Mapping war by Japanese initiative

The project is a 3D Photogrammetries Map of Ukraine[10] created by Professor Hidenori Watanave, of the University of Tokyo, and Professor Taichi Furuhashi, of Aoyama Gakuin University with aim of mapping the damage in Ukraine as a result of war. The hosting planform is Cesium[11] , where 3D photogrammetry data and satellite imagery from a number of sources are optimized into storytelling. According to the description from Cesium, the data is contributed by volunteers and creators from around the world.

Developed by: Hidenori Watanave and others

Funded by: developed *pro bono*

Release date: February, 2022.

ReStart Ukraine

The platform is aimed at data collection, interactive reliable analysis of geo datasets, creation of accessible information about every municipality, interactive analytics of geospatial data, and development of hypotheses based on it. The project is being structured around three phases:[12] 1) building nine know-how clusters around activists, architects, designers, researchers and others willing to contribute; 2) developing guidelines based on the pilot project results in Chernihiv

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[9] https://zakon.rada.gov.ua/laws/show/380-2022-%D0%BF#Text

[10] https://ion.cesium.com/stories/viewer/?id=8be6f99c-0d4c-46ce-91a3-313e3cac62fe

[11] https://cesium.com/blog/2022/03/08/cesium-story-depicts-damage-in-ukraine/?fbclid=IwAR1pZaMTsm2nS0YdkwCJLYL74lXwsY8DhhgCUmP4V2MHz7GSvHuyZjza3lI

[12] https://restartukraine.io/ua/

region;[13] 3) implementation together with the partners the developed guidelines. Currently, the project is in the first stage of implementation.

Developed by: ReStart Ukraine team

Funded by: developed *pro bono*

Release date: 2022.

3D scanning of Ukrainian heritage objects by Skeiron and Pixelated Realities

Both Skeiron[14] and Pixelated Realities[15] are performing 3D scanning of monuments and other heritage objects with aim to aid future rebuilding efforts in three-dimensional reconstructions as well as secure records of such.[16] Skeiron is a private company based in Lviv, while Pixelated Realities is NGO based in Odesa. By making digital copies of culturally remarkable buildings and monuments, damaged by russian's attacks NGO Pixelated Realities has launched a project called "Museum of Ukrainian Victory". Overall, the amount of digitalized objects by NGO Pixelated Realities counts 50 memorials and by Skeiron – 39.

In addition, NGO Pixelated Realities prepared a digital twin of Greek Square in Odessa, in partnership with Virtual city systems GMBH with the support of BF Bavarian House Odesa and the Goethe Institute in Ukraine, back in 2021.[17]

RISE UA

Besides, the growing number of digital platforms resulted in the idea of the *Electronic Reconstruction Management Programme* by RISE UA[18] that would be a "user-friendly interface to create an understandable and clear representation of the lifecycle of a reconstruction project"[19] and add transparency value for donors and Ukrainian society.

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[13] https://docs.google.com/presentation/d/1E-85nHvxLvnw5iksQOKt6BoRLBc8zcTFaaB8_Iv8lks/edit#slide=id.p

[14] https://skeiron.com.ua/

[15] https://pixelatedrealities.org/uk/

[16]   https://www.economist.com/culture/2022/06/13/the-race-to-digitally-preserve-ukraines-buildings-and-monuments?fbclid=IwAR0Sw4J1osS0JJ_0pYHieRcmJv8IWbDj7EwHN4B9qy4DT6TgyMGQe1dwtJA

[17] https://ion.cesium.com/stories/viewer/?id=60aa46c3-cc62-4faf-b8a6-43b5c53b6d12

[18]   RISE   UA   https://www.rise.org.ua/blog/discussion-paper-the-institutional-architecture-of-reconstruction-proposals-of-rise-ukraine-coalition?fbclid=IwAR1r1AGJFhEwCxx0XKalf_WE8nAdGW5-U3QsG5QpQiEtaGhfPybIKVcQmTA

[19] MetricsLed, Rebuilding Ukraine: digitally driven reconstruction and the challenges of coordination

https://www.metricsled.com/rebuilding-ukraine-digitally-driven-reconstruction-and-the-challenges-of-coordination/

Digital project funds

The initial approach to funding the project is based on a Lithuanian effort. However, there are alternative options that require Ukrainian municipalities to become an initiator in applying procedures. A few examples are listed below.

EBRD Green Cities

EBRD Green Cities strives to build a better and more sustainable future for cities and their residents. The program achieves this by identifying, prioritizing, and connecting cities' environmental challenges with sustainable infrastructure investments and policy measures.

Eligible cities must meet the following criteria:[20]

1. Be a city in the EBRD regions (Ukraine is)

2. Have a population of at least 100,000 (cities with a population of **50,000** will be considered in exceptional circumstances)

3. Be willing to conduct a Green City Action Plan

4. Initiate an investment trigger project in one of the following sectors: solid waste, water and wastewater, urban transport, district energy, low-carbon and climate-resilient buildings, renewable energy, street lighting, distribution network, **smart solutions**, climate change resilience, and nature-based solutions.

The Nordic Environment Finance Corporation

NEFCO already has Green Recovery Programme for Ukraine. The NEFCO plan to **work directly with municipalities** and help them to plan and **finance sustainable recovery** from the damage caused by the Russian military invasion of Ukraine as well as provide assistance in designing **Local Green Recovery Plans**.

https://www.nefco.int/

RED ROSE

Partner with the iNGOs, UN organizations, and donors to empower their programs with a **digital** approach.

https://www.redrosecps.com/

Summary

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[20] https://www.ebrdgreencities.com/become-a-green-city

Several related initiatives have started in Ukraine which could be invited for a possible collaboration.

A DPT would help interested Lithuanian planning professionals to join forces with Ukrainians and start planning processes remotely. This would allow us to make rational decisions based on evidence, create a ground for collaborative analysis, and start the processes before the loss of russia and the end of the war.

DPTs provide capacities for design visualization, contemporary planning practices, and storage of data which would benefit the future development of the cities in Ukraine.