Approaches to web mapping of post-military facilities in Lviv region

S. Repekhovych, *R. Sossa (Lviv Polytechnic National University)

SUMMARY

A web map of post-military facilities in the Lviv region has been created using the ArcGis Story Maps web application. Information was collected on 34 post-military facilities. Collected information includes description, condition, location, photos. The search for materials for the project was carried out both remotely, using Internet resources, and during field expeditions. Post-military objects are classified by functional types and time periods, on the basis of which separate maps created. Story Maps, due to its ease of use and its functions, made it possible to fully realize the visual plan and compactly gather information on web maps. The project has great prospects for future development, and will help promote both tourism and the history of Lviv region.

Keywords: post-military, web mapping, pilot project, story maps, Lviv region
Introduction

Web mapping allows to visualize a lot of diverse information. Now, very popular are various mapping applications and online maps, which have hundred thousands of registered users and offer extensive operation features. They are widely used not only by mapping experts, but also in a variety of human areas like education, science, tourism, finance, programming, healthcare, environment etc. Over centuries, Lviv Oblast had been strategically located and enjoyed well-developed military infrastructure accordingly. The contemporary territory of Lviv Oblast had different-purpose military facilities, which, however, lost their importance over time and were subsequently either wound up or abandoned. Today, the issue of post-military facilities in Ukraine is not studied enough, even though quite a few of them have special cultural, historical, landscape and architectural meaning. This issue plays an important role in retaining the cultural and historical value of the region, in tourism expansion in Lviv Oblast, which overall makes our study relevant. Online map development will help to make the region more popular and facilitate the search of information about the famous and less known facilities, which had once been military.

Method and Theory

The objective of our study is to work over the methods and techniques of developing an online resource of post-military facilities in Lviv Oblast, whereby to implement the respective pilot project. A post-military facility means a military facility, which is not used already for its once intended purpose. These facilities include: former military units, permanent fire positions, forts, bunkers, airfields, hideouts, missile pits, armories, castles, remnants of equipment, fighting scenes etc. In our study, we have involved the facilities dated from late XIX century until now. They include the former military facilities of the Austria-Hungary, Poland and Soviet periods and of Ukraine’s Independence period.

Given that the issue of post-military facilities in Lviv Oblast and in Ukraine overall is understudied, it was important first to make a database of such facilities. This database should have included the information about post-military facilities and been open for updates, which would allow to supplement the already existing material.

As for now, there is no resource that would have a summary list of post-military facilities with their details (Sulyk, 2013). One can find only segmentary information in miscellaneous web resources like Wikimapia, in archives. Since the information is available in various sources, its collection took a lot of time and effort. As a result of our search, we have identified 34 post-military facilities in Lviv Oblast and collected extensive details about them.

During the data collection and preliminary analysis of the collected information, there arose an obvious need to classify the already non-operating military facilities, which details we have managed to find. The key underlying factors for classification of the collected material are the intended purpose of a facility (its type) and its operation period.

We have identified that specific study is needed also to research the war actions that occurred in Lviv Oblast as the ones to give us more comprehensive understanding of how these or those military facilities had been used or located. Hence, we have also studied the war actions that took place during the periods mentioned, principally during the two world wars.

The classification of post-military facilities by type and operation period also allows to trace their historical interaction, because all of them are located within the boundaries of the region under our study (Sulyk, 2013). By type of facilities under our study, we single out the following: forts, permanent fire positions, military units, bunkers, hideouts, airfields, missile pits (systems).

This classification first helps to group the same-type facilities and to facilitate their search on the web map in future. The classification of the studied facilities by operation period allows to group the post-
military facilities constructed and operated in the particular historical environment and accompanied by particular political and military actions. Such presentation of information reflects the interrelation between the facilities and the then existing military and political situation and demonstrates their importance in the progression of events, and it will show the change in the quantity of facilities and illustrate their condition during the appropriate historical periods.

Chronologically, we have classified the post-military facilities by the following operation periods: late XIX century – early XX century, 1914-1918, World War I, 1918-1939, 1939-1945, World War II, 1945-1991, 1991-now (Ukraine’s Independence period).

To implement our pilot project, the above classifications by type and operation period are not enough – we also need the detailed information about the facilities, otherwise the ultimate result will be incomplete and look kind of underfinished. That is why an important feature of our study and subsequent pilot project implementation is the search and collection of extensive details of the facilities – which includes the following data: description of a post-military facility (historical background), location, the then existing plans and maps, photo materials, present condition.

During the information search, we have been focusing on the above criteria and trying to find as detailed and true data as possible – the ones, which would also bring in some interesting content for potential users. We have visited personally many of the facilities, because the information we collected was simply not enough – and so we had to supplement it with our own photos and observations.

To implement our project technically and technologically, the following factors were decisive: user friendliness, information value, updates allowed, overall availability (Fu and Sun, 2010). Rapid development of web mapping has increased the variety of online maps and the features they offer. A lot of methods to visualize information have arisen, new information presentation options evolved. To select the adequate software for web mapping of post-military facilities in Lviv Oblast, we have analyzed the following web mapping services: Google Maps, ArcGIS StoryMaps, ArcGIS Online.

Selecting from the above list, we have stopped on ArcGIS StoryMaps intended to make various stories on the ArcGIS (Zanko, 2016) platform and to give access to your maps along with the description and other multimedia resources. The selected application extends the opportunities in the context of an online map allowing to combine multimedia materials, text files and maps within a single original project. StoryMaps is available for any user, because it does not require any specific web mapping skill or knowledge. The final project looks not just like an online map, but rather like an integral story with map tours, stories and map journals. The service includes several diverse maps suitable for various purposes and appropriate to implement particular projects. Available on desktops and in smartphones. Unlike most similar apps, StoryMaps makes it possible to create the story itself, personal and unique, with the help of web mapping resources.

The main (general) map has layers with all highlighted types of facilities (Fig. 1). For groups of facilities, we add auxiliary maps with detailed description and additional photos. In a similar way, we have made the chronology of split into operation periods.

For large-scale facilities consisting of several elements, we have made additionally standalone detailed maps with detailed descriptions and illustrations (Fig. 2).

We have been plotting the facilities on the map using Map Tour, which allows to make a virtual tour around certain facilities. This function is good for its compactness and convenience, because the user, when scrolling the page, can see immediately the neighboring fort with a photo and description.

Alongside virtual tours, Map Tour can help to organize a real-life trip, because it is possible to add a spatial reference to the facilities on the map. So even with the help of simple smartphone navigation, it is easy to visit interesting facilities (Fig. 3).
Figure 1 Online map of post-military facilities in Lviv Oblast.

Figure 2 Forts in Popovychi.

Figure 3 Map Tour around Strumyliv fortified area.
Conclusions

Based on the data about the post-military facilities in Lviv Oblast, we have worked over the methods and techniques of developing such an online resource. From the archive, literature and web resources, we have collected the information about 34 post-military facilities in Lviv Oblast. To identify the present condition of certain facilities, we have initiated field surveys. The post-military facilities have been split and classified by their functional types and chronological periods. In ArcGIS StoryMaps, we have implemented our pilot project of making a detailed map of post-military facilities in Lviv Oblast with the appropriate supplements and extensions. In future, it is possible to update the map.

Hence, web mapping allows users to benefit from considerable opportunities of visualizing large scopes of diverse information (spatial, verbal, graphic). The implementation of our pilot project has proven the importance and advantage of making several interrelated maps to highlight the issue of our study. It is impossible to render this scope of information on a single map in an as compact, high-quality and at the same time informative enough way. Alongside, unlike software, applications do not require much from the users’ computers.

References


