CHOLNOKY MAP COLLECTION'S WEB SERVICES WITH ONLINE CATALOGUE AND SEARCH ON INTERACTIVE MAP

***Zsombor BARTOS-ELEKES*[1*], *Zsolt MAGYARI-SÁSKA*[2]**

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ABSTRACT
The library of the Institute of Geography at the university of Cluj / Kolozsvár, including cartographic materials, was founded in 1884. The maps and atlases of the library were hided around 1950. The remains, found in 2001, are the core of the Cholnoky Map Collection, one of the most important collections of old maps in Romania, with more than 6,600 items (map sheets, atlases), the earliest dating from the 17th century, including valuable manuscripts. Digitization is the key to the survival of this long-suffering collection, so it has always tried to be a pioneer in digitization and dissemination. The topic of this paper is the digitization and visualization of the cartographic heritage: how to realize a digital catalogue and online dissemination of a map collection. With this paper, the authors report on the approaches they applied: they realized the automatic update of the website from the online catalogue, and based on this database, a web search of the maps by their metadata and by their bounding coordinates. The paper presents the map collection: its history, its structure and the features of its previous website (https://hagyatek.cholnoky.ro/terkeptar). It provides an overview of the websites and online map-based search engines of major map libraries in the neighborhood and around the world. It describes how was completed the catalogue with geolocation data; how the back-end IT system enables the automatic updates of online content based on the continuously upgraded catalogue. The front-end interface, the new webpage (http://cholnokymaps.gis-it.ro/) allows users to search for maps by text matching in metadata, and to obtain the corresponding results depending on the actual map bounding box of the OpenStreetMap (OSM). The selected map is visualized using magnifier and panning tools and can be downloaded in high-resolution.

Key-words: *cartographic heritage, visualization, automated data update, geolocation, Jenő Cholnoky, Cluj-Napoca*

1. INTRODUCTION: theoretical background

The digital approaches to cartographic heritage have been at the focus of research in the last decades. The International Cartographic Association set up as a forum for such researchers a working group in 2005, which was upgraded to a commission in 2007. This forum has organized annual workshops, international conferences since 2006 (including one in Cluj-Napoca, where the Cholnoky Map Collection exhibited maps). Among the topics of the Commission on Cartographic Heritage into the Digital (http://cartography.web.auth.gr/ICA-Heritage/) are the visualization of cartoheritage and the web providing issues. Only a selection of recent papers is presented below. Fleet (2019) describes viewers and tools for delivering maps online. Tegeler & Bauer (2019) reports on trends in enabling spatial information retrieval of maps in libraries. Žabička & Pacek (2019) relates online tools for cataloguing and presenting old maps. Arevalo (2021) compares the quality of websites providing access to cartoheritage. Novak & Ostash (2022) lists websites of the online map collections. Appel (2022) presents a digital geographic index map standard. Ungvári et al (2023) introduces an interactive gazetteer on a virtual globe collection. The authors of this paper were inspired by the work of this commission.

[1*] *Department of Geography in Hungarian, Faculty of Geography, Babeş–Bolyai University, 400006, Cluj-Napoca, Romania, zsombor.bartos@ubbcluj.ro (corresponding author)*
[2] *Geography Department of Extensions - Gheorgheni Extension, Faculty of Geography, Babeş–Bolyai University, 535500, Gheorgheni, Romania, zsolt.magyari@ubbcluj.ro*

2. SOURCES: the Cholnoky Map Collection

2.1. History and structure

The nucleus of the collection is the library of the Institute of Geography at the former Hungarian-language Francis Joseph University of Kolozsvár (at that time Austria–Hungary, now Cluj-Napoca, Romania). This library was founded in 1884 and from 1895 it was the library of the Institute of Geography. The first director of the collection was Adolf Terner, who did not gather a significant map collection. At the time of his retirement, in 1904, the collection consisted of only 14 atlases and 755 map sheets, the latter probably being sheets of the 1:75,000 topographic map series of the dual monarchy (Magyar Minerva, 1904: 377; Cholnoky, 1998: 255).

From 1905, Jenő Cholnoky, an outstanding Hungarian geographer, became the professor of geography at this university until 1919. The most important development took place under his directorship; he was the main contributor to the map collection. By 1919 the collection had at least 951 maps, but in this calculation, the previously mentioned topographic map series was counted only as a single map (Cholnoky, 1998: 276), so the number of map sheets could be measured in thousands. Note, we obtain different numbers on the size of map collections when counting maps or map sheets, since a map may be kept in several copies or a map series may consist of several map sheets. The catalogue of the library has not been left behind, the sources for the amounts are: Magyar Minerva, 1912: 470; Magyar Minerva, 1915: 335; Cholnoky, 1917: 445.

The collection was taken over and slightly enlarged between the two world wars by the Romanian-language Ferdinand University, and then during the Second World War by the returning Francis Joseph University. The importance of the map collection at the time is illustrated by the fact that Vasile Meruţiu, the professor in the interwar period, when compiling a list of old maps of Transylvania, rather relied on the institute's collection than on the university's central map collection. The continuity of the map collection is indicated by the fact that he used the catalogue numbers of Jenő Cholnoky (Meruţiu, 1929: 204–207).

Under communism, presumably in the early 1950s, this collection and other similar institutional map collections were eliminated, and for half a century they were in an unknown location, presumed lost (Bartos-Elekes, 2015; Bartos-Elekes, 2022).

In 2001, by chance, a few cubic meters of maps, atlases and photographs were discovered in a storage room of the Faculty of Geography at the multilingual Babeş–Bolyai University (Cluj-Napoca), which quickly proved to be the remains of the disappeared collection. Old Austrian topographic map sheets no longer in use were added to them, most of which had previously also been in the collection of the Institute of Geography or other institutes. The collection is currently kept at the Faculty of Geography and is managed by the Cholnoky Geographical Society. This material consists of two parts: the photo and the map collection, containing about 5,300 photographs and 6,600 map sheets and atlases. The Cholnoky Map Collection consists of three collections from three different sources: a map collection (general, thematic and topographic maps: 4,383 map sheets), an atlas collection (133 atlases, 31 albums and 9 books) and a topographic map collection (2,111 topographic map sheets). The oldest maps are from the 17th century, the most recent from the mid-20th century, including several valuable manuscript maps (Bartos-Elekes, 2015; Bartos-Elekes, 2022; Imecs, 2004).

Thus, the collection started as a provincial university departmental collection in 1884, which was developed into a significant collection by its outstanding director in the 1910s, then locked away from the public during the years of communism from 1950, and has been available for use again since 2001. Among collections with a similar history is the Justus Perthes Collection in Gotha: founded in 1785, the publishing house was one of the world's leading geographic and cartographic institutions from mid-19th century until the mid-20th century, when the family business was expropriated in East Germany in 1953. Their collection, including 185,000 maps, 120,000 volumes and 800 linear meters of archival material, was acquired by the state in 2003 and integrated into the Gotha Research Library, and after 50 years of isolation now is made accessible for future generations (Ormeling, 1986;

Demhardt, 2006; Weigel, 2011). Besides the similar history, the two collections are also connected by the fact that only two copies of the 1858 manuscript map of an explorer of Africa, László Magyar are known in the world, and these were found in these two collections, which were previously unsearchable (Bartos-Elekes & Nemerkényi, 2014).

2.2. Catalogue and former web service

The catalogue and the website (https://hagyatek.cholnoky.ro/terkeptar) have not yet formed a coherent system.

The work on the catalogue started in 2006, until 2008 the most important metadata from maps, atlases and topographic sheets were entered quickly into an Excel spreadsheet. The scanning process started afterwards (since 2012 the collection has its own roll scanner), during which the metadata entered in the first step in the Excel spreadsheet are completed. Until now, 2458 image files have been digitized (2181 scanned map sheets, 270 photographed atlas pages and 7 scanned topographic sheets). With the former web service 672 images of the digitized material are available (395 of the scanned map sheets, plus the digitized atlas pages and topographic sheets). The items are visualized in low-resolution, with their most important metadata and, in a limited number of cases, with the option to download the high-resolution image.

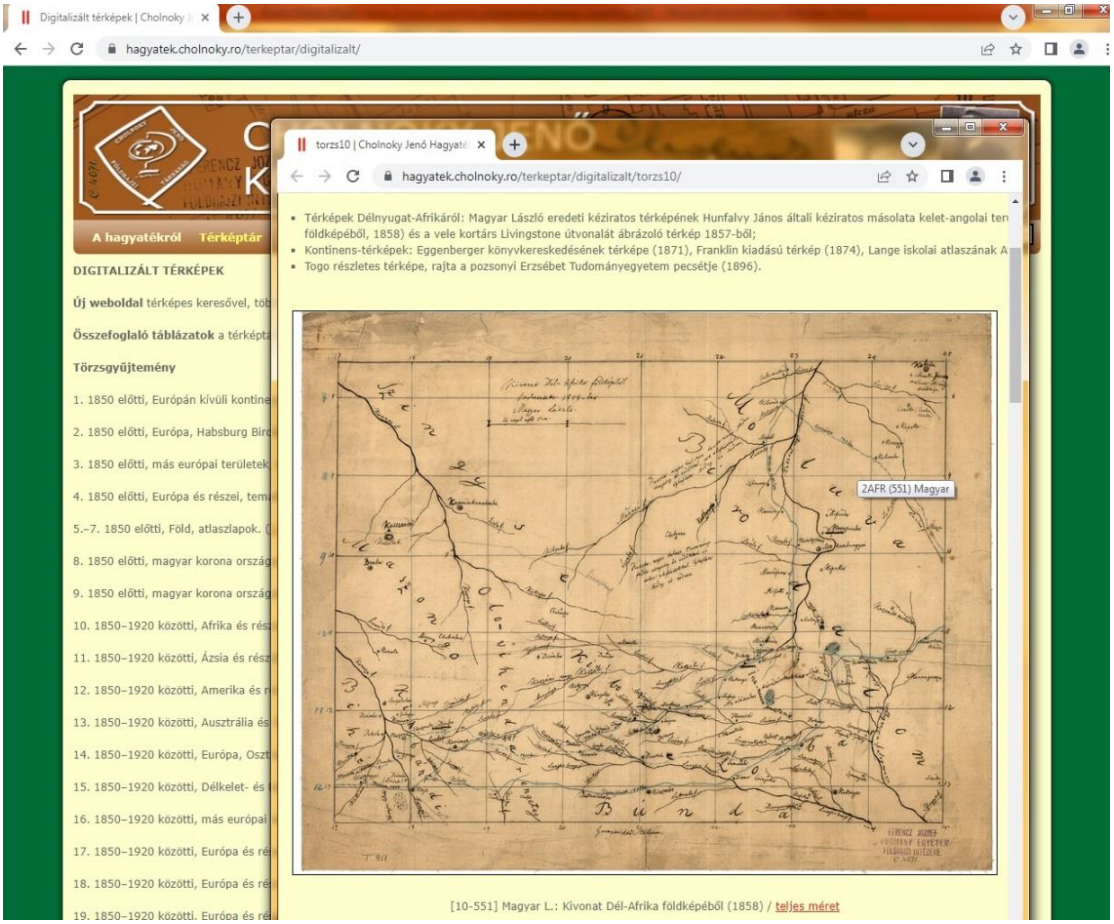

Fig. 1. The former website: the manuscript map of the inner parts of Angola from 1858 by László Magyar, explorer of Africa.

The website was edited as a WordPress blog. Adding newly digitized items to the website required manual editing. This limitation slowed down the dissemination of the digitized material, which led to the necessity of modernizing the website (**Fig. 1**, https://hagyatek.cholnoky.ro/terkeptar/digitalizalt/).

3. OBJECTIVES AND METHODS

3.1. Objectives

One of our objectives was to develop a back-end IT system that would be able to automatically update the online content, based on the constantly evolving catalogue. The other objective was to add geolocation data for each map in the catalogue, so that the cartographic items could be found on an interactive map in the online front-end environment. During the research, we overviewed the websites of the important map collections, the key elements of their online map-based search systems.

3.2. The web services of some important map collections

We visited the websites of some important Romanian and foreign (American, Austrian, British, French, German and Hungarian) map collections, looking for the examples that could be used as a model for our website.

The largest map collection in Romania is the Maps Department at the Academic Library in Bucharest, which has 16,606 maps, 3,786 estate plans, 552 atlases, 250 wall maps, relief maps and world maps. It has a traditional catalogue, so it can be researched on the spot. On its webpage, there is only a short description of the map collection (https://biblacad.ro/eng_harti.html). A search in the whole library's online catalogue of maps ("hărţi") in the field "subject" returns the metadata of 2,290 results (http://aleph23.biblacad.ro:8991/F), but we have no information on how much of these are kept in the map department.

Another important national map collection is the National Library's Map Collection in Bucharest, which contains some 5,300 maps and atlases. Until recently, it only had a handwritten inventory book, making research even more difficult. On its webpage, there is only a description of the map collection (https://www.bibnat.ro/Cartografie-s68-ro.htm). A search in the whole library's online database for map-type documents returns metadata for 687 results (https://aleph.bibnat.ro/F), but we have no information on how much of these are kept in the map collection. A significant progress is that the high-resolution images of 307 maps and of all pages of 11 atlases can be downloaded from the digital library (http://digitool.bibnat.ro/R).

Among the domestic university collections, we can highlight the Map and Atlas Collection at the Central University Library of Cluj-Napoca. It contains 580 atlases (in 698 volumes), at least 4,710 maps (as 9,669 map sheets), 103 wall maps and 202 guidebooks. An advantage compared to the previous collections is that the 8,453 cards of the traditional catalogue (which were managed until 2005) are available in scanned form on the website: https://www.bcucluj.ro/ro/resursele-bibliotecii/cat/csh. A search in the whole library's online catalogue of maps ("hărţi") in the field "subject" returns the metadata of 878 results (http://aleph.bcucluj.ro:8991/F), but in this case we know that from these only 69 atlases and 56 maps are kept in the map collection. Some of these are available for downloading as digital copies.

The Cholnoky Map Collection contains mostly cartographic material related to Transylvania. As the largest number of old maps related to Transylvania is kept in Hungary, these collections are presented below. The two largest Hungarian map collections are in Budapest.

The backbone of the Map Collection at the Military History Institute and Museum in Budapest was the map sheets from the War Archives in Vienna that were allocated to Hungary after the First World War, so its main collection is of topographic maps. Today it contains nearly half a million items. The most relevant items of these are available on two websites. Hungaricana, the portal of Hungarian

public collections, contains 77,823 maps and 42,652 plans (https://maps.hungaricana.hu/hu/). On this website this map collection appears with 20,285 digitized maps, where one map can contain several sheets. The website provides a table of contents of the collection. Hits within a category can be filtered or sorted by their metadata. The map view uses Google Maps, with around 30,000 maps searchable by represented area. The selected map is displayed with detailed metadata and is visualized with magnifying and panning tools, but downloading is not possible. The most important part of the collection (together with the material from the Viennese twin collection), that is the former topographic map sheets are available on a separate website. Arcanum Maps (https://maps.arcanum.com/hu/) is one of the world's leading digital historical map sites. Among other map series, it presents the three Habsburg military topographic surveys and former Hungarian topographic maps, tens of thousands of sheets. They are depicted together and thus visualized as a geo-referenced, interactive mosaic of maps: with the possibility to overlay multiple (historical and modern) maps, to adjust their transparency.

While the previous collection collects mainly topographic maps, the Map Collection of the National Széchényi Library in Budapest collects Hungarian maps and atlases of any type; today it has more than three hundred thousand items. On its webpage, there is some general information (https://www.oszk.hu/terkepek). A search in the whole library's online catalogue of maps ("térkép") in the field "subject keyword" returns the metadata of at about 52,000 results (https://nektar2.oszk.hu/librivision_eng.html). Of the printed maps, 1,183 can be viewed and downloaded in medium resolution on the map collection's website (https://foldabrosz.oszk.hu/). Among the manuscript maps, 2,314 are included in the Hungaricana website.

Some of the world's leading map collections are described briefly below, just for comparison with the above.

The world's largest map collection is considered to be that of the Library of Congress in Washington, D.C., with 5.6 million maps. Their website (https://www.loc.gov/maps/) contains 418,000 searchable maps, of which 57,000 are available online, for viewing and downloading.

Another major US map collection is the map collection of the American Geographical Society Library in Milwaukee, which contains 520,000 maps, 21,000 of which are available online, for viewing and downloading (https://uwm.edu/lib-collections/agsl-digital-map-collection/).

The David Rumsey Map Collection (https://www.davidrumsey.com/) in Stanford, California contains 150,000 maps, of which 130,000 are now digitized and available on their website, making it a reference in terms of digitization. The website has many tools for searching (by period, area and content keywords), visualizing (compare and overlaying in geo-referencing) and downloading (at various resolutions).

Besides the one in Washington, the other largest map collection in the world is in London: the British Library contains 4.5 million cartographic items (https://blogs.bl.uk/magnificentmaps/about-this-blog.html), and has an online catalogue on its website, but the amount of scanned maps is not significant.

The National Library of France contains 950,000 maps, of which nearly 70,000 are now available online, which can be listed by different criteria (e.g. by century), searched in the catalogue, downloaded (https://gallica.bnf.fr/html/und/cartes/cartes). Maps are accompanied by a pair of coordinates, which shows approximately where the center of the map is.

The Bavarian State Library in Munich has 430,000 maps, 260,000 of which can be searched in its online catalogue (https://www.bsb-muenchen.de/), some of which can be viewed and downloaded at a limited resolution.

The Austrian National Library in Vienna has a map collection of 300,000 maps, which can be searched in the online catalogue on its website, and a small number of maps can be viewed (https://www.onb.ac.at/en/departments/map-department).

In conclusion, the world's largest map collections contain around five million maps (Washington, London), but in major European cities even collections with a few hundred thousand cartographic items are outstanding (e.g. Vienna, Budapest). In Romania, the largest collections are with around ten thousands of maps (Academic Library, Central University Library of Cluj-Napoca), among which

Cholnoky is considerable. Libraries are working on making their collections available in their online catalogue, searchable by their metadata, but in many cases this is still only partially or even fragmentarily implemented. At best, around one hundred thousand maps can be explored online (e.g. David Rumsey, Hungaricana), in better case using magnifier and panning tools, and more rarely the maps can be downloaded. Among the collections in Romania, Cholnoky leads in this respect with more than two thousand digitized map sheets which are visualized and can be downloaded. The search by represented area using an interactive map is a rarity (e.g. Hungaricana). The American David Rumsey and the Hungarian Arcanum sites are outstanding in their special tools (overlay, transparency, geo-referenced mosaic).

3.3. The structure of the catalogue, addition of geolocation data

The digital catalogue (an Excel file) has been revised to allow easy automatic updating and data columns for the geolocation of the items have been added.

As a result of this upgrade, the catalogue of the map collection has the following data columns (fields) available online:

Bibliographic data:

- Title/map (*Mű címe*, e.g. *Map of North America*)
- Title/sheet (*Lap címe*, in the case of a map series with several sheets)
- Author (*Szerző*)
- Publisher (*Kiadó*, e.g. *United States Geological Survey*)
- Pub location (*Kiadás helye*)
- Pub date (*Kiadás éve*, e.g. *1912*)
- Scale (*Méretarány*, e.g. *1:5000000*)
- No. of sheets (*Lapok száma*, number of map sheets for this database row, e.g. *1*)

Categories, reference codes, digitization:

- Category (*Csoport*, e.g. *1850–1920, Amerika és részei térképek: általános, földrajzi, közigazgatási*, '1850–1920, America, general maps')
- List No. (*Tételszám*, e.g. *579*, physical identifier, the list number of the map sheet)
- Call No. (*Jelzet*, e.g. *12-0579*, logical identifier, it is located in folder 12 and has the call number 579. The call number is usually the same as the list number. If the sheets/copies of the same map were entered in more than one row, these rows have the same call numbers, which links them together)
- Year of dig. (*Digitalizálás éve*, e.g. *2011*)
- No. of images (*Fájlok száma*, number of images for this database row, e.g. *1*)

Former reference codes:

- FJTE-T (*FJTE-T*, e.g. *T608*, the 608th map in the Institute of Geography's library at Francis Joseph University)
- FJTE-C (*FJTE-C*, e.g. *C2640*, the 2640th catalogued item in the Institute of Geography's library at Francis Joseph University)
- IG (*IG*, e.g. *79*, the 79th map in the Institute of Geography's library of the Ferdinand University)

Notes:

- Area (*Terület*, e.g. *Észak-Amerika*, 'North America', the map represents approximately the area of these nowadays countries, regions or continents)
- Map type (*Műfaj*, e.g. *közigazgatási*, 'administrative map')
- Notes (*Megjegyzés*, e.g. *Souvenir of the visit of the geographers of the Transcontinental excursion*)

Besides the addition and organization of the existing database, a real novelty was the matching of the data rows with map bounding box data similar to Google Maps and OpenStreetMap. Three

columns were used to specify where the center of the map is located and at what zoom level the full map is displayed by the above mentioned web map services.

- Lat (e.g. *40*, latitude of the center of the map/sheet)
- Lon (e.g. *-100*, longitude of the center of the map/sheet)
- Zoom (e.g. *4*, the area represented on the map corresponds to this zoom level in web maps. Zoom 1 is for astronomical maps, 2 for world maps, 3–4 for a continent, 5–9 for a country, 10–11 for city maps).

The rows in the catalogue (records) can refer to a single map sheet (for which we may have one image file, or even front and back, so multiple image files can be associated with it), or a multi-sheet map series can be included in a single row (which can also have multiple image files associated with it). If just one image file is associated with a call number, the image file name is the same as the call number (*12-0579.JPG*). If there are multiple images associated with the same call number, the image file name will contain the call number, but will continue for identification purposes.

3.4. Implementation of the IT system and website

The digitization of the map collection is a continuous process that takes several years. We wanted to make the already processed, digitized content easily accessible to the public on the website, and to make the new results of the ongoing digitization work easily, automatically and efficiently incorporated as possible.

Accordingly, the IT implementation of the project was divided into two parts: the creation of visualization and browsing interface, and the development of a data uploading system. The two modules share a common database (the catalogue of the collection), so that when the database is upgrading through the data uploading module, its content is already available in real time on the visualization interface. The data flows are shown in **figure 2**. Since the beginning, the data was recorded in Excel spreadsheets, so the metadata of the image files is uploaded as XLSX file.

We used MariaDB database as data warehouse management system, PHP for the back-end and JavaScript for the front-end development. The map collection is currently available under the following domain: http://cholnokymaps.gis-it.ro/

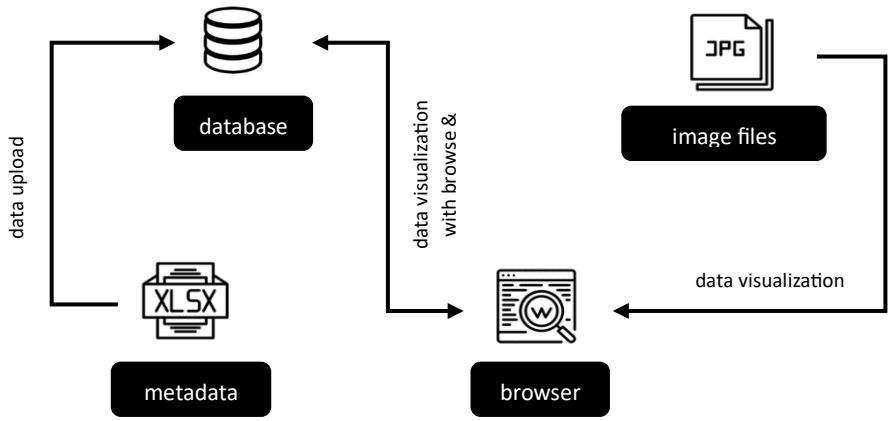

Fig. 2. – Data flows in the system

The upload of the catalogue including newly digitized data is done in two steps. Both the JPG image data files and the XLSX file containing their metadata have to be uploaded. The uploading of image files, accounting for their size of several 10MB each, should not be done using a web upload interface, but via FTP connection provided by the hosting provider. However, as the catalogue, including metadata is integrated in the database used by the visualization interface, a separate interface has been developed for uploading them.

4. RESULTS

4.1. Data upload

The user interface of the data upload module is simple. In addition to browsing the Excel metadata file from the local machine and providing the appropriate password a button activates the authentication check, the connection and the upload processes. In the upload window, the data uploader will receive continuous feedback on the success or failure of the steps. The access link to this interface is not public and is only available to those involved in the digitization and data management process of the map.

A key element of data uploading is that, although it is done from a public web interface, it can only be done with the appropriate authorization. For this purpose, we have chosen an authentication method that has a fixed – possibly modifiable – and a variable component that depends on external but easily accessible factors. Thus, using both components together the authentication is more secure than using a single keyword.

After the selected file is uploaded to the server, the password is checked. This is followed by the verifying of the availability of the database and the access rights on it, and afterwards the contents of any previously existing data table are deleted in their entirety. Once a new data table is created, its entries are populated with the individual columns of the corresponding data sheet of the uploaded XLSX file. It is therefore important that the Excel file has the same internal structure for each upload. It is also noticeable that the user receives continuous feedback on the success or failure of each step, so that any errors that may occur can be easily identified.

4.2. Data visualization and browsing

Three versions of data view and browsing have been implemented. The first option is to navigate in the table of contents (categories and folders) of the map collection: e.g. *1850 előtti térképek* (‘Maps before 1850’), within that *Európán kívüli kontinensek* (‘Continents other than Europe’). The second option is to search by text matching in metadata, next to the magnifying glass icon, where it is possible to specify the search field *(Keresés mezője).* The third option is based on geolocation: this is an interactive search on a map, depending on its current bounding box; the displayed results are the maps whose geographical area is within the bounding box of the map.

During the implementation, different client-side and server-side programming languages and techniques have been used to create a system that works in a unified way. MariaDB and PHP were used on the server side, while HTML, CSS and JavaScript were used on the client side.

The user interface is depicted to follow the design of today's modern web content, being easy to understand, simple and intuitive (**Fig. 3**). The results can be searched by table of contents or metadata, respectively on map. Switching between these two is made possible by icons in the top right corner of the interface. When navigating in table of contents, if the user navigates to the lowest level, the results corresponding to that category will appear in the list on the right. In all cases, the list of results will display the number of results after the word *Találatok* (‘Results’).

If the user wants to search by metadata, they can start by typing it in the field above the table of contents. It is possible to search for the totality of the metadata (*Összes,* ‘All Fields’, this is the default) or to select the field to be searched, from the drop-down list of the fields (*Cím, Szerző,* etc. for ‘Title’, ‘Author’), which can be done by pressing Enter or clicking on the search icon. Whether the results displayed on the right are the result of a content category selection or a text search is made clear by the note under the word *Találatok* (‘Results’): in the case of a content category, the name of the category is displayed (e.g. *1850 előtti térképek,* ‘Maps before 1850’), while in the case of a search, the searched text is displayed (e.g. *Keresett szó: Amerika,* ‘Searched text: America’). The search is performed on metadata except the last option, *Fájlnév* (‘Filename’), when the search is conducted for existing filenames in the data folder. In this case the search field must contain at least the first seven characters of the filename (in the format ??-????-*). If files with the specified prefix are identified, metadata for them will be extracted from catalogue.

Fig. 3. The new webpage: the map-based search and the results with similar bounding coordinates.

The results list will display, at each position, a thumbnail image of the map, accompanied by the most important metadata for identification (Title, Author, etc.). If the result does not yet have a thumbnail image, a replacement image will be displayed to indicate this status. When positioned on an item in the results list, the mouse cursor also indicates whether a high-resolution image of the content is available or not. In the former case a magnifying glass is displayed, in the latter a question mark icon, but in both cases, it is possible to click on it and thus select the detailed data display.

The third search option is map-based, and its implementation has meant the appearance of a new option in the interface, represented by an icon with a magnifying glass over a map. By selecting this option, the OpenStreetMap is displayed in the browser, and those results are displayed whose geo-locations are similar to the current bounding coordinates. The geo-localized search is performed based on catalogue data. In order to make this map-based search feasible, the catalogue includes three new columns containing the geographic coordinates of the center of each map and a zoom level. If the center of the map is located between the bounding coordinates and the OSM zoom level is less than or equal to the value existing in the catalogue, the map will be listed as a result. This map-based search is activated by panning and magnifier tools. After each of these operations, the values of the corner points are read and converted from Google Web Mercator projection (which is the projection of the OSM) to a geographic coordinate; these values are used to call the search function.

Whatever the search method is selected, clicking on each item of the results will open a window displaying the detailed content that will fill the screen. In the left part of this window, a high-resolution version of the map will be displayed, while on the right, the associated metadata will be displayed.

In the detailed image part of the window, it is possible to zoom in and out of the content using the mouse scroll wheel, and panning by holding down the left mouse button. Double-clicking will reset the image zoom. There are two actions available in this view: downloading the map (clicking the icon in the top left corner) or returning to the previous search interface (clicking the icon in the top right corner). Returning can also be achieved by using the icons in the top right corner of the browser interface to select the search mode.

When displaying a high-resolution image, a large amount of data has to arrive from the server to the client computer, which can take a few seconds, during which time an animated icon informs the user on the ongoing data transfer. By default, when downloaded, the file name will match the file name stored on the server, created during digitization.

5. CONCLUSION

This paper reports on how the Cholnoky Map Collection website (http://cholnokymaps.gis-it.ro/) has been developed recently:

- previously, the updating from the digital catalogue was done manually, now it has become automatic,
- previously, the maps could only be searched indirectly by the most important metadata, but now it is possible to search quickly and directly by all metadata,
- the new feature is the search by map bounding box, which is a great help in the case of maps representing different areas,
- previously, only a few maps could be downloaded in high-resolution, now any user can do this for any map.

The Cholnoky Map Collection, located in a store-room in the building of the Faculty of Geography, Babeş–Bolyai University, Cluj-Napoca has no staff: it is managed by a teacher of the university, with the help of a rotating team of students. The current level of digitization is as follows:

- it has a digital catalogue (an Excel file) of its entire contents (4,383 map sheets, 133 atlases, 31 albums, 9 books and 2111 topographic map sheets), with a wide range of data fields per records (bibliographic data, reference codes, notes, geolocation data, etc.),
- its website (https://hagyatek.cholnoky.ro/terkeptar/) is maintained by the Cholnoky Jenő Geographical Society, the site is mostly in Hungarian (with Romanian and English introductions), presenting studies and news,
- an old page of the website (https://hagyatek.cholnoky.ro/terkeptar/digitalizalt/) contains the low-resolution images and the most important metadata of 395 map sheets, 270 pages of 9 atlases and 7 topographic map sheets, grouped by categories, almost half of them can be downloaded in high-resolution,
- on a new page of the website (http://cholnokymaps.gis-it.ro/), the metadata of the 2,181 map sheets digitized so far have been made online from the digital catalogue: they can be browsed by categories, searched by text matching and by bounding box of an interactive map; the results are visualized (with magnifying and panning tools) and can be downloaded in high-resolution; the 395 map sheets of the old webpage are included here too, but the 270 pages of atlases and the 7 topographic map sheets can be browsed only on the old webpage.

The unfair history of the collection (its existence was unknown for half a century) is a strong warning of the importance of its survival. Given its limited physical space (only one store-room available), this preservation is only possible by promoting it in the online space. This is the key to making this fund of old maps accessible to potential researchers. Searching is facilitated by implementing location-based search in a map-specific graphical interface. The aim of this paper was to highlight these issues describing the web system analytically, thus providing examples for other solutions.

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