Usage of Innovative Technologies and Online Media Tools for Digital Presentation of Cultural Heritage in Bulgaria

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Abstract. The paper presents implementation of digital media tools and innovative technologies in open access presentation and sustainable preservation of cultural heritage objects, stored in museums. New digital preservation and curation tools like web sites, 3D modeling, virtual tours, and repositories, have been analyzed for usage in cultural heritage fields for memory institutions, museums, institutions, tourist routes, information centers and sites.

Keywords: Digital Preservation, Cultural Heritage, Museum Informatics, Open-access, Storytelling, Virtual Tours, 3D Models.

1   Introduction

Digital media and software tools have a crucial role in open access and sustainable preservation of cultural heritage (López, Virto, & San-Martín, 2019), (Nuccio & Bertacchini, 2021). Technically enhanced open access to digital culture and good practices of EUROPEANA, SSHOPENCLOUD, DARIAH and similar projects shows objects with enduring value that should be kept for future generations, following many technological, Semantic Web and legal requirements. Digital presentations, 3D exhibitions and modelling, multimedia screen posts, digital ticket reservations, email bulletins are part of museum instrumentarium already, but without proper digital curation and presentation this fact does not raise the quality of research in Digital Humanities area, as well as how wide the cultural heritage reaches (Krasteva, Todorova, Eneva, & Gavrilova, 2016), (Todorova, Bogdanova, & Niklolov, 2019). This paper presents qualitative research results of interviews and digital content analyses of museums in Bulgaria and shows good practices for implementing new digital media tools for sustainable open access and preservation of cultural heritage.

2   Digital Presentation of Museums and Their Heritage in Bulgaria

2.1. Results of a Qualitative Research

The paper presents some of the results of a qualitative research, implemented in 2021, focused on physical and digital accessibility of museums and realized by the team of the Institute of Mathematics and Informatics at the Bulgarian Academy of Science (G. Bogdanova, N. Sabev, J. Tomov) and the authors of this paper. The research was made with phone interviews and digital review analysis. According to the Ministry of culture, Bulgaria has 209 museums in total, which means that the research includes around one fourth of all Bulgarian museums. 54 of 55 analyzed and tested museums have their own websites with digital content (images and text). Most of the museums are already using various types of virtual tours as new digital presentation tools, some of them are creating and using 3D modelling technologies both for virtual restoration and online/in situ exhibitions. On the question: "Do you have a virtual tour of the museum online?", only two museums answered that they don't have such: Regional Historical museum Bourgas and Historical museum in Gorna Oryahovitsa city. All the rest have stated that they have virtual tours, although it is not clear what they mean by that - real virtual tours or just simple video presentations and are they open-access uploaded on their web sites or not. For example, the six virtual tours on the website of the National Literature Museum could not be opened at all. A good tendency in digital presentation and dissemination of cultural heritage is that only 10 museums out of 55 in the research do not have links to social networks on their webpage. Many of the museums have Facebook, Instagram and YouTube pages, but only a few maintain them regularly and interactively. We can conclude that Bulgaria started to use digital tools to present and preserve cultural heritage, but still there is a lot to be done, especially about digital presentation and digitizing as open access museum exhibitions, data, objects and artefacts.

In 2020, as a response to COVID-19 epidemic measures situation, the Bulgarian Ministry of Culture published a list with 50 cultural museums, objects and services that can be used online. Many of them have short video tours, as well as static images, and textual presentations, but only a few show rich data repositories with annotated objects with captions, metatags and detailed categorized descriptions and search functionality. Some museums have education sections with simple digital tools, images for painting, simple games and quizzes for kids; others have started recently to publish more live digital media videos with people presenting exhibitions or objects, incl. famous people talking about their experiences in a digital-storytelling-form.

2.2. Good Practices

The Virtual Heritage and Museums Center of Tutracan[1] has 9 virtual tours of different museums and historical places or objects in the city. It also has 4 digital models of some

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[1] Tutracan Museum Website Center - http://www.museumtutrakan.com

significant objects, as well as a lot of other objects and sights presented with images, video and text.

Tryavna's museums website[2] also has virtual tours, but not very rich standardized, catalogued and easily accessible databases of digitalized artefacts and objects with images and text or video.

Historical virtual Museum Center Iskra Kazanlak [3] with Thracian Tomb also has 7 virtual tours and many objects and sights digitized on the site with pictures and text and a 3D model. The art gallery in the city also has a virtual tour. The regional Nature museum in Plovdiv has a rich repository of animal photos with names, but does not include metatags and detailed caption description about each.

ROUSSE

Many of the museums together with cultural institutions, Bulgarian academy of sciences, universities and other partners have made in the recent years 3D model exhibitions of objects of cultural and historical value.

Bulgarian-Romanian project "Danube-River with a lot of history" (the Program: 2014-2020 INTERREG V-A Romania-Bulgaria). The Technical University - Ruse has developed a project for creating realistic three-dimensional scale models of cultural and historical sites located on both sides of the Danube River and realized with the help of 3D printers. Modern three-dimensional printing technologies allow tactile accessibility (part of the sensor) of large objects [4].

In comparison: The Boyana Church has a detailed, precise virtual model, but the site of the church is quite conservative, simple and not interactive. There is a model made of the church, but it is uploaded in too small size and resolution and not shown in an interactive motion way - this is the opposite of a good example for a multimedia interactive site using new technologies and tools for presenting cultural heritage. Boyana Church website and digital presentation definitely needs improvement in order to be a good example for digital representation of cultural heritage.

SOFIA

A good example of such projects for digitization are BELL project [5]- "Research and Identification of Valuable Bells of the Historic and Culture Heritage of Bulgaria and Development of Audio and Video Archive with Advanced Technologies" (Bogdanova, Todorov, & Noev, 2011), (Bogdanova, Noev, Stoffel, & Todorov, 2011).

The project not only researched, recorded and described old valuable bells with the so called "passport files", but it also made them more accessible as a knowledge uploaded, categorized, presented and preserved online, as well as promoted with online and offline with portable exhibition Between "God and the people" in many cities. Even if the old valuable bells deteriorate, crack breaks in time, the knowledge of them is preserved and 3D models of them can be made.

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[2] Tryavna museums https://www.tryavna-museum.eu/

[3] Kazanlak Virtual Museums Iskra - https://kazanlakmuseum.com/

[4] Dunav Most - https://www.dunavmost.com/novini/maketi-na-istoricheski-zabelezhitelnosti-sa-izlozheni-v-kanev-tsentar

[5] Bell project - http://www.math.bas.bg/bells /

Another digital repository of Bulgarian bells – BellKnow [6], contains categorized and well described data with text, audio, images and video. The repository preserves, presents and promotes widely on national and international level valuable old bells in Bulgaria, which are part of the Bulgarian cultural and historical heritage.

BellKnow Multimedia Digital Repository is a project implemented by a team of the Institute of Mathematics and informatics of Bulgarian Academy of Science. The research also provides an insight into the history and features of the bells, which are historical, cultural and spiritual heritage objects. Results of the project include: vocabulary and ontology for a bell object; development of a methodology for 3D scanning and research of bells; building a repository of BellKnow digital resources with additional researched bells, to provide reliable protection of multimedia knowledge and scientific results.

Sofia History Museum's site[7] has a regular digital presentation concerning events, exhibitions and educational activities in the museum. Those activities attract tourists and local citizens to visit the museum, which is becoming a live center of culture, not just exhibiting static objects of history. The museum has also digitalized their objects and made 3D models of them, but does not show all on their site, probably due to intellectual property related issues. A lot of museum replica small models are presented and sold in the online store of the museum, as well as many books, cards, digital audio and video content.

VELIKO TARNOVO

The Regional Veliko Tarnovo Museums' site [8], with 10 museums included in it, has 4 virtual tours of different museum. It has a well-developed touristic rout showing history, culture, traditions and art and some of the museums have hosted 3D exhibitions or objects, but most of the objects of the museums are not published in an open digital platform with detailed description of the objects. An additional related project site [9] presents more information about touristic routes, as well as maps and drone videos and light show videos.

PLOVDIV

A detailed review is made by (Stoyanov, Jordanova, Somova, & Totkov, 2011) of two virtual 3D tours on the site of the Ethnographic museum in Plovdiv. The site of the museum also has 3 interactive multimedia virtual exhibitions with "Bulgarian Folk Jewels". The virtual tours and multimedia exhibition make the site and the place attractive for visitors, but there is more to accomplish about digital presentation and publishing online easily accessible catalogued, detailed open-access presentation of objects in the museum with text, images, video and metatag descriptions [10].

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[6] BellKnow- http://www.math.bas.bg/vt/BellKnow/
[7] Sofia Museum - https://sofiahistorymuseum.bg/
[8] Regional Veliko Tarnovo Museum - https://museumvt.com/
[9] Art and culture - https://artandculture-robg.eu/
[10] Museum Plovdiv - https://www.ethnograph.info/front/virtual_exhibitions.php

2.3. Storytelling with Digital Multimedia – not Just Artefacts and Objects Behind a Museum Glass.

The modern visitors of museums online or offline have a very short attention and focus span and new digital and multimedia tools, as well as putting them into context, a proper historical and cultural environment to experience is crucial. Storytelling with new interactive multimedia tools is also widely used online and offline to present the value of a certain place, museum or object and people's experiences, emotions and sound make it more attractive. Interviews with people explaining about historical and cultural discoveries, historical objects, their meaning, discovery and context can be found on many museum sites. A good example are videos made by the Archeological Museum in Varna[11] about prehistoric discoveries, objects and exhibitions. In another video of Varna Museum of Archaeology, with Slavyan Stoyanov, one of the organizers of the Exhibition of Bulgarian Embroidery in the museum explains about the symbols in the Bulgarian embroidery. The story, gestures, emotions, tone and video look make the information more interesting and attractive as well as dynamic for making a video.

The National Gallery Museum also has storytelling video series "Live the Magic"[12]. The videos tell interesting stories connected to Sofia and its' gallery and they are told by its representatives and famous people involved. The videos are made professionally in an interactive way. The storytelling contents are digitized and uploaded not only on the site of the owner, but also on international cultural databases and in YouTube channels and social networks. Through storytelling, presenting cultural objects online can also avoid problems with certain intellectual property rights of institutions and authors.

3   Conclusions

The research presents results of qualitative interviews and analyses of digital presentations online of one quarter of Bulgarian museums. The results can be used both by memory institutions, researchers, non-profit entities and educators in the wide interdisciplinary area of Heritage Studies and Museum Informatics. The usage of new digital technologies and digital media like 3D modeling, virtual tours, video storytelling, digital open-access catalogue repositories and interactive online websites and platforms of objects, museums and sights of significant value can improve and develop tourism, economy, education and scientific work.

The authors plan to continue research in the field and publish more papers about innovative technologies and new media tools used for cultural heritage digital presentation, including best practice examples from foreign countries.

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[11] Varna Museum of Archeology -http://www.archaeo.museumvarna.com/bg/category/list?category_id=3&idhttps://www.youtube.com/watch?v=d5t58iYA7eE, t visited: 16-06-2021
[12] National Gallery Museum's "Live the Magic" videos - https://www.youtube.com/channel/UCzOxVjIomsxv_iZAjtGA9Tg.

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