Digital Archaeology in Bosnia and Herzegovina: Current State and Future Challenges

Meliha Handzic and Ivana Pandzic

This article provides a brief overview of the current state of digital archaeology in Bosnia and Herzegovina (BIH) and points to major challenges for its future. It presents the most important efforts and achievements made by institutions, communities and individuals involved in various digitisation projects. The article also reveals significant obstacles that limit the current scope and speed of the digitisation process. In order to move forward, the article advocates the adoption of a 'participative perspective', where different stakeholders may participate in a socially inclusive way to remember and celebrate BIH cultural heritage through digital archives, exhibitions and storytelling practices. The article also suggests the need to take a more holistic approach to managing BIH archaeological knowledge in a digital environment in order to realise the full power of that knowledge.

1. Introduction

1.1. Historical background

Bosnia and Herzegovina has abundant archaeological artefacts from prehistory, antiquity, and the Middle Ages, as well as from the modern era. New and important archaeological excavations and discoveries are being made and reported continuously. By examining and re-examining our history with ever-developing technology, archaeology can help us to better understand who we are.

Historically, the first archaeological projects in Bosnia and Herzegovina (BIH) were associated with major national and regional museums. They contributed to the

construction of national and other identities through collections, selections and classifications of objects of interest and through historical narratives (Lozic [2011]). The oldest one, the Zemaljski Museum of Bosnia and Herzegovina, was established in Sarajevo in 1888, as a provincial museum within the Austro-Hungarian Empire. The aim was to contribute, on the one hand, to the cultivation of provincial identity, and on the other hand to the Austro-Hungarian imperial identity.

During the Kingdom of Yugoslavia, the Museum of Vrbas County (now the Museum of the Republic of Srpska) was founded in Banja Luka in 1930, with a local focus on north-western Bosnia. Its archaeological exhibits demonstrate the continuous colonisation of the territory of Bosanska Krajina (Radojcic and Vracar [2012]). Other various regional and town museums were founded after World War II. They often hold significant archaeological collections from prehistory, ancient Roman and medieval periods. However, this boom in the establishment of new museums centred primarily on interpreting the contemporary past in accordance with strict guidelines of the regime of socialist Yugoslavia (Novakovic [2021]).

Unfortunately, the dissolution of Yugoslavia and the subsequent 1990s war caused damage to the cultural heritage of BIH. The fact-finding mission by the Committee on Culture and Education of the Council of Europe reported significant damage to both museum buildings and collections (COE [1996]; [1997]). These included damage and loss of artefacts and documentation, as well as a lack of staff, materials and equipment, conservation facilities and broken professional networks.

The post-war evolution of BIH archaeology followed the political, cultural, territorial, demographic and technological changes of BIH society. Political and administrative changes led to a shift in ideological and identification-making focus of different museums. This created additional difficulties in securing government support for archaeological projects in the already reduced cultural heritage sector.

However, the situation is improving slowly, with assistance from various international agencies. In addition, contemporary communities and individuals are starting to engage with archaeological heritage objects, artefacts, information or knowledge outside the realm of professional archaeology (Lauzikas et al. [2018]). They are making an especially significant contribution to the digitisation effort.

1.2. Going digital

It is acknowledged here that archaeology in BIH has to adapt to the evolving socio-technical, organisational, legal, economic, and ethical frameworks for collecting, archiving, displaying, and retrieving cultural materials. In doing so, it can greatly benefit from others' experiences and lessons learnt so far.

According to Kersel ([2016]), the discipline of archaeology presently lives in a 'semi-digital kinda life', partly paper-based, and partly paperless. However, it is predicted that it will move forward in a fuller digital mode in future projects. Speaking about the potential of digital archaeology in general, contributions to the Averett *et al.* ([2016]) volume articulate many different ways in which archaeologists can embrace the digital. Some authors argue that data are now democratised, easily shareable and

understandable. Others contend that real-time digital data allow for early detection of mistakes. Some illustrate that digital methods improve both the efficiency and effectiveness of data recovery. These contributors also demonstrate the global and temporal applicability of varied technologies to archaeological work. Jointly, they show that the move to the digital results in greater accuracy, consistency, and efficiency in the field.

However, the question remains if the increase in productivity and capabilities really does improve our ability to interpret archaeological records, and do better archaeology. In response to these questions, Rabinovitz ([2016]) offers three complementary perspectives from which we can view the current state of digital archaeology and plan for its future: celebratory, reflective, and cautionary. The celebratory manifesto emphasises the ever-developing role of technology to the point of removing the human element altogether. The reflective manifesto distinguishes between data collection and interpretation. It recognises that machines can collect data, but archaeologists must create stories to explain the history. It asks us to think more critically about the interaction between our tools, our practices, and the knowledge that we seek to create. Finally, the cautionary manifesto encourages us to keep in mind the socioeconomic factors that condition our use of digital tools as they create inequality and dependency relationships. In summary, they point to the need to mobilise for a 'Critical' Digital Archaeology that will not only seek to save time, but should also theorise our tool use, and make us think carefully about the human dimension of digital data management and underline the need for political and ethical sensibility.

Recognising and embracing the above ideas and needs, the main objective of this study is to address these issues in the context of BIH. In particular, the following section will review a range of archaeological projects in order to illustrate and assess the current state of digital archaeology in BIH. We will present major players, digital objects and data of interest, processes and technologies used, and their purpose. We will also point to the obstacles and difficulties hindering these projects' goals and activities.

2. Current State

2.1. Institutions

BIH used to be an important centre of archaeology in former Yugoslavia. Unfortunately, history and archaeology are currently largely neglected and marginalised by all levels of BIH government. This reflects negatively on the ability of public institutions, such as museums, archives and galleries, to carry out their daily activities. It also hinders their greater involvement in digital archaeology projects.

Even the oldest and most important public memory institution, the [Zemaljski Museum of BIH], experiences serious financial problems and has to rely on international funding agencies for support. Established back in 1888, this museum has an archaeology department with collections covering all aspects of human life in Bosnia and Herzegovina (habitation, everyday life, economy, art, spirituality, religion, etc.),

from the early Stone Age to the late Middle Ages. These artefacts were mostly gathered in the field, while a small percentage were purchased or received as gifts. The museum's digitisation campaign started in 2019 with the assistance of the Global Digital Heritage (GDH) organisation. So far, the results include 3D models and descriptions of 87 selected archaeological artefacts from prehistory, classical antiquity and the Middle Ages. They can be freely accessed at https://www.zemaljskimuzej.ba/en/archaeology.

Another important museum that started selective digitisation of its collections is the History Museum of BIH. Founded in 1945 as the Museum of Revolution, it changed its name in 1993. It also changed its thematic structure from the earlier narrow focus on anti-fascism during WWII to a more comprehensive history of BIH, from the Middle Ages to present times. However, there is an attempt to preserve the memory of former Yugoslavia through an ongoing project of creating a digital archive of the museum's collection of over 80,000 photographs (Krizanovic 2019). Scanning equipment has been used for this project, with a network of volunteers who are helping with the task. The digital processing of other material from the museum is progressing slowly and with difficulty, owing to the lack of financial support.

One notable local (town) museum with an ongoing digitisation project is the Museum of Sarajevo. It was established in 1949, with the mission to collect, preserve, analyse and present the social, economic and cultural history of Sarajevo. Today, its archaeological collection has about 1300 artefacts, which can approximately reconstruct the past of the city from the Neolithic period to Ottoman times. Its current digitisation efforts are focused primarily on creating a virtual museum. At present, it includes 3D models of selected objects, as well as 4D presentations (where applicable) of historical development of the city's cultural heritage through digital stories, combined with interactive 3D models from various time periods. In general, virtual museums are considered excellent platforms for the dissemination of cultural heritage, especially in countries with few resources, such as BIH (Lopez-Menchero Bendicho and Rizvic 2014).

In addition to the institutions mentioned above, sometimes local governments participate in projects involving creation and adoption of digital applications that promote archeo-tourism. One such recent example is the use of the ArcheoTales application to guide visitors to archaeological sites in the area of Centar Municipality (Acta 2022).

In the Republic of Srpska, the situation varies, owing to the different political structure. The Government has one Ministry of Education and Culture responsible for all the museums and archaeological sites. The Public Institution Museum of the Republic of Srpska (MoRS) is the central museum institution for the protection of movable cultural property of the Republic of Srpska and it has the longest tradition in this entity of BIH of any such cultural institution, recognisable both here and in the region. During 2017, MoRS started its cooperation with the Faculty of Philosophy and Faculty of Electrical Engineering of the University of Banja Luka in the process of digitisation of the cultural heritage in the form of the VI-SEEM project, in the areas of 3D scanning, photogrammetry, structure from motion, as well as data and metadata management, in order to facilitate interdisciplinary regional cooperation in the field of biosciences, climatology and digital cultural heritage. The processes of

digitisation and data and metadata management were parts of the overall process, with the overall goal being the efficient use of available resources for digitisation and presentation of digitised cultural heritage. As ETFBL was involved in the area of digital cultural heritage, they closely cooperated with personnel from MoRS and the Faculty of Philosophy of the University of Banja Luka in the process of digitisation and management of cultural heritage, metadata and workflow aspects. Cooperation between MoRS and ETFBL also extends to ARKWORK and SEADDA COST projects, which connect archaeology and digital tools. The two main aims of the cooperation were to utilise limited available resources to enable an efficient digitisation and management process, and to design and implement a system suitable for the presentation and visualisation of digitised cultural heritage. As part of the collaboration, the 3D scanning of more than 100 objects, some of which are available online, was carried out, and several lectures were held about digitisation for employees in cultural heritage sectors, as well as NGOs and freelancers involved in these sectors. MoRS was the first museum in Bosnia and Herzegovina to incorporate 3D scans of museum material into the system of museum documentation (Zagorac and Pandzic 2016).

The team at the ETFBL within the VI-SEEM project developed an application named CHERE (Cultural HEritage REpository) that enables end-users to create and manipulate 3D representations of real world objects. CHERE consists of three modules:

- 3D reconstruction – generating 3D models from a series of photographs of the real world object. This module utilises a structure-from-motion approach and is based on Vlfeat SIFT, VisualSFM, PMVS/CMVS, Screened Poisson Surface Reconstruction and MVS-Texturing codes. The module can also be used as either a Docker container for local usage, or as a web-based application, with reconstruction happening on the server.
- 3D editing and conversion – users of the web-application can edit and convert 3D objects from within the browser. This module uses Meshlab and meshlab.js applications.
- A measurement module – users can define measurement sets and then perform an arbitrary number of measurements on selected 3D objects, also from the web browser (Pandzic *et al.* 2018).

MoRS also became a part of the new project of digitisation in cooperation with the Republic of Serbia, with the primary objective of creating a unified platform for data and metadata management. In 2017, the MoRS and the Museum of Vojvodina Novi Sad signed the Protocol on Cooperation in the Field of Digitisation of Cultural Heritage, which is an integral part of the Memorandum on Cooperation between the Ministry of Education and Culture of the Republic of Srpska and the Ministry of Culture and Information of the Republic of Serbia for the period of 2017-2021. Based on the signed Protocol, the signatory parties began preparatory activities for the digitisation of cultural heritage and processes in the service of its protection, visibility, data exchange, collection enhancement and availability, for which they planned to use the IMUS information system. This cooperation was based on the installation of the technical and information infrastructure necessary for the operation of the IMUS program (LENOVO TS 150 server) with accompanying information systems (ZENTYAL and others) and connection to the existing network infrastructure of the MoRS with training and a joint workshop on the IMUS program.

In 2019, the plan was to start installing the system in other museums in the Republic of Srpska, and the role of the MoRS's Center for Documentation and Digitisation was to coordinate between the Ministry of Culture and Information of the Republic of Serbia and the museums in the Republic of Srpska, where it was planned to install the necessary hardware and software equipment and launch the IMUS program. Five museums were visited during 2020, with four museums in the Republic of Srpska (Museum of Herzegovina Trebinje, Museum of Semberije Bijeljina, Regional Museum in Doboj, Museum of Kozare in Prijedor) and one in the Federation of BIH (the Museum of the Old Orthodox Church in Sarajevo). Due to the coronavirus pandemic, the dynamics of project implementation have slowed down. The results of the project are visible online on the portal for searching the cultural heritage of Serbia and at the website https://kultura.rs/ where the objects belonging to the MoRS can be viewed together with objects from the Museum in Serbia. Within the IMUS information system in the MoRS, a database of several thousand entries has been created so far on objects, records of exhibition activities, conservation works, educational and teaching activities and other events held in the Museum of the Republic of Srpska.

2.2. Communities

Although there are several professional archaeological associations operating in BIH, it appears that non-professional and non-profit communities are key players in digital archaeology projects. They gather experts coming from different fields including computer graphics, informatics, culture, cultural management, cultural tourism, and marketing, all of them having a common interest in the field of digitisation and visualisation of cultural heritage. Typically, these communities rely on financial support from international funding agencies and voluntary participation of their members.

The most productive among them is the Association for Digitisation and Information of Cultural Heritage (DIGI.BA). This association provides valuable services in digital heritage production, consulting and education for various institutions. Over the past 10 years, the association has completed over 50 projects involving virtual reconstruction of cultural heritage and its multimedia presentation. These are freely accessible at the association's website and further promoted in a documentary film available on YouTube. In 2019, DIGI.BA received a valuable donation from GDH, comprising a set of equipment and software for photogrammetry that will significantly enhance the scientific research capacity of its members and enable computer science and archaeology students to use state-of-the-art technology in cultural heritage digitisation.

The association DIGI.BA works closely with two university-based groups: Sarajevo Graphics Group (SGG) at the University of Sarajevo and Digital Media Center (DMC) at Sarajevo School of Science and Technology. SGG specialises in the use of 3D technologies for cultural heritage presentation, while DMC is equipped with high-quality equipment that enables all kinds of media productions. In 2018, SGG established the SARAJEVO CHARTER, a free online knowledge exchange platform that aims to gather, exchange and disseminate experiences in creating interactive digital stories. A team of multidisciplinary experts from computer science, visual arts,

literature, film directing, psychology, communications and human-computer interaction works on further development and evaluation of novel interactive digital storytelling methods.

The foundation [Cultural Heritage without Borders](#) (CHWB) is another highly active community focused on promoting cultural heritage as both a right and a resource. In general, it works with cultural heritage as a force in reconciliation and peace building. Towards this end, it started a project where local heritage sites were used to contribute to the shared understanding of heritage in the divided city of Stolac. With new technologies, an innovative digital model was built that highlights the region's heritage resources in a qualitative, innovative and interactive way. The effects of CHWB's digital contribution to the visibility of the rich cultural heritage were reached through a smartphone application and a touchscreen platform installed in the high school.

Some communities, such as Foundation '[Mak Dizdar](#)' have chosen a narrower focus on a specific heritage, namely Stećci. These monumental tombstones represent some of the most important [UNESCO-listed Bosnian heritage](#). Despite this, digital records of these monuments are still sparse and incomplete. In 2019, the foundation started an ongoing project aimed at digital cataloguing and promotion of Stećci. As part of this project, an interactive map was developed showing the spatial distribution of [Stećci](#) in BIH. Other project results include a publication, documentary film, webpage and a 3D virtual exhibition of the most beautiful monuments. The project was financially supported by USAID and carried out by teams of volunteers.

Prior to the beginning of the above-mentioned project, a very important initiative proposing a systematic approach to creating digital records of Stećci was offered by a team of archaeologists from the University of Sarajevo. Their approach was successfully tested in several municipalities (Bujak *et al.* [2016](#)) and can serve as a reference for all other municipalities until all of the estimated 3,000+ necropolises with over 70,000 tombstones are digitally recorded, stored and preserved for future reuse.

In the Republic of Srpska, there are also several non-profit communities dealing with digitisation of cultural heritage. One of the most active is the Association of Archaeologists of the Republic of Srpska which, in cooperation with MoRS and the University of Banja Luka, and with the help of professionals in the field of computer science, gaming and the internet has started the project of 'Digitisation of movable cultural heritage' by undertaking the promotion of cultural heritage, presenting it as NFTs (non-fungible tokens).

Another very successful project of digitisation was done by the administration of the City of Banja Luka, about the Jewish cultural heritage within the framework of the Rediscover Interreg project, which rediscovers, exposes and exploits the hidden Jewish heritage of the Danube Region. Through this project, five videos were published about the history and culture of the Jewish community in Banja Luka, as well as a mobile app with information about where Jewish cultural heritage used to be and how it used to look. See www.get360tour.com and https://www.interreg-danube.eu/approved-projects/rediscover.

There are also several NGOs applying for regional funds that relate specifically to cultural material digitisation, such as the NGO 'Culture for Promotion of Kastel fortress as a cultural heritage', NGO 'Fluks Lab' with project 'Grifon: Digitisation of cultural heritage', but we still do not have the results of their work. We found information about their activities only through the results of public competitions in the field of protection and promotion of cultural heritage in the Republic of Srpska for the last few years.

2.3. Individuals

Besides institutions and communities, there are many individual practitioners, researchers and students from BIH who are actively involved in projects and studies pertaining to visual approaches to digital archaeology. For most of these, medieval Bosnia provides a rich source of inspiration.

Ivan Ramadan (architect) retold a well-loved legend of a dragon from Umoljani village in his animated film 'Azdaja'. Together with Amar Zubcevic (computer scientist) he designed an interactive game 'The Enchanted World' that allows players to experience the atmosphere of medieval Bosnia. Furthermore, Mila Melank (artist) created several usable fonts of Bosancica, a medieval Bosnian alphabet. Finally, Emir Isovic (illustrator) used infographics to present many important monuments including the famous bridge in Mostar, another UNESCO-listed Bosnian heritage site.

A different approach, focusing on Stećci metadata capture, analysis and visualisation was introduced by Meliha Handzic (information scientist). The purpose was to create relevant metadata in a spreadsheet file (MS Excel) and perform data mining using freely available and user-friendly software (Palladio and Gephi) in order to discover novel and interesting patterns from those data. The majority of this work was done as part of the COST actions ARKWORK and SEADDA. It was intended primarily for the research community and was shared with other scholars on the ResearchGate platform. Overall, all the above-mentioned projects showcase innovative use of visual techniques and tools in a variety of digital archaeology contexts.

3. Future Challenges

Overall, the presented cases reveal limited scope and a fragmented current state of digital archaeology in BIH. The review also identifies many different players, strategies and practices involved. The main stakeholders include public memory institutions like museums, as well as diverse professional and non-professional groups and individuals. They use different digital technologies to collect and analyse data, interpret and narrate them in the quest for a better understanding of the past. They all participate in a socially inclusive way to remember and celebrate our cultural heritage through digital archives, exhibitions and storytelling practices.

In such a situation, the traditional authoritative role of public institutions and a single disciplinary focus may not be the best way to move the field of digital archaeology in BIH forward. Instead, we advocate the adoption of an alternative 'participative

perspective' as a better suited approach for addressing the existing diversity and complexity in the field. Some researchers (Lauzikas et al. 2018) have already started to examine the value of participation of various stakeholders outside the realm of professional, academically based archaeology in the processes of heritage and memory production. However, the general understanding of the participatory perspective in digital archaeology remains sparse and partial (Koch 2022).

Most recently, there have been some notable attempts to take a more holistic approach to managing archaeological knowledge in a digital environment (e. g. ARKWORK, SEADDA). Bringing together what is currently scattered research, Handzic (2023) offered a consolidated conceptual theoretical framework for future research and practice in digital archaeology. Previously, such a framework was useful as a theoretical basis for designing a virtual research environment for the Digital Republic of Letters (Handzic and Heuvel 2019). This is based on the author's earlier work (Handzic 2004) that unifies knowledge stock, process and combines technology aspects into a comprehensive knowledge management (KM) model. This generic KM model proposes that technology should provide support for knowledge exploitation of what is known and exploration of unknown domains. Technology should also support knowledge codification strategy, focused on explicit knowledge encoded in digital objects, and personalisation strategy orientated towards people and tacit knowledge held in their heads. It is argued here that a combination of all four approaches to managing archaeological knowledge in a digital environment is necessary in order to realise the full power of that knowledge.

Embracing the above general principles and experience from prior work on designing virtual knowledge environments, this article suggests that an ideal digital archaeology space should incorporate the following features: the ability to capture, organise and access content (e.g. visuals, text, metadata) in structured and unstructured knowledge repositories (e.g. databases, LOD, cloud); tools for discovery and presentation of knowledge from data (e.g. data mining, topic modelling, graphs), mechanisms for communication and knowledge sharing among people (e.g. email, chat, social networks); and support for creativity and generation of new ideas (e.g. games, simulations, brainstorming). Such conceptual space may serve as a reference for implementing various digital archaeology projects in BIH and beyond. It can also serve as an incentive for further improvements and future empirical research on adoption and usage.

In summary, the future looks promising for digital archaeology in BIH, but there is still work to be done. According to Kersel (2016), the current semi-digital circumstances allow us time to improve, expand and include missing elements into digital archaeology. The experience gained so far suggests that the right digital space for managing archaeological knowledge needs to be dynamic (enable future additions to repositories), reliable (able to be trusted as accurate and consistent), flexible (support different professional and non-professional user needs), interactive (allow two-way communication), and easy to use (by users who are not technologically savvy).

Beyond the BIH case, knowledge production and its use in sub-disciplines and professional areas is vital for overcoming the current widely acknowledged problems of integrating and linking heterogeneous and difficult to access local, national,

regional and discipline-specific datasets and collections of physical artefacts, literature and other types of digital and non-digital information for the benefit of all stakeholders within and beyond archaeology.

An integrated understanding of how archaeological knowledge is produced and used in different countries and contexts is key to developing effective trans-national and trans-disciplinary (different branches of archaeology and material culture studies) access to archaeological collections en masse and to opening European archaeological knowledge for international and interdisciplinary research based on archaeological data and collections, use of the existing assets in heritage contexts and education, and functional integration of archaeological information as a part of societal information infrastructures vital in addressing contemporary and future societal challenges. The need is especially acute now, when archaeological heritage is facing conflict and decay and is at stake in cultural resource and land management, the shaping and negotiation between national, infra- and trans-national cultural identities, public interpretation, formal and informal learning, tourism and leisure.

Bibliography

Acta 2022 *Arheologija 11 zemalja ostaje u nasljeđe kroz digitalna rješenja*. https://www.akta.ba/vijesti/bih/147198/arheologija-11-zemalja-ostaje-u-nasljede-kroz-digitalna-rjesenja

Averett, E.W., Gordon, J.M. and Counts, D.B. 2016 *Mobilizing the Past for a Digital Future: The Potential of Digital Archaeology*, University of North Dakota, Grand Forks: The Digital Press. https://doi.org/10.31356/dpb008

Bujak, E., Aladuz, V., Jasika, D. and Dzemidzic, A. 2016 *Stechaks of Hadzici - Inventory of stechaks in the municipality of Hadzici*, Hadzici: Municipality of Hadzici & Stanak (Society for Medieval Bosnian History).

Council of Europe 1996 *War damage to the cultural heritage in Croatia and Bosnia-Herzegovina*, Ninth information report http://assembly.coe.int/Main.asp?link=/Documents/WorkingDocs/Doc96/EDOC7464.htm

Council of Europe 1997 *War damage to the cultural heritage in Croatia and Bosnia-Herzegovina*, Tenth information report http://assembly.coe.int/main.asp?Link=/documents/workingdocs/doc97/edoc7740.htm

Handzic, M. and Heuvel, C. 2019 'Virtual research environments for the digital republic of letters' in H. Hotson and T. Wallnig (eds) *Reassembling the Republic of Letters in the Digital Age: Standards, Systems, Scholarship*, Germany: Gottingen University Press, 433-45. https://doi.org/10.17875/gup2019-1146

Handzic, M. 2004 *Knowledge Management: Through the Technology Glass*, Series on Innovation and Knowledge Management, Singapore: World Scientific Publishing. https://doi.org/10.1142/5639

Handzic, M. 2023 'Managing archaeological knowledge: a researcher's perspective', Paper presented at CAA 2023, Amsterdam, 3-6 April.

Kersel, M.M. 2016 'Response: living a semi-digital kinda life' in E.W. Averett, J.M. Gordon and D.B. Counts (eds) *Mobilizing the Past for a Digital Future: The Potential of Digital Archaeology*, University of North Dakota, Grand Forks: The Digital Press. 475-492. https://doi.org/10.31356/dpb008

Koch, G. 2022 *Participatory Memory Practices*. https://www.poem-horizon.eu/.

Krizanovic, T. 2019 'Digitisation of the photo collection of the History Museum of BIH', *Proceedings of the Special Session on Visual Approaches for Digital Humanities*, Sarajevo, Bosnia and Herzegovina: Eurographics Workshop on Graphics and Cultural Heritage (GCH 2019), 8 November, 23.

Lauzikas, R., Dallas, C., Thomas, S., Kelpslene, I., Huvila, I., Luengo, P., Nobre, H., Toumpouri, M. and Vaitkevicius, V. 2018 'Archaeological knowledge production and global communities: boundaries and structure of the field', *Open Archaeology* **4**, 350-64. https://doi.org/10.1515/opar-2018-0022

Lopez-Menchero Bendicho, V.M. and Rizvic, S. 2014 'The virtual museum of Stecci', *Virtual Archaeology Review* **5**(11), 109–12. https://doi.org/10.4995/var.2014.4188

Lozic, V. 2011 'National Museums in Bosnia-Herzegovina and Slovenia: a story of making 'Us'' in P. Aronsson and G. Elgenius (eds) *Building National Museums in Europe 1750-2010*, Conference proceedings from EuNaMus, European National Museums: Identity Politics, the Uses of the Past and the European Citizen, Bologna 28-30 April 2011. EuNaMus Report No. 1, Linköping University Electronic Press. http://www.ep.liu.se/ecp_home/index.en.aspx?issue=064

Novakovic, P. 2021 *The History of Archaeology in the Western Balkans*. Ljubljana: Ljubljana University Press, Faculty of Arts University of Ljubljana, Faculty of Philosophy University of Belgrade, Faculty of Humanities and Social Sciences University of Rijeka, Faculty of Humanities and Social Sciences University of Split.

Pandzic, I., Savic, M. and Zagorac, N. 2018 '3D scanning system as a part of museum documentation - digitalisation of the cultural heritage in the Museum of the Republic of Srpska (case study on the archaeological material)', Paper presented at the Third VHN Ireland Conference, 11-13 April 2018, Hosted by the School of Information & Communication Studies, UCD, held at Royal Irish Academy, Dublin.

Rabinowitz, A. 2016 'Response: mobilizing (ourselves) for a critical digital archaeology' in E.W. Averett, J.M. Gordon and D.B. Counts (eds) *Mobilizing the Past for a Digital Future: The Potential of Digital Archaeology*, University of North Dakota, Grand Forks: The Digital Press. 493-520. https://doi.org/10.31356/dpb008

Radojcic, M. and Vracar, J. 2012 *Guide to Museums and Galleries in the Republic of Srpska*, Banja Luka: Muzej Republike Srpske.

Zagorac, N. and Pandzic, I. 2016 '3D Scanning as a part of the system of Museum Documentation - the process of digitisation of cultural heritage in the Museum of the Republic of Srpska', Book of Abstracts, Third Regional Scientific Conference ICOM SEE, *Revitalisation of Cultural and Natural Heritage in the Region Of South Eastern Europe*, Belgrade: Alfa BK University, 8-10 December. 103-5.