Digitisation and Data Management of Archaeological Heritage in Serbia (1991-2020)
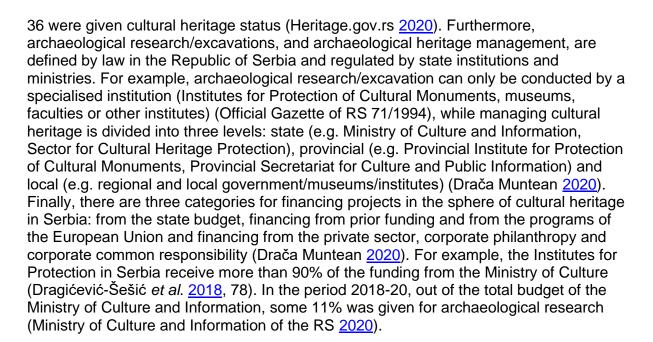
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Summary

In the Republic of Serbia, digitisation of cultural heritage was recognised as a segment of cultural development, while the digitisation process is understood as part of a complex system of managing cultural heritage in institutions of protection, such as museums, institutes for the protection of cultural heritage etc. By focusing on the issue of electronic/digital archaeological heritage management in Serbia's institutes for protection, this article briefly describes the national framework of archaeology in the country and presents some crucial moments in the journey towards digitisation and electronic management of archaeological heritage in Serbia since the 1990s. It also discusses recent efforts by the Ministry of Culture and Information in terms of regulating the procedure of cultural heritage digitisation and establishing a common information system. Finally, it identifies current challenges in archaeological data management in cultural heritage institutions and briefly discusses possible future scenarios.
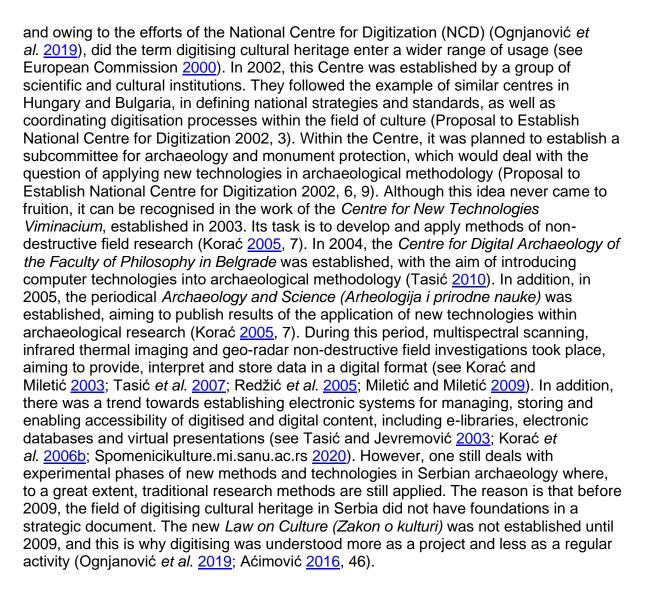
1. Digitisation and Data Management

Within Serbian archaeology, the concept of cultural heritage includes physical heritage (for example archaeological sites and archaeological finds), archaeological excavations/research and their results (for example archaeological field documentation), as well as managing cultural heritage (for example restoration and protection) (Official Gazette of RS 71/1994; Official Gazette of RS 42/2009). Archaeological heritage including archaeological sites can be classified as cultural goods, which is determined by the Government of the Republic of Serbia or the Institute for the protection of cultural heritage in charge (Official Gazette of RS 71/1994). One should bear in mind that in the Republic of Serbia, declaring something as cultural heritage is often a time-consuming process. This is why from 1948 to the present day, out of 194 archaeological sites, only

36 were given cultural heritage status (Heritage.gov.rs 2020). Furthermore, archaeological research/excavations, and archaeological heritage management, are defined by law in the Republic of Serbia and regulated by state institutions and ministries. For example, archaeological research/excavation can only be conducted by a specialised institution (Institutes for Protection of Cultural Monuments, museums, faculties or other institutes) (Official Gazette of RS 71/1994), while managing cultural heritage is divided into three levels: state (e.g. Ministry of Culture and Information, Sector for Cultural Heritage Protection), provincial (e.g. Provincial Institute for Protection of Cultural Monuments, Provincial Secretariat for Culture and Public Information) and local (e.g. regional and local government/museums/institutes) (Drača Muntean 2020). Finally, there are three categories for financing projects in the sphere of cultural heritage in Serbia: from the state budget, financing from prior funding and from the programs of the European Union and financing from the private sector, corporate philanthropy and corporate common responsibility (Drača Muntean 2020). For example, the Institutes for Protection in Serbia receive more than 90% of the funding from the Ministry of Culture (Dragićević-Šešić *et al.* 2018, 78). In the period 2018-20, out of the total budget of the Ministry of Culture and Information, some 11% was given for archaeological research (Ministry of Culture and Information of the RS 2020).

The following focuses on managing archaeological heritage in the electronic/digital environment. Although Serbia did not establish a regulation until 2020 for documentation of archaeological heritage to be kept electronically within a unique information system (Official Gazette of RS 67/2020), instead of physical forms in the shape of cards or sheets (Official Gazette of RS 102/2006), the idea of electronic management of cultural heritage is several decades old. In 1991, after accepting the *Strategy systems of scientific and technological information in Serbia* (SNTIS), the Institutes for Protection slowly started to connect with centralised communication computer networks. In cooperation with software companies and scientific institutions in the country, they developed their own information systems and databases (Lazarević *et al.* 1996, I; Trtovac 2017). Within Serbian archaeology, initial suggestions about information systems dedicated to cultural heritage were made, such as the Information System for Archaeology (ISA) (1989) (Korać 1990), Proposal for application AGORA BBS (1991) (Korać 1991), Archaeological database model proposal (1994) (Korać 1994), Information System of Cultural Monuments (SINS) (1996) (Temerinski 2002), Museum Information System of Serbia (MISS) (1996) (Gavrilović 2015), and Proposal for application of SUPERBASE for Archaeologists (Korać 1999). However, due to the lack of funding for the equipment, coordinating mechanisms and the lack of experts, as well as the fast development of technology, the suggested solutions were either not accepted or did not last very long.

The earliest attempts at digitising Serbian archaeological heritage took place in the mid-1990s. The PANDORA project (1995-96) is regarded as the first project digitising cultural heritage in Serbia (Mijajlović 2002, 12). Its goal was to create a prototype of an expert system for dating archaeological material according to digitised archaeological knowledge. It was inspired by similar systems within the field of medicine (MYCIN expert system) (Korać *et al.* 2006a, 119). It should be mentioned that during this period, the term 'digitisation' was not used, nor did project participants declare themselves as experts in digitisation (Mijajlović 2002, 25). They were archaeologists, museologists, archivists, librarians, IT specialists and mathematicians, and with their common efforts, they tested the possibilities of interdisciplinary cooperation in creating an infrastructure for storing and presenting cultural heritage in electronic form (Ognjanović *et al.* 2019). Only at the beginning of the 21st century, under the influence of the European Union
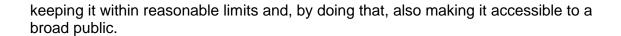
and owing to the efforts of the National Centre for Digitization (NCD) (Ognjanović *et al*. 2019), did the term digitising cultural heritage enter a wider range of usage (see European Commission 2000). In 2002, this Centre was established by a group of scientific and cultural institutions. They followed the example of similar centres in Hungary and Bulgaria, in defining national strategies and standards, as well as coordinating digitisation processes within the field of culture (Proposal to Establish National Centre for Digitization 2002, 3). Within the Centre, it was planned to establish a subcommittee for archaeology and monument protection, which would deal with the question of applying new technologies in archaeological methodology (Proposal to Establish National Centre for Digitization 2002, 6, 9). Although this idea never came to fruition, it can be recognised in the work of the *Centre for New Technologies Viminacium*, established in 2003. Its task is to develop and apply methods of non-destructive field research (Korać 2005, 7). In 2004, the *Centre for Digital Archaeology of the Faculty of Philosophy in Belgrade* was established, with the aim of introducing computer technologies into archaeological methodology (Tasić 2010). In addition, in 2005, the periodical *Archaeology and Science (Arheologija i prirodne nauke)* was established, aiming to publish results of the application of new technologies within archaeological research (Korać 2005, 7). During this period, multispectral scanning, infrared thermal imaging and geo-radar non-destructive field investigations took place, aiming to provide, interpret and store data in a digital format (see Korać and Miletić 2003; Tasić *et al*. 2007; Redžić *et al*. 2005; Miletić and Miletić 2009). In addition, there was a trend towards establishing electronic systems for managing, storing and enabling accessibility of digitised and digital content, including e-libraries, electronic databases and virtual presentations (see Tasić and Jevremović 2003; Korać *et al*. 2006b; Spomenicikulture.mi.sanu.ac.rs 2020). However, one still deals with experimental phases of new methods and technologies in Serbian archaeology where, to a great extent, traditional research methods are still applied. The reason is that before 2009, the field of digitising cultural heritage in Serbia did not have foundations in a strategic document. The new *Law on Culture (Zakon o kulturi)* was not established until 2009, and this is why digitising was understood more as a project and less as a regular activity (Ognjanović *et al*. 2019; Aćimović 2016, 46).

The Law on Culture was accepted in 2009 and expanded in 2011. It defined the process of digitisation as a matter of general interest in culture and it opened the way for implementing various software solutions for designing electronic registers, databases and the development of information systems within institutions of protection (Ognjanović *et al*. 2019). It especially influenced the process of digitisation of cultural heritage to be recognised in the future division of funding. As a result, in the period 2013-2017, the Ministry of Culture and Information funded and co-funded several projects of digitisation in the field of archaeology. They were mostly used for purchasing equipment for digitisation, digitisation of archaeological collections and documentation, 3D laser scanning and designing information systems such as those for archaeological field documentation (see Ministry of Culture and Information of the RS 2013-2017). However, the problem remained that there was still no clear national strategy or transparent evidence of how many funded digitisation projects were actually conducted. This is why the Ministry of Culture and Information presents several strategic initiatives and documents, wishing to determine the future development of digital transformation processes in the field of culture. Furthermore, it established the Sector for digitising cultural heritage and contemporary art as a mechanism for coordination and organisation of this process (Ministry of Culture and Information of the RS 2019). The core of the entire initiative of the Ministry of Culture and Information is to introduce order, technology and the best of experts into a 'rather chaotically initiated digitization process'

(Vukosavljević cited in Blic 2017), but also to get 'clear instructions' how to 'preserve cultural heritage in a digitized form and how to make it accessible at a click of a mouse' (Vukosavljević cited in Novosti 2018).

The issuing of *Precise regulation conditions for digitizing cultural heritage* in 2018 is also of interest. It was the first Serbian law in which the process of digitising in the field of culture was regulated. It obliges all institutions of protection to establish a plan and a program of digitising within their annual reports and establish an information system determined by them (Official Gazette of RS 76/2018). In other words, it also obliges institutions responsible for managing archaeological heritage to implement information systems defined by law and to forward all the data entered into such a system not only to state data centres for permanent management and preservation (Official Gazette of RS 27/2018; Vulikić 2018), but also to the national aggregator/search engine for cultural heritage, in order to make them publicly accessible (see kultura.rs 2020). Practically, this means overcoming several challenges, among others accepting the proposed system, educating staff and transferring data from previous systems without information loss. Furthermore, it means finding solutions for making data open and publicly accessible, while still protecting them and respecting privacy in accordance with the *Law on personal data security* (Official Gazette of RS 87/2018). Finally, although the ultimate goal is to switch to a unique information system, no unique solution for archaeological heritage was offered. For example, by following the *Regulation* mentioned earlier, institutes for the protection of cultural monuments are obliged to implement the system with locally developed standards for describing archaeological artefacts coordinated by the Republic's Institute for Protection of Cultural Monuments (Lajbenšperger 2019), while museums use the system based on the Museum Documentation Association/Spectrum standard, coordinated by the Historical Museum of Serbia (Vulikić 2018). The whole issue is further complicated by the method of keeping archaeological field documentation, indicating that it should be kept electronically within a unique information system for keeping common archaeological documentation (Official Gazette of RS 67/2020), supplied by the Ministry of Culture and Information in order to 'unify data and accessible information of Institutions for Protection and other state institutions' (Official Gazette of RS 76/2018). It is therefore suspected that in the future, archaeological heritage will be described within at least two different standards, kept within two different systems and most likely having duplicate contents. Nonetheless, this government initiative should be described as positive, since it deals with the question of accessibility. The majority of Serbian institutions rarely share their digitised and digital data owing to the fear of misuse, and access is allowed only to authorised people and a narrow circle of experts.

In the future, this question needs to be clarified and very precisely defined, enabling the public and experts to get insight into the digital database but still preventing misuse. On the other hand, in many cultural heritage institutions of national importance, a tendency was observed of 'over-digitising' their data. For example, dozens of photographs are made of a single artefact, although it does not possess any extraordinary value. 3D images of various objects are designed, although again, many of the objects are simply duplicates. A step forward will surely be made with many of the international projects currently taking place and with several of our experts taking part in those projects. One of them is the SEADDA COST Action. This deals with European archaeology as a target to be digitised, but it keeps focus on the questions of how, why and when something needs to be digitised. The authors hope that in the future, possibly by 2023, at the end of SEADDA, a clear picture will emerge, supporting digitisation of cultural heritage, but

keeping it within reasonable limits and, by doing that, also making it accessible to a broad public.

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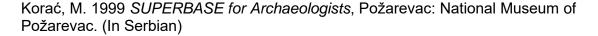
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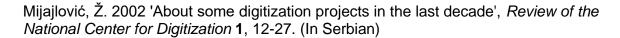
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