PHD IN PROCESS:
DIALOGUE BETWEEN HERITAGE AND TECHNOLOGY
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G E N E R A L _ I N F O R M A T I O N

C O N T E N T S

Guest Editor: **Ana Nikezić**

DIALOGUE BETWEEN
HERITAGE AND TECHNOLOGY

The concept of this particular issue of SAJ is double-folded. On the one hand, it is a part of the edition within SAJ dedicated to the research of doctoral students. It represents a specific form of research in process and examines parts or aspects of doctoral research done in collaboration with mentors.

On the other hand, in the capacity of the vice dean for research and science, as my work is closely related to all aspects of doctoral studies, the topic "Dialogue between heritage and technology" emerged as the one that came out on the surface in PhD applicant's letter of intention, but also as a topic of great interests for teachers and mentors visible through offered elective courses, seminars and laboratories.

The question of technology and heritage is particularly interesting for the research in architecture and urbanism in the third cycle of education as it crosses different disciplinary fields, such as science and art.

Conducted researches vary from those focusing on the phenomena of heritage perception in the era of digital turn to those intended to deal with heritage in developing improved interpretation models and methodologies.

It is interesting that researches vary from historical interpretation to correlation studies and research by design. The topic of collective memory is elaborated through the relation between the digital realm and intangible memory in the words of Nina Bačun. The issue of reinterpretation, reading, understanding and critical observation of heritage was envisioned in the article written by Milica Bozić, exploring the introduction of hyperobjects; as well as through the article of Francesco Maranelli, focusing on the contemporary interpretation of material culture. The very disciplinarian topic, the use of technology as a new, improved tool in the process of experiencing heritage, was the focus of Milja Mladenović's research elaborated through the position of mixed reality public spaces, as it was the case in Staša Zeković's elaboration of Stimulus-Organism-Response model.

While gazing through articles, one cannot but realise one thing in common to all researches – a need to open new possibilities for interpreting heritage in modern culture and societal circumstances. With the ambition that only young people can strive for, the ideas, topics and experiences discussed in this issue will raise new questions and position this dialogue in the field of architecture and urbanism as a valuable subject of both research and education on one side and profession on the other. Ideally, they will provide a powerful impetus for readers to develop their capacity for learning from heritage in circumstances of a technologically advanced society.

MIXED-REALITY HERITAGE: EDUTAINMENT POTENTIAL IN STUDENTS SQUARE AREA PUBLIC SPACES

ABSTRACT

Contemporary everyday life acknowledges the wide use of new technologies and digital media in many spheres of public life, making it a valuable aspect to be explored when designing contemporary public spaces. Approaching heritage information within public space, the use of new technologies enables interaction not only with the visible spectre of heritage sites but can also unveil the 'invisible' heritage through mixed-reality environments. Overlapped heritage sites within Belgrade's historical centre around the Students Square offer significant aspects for exploring the potential for creating interactive mixed-reality environments. The paper aims to define the variety of spatial aspects and public space qualities required for creating places of contemporary interaction with heritage sites. Considering the previously adopted concept of edutainment (education + entertainment) to communicate heritage information with users through different media, the research addresses new ways of heritage presentation to improve public spaces with densely overlapped heritage. By viewing mixed reality not only as a means of interaction but as a way of presenting multi-layered information, this research adds the requirements for digital infrastructure to the site analysis. By testing the new set of analyses in Students Square, research offers a new understanding of the relationship between stakeholders, users, and spatial characteristics, required for the mixed-reality presentation of cultural heritage.

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1. INTRODUCTION

The heritage paradigm shift opened the door to using heritage as a motive for reviving public spaces and creating interactive environments. By recognising the use of digital media in the interpretation and presentation of cultural heritage and the guidelines for presenting heritage *in-situ*, public spaces have re-emerged as places of storytelling. Understanding the complexity of overlapped heritage and multicultural influences on the morphogenesis of public spaces, thanks to new media, it is now possible to present them simultaneously and thus make open spaces interactive. Adding multivocal historical narratives to the public space character also adds new meanings to spatial structures. It provides a better understanding of the city and its many contexts, thus enabling a new way of education through public spaces.

The paper explores the spatial potentials and requirements for creating mixed-reality public spaces which promote cultural heritage and enable interactive education through communication with the visible and 'invisible' cultural heritage elements of urban areas. The paper is divided into four sections. The first section opens the question of the use of digital media in heritage presentation and researches the topic of heritage virtualisation. The second section presents the concept of *edutainment* as a new requirement of both heritage presentation and interaction with public spaces. The third section summarises the spatial requirements of mixed-reality heritage presentation for edutainment purposes in public spaces and offers new criteria for site analysis. The fourth section examines the requirements and the criteria in Belgrade's historical core – in the area of Students Square.

The results of the paper offer a new understanding of the spatiality of heritage presentation and present a new approach to the conceptualisation and analysis of contemporary public spaces, regarding the components of their planning and design. By enabling communication between heritage elements and contemporary public life, public spaces act as mediums for interaction. While preserving their contemporary characteristics and adding a virtual layer, public spaces rich with multicultural heritage offer an inclusive multivocal presentation of different cultural contexts. To achieve this, the paper examines the stakeholders, spatial elements, and technical requirements in the compact area of Students Square.

2. NEW HERITAGE PARADIGM AND HERITAGE VIRTUALISATION

According to the old heritage paradigm, heritage in public space was con-
served, restored and interpreted mainly through selecting the representative
periods, artefacts and sites and emphasising them throughout public spaces as
singular sites.[1] The 1964 ICOMOS Venice Charter suggested preserving the
artefacts, artwork, monuments, built structures and buildings by conserva-
tion or restoration was used to present evidence of specific pasts, extracted as
the most representative from the variety of layers. In contemporary heritage
studies, the selectiveness of conservation in the old paradigm is considered
flawed, because it preserves only some of the values from the past and does
not communicate with the heterogonous communities of contemporary cities.
The distorted image of the past constructed through the selective politics of
memory raises the question of adapting the interpretation and presentation of
heritage sites to the complexity of the "invisible" heritage.

After the adoption of ICOMOS *Burra* and *Ename* Charters, in addition to
material remnants of the past, the diversity of communities, cultural patterns
and historic urban landscape (HUL) became significant heritage elements to
be preserved and presented. The multivocal heritage presentation requirements
impacted the spatial manifestations of heritage sites. Stepping out from the
selectiveness of representative elements into a simultaneous presentation of all
societies, cultures and spaces of significance through the need for multivocal
presentation raises questions about the spatiality of an adequate presentation.

The density and overlapping of heritage within public spaces of historic cities
are often connected to the same spaces, which were inherited as spaces of
gathering, worship, trade or culture. During the many processes of urban
development, each culture has left traces within these spaces, raising the
density of heritage. The new heritage paradigm distinguishes these spaces
as places of multiculturality and suggests the presentation of the complexity
of meanings and values of the past. In addition, the new paradigm stresses
the need for *in situ* presentation, connecting heritage to specific territories.
This idea is supported by heritage theory, especially in the context of using
museology principles outside of museums. The significance of this approach
in urban design and urban planning is connected to concepts of urban design
that accent the *genius loci* and concepts related to defining spaces by their
identities.

The *in-situ* heritage presentation reactivates different spaces within the urban
tissue. Due to the requirement for presenting heritage in authentic sites,

different layers of the past can re-emerge through buildings, streets, parks and squares and provide inhabitants and visitors with new information and levels of interaction. The character of *in situ* interventions stresses both the visible and the 'invisible' identities of spaces, offering dominant guidelines for architectural shaping. The ability of spaces to change[2] and the processes which have impacted the development of urban tissue are significant *in situ* markers which determine not only the HUL elements within a city but also the diversity of influences which provide new insight into understanding the space.

Due to the constant development and rebuilding of city centres, the requirements for the simultaneous presentation of multivocal heritage expand from material presentation embodied in monuments, plaques or different markers of singular elements of the past and transcode to a variety of media. In the documents of the New Paradigm, the digitalisation of heritage is endorsed as a way of presenting heritage independently from a spatial situation or the level of decay of heritage. In the documents, the concept is mainly associated with the potential for unlimited database gathering and preserving heritage elements from decay in the digital version. Although mostly connected to indoor museums, archives or libraries, the concept can be adjusted to outdoor public spaces to present overlapped heritage in public spaces. The value of digitalised heritage in public spaces can rely on Jeff Malpas's thesis that besides digital preservation and documenting, the use of digital media in public spaces influences the presentation of sites in their entirety, regardless of visibility and material characteristics of artefacts within sites.[3] As well as stressing the potential for presenting all the layers of the site, Malpas points out the potential of digital media to create environments which enable the freedom of movement, as well as the freedom of choice of information within the interaction with heritage.[4]

The process of heritage digitalisation within public spaces enables a new way of interacting with heritage. Especially within spaces with dense and multivocal heritage, the use of digital media offers the interlocking of physical and virtual worlds on several levels. Relying on the thesis by Neil Silberman that the 'past is the most virtual of all the realities'[5], mixed-reality environments offer interaction with heritage in spaces in which both the heritage and the user's presence exist in the virtual realm. Treating heritage as digital information, as suggested by Silvio Zancheti, enables the transition between passive and active communication with heritage – from observation to interaction.[6]

The idea of creating interactive environments[7] within cities has been present in the field of urban studies since the middle of the twentieth century, as anticipation of the potential for urban development in the era of rapid technological

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development. The wide use of photography, film and early computers in everyday life implied new challenges for the planning and design of public spaces. Considering digital media as a 'connective tissue' with a 'profound impact'[8] on contemporary cities, the approach to urban design should include virtual interventions to enhance interaction between spatial information, user and space. The qualities of virtual and mixed reality environments in public space have the ability to create interactive urban environments by containing multiple layers of information and offering users the choice within the database. More precisely, the element of choice and free movement makes interaction through digital media an individual and personalised experience – crucial for creating contemporary user-oriented public spaces.

In the context of heritage, mixed-reality environments offer spatial experience in interactive surroundings, which can be accessed by different forms of websites or applications or within a *gamified* environment. The mixed-reality public spaces enable users to experience their physical surroundings with added (augmented) virtual layers which offer additional information or types of spatial experience. Within these environments lies the potential for creating interactive education spaces within public spaces, making heritage more accessible and interesting for a wider spectre of users.

3. *EDUTAINMENT* AS A CONTEMPORARY REQUIREMENT FOR HERITAGE PRESENTATION

The interactive character of digitalised heritage introduced new ways of communication between heritage elements and sites with users of public spaces. According to international documents, strategies and agendas, the new need for the popularisation of multivocal heritage led to the establishment of new concepts in heritage management. *Edutainment* is one of the new concepts in heritage presentation, which empowers an interactive and immersive experience of heritage sites. The term is coined from education and entertainment and suggests creating informative and educational content that can be experienced informally.

The idea of making heritage more popular is present in a variety of international documents and agendas, such as the UN Agenda 2030 and many UNESCO documents. The guidelines suggest making heritage 'accessible for all', which can be implemented through different strategies within the field of urban planning. The position of informal education and 'lifelong learning' can be tightly connected with heritage, making public spaces the pilot locations for

the implementation of different concepts. The adaptable characteristics of mixed-reality installations in public spaces overcome different disabilities and barriers in language or physical accessibility, making them optimal solutions for a variety of user groups, thus promoting the 'lifelong learning' concept.

The entertaining approach to educational characteristics of heritage sites as 'non-scientific' principles of communication[9] is a valuable guideline for creating attractive public spaces with dense heritage information. Unlike the traditional methods of heritage presentation, which are frequently limited to observing, heritage presentation designed by the *edutainment* principles expands the group of users and offers a unique experience. The design relies on mixed-reality environments by collecting an interactive database with mixed media content (audio-visual files, textual descriptions, trivia, 3D models, etc.), which can be accessed through personal devices. Using phones, computers and tablets to interact with heritage enhances the familiar ways of interacting with information, treating heritage as an interactive complex database. Thanks to the unlimited database, the complexity of heritage can be sorted or in the language of the new media – 'filtered' by type, chronology or topic, enabling a variety of experiences through interaction.

The flexibility of choice, characteristic of digital media offers a new experience each time by choosing different 'filters', which adds to the entertaining potential of the mixed-reality environment. The *edutainment* concept is already present in different virtual environments, such as video games and virtual communities and their characteristics can be combined with museology principles for an adequate heritage presentation in public spaces. By creating an immersive surrounding, users can experience different layers of heritage in first-person, through VR or AR installations or different sets of informative databases, trivia and videos. This approach enables interaction and identification with locations through heritage for younger users, making heritage more approachable.

The examples of heritage *edutainment* environments range from historical re-enactment in museums and heritage sites, through video games with historical topics and environments, to virtual heritage installations in public spaces. The concept of activating public spaces for heritage presentation in the form of an 'open museum' goes beyond museology development and practice and represents a broader context of expression of cultural identities to raise interest in visitors.[10] Both the virtual and the non-virtual concepts can be applied in public spaces for the presentation of cultural heritage. However, due to the characteristics of overlapped heritage within urban tissue, the paper will focus primarily on the use of digital media and mixed-reality environments. The

virtual heritage content[11] designed for interaction and education within public spaces can be perceived as a kind of 'digital urban acupuncture', not only as a part of the reactivation of public spaces but also as a generator of their tourist potential.

Understanding heritage as a potential for revitalisation of urban spaces and the contemporary need for introducing digital media to different aspects of public life suggest designing the interaction with heritage in public spaces through mixed-reality environments. Relying on the qualities of interactive environments defined in the previous section, the paper will further explore the spatial requirements, opportunities, and limitations for implementing mixed-reality environments on heritage sites in public spaces.

3.1 Edutainment and heritage as a public space event

The possibility to experience educational environments in a virtual or semi-virtual realm has evolved at an 'accelerated pace' during COVID-19 and the development of various apps, programs and immersive environments that enable virtual substitutes for the physical world.[12] During this period, both entertainment and education have transitioned into a new format, enabling the combination of experiences, spaces, and interactions, stressing the importance of further research on interactive *edutainment* installations in everyday public life. These kinds of installations, especially in public spaces, are closely related to Richards and Palmer's concept of *eventful cities* and introduce a new reading to it.

Regarding heritage as the event quality of urban spaces, Richards and Palmer[13] emphasise the following benefits of eventful interaction and heritage preservation: 1) flexibility in contrast to the fixed physical structures; 2) differentiation of environments; 3) offering 'spectacle' and an 'atmosphere'; 4) meeting the need of presence within the historical environment (feeling of 'being there'); 5) economic aspect and cost. Specifically in the context of introducing mixed-reality environments to public spaces of heritage sites, the *eventful city* concept and named aspects, identifying mixed-reality environments as events proposes an already familiar planning concept to heritage in public spaces.

Combining the mixed-reality education environments, and thus implementing the 'non-scientific settings of heritage presentation'[14], and connecting them to contemporary concepts of urban planning enables a new approach both to the design and use of public spaces, as well as to the popularisation of heritage among a variety of users. In this context, the requirements of interactive and

mixed-reality environments present urban design and public spaces with new infrastructural and spatial requirements and, as such, offer a new, more approachable reading of spatial information.

4. SPATIAL AND INFRASTRUCTURAL REQUIREMENTS FOR CONTEMPORARY HERITAGE SITES IN PUBLIC SPACES – A SITE ANALYSIS

In addition to the site analysis required for determining physical and functional characteristics of potential locations for implementing the mixed-reality heritage presentation, the digital media and user-oriented concepts have another set of spatial values to be considered when planning contemporary heritage sites within public spaces. As implied in the paper's second section, the places which are adequate for virtual heritage presentation should have overlapping heritage elements in the same locations, making the material and conventional marking of sites inadequate and selective. For further understanding of the issue and concerning multivocal heritage presentation, the site analysis should include historical analysis and the use of the palimpsest method to determine the sites with the higher density of heritage information. Mapping the heritage sites within the contemporary urban tissue provides insight into the potential for an adequate choice of digital media for interaction.

The mixed-reality environments rely on the use of personal devices and/or internet-based media for interacting with the heritage database. Translating these requirements to site analysis means adding the digital infrastructure layer and the internet coverage level in observed areas. Within the concept of accessibility, *edutainment* environments should not depend just on personal mobile data for use in public spaces, so the spaces are expected to be equipped with internet coverage with free access, thus not limiting the user groups and minimising the potential barriers in use. While the optimal solutions would involve the planned public access networks specifically positioned for the mixed-reality heritage sites, the analysis can incorporate all public access networks and consider them a part of the city's digital infrastructure.

Playful characteristics of the *edutainment* concept imply interaction with younger users and introducing them to heritage sites and values from an early age. Bearing in mind the safety requirements of *child-friendly* public spaces, site analysis should include the analysis of pedestrian areas, surfaces, and paths to determine the safest surroundings or potential hazards which should be eliminated to enable safe use for all. In addition to safety, the

edutainment concept can be implemented in spaces already familiar to the target population, thus adding another layer of interaction to already active spaces. From this aspect, a valuable marker of urban settings includes parks and playgrounds, which are already used by the target population. In places requiring revitalisation, the proximity to public buildings, such as schools, can help determine the presence of anticipated user groups without artificially attracting them to sites.

The social infrastructure significant for determining the potential of public spaces to act as pilot locations for implementing mixed-reality heritage sites relies on the proximity and interest of different stakeholders from the fields of culture and education. In this case, relevant stakeholders include museums, universities, schools, kindergartens and different levels of governance, especially on the municipal level, which can contribute to creating pleasant and educational public spaces.

According to the criteria from different aspects required for the implementation of the *edutainment* concept on heritage sites, the site analysis in this research contains several aspects for determining the optimal locations for mixed-reality and child-friendly public spaces. Based on the criteria from this section, site analysis can be both mapped and conducted through a quantitative chart (Table 1) containing relevant factors, such as proximity to educational buildings, cultural buildings, existing places of gathering and Wi-Fi network coverage of heritage sites. Due to the characteristics of target users, the observation area is narrowed to 400 and 600 meters, optimal for pedestrian movement.

TABLE 1: Aspects of site analysis

Type	0-400m	400-600m	Total
Heritage sites			
Education			
Culture			
Gathering places			
Wi-Fi networks			

5. MIXED-REALITY EDUTAINMENT POTENTIAL
IN THE STUDENTS SQUARE AREA

The area surrounding Students Square is the area of Belgrade's historical centre with the highest density of heritage sites. The sites show the continuity of urban development of the area from the 2nd century AD until today and, observed within a 600-meter radius, the analysed location consists of eighty heritage sites (Figure 1). Most sites are 'invisible' and overlapped with other sites or contemporary urban tissue, making them adequate for presentation in a mixed-reality environment.

Using a palimpsest method for mapping the heritage sites reveals the traces of Belgrade's urban heritage embedded within the urban tissue. By identifying and mapping the sites, it is possible to observe them from the point of the highest density – the University Park and surrounding buildings, as the centre of the walkability and accessibility radius of 400-600 meters. The sites offer a new understanding of the multicultural layers of Belgrade's urban development, from the Roman Empire, through Ottoman and Austrian empires to the Modern Serbian state and the contemporary city.

FIGURE 1: The walking distance of 400-600 meters superimposed to overlapped heritage sites

5.1 Heritage sites in the Student Square area

The Student Square area and the observed territory are covered in heritage sites. The quantitative research of the heritage sites is based on overlapped data from the cartographer Željko Škalamera's maps and various strategic and urban plans of Belgrade. According to this digitalised database, eighty heritage sites are dispersed throughout the inner-city core. Of the eighty mapped sites, only thirteen are a part of the visible contemporary urban tissue, while the remaining sites present the places which were, over time, demolished and replaced by contemporary buildings and structures.

Mapped sites include mostly buildings and places of historical everyday life, which enable a wide range of possibilities for gamified interaction. In the *edutainment* concept of heritage presentation in public spaces, the variety of potential mixed-reality environments enables recreating experiences of Belgrade and its public life in different historical periods. By unveiling the 'invisible' heritage sites, the mixed-reality environments enable interaction with the city in different phases of its development.

The walkability analysis of the sites (Figure 2) shows that the eighty heritage sites can be accessed on foot within a comfortable walking distance.

FIGURE 2: Walkability map of Belgrade's historical core
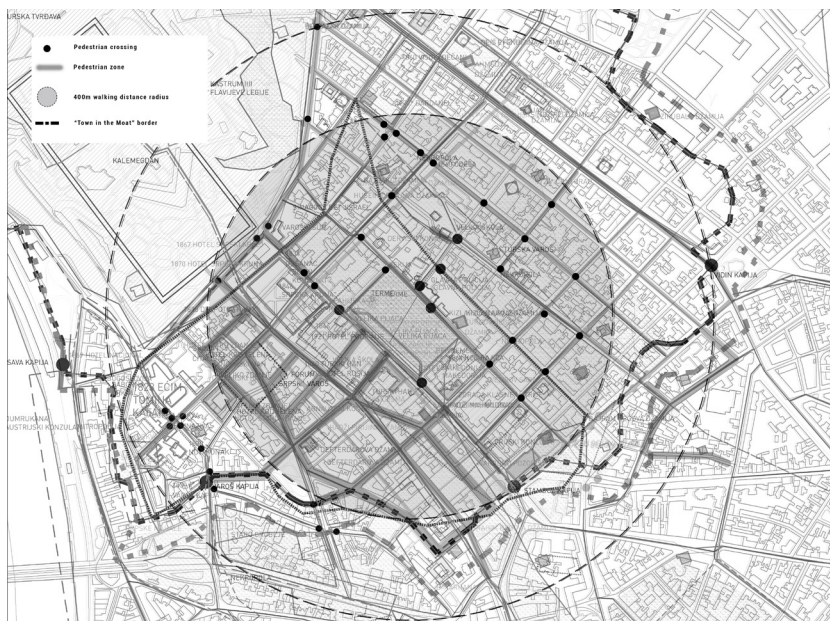
Within the 400-meter diameter are the forty-eight sites and places of memory, and in the wider area of 400-600 meters are the remaining thirty-two sites, which can be accessed by walking or public transport. This proximity and density of sites enable connecting different virtual installations in the forms of single installations or networks of walkable mixed-reality tours. The walkability of the area is determined by the proximity of sites and the safety of use. The majority of the area is connected through a pedestrian zone and clearly marked pedestrian crossings between streets with pavements on each side of the streets, making spaces safe for independent use by younger groups.

5.2 Gathering spaces around heritage sites

For the popularisation of heritage sites among different groups of users, it is optimal to identify the public spaces which are already frequently used and to optimise them for heritage presentation by adding a new mixed-reality 'layer' to their functions. This way, the familiar places for users and communities contain another set of values and contexts, which can provide more levels of communication with spatial information. In the observed area are fifteen open public spaces – parks, squares, playgrounds and open courtyards which attract the community of younger users, which are the target group for implementing the *edutainment* concept (Figure 3).

FIGURE 3: Gathering spaces within walking distance of heritage sites
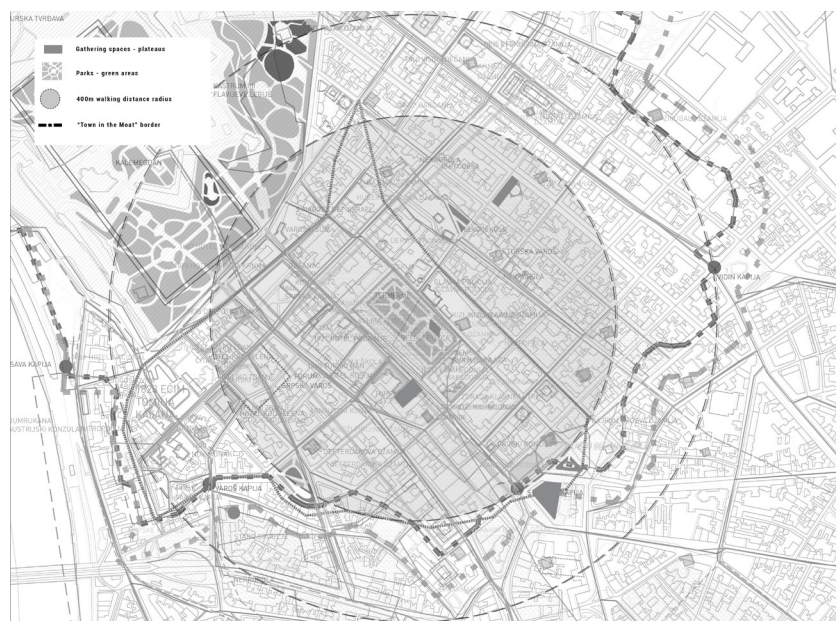
Ten gathering spaces are located within 400-meter walking distance and mostly connected through a pedestrian zone, making it a safe spatial polygon for creating networks of mixed-reality installations. According to the types of places, the mapped gathering areas attract three distinguished age groups, which further determines the types of virtual interaction with heritage sites – 1) the youngest group, which uses playgrounds (children up to the age of 12); 2) teenagers (13-19 years old); 3) university students and young adults (19-25 years old). The gathering spaces and age groups are closely related to educational and public buildings in the Student Square area, which further improves the site analysis by adding different sets of potential stakeholders.

5.3 Education and culture -
public buildings in The Student Square area

As concluded above, the gathering spaces in the observed area are mostly related to open spaces near schools, kindergartens and faculties, which attract the majority of users and define the dominant character of spending free time. The twenty educational buildings and thirty-six cultural buildings (Figure 4) offer not only groups of predefined users, but a wide range of professionals who can contribute to the implementation of the mixed-reality *edutainment* installations, from the aspects of adapting the communication between heritage

FIGURE 4: Educational and cultural institutions in the observed area
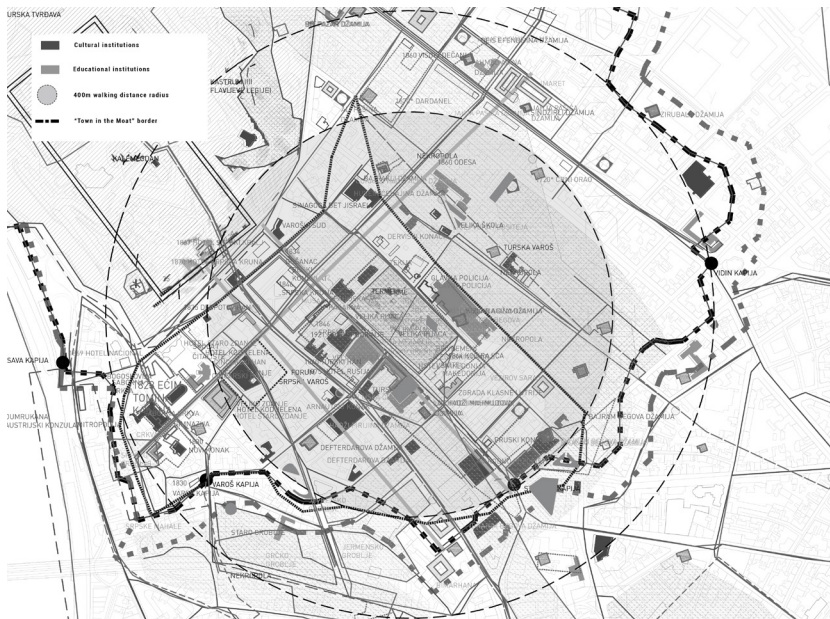
and users as a means of education through public space, as well as providing materials and data as a contribution to the development of the installations.

By approaching the educational and cultural buildings as potential stakeholders, the mixed-reality heritage presentation becomes a part of participatory planning and enables collaboration between different fields in creating contemporary places of interaction with heritage sites.

5.4 Overlapped heritage and Wi-Fi coverage

Experiencing the virtual layer of public spaces usually relies on the use of Internet networks and personal devices. In the observed area, the 163 public networks covering the eighty heritage sites enable the almost seamless transition from site to site, creating a continuous flow of users between visible and hidden elements of heritage (Figure 5).

The network coverage contributes not only to the interaction with heritage in mixed-reality environments but also provides unlimited storage for a complex database, which can constantly be improved and updated to facilitate the *edutainment* and promotion of heritage through public spaces. The shift from material to virtual aspects, enabled by Internet coverage, creates new use of spaces without burdening the space with additional physical structures.

FIGURE 5: Wi-Fi network coverage of the observed area
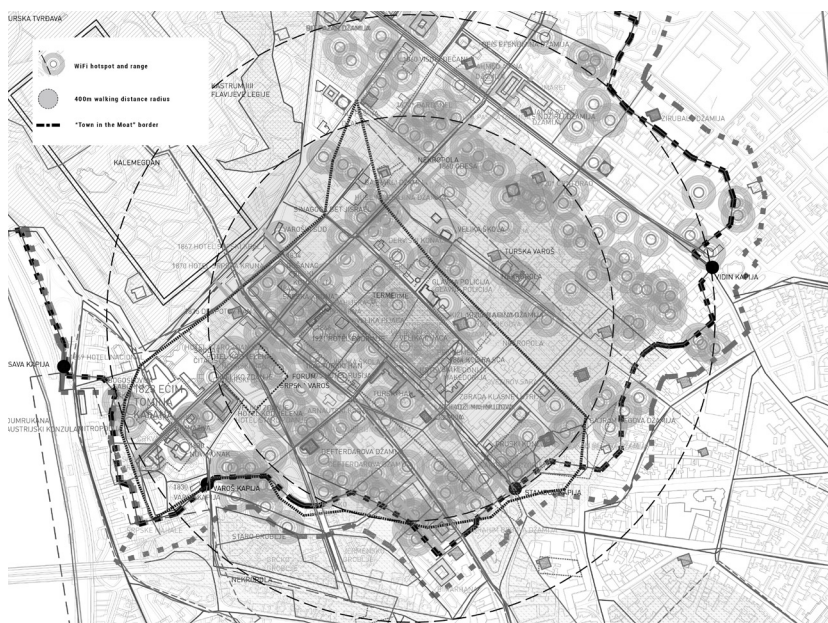
Especially among younger users, using the Internet-based database for presenting heritage also enables the use of different media and categorisation of heritage information by theme or chronologically[15], maximising the potential for individual choice of experience and enabling the users to experience the same spaces through a variety of different algorithms, making each interaction unique and dynamic, based on personal selection and preferences among the mixed media database.

TABLE 2: Quantitative representation of site analysis aspects

Type	0–400m	400-600m	Total
Heritage sites	48	32	80
Gathering places	10	5	15
Education	11	9	20
Culture	27	9	36
Wi-Fi networks	120	43	163

6. CONCLUSION

Including aspects which define and enable a contemporary approach to heritage in public spaces to urban analysis introduces new inputs to designing and planning historic urban cores. The paradigm shift and introduction of concepts of virtuality to heritage presentation enabled the treating of heritage sites as places of entertainment, which attract new users and introduce various layers of heritage to communication between public space and users. The *edutainment* concept embodied in creating attractive environments for communicating heritage in public spaces enables an informal approach to education and makes heritage more approachable to younger users. Intertwining the principles of *edutainment* (such as creating immersive experiences) with urban design attracts new groups of users, but also creates new guidelines for planning places with a high density of heritage.

On the analysed site of Student Square, the urban analysis was conducted with added criteria for *edutainment* and heritage presentation purposes, introducing new aspects and readings to public space. The specified site offers not only a high density of multivocal heritage from different periods, but also a satisfying level of equipment with digital infrastructure as well as proximity to cultural and educational buildings pointing out the positive impact of infrastructural surroundings to creating attractive public spaces optimised for mixed-reality use by younger groups of users. This way, presented in the case of Belgrade, frequently used contemporary spaces can gain an additional layer of an immersive historical environment, enabling interaction with both the visible and the 'invisible' spectre of spatial information.

NOTES

1   ICOMOS, *International Charter for the Conservation and Restoration of Monuments and Sites*, (Venice: ICOMOS, 1964)

2   Gustavo Araoz, "Preserving heritage places under a new paradigm" *Journal of Cultural Heritage – Management and Sustainable Development*. Vol 1 No. 1 (2011): 58

3   Jeff Malpas, "Cultural Heritage in the age of New Media". Yehuda Kalay, et al., ed. *New Heritage – New Media and Cultural Heritage* (London: Routledge, 2007): 18

4   *Ibid.*

5   Neil Silberman. "Chasing the Unicorn? The quest for essence in digital heritage" Yehuda Kalay, et al*.,* ed. *New Heritage – New Media and Cultural Heritage* (London: Routledge, 2007): 82

6   Silvio Zancheti "Values, Built Heritage and Cyberspace". *Museum International* No 15 (September 2002): 23

7   Paul Virilio. *Lo spazie critico* (Bari: Dedalo, 1988): 125

8   Carlo Ratti, Matthew Claudel. *The City of Tomorrow: Sensors, Networks, Hackers, and the Future of Urban Life.* (New Haven and London: Yale University Press, 2016): 20

9   Eric Champion, "History and Cultural Heritage in Virtual Environments" Mark Grimshaw, ed. *The Oxford Handbook of Virtuality* (Oxford: Oxford University Press, 2014)

10   Adriaan De Jong, "The first open air museums. Innovative institutions for strengthening feelings of community and national identification". Nikola Krstović, ed., *OPEN AIR MUSEUMS 2014 - FOUNDING FATHERS International Yearbook* (Sirogojno: Open air museum OLD VILLAGE, 2014): 33

11   Eric Champion, "History and Cultural Heritage in Virtual Environments" Mark Grimshaw, ed. *The Oxford Handbook of Virtuality* (Oxford: Oxford University Press, 2014)

12   Tula Giannini, Johnatan P. Bowen. „Museums and Digital Culture: From Reality to Digitality in the Age of COVID-19." Heritage Vol. 5 (2022): 194

13   Greg Richards, Robert Palmer, *Eventful cities: cultural management and urban revitalisation*. (Oxford: Butterworth-Heinemann, 2010): 33

14   Eric Champion, "History and Cultural Heritage in Virtual Environments" Mark Grimshaw, ed. The Oxford Handbook of Virtuality (Oxford: Oxford University Press, 2014)

15   Milja Mladenović,, "Kulturno nasleđe u (virtuelnim) javnim prostorima: javni prostor i mešovita realnost" Mrlješ, Rade, ed. *Zbornik radova sa međunarodne konferencije Graditeljsko nasleđe i urbanizam,* (Beograd: Zavod za zaštitu spomenika kulture grada Beograda, 2022) 422-423

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