RESILIENCE OF CRITICAL CULTURAL URBAN IN-FRASTRUCTURES (CCUI) IN THE FRAMEWORK OF DIGITAL TRANSFORMATIONS.
SOME MANAGERIAL *MARKERS*

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Resilience has become, in all fields of activity but also in relation to the general way of characterizing the functionality of society, an essential condition, and subsequently a state but also a process, which brings added value to organizational practice, subject to appropriate management, in the face of an increasingly diverse spectrum of crises (military, economic, etc.). The article brings to the attention of specialists and readers interested in the subject an analysis of the conceptual features of the resilience of cultural critical entities, in the contemporary context assumed to be defined by the digital dimension of the current transformations, in order to identify possible managerial frameworks for achieving a sustainable level of this state. The topic presented has been chosen mainly in the light of broad considerations on the usefulness and practical necessity of urban critical infrastructure resilience approaches in the context of reinforcing security culture concerns. In subsidiary, based on previous individual research achievements of the authors, a certain scarcity of studies was also noted, at least at the national level, in this thematic area, the opportunity of undertaking the study and the novelty aimed to be created and exposed also arising.

Key words: *criticality, cultural institutions, urban environment, resilience, management.*

1. IMPORTANCE OF THE STUDY AND LITERATURE REFERENCES

Given the general framework of approach outlined in the summary section, the research methods used were convergent with documentary analysis in order to provide a good foundation for the concepts and trends identified. The following research questions were considered, subsumed under the general objective of making new contributions to the emerging field of urban resilience management, with a desired positive effect, at least at the national level, on the resilience management of urban cultural critical features: what is the current state of the art of approaches specific to these types of infrastructures, generally at the international level, and particularly at the national level? Which are the main stakeholders involved in specific management processes? How are the functionality and implicitly the security of these entities influenced by digital transformation processes? What are the key milestones in designing and ensuring management models dedicated to the resilience of these assets?

It is gratifying that at national level we can speak of a simple search of databases in the literature, a trend of increasing approaches to the subject of resilience, contextualized of course in different areas and methodological lines. Certainly, (at the time of finalizing this article – 31st of July 2022) this trend has been boosted by the overlap (full or partial) of latent or ongoing crises (health and military) and of some that were considered as possible ones (energy and food). Compared to other types of *hard* assets (energy, transport, telecommunications, etc.) in the area of critical infrastructure, some (culture, finance, research) that we consider to be *softer* in terms of the collective perception of their contribution to the smooth functioning of everyday life have been much less talked and written about in terms of this criticality characteristic. There are, however, elaborations that link the role and importance of cultural assets to sustainability.

In an attempt to support the topicality of the topic we also bring as an argument the description of a topical work (*The Cultural Infrastructure of Cities*, announced for publication in 2023) for the topic proposed in this article, in which the coordinators Alison Bain and Julie A. Podmore place among the questions to be answered the following (https://agendapub.com):

"How does urban cultural infrastructure adapt and respond

to systemic challenges of austerity, exclusion, and inequality to articulate forms of solidarity, care and community within and beyond crises like Covid-19? And how is the cultural infrastructure of cities maintained and with what capacities to foster more resilient and hopeful urban futures?"

In this context, the inclusion of a section on *"Culture, National Cultural Heritage and National Identity"* in the recent 5th edition of the internationally renowned national scientific event "*Critical Infrastructure Protection Forum*" (14-16 June, Bucharest), with interesting and relevant presentations on the state of the art of national approaches, is a good omen. The conference will be highlighted by the communication of the Vice President of the Romanian Academy of Scientists, Doina Banciu, on "*Ethics – NonEthics in Critical Infrastructure Protection for Cultural Institution in Digital Era*", with a special focus on the functionality of museums and public libraries.

As a catalyst for setting the idea and framework for this article, the destruction of cultural assets as collateral war damage in the current conflict in Ukraine was also taken into account, in addition to previous cases in Syria, Sarajevo, Iraq, etc., some of which are of immeasurable value to human history.

2. URBAN CRITICAL CULTURAL INFRASTRUCTURES - TYPOLOGIES AND ROLE IN SOCIETY

Generically, which is supported by the literature (*Western Australian Cultural Infrastructure Framework 2030+, p.2*) cultural infrastructure is broadly defined and refers to:

"*the buildings, places, spaces, people and technology necessary for arts and cultural education, creation, production, engagement, collaboration, ceremony, preservation, conservation, interpretation, sharing and distribution*".

As a best practice in addressing cultural entities as critical infrastructures, it is notable in the US to consider them within commercial facilities, the latter containing the following sub-sectors (https://www.cisa.gov): entertainment and media; gaming; lodging; outdoor events (fairs, exhibitions, parks); public assembly (arenas, stadiums, museums, convention centers); real estate; retail; sports leagues. Further clarification of the scope of this sector is provided by specific plans drawn up for each area, the current approach for this sector being (https://www.dhs.gov):

"Are recognized both nationally and internationally as representing

the Nation's heritage, traditions, and/ or values or are recognized for their national, cultural, religious, historical, or political significance; and serve the primary purpose of memorializing or representing significant aspects of our Nation's heritage, traditions, or values and as points of interest for visitors and educational activities".

In Romania, the critical infrastructure sector "Culture and national cultural heritage" has been regulated as a typology since 2018, with the sub-sectors of public cultural institutions and protection of national cultural heritage. According to the information published on the Ministry's website (http://www.cultura.ro), monuments are classified according to both structural classification (archaeological monuments, architectural monuments, public monuments, memorials and funerary monuments) and value classification (historical monuments of national or universal value and historical monuments representative of local cultural heritage).

Given the multitude of structures that can fall into this category (based on pre-determined and governmentally agreed critical threshold sizes) we have limited the scope of our study to only those critical cultural entities located in urban areas. With regard to the role played by these assets in society it is relevant to mention here the view expressed through the *United Cities and Local Governments* platform in the context of concerns for the operationalization of *Agenda 21 for culture and Culture 21 Actions*, according to which:

"*Cultural infrastructure can develop participatory spaces for public dialogue, iterative steering, and local management. These participatory approaches can take place at all scales, that is, not only in cultural infrastructure serving a neighborhood or a community, but also in national "prestigious" facilities.*" (Duxbury et al., 2016, p. 28)

We are at this point stating that, conceptually, the resilience of urban cultural critical infrastructures contributes to increasing the resilience of the classical infrastructures listed above, because a robust individual or collective mindset (which is in turn based on the functionality and added value inherently brought by the cultural entities existing and used at a given time) plays a decisive role in educating attitude and awareness of the importance of achieving and operationalizing resilience of hard infrastructures. Strictly functionally, corroborated to some extent also with Maslow's pyramid of needs (with all

the criticisms made), the relationship described above can be reversed (for example - in the absence of electricity the history of technology museum cannot function at optimal parameters). From the point of view of a country's public agenda, investment in cultural infrastructure (creating new facilities or renovating existing ones) is an indicator of the level of development achieved.

In a broad sense, according to recent approaches with the character of a resilience directive at European level (https://www.consilium.europa.eu), the concept of critical entity is defined and will be used in the sense of

"those public or private entities that provide essential services on which the livelihoods of EU citizens and the proper functioning of the internal market depend. One of the key components of a critical entity is its infrastructure. This may include an asset, facility, equipment, network or system necessary for the provision of an essential service."

3. CURRENT CHALLENGES AND VULNERABILITIES FOR THE CRITICAL URBAN CULTURAL INFRASTRUCTURE

The current security environment is entering a phase of increased volatility and competition between state and non-state actors. From the military point of view, the deliberate targeting and destruction of the critical urban cultural infrastructures during conflicts is unfortunately not a new tactic, and it has been used in different modern conflicts in both hybrid and conventional conflicts.

NATO defines resilience as:

"*a society's ability to resist and recover from such shocks and combines both civil preparedness and military capacity. Civil preparedness is a central pillar of Allies' resilience and a critical enabler for the Alliance's collective defense, and NATO supports Allies in assessing and enhancing their civil preparedness.*" (https://www.nato.int)

This approach is useful for the analysis of the current challenges and vulnerabilities related to critical urban cultural infrastructures, as it provides the foundation of identifying both the problems, but also the opportunities presented by this type of infrastructures.

As was mentioned, the public critical urban cultural infrastructures refer to a variety of infrastructures – sports related (such as sports arenas or other public sports facilities), theaters, museums, public libraries, places of worship, monuments, but

can be extended to public spaces such as emblematic parks, public fountains or iconic buildings. The 9/11 attack had such an impact on the public psyche (both nationally and internationally) not only due to the number of casualties, but also because it targeted the Twin Towers, iconic building that were part of New York's identity. (Vail et al., 2012) The fire that damaged the Notre Dame Cathedral in Paris generated worldwide emotion, manifested in widespread grief, support, but also sparked conspiracy theories and manifestation of chauvinism or racism. Perrault eloquently captured the importance of critical urban cultural infrastructures

"*this incandescent wound also reveals the emotional dimension carried by architecture and how its universal cultural value, its unique symbolic force, and its mythical dimension nourish the arts, literature and every individual's own, personal geography*." (Perrault, 2019).

We can only imagine what would be the impact of the destruction of the Fountain of Trevi, the Mecca, the Vatican City, the Louvre museum, in the event of a war, on the morale of the population or the armed forces. This type of critical infrastructures is especially vulnerable in case of conflict, as it considered a "soft target", due to the fact that it usually benefits from less protection than other types of infrastructure, to a kinetic strike or to a cyber-attack. It is a lot easier for a state or non-state actor to attack an archeological site, a museum or a theater, than it is to attack a military base or an industrial facility. Unfortunately, there is no shortage of recent examples in this respect, such as the bombing of the Marioupol Theater by the Russian forces, in which hundreds of civilians lost their life as opposed to the difficult and fierce battle the same Russian forces had to fight in order to take control of the Azovstal metallurgical facility.

The deliberate targeting of the cultural heritage of a nation/population has been used as a weapon of war for millennia, and the modern international law prohibits the deliberate seizure, destruction or damaging of cultural property, starting from the first codifications of the laws and customs of war in the nineteenth century (Vrdoljak, 2016). More recently, in 2017, the UN Security Council unanimously adopted resolution 2347, which proclaimed the protection of cultural heritage a security imperative and condemned the deliberate destruction of cultural property as a war crime. (https://www.un.org)

The provisions of the rules of international humanitarian law must be considered (1954 Hague Convention), which define cultural property by

"*movable or immovable property of great importance to the cultural heritage of peoples, such as architectural, artistic, historical, religious or secular monuments, archaeological sites, groups of buildings which, taken as a whole, are of historical or artistic interest, works of art, manuscripts, books and other objects of artistic, historical or archaeological interest, as well as scientific collections and important collections of books, archives or reproductions of the property defined above*"

Military leaders, legal experts and civilian decision makers have acknowledged the importance of cultural and religious sites for a long time, due to their importance to a community or a nation. Considering the value of these infrastructures strictly from the material or utilitarian point of view underestimates the impact their destruction could have, as they are an intrinsic part of a complex network of inter-related cultural, social, psychological, political factors that compose the fabric underlying a community's culture. The destruction of the material components of a cultural heritage (the critical cultural infrastructure) is only a first step towards the destruction or severe damage to a culture itself, as it serves as a symbol for the origins, values, aspirations, interests and identity of a community. Often, the deliberate targeting of a critical urban cultural infrastructure has multiple aims:

As a show of power and as a means to intimidate the adversary and its allies;

As a means of getting national/international attention, promoting the attacker's own values and interests and perhaps attracting more followers;

Destroying the cultural memory and identity of a community, as an initial phase or part of a genocide.

But the critical urban cultural infrastructures are not only vulnerable in case of war. They can be equally affected by natural hazards (floods, fire, earthquakes) with equally serious negative psychological and social impact. Even the simple denial of access of the population to these types of infrastructure (which are otherwise physically undamaged) can have serious consequences on the morale and cohesion of a community. There are numerous recent examples, during the COVID pandemic, when cancelling of sports and cultural

events or restricted access to public cultural urban infrastructures has exacerbated the psychological impact of the pandemic itself and the associated social distancing/isolation measures.

In terms of opportunities, the urban cultural infrastructures should be considered critical not only based on their psychological, social and historical importance, but also due to their practical uses in terms of civil preparedness. Some of these infrastructures, especially the sports arenas or sturdy buildings can have a dual use during natural disasters. Besides their role in supporting morale and cohesion through sports and cultural events, some of this facilities could be used also during disasters (natural or caused by man), considering that building resilience requires also an appropriate infrastructure, as a crucial component of the disaster management process. The use of the Louisiana Superdome sports arena from New Orleans as "shelter of last resort" to the people unable to evacuate the ravaged city during hurricane Katrina is a good example in this respect. Sport stadiums could be designed and purposely build for this dual use, in order to allow their use for disaster relief purposes and as shelters during natural disasters. (Carpenter, 2015)

4. DIGITAL TRANSFORMATION IMPLICATIONS ON THE CRITICAL URBAN CULTURAL INFRASTRUCTURE

Digitalization and digital transformation are today imposing step by step, a new way of organizational and professional, individual and collective life, in other words nothing without digitization or everything outside digitalization is obsolete. As a working assumption, Ines Mergel et al. (Mergel et al., 2019, p.2) note that:

"The results of digital transformation efforts are changes in the delivery mode of services, but also new forms of direct interactions with customers, for example, through social media to adapt products and services according to changing customers' needs."

The experience of humanity in the context of the Covid-19 pandemic crisis has certainly been a positive influencing factor, an accelerator of the processes of digitalization, digital transformation and implicit virtualization within cultural entities. While for some of them (especially those in private ownership) the processes were either underway or at an advanced stage of implementation, for the majority of these cultural infrastructures it

was a zero moment to understand that digitization is a must, both from the perspective of ensuring the continuity of the provision of cultural services to the general public and from that of protection and security considerations.

The current trend of digital transformation has implications on the all aspects of society and the critical urban cultural infrastructures are no exception. This section proposes two main areas of analysis in this respect, both with positive and negative implications.

The digital revolution can support the preservation of the cultural heritage, through the digitalization of books, pictures, architecture, artworks etc. In the event of damage or destruction of the critical urban cultural infrastructure, the buildings could be reconstructed based on detailed plans, pictures or models preserved in digital format, while the information sheltered in those buildings (books, artwork) can be at least partially preserved or restored. Of course, on the downside, a digital reproduction of a paining will never equate the experience of seeing the real one, and this reconstruction may be extremely difficult in less developed countries, but it is at least a way to preserve some part of an important heritage.

The widespread use of social media is another area worth of analysis in respect to its impact on critical urban cultural infrastructure. The fast dissemination of information at global level regarding the destruction of World Heritage Sites, generating wide-spread outrage, may potentially convince states, international organizations to take measures to dissuade an attacker from causing further damage. On the other hand, social media can exacerbate the destruction of critical urban cultural infrastructure, as it provides an effective platform for spreading terror and/or disseminating the attacker's own values and interests.

5. CCUI RESILIENCE MANAGEMENT - DIRECTIONS OF APPROACH

It is clear that in the case of these infrastructures, from the point of view of ensuring resilience, things are much more delicate (as a consequence of the materialization of a destructive factor), compared to other sectors of the economy - transport, energy, etc. (in the sense that, for example, if the physical destruction of a collection of old books, paintings or an ancient statue has occurred, the character of uniqueness and authenticity is

eliminated, which could ensure a form of continuity of the functionality of the exhibit in question being the redundancy given by digital or virtual storage).

The issue of protecting cultural critical infrastructures and ensuring their resilience (we consider protection as a first condition for achieving a high level of resilience) is a complex one, also managed in relation to a country's economic performance (simplistically speaking, the economic aspects directly related to vitality and living standards take precedence, and then follow the others). The main types of threats identified generically (on the hypothetical example of a medium developed country with low country risk) in the case of the CCUI are: extreme weather events (low probability/2 and high impact/4), terrorist/armed attack (very low probability/1 and very high impact/5), human error in specific current activities (low probability/2 and high impact/4), organized crime (low probability/2 and high impact/4). The main vulnerability lies in weaknesses in the physical protection system of the entity concerned.

The main actions required to increase resilience in this context

are: updating the inventory of urban cultural assets (location, quantity, state of maintenance, etc.); setting criticality values (critical thresholds, sectoral criteria); applying these dimensions to existing assets and determining the list of urban cultural critical targets; drawing up security plans and putting them into practice.

In terms of allocation of responsibilities, things cannot be standardized (national specificities and the importance of cultural assets in the public agenda make the difference), but the main national departments or ministries that need to be involved are those responsible for the culture and home affairs portfolio.

It is obvious that in terms of recovery or return to baseline time ("*rising from the ashes*"), compared to other types of critical infrastructure, we are talking about much higher values or even impossibility.

For contemporary cultural infrastructures newly created or entering a cultural heritage, of course, the issue of ensuring resilience has other valences in the sense of the freshness of the rescue possibilities both by means of physical protection of the material component itself and by using the assets of the digital age.

At the European level, the following is listed (https://eur-lex.

europa.eu) among the priorities in this field:

"establishing long-term measures by implementing risk management plans in tandem with planned policies, protection measures and good practices is key for the efficient prevention and mitigation of damage in a people-centered approach to safeguarding cultural heritage."

6. CONCLUSIONS

At the level of the types of critical infrastructure officially recognized in various national or international legislative frameworks, the issue of defining and designating the existence and subsequent resilience of cultural critical infrastructure is least addressed, with examples of good practice existing in the US. Approaches to cultural infrastructures are more focused on the idea of cultural value, heritage and less on criticality and the need to operationalize integrated risk management and continuity plans as the foundations for ensuring resilience.

As a functional peculiarity, it is much more difficult to financially estimate the consequences of their destruction or inability to provide the specific service, as the value level of the most reprehensive and outstanding ones is in many cases related to the idea of regional, national, European or even global identity. Digitalization and specific ICT processes are lines of opportunity for increasing the resilience of these infrastructures, within the framework of project management approaches.

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