Letter to the Editor. – Review

Sustainability 868597

Dear Editor,

We would like to express our gratitude to the editor and reviewers for analyzing our proposal in depth and for proposing suggestions to improve the quality of our manuscript. In light of their comments and suggestions, we have revised the manuscript. We truly think that this new version of our paper addresses carefully all the reviewer's concerns. Please find below our detailed response to such comments.

Thank you very much for your time and attention.

Yours sincerely,

The authors.

Reviewer #2:

Comment 2.1.- Lines 27-32: This introduction effectively acquaints reviewers with the subject of the article. However, might it also be worth mentioning purposeful destruction of historic sites (e.g. by ISIL in Syria and the Middle East)? That could help the generalizability of the study.

Response.- We appreciate the reviewer's proposal, which helps generalise the study. This aspect has been included in the introduction between lines 27 and 31:

"On April 15, 2019, the images of fire destroying the cathedral of Notre Dame in Paris were seen around the world. Other examples, such as the fire at the National Museum of Brazil in September 2018, or the destruction of the Bāmiyān Buddhas in Afghanistan, helped raise immediate awareness about the fragile state of many heritage sites. The risks they face are in many cases unpredictable, sometimes intentional and sometimes accidental. But, in any case, such losses highlight the need to establish preservation strategies, which must begin with accurate and sustainable digitisation of the heritage asset".

And in line 62:

"But other risks stemming from human action must not be forgotten, such as intentional destruction of heritage or heritage buildings threatened by rapid urban expansion of cities".

Comment 2.2.- Lines 82-86: This is a good place to describe why digitized heritage preservation matters -- what it accomplishes for the local community, academic audience, or the world.

Response.- We deeply appreciate the proposal of the reviewer. We have added a new paragraph to describe why the preservation of digitized heritage matters. It is included in the introduction, as it proposes, and we have linked it to another paragraph where we said that protecting all heritage is hard. We think that with this new paragraph it is better explained, thanks to the contribution of the reviewer.

The new paragraph between lines 74 and 77:

“Digitization can enhance understanding of the cultural heritage and respective values, while new tools enable better management and control of heritage as well as appropriate conservation. Also, publicizing heritage via formats that actively explain its meaning and value helps raise public awareness; this is the surest way to preserve it”.

Comment 2.3.- Lines 130-143: Excellent overview of the Añana Salt Valley's relevance.

Response.- We greatly appreciate the reviewer's comments.

Comment 2.4.- Lines 218-255: These passages effectively combine a discussion of the region's heritage with an explanation of why this kind of work matters. Information such as this is the real "meat" of the paper.

Response.- We greatly appreciate the reviewer's comments. We strongly agree.

Comment 2.5.- Lines 328-337: Strong explanation of why historic preservation matters. Some of this reasoning would be helpful for the introduction or abstract.

Response.- Although the importance of preserving industrial heritage is specifically discussed in this paragraph, the Nizhny Tagil Charter principles apply to all heritage. Based on the reviewer's recommendations, an explanation of why digitized heritage preservation is important has been added to both the introduction (lines 74- 77) and the final discussion (lines 807-820). These reasons are also developed in comments 2.2 and 2.7.

Comment 2.6.- Lines 569-571: The introduction of virtual reality is fascinating. You might mention this as an area for further research later.

Response.- We appreciate the reviewer's comment and take it as a compliment. Considering that the other reviewer also told us something similar, a paragraph has been included in the discussion between lines 798 and 806.

"The possibility of integrating these digital models in Virtual Reality media improves access to the heritage asset, so it can overcome the spatial complexity of certain environments and the respective access restrictions or effect on the public. At the same time, there are new possibilities for interaction with the site and knowledge about it, promoting dissemination and understanding of its values. Some of these models were configured on the *Sketchfab* platform for viewing in VR, as a prior step toward broader investigation into how these new Immersive Reality techniques are applied; this could, for example, help ease the restrictions on access to wooden churches in the Basque Country, leading to greater recognition of their heritage value".

Comment 2.7.- Lines 758-765: This would be an ideal place to discuss the purpose of heritage digitization. What end does it serve? Renovation? How does it meet some public or academic need?

This is a suggestion, but might is also be worth noting the political context of heritage preservation and destruction? The piece hints at this with discussions of changing building use over time, but efforts of governments to destroy or preserve heritage might also be worth mentioning.

Response.- We welcome the reviewer's suggestion and have expanded the final part of the discussion to include a heritage preservation perspective in a broader context. The political context is also covered, and the principles contained in the ICOMOS-ICORP Statement on Cultural Heritage Protection in Times of Risk are mentioned. We complete the existing information that is collected in a paragraph between lines 807 and 820:

"It can be said that every heritage element is exposed to some unforeseeable or inevitable risk. The social and political contexts of historical heritage assets significantly influence their proper management and preservation. The involvement of governments and those responsible for overseeing heritage, depending on available financial resources, can either reduce or increase the risk of destruction. Since cultural heritage is constantly endangered [61], one of the fundamental steps to ensure its protection should be the respective digitization. Market-available digitization tools and technologies have improved remarkably in recent years, enabling fast compilation of an accurate and affordable record of heritage assets. It is therefore essential for heritage managers and governments to encourage this process. In the event of a disaster, digitization will enable the historical legacy to be restored in accordance with accepted conservation practices [61]. Such a record will also enhance understanding of the heritage and contribute toward better management and awareness thereof. The results of

the conducted research indicate that the preservation of heritage monuments and sites in diverse situations and risks is certainly possible".

Comment 2.8.- Line 19: remove "etc"

Response.- Based on the recommendations of the reviewer we have removed it.

Comment 2.9.- Line 27: "the world saw" -- can the world really see anything? Odd phrase.

Response.- It is true that the phrase was excessively colloquial. The phrase between lines 27 and 28 has been modified:

"On April 15, 2019, the images of fire destroying the cathedral of Notre Dame in Paris were seen around the world".

Comment 2.10.- Line 47: "from what is needed" -- passive voice, which occurs throughout the article. I am not an architect, so perhaps passive voice is more prevalent in that discipline, but it is less common in academic vernacular.

Response.- This sentence has been revised in line 56:

"However, the objective in this case was different; it was not meant to ensure effective and exact reconstruction in the wake of a disaster".

The passive voice (much more used in Spanish than in English) has accordingly been removed or altered in several instances elsewhere in the text to ensure a smoother read in English.

Comment 2.11.- Line 99: "it is also cautions" -- grammatically incorrect

Response.- It refers to The Managing Cultural World Heritage manual of UNESCO. The phrase has been modified between lines 115 and 120:

"The Managing Cultural World Heritage manual of UNESCO sets out basic guidelines for developing heritage management plans. Its central core provides a common framework for documenting heritage management systems, establishing a series of processes, among which data collection, including in monitoring processes, is fundamental. The manual warns that such systems must be able to deal with risks deriving from unpredictable events such as natural disasters or damage generated by human destructive action".

Comment 2.12.- Line 383: does "Own activity" mean owner activity? Unclear.

Response.- We have clarified the term, it refers to the activity of the building.

"Building activity".

Comment 2.13.- Line 436: "avatars" is an odd word choice.

Response.- The phrase has been simplified and modified between lines 467 and 468:

"In the 19th century it was declared a national monument and placed under state protection".

Comment 2.14.- Line 758: "In conclusion" is overwrought.

Response.- Based on the recommendations of the reviewer we have removed it.