Exploring CyArk: Needs, Novelties, and Dilemmas

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This paper explores the burgeoning digitization of public heritage, focusing on its ethical quandaries by examining CyArk, a prominent platform dedicated to digitally preserving cultural heritage. The paper delves into CyArk's inception, its mission, and its evolving role in the digital preservation landscape. It scrutinizes CyArk's methodology, particularly concerning ownership of 3D model data, language representation, and community involvement. Drawing on post-colonial discourse, it critiques CyArk's approach and proposes improvements for a more inclusive and ethically grounded digitization process. The reflection section offers insights on community engagement, language inclusivity, enhancing interactivity, transparency, and embracing immersive technologies. The research advocates for a nuanced and ethically informed approach to heritage digitization, urging CyArk and similar platforms to address concerns and foster greater inclusivity in preserving global heritage digitally.

1. Introduction

Lately, there has been exponential growth in the digitization of public heritage, bringing exciting new opportunities. Still, it also, like other technologies, comes wrapped with ethical challenges (Manžuch 2017). The rebuilding of Notre Dame using Building Information Modeling (BMI) is an excellent example of what digitization of public heritage could mean for the future. ("Rebuilding Notre-Dame de Paris Cathedral | Autodesk" n.d.) As in the words of the famous English novelist George Orwell, "Who controls the past controls the future. Who controls the present controls the past."(Dubois & Roduit 2019) The advancement of information technologies coupled with the digitization of heritage has a multidimensional impact on the protection, consumption, and education aspects of public heritage. However, exploring what best practices exist and how to avoid ethical challenges within this field is crucial. I will connect these thoughts through the tool I aim to review for this paper, CyArk. ("CyArk" n.d.)

Founded in 2003, CyArk's mission is to preserve and curate the shared cultural heritage with statistics, emotions, and cross-platform support. With hundreds of models readily available from the platform, it offers a guided experience of heritage sites from the Americas to Asia. Further details on the platform's operability and the thought process behind it are shared later. CyArk has emerged as a critical player in heritage digitization, which it makes possible through its historical ground-breaking work, evolving vision, and institutional partners. The application of CyArk's work is not limited to digital screens, but it has

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provided valuable inputs when the heritage sites were destroyed or were on the verge of it (Addley 2019). CyArk's CEO expressed his faith in the tool to re-construct lost heritage with digital scanning and data points. Through this, one could quickly establish that CyArk is a revolutionary platform that educates its users online and provides real-time data that can enable engineers to rebuild a site with precision. On the other hand, it opens a series of ethical and moral questions. Why is CyArk documenting the heritage sites globally? What will be the commercial value of their work in a born-digital age? What methodologies do the works follow? Who owns the data points of public heritage sites? The remainder of the short paper will answer these and other connected questions.

As exciting as the work of CyArk seems, tools, when used by humans, are not neutral (Markoff 2006). They are shaped or dictated by how humans may wish to use them. The digitization work by CyArk needs to be further peeled off using ethical methodologies to understand the ambitions, needs, novelties, and dilemmas. The human-technology relationship can explain the co-evolution of the users and the tools (Jouhki & Hurme 2017) if we establish that tools are not neutral and their users shape them. There is an inherent bias in which they operate; we can also, for example, establish a hypothesis that CyArk's work is not neutral. As the work of CyArk is also based in countries that were once colonized, it is only fitting that I guide my analysis through post-colonial theory. Post-colonial theory goes at length to explain the key characteristics of framing a narrative that brings equity. Still, for the paper's relevance, I will pick three main features for the argument (Léglise & Migge 2007). First, colonial powers have historically captured materials for use, making exploitation the center of the discourse. Secondly, they have perpetrated their language and culture as ethically and morally better. Thirdly, colonialism's moral grounding was leveled into the greater good or happiness of the world. There is another concept that will help me in connecting my thoughts, and that is what Harold Schiller coined as "Electronic Colonialism." Schiller described it as the ability of electronically advanced countries to use the mediums and propagate their views and discard the needs of marginalized groups (Schiller 1975).

CyArk, which started as an archive to document the endangered world heritage sites (see Figure 1), has evolved into an open-source platform to document heritage and foster a community where this dialogue is further shared and nurtured. By collaborating with initiatives such as Open Heritage 3D ("Open Heritage 3D | About" n.d.), CyArk is one of the front-runners that makes heritage digitization as open data accessible and readable for other stakeholders. It has further delved into documenting historical events, thus expanding its scope and thus also incorporating intangible heritage as part of its platform. The works are segmented into various categories; a few of them are Sacred places, Journey to equal rights, Places of worship, United States history, and others. Over the years, it has expanded into a storytelling platform, connecting with audiences who wish to understand and work with existing 3D models.

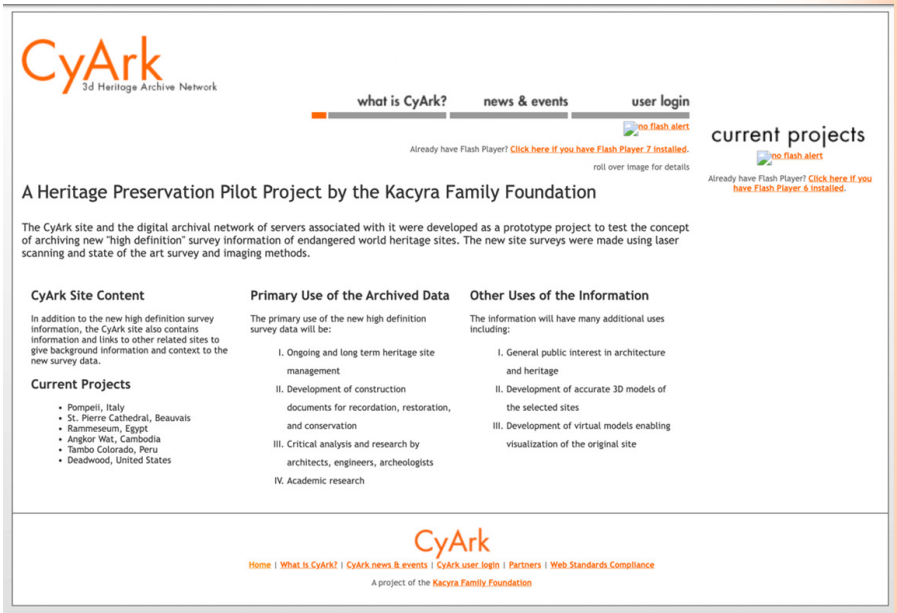

Fig. 1. Image of CyArk taken through Wayback Machine for the date 06 December 2004. Source: https://web.archive.org/web/20041206142350/https://www.cyark.org/

CyArk's work is commendable, exciting, and innovative, considering our world is on fire with polycrisis, especially with climate change and religious extremism, the heritage sites are at a greater risk than ever before (Vyshkvarkova & Sukhonos 2023). Such events have accelerated the need to adapt and understand digital public heritage. Within the last decade or so, we have also seen the devastating impacts of religious extremism on cultural sites. In 2015, ISIS destroyed some of the key heritage sites in Iraq and Syria, evoking a global response from digital heritage professionals to re-create, preserve, and fight the extremist ideology (Michelle Starr 2015). Now CyArk is not alone — several other tools and institutions are working to digitize the heritage, such as Smithsonian, The Institute for Digital Archaeology, Three D Scans, Carare, Europeana, Iconem, and others. As a researcher, this gives a solid grounding to further examine CyArk for what works and what does not. I will use the opportunity to employ comparative analysis to examine further the highlights, the limitations, and how it can improve its operability, technicalities, experiences, and user interaction.

2. Methodology

By establishing the Universality of heritage preservation and using terms such as "collective" and "shared," UNESCO has divided the burden and urgency of preservation among us ("Culture | UNESCO," n.d.). The "novel" mission is taken up by various organizations, using various tools and techniques such as but not limited to 3D modeling, photogrammetry, videography, and algorithmic projections. The idea of digital preservation has evolved in its scope and meaning. Thanks to interactive technologies, the heritage sites at risk can be digitally recreated and, in other instances, printed as well (Blahut 2016). The trends of digitizing go as back as early as the 1970s when various audio-visual techniques were involved in the documentation of the heritage (Wang et al. 2020). However, what does it mean for the heritage to be Universal? How do different organizations explore this concept? What fundamental ethical challenges lie within such a thought process?

The earlier version of CyArk's website (see Figure 1) presents itself as a heritage archive or a database. As you see the platform's evolution over time (see Figure 2) word "saving cultural heritage" becomes the center of it. Novelty is added to the tool's mission, giving it a greater acceptance that it is worth saving the heritage for future generations. The grounding of CyArk's work is deeply rooted in Western Utilitarianism for greater happiness. So, in its true sense. CyArk believes in Universality and a Utilitarian way of working. In his TED Talk, the founder, Ben Kacyra, mentions his helplessness when the Bamyan Buddhas were destroyed in Afghanistan, so he founded CyArk to digitize heritage sites for future generations (TED 2011). The surface morality behind it is worth praising, but it opens a series of ethical and moral dilemmas. What is the motivation of CyArk to document the sites at risk? Which heritage sites are shortlisted and why? What becomes of the 3D data points? Who owns them? What is the involvement and ownership of the local communities? Who gets the credit? What partners are financing such works, and what are their ambitions behind them? These and similar connected questions will aid in understanding the methodological grounding of the tool.

Fig. 2. Image of CyArk taken by Wayback Machine dated 11 May 2009. Source: https://web.archive.org/web/20090511012716/http://archive.cyark.org/

I agree that CyArk's being pioneers of digital heritage has come a long way. However, it has layers of electronic colonialism, which Morehshin Allahyari, an Iranian-American artist, puts as information technologies that embody colonial fragments (Allahyari 2020). To establish my case, I will compare two works from the same region and try to put my argument through a comparative analysis. The first work is from CyArk, Lamassu (from the British Museum), and the other is The Distributed Monument by Morehshin Allahyari ("CyArk Projects: Assyrian Collection of the British Museum" n.d.; "The Distributed Monument" 2016).

The digital representations of both models are accessible online for audiences to interact and explore. However, only Allahyari makes the corresponding communication, source files, and credits readily available online. By doing so, Allahyari is re-writing how 3D models of public heritage objects should be for everyone. At the start of the paper, I mentioned three characteristics to examine works through a post-colonial framework: material control, linguistics, and the greater good. I will use this critical point of departure to put forward my case and establish that CyArk needs to improve its methodological grounding as there are currently ethical challenges encapsulated with its work.

2.1. Who owns the 3D model data?

Let us start with the 3D data and source files. CyArk states they can share the project's source files for non-commercial and educational purposes. By enabling this, they suggest a creative common usage of the data sets. In the future, if the models are required to be printed for commercial use by the local Chilean institutions, would they need to pay CyArk? How can one institution trademark data sets of public heritage sites for digital distribution? These questions of ownership are inspired by the conversation of traditional museums returning their looted artifacts to their country of origin (Daniels 2020). The knowledge and datasets acquired by CyArk have financial and material significance that should be shared with the local cultural institutions whose heritage is in question. So, let us revisit this, and in the words of the Allahyari, the Western institutions digitizing the heritage of emerging countries is similar to museums keeping the artifacts in their collections and benefiting from it (Rhizome 2019). The mediums have changed, but the power dynamics are effectively unchanged.

2.2. What languages are used and why?

Language remains a tool of colonialism (Sayeh Sayedayn 2021). Language also depicts who are the intended audience of the project. Who is it designed for? Who are the primary and secondary stakeholders? Who gets to access it? Almost all the CyArk works are digitized and presented in English. Is it done for its Global North audiences? Why doesn't the model include the local language of the heritage sites? Which heritage sites are picked and why? Does it rely on public and media sensations? These questions can help further navigate the reasoning behind the choice of language in the presentation. For CyArk, most of the work is driven by English-speaking audiences in the West. For the 3D model to be more inclusive, it should have an option for local language translation so the people whose heritage is in question can understand how it is presented and why. This language barrier propagates social injustice, moral hierarchy, and cultural alienation that are remanent of a colonial legacy (Heller & McElhinny 2017). In contrast, when Allahyari's work is on display, it features a USB that documents her project in English, Arabic, and Persian, the languages of the communities on which her work is based.

2.3 What about the community in question?

The questions centering on the community are around finances, labor, and ownership. In her take on heritage digitization, Sarah Bond asks if the local communities should get a share of the donations or earnings raised through the 3D modeling of their heritage sites (Bond n.d.). Should the local communities and partners get explicit mention of their work? As Matthew E. Davis points out in his work, even a simple digitization of an image is much work and requires several steps (Davis 2018, 106). There must be actors involved beyond a single entity. These ideas are also connected with labor ethics and the invisible workforce that makes digitization possible (Smith & Whearty 2023). Would the local community co-share the ownership of the digitized works? At present CyArk website only mentions the institutional partners that it works with. It also lacks a clear framework of what becomes of the digital pieces once digitized and how much contribution remains from the community whose heritage is in question.

The above questions' presentation and further analysis with CyArk and other tools can help us establish their work's lack of ethical grounding. CyArk work has successfully tapped into one urgency of present times: to save our heritage. In doing so, it is playing at the hands of what Allahyari terms digital colonialism. With careful deliberations and addressing the needs of a post-colonial framework, CyArk's work grounding methodology should be improved to make it more inclusive. To put it more vividly, it is not a one process but a continuous collaborative dialogue that needs to happen with the institution working in digitization, the community in question, and other relevant stakeholders.

3. Technicality

CyArk has delivered works in diverse geographics, making them a critical digital heritage player. The platform has evolved to cater to technological advancement and user needs. In this section, I will examine the platform through a series of questions, including: What are the critical features of CyArk? How does it work? Where is it lacking? How does the overall user experience of the tool perform as per the industry standards? How can it be improved in comparison with other similar tools?

CyArk offers web and mobile-based solutions through its website and additional curated experiences through its portal called Tapestry ("Tapestry - 3D Virtual Tours," n.d.). At first glance, it is easy to navigate; in the projects section of the website, you can explore various projects individually or through curated collections. Each project is represented through a webpage containing descriptions, locations, and further characteristics such as 3D virtual tours (through tapestry) and lesson plans. A few other projects also include 3D models that can be accessed through Virtual Reality equipment. It adds another layer of immersive experience. In terms of the user experience, the website and platform are designed for an average Internet user with an understanding of basic website browsing and the English language. The key features of CyArk include free access, source data files available for non-commercial use, curated tours, and immersive experiences through virtual reality. In terms of Sustainability, CyArk's platform has been there for more

than 20 years, which is a testament to the seriousness of the work carried out by the institution.

The platform's working is simple; a user can explore through a series of projects. Once on the selected project, you can sit back and toggle through various scene controls. In a few instances, the platform also features local voices and additional imagery with the heritage site, adding another interaction layer. I will analyze CyArk user experience through interactivity, accessibility, operability, and customization.

One of the platform's limitations is the inability of the user to customize the 3D model further and play around with its characteristics. For example, Iconmen allows users to play with the display appearance ("Iconem Platform - Murad Khane District - Kabul," n.d.), cameras, perspective, and other settings. It also allows users to make measurements and GPS coordinates with the existing model, adding a layer of interactivity that seems missing from CyArk (see Figure 3). The information on CyArk's display is quite polished and well-curated. If you are a user interested in the data and what imagery has contributed to the 3D model, CyArk has limited representation. Specific models on display through Icnonem's website have captured media files that give an instant idea of the working files and data behind the digital representation.

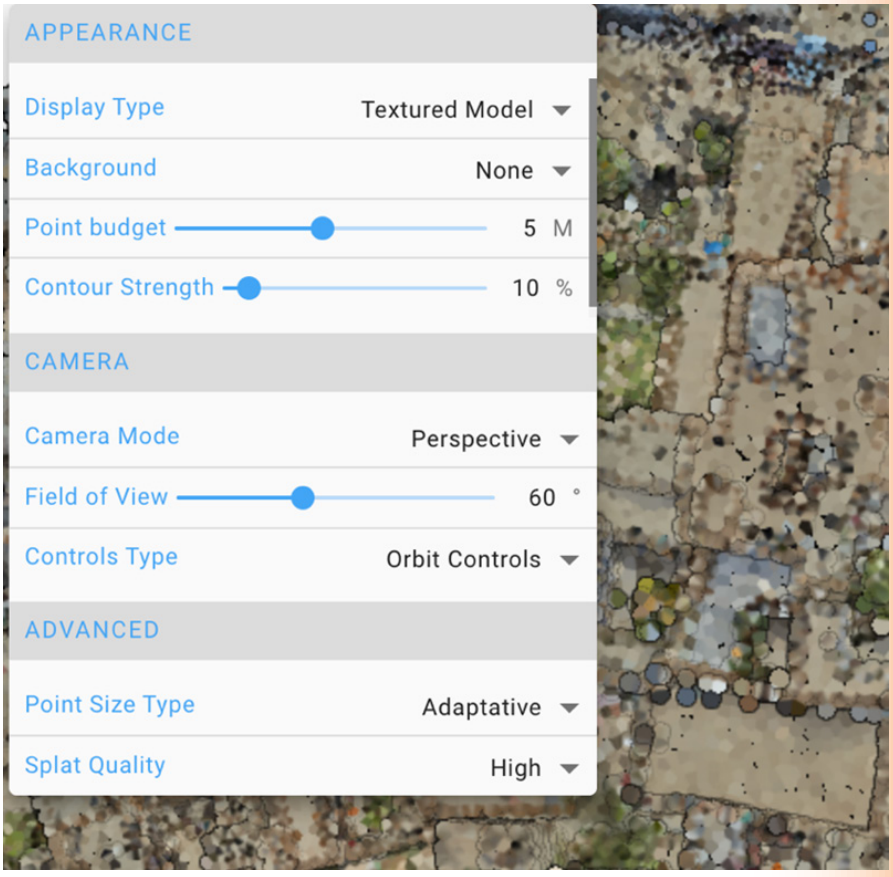

Fig. 3. screenshot from Icnonem's website that allows further characteristics manipulation. Source: https://app.iconem.com/

Regarding accessibility, the models and their associated data are only available for non-commercial use. The grounding of this was discussed in the first section. However, CyArk can learn from projects such as Three-D-Scans, where 3D models and associated data have no limitation use ("Three D Scans" n.d.). CyArk does not allow its users to embed the 3D models publicly to the third-party website, which reduces its external application. For example, Sketchfab allows the models hosted

on its website to be embeddable on other platforms and websites, which enhances the visibility of public works to appear on various other web pages (“Sketchfab – The Best 3D Viewer on the Web” n.d.). Another critical feature missing from CyArk’s website is allowing users to download or print the 3D model directly from the platform. The platform suggests its users get in touch for access under Creative Commons. In comparison, the tool Smithsonian, still restricted under Creative Commons, allows its users to download the model directly without requesting access (see Figure 4) (“3D Digitization | Smithsonian” n.d.). Also, the tool Global Digital Heritage allows its models to be downloaded directly through Sktechfab (Roman Temple of Evora – Download Free 3D Model by Global Digital Heritage and GDH-Afrika – Sketchfab, *n.d.*). This removes a layer of bureaucracy that allows users to delve further into the 3D model and its characteristics. Currently, the models are only presented in English, but incorporating the local languages of the digitized sites can further improve user access. Imagine having Spanish, French, Arabic, and other languages, making the platform more inclusive and increasing its overall application.

Another key feature that can increase the user’s overall experience would be saving and retaining their experiences on the website. The platform could also be further improved by allowing users to create an account and populate the model with key findings, thoughts, and crowdfunded information. This will enable audiences to take further interest in the overall story of the works, and by having the possibility to connect with other interest groups, it can increase its application.

Fig. 4. Screenshot from Smithsonian that allows direct download of the models. Source: https://www.si.edu/object/3d/orbiter-space-shuttle-ov-103-discovery:d8c636ce-4ebc-11ea-b77f-2e728ce88125

4. Reflections

By using the methodological and technical grounding that was presented in the previous sections, here are a few reflections that will help me place CyArk’s work in a post-colonial digital humanities world:

1. The ethical discourse on digitizing heritage is pretty novice, but it is a direction where the future models should be headed. If CyArk wishes to continue digitizing public heritage, it should think beyond saving heritage and encapsulate the post-colonial discourse in its models. This can be done vis-à-vis greater collaboration, transparency, co-ownership, and representation of the local communities. In her project Memory Matrix, Azra Aksamija at the MIT Media Lab presents a collaborative

way of understanding what is lost and what is to be preserved by having community input (“Memory Matrix – Fragment Azra Aksamija” n.d.).

2. The choice of language is essential in the discussion – if CyArk believes its models are for the greater good of the communities in question. It should incorporate the language of the communities in question and examine the wide-ranging relationship between the languages, colonialism, and digitization of public heritage. An example of the Te Papa Museum providing Māori language transcription as part of the overall website could be seen as one guiding example (“Home | Te Papa” n.d.).

3. The tool provides a great starting point for the audiences to interact with the heritage sites, but in terms of interaction, it is what Edmonds would term as a static model (Edmonds, Turner, and Candy 2004). For a model to be truly interactive, it should allow audiences to interact with it at a symmetrical communication level (Schultz 2000). CyArk only offers a pre-defined journey curated by the platform. Suppose users can create accounts, leave comments, add imagery, and further modify the models. In that case, the digital model’s story will be rewritten by each user and will induce interactivity at a greater level. An example of Plateau Peoples’ Web Portal where the indigenous community is updating the collection records by the additional context of the imagery. Washington State University’s (WSU’s) record mentioned one photograph as “3 Yakama Women in Regalia (1911).” As the web portal allowed contributions from the community, it enriched its content and enabled more comprehensive discussion on muti-contexts of a curation (Christen 2018).

4. Keeping a tool servicing for more than 20 years deserves appreciation on its own. The sustainability of any tool or platform is challenging, but CyArk lives up to it. Further improvements can be made by more transparency on the labor angle of their work. By including the names of the contributors, it can minimize the ethical challenges that surround this aspect.

5. CyArk currently offers the virtual reality (VR) mode for some of its models. Being the industry leaders, other techniques of immersive technologies could be offered, especially with the mainstreaming of Quest, Holo-Lens, and other similar tools that can provide users with better storytelling experiences. 1RIC studio is one example of using people’s intangible experiences to generate highly interactive holograms and games, allowing users to walk through a digitized work (1RIC 2018).

We live in a rapidly advancing world of data; its value and power relationship are significant in society. CyArk and other digital heritage tools have an ethical and moral responsibility to consider the challenges that arise from their work. If the public digital heritage models are monetized, data points are not public knowledge, and local communities’ voices are not represented. It is Disneyfication; it is theatrics, but it is not heritage in its actuality.

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