

The Application of Decolonial Digital Archaeology: Creating a Set of Recommendations for Future Works



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Grace Shepherd

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Department of Archaeology and Ancient History

Supervisor: Nicolo Dell'Unto

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III. Abstract

Colonialism has been a significant influence on the shape of our modern world. Colonialism creates power structures and social systems that continue to inform contemporary institutions and systems of knowledge production. Archaeology has historically been connected to these colonial structures by privileging hegemonic and Eurocentric epistemological research structures. In efforts to acknowledge these legacy ties to colonial harm and dismantle it going forward, there is increasing questions of how we, as archaeologists, can implement these changes. One of the emerging solutions is decolonial theory. Decolonial theory challenges colonial structures and institutions by dismantling traditional structures of research and refocusing on the benefits and interests of the communities archaeology works with. Digital methods within archaeology make these conversations increasingly nuanced. Common critiques are that the digital development in archaeology is much faster than theoretical and ethical developments. As a result, colonial structures stand to be perpetuated in digital archaeology unless decolonial theory is included.

This research aims to create a set of flexible decolonial recommendations that will make meaningful changes to the future of digital archaeology. This work will approach this goal by using a qualitative study to develop a decolonial analytical framework and applying them to a diverse collection of three case studies. The findings of these case study analyses are that much of the work in digital archaeology needs to reprioritize data governance standards at every stage of research. The outcome of this qualitative research is that decolonial recommendations can be created and still be adaptable to very different archaeological and cultural contexts. This can be done while maintaining data-driven digital research goals.

Keywords: Colonialism, Decolonial Theory, Digital Archaeology, Community Engagement, Archaeological Theory, Ethical Archaeology

Chapter 1. Introduction

Globally, there is a growing trend in public and academic engagement with colonialism and colonial discourse. Not only to acknowledge the colonial past, but to dismantle it in the present. Due to this, understanding how colonialism acts, in its modern form, is evermore important. We as archaeologists, are not outside of discourse, and also have a part to play.

As the study of human past and culture, archaeology is deeply tied with how we understand and form cultural identities (Díaz-Andreu et al., 2005, pp.1-2). Because of this, archaeology was used for colonial control over cultural identity. However, archaeology is more than just a tool for colonial coercion. With the right ethical guidance, archaeology can find a better path forward, one that avoids the missteps of its past (Negro, Gustafson and Marras, 2023, p. 10). Ethics becomes essential here as archaeologists to try to navigate their own agency within a research discipline of historic colonial ties (Tarlow, 2006). Decolonial theory is one answer to call for ethical guidance.

For decoloniality to be impactful, it will have to keep pace with the acceleration of digital methods within archaeology. The advancements in technology are happening so incredibly fast, that there is a need for the theoretical and ethical developments to keep up (Perry and Taylor, 2018). It is here where decolonial theory and digital methodology must overlap.

This thesis aims to support to the growing, overlapping, conversations around decolonial theory and digital methods. This thesis contributes directly by expanding decolonial theory to include the nuance of working in the digital age. Specifically, by creating a set of flexible recommendations for managing digitized heritage data through a decolonial lens. This will supply archaeologists with an ethical foundation to build future research off of.

1.1. Research Background and Context

Colonial studies is an ever-expanding field of study with increasing relevance in our modern political age. The history of colonialism is one muddled by different definitions and interpretations of what colonialism is and how it works. Many scholars debate about the distinctions between imperialism and colonialism, often only distinguishing it based on colonial settlements where a foreign body forcefully assimilates Indigenous people and culture on new land (Kohn and Reddy, 2024).

However, clarifying distinctions between colonial concepts and terminology is also vital to this conversation (Cooper and Brubaker, 2005, pp.4, 16). Settler colonialism, colonialism, and imperialism are different concepts, however, they are often conflated when talking about the subject of decolonization and colonial history (Kohn and Reddy, 2024). Settler colonialism is the direct, most understood iteration of colonialism and imperialism, wherein an external dominant power, colonizes a land

and people foreign to them and assimilates or attempts to eliminate the Indigenous culture to be replaced by its own (Kirkby and Coleborne, 2010, pp.3–4). Imperialism and colonialism as definitions that are often blended together, almost indistinguishably, and depending on the theorist or historian it can have slightly different interpretations (Kohn and Reddy, 2024). The general defining distinction between the two, and the format of understanding for this thesis is, colonialism is the system of control, governance, and domination over an area or people and that system's source of legitimacy, ideology, and military expansion comes from imperialism (Osterhammel, 1997, pp.4–8).

According to modern theorists, colonialism in the post-industrial technological world takes a different form from its past (MacQueen, 2016, pp.29–30). Capitalism is often identified as an extension of the modern colonial interests in economic centralization and global exploitation of land and people for capital gain (MacQueen, 2016, pp.29–30). In other words, traditional colonial powers may not need to directly have influence on a people, political system, or land for them to be impacted by colonialism.

When colonial powers exert control directly, they do so through institutional and social structures, who has power, what is the “valued” epistemology, and how to categorize people based on colonial definitions of identity (Mignolo and Walsh, 2018). Even if not the original conception or anticipated outcome of colonialism, it influences modern political infrastructures, epistemological systems of knowledge production, and social relationships (Mignolo and Walsh, 2018, p. 156). The institutions built during colonial rule continue on even after the originating administrative colonial body ceases to exist (Quijano, 2000, pp. 534-535). The results of modern colonialism in research from epistemic power institutions with non-community researchers, extracting cultural heritage data to reproduce, explain, and publish strictly outsider-interpreted narratives about the cultural history of a descendant community (Alatas, 2024, p. 2). What is meant by institutions here is the hegemonic epistemological foundations and the centralized power that uphold them. In many decolonial and colonial studies, this often refers to the epistemological knowledge production, through avenues such as religion, politics, or education (Mignolo and Walsh, 2018, pp.135–137). These create the sense of identity that leads to those that are within the “colonized” groups of a colonial dominant rule are forced to assimilate or erase what has been deemed as an opposing system of knowledge or ontology (Quijano, 2000, p. 544).

It is also through this spread, that imperialism can affect the sense of nationalism and sense of identity that people under its rule have for themselves and people around them (Kirkby and Coleborne, 2010, pp.3–4). Often cases like this create reactions even after the colonial power is gone that is nationalistic in a new way, and this can easily be influenced by external colonial powers or even influenced by the

colonial power itself after it has left position as dominant ruler (Ashcroft, Griffiths and Tiffin, 2025, p.106).

The way that colonialism impacts people and culture cannot also be reduced to just one form. While it is important to talk about colonialism as an overarching concept, it can also be dangerously reductive, making it imperative to also address it in granularity (Cooper and Brubaker, 2005, p.27). The way it functions economically and within communities is very contextually specific (Cooper and Brubaker, 2005, p.16). It not only acts by assimilation and asserting a dominant culture in a new land, it also does this within its own borders, an area also referred to as the metropole of a colonial power (Turner, 2017, p.767).

The origins of modern colonialism, as it is understood by postcolonial and decolonial theorists, starts in its earliest forms around the 15th century (Ashcroft, Griffiths and Tiffin, 2025, p.103). This is the beginning of the most prominent and strongest examples of the direct settler colonial relationship between colonizer and Indigenous people are found in the North American context. Places such as Canada and America, demonstrate the example of what it looks like for colonial powers coming to a foreign land to aggressively impose their own institutions, ideology, and ontology on Indigenous people and culture (Ashcroft, Griffiths and Tiffin, 2025, pp.20–21). However, outside of the North American context of settler colonialism, there are other examples of colonialism that act in both direct and indirect ways.

While settler colonialism is a well-documented area of colonial studies, it is not the only form of colonialism that has impacted cultures and heritage. Colonialism that is conflated with imperialism or that draws parallels to settler colonial metropolises is also part of these discussions. Jordan and Greece, which will be discussed in depth later in this thesis, both have been impacted by similar forms of imperial rule, the Ottoman Empire (Finkel, 2007). When looking at the impacts of the Ottoman Empire, it is often dependant on the background of the author or historian to determine whether their interpretation of the effects of the Ottoman Empire are colonial. A term used to refer to the Ottoman Empire and its impacts is “borrowed colonialism” (Deringil, 2003, p.312). The actions of the Ottoman Empire throughout its reign show direct parallels to other colonial empires through violent assimilation tactics, genocidal tendencies, and economic power imbalance (Deringil, 2003, p.312). Areas impacted and destabilized by the Ottoman Empire also include areas of Europe, Western Asia, and North Africa. One of the more nuanced examples of the Ottoman impact is that the destabilization from the rule of the Ottoman Empire created a gap for the sense of identity for Greek people which subsequently other political ideologies, British colonialism and political nationalism to try to fill (Alon, 2005, p.213). This also connects archaeology as a colonial tool, that perpetuates socio political narratives, like on specific regions of Greece such as Cyprus (Negro, Gustafson and Marras, 2023, p.8) or in the case of Crete (Papadopoulos, 2005, p.90).

This also created an opening for archaeological ambassadors of other colonial ideologies and institutions, such as British academia. This took advantage of destabilized areas experiencing violent conflict and politically corrupted sense of local identity, through external people buying Greek heritage archaeological sites, for example, the Kingdom of Knossos (Quinn, 2024, p.27).

There is the other important aspect to this conversation around colonisation which is that colonial powers also enact power imbalance and exclusionary systems within the metropole of their governing body, a term referred to as internal colonialism (Turner, 2017, pp.766–767). Colonial ideas not only influence the territories they colonize, but the structures within its own society and people (Cooper and Brubaker, 2005, p.14). These systems do not solely center the exclusion of other cultural or racial backgrounds, but it can also center systems of colonial identity like ideology, class, and gender (Kirkby and Coleborne, 2010, pp.292–293). These exclusionary systems carry into modernity and impact those still residing within colonial metropolises, like the UK. Specifically, areas that have less access to resources and educational institutions due to state-led isolation and systemic inadequacies (Kirkby and Coleborne, 2010, pp. 292-296). Another repercussion of this is that people in these under resourced areas also do not have a direct connection to their heritage or archaeology. This is because the institutions for education and identity through nationalism were used as tools for colonization and this was systemically set up to harm certain groups determined by race, class, religion, and gender (Kirkby and Coleborne, 2010, p.295). In the 19-century, archaeology played a direct role in colonialism, prioritizing a singular, epistemological framework, (e.g. Eurocentrism or other forms hegemonic ontology), to base research structure on (Díaz-Andreu, 2007, p. 8). Archaeology also has exercised its foundations of colonial power through exclusionary tactics within Indigenous and marginalized communities so that only select few have access to cultural heritage and the narrative used to convey it (Negro et al., 2023, p. 9). In this way archaeology became instrumental for rejecting narratives originating outside the centres of colonial power and its valued epistemology. This concept also translates beyond just those outside of colonial powers, but those within them through constructs such as class and political affiliation (Cooper and Brubaker, 2005, pp.14-15). With only a select few, even within the European colonial metropolises, being considered a perspective valued in epistemological institutions (Quijano, 2007, p.168).

Post-colonial studies have led to the expanding discussions on the nuanced impacts of colonialism and the different iterations of colonialism outside of just traditional settler colonialism (Young, 2020, p.35). These recent expansive understandings are not only an academic pursuit but one that is a current political pursuit. These academic and political conversations are primarily led by those who are actively, and historically, marginalized or harmed by colonialism (Gupta et al., 2022; Perry and Taylor, 2018). It is because those leading these conversations also exist as people

who still feel the impacts of colonization, it is important the focus also turn to how we all move forward with decolonization (Tuhiwai Smith, 2021, p.28).

Decolonial theory, also referred to as decoloniality, is the process of going against colonial powers that universalize, hegemonize, and suppress multiple perspective, multi-epistemological, systems (Herrera Malatesta et al., 2025; Mignolo and Walsh, 2018). Decolonial theory, at its foundation, calls for the inclusion of historically marginalized voices to have an equal level of priority at the “table” as other stakeholders within academia and the larger marketplace of ideas (Lemos et al., 2025, p. 299). Too often, the dominant voices in the overall discussion on decolonial theory in archaeology are often led by researchers who are not members of an Indigenous or marginalized community (Alatas, 2024, p.1). This can homogenize or reduce the understanding of what decolonial theory is (Alatas, 2024, p. 1), as it is supposed to be equitably multi-perspective.

The conversations around colonialism in its modernity is often found within the context of Indigenous research, as the subject of modern Indigenous experience is greatly impacted by colonial history (Tuhiwai Smith, 2021, p.22). Indigenous archaeology is the discipline of archaeology that works with Indigenous heritage data, listens to descendants of the studied culture, and includes Indigenous scholarship within archaeology (Londoño, 2021; Nicholas and Watkins, 2014). It is consistent practice for the decolonial archaeology and Indigenous archaeology to be inseparable as researchers understand that Indigenous ontology is part of Indigenous archaeology (Lemos et al., 2025, p. 296). Researchers within Indigenous archaeology approach the conversation of community benefit and positive outcomes for research overall as attainable if the researchers use a decolonial lens (Lemos et al., 2025, p. 293). This is because the decolonial lens deconstructs the colonial ties to research, and subsequently mitigating its impact on Indigenous archaeology.

Decolonial theory leads researchers to deconstruct how they approach community stakeholders affected by their research (Herrera Malatesta et al., 2025, pp. 5-6). What is meant by community stakeholders and descendant communities is those individuals who have vested interest in the activities surrounding the community and the archaeology that affects it. This can be a very diverse, nuanced definition of community as well. When looking at the history of colonialism, different regions with different colonial relationship affect how the community sees themselves and how they approach their connection to their heritage (Atalay, 2012, p.25). The descendant communities are also related to this in that they have vested interest in the archaeology of a culture that they have descendant ties to, either genetically or culturally. The point of decoloniality is that every stakeholder involved in the research has equitable voices in the construction of research (Herrera Malatesta et al., 2025, p. 6). Everyone, including community stakeholders, should be involved from the beginning and can contribute to constructing the research in the interests of their community. It is also important to note here in this discussion on stakeholders that

their inclusion in research can look different depending on the colonial relationships at play, both historic and modern. While it is important to discuss the granularities of community and stakeholder relationships, as defined by colonial histories, it is also important to look at the general approach learned from other community relationships that archaeology can use for decolonizing its approach (Atalay, 2012, pp.5–7). Later in this thesis, specific cultural and regional stakeholder relationships will be explored as they relate to case studies. See *Table 1* for examples of what is meant by stakeholders, their role in research, and what concerns the decolonial lens in regard to this relationship between stakeholder and data. Table 1 includes the general relationships between stakeholders and research, tables with regional and context specific relationships is addressed further in this thesis.

Table 1- Examples of stakeholders generally involved in archaeology

Stakeholder	Relationship to Data	Decolonial Lens
Indigenous community member/Descendant community member/related community member	Cultural, ontological, spiritual connection to the data and traditional knowledge keepers, geographic or economic ties to the archaeological site.	They must not be excluded from research. This in turn will prevent harm from their lack of control over archaeological and political narrative and sharing of heritage data.
Archaeologist	Researcher	They cannot solely have input over the research structure when other stakeholders are involved, like community. They must not exclude other perspectives and need to prevent perpetuating harm done by colonial narratives of community identity and heritage
Research Institution	Deciding power over data and research	The institutional control and interests must be as valued as community control and interests.
Members of the public	Consumer of disseminated information and narratives	Their must not be a reductive narrative to be absorbed nor room for misleading reinterpretation of simplified archaeological data dissemination.

While decolonial archaeological research is often in conjunction with Indigenous archaeology, it cannot be the only focus of decolonial conversations (Lemos et al., 2025, pp. 295-296). That is why it is also the point of this research not just to use Indigenous archaeology as the focus area where these recommendations can exclusively be applied. It is anticipated that these recommendations can be applicable to any area of digital archaeology regardless of culture, history, or era. It is the perspective of this paper, that the purpose of decolonial theory is to deconstruct the ways in which colonialism still influences academic research conduct. By doing this, archaeological research can be more fruitful, include depth, and a larger picture of past contexts (Lemos et al., 2025, p. 296).

1.2. Research Gap

The research gap for decolonial theory being applied to digital archaeology, is that it doesn't have an easily adaptable framework. Currently the focus of decolonial frameworks are primarily on contexts that include Indigenous people who have been subjected to colonial harm. While important to the discourse on decolonial theory, these frameworks do not offer components applicable to a broader range of contexts. Specifically, there needs to more frameworks with guidelines that focus, at the institutional level, how we decolonize our research practice in most contexts (Meyer, A., 2022, p.74)

One of the more prominent decolonial frameworks created to be used in multiple disciplines of research are the CARE principles. The CARE principles were documented with an explicit focus on protecting digitized Indigenous data to fit Indigenous sovereignty and data rights, as outlined by the UN Declaration of the Rights of Indigenous Peoples, UNDRIP (Carroll, et al., 2020, pp. 1-4). These CARE principles are now being cited in some of the current research focusing on how to apply decolonial theory to digital archaeological methods. This is a great foundation for the decolonial approach to digital archaeology, but, CARE only loosely touches on heritage data in its framework (Carroll, et al., 2020). This, in turn, misses a lot of the nuances and contextuality that comes with archaeological heritage data in digital spaces. CARE also only pertains to the Indigenous context and excludes other communities that may be affected by the colonial ties to archaeology.

This gap is apparent in contemporary digital archaeology. In some cases, there are attempts to rectify this by revisiting digitized archival archaeological data and recontextualizing the research questions to fit a decolonial lens. These half-measures often fall short (Gupta, N. et al., 2023, p. 77), which furthers the need for research that applies a decolonial lens at the outset. Applying decolonial theory as an afterthought creates issues managing community stakeholder input as it should be engaged with from the beginning, embedded in the research structure.

1.3. Research Aims, Objectives, and Questions

This thesis aims to contribute to the discourse on the application of decolonial theory in digital archaeology. Within digital archaeology, particular attention will be made to developing technological methods such as geovisualization and 3-D visualisation of cultural data. This thesis will explore whether a set of recommendations can be constructed from producing an operational decolonial analytical framework using case study analyses.

This thesis addresses the following research questions:

1. Can a set of flexible decolonial recommendations for digital archaeology be created?
2. What are the implications of creating a set of flexible recommendations for the future application of decolonial digital archaeology?

The objectives are:

- Examine the current discourse on decolonial theory and its application within archaeology
- Identify current gaps between decolonial theory and digital archaeological methods
- Develop an analytical framework for evaluating other research through a decolonial lens.
- Use the decolonial analytical framework to analyse specific projects.
- Synthesize the findings of the analysis into a set of flexible recommendations for the future application of decolonial theory on digital archaeology
- Reflect on the implications of these recommendations for future research

The hypothesis for the outcome of this thesis is that it is possible to create these flexible recommendations through decolonial analysis of case studies, without losing the foundations of decolonial theory through standardization. However, the emphasis here is that this only is possible if the recommendations are adaptable to fit the individual, cultural, and political contexts for the areas it works in. It is also expected that the implications of this will be positive outcomes through the accessibility and collaborative nature that decolonized digital archaeological data practice and research can bring with it.

1.4. Research Significance

The significance behind this research is that the theoretical framework has not caught up with the current developments in digital methodologies. Existing solutions, such as CARE fall short, as discussed in this thesis. The applications of decolonial research prove to have positive outcomes (Lemos et al., 2025, p. 293). Included in these outcomes is the overall analysis and outcome of the research being holistically

developed with multi-faceted perspectives to create a deep, nuanced understanding of the past (Lemos et al., 2025, pp. 298-299).

Decolonial theory offers insight into how research can mitigate the future harms of colonialism while engaging emerging methodologies such as digital tools. It can help deconstruct the ways in which hegemonic systems of knowledge production perpetuate harm through physical and virtual methods. Not only hegemonic systems in general, but the ones connected to archaeological influence of heritage and identity.

1.5. Thesis Structure

This thesis structure begins with an overview of theory on decoloniality, beginning from foundational publications. The review will also extend up until recent examples of decolonial theory, specifically within the field of archaeology and sub-discipline of digital methods. This will provide an overview of the evolution of decoloniality and its current adaptations to the digital methods within archaeological research.

Grounding the theory overview, this thesis will go on to develop a decolonial analytical framework. This analytical framework will be substantiated by synthesizing key principles found in digital decolonial research projects. These selected decolonial heritage projects, used to develop the analytical framework, are identified by their research structure using a decolonial lens and their digital methodology. Based on the synthesized key decolonial principles, the analytical framework will be a crafted list of decolonial criteria that can be applied to the case study analyses.

The framework will be used to analyse case studies: published research in digital archaeology. The case studies used in this thesis are identified by their community engagement, collaborative research aims, and 3-D visualization and geovisualization methods. This application will show alignments and gaps between the digital archaeology practice of the cases and the decolonial principles of the framework. The findings of this analysis will be evaluated to see the extent to which flexible decolonial recommendations can be developed for broader applications within future digital archaeology. To be broadly applicable, they must be flexible for cultural and archaeological contexts. The thesis concludes by discussing the answer to the second research question on the implications of these findings for future research.

1.6. Conclusion to Introduction

This chapter has introduced the key concepts essential to this research and its questions. Specifically, how decolonial theory and colonialism are defined and how they pertain to the discipline of archaeology and its digital sub-discipline.

Through this discussion, it has also identified the gaps between the decolonial theoretical application and digital archaeology methods. Filling this gap is significant to the empowerment of those harmed by colonialism and prevent those who would

be harmed in the future. This thesis aims to address these gaps through its research questions. Specifically, can synthesis create a set of recommendations for operationalizing decolonial theory in digital methods and what are the implications of this?

The following chapter presents a theoretical review of existing literature on decolonial theory and its applications in archaeology and digital archaeology.

Chapter 2. Decolonial Theory

This chapter aims to provide an understanding of current theoretical needs surrounding the expansion of decolonial perspectives into heritage studies as well as digital methods in archaeology. As digital technologies continue to shape archaeological research, there is a corresponding need for theoretical development to evolve alongside technological advancement so that research not only adopts new methods, but also critically considers their implications (Huggett, 2015, pp. 86–89). This includes questions surrounding the management, ownership, and accessibility of heritage data.

This chapter will establish the theoretical foundations this thesis uses by examining decoloniality and its emerging applications in digital archaeological contexts. This discussion will identify gaps that currently exist between decolonial theoretical discourse and the implementation of digital archaeology. These current discussions surrounding decoloniality and archaeology will be used to establish the theoretical basis for creating an adaptable set of recommendations for future digital archaeology.

2.1. Origins of Decolonial Theory

Decolonial theory, in its contemporary academic form, largely emerged through the work of Aníbal Quijano. Quijano's main argument is that colonialism still exists in the power structures it creates, even after its administrative body no longer exists (Quijano, 2000, pp. 534-535). Colonialism continues to operate through its inherited classification systems such as race, knowledge structures, and social status. Eurocentric epistemologies have historically been positioned as universal systems of knowledge, resulting in the marginalization of alternative ontologies and perspectives (Quijano, 2000, p. 542). Colonialism blends cultures to fit one dominant, Eurocentric culture. In this blending, it meets the hypothesized "ideal" vision of the globalized, modern world (Quijano, 2000, pp. 542-543). In defining modern colonialism, Quijano challenges the idea of colonialism only acting in a past tense. He creates new standards for how to identify colonialism in our modern world, and subsequently challenge it.

Building on the ideas of Quijano, Walter D. Mignolo expands his decolonial discussion through the concept of "delinking". Mignolo uses the concept of modern colonialism to build the reactionary argument which advocates for separating knowledge production from dominant, Eurocentric, epistemological systems (Mignolo, 2007, pp. 452-453). He encourages this delinking through the empowerment of cultural identity, and for marginalized communities to use their own ontologies (Mignolo, 2007, p. 453). Once epistemological institutions, and individuals within them, deconstruct their ties to colonial knowledge systems, then we can achieve "pluriversality as the universal goal" (Mignolo, 2007, p. 497).

Pluriversality is the repeating concept used by many decolonial theorists. Pluriversality is the equity of diverse knowledge systems without subjugating them

under one universal standard knowledge system. It also means that plurality in an academic context ensures multi-ontological approaches are structurally part of research, not just an after-thought (Wylie, 2015).

2.1.1. Semantics Within Decolonial Theory

Decolonial theory has often been conflated with other related disciplines, such as post-colonial theory. Decoloniality is not just the act of deconstructing Euro-centered epistemological systems. It is also the inclusion of multi-perspective, pluralistic knowledge systems going forward (Mignolo and Walsh, 2018, p. 136). Decoloniality is also the general delinking from any hegemonic knowledge system (Hamilakis, 2025), not just the Eurocentric epistemologies. Post-colonial theory, while still a highly debated terminology, is interested in understanding the legacy of colonial systems and its impact of social, cultural, and political structures (Ashcroft, Griffiths and Tiffin, 2025, pp. 265-267).

2.2. Decolonial Archaeology

The concepts surrounding colonialism, delinking, and pluriversality became increasingly relevant within archaeology because of the discipline's historical relationship with colonial institutions and knowledge production (Díaz-Andreu, M., 2007, p. 8). Archaeology has frequently been critiqued for privileging Western interpretations of the past while excluding or marginalizing descendant and Indigenous perspectives. As a result, decolonial approaches within archaeology increasingly sought to challenge these traditional research structures and reconsider how archaeological knowledge is produced and shared. Because of these historic ties and the influence on Indigenous archaeology, decolonial archaeology is often closely associated with Indigenous archaeology (Londoño, 2021, pp. 387-389).

In works like *Indigenous archaeologies: decolonising theory and practice*, we start to see the call for archaeology tied to Indigenous peoples of North and South America to decolonize the way in which it conducts research (Smith and Hans Martin Wobst, 2005). Particularly, one of the main arguments of this is changing the approach to Indigenous archaeology to prioritize the input of members of the descendant communities (Smith and Hans Martin Wobst, 2005, p. 6). Descendants being those tied to the archaeology, either culturally or genetically. The authors argue for researchers to reconsider the way they conduct themselves and uphold colonial systems. Instead, they ask researchers to collaborate equitably with communities in the research and to uphold their traditional knowledge systems as equally valuable, epistemological entities within it.

2.2.1. Differentiating Collaborative, Community-Engaged Archaeology, and Decolonial Archaeology

Community-engaged, collaborative, and public archaeology are often conflated both with one another and with decolonial approaches to research. The distinction between engagement and participation is often subtle because levels of community inclusion exist on a spectrum (Montgomery and Fryer, 2023). While one approach

cannot necessarily be considered superior to another, varying levels of inclusion influence the degree to which community interests are integrated into research design (Montgomery and Fryer, 2023). However, none of these approaches are inherently decolonial. Community, collaborative and public archaeology do not necessarily incorporate anti-colonial power structures or colonial harm reduction into research design and methodology (Lemos et al., 2025, pp. 292–294). These are essential to the decolonial approach.

Archaeology more broadly has increased emphasis on collaborative and community-led approaches (Wylie, 2015; Montgomery and Fryer, 2023). These titles alone do not necessarily constitute a decolonial practice. Decolonial approaches seek not only to increase participation but also to transform the structures through which knowledge is produced. This includes considerations of power relationships, community authority, and how research design incorporates pluralistic perspectives. Alternatively, assumptions surrounding unrestricted access to heritage data are not inherently decolonial and raise questions regarding ownership and control over cultural information (Fredheim, 2020, pp. 5–6).

2.3. Decolonial Digital Archaeology

Digital archaeology primarily focuses on the use of digital tools within archaeological research and the theoretical approaches used to analyse and communicate information about the human past (Morgan, 2022, p. 214). As a methodological sub-discipline of archaeology, it has only recently begun engaging with theoretical frameworks, like decoloniality, that critique systemic power structure and hegemonic epistemology (Morgan, 2022, pp. 221-224). A fundamental component of digital archaeological research concerns the governance and standardization of digital infrastructures. The nature of digital archaeological data introduces additional layers of complexity into these discussions. Particularly, regarding how decolonial frameworks can account for the nuances of spatial data within digital archaeology contexts. Within digital archaeology, decolonial approaches critique conventional forms of data governance by questioning practices surrounding data management, ownership, and accessibility of heritage data (Gupta, Blair and Nicholas, 2020).

In the Indigenous digital archaeology context, CARE principles have become commonly adapted to fit the research structure and data governance practice. The CARE principles are a set of ethical guidelines to promote community led data governance in research involving Indigenous people. To understand what the specifics of these principles, see *Table 2* below for a description of CARE principles. They are focused on Indigenous data sovereignty and have been cited for different scientific and research contexts (Carroll et al., 2020). One of those contexts more recently are those within digital archaeology (Gupta et al., 2023). This adaptation highlights the prioritization of community interests, community-led data governance, and equitable collaborative work on heritage research (Gupta et al., 2023).

Table 2: CARE Principles and Their Core Components (adapted from Carroll et al., 2020)

CARE Principle	Core Focus
Collective Benefit	Inclusion, community engagement, equitable interests
Authority to Control	Recognizing community rights, Indigenous right to data, Indigenous right to data governance protocols
Responsibility	Trusted relationships, enhance digital literacy in Indigenous community, include language and ontology
Ethics	Mitigate harm and ensure benefit, justice, future implications

The recent adaptation of CARE principles within First Nations archaeology in Canada demonstrates how decolonial approaches can lead to community-participatory projects that prioritize community interests (Gupta et al., 2023). Gupta and colleagues additionally frame the digital sphere through a decolonial lens by emphasizing that heritage data should be governed according to principles of community sovereignty and authority (Gupta et al., 2023).

Other recent applications of decolonial digital archaeology focus on regenerative, sustainable, and ethically informed approaches to data-driven research (Demilio and Castro, 2025). Demilio and Castro challenge the assumption that decolonial approaches apply only to specific contexts, such as Indigenous archaeology, and instead argue for their broader relevance across archaeological practice. They additionally emphasize that decolonial research can both prioritize data preservation and continually strengthen relationships between researchers, institutions, and communities. Their argument summarizes with the sentiment that digital methods can only meaningfully expand understandings of the past through decolonial, equitable collaboration with every stakeholder (Demilio and Castro, 2025, p. 23).

2.4. Gaps between Theory and Digital Methods

As discussed in the previous section, theory work in decoloniality is well developed and underway. However, theorists are already identifying a lack in application. The following three sub-sections dissect the areas in which theorists and digital archaeologists explain why there is a lack in application. These explanations are concerned with the following gaps:

- Technological prioritization over theory
- Structural and institutional barriers
- Data infrastructure and heritage complexity

2.4.1. Technological Prioritization Over Theory

The speed of theoretical development in archaeology leaves much to be desired, especially when compared to technical developments. Digital archaeologist, Jeremy Huggett, writes a literature review of digital archaeology publications and meetings over the last 50 years (Huggett, 2024). Through this review, Huggett identifies that

there are significant advancements in the technological interventions of archaeological research. However, the theoretical discussions on how and what to do with this technology have left some archaeologists critical of where digital archaeologists are consolidating their efforts (Huggett, 2024, p. 328). Some critical researchers want fellow digital archaeologists to contribute equally to the theoretical development, as they do to digital infrastructure and technology (Perry and Taylor, 2018, p. 11). These researchers suggest actions to combat this gap through (Perry and Taylor, 2018, p. 15):

- A workflow that allows for theoretical introspection.
- Fostering critical and theoretical engagement in research through creative dissemination.
- Designing research that forces attention to ethical, structural, and even political implications of the results and work

Huggett also highlights those with specific critiques of digital methods, specifically geovisualization tools like GIS, and the pattern of lacking theoretical applications within research focused on spatial data (Huggett, 2024). Other researchers go so far as to criticize the sole focus without a theoretical perspective on “big data” and spatial data. They refer to this as “dehumanizing,” when our goal as archaeologists is to understand past human interaction with landscape and spatial movement (Huggett, 2024; Hacıgüzeller, 2012; Kempf and Günther, 2023).

2.4.2. Structural and Institutional Barriers

Individuals from marginalized communities are largely doing the work in digital theoretical development. While this has an opportunity for their perspectives and experiences to be represented, it also places the weight of the intellectual and emotional labour associated with this work, solely on them (Gupta et al., 2023). Although these decolonial theory and digital method conversations increasingly appear within publications, their suggestions for future work are not always put into practice (Perry and Taylor, 2018; Costopoulos, 2016; Gupta et al., 2022). While this lack of practice could be on the researchers, it seems apparent that institutional barriers also play a huge part here.

Specific gaps also exist between theories on colonialism and digital archaeological methods. Gupta and colleagues identify a divide between researchers focused on colonial power structures and those primarily developing digital tools (Gupta et al., 2022, p. 2). Particularly, those theories associated with politics and colonialism (Gupta et al., 2022; Perry and Taylor, 2018). Systemic barriers for marginalized groups are also a huge factor here when we discuss who is the researcher putting in the work and how they are accepted into academia (Gupta et al., 2022, pp. 1-2). Indigenous, racialized, and other historically marginalized researchers frequently lead the discussions regarding politically tied theory (Gupta et al., 2022; Perry and Taylor, 2018). Yet, these are the individuals who receive unequal resources and opportunities within these research institutions (Gupta et al., 2022).

2.4.3. Data Infrastructure and Heritage Complexity

There is a large focus on big data and digital infrastructures within decolonial archaeology. This focus has been shown to leave less room for the human cultural aspect of the data that they collect, with some calling it “dehumanizing” (Huggett, J., 2024; Hacıgüzeller, P., 2012; Kempf and Günther, 2023). Some responded to this with the summation that researchers within the digital discipline do not have the motivation to structure research to include the introspection, criticality, and nuances of collecting digitized heritage data (Perry and Taylor, 2018, p. 15). This dehumanization is also related to the critiques that decoloniality has of digital archaeological practice.

Digitized heritage research infrastructure also shows a gap between decolonial theory and digital methods. Archaeology often uses commercially available, “point and click” software for managing digital heritage data because of efficiency and ease of implementation (Gupta, 2020). Because of this, there is often a lack of flexibility needed to include exceptional, culturally specific forms of data. Subsequently, this means they cannot easily fit within the traditional digital format systems (Gupta, 2020, p. 18; Gupta *et al.*, 2022, p. 29). This leads to the researchers into the dilemma of choosing between adapting the infrastructure to the data or adapting the data to fit the infrastructure. This choice is difficult for any one researcher to make, but by creating theoretical pathways that also include ethical standards for conducting inclusive digital heritage research, it can be an clearer which decision to make.

2.5. Decolonial Theory Conclusion

This chapter examines the theoretical foundations of decoloniality and its subsequent development within archaeology. It further expands on this in digital archaeological contexts. There are key themes that emerge in the decolonial discourse;

- Dismantling hegemonic knowledge systems
- Incorporation of community interests
- Pluralism

These discussions also identified the significant gaps between theory and digital practice. These gaps become particularly apparent with institutional barriers, data governance issues, and low priority for theoretical development. These gaps are not just identified by those in the decolonial discipline, but also in digital archaeology as a whole.

This theoretical understanding helps to establish the conceptual foundations for the analytical framework that will be constructed in the following chapter. It is the foundations of the understanding of decolonial practice in archaeology that will be used to establish the analytical criteria in this framework.

Chapter 3. Materials and Methods

In this chapter, an analytical framework will be developed. This framework will provide a foundation for analysing research through a decolonial lens. The analytical framework will be derived by synthesizing the key decolonial principles from selected sources. In Chapter 4, the decolonial framework will be used to analyse three case studies, and the results of that analysis will be discussed in Chapter 5.

Deriving the framework, analysing case studies, and discussing the results will be done with a qualitative research approach. This methodology was chosen due to the theoretical nature of this research (Creswell and Creswell, 2018, pp.183–215).

Rather than adopting a single predefined decolonial framework, this study synthesized key themes across existing applications of decolonial digital heritage research. As part of the qualitative approach, these key themes from the selected sources were then synthesized into the analytical criteria for the framework (Jabareen, 2009). Due to the selection process for these sources, the resulting analytical framework is applicable for most digital archaeological contexts. These contexts include digital archaeological methods like geovisualization of spatial data and 3-D visualizations. These types of data are particularly nuanced and require careful consideration in the construction of a decolonial framework (Gupta, Blair and Nicholas, 2020; Huggett, 2024).

3.1 Research Design and Methodological Approach

This research uses a qualitative research method. This approach was considered appropriate because no standardized decolonial analytical framework currently exists for most contexts of digital archaeology. The qualitative methodology creates a research structure to develop analytical frameworks by identifying and organizing key concepts found within prior decolonial research (Creswell and Creswell, 2018, pp.183–215). Therefore, synthesizing key concepts from previous decolonial applications. This will supply a structured means of operationalizing decolonial theory for case study analysis (Jabareen, 2009). The promotion of a concept to a key concept is based on alignment with the decolonial theoretical background established in Chapter 2. The framework that results with from this synthesis will be made of five key criteria.

The analysis in chapter 4, will deal with applying the framework to three case studies. The case studies are evaluated through the decolonial analytical framework for points of divergence and convergence. From this, I hope to see a pattern amongst what criteria are easily applicable to research from different cultural and regional contexts. In chapter 5, the discussion of these patterns will then influence whether a set of decolonial recommendations for future digital archaeology projects can be created. See *Figure 1* below for depiction of the research design of this project.

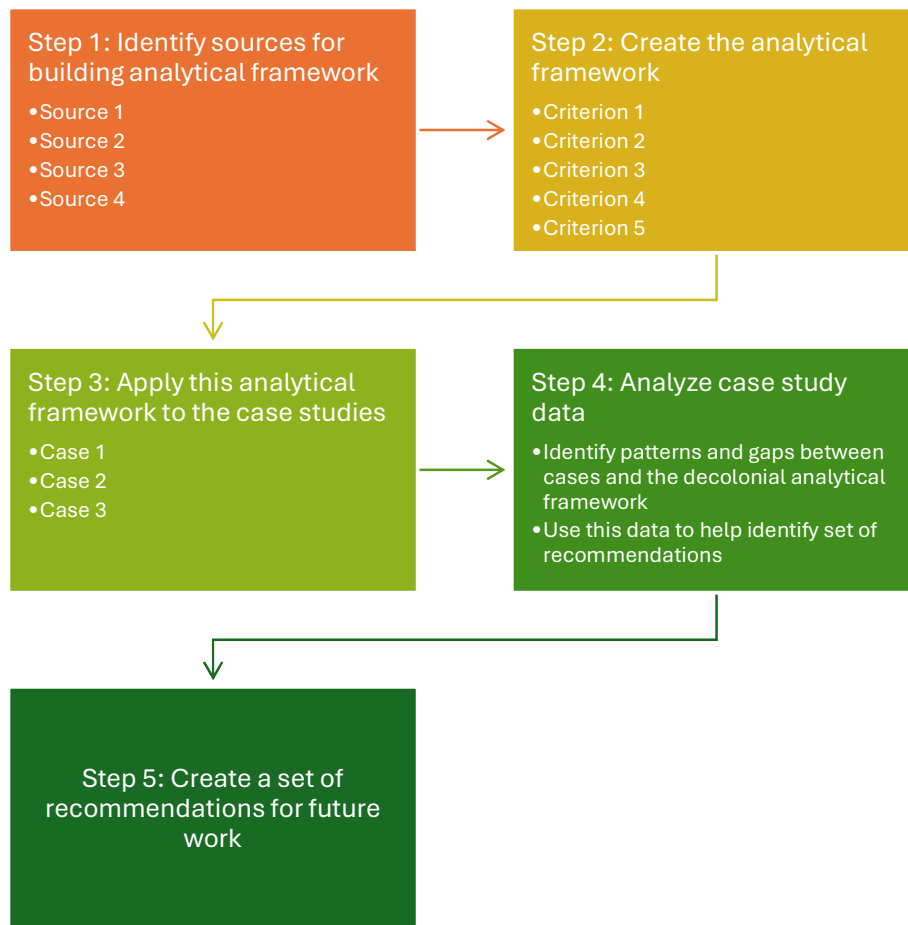


Figure 1: Research Design

3.2.1 Materials for Building Decolonial Analytical Framework

The materials for this study were gathered by reviewing literature on recent applications of decolonial digital research. This review identified four sources with key principles that could be synthesized to build a decolonial analytical framework. There were four guiding selection criteria used in the process of identifying potential sources for the synthesis:

1. Does the source explicitly identify decolonial theory as a foundation for the research? If not, do they apply the fundamentals of the decolonial approach, e.g. against exclusionary tactics of colonial institutions?
2. Does the source include digital heritage data or methodology in their research design?
3. Does the source include the culturally-specific nuances of different ontological, non-Western perspectives in the digital infrastructure?
4. Does each source vary in archaeological or cultural context? i.e., Is the cultural/ contextual scope of all sources diverse enough?

These guiding selection criteria were crafted from the theoretical discussion in Chapter 2 and common considerations noted in decolonial discourse. These selection criteria incorporate core values of decolonial theory. The first selection criteria either picks sources that specifically identify decolonial theory or incorporate it into the research structure.

Selection criteria two, optimizes for decolonial work in a digital medium. Selection criteria three, seeks sources with culturally-specific nuances in its digital infrastructure. Selection criteria two and three ensure the resulting analytical framework is also applicable to decolonial digital spatial infrastructure and 3-D visualizations. As these fundamentally need to be considered in future decolonial digital archaeological research (Gupta, Blair and Nicholas, 2020).

Selection criteria four required that the sources include varied contexts. This ensures that the framework incorporates diverse language and perspectives. This connects back to decoloniality not solely being a critique of Western hegemonic colonial epistemology (Hamilakis, 2025). Decolonial applications must be able to fit any context that supports the deconstruction of a hegemonic epistemological and colonial rule over any community.

After applying these four selection criteria to decolonial research, four sources were identified for developing the analytical framework. See *Table 3* below for these 4 sources.

Table 3: Sources used for constructing the decolonial analytical framework

Source	Title
Source 1	<i>The CARE Principles and the Reuse, Sharing, and Curation of Indigenous Data in Canadian Archaeology</i> (Gupta et al., 2023)
Source 2	<i>Digital Methods in Indian Heritage Data Collection</i> (Gupta et al., 2024)
Source 3	<i>The Pragmatics of Decolonizing Metadata</i> (Hodge, 2024)
Source 4	<i>The Biocultural Labels Initiative: Supporting Indigenous rights in data derived from genetic resources</i> (Anderson and Hudson, 2020)

All four of these sources not only meet the guided selection criteria above, but they also all identify key concepts for the application of decolonial theory in digital heritage research. These key ideas are what will be used for constructing the decolonial analytical framework.

3.2.2. Materials for Case Study Analyses

In chapter 4, the case study analysis will be done on three selected cases. There are three main decision criteria used in choosing case studies.

- Digital methodology includes geovisualization or 3-D visualizations.

- Each case is explicitly not decolonial but incorporates decolonial-adjacent language like collaboration, community engagement, or public engagement, in their research structure.
- Each case must be from different archaeological contexts and regional areas, outside of Indigenous North American contexts.
- All cases must have colonial relevance to the decolonial research, meaning it has been influenced in some capacity, directly or indirectly, by colonial ideology, systems, or power

These case studies were also selected because of their emphasis on digital methods. There is a need for additional decolonial methodologies within digital archaeological research. The applicability of the decolonial lens is not limited to the ethical interactions with physical artifacts. There are institutions which have ethical frameworks for digitized collections, including artifacts and historic photos. However, this research aims to bring more nuance to decoloniality in digital heritage data management.

Digital heritage data also includes digitized spatial data and 3-D data. Spatial data in the archaeological context, refers to any data generated from high density survey methods (HDSM) and are generally interpreted to understand past human interactions with landscape and environment (Klehm, 2023). Its role in digital spaces, as well as the interaction with the institution and community, acts very different than other forms of heritage material. This type of data is not always protected by existing data governance measures (Gupta, Blair and Nicholas, 2020; Klehm, 2023). Thus, all of the case studies selected deal with digital methodologies that generate heritage data, including geovisualization and 3-D visualizations.

The selected case studies were identified because of their diverse cultural and archaeological contexts. Each case includes a collaborative or community-engaged approach that shows a prioritization of community and public participation. As mentioned in chapter 2, many similarities in the semantics and goals of research are found in decolonial archaeology and collaborative, community-engaged archaeology.

Collaboration and community-engaged, remain a unified quality across the case studies. This quality is necessary for them to be compatible with decolonial theory. This leads back to the discussion on how collaborative research can be improved with the application of decolonial theory to research structure. It was mentioned in the theoretical background that much of the work on decoloniality has been from individuals from historically marginalized communities (Gupta, N. et al., 2023, pgs. 84-85). This collaborative research is an example of how many instances of research may have the intention of undoing harm from colonial research, but may be missing the mark. For example, making it so the heavy lifting is solely on the community members involved or that the community collaborators don't actually have equitable contributions at every stage of research (Gupta, N. et al., 2023).

It was also important in the identification of cases, that they aren't solely focused on Indigenous archaeology in the North and South America. This is not because they are less valuable case studies or do not contribute valuable data to the discourse. It is because this work is interested in showing the applicability and benefit that decolonial theory has to offer broader archaeological, cultural, and colonial research contexts. While these cases may appear archaeologically unrelated, their cultural and historic contexts are inseparable from past colonial impacts. These varied cultural contexts can offer insight on how decoloniality is applicable, at a macro and granular scale, through a generally adaptable recommended research foundation.

3.2.2.1. Case Study 1

The first case chosen for analysis is *The Kingdom of Copper* by Howland et al. (2020). The archaeology of this project takes place in Faynan, Jordan. The archaeology of this site is dated to Early Iron Age Jordan, (ca. 1200–800 BC). The research is led by researchers who collaborate from multiple institutions, based out of the USA, University of California San Diego (UCSD) and the Jordanian Department of Antiquities. The researchers involved in the excavation have named their research team Edom Lowlands Regional Archaeology Project (ELRAP) to incorporate the collaboration between the different stakeholder institutions and its researchers. The lab that processes most of the archaeological material is the UCSD Levantine Archaeology Laboratory. See *table 4* below for breakdown of the identified stakeholders associated with the Kingdom of Copper project, this is identified through Howland et al. (2020) and Howland et al. (2021).

Table 4: Stakeholders identified in the Kingdom of Copper case study

Stakeholder	Relationship to Data
Bedouin tribal people	They are the traditional inhabitants of Faynan and have cultural, economical, and geographical ties to the site and its data, they are also listed as team members of ELRAP and are involved in data collection and survey on site.
Faynan Museum/Jordanian Department of Antiquities	Acts on behalf of the Jordanian Department of Antiquities (as the museum was created by this department), and is one of the primary liaisons that work to disseminate the archaeological information from the site to visiting tourists and the local Bedouin tribal community members.
ELRAP Researchers	This is mixed team of researchers in charge of the excavation and data collection at the Kingdom of Copper site. Primarily the researchers from the Jordanian Department of Antiquities and the University of California San Diego are the primary collaborators of this research team.

University of California San Diego	This is the primary university/institution that houses the archaeological research, analyses, and publishes the information from the researchers at the archaeological site.
Members of the public and tourists	Those who interact with the disseminated information through the tourism industry related to the Kingdom of Copper site via the Faynan Museum or may interact with the disseminated publications.

This work was selected in two fold. Firstly, because it has relevance to decoloniality, and secondly, because it has an emphasis on public and community engagement through disseminating the geovisualization of spatial data from the research. The colonial context of this case is based in Jordan which was formerly under British colonial rule, referred to as Transjordan at this time, through the Mandate system, 1921-1947, (Wilson, 1990, p. 3), and Ottoman rule over, the territory that is now presently called, Jordan before that is 1516– 1918 (Finkel, 2007, pp. 560, 572). The late Ottoman Empire had begun more campaigns in an attempt to “modernize” or “civilize” tribal people according to their standards (Deringil, 2003, p. 317). This included attempts to go into Bedouin nomadic communities and restrict their movement and grazing across traditional lands, as well as attempting to assimilate them into the population through collecting census data that was considered “alienating” to tribal people (Deringil, 2003, p.321-322). Not only did the Ottomans have an impact on tribal people, but the British colonial rule of Transjordan, also had impacts on the Bedouin tribal people, also felt still today. This included British colonial impacts on Bedouin identity through the integration of tribal people into the newly formed nation-state and the British colonial formed military that transformed tribal identities and traditions into that which was dictated through the military and originating in British colonial values (Massad, 2001, pp. 101-102). These impacts carry on in to the modern day, as Tribal people face exclusion from their traditional lands through colonial imposed territory borders and forced separation from traditional lifeways and identities (Abu Hamdan and Mason, 2026, pp.2–3). However, since this colonial context is not a settler colonialism, it can bring more nuance to the conversation regarding the expansion of decolonial archaeology.

This case study, while connected to colonialism historically, also does not include the perspective of decolonial theory in its approach. This work highlights the overall push in archaeology to develop technology towards a more accessible, engaging, and sustainable digital medium for dissemination. This analysis highlights how the authors may be able to add decoloniality to their work in conjunction with their overarching goal of community and public engagement.

3.2.2.2. Case Study 2

The next case study is *iGuide Knossos* based on Farazis et al. (2019). For background on the research of this project, this 3-D reconstruction project is led by researchers funded under the Integrated Systems Laboratory within the National Centre of Scientific Research "Demokritos" also referred to as "NCSR". This research falls under the supervisory jurisdiction of the General Secretariat of Research and Innovation (NCSR, 2017). This reconstruction is based on data extracted from the archaeology of the Kingdom of Knossos located on the island of Crete. See *table 5* below for a breakdown of the identified stakeholders associated with the *iGuide Knossos* project, this is identified through Farazis et al. (2019).

Table 5: Stakeholders identified in iGuide Knossos case study

Stakeholder	Relationship to Data
Local community of Crete	These are members of the community related to the archaeology at Knossos on Crete geographically and economically.
Researchers	These researchers are in charge of the data acquisition (via past archaeological research and current), interpretation, 3-D reconstruction, and dissemination.
Integrated Systems Laboratory	Houses the researchers, 3-D data, analysis, and reconstruction.
National Centre of Scientific Research "Demokritos" (NCSR)	Supervises the research at every stage, input in data management procedures not disclosed.
Members of the public	Active members of the public- those who participated in feedback workshops for the research team. Passive members of the public- those who may be interested in participating in the interactive <i>iGuide Knossos</i> application or any of the disseminated research materials.

The case was chosen, in part, because of the colonial relationships and history that exist in a more nuanced way than that of settler colonialism. The location of this case study includes archaeology that takes place on the island of Crete in Greece. Greece was historically ruled over by the Ottoman Empire until 1821, when the war for Independence from the Ottomans was started (Finkel, 2007, p.564). The island of Crete, however, was a distinct territory, still under Ottoman rule until 1669-1897 (Finkel, 2007, pp. 564, 571). The ways that the Ottomans ruled over the people of Greece parallel that of European colonial powers (Deringil, 2003, p.313). There was

much violent conflict on the basis of religious ideology in Greece and specifically Crete.

The Island of Crete, had a longer time under the Ottoman rule and violent conflict between the locals and the Ottoman troops became a recurring aspect of life on Crete (Finkel, 2007, p. 464). Through these violent rebellions, the people of Crete expressed their interest to join the Greek nation-state after its official nation status (Finkel, 2007, p. 464). The reaction to this from the Ottoman Empire was to drastically reform its stance to be more equitable for Muslim and Non-Muslims within its Empire (Finkel, 2007, p. 458). These reforms were a reaction to the European colonial influence on these non-Muslim rebellion and violence. Which were an attempt to weaken the Ottoman control over territories that the European colonies were attempting to take under their control (Hanssen, Philipp and Weber, 2002, pp.32–33). This prolonged colonial conflict also connects to the archaeology of this site and subsequently local identity, as much of the heritage data and artifacts had been taken by Ottoman institutions and severed the locals from their own heritage connections, leaving them hesitant to allow foreign archaeologists to excavate (Papadopoulos, 2005, p.96). This created a context with the local community that was under duress during this time and created a situation where relationships with outsider researchers were a potential avenue for harm.

iGuide Knossos, is an interactive archaeological application that allows users to walk through a 3-D reconstruction of the Kingdom of Knossos, as the researchers think it existed during its occupation. This work also aligns with the other two in that the researchers express explicit intention to engage the public and community in the development of their dissemination tools. They include workshops and feedback in their approach. This allowed for users and engaged members of the public to let the researchers know what worked for them and what didn't. This analysis aims to highlight where a decolonial lens could be applied to their research goal of engaging with community and public stakeholders in a sustainable, meaningful way.

3.2.2.3. Case Study 3

The last case study for analysis is the *DigVentures* platform by Wilkins (2020). For background on this project, it was started by 2 UK-based archaeological researchers involved in commercial archaeology and was strongly encouraged by crowdsourcing. It is currently Chartered Institute for Archaeologists Registered Organisation (DigVentures, 2012). While the founders and research leads are not affiliated directly with government or research institutions, the platform does have official clients and partners that include government cultural centers and academic institutions. The archaeological research that this platform disseminates is primarily based within the UK, however, future goals of their research is to expand outside of the UK (DigVentures, 2012). See *table 6* below for a breakdown of the identified stakeholders associated with the DigVenture platform, its research, and in this case study. These are identified through Wilkins (2020) and DigVentures (2012).

Table 6: Stakeholders identified in DigVentures Platform case study

Stakeholder	Relationship to Data
Local communities of the archaeological sites	Connected to the archaeological site through local proximity geographically, contribute to the excavation, data collection, and analysis through varying degrees.
Researchers for DigVenture Platform	In charge of the excavation, research structure, data collection, analysis, and dissemination.
DigVenture institutional collaborator(s)	Often financially invested in the cost of all stages of research, housing collected materials
Members of the public	Active members of the public- as the public can apply to directly contribute to the excavation and data collection process. Passive members of the public- through interacting with the digitized archaeological data and DigVentures platform.

This case was chosen in part because it has one of the more unique and nuanced colonial contexts. This is because, while it is impacted by British colonialism, it involves archaeology that is based within the British homeland itself. This context gives a diverse insight into how internal colonization works within the metropole of a colonial power and how that connects to the colonial relationships outside its borders (Turner, 2017, pp.766–767). The colonial relationships at play within this context identify how the colonial institutions can exclude other perspectives for not just things like race and culture, but also class, gender, and political or religious ideologies that fall outside of the “valuable” (Turner, 2017, p. 770) Excluding the history of settler colonialism here, the internal colonial movement in England to start around the 19th century encouraged by the industrial revolution (MacQueen, 2016, pp. 27-29). This is what led to the change in colonial priorities and an emphasis on economic centralization, technological excellence, and led to changes in class systems and who was considered valued (MacQueen, 2016, pp. 33-36).

This case is also the most archaeologically unique to the other two as it is a platform for archaeological site data and does not focus on one site or archaeological context. This case was also chosen because the researchers’ intention is for this work to be explicitly community-engaged and also participatory, but not decolonial. This platform was constructed from the beginning with this intention in mind as the researchers wanted to bridge the gap between traditional academic archaeological research and the community at large. It is a multi-tiered system of engagement, where community members can choose to participate in data collection in person or engage with the digitally disseminated archaeological data, including 3-D archaeological artifacts. The case analysis for this work will provide insight into how this research can change components of design to fit a more decolonial lens to benefit the community and

public engagement aim that it has. This can offer unique insight into how adaptable a set of decolonial recommendations can be even within colonial borders and how that may influence the relationships outside of the UK but connected through colonial history.

3.3. Building the Decolonial Analytical Framework

Returning the analytical framework, four sources were selected. They are (also in Table 3):

1. *The CARE Principles and the Reuse, Sharing, and Curation of Indigenous Data in Canadian Archaeology* (Gupta et al., 2023)
2. *Digital Methods in Indian Heritage Data Collection* (Gupta et al., 2024)
3. *The Pragmatics of Decolonizing Metadata* (Hodge, 2024)
4. *The Biocultural Labels Initiative: Supporting Indigenous rights in data derived from genetic resources* (Anderson and Hudson, 2020)

The commonalities with, and alignment to, decoloniality in these works were instrumental in building a proper analytical framework. The framework is made of the criterion identified as key principles throughout these sources. They are as follows in Table 7

Table 7: Decolonial Analytical Framework Criteria

Criterion	Core Description	Key Implication
1. Community contribution	Active community collaboration at every stage of research, equitable inclusion of every stakeholder	Stronger community relationships, holistic and deep research that includes multiple perspectives
2. Platform choice	Selection of platform based on decolonial priorities; user-friendly, culturally inclusive digital infrastructure, sustainable.	Sustainable data-driven research, promotes shareability and accessibility, includes multiple perspectives in digital infrastructure.
3. Data governance	Multi-stakeholder centered data guidelines that promote community stewardship, appropriate metadata formatting, data rights, data management	Stronger stakeholder control of heritage data, sustainable data management practice
4. Political engagement	Acknowledgement of political and bureaucratic contexts and potential implications in research	Reduce risk of perpetuating systemic and political harm on community
5. Language usage	Inclusion of accessible and appropriate language, including multilingualism where appropriate	Reduce linguistic exclusion and potential harmful narrative through inappropriate language usage

3.3.1. Decolonial Analytical Framework Source 1

The first source used as part of the foundation for this framework is *The CARE Principles and the Reuse, Sharing, and Curation of Indigenous Data in Canadian Archaeology* (Gupta et al., 2023). This source's aim is expanding the CARE principles to adapt them to fit digital archaeology, specifically within the First Nations' archaeological contexts in Canada. In the First Nations' cultural and colonial contexts, settler colonialism has impacted the relationship that Indigenous people have with their heritage data (Nicholas, 2010, p.11). The introduction of settler colonialism to First Nations people in Canada is what led to violent conflict over the colonial forced assimilation and control over Indigenous culture and the resources of their traditional lands (Wolfe, 2006). Despite the violence from colonial "conquests" ending, the current relationships between First Nations people and their heritage is still strained. There currently still exist legislation that restricts and controls access to their traditional lands, such as the Indian Act (Gupta et al., 2023, p. 85). This existing legislation still controls over the way that First Nations people connect with their heritage and identity (Gupta et al., 2023, p. 85). This why there is a still a need for further efforts from archaeologists to create decolonial research that prioritized Tribal community interests and decolonial research structures.

This research is an example of that decolonial research structure. The pluralism in the perspective of this work is decolonial in that it opposes what historically meant to do which is uphold only one valued narrative of culture (Mignolo, 2007). Historically, archaeology of First Nations people, the narrative would center a Eurocentric view that reduced or was derogatory towards Indigenous people, often perpetuated by ontological systems of knowledge valued by the colonial power (Negro, Gustafson and Marras, 2023, p.10; Lemos et al., 2025, p.291). However, the prioritization of multiple perspectives of this work, is an important component to this thesis in how it aims to decolonize archaeology with other colonial contexts.

Throughout this work, the authors identify the nuances that require further expansion from the existing CARE principles. This includes reconsidering access and data management for spatial data and other forms of digitized heritage data. Along with this, the authors consistently reiterate the decolonial aims of the work with ensuring that community interests, perspectives, and data governance rights are always included.

There are five key decolonial principles repeated throughout this work that informed the creation of the decolonial analytical framework. The first key point is that the authors include the baseline that there needs to be an established relationship and/or collaboration with community members, **criterion one: community contribution**. In doing this, they anticipate seeing outcomes that create a digital data infrastructure for research that collects, manages, and sustains future research, but also fits within the interests of communities themselves (Gupta et al., 2023, p. 79).

Another key principle of this work is, selecting user-friendly and/or web-based tools to house and access the data from research, **criterion two: platform choice**. It is argued that through intentional selection of software before the research occurs, the research can then focus its decolonial lens on creating accessible, shareable, and sustainable data. This project also heavily calls back to the idea of data reusability and encourages clean data practices to be able to create legacy data works and contribute to future research. Good data documentation and ethics standards is key here, because this fusion creates a project that not only is data-centered in its integrity interests, it also takes into account how vital a strong relationship with communities is at the center of all of that work (Gupta et al., 2023, p. 78).

Another aspect of digital infrastructure in the decolonial lens outlined in this source, is communities and Tribal governments should be involved in decision-making in research structure and data collection. One of the examples given is the example that of Łíídlı́ Kúę First Nation. Their Tribal legislation dictates all “raw data” is co-owned by the Tribal Nation. Any intended research and data collection must be outlined and agreed upon by the Tribe before the research commences. These Tribal requirements outlined examine how data will be collected, what methodology is used, how often researchers will go into the community, and where the data will be stored and disseminated (Gupta et al., 2023, p. 80). This identifies **criterion three: data governance**.

Another main point of this work is encouraging other projects to acknowledge the historic and systemic issues related to archaeological data extraction and research, **criterion four: political engagement**. Through this, it calls out the past and current exclusionary practices of archaeological research in historically marginalized communities that perpetuate systemic, oppressive harm (Gupta et al., 2023, p. 79). Especially to those using digital methods, as it can often be an assumption that digital methods and big data are inherently less bias because they require more scientific methods of collection and analysis. This, however, is inaccurate since systems of scientific inquiry and digital infrastructure are often established in academia with Western and colonial standards.

This work consistently refer back to the original CARE principles to guide the fundamentals of their approach. It quotes the original authors in that each principle of the CARE principles should be carefully incorporated into each aspect of the digital infrastructure. One of the examples given is the Metis Tribal approach to digital heritage data base infrastructure. Specifically, Metis Tribal approach is interested in metadata formatting that is not part of the institutional standards focusing on context and language that is not part of the Indigenous ontology of Metis culture. A primary acknowledgement here, tying back to the “Responsibilities” principle of CARE, is the language. This is related to **criterion five: linguistic considerations**. The language used in the digital infrastructure of heritage data management is crucial for upholding the cultural and community context that it relates to (Gupta et al., 2023, p. 79). This also encourages easy access and shareability amongst community

stakeholders. In this example it is the Metis cultural context, but for the decolonial framework, this can be applied elsewhere.

3.3.2. Decolonial Analytical Framework- Source 2

The second project used as a foundation for this analytical framework for decolonial digital archaeology is *Digital Methods in the Collection, Management, Reuse, Sharing, and Circulation of Indian Heritage Data*, through the “MINA project”, by N. Gupta, G. S. Abhayan, Sharmistha Chatterjee, and S. V. Rajesh (Gupta et al., 2024). This project’s main focus was to analyse the current access to Indian heritage data at the local community level and then create an interactive, accessible 3-D map for community members to be able to engage with (Gupta et al., 2024, p.160). This map includes a collection of archaeological sites from all over India, not just one region.

For some of the colonial context and history of this area of work, India was occupied and impacted by British colonial rule for centuries starting around 1757, when the East India Company took over one of the wealthiest regions of India and began controlling the financial resources of this area through taxation (Cohn, 1996, pp.57–58). This control over India through finances and resource exploitation primarily came through the East India Trading company (Cohn, 1996, pp.57–58). This was unique to this region compared to the other territories under British colonial rule, as much of the resources, financial gain, and control came through the British crown, and means it cannot be compared to other forms of British settler colonialism. When looking at how this control over the region through what is referred to as “conquest” from warfare with local Indigenous self-governing areas.

This colonial background connects to the archaeology and heritage preservation attached to these colonial relationships. The British representatives in India were interested in “collecting” relics and sacred objects from India, in order to send back to Britain for study and display. Not only this, but they begin to translate sacred Sikh religious texts into English as a way to control knowledge making systems within India (Cohn, 1996, p. 104). Not only through this “conquest” of heritage through warfare, but also through systemic institutions created by the East India Company Governor-General in India, with the Archaeological Survey of India (ASI) in 1861 (Cohn, 1996, p. 9), an institution that still exists today (Archaeological Survey of India, 2021). ASI was a tool for colonial hegemony of knowledge production. Its purpose was to preserve, display, disseminate a narrative constructed about the Indian past, but did not include Indian perspectives in the understanding and reconstruction of this past (Cohn, 1996, p. 9-10).

The first case study, set in Jordan, offers parallel to this Indian archaeology context. They were both formerly under British colonial rule, not settler colonial rule, as explained earlier. Although specifics of colonial context differ in India and Jordan in terms of the duration of colonial rule and the administrative framework under British mandate in Transjordan, both colonial contexts continue to shape peoples’ relationships with their cultural heritage (Gupta et al., 2024; Abu Hamdan and

Mason, 2026). This is also why these colonial contexts matter when talking about this current archaeological research.

This first components of this research that correlate with **criteria one: community contribution** are the authors thorough explanation of the depth of contribution that community members in the local areas of archaeology can bring to research (Gupta et al., 2024, p. 146). They mention that these contributions are as equally important to the work as the contributions of researchers not tied to the archaeology through heritage. The authors of this work ensure that their research and connection to the community-at-large in India can interact with this project. Since it is not based solely on one site, but it is an accessible geovisualization tool for community members to engage with. This leads into **criterion two: platform choice**. This project is hosted via GitHub and has a relatively accessible user interface that allows individuals of any background to search through current archaeological sites throughout India and read up on the research associated with the site (Gupta et al., 2024, p.157).

The researchers use decolonial approaches to ensure that local communities are active participants and retain access to their heritage data even after data collection has concluded (Gupta et al., 2024, p.158). This correlates to both **criteria three: data governance and five: linguistical consideration**. As the authors specify that multilingualism in research is a huge barrier and often overlooked, as many academic papers often default to using few or one language, commonly English to publish their work. This creates another issue where current and future community engagement with the publication is inhibited by the language they use to communicate and understand with (Gupta et al., 2024, p.160). The approach of this work emphasizes that the long-term preservation of digitized heritage data should not be left solely to the state by default but instead be supported through collaboration between researchers and the engaged community.

In this research, the authors highlight the obstacles related to archaeological research in the Indian context is bureaucratic hurdles. This correlates with **criterion four: political engagement**. The researchers add that many of the systemic barriers in India for archaeological research is that local political systems identify themselves as heritage gatekeepers by default (Gupta et al., 2024, p.149). This also often means universities themselves are cut off from conducting any research. While many systems around the world operate this way, oftentimes, these political bureaucrats are disconnected from the local communities. There is often an underlying distrust between the state and the community at large due to fear that the community will be severed from their land, history, and/or livelihood due to government intervention in archaeology (Gupta et al., 2024, p.152).

3.3.3. Decolonial Analytical Framework Source 3

The third project used as a foundation for this work is *The Pragmatics of Decolonizing Metadata*. This work is created by Christina J. Hodge. This work does not exist with a specific colonial or cultural context, however it is a reaction to the

historic entanglement of archaeology and colonialism (Negro, Gustafson and Marras, 2023, p.5). It specifies decolonial adaptations to research that touch on the Eurocentric and settler colonial impacts on heritage data (Negro, Gustafson and Marras, 2023, p.5). There are more references to the Indigenous cultural histories and history of the colonial relationships with Indigenous heritage data throughout Hodge's work. With this, this source acts as an important perspective for how to combine colonial histories and relationships to create adaptable research frameworks to fit a decolonial lens. Hodge's work is not meant to reduce or generalize colonial experiences through archaeology, but to acknowledge the existing histories and impacts depending on the context and react accordingly with decolonial digital protocols.

This work is meant to act as a general framework for future digital heritage research to decolonize the way they collect, store, and govern digitized heritage data. This can be an example of a way in which the granularity of colonial relationships with people and culture can be generally addressed through decolonial measures for archaeology research.

Hodge suggests using a standard cataloguing system, like MARC, as a foundation that can have added features to fit cultural nuances and ontologies (Hodge C., 2024, pg. 67). This way, institutions that may not have the resources or bandwidth to create an entirely new metadata standard and digital infrastructure, can still apply a decolonial approach. Hodge explains that with an emphasis on changing digital standards of cataloguing and metadata, researchers can also encourage community collaboration and to recontextualize misrepresented data, **criterion one: community collaboration**. If researchers are willing to deconstruct the colonial practices of their institutional standards and the traditional authority used in metadata, many communities may be more open and willing to collaborate with institutions (Hodge C., 2024, pg. 67).

This project has a huge emphasis on language usage and metadata within the framework of decolonial data governance practice. In this project's discussion, the author talks about how metadata can often fall into traditional academic colonial standards. This comes up when the author dissects the standard of controlled vocabulary and accompanying authority (Hodge C., 2024, pg. 64). In this standardization, institutions are motivated to stick with standardized, reused controlled vocabulary. What this can do is create metadata attached to heritage data that is reductive or exclusionary to the ontology and language of the cultural context, **criteria three: data governance and five: linguistic considerations**.

3.3.4. Decolonial Analytical Framework Source 4

The fourth source used as a foundation for this work is *The Biocultural Labels Initiative: Supporting Indigenous Rights and Interests in Data* (Anderson and Hudson, 2020). This project is housed within and supported by an online network called Local Contexts. It is a global network that includes tools, such as "traditional

knowledge” labels, which allow Indigenous community stakeholders, leaders, and researchers to enact stewardship and data governance over their digitized heritage data (Anderson and Hudson, 2020, p. 2). It is important to note that this biocultural label resource was originally created by researchers in collaboration between multiple institutions but with the co-founders of it primarily based in United States institutions. However, of their collaborative partners are based in New Zealand and Canada. The primary focus for the communities and potential stakeholders for their work focus on the colonial context of settler colonialism impacting Indigenous people (Local Contexts, 2020). The researchers behind this work identify that it is meant to contribute to protecting Indigenous data rights and the right to sovereignty within heritage studies and research (Local Contexts, 2020). While this methodology for digital heritage data collection and management is created with the basis of settler colonialism, it can still be meaningful to other contexts within colonial imperialism.

This network is also an example of what community-focused, collaborative research can look like in practice, **criterion one: community collaboration**. What this initiative and traditional knowledge labels aim to do is create a new metadata standard that incorporates Indigenous and community-based authority. It also enables proper source and ownership attribution for digital heritage data, especially in cases where there has been misattribution or a lack of acknowledgement in the past (Anderson and Hudson, 2020, p. 2).

This work is also concerned with decolonizing digital heritage data through data formatting and digital infrastructure. This source is cited in multiple works listed here and addresses nuances in data collection and analysis that parallel those found in heritage data within archaeology. It challenges standard metadata practices and labelling systems within digitized heritage databases, **criterion three**. The project focuses on MARC and Dublin Core digital infrastructures by adding features in the form of what are termed “traditional knowledge” labels. The aim of this work is to address the shortcomings of standard digital formatting, particularly its lack of structural tolerance for terms, keywords, and concepts that encompass culturally specific ontologies (Anderson and Hudson, 2020, p. 1).

3.3.4.1. Summary of Identifying Decolonial Criteria in Sources

Table 8: Summary of identified criteria in source

Decolonial/Digital Project Analysed	Criteria Identified
1. <i>The CARE Principles and the Reuse, Sharing, and Curation of Indigenous Data in Canadian Archaeology</i>	Criteria 1, 2, 3, 4, and 5
2. <i>Digital Methods in the Collection, Management, Reuse, Sharing, and Circulation of Indian Heritage Data</i>	Criteria 1, 2, 3, 4, and 5
3. <i>The Pragmatics of Decolonizing Metadata</i>	Criteria 1, 3, and 5

4. <i>The Biocultural Labels Initiative: Supporting Indigenous Rights and Interests in Data</i>	Criteria 1 and 3
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3.5. Methodology of Case Study Analyses

The final methodological component for this thesis is the qualitative case study analyses. In chapter 4, the three case studies will be analysed. These case studies were selected based on the criteria of; are they using digital methods that include geovisualization and 3-D data, do they all cover different archaeological contexts and regions, and do they specify collaborative or community-engaged research goals. In this section, the methodology of that analysis will be explained.

This case study analyses will consist of taking the decolonial analytical framework and applying it to each case study. The analytical framework is made from 5 key decolonial criteria. Each case study will be checked for alignment or divergence with the 5 key decolonial criteria. In chapter 5, these results will be interpreted and discussed.

The alignment and divergence values behind the application of the analytical framework will be listed as (present/absent) in the case study data. The alignment is defined by evidence within the case study that demonstrates the decolonial criterion was met adequately in the research structure. The absent value or divergence is met when the case displays component that display the decolonial criterion. Due to the 5 key criteria of the analytical framework, this assessment uses a simple, binary “presence/absence” measurement system.

Following the case study analysis, the results will be compared across the cases to see the similarities amongst all three case results. The broader patterns within this data will help to examine the applicability of the decolonial framework across a variety of archaeological and cultural contexts. This will help to identify whether a set of recommendations for the decolonial approach can be created.

3.6. Materials and Methods Conclusion

This chapter outlined the materials and methodological approaches used in this study. It first discussed the selection criteria used for identifying source material for the decolonial analytical framework. This chapter also discussed the justification behind the qualitative research design used for answering the research questions.

Through the process of constructing the decolonial analytical framework, five key criteria were identified. These criteria are intended to serve as a guide for analysing where decolonial theory can be practically applied within other cases of digital archaeology. The purpose of this analytical tool is to identify where a decolonial lens can be meaningfully integrated in other digital archaeological while still accommodating the diverse community, cultural, and digital infrastructure needs.

The decolonial analytical framework, in chapter 4, will be used as analytical tool in the case studies. The case study analyses will test notions of the applicability of decoloniality in broader contexts.

Chapter 4. Case Study Analysis

This chapter analyses three case studies through a decolonial framework. The aim of this analysis is to identify where the case studies align with the decolonial framework and where they do not align. Once comparing results of each case study, it will be clear whether or not this work can create a set of decolonial recommendations.

This analysis follows a qualitative approach in which each of the three case studies are examined through a set of decolonial framework criteria. As discussed in the chapter 2, there is a connection between collaborative/community-engaged research and decolonial research. This relationship is where the selection process for the three case studies comes from. This selection includes how the cases identify adjacent language regarding community prioritization without specifically labelling the decolonial lens. They are also chosen because the scope of their work includes digitized heritage data and spatial data presented using digital methods such as 3-D visualizations or geovisualization.

Through the analysis of the case studies, this research examines how decolonial principles can be adapted to fit multiple digital archaeology contexts. In using these cases to identify potential decolonial recommendations, this research aims to contribute guidance for researchers interested in adapting decolonial approaches within their work.

This chapter will first start by introducing each case, their archaeological context, and their research structure. From this case introduction, the analytical framework will be applied and there will be a thorough examination of the gaps and patterns between it and the case. Lastly, the summary of this analysis will review the key take aways from each case study analyses.

4.1. Case Study 1: *The Kingdom of Copper*

Case study 1, is referred to as *The Kingdom of Copper* and focuses on the aspect of community engagement through a specific platform, ArcGIS StoryMaps. This project was very interested in creating a “deep mapping” visualization for users and community members to be able to look at the data from the project and supply feedback (Howland et al., 2020, p. 356). This project focuses on the Copper Kingdom excavation located in Jordan, dated to the early Iron Age. The community directly connected to this research are the Bedouin Tribal people living in this area.

Going back to the cultural and colonial context of this area. Jordan is formerly referred to as Emirate of Transjordan, was briefly under British rule from 1921-1947, (Wilson, 1990, p. 3), It was also before this a territory with the Ottoman Empire from 1516– 1918 (Finkel, 2007, pp. 560, 572). While it does currently exist as an independent state now, this historical context influences how this analysis approaches this case. This area has a history of external powers and colonial

ideology influencing and destabilizing the economy and resources of the traditional tribal peoples of these areas.

The researchers wanted this form of dissemination to create a durable interest in the project and make it interactive for interested parties, especially those who are directly connected to the archaeology and cultural context. The analysis includes the current publications on the project as well as how the authors intend to rectify missing components that fit their community engagement aims. This will help with understanding how decolonial frameworks can be applied at every stage of research.

4.1.1. Case Study 1: Patterns with Similarities to Decolonial Theory

One of the criteria that demonstrated alignment with the decolonial analytical framework, **criterion two: platform choice**. The researchers demonstrate that some of the considerations in their platform choice were accessibility as well as something that adds to the deep understanding of what was going on at the time of occupation for the site (Howland et al., 2020, p. 353). They include their cross-examination of multiple avenues that could have been taken with their platform choice to disseminate an interactive map for the project. The reasons for not choosing other platforms included; they did not allow storytelling mapping, user-generated datasets, or were out of the research budget. Ultimately, they chose ArcGIS StoryMaps as the platform because it allows more types of data to be integrated into the map. Furthermore, the user interface is more accessible, and they felt the interactivity of the “Deep mapping” promoted the type of community engagement they were looking for (Howland et al., 2020, p. 353). They also mention that this platform offers a “longer life cycle of support,” which means there is the reliability of the map and its dataset being maintained through the proper platform protocols (Howland et al., 2020, p. 353).

This case has the primary focus of community engagement at the data collection and dissemination level. When analysing the structure of the dissemination process, the authors mention they realized during the creation of the geovisualization (ArcGIS StoryMaps), that multilingualism needed to be a component of this project. As they stated in their report, the local population mostly speaks Arabic. This necessitated a version of the StoryMaps in Arabic. They hypothesised that not textual dissemination could be done through audio files and local museum officials presenting the work in person (Howland et al., 2020, p. 357). This establishes that their work touches on **criterion five, linguistical considerations**.

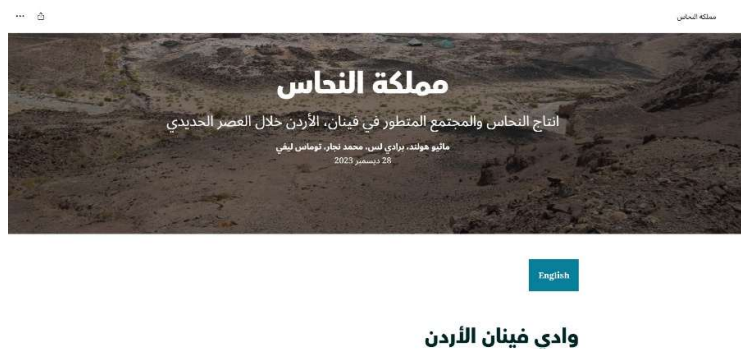


Figure 2: Screenshot of The Kingdom of Copper- Copper Production and Social Complexity in Iron Age Faynan, Jordan ArcGIS StoryMaps website page (Version in Arabic) (Howland et al., 2021; Howland et al., 2023)



Figure 3: Screenshot of The Kingdom of Copper- Copper Production and Social Complexity in Iron Age Faynan, Jordan ArcGIS StoryMaps page (Version in English) (Howland et al., 2021)

4.1.2. Case Study 1: Gaps Between This Research and The Framework

This case has some gaps between its execution and that of the decolonial analytical framework. While not clear why they chose to conduct this research outside the decolonial lens, they are being more intentional about the way they engage with the public and community in their work. However, based on the decolonial analytical framework, this case did not fulfill **criterion one: community contribution**. Based on the published reports, the Bedouin tribal communities were involved only in the data collection, interpretation, and dissemination stages (Howland et al., 2020, p. 357). Considerations for what would benefit the community, from their perspective, not discussed in any research publication or the ArcGIS StoryMaps site. The lack of community contribution at every stage also translates to the fact they did not consider the literacy needs of the community before dissemination. If community members were involved in decision making or structurally, individuals are not credited in the published reports. This research does identify engaged communities by the names of their tribes, 'Ammarin, Sa'idiyyin, Rashaydah, and 'Azazmah

(Howland et al., 2020, p. 357) as well as mentioning on the ArcGIS StoryMaps site that tribal members are a part of the ELRAP collaborative team for survey and excavation (Howland et al., 2021). Through a decolonial lens, this does not meet the community contribution requirement at every stage of research.

Another gap between this work and the analytical criteria is **criterion three**, data governance. The decisions behind how the data is managed, who owns it, and access, are not outlined in the research and the project map. While they do offer the opportunity to get feedback from community members after the fact (Howland et al., 2020, p. 357-358), it does not appear that the community has any input on or ownership over the data collected from the site. While they credit the community for their contributions to the data collection and the interpretations (Howland et al., 2020, p. 357), it is not clear the community or Tribal leadership is allowed any input over the data management practices or access to the site data. If there are stipulations around the ownership or copyright of the heritage data belonging to the descendant, Tribal communities, it has been completely left out of all publications. It is for these reasons, that this case did not meet the decolonial framework criteria for data governance measures.

This research also does not align with **criterion four: political engagement**, of the decolonial framework. The researchers do not include consideration for the current and past political and bureaucratic issues between descendant communities and the impact of their work. While they do include archaeological history of the site itself in the StoryMap and report (Howland et al., 2020, p. 354; Howland et al., 2021), there may be many systemic issues as to why descendant communities have a disconnect between themselves and their own heritage data. One of the primary historic systemic issues being the strategic changes in territorial borders, displacement and the limitations on Bedouin tribal government to create the dependence on the developing nation-state government that happens primarily during the British mandate period (Alon, 2005, pp.221-222). These changes still influence the Bedouin people to this day. It is also well documented that larger heritage sites in Jordan, such as Petra, have displaced Bedouin tribes due to the tourism and heritage conservation efforts (Abu Hamdan and Mason, 2026), which greatly puts Bedouin identity and traditions at risk in the long term if there isn't a change to how we approach heritage and conservation on traditional Bedouin lands.

While the research demonstrates the understanding that the communities that live in these areas lack some of the access that would give them the opportunity to academia (Howland et al., 2020, p. 357), the researchers do not touch on how it could be rectified through their research design. They leave a lot to the Faynan museum for their on-the-ground work in helping the communities access their heritage data and to help close the gap between the research institution and community members (Howland et al., 2020, p. 357). Because the researchers do not emphasize these structural considerations in the research publications, it does not fit the political engagement criteria.

4.1.3. Case Study 1: Summary of Results

For a summary of the decolonial analytical framework criteria identified in this case study, see Table 9 below.

Table 9: Case Study 1 Results

Decolonial Framework Criteria	Identified in Case
Criterion 1: community contribution	Absent
Criterion 2: platform choice	Present
Criterion 3: data governance	Absent
Criterion 4: political engagement	Absent
Criterion 5: linguistical considerations	Present

4.2. Case Study 2: iGuide Knossos

This case study follows the case of iGuide Knossos. iGuide Knossos is based on the Minoan kingdom and archaeological site, Knossos. This is a world heritage site that has been used for archaeological research since as early as 1878 on the island of Crete (Fitton, 1996, p.123). Due to political unrest and the conflict with the Ottoman Empire over the territory of Crete (Finkel, 2007, p. 464). It was finally independent from Ottoman rule in 1897 (Finkel, 2007, p. 571). Large scale excavation on the site did not commence until 1900 started by Arthur Evans, a British archaeologist, who purchased the land that the site was later excavated on by British archaeologists (Fitton, 1996, p.123; Quinn, 2024, p. 27), and he is also credited with the identification of the “Minoan” culture in classical archaeology studies (Fitton, 1996, p.125; Quinn, 2024, p. 27). It is Evans’ research that is identified as the primary source material that the researcher base their 3-D reconstructions on.

This particular project focuses on their interactive 3-D reconstruction of the Minoan kingdom as it is interpreted to have looked at the time of occupation. iGuide Knossos aims to bridge the gap identified by the researchers between heritage data sciences, dissemination, and community members not directly involved in archaeological research. This analysis will be doing the same comparative analysis on the case by looking at how the research stages and characteristics of the data acquisition process compares to the analytical framework. This includes how the researchers reflect on the research productivity and its interaction with the community at large, through the outcomes of the research goals.

4.2.1 Case Study 2: Patterns with Similarities to Decolonial Theory

The primary motivation of this research is to create engagement with the archaeological material and the communities at large through digital media.

Criterion two: platform choice, is the researcher’s primary focus for the research methodology and is in alignment with the analytical framework. Archaeological researchers in the Integrated Systems Laboratory (ISL) of the Institute of Informatics and Telecommunications of the National Center for Scientific Research (NCSR), also referred to as “Demokritos”, (Farazis et al., 2019, p. 2), worked on the 3-D

reconstructions of the Knossos site. These 3-D reconstructions are based on archaeological interpretations of structures and structures related from other archaeological sites. Researchers wanted the 3-D visualizations of this application to capture the real-world experience of those occupants of Knossos during its use period (Farazis et al., 2019, p. 6). They also used technologies for visualization that are meant to feel life-like to the user and allow a perception of space and time, to evoke a sense of real engagement with archaeology and cultural heritage. Because these researchers wanted these 3-D interactive visualizations to be engaging for a wide audience, this is where the researchers identified Steam as a platform for app distribution (Farazis et al., 2019, p. 6). This is aligned with the analytical framework criteria as it includes the thought process behind their platform choice by prioritizing user-friendly, accessible, and maintainable digitized heritage data. The steam platform also allows for users without VR headset equipment to still interact with the virtual archaeological world, which creates accessibility. This platform also allows for those with different digital literacy skills and ages to be able to have access to the game (Farazis et al., 2019, p. 6).

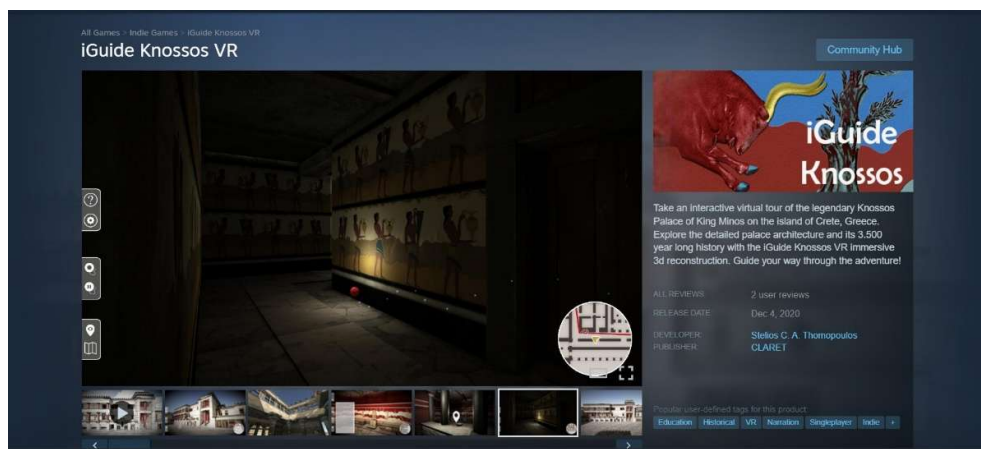


Figure 4: Screenshot of iGuide Knossos VR on Steam Webpage (in English) (Thomopolous, 2021)

The the iGuide Knossos application also focused their attention to user feedback after the launch of the application through their workshops focused on multilingualism. This is a very distinct choice by the researchers as they are interested in reaching a wider audience through their interactive games and the linguistic needs of relevant communities. This is the identification of **criterion five: linguistical considerations**, in the analytical framework. They offered these dissemination workshops in Arabic, Farsi, Greek, and English. Through these multilingual workshops, they are able to identify the needs of communities and engage members of the public who have connections to the research, not just directly through academia or local proximity (Farazis et al., 2019, p. 6). It was also a key takeaway from these workshops that the researchers wanted to understand what kind of cultural dialogue, as well as personal experiences and stories, could be shared amongst participants who interacted with archaeological games (Farazis et al., 2019, p. 6). However, it is also important to note here that the game distribution on Steam only offers access in Greek or English. In this case, the dissemination

workshops varied in linguistic accessibility compared to the application availability on Steam.

4.2.2 Case Study 2: Gaps Between This Research and The Framework

In identifying gaps in this case study, it seems to consultation with community interests happens after data collection and iGuide Knossos as an application is disseminated. Some consideration of the community interests at the dissemination portion of the project did encourage researchers to think about the accessibility of the application. However, if the community had been consulted from the beginning and at every stage of research, maybe some of the outcomes of engagement would be more beneficial to local communities. In this case, **criterion one: community collaboration**, is identified as absent from this project. The researchers do include their feedback from participants during the iGuide Knossos mini game workshops they host (Farazis et al., 2019, p. 6). However, this again reiterates the point that the community interest and input are only considered at the dissemination stage of research. The individuals of the local community and their contributions during dissemination, through the feedback workshops, are only vaguely documented (Farazis et al., 2019, p. 6). This does not offer insight into how valued or equitable community voices were considered in throughout the entirety of the work.

Much of the care around data and digital visualizations through intentional platform choice started to lead the conversation in a direction that may have encourage a discourse on data governance. It is also complicated because communities within this area may not have leaders or gatekeepers to act as representation during the discussions around data governance. However, it is still important that the researchers think about this at the research planning stage, especially when their own goal is wide accessibility. Here is where **criterion three** data governance, was identified as another gap in this research. Specifically, I was interested to see if the authors were including in their research design community-focused governance that offers local and descendant communities the opportunity to contribute and maintain ownership of heritage data. If not at the research design stage, maybe it would be part of their concluding thoughts and future research to offer guidelines for community-engaged data governance practices that include standards for accessibility of the data, sharing, and maintenance practices. This was not part of their discussions in their publications, but it is clear that they are thinking about engaging with communities in the future. Including criterion three into their considerations for future engagement would be of value to all parties involved, especially if the authors chose to use a decolonial approach.

One of the main reasons behind creating a public-facing 3-D dissemination tool is an attempt to bridge the gap between bureaucratic gatekeeping of heritage data and the public. However, through a decolonial framework, this would not be an adequate formulation to mitigate the harm of the exclusionary practice. It is because of this misalignment with the decolonial framework that **criterion four: political engagement**, is identified as a gap. A decolonial lens dictates mitigating the harm

from bureaucracy and colonial power structures, should be incorporated in the research structure. The surrounding area of the Knossos site is still inhabited by locals to this day. There is only one research article on the identity associated with this site and the local inhabitants of the island (Solomon, 2003). This article talks about the ways in which this site has much of an impact on the local community and the ways in which they use the heritage materials from the site to fit their own sense of identity, but also political sources of heritage knowledge (Solomon, 2003, p. 31-33). Sir. Arthur J Evans was one of the first archaeologists involved with the Knossos site. This is a British archaeologist and a highly political figure without clear ties or collaboration with local populations at the time of his research (Hood, 2004, p. 558). Not only does Evans have documented political affiliations and incarceration due to involvement (Fitton, 1996, pp. 119-120), he takes advantage of the political and violent instability of Crete due to conflict in the region with the Ottoman empire. He does this by purchasing the site that later became the archaeology at the Kingdom of Knossos (Quinn, 2024, p.27). This purchasing power, not only opened up the site for research after the local authority forbade it, but the purchase created a relationship where almost exclusively British archaeologists and institutions were allowed to conduct research, benefit from publications, and grow a relationship with the heritage data there (Fitton, 1996, p.123). Not only this, but Evans at the time has a sole narrative that he is able to create on the history of the Minoan culture in Greece and how it shapes the rest of the developing western world narratives and growing Eurocentrism in archaeology at the time (Papadopoulos, 2005, p.90). This is especially important, as the researchers of this project use much of his work and interpretations to influence the reconstruction of the 3-D visualizations (Farazis et al., 2019, p. 2). Through a decolonial lens, identifying a correlation between political and systemic issues and the archaeological research data would offer an opportunity for the researchers to acknowledge this history and mitigate potential future harm.

4.2.3. Case Study 2: Summary of Results

For a summary of the data presented in case study two analysis is listed in Table 10 below.

Table 10: Summary of Case Study 2 Results

Decolonial Framework Criteria	Identified in Case
Criterion 1: community contribution	Absent
Criterion 2: platform choice	Present
Criterion 3: data governance	Absent
Criterion 4: political engagement	Absent
Criterion 5: linguistical considerations	Present

4.3. Case Study 3: The *DigVentures* Platform

This case study focuses on the *DigVentures* platform (Wilkins, 2020). *DigVentures* is a peer-to-peer archaeology platform created by researchers to bridge the gap between academia and community members. The location of this project takes place

in multiple regions and archaeological sites throughout the UK, so this analysis will not focus on one locale or specific regional or cultural community directly connected. It will incorporate more than one to demonstrate the general scope of work and common relationships with stakeholders directly connected to the research on the DigVentures platform. Throughout this analysis, since this platform does not solely focus on one archaeological research site, there will be specifications for the platform in terms of projects they have published information on and archaeological dissemination tools that researchers at DigVentures have created.

This platform was created so that anyone can be empowered to participate in archaeological research. This peer-to-peer platform is a collaborative network that allows community members and the general public to interact with archaeology digitally and in-person. This case is unique in that, unlike the other two, it does not just focus on one archaeological site. This project includes research on multiple archaeological sites in the UK, as well as virtual museum interactivity, online webinars, and courses for individual and professional development. This is meant to create a network of interaction that creates shareable, regenerative, and accessible heritage data (Wilkins, 2020, p. 40). It is also unique in that it doesn't just house one type of digitized heritage data. It works with a variety of heritage data types and software, including geovisualization software and 3-D visualizations. This analysis will implement the decolonial framework created in this paper to identify where the gaps and patterns are in decolonial research. This analysis data will also influence and show how this case can be adapted to fit a decolonial lens.

4.3.1 Case Study 3: Patterns with Similarities to Decolonial Theory

This case also greatly aligns with **criterion one: community collaboration**. It is clear from the documented beginning stages of this work that this platform was designed with engaging every possible stakeholder, local community and public, at every stage of research (Wilkins, 2020, p. 39). The researchers also want their work to be supported by the community before the excavation and research even begin. Their platform encourages feedback, expressed participatory interest, and crowdfunding. The crowdfunding feature acts as oneway to let community members and members of the public "vote" to express whether they feel the work benefits them and their community (Wilkins, 2020, p. 39). As another example, the researchers also published, through the *DigVentures* platform, one of their toolkit projects in 2023, *Community Engagement in Archaeology: ClfA Toolkit Project*. This toolkit was created with the intention of creating adapted tools for other researchers to effectively design research structures that work toward mutually beneficial, community engaged research (Forster, Westcott Wilkins, and Tatton, 2023, p. 10).

Another similarity to the decolonial analytical framework was **criterion two: platform choice**. This project is based on platform optimizations and platform efficiencies that fit the overall goal of community engagement and access. Much of the platform infrastructure focuses on data regeneration, shareability, and access. They do this through crowd sourced heritage research, interactive engagement through

workshops and virtual museums, and multi-tier engagement levels (Wilkins, 2020, p. 40). In this discussion, the researchers also include the toolkit they used for the creation of this project in their methodology. This toolkit in particular, is called the “Platform Design Toolkit” (Wilkins, 2020, p. 40). They use this toolkit to create a digital environment that opens opportunity for equitable exchange of ideas and data, while also maintaining data integrity. It is also clear that a huge part of the accessibility of heritage data in this platform is through its dissemination components. For example, *DigVentures* has a “discover” feature on the platform, where individuals can interact with 3-D visualizations of artifacts. This feature is referred to as the “virtual museum” and allows users to interact with artifacts recovered from *DigVentures* excavations (DigVentures, 2019). They created these dissemination features in this platform to offer the opportunity for different levels of stakeholder engagement (Wilkins, 2020, p. 40). Community members who may not have been a part of the research design and data collection, they can still use *DigVentures* to explore and interact with the archaeological material in a meaningful way.

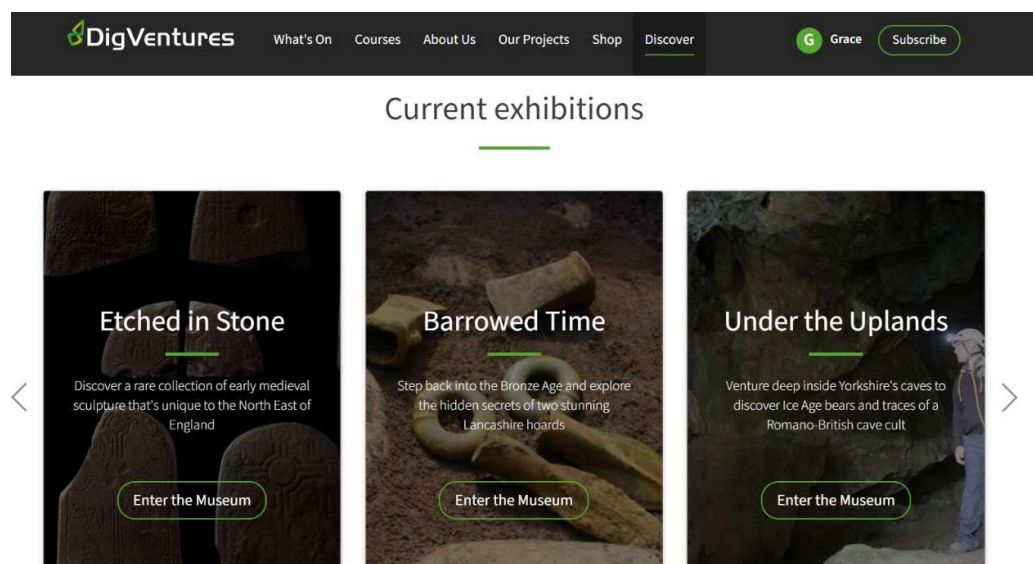


Figure 5: Screenshot of the DigVentures website showing the Virtual Museum feature (DigVentures, 2019)

The researchers of this work also demonstrated a lot of care when it came to **criterion four: political engagement**. The researchers include their understanding of political and systemic barriers for those who may not have direct connections to specialized archaeological education. This is also a concept documented in colonial studies that look at how colonial ideology impacts the citizens within a colonial metropole (Turner, 2017). Specifically, how citizens within the colonial empire may find themselves excluded from these academic and research institutions based on colonial input on identity, through concepts like race, gender, and class to determine what is “Englishness” (Kirkby and Coleborne, 2010, p.292). In fact, it is not just mentioned in the articles published on the platform itself, but it is written throughout

their platform site, and its content (Wilkins, 2020, p. 39). *DigVentures* also hosts open-access workshops with themes centering the ideas around systemic and political influences on the gap between academia and the rest of the public (Wilkins, 2020, p. 39). Another example of this acknowledgement of systemic barriers, is there Late Bronze Age site in Lancashire. This acknowledgement comes through the consideration of the wealth disparities of the local community through survey data on local demographics. This influenced the way the research is structured to accommodate the local communities needs within the work (Wilkins, 2020, p. 43-44). Through this understanding of the local community, they tailored their dissemination and engagement to fit the needs of the community and create an awareness of the heritage research going on near them. They also created opportunities for these locals to get field school training so that they could participate in the research and data collection (Wilkins, 2020, p. 44).

Lastly, I identified **criterion five: linguistic considerations**, as in alignment with the decolonial framework. Considering this criterion stipulates that the languages it is offered in must be accessible to the community members it directly affects, then it being distributed only in English still fits this. However, multilingualism is also only one component of this criterion. This research fit in alignment with the criteria because of the inclusive and accessible language that they disseminate and collaborate on their platform and research. They are intentional about their use of language as they want their platform, publications, and project designs to be accessible to all of their stakeholders (Wilkins, 2020, p. 40). Their language usage is also distinct in that they do not use reductive language to talk about the community members they work with. They always simultaneously refer to community members as not just community members, but collaborators and peers. This is not just displayed in what they publish, but in the structure of their work. Their work is meant to facilitate equitable and meaningful engagement from all parties involved (Wilkins, 2020, p. 40-43).

4.3.2 Case Study 3: Gaps Between This Research and The Framework

It became clear after researching this *DigVentures* platform, and its relevant publications, that there is not a mention of components of **criterion three: data governance**. This missing criterion includes components like data shareability guidelines and metadata standards for preserving context of digitized archaeological data. It is not as clear what has been contributed by community members, and if so, how they were credited. If they had a say in how the data is distributed, this is also not disclosed in their publications or platform. That being said, it is clear that much of their philosophy around this project is heritage research being open-access, sustainable, and collaborative. The researchers do disclose community feedback through their project workshops and crowdsourced funding. It still cannot be assumed that every community has the exact same interests and opinions on how heritage data related to them can be accessed. The lack of criterion 3 may be due to the fact that the researchers have not published all of the data governance

guidelines, data management, authorship, and ownership stipulations. Also, they have not talked extensively about the digital formatting and metadata guidelines surrounding their published heritage data on 3-D visualizations and geovisualization. Also, keeping in mind, things such as 3-D visualized heritage data also need data governance standards to prevent community copyright and ownership infringement (Gupta, Blair and Nicholas, 2020, p. S47), as well as misusing and misidentifying important contextual information (Hodge, 2024, pp. 60-61). Data governance standards and properly embedded contextual coding in 3-D and cultural imagery can help mitigate these harms. For the scope of this analysis, the data governance measures for their research did not meet the decolonial criteria.

4.3.3. Case Study 3: Summary of Results

For a summary of the case study three results using the decolonial analytical framework, see *Table 11* below.

Table 11: Case Study 3 Results

Decolonial Framework Criteria	Identified in Case
Criterion 1: community contribution	Present
Criterion 2: platform choice	Present
Criterion 3: data governance	Absent
Criterion 4: political engagement	Present
Criterion 5: linguistical considerations	Present

4.4 Case Study Analysis Conclusion

The purpose of this analysis was to examine the adaptability of the developed decolonial framework when applied to digital archaeological research across varying contexts. The results of this demonstrate areas of overlap between the framework criteria and research practices that emphasize community engagement and participation.

It should also be acknowledged that this analysis is limited to information presented within the published research. Therefore, criteria that were not identified within the case study may not necessarily have been absent from the project itself. Factors such as funding requirements, community preferences, publication scope, or available resources may have influenced whether these aspects were explicitly discussed. This analysis is not intended as a critique of specific projects, but rather as an examination of the potential for applying a decolonial lens to existing digital archaeological research structures.

In the next chapter, the summary of the results of all three cases will be presented. After the summary is presented, the discussion will lead into the interpretation of these results, as they pertain to the research questions. Following this, the discussion will include other considerations beyond recommendations, limitations of the research, and implications for future work.

Chapter 5. Discussion

This chapter discusses the findings of the case study analysis presented in Chapter 4. This discussion will build on these findings to create the set of recommendations for future decolonial digital research. This set of recommendations is based on the criteria for the decolonial analytical framework, where it aligned with existing digital archaeology, and where it did not align. The interpretation of this data will help to identify where decoloniality can be applied or emphasized in this collaborative digital archaeology and other, future archaeological works.

This chapter examines recurring themes identified through the analysis, that may not have been included in the final recommendations for future work. These themes, while not developed into formal recommendations, remain an important consideration when implementing a decolonial lens into future research. Then this discussion will include the shortcomings with this qualitative research approach and what the case study analysis did not include. The discussion will finish by reviewing the possible effects of implementing the recommendations.

5.1. Case Study Analysis Result Summary

The results from the case study analysis demonstrate the applicability of the decolonial framework. For summarizing the data analysed, where the decolonial analytical framework aligned with the case is represented by the value shown as “Present”, and where it did not align with the case, the value is shown as “Absent”. This grading criteria is purely based on whether the criteria from the analytical framework was identified, or not, within the case, and not additional value factor. See *Table 12* below for summary.

Table 12: Summary of Case Study Analyses Results

Decolonial Framework Criteria	Case Study 1	Case Study 2	Case Study 3
Criterion 1: community contribution	Absent	Absent	Present
Criterion 2: platform choice	Present	Present	Present
Criterion 3: data governance	Absent	Absent	Absent
Criterion 4: political engagement	Absent	Absent	Present
Criterion 5: linguistical considerations	Present	Present	Present

5.1.1. Interpretation of Results

Returning to the first research question, “can a set of flexible decolonial recommendations be generated from case studies analyses using a decolonial framework?”, these findings suggest that adaptable decolonial recommendations are possible. Although each case has a different community relationship, funding structure, and research design, broad similarities could be identified when it comes to community engaged practice and decoloniality. All cases focused on dissemination measures as the input for community-engagement. Because these cases focused on such a late stage, it was also this thesis’s interpretation that this research focus could also be moved to earlier stages of research.

This leads into the second research question, “what are the implications of creating a set of flexible recommendations for the application of decolonial digital archaeology?”. One implication is the proliferation of the decolonial lens. Once recommendations exist, knowledge barriers to implementing the decolonial lens in research are reduced. As the application of decolonial recommendations makes it more accessible to implement, especially when there is an adaptable foundation. However, it is also a possibility that these barriers are not just bureaucratic or structural but are due to researcher hesitancy to deal with the political nature of decoloniality.

5.2. A Set of Decolonial Recommendations for Future Work

The case study analyses influenced the development of recommendations for decolonial approaches within digital archaeology. These were developed from the applicability of the decolonial criteria to the different research contexts of the cases, as well as where the common convergences and divergences with decoloniality were. The recommendations are intended to remain flexible and adaptable across differing archaeological and cultural contexts.

Figure 6 below presents the proposed recommendations, followed by an explanation of each of the recommendations.



Figure 6: A set of decolonial digital archaeology recommendations

5.2.1. Decolonial Recommendations Explained

1. **Community-focused, Equitable Collaboration:** Requires dialogue before research collection with community stakeholders to understand the needs and interests of the community at large. Takeaways from these dialogues should influence the research design of the project, with special focus on data governance, platform choices, and dissemination practices. This also means

that the voice and knowledge of the community within these dialogues need to be treated with equitable value as other perspectives and voices involved.

2. **Platform Choice and Optimization:** The platform choice or creation within the study must be decided on before the research implementation begins. The platform choice must consider the benefits and interest of all stakeholders, including community stakeholders. It must also be optimized for the data governance planning that has taken place and be able to accommodate, store, and share in whatever capacity deemed fit. It should also be accessible to the data literacy skills of every stakeholder. It must also be adaptable to changing technological needs so as to reduce the possible change and harm induced by future development.
3. **Data Governance:** Data governance planning, including data management, from the beginning to help with the longevity and sustainability of the work. This also includes making sure the community members involved have an equal voice in the construction of this plan, and all parties agree that this plan is sustainable. This is also strongly associated with metadata format consideration and embedded metadata coding for including context and proper data ownership/copyright.
4. **Political and Bureaucratic Considerations:** The researcher(s) should have a thorough understanding of the political and systemic history surrounding archaeology and the community at large. This should be used to mitigate any potential harm to the community from the research. Such as, writing into the research plan an informed methodology to gatekeep heritage data. In that example, the plan would prevent potential co-opting of heritage data through loose access standards.
5. **Linguistic Adaptations and Considerations:** The research must be multi-lingual and accessible to every stakeholder involved in the research, especially community stakeholders. It cannot only be accessible and multi-lingual at the dissemination stage, but at every stage of the research. Each stakeholder should be able to access and contribute heritage data wherever appropriate. The language must also be considerate and equitable for all shareholders. Paying special attention to culturally specific language, identity, and ontological context for inclusive language use and harm reduction.

5.3. Considerations Outside of Set Recommendations

Regardless of intention, all research must address funding considerations. Funding sources are contextual and unique to each case. Due to this nuance, funding is an area that cannot be advised by a set of semi-standard recommendation.

It is mentioned multiple times throughout *The Kingdom of Copper* case that the longevity of data and the platform choices were dependent on the funding, the project timelines, and the amount allocated for software and data management

(Howland et al., 2020, p. 352). The *DigVentures* platform offers one solution to funding limitations through crowd-sourced funding (Wilkins, 2020, p. 46). While a set of recommendations for funding won't be made here, It is important for researchers who want to construct decolonial research consider the decolonial recommendations during funding procedures such as grant-writing.

5.4. Shortcomings of this Research

Decolonial theory is inherently about empowering cultural diversity and cultural sovereignty within an inherently colonial modern world (Herrera Malatesta et al., 2025, p. 2). In order for decoloniality to work, it must be driven equally by all stakeholders. This also includes multi-perspective approaches with equitable collaborations (Herrera Malatesta et al., 2025, p. 10). This thesis has not been conducted in collaboration with a member of a community directly affected by the archaeological work analysed in these case studies. This does contribute an implicit bias to the perspective of this work, and it does not engage with other perspectives in the analysis and interpretations of the case study findings.

Furthermore, since the researchers and communities involved in the case studies were not consulted, this analysis cannot include the full background and scope of the original research process. In other words, this analysis does not have the background infrastructure and research planning information regarding how the research was conducted with community stakeholders. Essentially, it is expected that some aspects of the research process didn't make it into the final publication.

Lastly, a shortcoming of these recommendations is they have not demonstrated explicit causality between their implementation and beneficial research outcomes. The recommendations are founded in decolonial theory and are derived from multiple practical applications of other decolonial digital archaeology. However, It has not been implemented directly in a research structure to prove the causality between implementing the recommendations and decoloniality. It is anticipated that future work will allow for these recommendations to be implemented to present through data, their practical benefits and limitations.

5.5. Implications for Future Work

This analysis demonstrates that decolonial analytical criteria can be applied across a variety of digital archaeological contexts. This has been demonstrated with archaeological research that prioritizes community engagement and collaboration. One implication of this is that the development of clear, flexible recommendations may lower barriers for researchers who want to apply a decolonial lens in their work. Rather than requiring researchers to determine how decoloniality applies to specific contexts, these recommendations provide an adaptable and structured foundation to work from.

This research has also shown that sustained, equitable collaboration with community stakeholders across all stages of research contributes to more nuanced and holistic

interpretations of the past. These findings respond to ongoing calls within archaeology for theoretical development to keep up with technological development. Integrating decolonial approaches into digital methodologies may therefore support the development of more ethical and analytically diverse analyses.

However, these findings also point to potential limitations in decolonial approaches. The emphasis in decolonial theory is challenging colonial power structures and Eurocentric epistemologies. However, this may be perceived as excessively politically motivated. Some of the case studies analysed here suggest that some researchers avoid explicitly engaging with these topics, possibly reflecting a reluctance to adopt politically explicit theoretical frameworks. This indicates that, despite their inherent value, decolonial approaches may not be universally acceptable without a broader shift in archaeology for how we see ourselves as agents in institutional research interests.

5.6. Discussion Conclusion

There were several key findings across the three different case studies. The consistent absent decolonial criteria amongst all three was data governance. Of all three cases, case study three presented the most commonalities between its research components and the criteria of the decolonial framework. However, it was established that the decolonial framework was applicable to all three case studies, despite the range in cultural and archaeological contexts. All three cases presented opportunities for a decolonial lens to be applied in the future. All three demonstrated aims to engage with community and they primarily focused these aims in the data collection and dissemination stages.

These findings provide a basis for considering the larger implications of the applications of decolonial theory in digital archaeology. One of the main implications being that with an adaptable set of recommendations there would be less barriers for these and other projects to implement a decolonial lens.

In the next chapter, the results of this thesis will be discussed, and the key findings throughout will be touched on. Following these key findings, the overall implications, limitations, and considerations for future work will be discussed.

Chapter 6. Conclusion

This thesis aimed to address two research questions. These questions were concerning whether flexible decolonial recommendations for digital archaeology can be developed and what are the implications of creating this set of flexible recommendations. Through the development of a decolonial analytical framework and its application on varied case studies in the United Kingdom, Jordan, and Greece, this research demonstrates that digital decolonial research can be applicable in multiple colonial and archaeological contexts.

Colonialism, as it understood further, acts in more granular and nuanced ways that still impact culture no longer under direct colonial rule. As mentioned, settler colonialism is not the only iteration of colonial imperialism and colonialism not only affects those within the colonies or outside of the colonial metropole. It is through the case studies, that we see colonialism effects cultural groups and sharing of heritage and identity, not just through settler colonial assimilation, but also internally through the power structures found within the colonial metropolises.

The decolonial analytical framework was developed from a synthesis of chosen source material that identified key principles for the application of decolonial theory to digital heritage research. These sources represent multiple iterations of colonialism and the current decolonial research that addresses colonialism in archaeology. These sources incorporate the settler colonialism found within the Canadian and US contexts. These backgrounds offer the understanding of how researchers address the need for research structure that is created with and for Indigenous communities that are connected to the heritage data from the archaeology itself.

The case study analyses demonstrated areas where decolonial criteria aligned with existing digital archaeological practice and where gaps remained. For cases one and two, Jordan and Greece, the colonialism that impacts them are similar in that they are both under Ottoman rule for centuries before their separation. The violent conflict between the Ottoman troops and the locals offer an insight into the duress and destabilization from Ottoman colonialism. On the other hand, case study three based in the UK offers a unique colonial context of internal colonialism within the British empire. This internal colonialism shows the nuance of colonial impact even when it impacts those within the metropole, often leading into the relationships outside of the borders. The combination of these contexts as case studies demonstrates the need for granular discussions for contextual clarity and the need to meet the contextual needs of the community at large. However, this also demonstrates the patterns and similarities amongst colonial impacted areas globally and that the generally adaptable framework necessary to be applicable for most researchers to work from.

One key finding was that data governance was consistently absent amongst all three cases. Along with data governance, another key finding was only case study three

met the decolonial criteria regarding community collaboration, political acknowledgement, and linguistic considerations. These findings show the need for recommendations of a decolonial lens in collaborative, community archaeology to be more focused on their impact on community through systemic, linguistic, and structural measures.

The limitations from within this research should also be acknowledged here. This research lacked multiple, direct voices contributing to it. Through the decolonial lens, multiple voices in the construction, implementation, and analysis would have helped to deconstruct the implicit Eurocentric bias behind this work. Another limitation is that some details of research do not make it to publications and therefore would be excluded from the case study analysis due to lack of access.

The findings of this study also suggest both benefits and potential challenges associated with implementation of these recommendations. One implication is the benefit of a deeper, holistic understanding of the past through strong relationships with community stakeholders. This should also affect the future trajectory of the relationship with archaeology and community. Another implication is that some researchers may be hesitant to implement the theory to their work as it may be too political in nature. While this is not exclusive to this thesis's interpretation of decoloniality, it is a hindrance that may still persist, despite an adaptable set of recommendations.

As digital technologies increasingly influence archaeological practice, and colonialism persists, theoretical and ethical approaches must also continue to evolve along side. Communities affected past and presently by archaeology's ties to colonialism, which must be acknowledged. But archaeology must examine how they might impact future communities by incorporating preventative measures. Technology will also change the ways in which colonialism perpetuates harm in the future and there is the threat of new communities will be harmed by colonial oppression.

Ultimately, this thesis argues that decolonial digital archaeology is not meant to be a fixed methodology or prescriptive research framework. This, instead, should be understood as flexible process to approach colonialism as it has shaped stakeholder relationships with research, digital tools, and archaeological authority over heritage narratives. By comparing three very different archaeological and cultural cases with their colonial histories, common issues regarding inclusion of pluralism at every stage of research and proper data governance measures became apparent. With these common research gaps identified and this expansion of the decolonial framework, it is the hope that others will also see the value in adding a decolonial lens to their digital archaeological work. These recommendations must be incorporated at every stage of research, not as an afterthought. This research demonstrates that decoloniality can also be actionable and adaptable principles that extend beyond the theoretical discussion.

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