An Investigation of changes to the Perception of Historical Artefacts brought about by 3D Scanning Technologies

A research component submitted to Auckland University of Technology in partial fulfilment of the requirements of the degree of Master of Creative Technology

Supervisor

Frances Joseph

2026

By

Liam Doyle

Auckland University of Technology

Table of Contents

Attestation of Authorship iii

AI Declaration iv

List of Figures vi

List of Tables vii

Acknowledgements viii

Ethics Approval viii

Abstract ix

Chapter 1 Introduction 1

Chapter 2 Literature Review 4

2.1 Walter Benjamin 5
2.2 Digital Culture 9
2.3 Photogrammetry 14
2.4 Māori Perspectives 17

Chapter 3 Research Methodology 22

3.1 Literature Review 22
3.2 Online Survey 24
3.3 Expert Interviews 31

Chapter 4 Research Findings 35

4.1 Online Survey 35
4.1.1 Accessibility and Education 36
4.1.2 Aura and Physical Experience 39
4.1.3 Concerns about Technological Manipulation 41
4.1.4 New Forms of Interaction 43
4.2 Focus Group 44
4.3 Interviews 47
4.3.1 Accessibility 48
4.3.2 Authenticity and Aura 49

4.3.3 Ethical Responsibility 50
4.3.4 Digitisation is not a Neutral Reproduction 52
Chapter 5 Discussion 54
5.1 Accessibility and Democratisation 54
5.2 Authenticity, Material Presence, and Aura 55
5.3 Digital Artefacts as New Objects 57
5.4 Implications for Historical Practice 60
Chapter 6 Conclusion 64
Chapter 7 Bibliography 67
Chapter 8 Appendices 73
Appendices A - Ethics Approval 73
Appendices B - Tools 74
B1 - Focus Group Participant Information Document 74
B2 - Focus Group Consent Form 78
B3 - Participant Expert Interview Information Document 79
Appendices C 83
C1 - Public Survey Questions 83
C2 - Artefact Descriptions 86

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Liam Doyle

4/7/2026

AI Declaration

Artificial Intelligence Guidelines:

Artificial Intelligence (AI) tools, including generative AI tools approved for use by AUT (AI Tool Register), can be used as learning tools when preparing to write your research proposal or research component. AI tools also have capability to assist with data modelling, data analysis and data visualisation. However, the research component you submit for examination must be substantively your own work. AI tools cannot solely be used to generate content when writing or creating an artwork/artefact, as this constitutes plagiarism. The formal guidelines for appropriate use of AI on the AI Hub must be followed. Also refer to the Using Artificial Intelligence in your Research: Self-Assessments, Checklists, and Sample Text, for examples and sample text.

If you do plan to use AI tools, this declaration should be submitted with the initial research proposal, Confirmation of Candidature, and when you submit your research component for examination. You must complete the template below for each AI output used detailing the following:

- **Chapters where AI was used in any way**
- **Purpose of AI Use**
- **AI Tool(s) Used**
- **Prompts Used**
- **Post-AI Processing Methods**

Specify the chapter number(s) in your research proposal/research component where AI was used.	
Chapter number(s):	Chapters 1, 2, 3, 4, 5, and 6
Briefly explain why the AI tool was used (e.g., idea generation, summarization, data analysis, image creation, etc.).	
Purpose of AI Use:	To ensure proper grammar was used and to help condense sentences to sound more professional and academic.
Clearly state the AI tools used.	
AI Tool(s) Used:	Grammarly Writing Assistant Tool and Microsoft 360 Copilot
Prompts or queries entered into the AI tool (only the instructive portion of the prompt is required). Include all relevant variations.	
Prompts Used:	• Summarise this research article… • Make this sentence sound better…. • Does this sound like academic writing… • Is this a good master's level thesis paragraph……and how to make it sound more cohesive/sound better. • Antonyms for the phrase…. • Synonyms for the word….
A summary or description of the AI-generated output.	
Output Received:	The AI-generated outputs were all focused on ensuring a consistent academic tone throughout the chapters. The outputs were my ideas in rephrased sentences or paragraphs with the ideas laid out in a more readable and professional manner
Describe how the AI output was used, edited, or transformed.	

Post-AI Processing Methods:	The AI outputs were all reviewed, edited and transformed t into my own style of writing while maintaining the proper grammar and the generated academic tone. While I would use the way ideas were structured in a sentence more often than not, I would not like the way the sentence was worded so I would do further work on the writing myself. All amendments proposed by AI reviewed and edited to reflect my writing style and ensure my ideas came through clearly.

You may use this free text box to explain the intent for the use of the AI generated content. *For example, rather than stating what prompt(s) were used, you may articulate the purpose for which the prompt was used (supported by examples) here:*
All the Ai tools used were for grammar or wording advice or as a proofreader to complement all the readings and editorial advice of my supervisor, of which her edits and suggestions were prioritised over those of the Ai tools.

STUDENT DECLARATION					
By signing you are confirming that the AI use stated in the table(s) above are accurate and follow AUT's recommended guidelines detailed in the AI Hub and Postgraduate Handbook.					
Student Name:	**Liam Doyle**	**Signature:**		**Date:**	**4/7/2026**

List of Figures

Figure 1: Poster used to advertise the survey 25

Figure 2: Photo 1 of Old Customs of Chinese Festivals book.....29

Figure 3: Photo 2 of Old Customs of Chinese Festivals book.....29

Figure 4: Photo 1 of the little red bowl 30

Figure 5: Photo 2 of the little red bowl 30

Figure 6: Image of digital model of Old Customs of Chinese Festivals book 31

Figure 7: Image of digital model of the little red bowl.....31

List of Tables

Table 1: Demographic breakdown of survey participants 35

Table 2: Agreement with statement in Question 6 36

Table 3: Agreement with statement in Question 5 377

Table 4: Agreement with statement in Question 3 388

Table 5: Past usage of digital tools for historical exploration 38

Table 6: Formats participants prefer to help them to understand history best..... 40

Table 7: Agreement with the statement in Question 4 433

Acknowledgements

I want to give my sincerest thanks to my supervisor Frances for her knowledge and advice throughout this whole process. Without your expertise and patience, I would have been lost. Thank you to my friends who had to listen to be speak about the entire process and to my family and all the love they provided as support.

Ethics Approval

Ethical approval for the survey study was granted by the Auckland University of Technology Ethical Committee (AUTEC) on 13th November 2025. Approval code: AUTEC 25-346.

Abstract

Technological advancements have continually transformed how societies perceive and engage with both past and present events. More recently, developments in 3D scanning and modelling technologies have begun reshaping the ways in which historical artefacts are studied, interpreted, and disseminated. Despite the growing use of these technologies in museums, archives, and historical research, their broader cultural and ethical implications remain underexplored due to the field's interdisciplinary nature. This research examines how digital technologies, particularly 3D scanning and photogrammetry, are influencing contemporary engagements with history. The study draws on a wide range of literature, from Walter Benjamin's essay on *Art in the Age of Mechanical Reproduction* including Māori perspectives on photography and cultural representation, alongside qualitative research including public surveys, focus groups, and expert interviews. The findings reveal a cautious but optimistic embrace of 3D scanning technologies by both public participants and academic professionals. While participants recognised the potential of digital technologies to increase accessibility and public engagement with history, they also expressed concerns regarding authenticity, cultural context, technological inequality, and the ethical implications of digital reproduction. The research suggests that the increasing dissemination of digital artefacts may fundamentally reshape how historical artefacts are experienced, creating both the risk of disconnection from material and cultural context and the possibility for broader, more democratic forms of historical engagement. While this study focuses specifically on 3D scanning technologies, it also highlights the wider impact digital technologies are having on contemporary historiography.

Chapter 1 Introduction

The increasing digitisation of museum collections and the widespread adoption of 3D scanning technologies are reshaping how historical artefacts are perceived. In particular, the use of photogrammetry is changing how the past is accessed, interpreted, and understood. With the transformation of physical artefacts into digital representations that can be widely distributed and interactively explored, our understanding of these objects has shifted. This shift raises important questions about how digital mediation has influenced relationships between people, artefacts, and historical knowledge. This thesis aims to examine how these 3D scanning technologies affect historical objects using a mixed-methods approach that combines surveys, focus groups, and expert interviews.

Photogrammetry is the process of digitising an object by utilising 2D photographs to create accurate 3D models without manual modelling or texturing (Schindler, 2020). While digitisation has greatly expanded access to historical material, less is understood about how digital representations shape the relationships among historical meaning, cultural value, and accessibility. A digital twin, defined as an object whose physical structure is transformed into a digital entity that can be stored, manipulated, shared, and virtually navigated (Sogbesan, 2021), may replicate a physical object's form with considerable accuracy. However, the emotional and sensory shift between encountering a physical artefact and its digital counterpart introduces questions about how such objects are experienced and interpreted in both public and academic contexts. This thesis reflects the view that authenticity is far more complex and relational, shaped by context, interpretation, and cultural frameworks (Rahimi, 2025), prompting broader questioning rather than a simple yes-or-no assessment of whether digital artefacts are authentic or inauthentic.

This research aims to investigate how 3D scanning and digital objects influence public and professional understandings of historical artefacts, with particular attention to questions surrounding accessibility, interpretation, and cultural responsibility. In doing so, the research examines how digital artefacts function not as replacements for physical objects but as more complex objects that create distinct modes of engagement while remaining, in some way, connected to their physical counterparts.

The significance of this research lies in its engagement with the growing field of digital heritage. As museums and cultural institutions increasingly digitise their collections, digital artefacts are becoming central to education and public access. At the same time, these processes raise important considerations regarding cultural authority, particularly regarding

Indigenous perspectives and the stewardship of heritage. The expanding role of digital models in standing in for historical artefacts makes it essential to better understand how these representations shape meaning and relationships among different audiences.

The central research question guiding this thesis is how photogrammetry and digital 3D representations influence public and professional understandings of historical artefacts, reflecting a broader concern with how digitisation reshapes relationships between artefacts, people, institutions and cultural meaning.

As a casual history enthusiast, I am particularly interested in how technology shapes my understanding of the past. Moreover, beyond members of the general public, this research also examines the perspectives of professional academics, who are at the cutting edge of historical research. This perspective allows for a more comprehensive understanding of how digital artefacts are perceived across different contexts.

My interest in 3D scanning technologies, such as photogrammetry, developed during my undergraduate studies in Creative Technologies at Auckland University of Technology, where I was first introduced to tools for capturing and modelling physical objects digitally. I then became increasingly interested in how digital technologies can extend access to historical material and create new forms of engagement with the past. Combined with my deep interest in history, these experiences have shaped both the focus and the questions that underpin this research. Consequently, this research emerges from an intersection of technological curiosity and historical inquiry, influencing my interest in how digital reproductions affect perceptions of authenticity, meaning, and cultural value.

My perspective has also been shaped by my experience as an international student who moved from the United States to Aotearoa New Zealand to pursue my university education. Before arriving in New Zealand, my understanding of heritage and historical objects was largely shaped by the dominant Western perspectives found in the United States. Through my academic studies and this research, I have developed a greater awareness of Māori culture and the distinct ontological perspectives that shape Māori understandings of objects, heritage, and cultural authority. Engaging with Māori scholarship and perspectives has highlighted that historical artefacts cannot always be understood solely as material objects or sources of information, but may also exist within wider relationships connecting people, Whakapapa, knowledge, and place. While I do not position myself as an authority on Māori worldviews, this research has encouraged me to reflect critically on my own assumptions about digital heritage. It has reinforced the importance of considering multiple cultural frameworks when examining the implications of digitisation.

To address the research question, this study utilises a mixed-methods approach that combines a public survey, a focus group, and expert interviews. The survey captures a broad range of public perspectives, while the focus group allows for more detailed discussion of specific artefacts and their digital counterparts. Interviews with academics and museum professionals provide insight into how these technologies are understood within professional settings. Taken all together, these methods provide a multi-layered understanding of how digital artefacts are interpreted and valued.

Chapter 1 introduces the thesis's key themes and organisation, outlining the research's concepts, context, and structure to provide a clear foundation for all that follows. The second chapter is a literature review divided into four main sections; the first section on Walter Benjamin, explores the concepts of aura and authenticity which are central to understanding how value is assigned to physical and digital artefacts. The second section subtitled, Digital Culture, examines the themes of mediation and access, focusing on how digital technologies modify the ways in which historical information is engaged with and interpreted. The third section, Photogrammetry, addresses the historical evolution of physical objects into digital forms, providing real-world context for the study. The fourth and final section, Māori Perspectives, introduces concepts around cultural authority, highlighting the importance of Indigenous frameworks in understanding the ethical and cultural dimensions of digitisation. This organisation serves to contextualise a diverse range of references for each concept and their significance to the study's foundation.

The third chapter is the methodological section, which explains the strategies used to collect data for this research. It justifies the use of a survey, a focus group, and interviews, and explains how each method was implemented in the data collection process. Chapter four presents and compares the data collected. This chapter begins to identify key patterns, similarities, and differences emerging from the survey, focus group, and interviews. Chapter five is the primary analytical discussion chapter, in which the data analysis and the theoretical literature come together to identify the main themes that have emerged through the research and explain the significance of their relationships. The sixth and final chapter reflects upon the research project outcomes and speculates on their significance and future research directions.

Chapter 2 Literature Review

Across all academic disciplines, technology has helped shape the way people engage with and interpret the knowledge produced. The evolution of historiography, the writing and interpretation of history, and its technological evolution from handwritten chronicles to printed archives have shifted the way in which historians conduct historical research. As historical research and digital technology progressively intertwined, traditional research methods, including manual archival work, are being steadily replaced by digital tools (Milligan, 2022). This digitising shift in historical information has significantly transformed data collection, dissemination, and interpretation. As technological developments alter the dissemination of history, they also influence the way people perceive it.

The integration of technologies such as photogrammetry and 3D scanning has influenced how both the public and academia engage with the past. Photogrammetry, with its ability to rapidly produce numerous highly detailed 3D models, has become instrumental in documenting and preserving historic sites and artefacts (McCarthy et al., 2019). Initially developed for engineering projects, photogrammetry has become a powerful tool in the humanities, expanding historians' possibilities to document, analyse, and interpret historical research (Magnani et al., 2018).

Photogrammetry may be defined as the detailed extraction of “geometric and semantic information from imagery” (Schindler, 2020). Alternatively, in simplified terms, photogrammetry is the digital process of extracting information from 2D photographs of objects to create a 3D model. When using photogrammetry manual 3D modelling and texturing can be avoided, especially as achieving satisfactory results typically requires a high level of skill, however, currently it only requires a few photographs.

Within an academic context, photogrammetry has facilitated a shift from more traditional and manual recording techniques requiring written descriptions or drawings of an artefact, to the rapid and precise reproduction and distribution of digital replicas. Researchers can now capture complex geometric data of an artefact or site in the field and digitally process it into detailed models that support both qualitative and quantitative analysis (Grosman, 2016). Photogrammetry has not only improved the efficiency of archaeological documentation but also opened new paths for interdisciplinary cooperation, digital preservation, and historical participation (Marín-Buzón, 2021). Marín-Buzón emphasised the value of photogrammetry a digital technique from the engineering field, helped enhance understanding of work on a “nuraghe”, a type of megalithic monument built only in Sardinia during the Bronze Age.

Beyond academia, photogrammetry has had a significant impact on the public's perception of history, which (Bagi, 2018) sees as a tool of great potential for engagement with archaeological heritage. This is because displaying 3D information, enabled by photogrammetry, can generate greater public interest and deeper historical interpretation. This technology enables interactive reconstructions of historical sites and artefacts, allowing the public to engage with history in innovative ways. Neamtu et al. (2011) discuss how, with the innovation of digital artefacts and digitised landscapes, a full experience in visualising and interacting with the 3D models in a virtual reality environment can be created. The digitisation of artefacts increases involvement with cultural heritage previously limited by geography or by restrictions on visiting archaeological sites due to preservation concerns (Mustafa et al., 2013). The introduction of new ways of viewing history through this technology may also reshape perceptions of history (Burkholder & Schaffer, 2024). These examples showcase a change in how historical artefacts are engaged with as a result of photogrammetry.

These new digital tools for historiography have sparked enthusiasm and critical reflection on the transforming relationship between historians and technology (Lian & Xie, 2024). This review examines how photogrammetry is reshaping the relationship between historiographical practices and engagement with history. It argues that 3D scanning technologies symbolises a shift in the methodology and interpretation of historical knowledge.

2.1 Walter Benjamin

There is a growing body of literature addressing how the use of technology has fundamentally changed the way we view the world around us. Walter Benjamin's, *The Work of Art in the Age of Mechanical Reproduction* (1935) examines how technological methods of image reproduction altered society's perception of cultural objects.

Benjamin argues that the introduction of mechanical reproduction, in the context of photography and film, fundamentally changed the status of art by detaching it from its ritual foundations. He explains that this shift erodes the "unique phenomenon of a distance, however close it may be" of the artwork, which he famously termed the "aura" (Benjamin, 1935). For Benjamin, aura is inseparable from the object's singular presence in both time and space, as well as from the historical and ritual contexts that confer its authenticity. Benjamin conceptualised this ritual context as "cult value." Digitising cultural heritage, by contrast, aims to bridge this distance, creating deeply engaging environments where users can interact with digitised artefacts or reconstructed sites as if they were physically present. This virtual

immersion challenges the very conditions Benjamin identifies as inherent for the existence of aura: uniqueness, locality, and temporal specificity.

Benjamin illustrates the concept of aura through the example of how, in ancient times, certain statues of the Gods were kept in the Cella (a small inner chamber of an ancient Greek or Roman temple), hidden from public view, with only the high priests able to access them because of their magical connection to the divine. They were not for the general public to admire as we view such statues today, for their value lay not in their aesthetic qualities but in their cultic roles, rooted as exclusive ritual items. Nevertheless, even beyond objects of veneration, Benjamin recognises that all art bears this aura. Over time, as objects moved from cult contexts to exhibition spaces, their aura persisted, though it was transformed from the divine to the aesthetic. However, with the invention of photography, Benjamin observes a key breaking point in the preservation of such cult value since, “from a photographic negative…one can make any number of prints; to ask for the ‘authentic’ print makes no sense” (Benjamin, 1935). In other words, according to Benjamin, before the invention of photography, the available technology and the labour required to produce a perfect replication of a work of art meant that every work was unique. However, in this case, the mechanical reproduction of photographs introduces the logical possibility of infinite replication, thereby undermining the uniqueness that sustains the aura.

Benjamin (1935) notes that before the camera, the artistic process was highly labour-intensive, and that with the photograph, anyone could capture the likeness of a portrait or landscape, no longer needing to spend years honing their artistic craft. This is somewhat reflective of contemporary digitisation, in which individuals no longer need to visit specialised institutions run by professional historians but can now view a seemingly endless collection of artefacts online. Just as Benjamin describes how, in the 19th century, the rise of literacy turned the masses into potential writers, so too can it be said that today, with the mass dissemination of history through digitisation, there is endless potential for ordinary people to encounter history.

Benjamin’s view of aura highlights the contradictory nature of this transformation. On one hand, the replicative nature of photogrammetry helps to intensify the loss of aura by collapsing spatial and temporal distance. Reducing the singularity that Benjamin saw as essential to aura, since a digital file of an artefact can be viewed, rotated, and zoomed in without regard for its original setting. However, the very precision of these digital replications raises questions about whether new forms of aura might emerge in the digital realm. Although it occurs through accurate spatial and sensory simulation, this presence is not the same as aura. The aura is a constructed immediacy that substitutes technical accuracy for historical authenticity.

Benjamin suggests that technological reproduction not only destroys the aura but also modifies it by shifting the ritual emphasis toward accessibility and political engagement. Similarly, 3D scanning introduces a new form of direct engagement that prioritises interaction over presence and contemplation.

This tension underscores the stakes of digital heritage: whether immersion brings about a deeper historical understanding or merely aestheticizes the past for consumption. Benjamin's framework suggests that the promise of “being there” in virtual environments is an illusion, a mask for the artefact's fundamental displacement from the historical context from which it came. The conditions Benjamin associated with aura may be substantially altered within digitally reproducible environments, not because technology fails to replicate the object, but because replication transforms the very conditions of historical experience (Benjamin, 1935).

Benjamin warns against the idea that cultural redemption would be found within technological progress. He argues that mechanical reproduction is not neutral; it simply shifts the perception and authority. When applied to photogrammetry, this understanding helps showcase the stakes of digital heritage projects. While they expand access to the general public, they also risk reducing history to an aestheticized experience by obscuring the conditions under which it came into existence. Rather than offering critical reflection, the scanned artefact, like the ancient statue, is detached from its historical context and reduced to consumable material. When viewed through Benjamin’s terms, the dialectic he is trying to tease out is that the shift from cult value to exhibition value is both a loss and a liberation. This dynamic continues to shape our perception and engagement with history in the age of digital reproduction.

Benjamin’s analysis of mechanical reproduction in art provides a robust theoretical foundation for examining how 3D scanning and photogrammetry transform our perception of history. By confronting concepts such as the cult value, aura, and the politics of accessibility, his work enables a nuanced understanding of the benefits and risks of digitising the past. Just as photography and film redefined art in the early twentieth century, 3D scanning and photogrammetry are redefining history today, not simply by preserving it but by altering the very conditions by which it is experienced, understood, and valued (Benjamin, 1935).

Given the boundless reproductive potential of art in the modern world, have all previous works of art lost the halo of authenticity that once surrounded them, making them truly unique? That is one of the questions Benjamin poses in his writing that has relevance to this research.

In his final published work, *On the Concept of History* (1940), Benjamin addresses changes in the perception of history comes to mean. Writing in the looming shadow of fascism around the globe, Benjamin critiques historiographic approaches that rely on linear, progressive models of historical time. He argues that this way of presenting history obscures the violence and exploitation that underpin historical continuity. Benjamin continues to argue that the dominant historicist view of history, that history is a continuously accumulating narrative of progress culminating in the present, serves only to legitimise the existing power structures by aligning historical empathy with the so-called "victors of history" (Benjamin, 1940).

Benjamin insists that historical materialism must reject the homogeneous, "empty time" (*leere Zeit*), and instead see history as moments of dangerous ruptures that suddenly become legible to the present. He refers these moments of the past as *Jetztzeit* (now-time), and they are not a stagnated collection of facts from past but instead charged constellations of individual historical moments in which historical meaning is actively produced. The present is not a smooth path laid down by the past; rather, the past flashes by at moments of danger, demanding that something be actively seized, reinterpreted, and politicised (Benjamin, 1940). This understanding of history as discontinuous and constructed provides a critical framework for examining how new technologies, including 3D scanning, mediate encounters with historical objects and sites.

Benjamin's critique of cultural communication is also informative within this context. He argues that "there is no document of civilisation which is not at the same time a document of barbarism," meaning that a historical artefact is inseparable from the conditions of domination under which it was produced and preserved (Benjamin, 1940). Returning once again to 3D scanning, this particular insight of Benjamin's foreshadows the ethics of digital preservation. Highly precise scans may appear to preserve objects from decay or loss, yet they can also abstract them. For they are placed in a digital void, forever separated from the histories of violence, displacement, and ruin from which they originate. Without critical framing, digital reconstructions risk reducing historical debris to fun facts and meaningless data, thereby neutralising the very historical catastrophes they purport to represent.

Benjamin's use of the "Angel of History" image further reveals his relevance to technologically mediated history. The angel, blown into the future while looking back at the accumulating wreckage of the past, embodies Benjamin's rejection of progress as a redemptive narrative. Benjamin illustrates here not the story of progress we are told, but one of unending catastrophes masked by claims of advancement (Benjamin, 1940). The use of 3D scanning technologies are often justified through narratives of technological progress and the potential for

greater historical preservation (Schaich, 2013). However, this also highlights the sorts of tensions Benjamin describes, as one must operate within a historical field marked by loss and fragmentation.

Crucially, Benjamin argues that the task of the historian is not to reconstruct the past “as it really was,” but to rescue from oblivion histories suppressed or endangered meanings. For Benjamin, historical materialism aligns with those who were defeated and who refuse seamless narratives in favour of critical interruption, rather than with the so-called victors who write history (Benjamin, 1940). When applied to 3D scanning, this historiographical principle suggests that the potential of this technology lies not in producing complete or immersive reconstructions, but in highlighting absence, damage, and discontinuity.

In this sense, photogrammetry can function either as an extension of Benjamin's view of historicism or as a tool for historical critique. When used to create seamless, interactive models that promise total access to the past, it risks solidifying the ideological underpinnings of historical continuity. However, when approached self-consciously and with an acknowledgment of the constructed nature of digital models and the political conditions shaping their production, photogrammetry can produce moments of historical rupture that resonate with Benjamin’s concept of *Jetztzeit*. Thus, the technology becomes a site where the struggle over historical meaning is realised in the present rather than resolved through pointless accumulation.

Ultimately, *On the Concept of History* provides a critical lens for understanding how contemporary digital technologies reshape our perception of history. Benjamin’s emphasis on historiographical rupture, self-conscious responsibility, and the unfinished nature of the past challenges dominant narratives of unending, progressive technological advancement and opens the possibility of a more cautious, politically informed engagement with 3D digital historical representation. Through this framework, photogrammetry is revealed not as a neutral advance in historical methodology, but as a practice that actively participates in the ongoing contest over how history is seen, remembered, and mobilised in the present (Benjamin, 1940).

2.2 Digital Culture

Following on from Benjamin’s critique of technological reproduction and its impact on cultural perception, Jussi Parikka’s book, *What Is Media Archaeology?* (2012) offers a complementary yet distinct conceptual framework for understanding how 3D scanning technologies help change our perception of history. While Benjamin focuses on the erosion of aura through mechanical reproduction, which leads to the politicisation of art, Parikka situates contemporary digital technologies, such as 3D scanning and photogrammetry, within the wider

array of nonlinear, material, and technological genealogies of media history. Similar to Benjamin's historical materialism, the media archaeology Parikka discusses does not regard digital reproduction as a singular historical narrative; rather, it positions digital heritage within longer trajectories of digital maintenance, representation, and technological experimentation (Parikka, 2012). Parikka reveals how every digital reconstruction, including 3D models, is set within deep infrastructures of processing and storage, constituting “a fold of time and materiality where the past might be suddenly discovered anew” (Parikka, 2012).

A central theme in Parikka’s book is that media cannot be understood solely through their symbolic or illustrative functions. He states that media cultures are fundamentally non-linear and composed of recurring technical and cultural forms that continually reappear (Parikka, 2012). This approach aligns closely with the current use of 3D scanning and photogrammetry, which often present themselves as modern, cutting-edge innovations while also reviving older impulses toward cataloguing and preservation. The practice of scanning artefacts to produce highly detailed and manipulable digital objects can be understood as part of the same archival and documentary logic that Parikka identifies as a recurring cultural methodology of modernity: the attempt to stabilise and capture the world through technical means.

Parikka also argues that media archaeology “is not interested in universalising models of technological progress” but rather in looking into the known, forgotten, and alternative material histories of media that disrupt the dominant narratives of the eternal newness of digital media (Parikka, 2012). This emphasis on the materiality of digital media provides a pivotal view for analysing 3D scanning technologies. Photogrammetry may, at first glance, appear to be a purely visual or representational tool; however, from the perspective of Parikka and media archaeology, it is also a collection of computational processes and algorithmic transformations. These often-overlooked technical aspects shape not only what kinds of historical reconstructions are possible, but also how those reconstructions are experienced and perceived.

Parikka’s emphasis on the materiality of media is informative for digital heritage. His approach is beneficial in challenging the assumption that digital technologies simply “preserve” or “save” the past. Media archaeology helps to showcase that every recording or reconstruction is an active, interpretive operation that produces new historical objects rather than neutral replicas (Parikka, 2012). This parallels Benjamin’s stating that reproduction changes the conditions of perception. However, Parikka goes further, showing how the digital process transforms the artefact's very being. In this regard, 3D scans are not neutral reproductions of historical objects but entirely new media artefacts that, through their algorithmic generation and

the technical upkeep required, introduce their own forms of distortion, abstraction, and temporality. Thus, the use of 3D scanning does not merely alter our access to history; it changes what the historical artefacts are and how they exist in both time and space.

This digital existence also connects to Parikka's discussion of how archives are nowadays dynamic, software-driven environments rather than static repositories of data. He argues that today's archives are "dynamic and temporal networks… software environments and social platforms for memory." When this shift is viewed through the lens of 3D scanning, digitised heritage objects circulate across different platforms or institutional repositories where they can be downloaded, edited, or recontextualised. The archive becomes less a place and more a process, sustained through continual replication, rendering, and maintenance. A place in which the "enduring ephemeral" nature of digital memory shapes what is forgotten and what remains. Within this framework, the artefact, digitised for preservation, has itself once again become a time-critical artefact. Whereas external environmental changes once affected the artefact, it now depends on codecs, storage capacity, file formats, and display protocols, whose obsolescence constantly threatens the longevity of the reconstructed past. This tension destabilises assumptions about historical continuity and raises questions about what it means to preserve the past within technological systems that age far faster than the artefacts they record.

At the same time, Parikka highlights the importance of forgotten and alternative media histories in understanding contemporary digital culture. When viewed through this lens, 3D scanning does not represent a revolutionary break from traditional historicism but rather the continuation of long-standing traditions of cataloguing and visualising the material world (Parikka, 2012). In this nonlinear history, digital reconstructions become part of a recurring desire to render the world calculable, reproducible, and systematised. Parikka's media archaeology demonstrates that 3D scanning is not a novel solution for preserving historical objects, but rather a manifestation of a more profound historiographical practice that has shaped the perception of history for centuries.

Finally, Parikka emphasises that media archaeology is not merely a mode of historical analysis but also a critical practice that reveals the power relations embedded in media systems. In the context of 3D heritage, this encourages scrutiny of who digitises historical objects, whose narratives are elevated or erased through digital reconstruction, and how access to digitised artefacts is governed. Just as Benjamin warns that mechanical reproduction can obscure structures of authority, Parikka shows that digital reproduction can similarly obscure the infrastructures, labour, and institutional decisions that shape which parts of the past become hyper visible and which remain hidden (Parikka, 2012).

In summary, Parikka provides a theoretical foundation for understanding 3D scanning not as a transparent window onto the past but as a complex, materially grounded media practice that actively reshapes historical knowledge. Positioned decades after Benjamin's critique of aura, Parikka's work expands the conversation by revealing how contemporary digital technologies participate in longer, more intricate histories of mediation, histories that fundamentally alter how the past is produced, accessed, and understood.

Ian Milligan, contends in his book, *The Transformation of Historical Research in the Digital Age*, digital technology has radically changed the everyday practices of historical research to the extent that all historians, not just those who identify as digital historians, are now "digitised historians" (Milligan, 2022). Milligan illustrates that the work of the historian has been transformed at every stage, not just by 3D scanning technology but also by all digitised workflows, from discovery and archival access to analysis and publication. A historian's contact with the past is now mediated by search engines, digitised databases, algorithmic filtering, and large-scale digital collections, shaping not only what sources are visible but also how research questions are formed in the first place (Milligan, 2022). This reframing is critical for understanding the influence of 3D scanning technologies, which similarly alter the conditions under which historical objects are studied by replacing physical encounters with digital access.

Milligan places particular emphasis on how digitisation affects the scale and speed of historical research. He notes that historians now regularly work across millions of documents using keyword searches and database queries, often without fully understanding the algorithms that structure the results showcased (Milligan, 2022). This algorithmic mediation introduces a new tension between new possibilities and new blind spots, granting certain forms of visibility while obscuring others. When applied strictly to 3D scanning, this insight suggests that the highly detailed digital models not only enhance historical understanding but also restructure it. Scanned artefacts, monuments, or historical sites become searchable, modular data objects that can be compared and circulated at an extraordinary scale, potentially prioritising visual and spatial information over contextual, sensory, or cultural knowledge.

Milligan also highlights the transformation of archives from places bound by limited physical access to digitally navigable spaces shaped by digitisation priorities, institutional resources, and platform design. He describes how historical interpretation is relegated to later analysis on computer screens as historians increasingly conduct "whirlwind archive trips," which usually involve extensive digital photography rather than engagement (Milligan, 2022). This observation by Milligan resonates strongly with 3D scanning practices, which often relocate the historical object's ways from its original state and thus change its analysis. As a result, historical

understanding becomes increasingly screen based, emphasising visual consistency and quick access. Milligan cautions that, while this expanded access can democratize research, it also distances historians from the material and spatial contexts that traditionally ground historical analysis (Milligan, 2022).

Finally, Milligan argues that digital tools should be understood not as neutral aids but as active influences on historical methodology and interpretation, which means that historians must become more self-conscious about their practice (Milligan, 2022). This call is particularly relevant in the context of 3D scanning technologies. As digitised artefacts increasingly stand in the place of physical objects, historians must critically examine how scanning, modelling, and visualisation processes shape historical narratives, what they foreground, what they omit, and how they reframe authority over the past. Milligan's intervention thus provides an essential theoretical foundation for analysing 3D scanning not merely as a technical innovation, but as part of a broader transformation in how history is presented, researched, and ultimately understood in the digital age.

Among the most thorough examinations of the interdisciplinary blend of technology and history is the article titled "*The Evolution of Digital Cultural Heritage Research: Identifying Key Trends, Hotspots, and Challenges through Bibliometric Analysis,"* by Yuntao Lian and Jiafeng Xie. The two authors have compiled a wide range of cultural heritage research since the late 1990s to provide an overview of how digital technologies have reshaped the discipline of cultural history. Using a bibliometric analysis of over 1,500 publications, the authors demonstrate that digitisation has become a foundational driver of the ways in which heritage is preserved, communicated, and interpreted. They argue that heritage preservation has become "an act of communication," in which digital tools intervene in cultural meaning between the past and present audiences rather than simply reproducing historical objects (Lian, Y. & Xie, J., 2024). This reframing is essential for understanding the impact of 3D scanning technologies, which transform artefacts and historic sites into communicative digital forms that extend beyond their original geographic and academic boundaries.

A key aspect of the article is the identification of three major developmental phases in digital cultural heritage (DCH) research: an early formative stage focused on documentation methodologies, a middle phase concentrating on digital narratives and case studies, and a recent "booming phase" characterized by immersive technologies such as 3D replication, virtual reality (VR), and augmented reality (AR) (Lian, Y. & Xie, J., 2024). Since 2017, research publication output has increased dramatically, coinciding with international initiatives promoting digital workflows for heritage conservation (Lian, Y. & Xie, J., 2024). In this latest phase, 3D

digitisation technologies are identified as a central methodological development. For Lian and Xie, these technologies have fundamentally changed how history is accessed, studied, and visualised by both scholars and the public.

The bibliometric clustering analysis further highlights 3D visualisation and immersive technology as key research areas. Lian and Xie show that 3D scanning is not merely a technical tool for preservation but also a foundation for practical and interpretive methodologies that could help to support virtual museums, interactive exhibitions, and digital archaeology. These technological developments help shift historical understanding from passive observation to participatory exploration, where the perception of the past is shaped by the interactive user experience rather than by the mediation of a text or photograph (Lian, Y. & Xie, J., 2024).

At the same time, Lian and Xie caution that the rapid expansion of digitisation and 3D technologies has introduced new challenges. They note the rise in concerns about overreliance on technological spectacle, the fragmentation of cultural context, and the risk of reducing heritage to a visually optimised digital product. Lian and Xie emphasise that this new interdisciplinary collaboration needs to balance technological innovation with cultural sensitivity to ensure that digitisation does not distort the cultural context embedded in heritage (Lian, Y. & Xie, J., 2024). Lian and Xie provide a crucial insight into how 3D technologies greatly expand the ways history can be perceived and accessed. However, this technology also requires careful methodological and ethical frameworks to ensure that digitised artefacts deepen historical understanding rather than replace it with a reverence for realism.

2.3 Photogrammetry

The early adoption of photogrammetry was hindered by significant technical and financial limitations. Fraser et al. (1986) and Gagnon et al. (1990) collectively highlight the dependence on specialised equipment, expert knowledge, and resource-intensive processes, which restricted its widespread adoption. While these studies emphasise different technical challenges, they converge in presenting photogrammetry as a promising yet, at the time, impractical tool for routine archaeological or historical use. This shared perspective demonstrates the extent to which early limitations were not conceptual, but infrastructural.

Nevertheless, as the 20th century gave way to the 21st, the once bulky and expensive technology began to evolve rapidly. Remondino (2011) identifies a shift towards greater usability in 3D scanning technologies, marking an evolution towards more user-friendly accessibility. With more data storage is being highlighted as a significant step toward the mass adoption of photogrammetry. This observation aligns with wider trends in digital humanities, where tools are

increasingly designed for non-expert users. A key step in this direction was the mass production of what would eventually be called “digital twins”, which are exact virtual reconstructions of artefacts digitised for conservation (Rahimi et al., 2025). As more researchers gain access to increasingly user-friendly technologies, they may consider additional use cases for photogrammetry. Others, such as Grosman (2016), argue that these digital copies are now essential for archaeological field and lab work. As historiography and technology continue to intertwine, methodological changes will occur as more researchers, such as Grosman, find photogrammetry to be an effective tool.

Many researchers are now returning to well-researched sites and artefacts to begin digitising them; for example, McCarthy et al. (2019) utilise photogrammetry to create detailed 3D models of well-documented shipwrecks. McCarthy et al. (2019) argue that photogrammetric models can contribute to a more comprehensive understanding of underwater archaeological sites. While their work demonstrates clear advantages over traditional 2D documentation, it also assumes that increased visual detail leads to more refined historical interpretation. Without supporting archaeological analysis, highly detailed visualisations may risk privileging visual realism over historical interpretation.

Magnani et al. (2020) highlight how digital technologies, including photogrammetry, have increased accessibility, particularly by enabling remote analysis of archaeological sites. While this aligns with broader efforts to overcome geographical limitations in research, it simultaneously introduces a tension between access and context. As access becomes detached from physical presence, there is a risk that critical cultural and environmental factors may be overlooked in analysis. This tension highlights an important limitation of photogrammetry within historiographical practice.

Nevertheless, a conversation has begun about how the accessibility of digitised artefacts and historical sites has affected the way people interact with these digital objects. McCuistion (2013) discusses how digital artefacts created with photogrammetry can help people become more connected to their local history through public outreach projects. McCuistion (2024) also discusses 3D-printed digital twins that create physical replicas of artefacts, enhancing the educational environment and helping people connect more closely to the past. Magnani et al. (2018) discuss how 3D scanning not only enhanced their research but also helped connect the local Sami community to their culture and history. However, these interpretations rely on differing assumptions about what constitutes meaningful engagement, whether it is increased access, emotional connection, or critical understanding, highlighting a lack of consensus within the literature. Corbin (2012) argues that most archaeological projects treat public engagement

as one-way communication from the researcher to the public rather than a purposeful, two-way collaboration. With historians and archaeologists seeing themselves only as disseminators of information to the public rather than as active interpretive collaborators with the public.

Some historians are attempting to modernise public engagement by integrating 3D models created through photogrammetry into local communities. Marín-Buzón et al. (2021) advocate incorporating 3D models into virtual museums to enhance public interest in history. Kamimori (2023) complements this by arguing that museums should offer virtual tours of their digitised artefacts to make their collections more engaging for the public. Both Marín-Buzón et al. (2021) and Kamimori (2023) advocate for integrating photogrammetry into virtual museum environments, reflecting a broader shift towards participatory models of historical interpretation. This shared emphasis on accessibility suggests a shift that has challenged traditional hierarchies of knowledge production within historiography, as institutions and academics move from authoritative interpreters to more facilitators of public interaction.

Though some see many positives in this age of rapid digitisation, others have also raised several ethical concerns, such as what is and is not preserved. Zecher (2024) discusses a government plan in the United Kingdom to digitise more than 100 million wills and destroy the paper originals. Zecher (2024) argues that the loss of many primary sources' risks erasing essential references for historical research. While digitisation offers preservation and accessibility benefits, this debate reveals a deeper tension between technological efficiency and archival integrity. It raises fundamental questions about whether digital surrogates can fully replace material originals in historiographical practice. These concerns about the willingness to destroy thousands of historical documents after their digitisation pose a new challenge for historians, one that was unforeseen just a few decades ago. Beyond this example of destruction in the United Kingdom, digitisation, though it may not entail environmental destruction, raises new technological and digital concerns (Milligan, 2022). Questions thus arise about the authorities behind the technologies, who controls access or for how long a digitised artefact will be preserved. Boyer (2016) sheds light on the growing global digital divide and the need for historians to consider it in their research presentations. Today, much of academia is behind paywalls, preventing those without the financial means from accessing and engaging with the most up-to-date research.

Despite the many questions arising concerning the ethical responsibility of digital artefacts and accessibility, historiography and photogrammetry continue to become increasingly intertwined. Rahimi et al. (2025) explains that photogrammetry software has become far easier to use, making digitisation even more efficient and accurate. Then, thanks to technological

advances such as smartphones, high-resolution cameras, and drones, gathering data is increasingly easy, according to Saif (2022). With these ongoing technological transformations, researchers have far more technological options. Researchers can quickly create 3D digital models of large research sites or artefacts, with Wyatt-Spratt (2022) discussing how entire archaeological landscapes can now be scanned using photogrammetry. The models can be reviewed as many times as needed, making historical study far more convenient. The convenience and power of digitisation are so significant that, despite ethical concerns raised by its use, it has become an invaluable tool for historical research and engagement.

Though photogrammetry was not as practical for archaeological research in the early days, the technology has evolved, and the number of researchers using it has grown. With the proliferation of digital twins and thanks to other technological advances, it is easier than ever for people to access digital copies of artefacts. With this being a notable evolution of historical presentation, created by researchers using photogrammetry. Some researchers do not yet recognise their expanding role beyond authoritative interpreters. In contrast, others have highlighted the need to expand their academic field in just as innovative ways as the technology they are not using. This research has provided insight into how photogrammetry and digitised artefacts have changed the way historiographical research is conducted and how historical objects are engaged with.

2.4 Māori Perspectives

Throughout this thesis ethical considerations regarding indigenous cultural artefacts have been recognised in research on their digitisation. This part of the literature review considers a Māori lens of viewing the world. The subsequent texts offer a culturally grounded reflection on photography in particular, on the deep ethical and spiritual dimensions attached to the making of images in Māori culture. From this focus on image-making and photography in Māori society, considerations about the relationship to subsequent technological developments might be extrapolate.

The article, *The world in its best light,* explains how photography has changed over the years among the Māori, who, when first introduced to photography, held it in high suspicion due to the belief that a photograph contains a portion of a person's Mauri, or spiritual essence, making each image *tapu* (sacred). Thus, photography was not a neutral technology for documentation, but something that required the correct cultural protocols (*tīkanga*) and spiritual obligations. The emphasis on the sacredness and vulnerability of historical subjects provides an

important counterpoint to the modern belief that digital technologies can capture and represent the past objectively (Pene, 2025).

The role of tīkanga is a key guide to the structure of Māori culture in ethical image making. The photographer in the article uses he experience photographing at *Te Whare Tū Taua o Aotearoa* (The Inter-National School of Māori Weaponry) as an example to illustrate the complex procedures involved in incorporating Māori contexts into documentation. The procedure involves the intersection of multiple layers of tīkanga, ranging from Māori customs to those governing traditional weaponry and ceremonial practice. This attention to process resonates with a critical view of digitising cultural heritage, treating it as mere content that can be freely digitised and circulated without negotiating agreements. However, this article shows how even seemingly straightforward photographic documentation is intertwined with cultural responsibilities and indigenous relationships (Pene, 2025).

This article contributes an essential ethical dimension to the perspective of this writing. Just as photography carries the Mauri of people and places, so too does 3D scanning capture the digital essence and the structural presence of *taonga* (cultural treasures). The author does their best “to ensure that the beauty of the building is seen by everyone” by removing distracting elements from the architectural photographs. This practice parallels how 3D scanning workflows may ‘clean,’ repair, or digitally perfect heritage objects (Pene, 2025). This comparison raises questions about the extent to which digital reconstruction participates in aestheticization, potentially altering or sanitising the past it presents. It is thus implied that digitally reconstructed artefacts, much like edited photographs, risk removing the past from the historically situated and materially lived one.

The article, *Tom Roa: The whakapapa of a photo* highlights a contrast with Western traditions of photography and documentary practice by focusing on a Māori worldview's deep understanding of images. Roa argues that photography has shifted from surface-level documentation of reality to capturing context, stories, and relationships, in which the meaning of an image is inseparable from its *whakapapa* and the *mana* of what it depicts (Yates, 2024). A view that implicitly challenges the notion that visual technologies provide a transparent entry into the past. Instead, Roa emphasises that images always participate in networks of rights and responsibilities between people, landscapes, ancestors, and histories (Yates, 2024). For historical representation, particularly in digital heritage, this showcases how technologies that infinitely reproduce objects must attend to the cultural and historical contexts that give those objects meaning.

Roa's discussion on the decolonising of the camera is particularly relevant to the ethics of 3D digitisation. He describes Māori photography as focused on honouring the mana and rights of "the space itself," including the people, places, flora, and fauna photographed, reflecting a practice that rejects a focus on aesthetic appeal (Yates, 2024). This shifts the act of capturing a photograph or scan from merely a technical process to an encounter that requires cultural understanding and sensitivity to the relationships embedded in place. For 3D scanning, which often claims technological neutrality through its precision and detail, Roa's argument warns that digital forms of capture risk maintaining alienating practices if one ignores the relational and cultural protocols (Yates, 2024).

One of the most compelling insights Roa offers in this interview is the idea of "photograph the invisible," which refers to aspects of meaning that are not visually present yet are nevertheless present in the images (Yates, 2024). For them, "the invisible" could include spiritual significance, ancestral narratives, local knowledge, and ecological relationships. This concept has direct connotations for 3D scanning and digital heritage platforms, as they often present images stripped of the context, which is anathema to a Māori cultural worldview. Roa would likely say that without acknowledging the *whakapapa*, a 3D-scanned artefact risks being interpreted merely as aesthetic or informational, rather than as something with obligations and living cultural significance (Yates, 2024). Though some might argue that, as Roa describes "the invisible" and what its definition contains, one could also simply call this the object's aura.

Finally, Roa's emphasis on approaching images through *manaakitanga* and responsibility provides an essential ethical lens for digital reconstruction work. Just as a photograph must acknowledge the mana of what it depicts, a 3D model must also honour the cultural, historical, and spiritual dimensions of the object or landscape it translates into digital form. From the framing presented by Roa and Hill, digital reproduction should not be viewed as a neutral act of preservation but rather as an appropriate practice for preserving the conditions of what is represented (Yates, 2024). For a thesis concerned with how 3D scanning changes the way history is viewed, this article offers a crucial perspective: that digitisation cannot only extend access but also change, distort, or uphold the meaning of the past, depending on how it is taken up.

The documentary, *I Am the River* (Cutore & McNeil, 2010) offers a potent testimony of how visual heritage carries cultural, emotional, and political weight, and its narrative resonates strongly with contemporary issues surrounding 3D scanning and digital reproduction. The film centres on the discovery of photographs taken of Māori communities along the Whanganui River from the late-19th-century, and the story of these images being put up for auction.

However, for local *iwi* (tribe/family), the photographs were not commodities to be auctioned off but taonga, material carriers of whakapapa that connect present-day descendants with their *tūpuna* (ancestors). Expressing a tension between commercial and genealogical value is a powerful modern-day example of the crisis of aura that Walter Benjamin described almost 100 years ago.

The documentary also highlights the extreme measures Māori communities are willing to take to regain control of these images. Sharon Dell, former Director of the Whanganui Regional Museum, recounts stories of people considering mortgaging their homes to secure the return of their ancestors' photographs, underscoring that the stakes of visual heritage extend far beyond aesthetic appreciation (Cutore & McNeill, 2010). This is a repeating central theme among the interviewees: that for them, the custodianship of these images is inseparable from the custodianship of history. When considered alongside the technological descendant of photography, 3D scanning, these insights raise critical questions about intellectual sovereignty over digital replicas of taonga and whether the history the object brings forth has changed due to its digitisation.

Furthermore, *I Am the River* is an illustration of how historical photographs function as living connectors between the present and the past, rather than static archival objects. The recovered Partington images are described as providing "a rare visual insight into 19th-century [New Zealand] history" and forging a renewed link between contemporary Māori communities and their ancestors (Cutore & McNeill, 2010). This living relationship to imagery that the local iwi demonstrates toward the photographs challenges the idea that technological reproduction merely documents history; instead, it can activate aspects of identity or political claims. In the context of 3D scanning, such activation becomes even more complex. A scanned artefact or reconstructed site does not simply preserve the past; it reframes it, producing new digital objects that may travel farther, circulate faster, and be more easily detached from their original cultural and historical environments.

Finally, the documentary is an excellent example of the ethical considerations that arise when the crisis of an object's aura is put front and centre. The attempted auctioning of the photographs sparked a "storm of protest over cultural differences of ownership" between Māori and Pākehā (New Zealanders of European descent) (Cutore & McNeill, 2010). This conflict provides a valuable lens for evaluating the aura of 3D scanning in museums and heritage institutions. Digital replicas carry the same potential for misalignment: they can be copied, shared, or embedded in global platforms with minimal oversight, raising the possibility that digitally reproduced taonga will circulate in ways that conflict with iwi values. Alternatively,

perhaps that after all that copying and sharing, it will be revealed that all those simple pixels on a screen never had any *taonga* to begin with. *I Am the River* (Cutore & McNeill, 2010), showcases the possible need for distributors of digitised history to prioritise Indigenous data sovereignty and ensure that digital access does not replicate older patterns of dispossession.

Taken together, these works reveal a distinctly Māori framework in which digital representations of artifacts are not merely neutral records of reality, but relational entities embedded in networks of whakapapa, mauri, mana, and kaitiakitanga. Across discussions of photography, museum practice, and digital heritage technologies, a common theme is that the significance of cultural heritage lies not solely in its material or visual form but in the relationships, responsibilities, and histories it carries. Consequently, the digitisation of cultural artifacts through technologies such as 3D scanning cannot be evaluated solely in terms of technical accuracy for preservation or improved accessibility. Instead, it must also be assessed by its capacity to uphold tikanga, protect cultural authority, and maintain the integrity of the relationships that give heritage its meaning. While digital technologies offer unprecedented opportunities for cultural reconnection and education, the literature consistently warns that they may also reproduce forms of dispossession when detached from Indigenous governance and values. For this thesis, these perspectives provide a crucial foundation for examining how 3D scanning transforms historical representation, suggesting that the central question is not merely whether digital technologies can reproduce the past, but whether they can preserve and communicate the cultural dimensions that make these artifacts significant in the first place.

Chapter 3 Research Methodology

This research project utilises a qualitative, interpretative methodological approach to explore how the emergence of 3D scanning technologies, particularly photogrammetry, are transforming the ways in which historical artefacts are experienced and interpreted. Rather than seeking to quantify technological impact, the research focuses on the interpretations and perceptions that shape encounters with physical and digitised objects.

The study is grounded in a theoretical framework, established through the literature review, that situates photogrammetry within both the evolution of the technology as well as broader philosophical and cultural considerations concerning authenticity, mediation, and the “aura” of artefacts. This framework has informed the design and implementation of the research methods. The methods combine an online survey, a focus group, and expert interviews, each contributing a distinct perspective: public attitudes, collaborative discussion, and professional insights. It was necessary to seek out ethical approval for this research and approval was granted on November 13, 2025, in accordance with the Auckland University of Technology Ethics Committee (AUTEC 25-346). A copy of the final approval letter can be found in Appendix A.

In bringing these approaches together, this research develops a more layered understanding of how digital reproduction is not simply another technical process, but one that actively reshapes historical understanding and engagement. To identify any recurring patterns across the data, thematic analysis, following Braun and Clarke’s (2006) six-phase framework, was employed. The collected qualitative data was analysed using thematic analysis to identify key patterns and interpretive themes across survey responses, focus group discussions, and expert interviews.

3.1 Literature Review

The research's Literature Review is divided into two different strands: the technological and philosophical. These two key components informed the design of the survey, focus group prompts, questions for the expert interviews, and the interpretive lens for analysis.

The technological aspect of the literature review was to establish the historical evolution of 3D scanning, with a particular focus on photogrammetry, and to examine how this technology is utilised today, with 8 different papers on the evolution of photogrammetry from a technology for specialised industrial tasks to an accessible and inexpensive piece of everyday technology. The literature review also brought together 12 recent papers on how professional academics have changed their ways of preserving, analysing, and sharing research due to the introduction

of 3D scanning technology. A particular international perspective was emphasised here to broaden the research outlook beyond a single nation's borders. The final 2 papers were examined to incorporate specific examples of ethical issues related to the effects of 3D scanning technologies on the world of historicism. From this section of the literature review, important understandings of photogrammetry are established, such as its technological evolution and the changes it has brought about in contemporary academic historicism. Examples such as archaeological sites using photogrammetry for preservation and museums using it to make their collections more accessible to the public are woven in, as it was important to ground the technology in real-world applications by people who practice the science of historiography.

The philosophical grounding of 3D scanning in the literature review has three key aspects. The first major pillar of the philosophical foundation of this research consists of two essays by Walter Benjamin. In, *Art in the Age of Mechanical Reproduction* (1935), Benjamin writes about the concept of the Aura of an object, which is pivotal to understanding how history is changing through 3D scanning technology. The second piece of Benjamin's writing, *On the Concept of History* (1940), helps lay out the framework for what the term "history" means and its inherent possibilities. Benjamin helps convey the idea that 3D scanning is not a neutral technology that simply showcases historical artefacts in new ways, but is, in fact, involved in the inherently political contest over historical remembrance and mobilisation in the present.

Another essential component of the philosophical section is initiated with Jussi Parikka's book *What Is Media Archaeology?* (2012), who traces a range of physical, non-linear, and technological developments in media history in order to help establish the historical narrative of the latest technologies. The next author in this media archaeology section is Ian Milligan. His book, *The Transformation of Historical Research in the Digital Age* (2022) explains the methodological shifts in historical practice when working with emerging digital research sources. The final paper in this section is, *The Evolution of Digital Cultural Heritage Research: Identifying Key Trends, Hotspots, and Challenges through Bibliometric Analysis* (2024) by Yuntao Lian and Jiafeng Xie, who provide a concise yet comprehensive overview of how digital technologies have transformed the collaborative relationship between technological innovation and historical preservation. All three papers trace the evolution of historiography in light of the new, digitally mediated nature of history and the ways its cross-disciplinary quality can be approached.

The third pillar of the philosophical section of the literature review is an examination of the Māori point of view, considering three perspectives. The first is the article written by Rewa Pene, *The world in its best light* (2025), which introduces a lens for viewing the world through

photographs and describes many modern Māori cultural expressions. Siena Yates's interview with photographer Dr Rodrigo Hill, *The whakapapa of a photo,* is an examination of the use of modern technology in photography becoming more about expressing the context and relationship of the reality being captured in an image, as that image is the same as the *whakapapa* and the *mana* of what it depicts. Cutore and McNeill's short documentary, *I Am the River* (2010), is about the discovery and auction of a group of photographs of Māori communities along the Whanganui River from the late-19th-century and is a powerful testimony to what photography means when viewed through a Māori cultural lens in practice. These Māori testimonies connect the meaning of photography in an indigenous worldview.

Overall, across the gathered literature, most documents explore highly subjective, qualitative experiences such as aura and personal engagement with historical objects, which inherently require interpretive discussion. While the literary collection paints an interesting and vivid picture of the theoretical shifts in how history is understood in the age of digitisation, it remains largely confined to academic discourse. This has created a gap in understanding how non-specialist audiences engage with digitised artefacts. To address this limitation and move beyond purely theoretical analysis, this research incorporates the voices of both public audiences and academic experts. By combining these approaches, the study grounds its theoretical foundations in both lived experience and professional practice, enabling a more comprehensive understanding of how digitisation is reshaping both the engagement with and interpretation of history.

3.2 Online Survey

To better understand public views on changes to history, it was decided to shift from literature and theoretical approaches to more practical ones. An online survey was conducted to gather feedback. The survey was used as a qualitative method to capture a broad range of public perspectives on the digitisation of historical artefacts (Braun et al., 2021). While surveys are often associated with more statistical and quantitative research, this research utilised more open-ended questions to prompt more introspective responses, aligning with the focus on subjective perceptions rather than measurable outcomes (Braun et al., 2021). This was done to identify any broad patterns in opinions regarding the impact of these technological advancements on the preservation, interpretation, and accessibility of historical material. By directly engaging with the public, the thesis moves more towards qualitative research principles that value real-world experience and personal perspectives, enabling the research to examine how non-academic audiences interpret and value digitised artefacts. With this wider range of

perspectives, the research can better reflect how historical change is understood and valued in everyday contexts that might otherwise go unnoticed in purely academic or theoretical interpretations.

To advertise the survey, a poster (Figure 1) was placed in various public places, mainly universities and libraries. These locations were chosen to attract those already interested in history while also reaching out to members of the public at random.

Figure 1

Poster used to advertise the survey



The quick response (QR) code would take an individual to the Qualtrics Experience Management platform. Qualtrics is the online software that I used to create surveys, and it also provided a system to visualise collected data for analysis. Due to the self-selecting nature of the survey and the fact that the chosen advertising locations foster a desire for knowledge, the respondents could be assumed to be intellectually curious and predisposed to a higher form of learning. Thus, the majority of responses in the survey and focus group are likely from people with a specific level of professional academic achievement and financial stability who are able to pursue a university degree.

The online survey was divided into four sections, with a copy of the exact questions available in Appendix C.

The first section asked some general demographic questions about the person taking the survey. This limited demographic data enabled a clearer examination of the later responses to assess whether there are any clear divergences in opinions.

The second section of questions focused on how the respondents engage with historical content. These questions were devised to identify whether the individual actively seeks out historical information in their own time, and, if so, how they do so. It was also to determine their preferred methods of learning about history, whether they preferred using modern technology or more traditional methods. This was to assess the general level of enthusiasm among all survey participants for the study of history.

The third section asked how the respondent felt about the accessibility of history through technology. The aim was to explore if and why they evaluated the integration of technology in historiography positively or negatively, and to gauge their familiarity with the technologies under examination.

The final section examined the respondents' perceptions of digital reproductions as potential replacements for authentic historical objects and their views on the increasing integration of digitised artefacts in the modern study of history. This line of questioning sought to tease out their views on the notion of an object's "Aura" and whether they were, consciously or not, rejecting or accepting the idea of its diminishing presence.

While the timing of ethics approval – coming just before the Christmas and summer holidays - constrained the survey sample size, qualitative research prioritises diversity and richness of responses and depth over a grand population of answers for statistical understanding. The aim was, rather, to identify recurring patterns and unforeseen divergent themes across the participants responses.

Focus Group

The purpose of this focus group was to gain a deeper discussion on the topics first explored in the survey. The focus group was designed not only to have a more in-depth discussion but also to observe the participants interactions with different forms of artefact representation (Hamilton & Finley, 2019). This approach recognises that embodied engagement provides just as much meaning as the verbal exchange (Hamilton & Finley, 2019). The structure of the focus group allowed the participants' discussion to convey more nuance than a few short survey responses. And we were also able to delve far deeper into the contradictions that were exposed in the discussions.

The reliance on self-selected participants introduces sampling bias, as individuals with a pre-existing interest in history or digital technologies were more likely to take part. While this limited the number of possible focus groups, due to a low uptake of respondents, it is nevertheless consistent with a qualitative research approach that seeks more engaged and informed participants who can offer reflective insights. Although ideally, had time allowed, at least one more group would have been organised, the one conducted nevertheless generated a nuanced discussion that yielded valuable insights into how the participants interpret and negotiate different forms of artefact presentation.

When the possible participants were asked if they were interested in joining the focus group, they were sent a participant information document that explained what they should expect from the discussion, with a copy of the form being found in Appendix B. The focus group held at the Auckland University of Technology, lasted for 1 hour. Before the focus group had begun each participant was asked to sign a consent form, with a copy of this form being found in Appendix B. The 5 participants were asked to examine two different items, both from my personal collection. The first artefact was an old book titled *Old Customs of Chinese Festivals,* and the second item was a little red bowl made in Kenya. These two artefacts were chosen for their small size and compatibility with the 3D scanner available at AUT, the Creality Raptor X and its CrealityScan software, where the physical objects were scanned to produce digital copies. They were also chosen for their distinct but simple shapes and colours. A clear distinction between the artefacts was desired to facilitate identification by the participants and by the 3D scanner. A balance between technological limitations and research requirements was key to selecting the artefacts for the focus group.

The process of creating the 3D models involved first scanning the top and bottom halves of the artefacts with the Creality Raptor X scanner, which produced two separate models that had to be sliced together. After the two halves were sliced together in the 3D modelling software

Blender, the models were imported into Unity360 and programmed so that a user could interact with the objects. Through the use of the scroll wheel on a mouse, the user could zoom in closer to or out from the models. By using the left mouse button, they could rotate the object on the X and Y axes of the screen, and shift-left-click to rotate along the X axis. During the focus group, two laptops had both models displayed to allow multiple people to view and interact with them at the same time.

The two artefacts were each presented in three different ways. The three modes of presenting the artefacts were through photographs (Figures 2, 3, 4, 5), 3D models (Figures 6, 7), and the physical artefact itself. These three methods of representing the artefact were chosen to simulate the technological evolution of presentation. First is the original physical artefact, which the participants were not allowed to touch; then the photographs, images that could be sent anywhere and taken by anyone; and finally, the 3D model, a digital tool they could manipulate. Placed next to each representation of the artefacts was a small description of the artefact, both of which can be found in C2.

All of this was combined to evoke the sense of academic professionalism one might experience at a museum. This was to simulate the level of social expectation one has in a museum, a place of contemplation, curiosity, and respect for the history presented. With the museum being the traditional location where a participant would experience history being presented in a new way. Also, to see if the participants would experience any shift in their understanding of history.

Figure 2

Photo 1 of Old Customs of Chinese Festivals book



Figure 3

Photo 2 of Old Customs of Chinese Festivals book

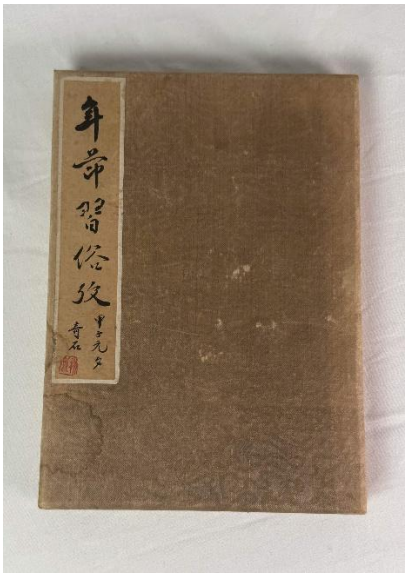


Figure 4

Photo 1 of the little red bowl



Figure 5

Photo 2 of the little red bowl



Figure 6

Image of digital model of Old Customs of Chinese Festivals book

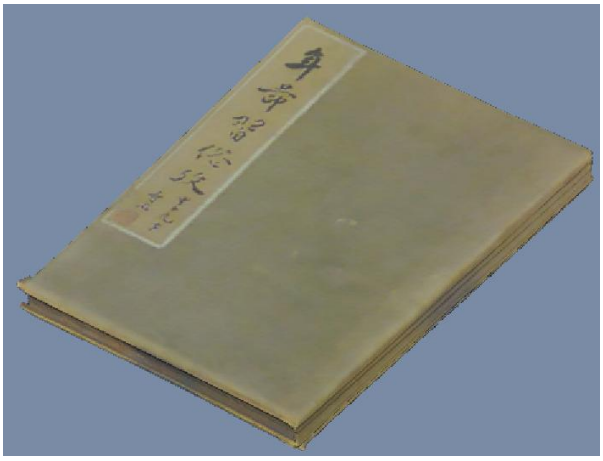


Figure 7

Image of digital model of the little red bowl



3.3 Expert Interviews

While the thoughts and opinions of members of the public were invaluable for the research, more professional and discipline-specific insight was also sought. In this research, experts were defined as individuals with a background in historical or cultural studies who use

digital artefacts to present history. Their use of digital twins could be an ongoing part of their research or work, or a one-off project. Ideal experts to be interviewed were from academic institutions such as museums or universities. The purpose of the interviews with museum and academic experts was to explore the experiences, opinions, and motivations of academic professionals. Expert interviews were conducted to help contextualise public perceptions within professional practice. This method allowed for the addition of specialist knowledge, offering personal insights into how digitisation is utilised within heritage and museum contexts. Through the semi-structured interviews, inductive analysis would allow themes to emerge from the experts' responses (Hamilton & Finley, 2019). The survey would enrich the overarching analysis with informed expert perspectives that could challenge or frame the trends identified in public responses.

From January 2026, when ethics approval was granted to conduct the research, to April 2026, when the last expert was contacted and interviewed, a total of 20 experts were contacted. After April, no additional experts could be invited due to time constraints on the research. Ranging from university professors to freelance historians, they were all asked to discuss their personal experience with 3D scanning technology and how they have seen a shift in historical research with the rise of digitisation. Each expert received an information document providing an overview of the research and the kinds of questions they would be asked; this document is in the Appendix.

With a longer timeframe I would have contacted other experts and had a more flexible period of time in which to schedule interviews. However, because of time constraints, I had to work with the y three respondents who generously gave me their time, from the 20 professionals initially contacted. Though the number of interviews that were conducted was small, the three experts who were interviewed had different professional backgrounds. The participants' distinct professional roles of academic leadership, museum curation, and digital collections management provided a diverse spectrum of perspectives that helped mitigate some limitations associated with smaller sample sizes. The wide range of experience proved to be invaluable for understanding the more diverse uses of photogrammetry among those in the field of historiography. Given the geographical distance of some interviewees, I proposed an online meeting on Microsoft Teams. This made negotiating the meeting's time and date much more flexible.

The first interview was held on the 4th of February 2026 with Dr Rachel Shearer, a senior lecturer in Creative Technologies at the Auckland University of Technology and the Kaiwhakatere of the School of Future Environments. Being a Kaiwhakatere means she is a

navigator or leader who will help guide the school through multicultural landscapes, continuing AUT's commitment to the Treaty of Waitangi and its Māori whānau. Dr Shearer provided insight into how 3D scanning technology and digitisation are viewed from an indigenous academic perspective. She also offered a perspective on how the relationship between technology and indigenous culture is being navigated today.

Dr Lucy Mackintosh, the second professional participant was interviewed on the 20th of March 2026. Dr Mackintosh is a New Zealand historian, curator, and author, and a senior research fellow at the Auckland War Memorial Museum. She took part in the Collections to Classrooms project at the Auckland War Memorial Museum, where they published an online resource featuring a number of digitised artefacts to help students more easily explore local histories and making their collection more accessible. Dr Mackintosh's participation in this project made her an excellent resource for discussing what digital learning is like today. But also, as a museum curator with extensive experience presenting physical artefacts, she contributed valuable thoughts on digitised artefacts and their utilization in the modern museum.

Dr James Taylor, who manages the Auckland Museum's online collections, was interviewed on 13th April 2026. He oversees more than 20 online platforms and partnerships through which the Museum shares its open data and imagery. With all the digitised artefacts and the museum's objects presented online under his watch, he was the perfect person to ask about public participation with digitised artefacts. Furthermore, as a former public historian, he has the skills to engage the general public more with history.

Although the number of interviews was limited, the insights provided by all three experts proved highly valuable in strengthening the research. Their diverse professional backgrounds offered a different perspective of how digitisation and 3D scanning are shaping historical practice. The interviews significantly aided the study by grounding theoretical and public discussions in informed, real-world experience. When placed alongside the public responses, the academic perspectives helped to both contextualise and challenge broader trends and reinforced the importance of combining professional expertise with public opinion.

The collective data from the online survey, focus groups, and expert interviews were analysed using thematic analysis. This approach involved a systematic process of identifying patterns across the dataset and developing themes that captured the meaningful aspects of the participants' experiences and perspectives (Ahmed et al, 2025). Thematic analysis was selected because it was flexible for analysing data collected through the three qualitative methods, enabling themes to be developed organically across the datasets rather than from individual data sources alone.

To enhance the thematic analysis of the findings, this study employed methodological triangulation by integrating data collected from an online survey, focus groups, and expert interviews. Triangulation involved utilising three methods to examine a perspective from multiple angles, allowing for different comparisons and interpretations of the data. Meydan and Akkaş (2024) argue that triangulation enables research the ability to capture more diverse viewpoints and thus develop a more comprehensive understanding of complex phenomena. In this thesis, the online survey provided broad insights into the general public's experiences and perceptions, focus groups facilitated in-depth exploration of shared and contradictory understandings, and expert interviews contributed academic knowledge and specialist interpretation. The findings from each data source were compared and integrated during analysis to identify areas of synthesis and contradiction.

Chapter 4 Research Findings

This chapter presents the findings generated through the three qualitative components of the study: the online survey, focus group, and expert interviews. Together, these methods were used to explore how emerging 3D scanning technologies, particularly photogrammetry, are influencing the ways historical artefacts are experienced, interpreted, and understood.

The findings are organised around the major themes identified through thematic analysis. Although each method generated distinct perspectives, several common themes emerged across all three datasets. These include the tension between accessibility and authenticity; the significance of physical presence and emotional engagement when encountering historical artefacts; concerns surrounding technological mediation and manipulation; new forms of interaction with historical material; and the ethical responsibilities associated with digitisation. While presented separately for clarity, these themes frequently overlap, reflecting the complex and sometimes contradictory ways participants understood the relationship between digital technologies and historical artefacts.

The chapter begins with the online survey findings, which provide an overview of public attitudes towards digitisation. It then examines the focus group discussions, offering deeper insight into participants' experiences of physical artefacts and their digital counterparts. Finally, it presents the expert interviews, drawing on perspectives from academia, museum practice, and digital collections management. Collectively, these findings suggest that digitisation is viewed not simply as a technological innovation, but as a process that reshapes how historical knowledge is accessed, interpreted, and experienced.

4.1 Online Survey

The online survey was conducted between 12 December 2025 and 10 April 2026. Thirty-one participants completed the survey, although not all answered every question.

Table 1

Demographic breakdown of survey participants

Age		Gender	
18-26	10	Male	8
27-40	4	Female	22
41-55	1	Other	1
56-80	16		

Among the respondents, most identified as women, while the age distribution was concentrated in the youngest (18–26) and oldest (56–80) age groups. This uneven distribution likely reflects the recruitment strategy, which relied in part on posters displayed across university campuses to attract younger participants, while older respondents may have been reached through wider community networks. The middle-aged range encompasses the peak ages of people who spend most of their day at work rather than in libraries or at universities. Although a more evenly distributed sample would have strengthened the breadth of perspectives, the survey's purpose was exploratory rather than statistically representative. Consequently, the findings should be interpreted as indicative of participant perceptions rather than representative of the wider public.

4.1.1 Accessibility and Education

One objective of the survey was to explore participants' attitudes towards the increasing use of 3D scanning technologies within museums and educational settings. When asked whether they would be interested in seeing more historical artefacts presented digitally in museums or classrooms (Question 6), most respondents answered either Yes or Maybe (Table 2), suggesting a generally positive attitude towards the use of digital technologies in historical interpretation. Because participants were not asked to explain their responses, particularly those selecting "Maybe", the reasons underlying this uncertainty cannot be determined.

Table 2

Agreement with statement in Question 6

Would you be interested in seeing more historical artefacts presented digitally in museums or classrooms?	Responses
Yes	12
Mayble	14
No	2

Participants expressed more varied opinions when asked whether 3D models could replace physical artefacts in museums (Question 5). Although several respondents supported digital substitution in certain circumstances, most viewed it as appropriate only in specific

contexts (Table 3). Of the five participants who elaborated on their responses, two suggested that digital models could support the repatriation of taonga where the return of physical artefacts is complex or contested. Others emphasised the educational value of digital models, describing them as a means of enhancing public engagement while increasing access to historical material. Although only a small number of respondents discussed repatriation, their responses indicate awareness of the relationship among digital heritage, cultural ownership, and restitution.

Table 3

Agreement with statement in Question 5

Do you think 3D models can replace physical artefacts in museums?	Responses
Yes	8
Maybe	5
No	5
Only in some cases	11

More broadly, these findings suggest that participants viewed digital artefacts as a means of extending access to cultural heritage, particularly for audiences geographically distant from the original objects. However, this perceived benefit coexisted with concerns about authenticity and the continued importance of encountering physical artefacts, indicating that participants generally viewed digital representations as complementary rather than substitutive.

To better understand participants' familiarity with digital heritage technologies, respondents were asked whether they had previously used digital tools such as virtual tours to explore historical artefacts (Question 2). While many participants expressed enthusiasm for expanding the use of digital technologies, a substantial proportion reported little or no direct experience with these tools (Table 5). This contrast suggests that positive attitudes towards digitisation were not necessarily based on prior engagement. Because participants were not asked to explain their responses, it is not possible to determine whether limited experience reflected age, opportunity, technological confidence, or differing interpretations of the term "digital tools".

Table 4

Agreement with statement in Question 3

Technology makes history more accessible to the public	Responses
Strongly Agree	16
Somewhat Agree	11
Neither Agree not disagree	2
Somewhat Disagree	1
Strongly Disagree	1

However, considering the participants' enthusiasm about making history more accessible, Question 2 asked whether they had ever used digital tools, such as virtual tours, to explore historical artefacts, to gauge their overall experience with these new tools. The full breakdown of the answers is shown in Table 5. The distribution of responses may reflect age-related differences in familiarity with digital tools, with digital natives, aka the younger participants, more likely to have experienced such technologies, while older participants might struggle more with technology and be less likely to have actively engaged with it. The 'Maybe' responses may indicate ambiguity in how participants interpreted the term 'digital tools' of the question, as participants likely do not know exactly what would be counted as a digital tool. But the raw numbers themselves provided an interesting reflection: while in previous questions respondents have expressed great enthusiasm for the additional introduction of technology into the experience of history, a significant proportion have not directly interacted with it. It is possible that greater prior experience with digital tools may influence attitudes toward their use; however, this cannot be confirmed within this dataset.

Table 5

Past usage of digital tools for historical exploration

Have you ever used digital tools (e.g., virtual tours, 3D models, AR/VR) to explore historical artefacts?	Responses
No	13
Maybe	6
Yes	12

When asked what interested them most about the use of 3D models in archaeology and museums (Question 9), respondents consistently highlighted the increased accessibility these technologies could provide. Many valued the ability to access collections remotely, explore historically significant sites that would otherwise be inaccessible, and broaden public engagement with cultural heritage. As one participant commented, "Living in Aotearoa means that it's difficult to directly access certain types of history, so 3D modelling can help create a sense of space and context." These responses reinforce the earlier finding that participants viewed accessibility as one of the primary benefits of digitisation.

When asked about the limitations of using technology to study history (Question 8), participants raised concerns that digital access may itself be uneven. Several respondents noted that access could be limited by geographic location, economic circumstances, or technological literacy, while others questioned whether older generations would engage as readily with emerging technologies. These responses highlight an important tension within the findings: although participants generally viewed digitisation as increasing accessibility, they also recognised that digital technologies may introduce new forms of exclusion.

Participants' final reflections reinforced the survey's central finding that increased accessibility was viewed as a major benefit of digitisation. However, this support was consistently accompanied by a preference for experiencing historical artefacts in person. Rather than viewing digital technologies as replacements for physical encounters, respondents generally perceived them as complementary forms of engagement that extend access while preserving the value of visiting museums and heritage sites.

4.1.2 Aura and Physical Experience

This section explores participants' perceptions of authenticity, material presence and emotional engagement when encountering historical artefacts. While respondents generally supported greater use of digital technologies, they consistently distinguished between the experiences offered by digital representations and physical artefacts.

Participants were first asked how they preferred to engage with history (Question 1). Most selected visiting museums or historical sites in person, while others favoured documentaries, reading, or other media such as video games. Notably, no respondent selected interactive digital models as their preferred mode of engagement (Table 6). These findings suggest that, despite widespread support for digitisation, participants continued to value direct encounters with historical artefacts.

Table 6

Formats participants prefer to help them to understand history best

Which format do you think helps you understand history the best?	Responses
Seeing museums/historical sites in person	18
Documentaries	7
Exploring interactive digital models	0
Reading	3
Other	3

When participants elaborated on their preferred ways of experiencing history (Question 7), most emphasised the importance of visiting historical sites and engaging with knowledgeable guides. These responses suggest that participants valued not only physical proximity to historical artefacts but also the shared, human dimension of historical interpretation.

Of the 16 responses, 9 also discussed a diverse array of ways to explore history, from the more established ones, such as books and documentaries, to the very modern ones, such as podcasts, YouTube videos, and even video games. Aside from reading books, all remote historical experiences are digital. This suggests the possibility that respondents may accept a new digital interface when experiencing history, with some even having an overall preference for it.

Participants also described a wide range of ways of engaging with history, including books, documentaries, podcasts, YouTube and video games. These responses indicate that participants were already comfortable using digital media to learn about the past. Their hesitation therefore appears to relate less to digital media in general than to the specific question of digitally replacing physical artefacts.

Taken together, these responses suggest that participants did not view physical and digital experiences as mutually exclusive. Rather than favouring one mode over the other, many described them as complementary, combining in-person visits with digital resources to enrich their understanding of history.

The earlier survey responses reinforce this interpretation. Although many participants had limited experience using digital heritage technologies, they nevertheless supported their broader adoption within museums and education. This suggests that respondents viewed digital

technologies as valuable additions to existing historical experiences rather than replacements for physical engagement.

Responses to Question 5 further illustrate this tension. While several participants considered 3D models appropriate substitutes in particular circumstances, many qualified their answers by selecting "Maybe" or "Only in some cases." Written comments emphasised that digital models could never fully replace the historical significance, authenticity and cultural value associated with physical artefacts. Participants therefore expressed cautious support for digital technologies while remaining reluctant to relinquish the distinctive qualities of original objects.

One participant observed that "3D modelling can help create a sense of space and context." Although this comment does not explicitly reference Benjamin's concept of aura, it suggests that digital representations may alter rather than eliminate participants' relationships with historical artefacts. Rather than simply reproducing objects, digital models may create new forms of engagement that coexist with the continued significance of the original artefact.

Participants frequently described digital artefacts as lacking the emotional and sensory qualities associated with encountering original objects. Responses such as "not the same as the real thing," "lack of emotional, personal and physical connection," and "seeing something in person makes it feel more real" demonstrate the continued importance participants placed on material presence. These concerns suggest that respondents associated authenticity not only with historical accuracy but also with embodied experience and emotional proximity to historical artefacts. At the same time, participants continued to recognise the accessibility benefits of digitisation, reinforcing the central tension running throughout the survey: digital technologies expand opportunities for engagement while remaining distinct from encounters with physical heritage.

4.1.3 Concerns about Technological Manipulation

Concerns regarding technological manipulation emerged consistently throughout the survey responses. These concerns centred not only on the reliability of digital technologies themselves, but also on the ways technology might influence access to, interpretation of, and trust in historical knowledge. Similar issues were later raised during the focus group and expert interviews, suggesting that concerns about technological mediation extended beyond the survey participants alone.

Several respondents questioned the long-term reliability of digital technologies, citing concerns about hardware requirements, software maintenance and the resources needed to

sustain digital collections. These responses suggest that participants recognised that increasing digital access also creates ongoing technical and institutional responsibilities.

Beyond technical reliability, respondents expressed concern that digital technologies could be used to manipulate historical information. Participants referred to algorithms that shape what information users encounter, platform owners who determine which histories receive attention, and the potential for digital systems to privilege particular narratives over others. Several respondents also highlighted the prevalence of paywalls and restricted access to scholarly resources. Collectively, these responses indicate a broader concern that technological mediation may influence not only how history is accessed but also whose histories become visible.

Participants drew a clear distinction between 3D scanning technologies and artificial intelligence. While responses throughout the survey were generally supportive of photogrammetry and digital modelling, AI generated considerably greater scepticism. Respondents worried that AI could oversimplify historical interpretation, undermine critical thinking, and compromise the integrity of historical records. Several participants also expressed broader concerns regarding the environmental impacts of AI technologies. These findings suggest that participants did not evaluate digital technologies as a single category but differentiated between technologies they considered supportive of historical interpretation and those they believed posed greater risks.

Participants also expressed concerns about financial barriers, unequal access to digital platforms, and the possibility that certain histories could be marginalised by technological systems. Together these responses suggest that participants viewed digitisation as creating new opportunities for access while simultaneously introducing new ethical and political challenges surrounding representation, ownership and interpretation.

Despite these concerns, participants remained broadly confident in using digital technologies. Most respondents agreed that technology increases public access to history (Table 4), while the majority also reported feeling confident or reasonably confident using digital tools to explore historical content (Table 7). These findings indicate that participants' concerns centred less on the technologies themselves than on the ways they might be implemented and governed.

Responses to Question 9 further illustrate this complexity. Participants described 3D models as realistic, accurate and capable of providing new perspectives on historical artefacts. At the same time, they remained cautious about who controlled these technologies and how digital information might be altered or selectively presented. Rather than expressing either

complete trust or complete scepticism, respondents demonstrated a nuanced position in which confidence in photogrammetry coexisted with concerns about technological mediation, ownership and authority.

Table 7

Agreement with the statement in Question 4

How confident are you using digital tools to explore historical content?	Responses
Very confident	3
Somewhat confident	14
Neutral	10
Somewhat not confident	2
Not confident at all	0

4.1.4 New Forms of Interaction

Participants also identified the potential for digital technologies to create new forms of interaction with historical artefacts. Although most respondents continued to prefer visiting museums and historical sites in person, many also described digital media, including documentaries, podcasts, YouTube videos, and video games, as valuable ways to engage with history. These responses suggest that participants viewed digital experiences as extending rather than replacing more traditional forms of historical engagement.

When asked what most excited them about using 3D models, respondents frequently cited immersion, interaction, and sensory engagement. Participants described the opportunity to experience history from "a different perspective," interact with objects in new ways, and gain a deeper appreciation of historical material through more engaging visual experiences. These responses suggest that participants valued 3D technologies not simply because they replicated artefacts, but because they enabled forms of interaction that are difficult to achieve through traditional museum displays.

Overall, respondents expressed enthusiasm for the new opportunities offered by digital technologies while continuing to value established forms of historical engagement. Rather than replacing traditional museum experiences, participants generally viewed 3D technologies as expanding the ways in which history can be explored, interpreted and experienced.

The participants were thanked for their participation at the end of the survey and asked to provide their email if they wished to be contacted about the possibility of joining the focus group for a more in-depth look at their individual thoughts and feelings about history as it becomes more digital.

4.2 Focus Group

Five participants who volunteered through the online survey took part in a focus group designed to explore their experiences of interacting with physical artefacts and digital 3D models in greater depth. The session consisted of an observation activity followed by a facilitated discussion. Together, these generated rich qualitative data concerning embodiment, materiality, authenticity, accessibility and the role of digital technologies in historical interpretation.

Embodiment and physical presence emerged as one of the strongest themes throughout the discussion. Participants repeatedly emphasised the importance of encountering artefacts in person, describing physical proximity as essential to understanding an object's material qualities and historical context. One participant, drawing on their experience as an art student, closely examined the physical artefacts from multiple angles, explaining that digitisation could diminish an object's material presence. Another described the digital models as creating "a layer of disconnect." These observations closely mirror the survey findings, where participants consistently expressed a preference for visiting museums and historical sites in person.

Several participants described their connection to historical artefacts in relational rather than informational terms. Even when artefacts originated from distant cultures or periods, participants regarded them as part of a shared human history. Rather than focusing solely on historical facts, participants emphasised emotional connection, suggesting that encounters with physical artefacts fostered a broader sense of human continuity

The discussion also challenged the assumption that digitisation alone creates disconnection from historical context. Participants observed that museums themselves inevitably reshape context through display practices. The example of the Elgin Marbles illustrated this point: removed from their original architectural setting and displayed at eye level within a museum, the sculptures acquire a different historical meaning. Participants therefore argued that preserving context involves more than maintaining physical objects; it also requires careful attention to the relationships between artefacts, place and cultural meaning.

Participants repeatedly used terms such as "essence" and "historical weight" to describe their experience of encountering original artefacts. These expressions suggest an attempt to

articulate qualities that participants found difficult to define yet consistently associated with physical presence. Although participants did not explicitly reference Benjamin's concept of aura, their descriptions resonate with his discussion of authenticity, presence and historical uniqueness.

Participants also distinguished between the material temporality of physical artefacts and the apparent permanence of digital models. Whereas physical objects continue to age and change over time, digital reproductions were described as fixed and unchanging. For participants, this material ageing formed part of an artefact's historical significance.

Participants were generally more critical of the digital model of the book than of the bowl. They felt that the book's texture, surface details and signs of age had not translated successfully into the digital model, leading several participants to describe it as lacking material presence. By comparison, the bowl's form translated more successfully, although participants still noted inaccuracies, including the loss of visible damage and subtle surface detail.

Participants were generally more critical of the digital model of the book than of the bowl. They felt that the book's texture, surface details and signs of age had not translated successfully into the digital model, leading several participants to describe it as lacking material presence. By comparison, the bowl's form translated more successfully, although participants still noted inaccuracies, including the loss of visible damage and subtle surface detail.

Participants also highlighted the importance of scale. Comparing the physical bowl with its photographic representation, they observed that digital images can distort perceptions of size. One participant illustrated this through the example of the Mona Lisa, noting that while digital reproductions reveal extraordinary detail, they often fail to communicate the painting's relatively modest physical scale. These observations suggest that digital representations may enhance some aspects of perception while simultaneously diminishing others.

Participants expressed concern that unequal technological literacy and financial barriers could create new forms of exclusion. Although they recognised the accessibility benefits of digitisation, they also worried that those unable to access or use digital technologies would be disadvantaged. Similar concerns emerged in the survey responses, suggesting that accessibility involves not only the availability of digital resources but also the capacity to engage with them.

Participants also questioned who should be responsible for producing digital heritage resources. They argued that effective digitisation requires both historical expertise and technical competence, expressing concern that important contextual information might be lost if these forms of expertise remain separated.

Despite expressing reservations about digitisation, participants consistently identified new possibilities created through digital interaction. The ability to rotate the digital model of the bowl enabled participants to examine aspects of the object that were difficult or impossible to observe physically. One participant noted that the digital model revealed the bowl's slight asymmetry, a feature they had not previously recognised. These observations suggest that digital technologies may facilitate alternative forms of historical engagement rather than simply reproducing physical encounters.

More specifically, Participant 4 noted that the digital bowl helped them notice the physical bowl wasn’t perfectly even, which gave them a better understanding of the object. This suggests that digital tools may offer alternative ways to examine artefacts that differ from physical observation. Earlier, it was explained that Participant 5 placed their face down on the table to view the physical objects as closely as possible; they noted that, as a former art student, they had many experiences at art galleries where getting very close to objects was normal. This participant was able to understand the artefact thanks to their prior experience in the art world. This behaviour and method of gaining a better understanding of an object were entirely unknown to Participant 4; it was only through the mediation of this technology that they were both able to gain the same awareness of the bowl's asymmetrical nature. This is a great tension within the focus group for both participants who had expressed a great deal of concern about the utilisation of technology and had said something was different when an object was digitised. While they both conveyed that something was lost to them through the digital object, they also gained something.

The participants are not expressing a black-and-white opinion that all digitisation is bad, and history should only be experienced in person. They are demonstrating a nuanced perspective on this tension of technological change. This was also reflected in most responses to the general survey, which generally showed an understanding of the complexity of this new technology. A new and entirely different understanding of history is possible. Still, as all the focus group participants explained, there is no guarantee that this change will be so one-sided as to be described as good or bad.

Participants repeatedly returned to accessibility. Using the example of the Terracotta Warriors, one participant explained that digitisation offered opportunities to engage with cultural heritage that would otherwise remain geographically inaccessible. These responses reinforce the central finding that participants viewed digital technologies as extending rather than replacing traditional encounters with historical artefacts.

Participants also identified considerable educational potential for digitised artefacts. One secondary school teacher described how digital models could provide students with opportunities to examine artefacts that would otherwise be inaccessible due to cost or distance. These comments reinforce the importance of accessibility as one of the dominant themes emerging from both the survey and focus group.

Participant 1 noted that, to them, seeing a digitised artefact online was still far more accessible than physically going to a museum, even if there is a disconnect from engaging with the artefact. The other participants also noted that many people will never have the privilege of seeing a specific artefact in person, so engaging with it in the digital realm remains incredibly valuable.

Overall, participants acknowledged that digitisation inevitably changes the experience of historical artefacts. While some aspects of material authenticity appeared diminished, digital technologies simultaneously created new opportunities for access, interaction and learning. Rather than evaluating digitisation as either wholly positive or wholly negative, participants consistently described a negotiated relationship between what is lost and what is gained

4.3 Interviews

To complement the perspectives gathered through the survey and focus group, three experts working in related fields were interviewed. Together, they provided perspectives from Māori scholarship, museum curation and digital collections management. Although approaching the topic from different professional backgrounds, all three discussed recurring themes of accessibility, authenticity, cultural context and the role of digital technologies in historical interpretation

Similar to the survey and focus group findings, the three experts expressed both enthusiasm and caution regarding the role of 3D scanning technologies in historical interpretation. Across the interviews, recurring themes emerged, including accessibility, authenticity, cultural context, ethical responsibility, and the interpretive role of digital technologies.

At the same time, they expressed tension around accessibility by attempting to describe the authentic emotional connection one feels when standing before a physical artefact versus a digital one. Along with the importance of cultural context and ethical responsibilities associated with various approaches to digitising artefacts. Without ever speaking to one another, they all expressed similar topics, but each had a differing understanding of the role of digital technologies in historical interpretation.

4.3.1 Accessibility

Accessibility emerged as one of the strongest themes across all three interviews. Although each expert approached the topic from a different professional perspective, all agreed that digitisation has significantly expanded public access to historical and cultural material.

Dr Shearer illustrated the value of digitisation through the example of a cloak woven by her great-great-grandmother, now held within the Auckland War Memorial Museum. Because the cloak is carefully conserved, opportunities for physical engagement are necessarily limited. She suggested that a high-quality 3D model could provide meaningful access while preserving the original artefact. For Dr Shearer, digitisation offers a way to extend engagement with culturally significant objects beyond the small number of people who can access them directly.

Dr Mackintosh described the Collections to Classrooms initiative as an example of how digitisation can broaden access to museum collections. Drawing on her experience as both a historian and a curator, she explained that digital models enable members of the public to engage with artefacts that would otherwise remain inaccessible due to conservation requirements or storage limitations.

Dr Mackintosh also noted that digitisation enables museums to showcase objects that would rarely be displayed in person due to their size or fragility. Using the example of a small berry from Te Papa's collections, she explained that digital models allow viewers to appreciate details that might otherwise go unnoticed, including subtle evidence of use and deterioration.

Both Dr Mackintosh and Dr Taylor emphasised that digitisation enables museums to share substantially larger proportions of their collections than could ever be displayed physically. In this sense, digital technologies extend rather than replace the museum's educational role.

When asked whether digital technologies democratise history or oversimplify it, Dr Mackintosh responded that they "can do both." While she strongly supported expanding public access, she emphasised that historical interpretation still depends upon context, evidence and careful scholarship. Increased accessibility, she argued, should not come at the expense of historical understanding.

Dr Taylor similarly described accessibility as central to the Auckland Museum's digital strategy. Over the past decade, the museum has progressively expanded online access, making approximately one million collection records available digitally, including hundreds of thousands of images released under Creative Commons licences. These initiatives enable members of the public to engage with artefacts that may never appear in physical exhibitions

due to storage, conservation, or display constraints. To achieve this, the museum draws upon established digital platforms, including Sketchfab and Google Arts & Culture, enabling broader public engagement without developing proprietary systems.

Taken together, the interviews demonstrate that accessibility was regarded as one of the principal benefits of digitisation. While each expert approached the issue from a different professional perspective, all viewed digital technologies as expanding opportunities for engagement rather than replacing encounters with physical artefacts.

4.3.2 Authenticity and Aura

The expert interviews also all brought up a topic that had also been of the utmost importance to the survey respondents and focus group participants: the presence of authenticity attached to a physical item.

Dr Shearer introduced the concept of Mauri to explain how cultural significance might continue within digital representations. Referring to her ancestor's cloak, she suggested that while a digital model lacks the same physical Mauri as the original object, it nevertheless retains the genealogical relationships associated with it. This perspective suggests that digitisation does not simply sever cultural meaning but may enable aspects of *whakapapa* and identity to continue through digital forms.

Dr Shearer also observed that similar concerns accompanied the introduction of photography within Māori communities, where questions surrounding Mauri and appropriate cultural practice were widely debated. She suggested that digitisation raises comparable questions regarding responsibility, stewardship and appropriate use, particularly once culturally significant material becomes widely accessible online.

Although Dr Shearer believed that digital models could carry important cultural meaning, she also maintained that they do not replace original artefacts. Using the example of Henry VIII's throne, she argued that even a perfect digital reproduction could not fully replicate the Mauri associated with the original object. Nevertheless, digital models remain valuable for those who have no practical opportunity to encounter the original.

Dr Mackintosh similarly emphasised the unique experience of encountering original artefacts, describing "the magic of the thing itself." She argued that physical proximity creates an emotional connection that cannot be fully replicated through digital representations. Although she found this experience difficult to define, she consistently associated it with being physically present alongside the object.

When asked directly whether digital artefacts possess the same authenticity as physical ones, Dr Mackintosh responded that they do not. Nevertheless, she acknowledged that digital representations remain valuable educational tools, even though they lack the emotional immediacy of original objects.

Dr Taylor approached authenticity from a different perspective. Although acknowledging that digital artefacts consist technically of digital data, he argued that they nevertheless remain meaningful representations of original objects. For him, the significance of a digital artefact derives not from its material form but from the historical and cultural meanings it continues to represent.

Taken together, the interviews suggest that authenticity is experienced as a layered and relational concept rather than a fixed property of physical objects alone. While all three experts acknowledged that digitisation transforms encounters with historical artefacts, none regarded digital representations as simply inferior copies. Instead, their perspectives suggest that digital artefacts may retain important cultural, genealogical and interpretive significance even while lacking aspects of the material presence associated with original objects.

4.3.3 Ethical Responsibility

Ethical responsibility emerged as a major theme across the expert interviews and echoed concerns previously identified in both the survey and focus group. While participants consistently discussed the importance of preserving historical context, the experts extended this discussion to include broader ethical responsibilities surrounding cultural authority, stewardship and the appropriate use of digitised heritage.

Dr Shearer argued that digitisation does not diminish an artefact's cultural significance simply because it exists in digital form. Although a digitised object may appear to be "just a cluster of pixels," it remains subject to *tikanga* and therefore requires appropriate cultural care and respect. She summarised this ethical challenge through the phrase "preservation versus extraction," suggesting that digitisation should preserve not only artefacts themselves but also the cultural relationships and contexts that give them meaning.

Dr Shearer further emphasised that cultural protocols extend beyond the artefact itself to the ways it is stored, displayed and shared. She described longstanding tensions between museums and Māori communities regarding the treatment of culturally significant *taonga*, arguing that decisions about digitisation should be guided by the communities most closely connected to those objects.

Central to Dr Shearer's perspective was the principle of Indigenous data sovereignty. She argued that *iwi* should determine whether culturally significant objects are digitised, how digital representations are used, and who may access them. For particularly tapu objects, she suggested that digitisation may be inappropriate altogether. These comments position digitisation not simply as a technical process but as one requiring ongoing cultural consultation and shared decision-making.

Dr Mackintosh similarly emphasised consultation with source communities before digitisation. Specifically, when comparing the presentation of a physical artefact to that of a digital artefact. She explained that museum practice routinely involves seeking permission from identifiable communities and discussing any cultural restrictions that should accompany digital access.

Dr Mackintosh also described the importance of incorporating multiple perspectives when developing digital heritage resources. Rather than relying solely on museum expertise, the Collections to Classrooms project drew on historians, archaeologists, descendant communities, and other contributors to develop richer contextual narratives for each artefact.

Dr Taylor described the museum's cultural permissions framework as central to decisions about digitisation and public access. He explained that not all scanned artefacts are released publicly and that access restrictions are applied where required to respect Māori and Pacific cultural values. In some cases, digital models remain accessible only to researchers or the communities most closely connected to them. An example Dr Taylor spoke of was the conservation project, *Te Toki-a-Tāpiri,* where the entire *waka* (canoe) is being scanned slowly, but at present only researchers and local iwi have access to those scans. The example of *Te Toki-a-Tāpiri* illustrates how digitisation can increase access while still respecting cultural authority through carefully managed permissions.

And within the museum's digital artefacts, Dr Taylor discusses the “30-odd that we've scanned and that we haven't made publicly accessible.” During the focus group discussion, the participants raised concerns that those with both the technical and historical knowledge to make judgements about digitisation are few and far between. Dr Taylor, a historian in charge of a museum's scanned artefacts, brings together the different professional backgrounds that the focus group participants desired in a person responsible for digitising artefacts. Here, he showcased not only technical knowledge but also historical and cultural expertise to minimise exposure of a scanned object.

Taken together, the interviews demonstrate that ethical responsibility extends beyond technical questions of digitisation to encompass cultural authority, consultation, and

stewardship. While each expert approached these responsibilities differently, all emphasised that decisions about digitisation should preserve not only artefacts but also the cultural contexts and communities to which they belong.

4.3.4 Digitisation is not a Neutral Reproduction

Across the interviews, experts consistently argued that digitisation is not a neutral process. Rather than simply reproducing historical artefacts, digital technologies shape how those artefacts are represented, interpreted and experienced.

Although Dr Shearer viewed digitisation positively overall, she emphasised that important decisions are made throughout the digitisation process, including which objects are selected, how they are represented and whose histories become visible. She spoke of her concerns about who gets to decide what is worth digitising, and how it brought to her mind the old saying, “the victors write history.” She therefore argued that digitisation inevitably reflects particular cultural and institutional values rather than functioning as a neutral process.

Dr Shearer spoke very pointedly about how “digitising cultural histories is never neutral.” Recognising the fantasy of technological neutrality and that, with any amount of digitisation, the very being of an artefact is transformed. Dr Shearer emphasised that digitisation is not neutral and involves interpretive decisions that affect how artefacts are represented, and how historical objects are shaped by the media that created them. This observation highlights that every stage of digitisation involves interpretive choices that shape the meanings attached to historical artefacts.

Dr Mackintosh similarly argued that historical interpretation is always shaped by perspective and spoke of the many “different ways that people can interpret the past.” She described the importance of incorporating multiple disciplinary and community viewpoints, suggesting that digitisation creates opportunities for a broader range of interpretations rather than a single authoritative narrative.

Dr Taylor approached the issue from a museum perspective, arguing that museums themselves are never neutral spaces. Simply relocating an artefact into a museum involves acts of selection, categorisation and interpretation. From this perspective, digitisation does not introduce neutrality or bias so much as it continues processes already inherent in museum practice.

Collectively, the interviews suggest that digitisation should not be understood as a passive process of reproduction. Instead, digital technologies actively shape how historical artefacts are selected, contextualised and interpreted. Although the experts differed in their

emphases, they consistently recognised that decisions about digitisation carry important cultural, ethical and interpretive consequences. While digitisation was generally regarded as a positive development, this support was tempered by concerns that the authority behind historical narratives could alter, shape, or exclude particular perspectives. The perspectives of Dr Shearer, Dr Mackintosh, and Dr Taylor collectively highlight the tension between democratising historical knowledge and maintaining critical, expert-led interpretation.

Chapter 5 Discussion

Data from a public survey, qualitative focus groups, expert interviews, and a comprehensive review of the philosophical and museum studies literature were synthesised to investigate the implications of digesting artefacts for the public's perception of history. A mixed-methods approach was employed to integrate these data sources, enabling the identification of convergent, complementary, and divergent themes across public opinion, professional expertise, and philosophical discourse.

The analysis identified four interconnected themes: Accessibility and Democratisation; Authenticity, Aura, and Material Presence; Digital Artefacts as New Objects; and Authority and Ethical Responsibility. Together, these themes suggest that the digitisation of historical artefacts does not merely expand accessibility but also reshapes how they are experienced, interpreted, managed, and understood.

5.1 Accessibility and Democratisation

Across all datasets, digitisation was consistently associated with greater accessibility to historical artefacts, particularly by enabling remote engagement beyond national and geographic boundaries.

Throughout the survey, respondents consistently expressed strong positive responses about the ability of digital technologies to expand access to history. At the same time, a broad trend in the survey responses was a preference for visiting museums and historical sites in person to engage with history rather than digitally. Similar sentiments were expressed by the focus group, who, while offering some caveats, also emphasised that, above all, 3D scanning technology had the potential to enable people from all over the world to experience historical objects they would otherwise be unable to see in person. Despite recognising the value of digital access, participants consistently placed greater value on encountering artefacts in person. All three experts interviewed regarded digitisation and of the potential of digitised artefacts to widen access to a museum's collection most favourably. For them, a digitised artefact was best understood as a complement to the physical artefact. Participants associated digitisation with increased inclusivity which enabled broader audiences to engage with collections that were previously geographically or economically inaccessible.

Despite their differing perspectives, all participant groups identified accessibility as a primary benefit of 3D scanning. This shared emphasis linked digitisation to broader themes of democratisation and public engagement. This thematic intersection suggests that increased

access to historical information is not simply a concern of museum professionals or digital specialists but is also recognised across a segment of the population.

Importantly, all three datasets exhibited this pattern of enthusiasm for accessibility. At the same time, increased accessibility was participants consistently identified accessibility as a benefit and emphasised on the continued importance of physical engagement. This suggested that participants perceived digitisation not as a replacement for traditional encounters, but as a complementary mode of access. The in-person encounter with physical artefacts remained the preferred mode of engagement. At the same time, they identified digital technologies as powerful tools rather than wholesale replacements for expanding access to cultural heritage.

The findings suggested that participants associated digitisation with educational opportunity and broader access to historical knowledge. Survey respondents, focus group participants, and museum experts all identified digitised artefacts as valuable educational tools that could deepen historical understanding. This perceived expansion of access is further reinforced by developments in digital technologies such as photogrammetry, which have reduced the constraints of distance and enabled wider engagement with historical material, allowing cultural sites to be shared and analysed remotely (Magnani et al., 2018).

The capacity of digital artefacts to make historical concepts more tangible and engaging, particularly for individuals who might not otherwise engage with historical or cultural heritage, emerged across the datasets. Across all datasets, engagement and education emerged as two overlapping outcomes of digitisation. For instance, innovations such as 3D-printed digital twins can reintroduce a form of interaction, enhance educational environments and help users connect more closely to the past (McCuistion, 2024), while community-centred projects demonstrate how digital methods can strengthen local connections to culture and history. However, participants also expressed reservations about the integration of digital technologies, particularly regarding the authenticity and the loss of physical engagement with digital artefacts. These caveats highlighted that accessibility, while valued, is understood as part of a broader tension rather than a unilateral benefit.

5.2 Authenticity, Material Presence, and Aura

The emotional effect that the materiality of an artefact could evoke remained central to participants' understandings of authenticity throughout the collected data. Participants frequently expressed a preference for physical artefacts over their digital twins, highlighting the unique nature of in-person engagement. The material qualities and emotional significance of encountering objects in person were consistently emphasised.

In the survey responses, many answers emphasised the irreplaceable sensory and emotional qualities of encountering objects in person. The majority of respondents demonstrated a clear preference for in-person experiences with history over digital replicas. This perspective was particularly pronounced in the focus group, where participants described the significance of an artefact's "essence" and "historical weight." These terms were used to grasp a connection between the physical object and the historical events or contexts it represents. In a very similar manner, Dr Mackintosh described the "magic of the thing itself," emphasising the importance of proximity to the original object.

Together, these responses suggest that authenticity was understood not simply as historical accuracy, but as a sensory and emotional experience rooted in material presence. Physical artefacts were believed to possess a form of presence that enables a more immediate and emotionally profound connection to the past.

Participants' comments could be productively interpreted through Benjamin's concept of aura, which refers to the unique presence of an object situated in a specific time and place. The emphasis on proximity to historical continuity and emotional connection to an object reflects key elements of Benjamin's argument that authenticity is tied to an artefact's contextual presence in both space and time. The preference for in-person experiences with artefacts further supports this interpretation, as digital reproductions were often seen as lacking the depth of connection felt while in an object's physical presence. Participants' references to "essence," "historical weight," and "magic" resonates with a Benjaminian argument that an object's significance derives from its perceived singularity and historical embeddedness.

However, it is important to note that neither the participants nor the experts interviewed explicitly referenced Benjamin or any other theoretical framework. Rather, their descriptions circle around Benjamin's concept at a more abstract level, demonstrating how similar understandings of the historical experience can independently emerge across both public and academic contexts. The collected data also highlights significant complexities that challenge a straightforward application of Benjamin's framework. Both the focus group and survey responses indicated that digital artefacts are not simply perceived as inferior copies, but as creating distinct forms of engagement. These findings align with recent scholarships indicating that digital technologies, such as interactive 3D environments, shift the historical understanding away from passive observation toward participatory exploration, in which the perception of the past is increasingly shaped by user interaction rather than by the mediation of text or static imagery (Lian & Xie, 2024).

Survey responses point to the perceived potential of digital technologies to enhance education and deepen engagement with artefacts, a possibility similarly recognised within academic discourse (McCuistion, 2024). Focus group participants similarly demonstrated the value of interacting with digital models, particularly through features such as rotation and zoom, which facilitate closer, more tactile examination. This perspective aligns with Marín-Buzón et al. (2021), who argued that digital environments enable expanded sensory experiences, at times offering forms of analysis that were not possible through physical interaction alone. The focus group participants noted that the digital twins allowed them to observe features they would otherwise have missed, suggesting that digital mediation can extend interpretive capacity.

This perspective on authenticity aligns closely with the arguments proposed by Sogbesan (2021), who views authenticity as culturally constructed rather than being inherent to the object itself. From this viewpoint, authenticity is not a fixed definition but a negotiation through interaction and interpretation. Digital artefacts may develop their own forms of significance, shaped by how users engage with and perceive them.

While digital artefacts may lack the perceived authenticity associated with physical presence, there is a tension. For what they seemingly lose in authenticity they also gain in providing new modes of engagement that can deepen interpretive insight. Rather than representing a simple deprivation, digitisation appears to involve both gains and losses. Physical and digital artefacts should not be understood as mutually exclusive categories but rather as distinct benefits within complementary modes of engagement.

When viewed as a whole, these findings suggest that the authenticity of digital artefacts is not necessarily diminished but rather reconfigured. In this sense, digital twins can be understood as negotiations in which authenticity emerges through the interaction among material presence, technological mediation, and user interpretation.

5.3 Digital Artefacts as New Objects

Across the three methods of data collection, participants consistently highlighted that digital artefacts were experienced as something fundamentally different from their physical originals. Survey respondents frequently described digital versions as “not the same as the real thing,” often noting reduced emotional weight or authenticity.

Similarly, focus group participants highlighted changes in some visual details and the objects' scale when viewing them digitally. They explained how material distinctions, such as surface wear, were altered or lost in the digital models, with these differences described as creating a “layer of disconnect.” This perspective aligns with the media-archaeological

approaches of Parikka, who argues that digital technologies fundamentally transform how historical artefacts exist in time and space, thereby changing their very nature. From this perspective, digitisation can be understood as the production of new media objects whose meaning is shaped by the technological systems through which they are accessed.

At the same time as participants are perceiving the transformation of digital artefacts into a new object, focus group participants also recognised that digital artefacts enabled new forms of engagement. The ability to rotate and zoom in on objects allowed users to notice details they had not noticed when viewing them in person. This suggests that digitisation does not simply reproduce artefacts but reshapes how people encounter and understand them. A Milliganian point of view would suggest that digitisation is not only a process of preservation but also one of transformation, in which the digital object's accessibility and interpretive possibilities are reconfigured. Within this framework, the digital twin is not a neutral replication, but a mediated reconstruction that reflects the opportunities and limitations of digital technology.

As digitised artefacts create new media objects and promote new forms of engagement with history, these findings taken together suggest that they are not perceived as straightforward replacements but as distinct objects that exist in relation to their physical counterparts. These interpretations emphasise the transformative nature of digitised artefacts, positioning them conceptually distinct from their physical counterparts.

In contrast, a different lens for interpreting these findings is Benjamin’s concept of aura. As discussed in the previous section, participants’ emphasis on “historical weight,” “essence,” and proximity to the original object resonates with Benjamin’s claim that authenticity is tied to an artefact’s unique presence in time and space. Advances in technologies have made the collection of highly detailed and realistic data increasingly accessible (Saif, 2022), enabling digitisation beyond specialised institutional contexts. From this perspective, the conditions of possibility in which authenticity is experienced are fundamentally altered. However, despite these developments, participants often perceived digital artefacts as lacking the individual presence that gives physical objects their aura. This helps explain their persistent preference for in-person encounters, even as they expressed strong enthusiasm for the benefits of increased digital accessibility.

These findings also complicate a purely Benjaminian interpretation. The ability to interact with artefacts in a new digital format introduced new forms of engagement that may not have been accounted for in his framework. These findings suggest that authenticity may be reconfigured rather than simply diminished. This thought creates a new object with its own interpretive possibilities and limitations.

A considerably different perspective emerged from Māori concepts of Mauri and *whakapapa*, as articulated by Dr Shearer. Rather than viewing digitisation as severing the connection between an artefact and its origin, this framework emphasises relationships, continuity and genealogical connection across time. If Mauri is understood as extending beyond purely physical forms, it may provide an alternative basis for interpreting the significance and authority of digitised artefacts. This perspective resonates with early Māori understandings of photography, which was initially approached with suspicion due to the belief that images could capture a portion of a person's Mauri, rendering them *tapu* (Pene, 2025). In this sense, digital representations may be understood not merely as neutral reproductions but as carrying spiritual and relational significance, reinforcing rather than diminishing connections to origin.

From this viewpoint, a digitised artefact may not share the material properties of the original, but through its genealogical and cultural relationships, it can still retain aspects of its Mauri. A *whakapapa*-based understanding shifts focus from the object itself to the relationships that give it meaning, allowing significance to extend across physical and digital forms. This aligns with Roa's idea of "photograph the invisible," referring to spiritual, ancestral, and ecological meanings not immediately visible in images (Yates, 2024). Applied to 3D digitisation, it highlights how artefacts risk being reduced to aesthetic or informational objects when stripped of *whakapapa*, overlooking their living cultural significance.

The perspectives presented in the documentary *I Am the River* similarly suggest that photographs can retain powerful ancestral and genealogical connections. A Benjaminian argument would propose that, rather than disputing ownership rights, the photographs should simply be copied, allowing everyone to have as many as they require. From a *whakapapa*-based perspective, the significance of an image derives not solely from its material form but from the relationships it sustains across generations.

Historically, these ancestral connections have been carried through oral traditions, *Wairata*, carving, weaving and later through photographic archives. Photographs, therefore, may function not simply as representations but also as carriers of ancestral relationships and memory. From this perspective, Dr Shearer's suggestion that a digitised artefact may retain aspects of its Mauri. This challenges Benjamin's assumption that reproduction necessarily diminishes an object's authority. Rather than asking whether a digital artefact is an authentic copy of an original, a *whakapapa*-based framework raises a different question: can genealogical, cultural and relational connections continue through digital forms? If so, digitisation may not simply reproduce artefacts but create new forms through which relationships with ancestors, histories and cultural knowledge are maintained. Although this

discussion began by noting similarities between Dr Shearer's comments about Mauri resonating strongly with Benjamin's concept of aura, the parallels between the two should not be overstated.

The perspective of continuity through transformation found in Mauri and whakapapa challenges strict interpretations of both media-archaeological and Benjaminian assumptions. Rather than framing digitisation as either the creation of a new object or the loss of authenticity, it proposes that transformation and continuity can coexist. Viewed through this lens, practices such as 3D scanning do not constitute a radical break from traditional historicism but rather extend long-standing historiographic practices (Parikka, 2012). The discussions in Ferreira et al. (2025) surrounding a digitised paddle and basket resonate strongly with the idea that, though the artifacts differ physically, their authenticity remains in a similar light. Digitisation through this combined process has seemingly become a means by which relationships with history and cultural knowledge are reconfigured rather than removed, and digital artefacts may be understood as part of a continuous effort to represent the world as reproducible and systematised. This highlights the idea that technological change operates within existing frameworks rather than outside of them.

Cumulatively, these perspectives suggest that digital artefacts occupy a rather ambiguous position between transformation and continuity. While theories such as media archaeology emphasise the emergence of new digital objects, and Benjamin highlights the transformation of authenticity, Māori concepts of Mauri and *whakapapa* demonstrate how cultural meaning may persist across physical and digital forms.

5.4 Implications for Historical Practice

A consistent finding across all datasets was that digital artefacts are best understood as complementary to physical artefacts rather than as replacements. While participants and experts expressed excitement for the access and new forms of interaction made possible by digitisation, there was also a consistent emphasis on the continued importance of material presence and in-person engagement. The findings highlighted that museums, archives, and educators should use digital artefacts to enhance engagement with historical collections by offering alternative forms of interaction and interpretation, thereby helping preserve understanding of the indispensable value of physical artefacts. Hybrid educational strategies can enhance learning and enable more interactive and contemplative encounters. Similarly, archives that continue to digitise their collections help provide greater access to and protection for fragile materials. The key implication across the board would be to balance access and

engagement with preservation and authenticity, with the understanding that digital technologies can extend and deepen the experience of physical artefacts rather than replace them.

Another important implication concerns the risk of decontextualization accompanying increased accessibility. Participants expressed concern that artefacts may become detached from their cultural frameworks, thereby reducing the complexity of the historical and cultural contexts that give them meaning. However, expert perspectives complicate this view suggesting that context is far more fluid throughout the processes of interpretation, whether in museums or digital environments.

The findings hold important implications for historians and the communities they engage with regarding how meaning and authority are managed in the digital environment. To prevent the diminishing of the historical and cultural value of artefacts that accompanies expanded access to information, there needs to be comprehensive and collaborative approaches to digitisation. This indicates that digitisation should not be approached as a neutral process, but one that requires deliberate efforts to embed contextual information. Collaborative methodologies are essential to ensure that digital artefacts retain the possibility for contextual interpretation. Metzger, J. A. (2022) discusses extending Māori voices beyond mere recommendation and placing their communities in positions where they can oversee the kaitiakitanga of their communities' history.

This connection to communities is another key implication of the data. Digitisation extends artefacts beyond their original physical and cultural settings, raising important questions of ownership, consent, and representation. New modes of cultural stewardship are required to ensure that communities connected to digitised artefacts retain meaningful input into the representation of their histories and cultural heritage (Ellis, 2023). Expert interviews highlight the work of Lian & Xie (2024), who emphasised the need for consultation with communities, particularly regarding cultural heritage. Ensuring the cultural sovereignty of data is particularly relevant in the context of Aotearoa, New Zealand, where Māori principles such as whakapapa and kaitiakitanga emphasise the ongoing relationships between people and taonga, as described by Yates (2024). This highlights the necessity for communities to retain authority over how their cultural heritage is accessed and represented in digital form. Digitisation should thus not be viewed solely as a technical process but as an interconnected one that requires constant engagement with the peoples connected to the digitised artefacts, a point of view that is shared by Ellis et al. (2023).

The findings also suggested a shift in the role of historians, driven by increasingly technology-driven systems for producing and accessing historical knowledge. While participants

valued expert guidance, they also expressed concern about technological mediation shaping interpretation. Milligan (2022) describes how the scale and speed of historical research have been affected by digitisation, with research shared across vast distances through the reduction to keyword searches and database queries. However, this can leave historians with limited understanding of the algorithmic systems that increasingly shape access to historical information.

This shift indicates that historians need not become highly technical software engineers but should have a baseline understanding of how digital infrastructures shape their own understanding of the past. As Remondino (2011) observes, photogrammetric technology has become increasingly user-friendly for non-specialists, aided by advances such as expanded data storage and higher baseline processing power that support wider adoption. This marks a significant shift from earlier decades (e.g., Fraser et al., 1986; Gagnon et al., 1990), when photogrammetry was a highly specialised technology. As more researchers engage with these tools, they are exploring new applications, with scholars like Grosman (2016) arguing that digital reconstructions are now integral to archaeological fieldwork and laboratory analysis.

Consequently, as historiography and technology continue to intertwine, photogrammetry is becoming increasingly widespread while also driving significant methodological change, underscoring the need for historians to develop sufficient digital literacy to evaluate how meaning is constructed through digitisation. A possible starting point for a conceptual framework in understanding and accessing information in vast disciplinary databases exists in the art world: the Categories for the Description of Works of Art. This framework is one possible model for understanding how metadata, classification systems, and descriptive standards shape interpretation within digital collections of art (J. Paul Getty Trust & College Art Association, Inc., 2013). Similar frameworks may help historians critically engage with the structures that organise and present historical information online.

The findings suggest a shift in the role of museums from custodians of objects to facilitators of engagement. With the rise of digitisation and the greater access digital artefacts provide to the public, questions about the future of traditional academic authorities have been raised. Dr Taylor expressed a desire for museums to remain repositories of historical knowledge while also prioritising opportunities for the public to engage with that knowledge independently and critically. Both participants and experts emphasised the value of public engagement alongside academic expertise, indicating a move towards more participatory and inclusive models of historical practice. However, this shift must also be considered in light of the persistent digital divide, which underscores the need for historians and institutions to remain

attentive to issues of access and inequality in the presentation and dissemination of digital history (Boyer, 2016).

Chapter 6 Conclusion

This research set out to explore how 3D scanning technologies, with a particular emphasis on photogrammetry, affect the perception, interpretation and accessibility of historical artefacts. As museums increasingly adopt digital technologies, the presentation of historical artefacts has shifted, meaning they are no longer experienced solely within physical collections but also through digital representations that expand access and transform how the past is encountered. These shifts change the way in which the public engages with history. This turns physical artefacts once bound to a single museum from unique pieces of cultural heritage, into digital files that anyone, from anywhere, can access. This type of access presents the possibility that the public to view and interpret history differently.

From this research, several key findings were established. Across the survey, focus group, and interviews, participants consistently viewed digital artefacts as valuable complements to physical artefacts rather than replacements. The findings indicate that when a historical artefact is digitised, it becomes far more accessible to the masses. The general public, as represented by the survey and focus group, expressed great excitement about the potential to disseminate digital artefacts worldwide. The experts spoke of their personal experience using 3D scanning to increase access with items that would usually not be on the museums showroom floor. Both public participants and experts emphasised that physical artefacts retain qualities that are not fully captured through digitisation. The data made it clear that, despite the technical perfection of a digital twin, a physical artefact retains a unique sense of authenticity, presence, and emotional connection.

Due to the perceived presence and material qualities of physical artefacts, digital artefacts are not seen as replacements for physical artefacts but rather as complementary, enhancing engagement alongside them. Participants noted that the addition of a digital rendition of an artefact improved understanding of the physical item. At the same time, experts described digital artefacts as tools to heighten insight into historical objects.

However, this engagement is not the same as traditional engagements with history, for the addition of this new technology has surely introduced some changes. Participants responded favourably to utilising digital artefacts to increase accessibility, which would enable broader, more diverse audiences to engage with the past beyond geographical constraints. For this, expanded access would allow for new educational contexts and encourage engagement from individuals who might otherwise be excluded. The focus group participants emphasised new forms of engagement through their actions and discussions of the interactive possibilities of digitised objects, such as rotating models, zooming in on fine details, and exploring features that

would be difficult or impossible to observe in person. These new interactions foster more personal exploration and interpretation, shifting the viewer from a passive observer to an active participant. Expert insights further noted how digital artefacts are shaped by technological and curatorial choices, giving each one a distinct interpretive framework. Altogether, the findings demonstrated that digitisation does not simply reproduce historical objects; rather, it transforms how they are accessed, experienced, and understood. Thus, it creates new forms of historical engagement and interpretation.

But this understanding raised important ethical and cultural concerns, such as ownership, authority, context, and stewardship of a digitised object. Across the data, participants expressed concern about the potential manipulation of digital artefacts and the distortion of historical information, alongside a tendency for digitisation to focus too heavily on the object itself rather than the cultural and historical context from which it emerged. At the same time, experts emphasised the importance of ensuring that digital twins are treated with appropriate respect and consideration. The combination of these findings highlights how digitisation involves issues of authority, responsibility, and cultural sensitivity that require careful consideration of how digital forms preserve or reshape an artefact's meaning.

This research contributes to the ongoing discourse on the nature of digital heritage by demonstrating that digitisation does not simply replicate historical artefacts but also reshapes how they are accessed, interpreted, and understood. By combining public and expert perspectives in the New Zealand context, the study highlights the simultaneous nature of increased accessibility and persistent concerns about authenticity, cultural context, and ethical responsibility. By integrating public, professional, and theoretical perspectives, the research provides a more nuanced understanding of digital heritage as a negotiated relationship among accessibility, authenticity, cultural responsibility, and technological mediation. The research also suggests that Māori concepts such as Mauri and *whakapapa* offer alternative ways of understanding the complex relationship of authenticity and the continuity in digital heritage, extending discussions beyond predominantly Western theoretical frameworks.

There are limitations within the research that were identified during the study. The sample sizes of the survey and focus group were quite small and given their size, too small to draw meaningful conclusions about the population at large. The participants were also predominantly from New Zealand, so the context and background in which they answered the questions was similar.

The focus of the research also limited itself to photogrammetry and 3D models, which does not encompass all forms of digital heritage. The research also limited itself to artefacts and

to museums, the institutions most associated with history and leading the effort to digitise it. This was to ensure that the scope of the research did not become so broad that the depth of analysis and the ability to draw meaningful conclusions would be compromised.

These limitations can serve as the basis of future research. Expanding the scope of this research with larger data sets would allow for a more representative understanding of public engagement. Further research could also explore other technological methods, such as virtual reality (VR), augmented reality (AR), or mixed reality, which were only mentioned in a limited, passing capacity in this thesis. Alongside this, a large-scale study could be conducted to better understand how a general population engages with digital artefacts. In addition, studies focusing on different user groups, such as secondary school students, museum visitors, and heritage professionals, could expand understanding of how digital artefacts are experienced. Finally, further research into Indigenous perspectives on digital heritage, with a particular focus on concepts such as Mauri, data sovereignty, and cultural permissions, provides an important and valuable direction for future study.

Ultimately, this study found that digitisation neither straightforwardly replaces nor preserves historical experience. Instead, it introduces new forms of engagement that expand access while simultaneously raising critical questions about authenticity, context, and cultural responsibility. In conclusion, as digital heritage becomes increasingly commonplace, the challenge is no longer whether history will be digitised, but how digital technologies can be implemented in ways that can best be used to preserve cultural meaning, respect the values and communities connected to artefacts, and enrich public engagement with the past.

Chapter 7 Bibliography

Ahmed, S. K., Mohammed, R. A., Nashwan, A. J., Ibrahim, R. H., Abdalla, A. Q., Ameen, B. M. M. & Khdhir, R. M. (2025). Using thematic analysis in qualitative research. Journal of Medicine Surgery and Public Health, 6, 100198. https://doi.org/10.1016/j.glmedi.2025.100198

Bagi, O. (2018). *The applications of photogrammetry and 3-D visualisation during archaeological fieldwork* (By Uniwersytet Warszawski, Otto Bagi & M. Bogacki) [Thesis]. https://doi.org/10.13140/RG.2.2.10063.12968

Benjamin, W. (1935). *The Work of Art in the Age of Mechanical Reproduction*. In Hannah Arendt (Ed.) & Harry Zohn (Trans.), Illuminations. Schocken Books. https://web.mit.edu/allanmc/www/benjamin.pdf

Benjamin, W. (1942). *On the Concept of History* (p. 1). https://www.sfu.ca/~andrewf/books/Concept_History_Benjamin.pdf

Boyer, D. (2016). *Finding the intersection of technology and public history*. National Council on Public History. https://ncph.org/history-at-work/finding-the-intersection-of-technology-and-public-history/

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., Clarke, V., Boulton, E., Davey, L. & McEvoy, C. (2021). The online survey as a qualitative research tool. *International Journal of Social Research Methodology*. https://doi.org/10.1080/13645579.2020.1805550

Burkholder, P. & Schaffer, D. (2024, October 6). *A snapshot of the public's views on history*. AHA. https://www.historians.org/perspectives-article/a-snapshot-of-the-publics-views-on-history-national-poll-offers-valuable-insights-for-historians-and-advocates/

Corbin, A. (2012). *What purposeful public engagement means for archaeology - Society for Historical Archaeology*. Society for Historical Archaeology. https://sha.org/what-purposeful-public-engagement-means-for-archaeology/2012/09/

Ellis, N., Macdonald, E., & Almeida, E. (2022). Taonga in a digital world: Maori adornment and the possibilities of reconnection. *Journal of the Royal Society of New Zealand*, *53*(3), 362–380. https://doi.org/10.1080/03036758.2022.2090967

Ferreira, J., Young, J., Shedlock, K., Welch, I., Patterson, L. C., Roberts, H., & Pantidi, N. (2025). Prototyping digital taonga: Considerations for digital representation, interaction, and access. In Proceedings of the 36th Australasian Conference on Human-Computer Interaction (pp. 665–673). Association for Computing Machinery. https://doi.org/10.1145/3726986.3726995

Fraser, C. S., Jr., Brown, D. C. & Geodetic Services, Inc. (1986). INDUSTRIAL PHOTOGRAMMETRY: NEW DEVELOPMENTS AND RECENT APPLICATIONS. *Phok~Qrurn/~ircricRecord*, *12*(68), 197–217. https://www.asprs.org/wp-content/uploads/pers/1990journal/may/1990_may_623-625.pdf

Gagnon, P., Agnard, J., Nolefte, C., Boulianne, M. & Faculté de foresterie et de géodésie, Laval University. (1990). A Microcomputer-Based General Photogrammetric System. In *Photogrammetric Engineering and Remote Sensing* (Vol. 56, Issue 5, pp. 623–625) https://www.asprs.org/wp-content/uploads/pers/1990journal/may/1990_may_623-625.pdf

Grosman, L. (2016). Reaching the point of no return: The Computational Revolution in Archaeology. *Annual Review of Anthropology*, *45*(1), 129–145. https://doi.org/10.1146/annurev-anthro-102215-095946

Hamilton, A. B. & Finley, E. P. (2019). Qualitative methods in implementation research: An introduction. *Psychiatry research*, *280*, 112516. https://doi.org/10.1016/j.psychres.2019.112516

J. Paul Getty Trust & College Art Association, Inc. (2013). CDWA list of categories and definitions (P. Harpring & M. Baca, Eds.). http://www.getty.edu/research/publications/electronic_publications/cdwa/definitions.pdf

Kamimori, S. (2023). 7 Applications of 3D Laser Scanning for Historic Preservation | 3D Virtual Design Technology. *3D Virtual Design Technology*. https://3dvdt.com/7-applications-of-3d-laser-scanning-for-historic-preservation/

Lian, Y. & Xie, J. (2024). The Evolution of Digital Cultural Heritage Research: Identifying Key Trends, Hotspots, and Challenges through Bibliometric Analysis. En Antonio Álvarez Fernández-Balbuena & Berta García Fernández (Eds.), *Sustainability* (Vol. 16, p. 7125). https://doi.org/10.3390/su16167125

Magnani, M., Douglass, M., Schroder, W., Reeves, J. & Braun, D. R. (2020). The digital revolution to come: Photogrammetry in archaeological practice. *American Antiquity*, *85*(4), 737–760. https://doi.org/10.1017/aaq.2020.59

Magnani, M., Guttorm, A. & Magnani, N. (2018). Three-dimensional, community-based heritage management of indigenous museum collections: Archaeological ethnography, revitalization and repatriation at the Sámi Museum Siida. *Journal of Cultural Heritage*, *31*, 162–169. https://doi.org/10.1016/j.culher.2017.12.001

Marín-Buzón, C., Pérez-Romero, A., López-Castro, J. L., Jerbania, I. B. & Manzano-Agugliaro, F. (2021). Photogrammetry as a new scientific tool in archaeology: Worldwide research trends. *Sustainability*, *13*(9), 5319. https://doi.org/10.3390/su13095319

McCarthy, J. K., Benjamin, J., Winton, T. & Van Duivenvoorde, W. (2019). 3D recording and interpretation for maritime archaeology. In Charles W. Finkl (Ed.), *Coastal Research Library* (Vol. 31). Springer. https://doi.org/10.1007/978-3-030-03635-5

McCuistion, A. (2013). Promoting the Past: The Educational applications of 3D scanning technology in archaeology. *Colonialwilliamsburg*. https://www.academia.edu/5242308/Promoting_the_Past_The_Educational_Applications_of_3D_Scanning_Technology_in_Archaeology

McCuistion, A. (2024). One million years of technology: lithic analysis and 3D scanning in the 21st century. *Colonialwilliamsburg*. https://www.academia.edu/8367568/One_Million_Years_of_Technology_Lithic_Analysis_and_3D_Scanning_in_the_21st_Century

McNeill, M. (Producer/Co-Director). (2010) *I Am the River* [Film]. Razor Films. https://www.nzonscreen.com/title/i-am-the-river-2010/quotes

Metzger, J. A. (2022). Mauri and museums: Who really cares? The tensions between kaitiakitanga and museology [Doctoral thesis, University of Otago]. OUR Archive. https://hdl.handle.net/10523/12773

Meydan, C. H. & Akkaş, H. (2024). The role of triangulation in qualitative research. In *Advances in library and information science (ALIS) book series* (pp. 101–132). https://doi.org/10.4018/979-8-3693-3306-8.ch006

Milligan, I. (2022). *The Transformation of Historical Research in the Digital Age*. https://doi.org/10.1017/9781009026055

Mustafa, M. H., Balaawi, F. A., Queen Rania Institute of Tourism and Heritage, Department of Sustainable Tourism, The Hashemite University, Department of Conservation Science, Ministry of Tourism and Antiquities, Jordan Press Foundation & UNESCO. (2013). EVALUATING VISITOR MANAGEMENT AT THE ARCHAEOLOGICAL SITE OF PETRA. In Mediterranean Archaeology and Archaeometry, *Mediterranean Archaeology and Archaeometry* (Vols. 13–13, Issue 1, pp. 77–87).https://www.academia.edu/39943688/EVALUATING_VISITOR_MANAGEMENT_AT_THE_ARCHAEOLOGICAL_SITE_OF_PETRA

Neamtu, C., Popescu, D. & Mateescu, R. (2011). From classical to 3D archaeology. *Annales D Université Valahia Târgovişte Section D Archéologie Et D Histoire*, *13*(1), 79–88. https://doi.org/10.3406/valah.2011.1082

Parikka, J. (2012). *What is Media Archaeology?* Polity Press. https://memoof.me/read/1131/pdf

Pene, R. (2025). *The world in its best light*. Otago Daily Times Online News. https://www.odt.co.nz/lifestyle/magazine/world-its-best-light

Rahimi, F. B., Demers, C. M., Dastjerdi, M. R. K. & Lalonde, J. (2025). Agile digitization for historic architecture using 360° capture, deep learning, and virtual reality. *Automation in Construction*, *171*, 105986. https://doi.org/10.1016/j.autcon.2025.105986

Remondino, F. (2011). Heritage Recording and 3D Modeling with Photogrammetry and 3D Scanning. *Remote Sensing*, *3*(6), 1104–1138. https://doi.org/10.3390/rs3061104

Saif, W., Northumbria University & King Fahd University of Petroleum and Minerals. (2022). *Photogrammetry: A brief historical overview*. https://doi.org/10.13140/RG.2.2.27518.87369

Schindler, K. & Förstner, W. (2020). Photogrammetry. In *Springer eBooks* (pp. 1–3). https://doi.org/10.1007/978-3-030-03243-2_139-1

Sogbesan, O. (2021). Digitisation versus Authenticity: Towards Digital Representation of Museum Artefacts. *Global Journal of Arts, Humanities and Social Sciences*, *9–9*(7), 1–9. https://www.researchgate.net/publication/353554854_DIGITISATION_VERSUS_AUTHENTICITY_TOWARDS_DIGITAL_REPRESENTATION_OF_MUSEUM_ARTEFACTS#fullTextFileContent

Wyatt-Spratt, S. (2022). After the Revolution: A review of 3D Modelling as a tool for Stone Artefact analysis. *Journal of Computer Applications in Archaeology*, *5*(1), 215. https://doi.org/10.5334/jcaa.103

Yates, S. (2024). *Tom Roa: The whakapapa of a photo*. E-Tangata. https://e-tangata.co.nz/arts/tom-roa-the-whakapapa-of-a-photo/

Zecher, J. L. (2024). *Digital technologies have made the wonders of ancient manuscripts more accessible than ever, but there are risks and losses too*. The Conversation.

https://theconversation.com/digital-technologies-have-made-the-wonders-of-ancient-manuscripts-more-accessible-than-ever-but-there-are-risks-and-losses-too-221869

Chapter 8 Appendices

Appendices A - Ethics Approval

13 November 2025

Frances Joseph

Faculty of Design and Creative Technologies

Dear Frances

Re Ethics Application: 25/346 An Investigation of changes to Historiography and the Public's Perception of History brought about by 3D Scanning

Thank you for your responses to AUTEC’s conditions.

Your ethics application has been approved for three years until 13 November 2028.

Standard Conditions of Approval 1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC.

2. All public facing documents must have the AUTEC approval number and be of a high standard of spelling and grammar. Dates on the Information Sheet(s) and Consent Form(s) must be consistent.

3. Any amendments to the project must be approved by AUTEC prior to being implemented.

4. A progress report is due annually on the anniversary of the approval date.

5. A final report is due at the expiration of the approval period, or, upon completion of project.

6. Any serious or adverse events must be reported to AUTEC, this includes unforeseen issues that might affect continued ethical acceptability of the project.

7. AUTEC grants ethical approval only. You are responsible for obtaining management permission for access from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

The application number and title need to be referenced on all correspondence related to this project. All forms are available online http://www.aut.ac.nz/research/researchethics For any enquiries, please contact the Secretariat at ethics@aut.ac.nz

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat

Auckland University of Technology Ethics Committee

Cc: liam26doyle@gmail.com

Appendices B - Tools

B1 - Focus Group Participant Information Document

Date that data collection will start:

18 April 2026

Project Title:

An Investigation of changes to the Perception of Historical Artefacts brought about by 3D Scanning Technologies

Kia Ora,

You are invited to participate in a research study on the perception of history. This study is being conducted by Liam Doyle a Master of Creative Technologies Student from Auckland University of Technology, New Zealand, with other research team members including my supervisor, Professor Frances Joseph. The study is being carried out as a requirement for a Master of Creative Technologies Thesis

What is the purpose of this research?

The research will investigate how the social science of history has changed due to the advent of 3D scanning technology. The project asks:

What changes have museums, historical sites, and other institutions made in how they present history to the public? Using new technologies?

This focus group, comprising up to 12 individuals, will participate in viewing and interacting with a variety of artefacts presented in three different formats: physical, 2D digital photographs, and 3D models. Participants will be asked to reflect upon the artefacts in their various forms and answer a number of questions on a survey.

Through this research, we hope to see how (or if at all) the new and different presentation of history has changed the way the general public views and interprets history.

The findings of this research may be used for academic publications and presentations

How was I identified and why am I being invited to participate in this research?

We are inviting individuals like yourself who are passionate about history or technology. You have been chosen because you have expressed interest in participating in the focus group via an initial online survey.

Participant Inclusion and Exclusion Criteria:

- Be over 18 years old.
- Be available to attend a 2-hour session in Auckland on the day of the focus group

Exclusions: Criteria for excluding people from participation include:

- Individuals under 18 years old, as they require different ethical considerations.
- People unable to attend the day of the focus group.
- Applications of interest will no longer be accepted once the target of 12 individuals is reached.

- As basic demographic information will be gathered on participants, should one particular age range have a higher proportion of expressed interest then some may be removed to allow for a wider age range across the participant group.

How do I agree to participate in this research?

You have expressed interest in participating and have been sent these details to inform you of the project and process of participation.

You will have two weeks from receiving the invitation to review the information, ask any questions, and discuss any concerns with the Researcher. Participation in the research is entirely voluntary.

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage you. You can withdraw from the study at any time by informing the Researcher. If you withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

Consent Process:

If you decide to participate, confirm your agreement by signing and returning the Consent Forms.

These forms outline your consent to participate and give details on how your information will be used.

What will my participation involve?

On the XX of November 2025 some 10 participants will be asked to attend an in person focus group hosted at AUT.

You will be presented with three artefacts presented in three different forms. During their presentation you will be asked to observe, at your own pace, each different presentation and to subsequently fill out a digital survey to elicit information about your experience of the artefacts. Additionally, during your viewing of the artefacts the primary researcher will be observing all the participants and taking notes.

The survey will ask you about your experience observing and interaction with the artefacts, their various forms and the technology involved.

The total time required of a participant (not including travel to/from the focus group) should be between 45 minutes to 1 hour.

What are the benefits?

Participants will:

- Help identify how the social sciences are being affected by the rapidly changing world of technology.
- Engage critically with how technology shapes our understanding of the past.
- Contribute to help museums better understand their relationship with technology.

- Shape future museum experiences by sharing what works best for learning and engagement.
- Develop media literacy by comparing how different formats affect perception and interpretation.

What are the costs?

The time commitment by participants will be approximately 45 minutes to 1 hour of taking part in the focus group (not including travel time to/from the focus group).

Will the results of the study be published?

The results of this research will be published in a master's thesis. This thesis will be available to the public through the AUT library. You will not be identifiable in any publication.

What are the discomforts and risks?

There are minimal risks or discomforts for participants in this research.

Participants unfamiliar with 3D models or digital interfaces might feel **frustrated or self-conscious** if they struggle to interact with the technology. The researcher will be on hand to assist with technology use and no disadvantage will come about due to those participants who are less technologically literate. The research will benefit in including their insights on how they viewed the technology.

- Should any participant wish to leave early or withdraw entirely from the research, due to any reason, they may do so at any time.

What will happen to information about me?

The information about your responses and interactions with the artefacts and their presentations will be kept confidential by the researchers, following AUTEC privacy guidelines. The information will only be used for this research project.

Participants will be non-identifiable should their responses be quoted in the research paper. The only identifiable information that will be collected is basic demographic information such as age, gender, ethnicity, education achievement, etc. All researcher notes and participant answers will be stored securely on password-protected servers during data analysis and on securely stored for six years on these servers once the project is completed. Only the research team will have access to raw data.

Participants will have the opportunity to give permission, review and approve any quotes, images, or content attributed to them prior to publication of the research report. By signing the consent form the participant is agreeing to the use of their information as stated in this Information Sheet.

Use of New Technologies.

Participants will be asked to engage with digital 3D models. The data collected from this interaction will be recorded by the participants survey answers.

What opportunity do I have to consider this invitation?

You will have up to two weeks to consider this invitation.

Will I receive feedback on the results of this research?

I will send a summary of the research to you at the end of the study, if you request this. I will send you a URL at which you will be able to read a summary of the findings if you indicate this on the Consent Form.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *enter name, email address, and a work phone number*.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz*, (+649) 921 9999 ext 6038.

Who do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Liam Doyle: fcn2538@autuni.ac.nz

Project Supervisor Contact Details:

Dr. Frances Joseph: frances.joseph@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 13th of November 2025, AUTEC Reference number 25-346.

B2 - Focus Group Consent Form

Project title: ***An Investigation of changes to the Perception of Historical Artefacts brought about by 3D Scanning Technologies***

Project Supervisor: ***Frances Joseph***

Researcher: ***Liam Doyle***

¡ I have read and understood the information provided about this research project in the Information Sheet dated 18th of April 2026.

¡ I have had an opportunity to ask questions and to have them answered.

¡ I understand that identity of my fellow participants and our discussions in the focus group is confidential to the group, and I agree to keep this information confidential.

¡ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.

¡ I understand that if I withdraw from the study then, while it may not be possible to destroy all records of the focus group discussion of which I was part, I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.

¡ I agree to take part in this research.

¡ I wish to receive a summary of the research findings (please tick one): Yes¡ No¡

Participants signature:

.....

Participants name:

.....

Participants Email (if 'Yes' is ticked to receive a summary of the research):

……..

……..

……..

Date:

Approved by the Auckland University of Technology Ethics Committee on the 13th of November 2025 AUTEC Reference number 25-346

Note: The Participant should retain a copy of this form.

B3 - Participant Expert Interview Information Document

Date that data collection will start:

February 2025 (Exact time and date will be determined with the participant)

Project Title

Exploring the Changes to the Perception of History brought about by 3D scanning

Kia Ora,

You are invited to participate in a research study on the perception of history through new technologies. This study is being conducted by Liam Doyle a Master of Creative Technologies student from Auckland University of Technology, New Zealand. The other research team member is my supervisor Professor Frances Joseph. The study is being carried out as part of the requirements for a Master of Creative Technologies Thesis.

What is the purpose of this research?

This research will investigate how the use of 3D scanning technology is changing the way we understand at history. This is an anonymous online survey that will investigate how the changing landscape of technology is influencing museums, archives, historical/cultural sites, and various other locations where the public interacts with history? Through this survey, your experiences and views will form part of the data I am gathering to help answer this question.

The findings from this research will be published in a master's thesis available through the AUT library.

How was I identified and why am I being invited to participate in this research?

We are inviting individuals like yourself who are interested in how the world views history in your professional work. Participants will be recruited through community networks, including museum curators, educators, and cultural researchers. You have been invited because your experience and perspectives can greatly contribute to exploring how the social sciences have been affected by 3D scanning technology.

Participant Inclusion:

- Be over 18 years old.
- Be available to attend a 1-hour interview session in Auckland or online.

Exclusion Criteria:

- Individuals under 18 years old, as they require different ethical considerations.
- Those without prior professional experience in historiography, museums, or cultural fields.

How do I agree to participate in this research?

You will have two weeks from receiving the invitation to review the information, ask any questions, and discuss any concerns with the Researcher. Participation in the research is entirely voluntary.

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage you. You can withdraw from the study at

any time by informing the Researcher. If you withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible

Consent Process:

If you decide to participate, confirm your agreement by signing and returning the outline your consent to participate and give details on how your information will be used.

What will my participation involve?

This interview will either be conducted in-person or online depending on the participants preferences. The one-on-one interview should take no longer than 1-hour, during which several general questions will be asked to all the different participants. Then some more specific questions will be asked depending on the field of expertise the participant has. The questions that will be asked by the researcher will be sent to the participant ahead of the interview for the participants review. Each participant interviewed will be asked around 10 questions each.

The participants responses will be recorded via the Adobe Audition software.

Indicative General Questions for All Experts

1. In your experience, how has technology changed the way people engage with history?
2. Do you think digital representations (like 3D models) can convey the same meaning or emotional impact as physical artefacts? Why or why not?
3. What are the benefits and limitations of using 3D scanning in your field?
4. How do you see the role of museums evolving with the rise of new digital tools?
5. What ethical considerations should be taken into account when digitizing cultural or historical artefacts?

Indicative Questions for Indigenous Researchers/Experts

6. How do you feel about indigenous artefacts being digitally scanned and shared online or in virtual exhibits?
7. What protocols or cultural sensitivities should researchers be aware of when working with indigenous heritage in digital formats?
8. What does “authentic engagement” with indigenous history look like in a digital space?
9. Can 3D scanning help support indigenous-led storytelling or education? If so, how?

Indicative Questions for Museum Curators/Experts

10. How have visitors’ expectations changed with the availability of digital tools in museums?
11. What impact have 3D models had on accessibility and outreach, especially for remote or underserved audiences?
12. Do you see 3D scanning as a preservation tool, an educational tool, or both?

13. How do you balance the physical experience of artefacts with digital enhancements in exhibit design?

Indicative Questions for Historians

14. Has 3D scanning changed the way historical narratives are constructed or interpreted?
15. Do you think digital tools democratize access to history, or do they risk oversimplifying it?
16. What role should historians play in shaping how technology is used to present the past?

What are the benefits?

- Indigenous researchers can share cultural protocols, concerns, and aspirations around the digital representation of heritage.
- Curators and historians can highlight institutional needs or public engagement goals.
- Expert participants will contribute to a project that may influence future museum practices, educational tools, or policy development.
- Expert participants become part of a dialogue across disciplines, which can lead to new partnerships or research opportunities.
- The interviews may prompt experts to reflect on their own practices, leading to new ideas or innovations in how they use technology.

What are the costs?

The time commitment by participants will be approximately a single 1-hour interview. The researcher will either set up a virtual interview or travel to the most convenient public location for the interview (such as a café).

Will the results of the study be published?

The results of this research will be published in a master's thesis. This thesis will be available to the public through the AUT library. You will have the option to not be identifiable in any publication.

What are the discomforts and risks?

There are minimal risks or discomforts for participants in this research.

The use of audio documentation could raise privacy concerns. All data will be kept private and secure. Participants will not be personally identified in findings and will have to give explicit permission for the use of any identifiable quotes for them to be used.

What will happen to information about me?

You have the option of being named to acknowledge any contributions to the research you aided in. Your name, area of expertise, and what you aided in would be described in the final write up of the data analysis. However, you also have the right to remain anonymous. Should you choose to remain unnamed then the following will describe your rights regarding your information.

The information about your understandings of your field of expertise will be kept confidential by the researchers, following AUTEC privacy guidelines, if you ask for confidentiality. The information will only be used for this research project.

If you wish to not be identified in the research than participants will be assigned a project ID for data analysis and reporting unless they explicitly agree to being identified.

All audio recordings will be stored securely on password-protected servers during data analysis and on securely stored for six years on these servers once the project is completed.

Only the research team will have access to raw data. Any publications or presentations will use anonymised data unless specific permission for attribution has been obtained.

Participants will have the opportunity to give permission, review and approve any quotes, images, or content attributed to them prior to publication of the research report.

What opportunity do I have to consider this invitation?

You will have up to two weeks to consider this invitation.

Will I receive feedback on the results of this research?

I will send a summary of the research to you at the end of the study, if you request this. I will send you a transcribed copy of your individual responses if you indicate this on the Consent Form.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr. Frances Joseph: frances.joseph@aut.ac.nz.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz*, (+649) 921 9999 ext 6038.

Who do I contact for further information about this research?

Please keep this Information Sheet for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Liam Doyle: fcn2538@autuni.ac.nz

Project Supervisor Contact Details:

Dr. Frances Joseph: frances.joseph@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 13th of November 2025, AUTEC Reference number 25-346.

Appendices C

C1 - Public Survey Questions

Q1 Introduction to the survey

Q2 Please indicate your age bracket

18-26

27-40

41-55

56-80

Q3 How would you describe your ethnicity?

Q4 How do you identify your gender?

Q5 Which format do you think helps you understand history the best?

Seeing museums/historical sites in person

Documentaries/Viewing photographs

Exploring interactive digital models

Reading about history

Other

Q6 What is your favorite way to explore history?

Q7 Have you ever used digital tools (e.g., virtual tours, 3D models, AR/VR) to explore historical artefacts?

No

Maybe

Yes

Q8 How much do you agree with the statement: “Technology makes history more accessible to the public.”

Strongly Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Strongly agree

Q9 What do you think are the limitations of using technology to study history?

Q10 How confident are you using digital tools to explore historical content?

Not confident at all

Somewhat not confident

Neutral

Somewhat confident

Very confident

Q11 What excites you most about the use of 3D models in archaeology or museums?

Q12 Do you think 3D models can replace physical artefacts in museums or classrooms?

Yes

Maybe

No

Only in some cases

Q13 Would you be interested in seeing more historical artefacts presented digitally in museums or classrooms?

Yes

Maybe

No

Q14 Any final thoughts on how technology is changing the way we experience history?

Q15 We are currently developing a focus group to further explore the use of technology in the presentation of history.

If you are interested in participating in an in person focus group please enter your email to be contacted with information about the focus group.

If you DO NOT wish to participate then please exit the survey and thank you for taking the survey.

C2 - Artefact Descriptions

Red Bowl from Kenya

This little red bowl is handmade from a single piece of Kisii soapstone, found only in the hills of southwest Kenya. Painted into the red glaze is a great flower within its centre, while the rim of the bowl is adorned with various geometric patterns.

Old Customs of Chinese Festivals

Published sometime in the early 20th century, the pages open up like an accordion to showcase hand-painted images and descriptions of several traditional Chinese celebrations. The book depicts scenes from of the Lunar New Year, the Dragon Boat Festival, and the Mid-Autumn Festival.