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The Practical and Ethical Considerations of Digitising Haitian Literary Archives

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MA (Hons)

Submitted in fulfilment of the requirements of the Degree of MPhil

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Abstract

Archives in Haiti are in danger from a multitude of threats including natural and manmade disasters, environmental crises, and political unrest. This thesis proposes the creation of an online digital archive for Haitian literary artefacts in an attempt to both preserve these documents and improve their accessibility; it is hoped that in doing so, it will encourage the study of Haitian literature and help to address Haiti's malignment in the Western sphere. The practical and ethical considerations of such a project are discussed, with issues examined through the lenses of postcolonialism and software engineering in order to make practical recommendations for the archive's development. Requirements specific to Haiti are discussed in the context of the software development process, with techniques suggested to overcome potential obstacles including accessibility and remote testing. The digitisation process is also examined as well as its application to archival literary materials. We will also consider the limitations of digital representations of physical objects, the role that location plays in an artefact's significance, and the importance of the oral as well as the written in Haitian cultural representation.

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Author's declaration

I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

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1. Introduction

This thesis proposes the creation of an online digital archive for Haitian literature and literary artefacts. Objects such as manuscripts and notes by authors can prove invaluable in critical readings of their works, but in the case of Haiti, these objects mostly hidden: relegated to private collections and at risk of being lost. It is hoped that in creating a digital archive of these objects, such as that of the Caribbean Literary Heritage Project,¹ we can ensure the preservation of these objects and facilitate access to them. Haiti is a country often misrepresented and misunderstood by Western nations, and it is hoped in allowing easier access to these materials, we will encourage wider academic study of Haitian literature. First, we will establish the necessity of the project: there are many risk factors threatening archives worldwide, but these are particularly pressing in Haiti. We will also consider Western perceptions of Haiti and how these have affected it in the past and present. The nature of methodologies used is twofold: first, we will consider the guidance of feminist standpoint appraisal and its relevance in designing a community archive. We will also examine the colonial histories and implications of archives and consider how we can adapt our methodology to better serve those whom archives have historically excluded. This process of decolonisation is relevant to all former colonies but presents itself uniquely in Haiti given that the country was the first in the world to gain its independence through slave revolt. Second, we will look at the software development aspect of the project and the techniques that will be used, as well as the potential challenges of these methods.

¹ 'Caribbean Literary Heritage', 2018 <<https://www.caribbeanliteraryheritage.com/>> [accessed 2 June 2022].

1.1 Necessity of the Project

1.1.1 Archives in Haiti

While national archives do exist in Haiti, many were damaged in the 2010 earthquake. Furthermore, there are gaps in these archives: preservation of materials was dependent on what colonising forces considered of worth. In *Decolonizing the Caribbean Record*, Bastian, Aarons and Griffin raise this issue, stating that many historical records were either considered too sensitive to remain in the relevant countries and were either appropriated or destroyed, or of little enough importance that they were never sent to the governing bodies in the first place.² This leads to a very one-sided perspective of the historical context of these countries and issues, with archives having been kept primarily as a means of control. Due to the colonial focus on record-keeping rather than cultural preservation, we find that many archival records of art, writing, and music are held in private collections, in Haiti and abroad. Indeed, in her writings on the aftermath of the Haitian earthquake, Rachel Douglas establishes,

‘Most *literary* archives in Haiti have no repository or architectural dimension. For the most part, they have not been deposited with a national library, but are instead physically located in the writers’ own private homes.’³

As a consequence, there is no standardised treatment for these archives. While the existence of archives of literature, art, and music is well-established, the vast majority are held in private collections which are passed down through families and friends; as a result, it is difficult to speculate on how many there are or the condition they are in: the nature of these archives means that there is no institutional home for them or standardised treatment. Often

² *Decolonizing the Caribbean Record: An Archives Reader*, ed. by Jeannette A. Bastian, Stanley H. Griffin, and John A. Aarons, 1st edn (Sacramento: Litwin Books, 2018).

³ Rachel Douglas, ‘Writing the Haitian Earthquake and Creating Archives’, *Caribbean Quarterly*, 62.3–4 (2016), pp. 388–405 <<https://doi.org/10.1080/00086495.2016.1260279>>, p.390.

these personal archives are formed by accident, with records posed to be discarded by the bodies who previously held them before being offered to citizens who find themselves thrust into the role of archivist. By their very nature these archives are often difficult to locate, and as a result we have no way of knowing how much information has already been lost through natural or manmade causes. In addition, as the archives are often passed down through families, it can be difficult and sometimes even impossible to track their journeys across various borders to know where they currently reside.

1.1.2 COVID-19 in Haiti

The COVID-19 pandemic has shaken the world, presenting a potent danger not only to health, but to cultural heritage: this is especially apparent in a country like Haiti, where so much of its culture and history are oral rather than written. The majority of Haiti's literary archives are private and scattered across the globe; this presents many difficulties normally, but now puts them at even higher risk when a global pandemic threatens their keepers. Unless efforts are made to reconcile these materials to a central archive, we risk losing them forever.

Restrictions on both domestic and international travel have also highlighted the potential benefits of a digital archive. As a consequence of the pandemic, researchers and academics have been unable to share physical spaces or materials: a digital archive would ensure accessibility and ease of cooperation even when international travel was not possible. Furthermore, the pandemic has proven the capabilities of digital resources: while travel restrictions have limited most people to their local area, vast swathes of information have been made available online, with museums offering digital exhibitions⁴ and art galleries

⁴ Rebecca Kahn, 'Locked down Not Locked out – Assessing the Digital Response of Museums to COVID-19', *The LSE Impact Blog*, 2020 <<https://blogs.lse.ac.uk/impactofsocialsciences/2020/05/08/locked-down-not-locked-out-assessing-the-digital-response-of-museums-to-covid-19/>> [accessed 17 May 2021].

allowing virtual tours.⁵ These have generally been a great success and some institutions are considering keeping these technologies in place even after their physical spaces are allowed to reopen. These are just a few examples of the potential of technology to improve accessibility of materials and to share information around the globe.

Another consideration is the cultural impact of the pandemic. The world has suffered what can be considered a collective trauma: unlike localised disasters like the 2010 earthquake in Haiti, most people regardless of country have had a similar experience during the pandemic. During the pandemic, exhibits were created attempting to document the cultural impact of COVID-19 and record the experiences of the global public; for example, the ‘Pandemic Objects’ project by the Victoria and Albert Museum.⁶ While the pandemic has been devastating, it can also be viewed as a potential opportunity to improve intercultural empathy: while it may be difficult for a British person, for example, to imagine the experience of an earthquake, it is feasible for them to relate to a Haitian who has lived through COVID-19. Already experiences, objects, and artwork relating to the pandemic are being shared widely online and in museums: with an online archive, accessibility to Haitian works will be improved, and help to ensure diverse representation in pandemic experiences.

1.1.3 Risk factors in the Caribbean

While archivists in all countries face risk factors, there are certain aspects of archive keeping which are made particularly difficult in the Caribbean. Haiti was recently indexed as one of the countries most vulnerable to climate change repercussions,⁷ and in a nation which is

⁵ Laura Feinstein, “‘Beginning of a New Era’: How Culture Went Virtual in the Face of Crisis”, *The Guardian*, 8 April 11AD <<https://www.theguardian.com/culture/2020/apr/08/art-virtual-reality-coronavirus-vr>> [accessed 17 May 2021].

⁶ ‘Pandemic Objects Archives’, *Victoria and Albert Museum* <<https://www.vam.ac.uk/blog/pandemic-objects>> [accessed 6 June 2022].

⁷ Madeleine Rubenstein, ‘Climate Change in Haiti’, *Columbia Climate School*, 2012 <<https://news.climate.columbia.edu/2012/02/01/climate-change-in-haiti/>> [accessed 17 May 2021].

already racked with natural and manmade disasters this could prove a death knell to physical archives held there. Of particular concern are rising sea levels, which have the potential to destroy many of the historical and literary archives held in Port-au-Prince. The climate of the Caribbean (high heat and humidity) also makes archive work particularly challenging, particularly for private archivists who do not have the means to control the temperature and humidity which their belongings are exposed to. The consequences of this can be dire, with mould and rust damaging or even destroying archived materials. It is unrealistic to expect private archive owners to invest in specialised and expensive containers to better house their materials; however, guidance can and should be provided on how best to protect and preserve these documents against natural threats. For example, Steve Jacobs of PennState Extension suggests a holistic approach to managing insects such as silverfish, which can devastate paper-based materials.⁸ Jacobs recommends measures such as dehumidifiers and airtight containers, which—while not infallible—are simple and inexpensive enough to be employed by private archive owners.⁹

1.1.4 Western perceptions of Haiti: the AIDS epidemic

Haiti suffered greatly from its association with the 1980s AIDS epidemic. While even at the time there was no evidence to suggest the virus had originated in Haiti, existing preconceptions of the country as ‘strange’¹⁰ and ‘hopelessly diseased’¹¹ led to it being blamed for the spread of HIV in North America. In 1983, the Center for Disease Control

⁸ Rebecca Dirksen, ‘Haiti’s Hidden Archives and Accidental Archivists: A View on the Private Collections and Their Keepers at the Heart of Safeguarding the Nation’s Classical Music Heritage’, *Latin American Music Review*, 40.1 (2019), 59–88 <<https://doi.org/10.7560/lamr40103>>, p.73.

⁹ Steve Jacobs, ‘Bristletails (Silverfish and Firebrats)’, *PennState Extension*, 2017 <<https://extension.psu.edu/bristletails-silverfish-and-firebrats>> [accessed 16 June 2022].

¹⁰ Paul Farmer, *AIDS and Accusation: Haiti and the Geography of Blame*, 2nd edn (California: University of California Press, 2006) <<https://r1.vlreader.com/Reader?ean=9780520933026>> [accessed 3 March 2021], p.4.

¹¹ Farmer, p.4.

included Haitians in the so-called ‘Four-H Club’¹²– the demographics believed to be at high risk for contraction of HIV; a year earlier, a physician with the US National Cancer Institute labelled HIV ‘an epidemic Haitian virus’¹³ which was ‘brought back’¹⁴ to the United States. In fact, evidence suggests the opposite was true: Paul Farmer characterises the Haitian epidemic as a ‘direct subepidemic’¹⁵ of the one in the United States, likely brought to Haiti by North American tourists. The consequences of this were numerous: Haiti’s tourism industry, predicted to become the country’s largest source of foreign currency, collapsed in the face of countless media outlets and health officials declaring the country rife with disease. Outside of Haiti, Haitians living in North America complained of a ‘wave of anti-Haitian discrimination’¹⁶ in the wake of speculation that the disease had originated in Haiti, with all Haitians, not only those with HIV, ‘branded as AIDS carriers’¹⁷. This also had consequences for the Western perception of Vodou: already regarded as a dangerous and unsanitary practice, sensationalist media reports cemented erroneous associations of it not only with the ritual sacrifice of animals, but also bloodletting, cannibalism¹⁸, and even human sacrifice¹⁹.

The Western response to the AIDS epidemic was not the beginning of the stigma towards Haiti; rather, it was symptomatic of it. Preconceptions of the Caribbean nation as strange, dangerous, and disease-ridden shaped the responses of officials and physicians, leading them to erroneously label Haiti as the source of the virus, even in the face of evidence which

¹² Farmer, p.211.

¹³ Farmer, p.208.

¹⁴ Farmer, p.208.

¹⁵ Farmer, p.xii.

¹⁶ Farmer, p.4.

¹⁷ Farmer, p.13.

¹⁸ Farmer, p.225.

¹⁹ William W. Newell, ‘Myths of Voodoo Worship and Child Sacrifice in Hayti’, *The Journal of American Folklore*, 1.1 (1888), pp. 16–30 <<https://www.jstor.org/stable/pdf/532883.pdf>> [accessed 16 May 2021].

suggested otherwise. Haiti has been misrepresented in Western media for decades, and its treatment during the AIDS epidemic illustrates the consequences this has and does hold for its citizens and diaspora.

1.1.5 Haiti's presentation in the media

Haiti has often suffered at the hands of Western media – constantly portrayed as the exotic and dangerous Other. From Orson Welles's reimagination of a 'Voodoo' *Macbeth* in 1936 to Disney's 2009 animation *The Princess and the Frog*, Haitian culture and particularly Vodou has become a shorthand for dark forces in Western media. Historically and in the modern day, productions praised for their diversity have misrepresented Haitian Vodou and continued the sensationalising of Haitian culture. This situation is far from unique. Western media consistently presents stereotypes of Haiti, peddling the narrative that is disaster-zone bereft of culture or morality. In 2018, the BBC released a documentary by British comedian Romesh Ranganathan which was criticised for its sensationalist portrait of Haiti and Vodou ceremonies.²⁰ Ranganathan's accompanying article in *The Guardian*—*Dogs, dives, voodoo and guns*— begins with a photograph of the comedian brandishing a naked Cabbage Patch Kid strapped to a basket lid, contextualised as his contribution to a Vodou ceremony. With such blatant exoticism perpetuated by some of the world's most prominent media corporations, it is no wonder that many, including Gina Athena Ulysse, have stated that Haiti is in desperate need of new narratives.²¹ As is seen with the phenomenon of Christopher Garland's 'voluntourism',²² these visitors fail to boost the voices of marginalised Haitians:

²⁰ Bocchit Edmond, 'The True Haiti Is Safe and Rich in Culture', *The Guardian* (London, 2 July 2018) <<https://www.theguardian.com/world/2018/jul/02/the-true-haiti-is-safe-and-rich-in-culture>> [accessed 15 May 2021].

²¹ Gina Athena Ulysse, *Why Haiti Needs New Narratives : A Post-Quake Chronicle* (Middletown: Wesleyan University Press, 2015).

²² Christopher Garland, 'The Visual Rhetoric of ' Voluntourists ' and Aid Workers in Post-Earthquake Haiti', *Social and Economic Studies*, 64.3/4 (2015), pp.79–102.

instead, they talk over them, bolstering harmful notions about the country and its culture while failing to consider the power they hold as Westerners.

1.1.6 Aid workers

In the age of social media, aid workers hold a surprising amount of influence over public perceptions of people and places: in his paper on disaster tourists and aid workers, Garland speaks of the ‘vast amount of visual rhetoric’²³ aid workers collect via their smartphones and cameras. These posts, whether in the form of social media uploads or blog posts, can feel more authentic than the offerings of mainstream news organisations. Despite the benevolent intent behind them, these photographs and stories further the image of Haitians as ‘noble savages’, inherently dependent on foreign intervention and NGOs. Rarely do these accounts speak of the country’s rich history or vibrant culture; instead, they focus solely on the collapsed buildings, the slums, the injured and dying. It is of little wonder, then, that the Western perception of Haiti is so narrow: the narratives we are given of it are limited in scope and often sensationalised. While no one project can be expected to change the world’s views of a country, it is hoped that in increasing awareness of Haiti’s culture and history, we will also encourage understanding and empathy towards a country which is so frequently misrepresented.

1.2 Methodology

1.2.1 Feminist standpoint appraisal

This project, while not exactly a community archive, aims to include the Haitian community and diaspora in its development. In creating an archive for use by Haitian and Western academics, we must ensure that the individuals and communities involved are listened to and respected: they should not be a passive force; rather, they should be actively consulted in the design and content of the system. This project will take guidance from the feminist

²³ Garland, p.88.

standpoint epistemology proposed by Michelle Caswell,²⁴ which aims to redefine how we assign value to archive materials.

This methodology is of particular importance in the project, as the primary researcher is not Haitian. Caswell's paper, while not exhaustive, offers guidance on archival attempts by outsiders to the communities they aim to document. First, she rejects the postmodernist idea that personal perspective should be avoided in archives: while this may initially seem an important step in the search for objectivity, in reality it can camouflage biases in the appraisal process—the titular 'fingerprints' Caswell is searching for. Instead, Caswell encourages researchers to acknowledge and examine their own biases in the search for balance. Further, she proposes that the researcher should not be the one to determine which artefacts are of value and therefore worthy of preservation: instead, communities themselves should be consulted. While in this case the primary researcher cannot be removed entirely from the appraisal process, to some extent these materials have already been appraised by their communities: the nature of private archives means that the contents consist only of what their owners deemed worthy of preservation. We can further mitigate the effects of bias in the appraisal process by, where possible, consulting the opinions of the authors themselves, scholars in Caribbean literature, and community members in Haiti.

Due to practical constraints, not all of these guidelines will be fully adhered to at all times. However, they offer important advice which should be borne in mind: while we can never eliminate bias entirely, it can be mitigated following the advice of Caswell and other community archive directives.

²⁴ Michelle Caswell, 'Dusting for Fingerprints: Introducing Feminist Standpoint Appraisal', *Journal of Critical Library and Information Studies*, 3.1 (2019), pp.1–36.

1.2.2 Software engineering techniques

While actual development of a digital archive is beyond the scope of this work, suggestions will be made as to the potential design of a future archive. Since the project would be the work of a small group of software engineers or indeed a single developer, the Waterfall method of software development is here suggested. This traditional approach is not suitable for situations which require rapid deployment or changing requirements; however, in this case, where base functionality is established and requirements are unlikely to change, it will remove the need for continuous communication with potential users and allow a sole developer to work methodically and thoroughly through the project. Here we will introduce some of the software engineering methods that will be used; in a future chapter we will look in more depth as to how these could apply specifically to an online archive.

The software development life cycle is generally considered to have seven iterative phases: Gather Requirements, Design, Build, Document, Test, Deploy, Maintain. Each of these are important in producing software that is functional, cost-effective, and fits the requirements of the end users.

First, planning will take place. This will consider the timescale of the project and any equipment or financial input that is required. A timeline will be constructed for development and expectations will be established as to the scope of the project.

Second, requirements elicitation techniques such as user stories, interviews, and wireframes will be used to establish a dialogue between the developer and potential users: in this way we will avoid working solely from the developer's assumptions of what the system should consist of and consider the requirements and preferences of the future end users. This will also take into account the requirements of an archive designed to be used by Haitians: accessibility will be a key priority. Due to the political unrest in Haiti, travel there is currently

inadvisable.²⁵ Were this to be the case at the time of development, it would prove difficult to interview or survey sufficient numbers Haitian citizens; it is therefore recommended that external organisations such as the Digital Library of the Caribbean and organisations in Haiti such as the Musée du Panthéon National Haïtien (MUPANAH), the Bibliothèque nationale d'Haïti (BNH), and the Archives Nationales d'Haïti (ANH) be contacted to discuss the project. In addition, university students and staff with an interest in archival work and/or the Caribbean should be surveyed and interviewed to gain information about their use of and preferences for such resources.

Next, the software for the archive will be built. Throughout this process, potential users should be consulted to ensure that the implemented features meet their requirements and expectations. As will be discussed in section 3.4 on software testing, methods such as crowd sourcing could be employed to garner information from a wide range of demographics, while techniques such as Wizard of Oz demonstrations allow for rudimentary user testing before features are fully implemented.

Documentation is a step which is often overlooked but is critically important. As well as providing accountability and tracking challenges which arose in development, it is also essential in allowing the system to be maintained in the future if the original developer can no longer support it. Furthermore, if the archive is released as open-source, documentation will provide important information for users who may wish to make changes to their own version of the software.

While testing in large-scale software projects is carried out by dedicated individuals, this is not feasible for a project of this size. Functional testing should be carried out using an automated test suite written alongside the program code. Non-functional testing can be

²⁵ FCDO, 'Haiti Travel Advice', *Gov.Uk*, 2022 <<https://www.gov.uk/foreign-travel-advice/haiti>> [accessed 2 June 2022].

carried out through crowd sourcing or with volunteers; techniques such as observation testing can garner important information about the software's usability.

It is hoped that through the employment of these techniques, a piece of software can be built which will be usable by scholars in Haiti and beyond. As well as aiding in the preservation of Haitian literary artefacts, this software will also aim to facilitate the analysis and criticism of them: as will be discussed in more detail in the next section, some literary criticism techniques such as genetic criticism have rarely been applied to Haitian texts, but would provide a particularly suitable lens through which to consider the various drafts and published versions of works which this archive would aim to encapsulate. In building a digital archive of these materials, it is hoped that this will encourage the criticism and study of Haitian works.

1.2.3 Genetic criticism

While genetic criticism has been a staple of French literary criticism for decades, it has rarely been considered for use in postcolonial studies. However, given its focus on what Schlegel terms the 'internal history'²⁶ of a work, taking into account its many iterations and drafts, it seems uniquely placed to interpret literature from Haiti, where authors, as Rachel Douglas describes, rewrite their works to a 'near obsessive degree'²⁷. Here we will examine genetic criticism and its potential for use not only in interpreting Haitian literature, but how its hypertext possibilities can guide the creation of an online archive.

Most critical approaches to text view different versions of a single work in terms of 'accuracy and error or corruption'²⁸— they focus mainly on what we would consider to be the 'final' version of the text – i.e. the published one – and use this to analyse the text. While the

²⁶ Louis Hay and others, *Genetic Criticism: Texts and Avant-Textes*, ed. by Jed Deppman, Daniel Ferrer, and Michael Groden (Philadelphia: University of Pennsylvania Press, 2004). p.3.

²⁷ Douglas. p.389.

²⁸ *Genetic Criticism: Texts and Avant-Textes*, p.11.

author's influences and background may be taken into account, this is not the focus of the criticism. This is where traditional textual criticism differs from genetic criticism: genetic criticism is not so explicitly focused on the final work itself – rather, it seeks more to understand the process of writing and the external factors which have influenced the author. Differences between drafts and versions of works are not seen as inaccuracies but rather as ‘meaningful variations’²⁹ which are worthy of study in themselves. While all authors rewrite their works, writers in the Caribbean and Haiti in particular do this continuously, in a process which Douglas terms ‘archivisation’³⁰: the various notebooks and manuscripts involved therefore provide a wealth of information about the author’s writing process and work, if viewed through the lens of genetic criticism. An element of genetic criticism particularly relevant to Haiti is its attempt to restore a ‘temporal dimension to texts’³¹ through looking for and interpreting the effects of ‘external social, economic, and cultural circumstances on the text.’³² While all works of literature are inevitably affected by the circumstances surrounding them, Haitian writers have been particularly influenced by politics and nature: for example, Yanick Lahens novels *Failles* and *Guillaume et Nathalie* provide poignant examples of how external factors can directly influence an author’s work. Lahens was in the early stages of her novel *Guillaume et Nathalie*—a love story set in Port-au-Prince—when the 2010 earthquake destroyed the city, rendering the setting of her work suddenly obsolete. Her work *Failles* illustrates the impact the earthquake had on her life and her writing; in it, Lahens recounts the experience of walking to an apartment block where she had imagined her characters would meet and then live, only to find it had been destroyed in the earthquake. She imagines Guillaume and Nathalie as crushed beneath the rubble, and must reanimate the

²⁹ Hay and others, p.11.

³⁰ Douglas, p.390.

³¹ Hay and others, p.5.

³² Hay and others, p.5.

two in her mind before she can continue her work.³³ Despite the characters not having been fully realised when the earthquake struck, they too became victims of an event that spanned reality and fiction and impacted every aspect of Lahens's life. Genetic criticism, and the analysis of drafts of Lahens's writing, can offer important insight into how such a disaster can affect not only a writer's work, but also their way of looking at the world. Furthermore, genetic criticism can help to uncover not only the external **factors** influencing an author's work, but also to offer an insight into the writing process and the author's aims. In tracking changes through versions and drafts we can see which elements the author considered to be key to their work and which were added at a later date, allowing us a better idea of how they perceive their own work. In the case of Haitian literature, where different published versions of works exist, we can see how time and experience has changed the author's perception of past events. For example, in examining the changes in versions of Dany Laferrière's post-earthquake novel *Tout bouge autour de moi*, we can speculate about temporal effects on traumatic experiences. Over a year after the novel's release, a new revised edition was released, with significant changes made by Laferrière. In the new version of his work, Laferrière repeatedly refers to himself and his fellow Haitians as 'dazed or stupefied'³⁴ in the aftermath of the earthquake, emphasising the dissociative nature of experiencing such trauma. In addition, as Rachel Douglas highlights, the two versions of the novel demonstrate Laferrière's new perspective on the earthquake and its aftermath: in the revised edition, the statement, 'Henceforth there is a before and an after 12 January 2010.' was removed. Douglas speculates that this exclusion suggests that 'the earthquake has in the event turned out to be a less decisive break with the past than Laferrière had initially feared.'³⁵ The two

³³ Douglas, p.398.

³⁴ Douglas p.397.

³⁵ Douglas, p.397.

versions of the novel provide valuable insight into Laferrière's experience of the Haitian earthquake, and how his memory of this experience has changed over time.

In addition, genetic criticism can guide us in the construction of an online archive. Hypertext has the potential to improve the accessibility of materials and better facilitate genetic criticism through allowing non-linear access to materials. Now, instead of the strictly chronological access offered by physical materials, documents can be linked together however we best feel represents them. The dynamic linkage offered by hypertext documents will mean we can represent different versions of a text as 'layers', highlighting areas where text has been added or removed, moved or changed. This is a consequence of what is described as the move from the one-dimensional chronological space of physical to a '3D space full of possibilities'³⁶ where we can link together texts in a way that we feel best represents how they relate to one another. The 'malleable'³⁷ nature of hypertext allows us to better emulate and analyse the writing process as dynamic and changing, rather than the 'static' final work. When we are considering how best to represent archival materials such as manuscripts and writer's notes, it is imperative that we consider carefully the best way to represent and link them in a way which takes full advantage of hypertext's flexibility and facilitates critical analysis of them.

1.3 Challenges and limitations of the project

1.3.1 Ethical considerations

Archives in the Caribbean are deeply entangled with the history of colonialism and oppression; therefore, great care must be taken to respect this history when considering how to proceed. In attempting to 'decolonise' the archives, we must prioritise the testimonies of

³⁶ Hay and others, p.221.

³⁷ Hay and others, p.221.

those in Haiti and the Haitian diaspora and ensure their representation in archives which have historically erased them.

It can be argued that technology will allow us to do this much more successfully. Paul Ricœur is critical of the potential of archives, in part due to the ‘absent’ nature of this past, and in part due to the nature of archives. He states, ‘Testimony is by origin oral. It is listened to, heard. The archive is written. It is read, consulted.’³⁸ While taking into account the importance of Ricœur’s arguments of the limitations of archives, advances in technology mean that digitisation does not limit us to only written records. Authority can be handed back to the people to whom these testimonies belong: audio-visual resources can be created at little expense. We are no longer limited even to physical film reel: solid state drive memory is now portable and inexpensive, facilitating the filming of interviews and historical events. Arguably, there is a real need to take advantage of these changes, to bridge the gap between testimony and archive criticised by Ricœur, and to break through the previous limitations of archives. No longer will they be only ‘silent’ and ‘read’, they will be more accessible, more full of life, and most importantly more accurately representative of the people whose history they aim to record.

However, while digitisation can provide a means of improving accessibility to and resilience of these documents, it is not without its flaws. We must consider the history of government censorship in Haiti and the authors and poets who have been exiled as a result of their works. While digitisation has the potential to greatly improve accessibility to these resources for Haitians and citizens of other countries, we must be wary of potential censorship efforts – in China, for example, we have seen the construction of the ‘Great Firewall’³⁹ which works to

³⁸ Paul Ricœur, *Memory, History, Forgetting* (Chicago: University of Chicago Press, 2006).

³⁹ Elizabeth C. Economy, ‘The Great Firewall of China: Xi Jinping’s Internet Shutdown’, *The Guardian*, 29 June 2018 <<https://www.theguardian.com/news/2018/jun/29/the-great-firewall-of-china-xi-jinpings-internet-shutdown>> [accessed 17 May 2021].

isolate Chinese citizens from their own history. Any reference to Tiananmen Square, for example, or other crimes of the Chinese government are expressly prohibited and are practically inaccessible in the country. This has allowed the Chinese government to rewrite their own history, and many young Chinese citizens now do not know of the 1989 protests and resultant massacre.⁴⁰ While it is impossible to know the future political state of any country, guidelines must be put in place as these resources are being developed, to ensure their safety and integrity for future generations.

Furthermore, there come the more practical issues of where the records should be stored. Ethically, the records should as far as possible be kept in Haiti, especially taking into consideration the colonial nature of archives in the Caribbean. However, with advances in technology as they are, the ‘cloud’ is often difficult to pin to a physical space, and with the worldwide accessibility of the internet, physical location of servers is no longer as simple as it once was. One must take into consideration the immense energy consumption of servers and the resultant cost of running and maintaining them; these machines need to be kept in dry, cold conditions in order to function efficiently, a stark contrast to the climate of the Caribbean. With entities such as Facebook moving their servers to the Arctic circle to cut energy costs,⁴¹ we can surmise that while ethically it would be preferable to host these archives on servers based in Haiti, it may be more practical and cost-effective to use servers based elsewhere. There is also a great risk in hosting these archives exclusively in the Caribbean, as they will then be subject to the same vulnerabilities and risks as physical

⁴⁰ Didi Tang, ‘Why Chinese Youth Are Ignorant of Tiananmen Square Protest’, *The Christian Science Monitor*, 2 June 2014 <<https://www.csmonitor.com/World/Latest-News-Wires/2014/0602/Why-Chinese-youth-are-ignorant-of-Tiananmen-Square-protest>> [accessed 17 May 2021].

⁴¹ James Vincent, ‘Mark Zuckerberg Shares Pictures from Facebook’s Cold, Cold Data Center’, *The Verge*, 2016 <<https://www.theverge.com/2016/9/29/13103982/facebook-arctic-data-center-sweden-photos>> [accessed 17 May 2021].

archives. No matter where the data is hosted, multiple backups in several locations should be made in order to guarantee data integrity.

Discussion of these issues highlights the need for international cooperation on these issues: already groups such as Archives Sans Frontières work to preserve information internationally, and to educate on and improve archiving standards. While this project aims to preserve literary artefacts through digitisation, it should not be viewed as a replacement for physical archives. While digital archives can prove a great resource, they are ultimately limited—they can only represent the physical object, not supersede or replace it. This project aims to complement physical archives by increasing their accessibility, reach, and content.

1.3.2 Practical considerations

Internet connectivity in Haiti is poor compared to other countries in the Caribbean:⁴² according to the World Bank, only 33% of Haitians used the internet in 2019, compared to 76% of those in the Dominican Republic and 95% in the UK.⁴³ A 2010 study by Google also focused on the inadequacies of Haiti's internet infrastructure, encouraging the use of public funds to establish a body to regulate and improve provision of the service.⁴⁴ There have been recent signs of improvement: in 2020 the World Bank approved a US\$60 million grant to improve internet provision in Haiti, including in rural areas: it is hoped that in doing so, it will improve Haiti's digital development and provide critical communications systems during natural disasters.⁴⁵ The project is expected to conclude in 2026, but the impact of

⁴² *Ideas for Haiti's Internet Reconstruction*, 2010.

⁴³ International Telecommunication Union, 'Individuals Using the Internet (% of Population)', 2021 <<https://data.worldbank.org/indicator/IT.NET.USER.ZS?>> [accessed 20 October 2021].

⁴⁴ *Ideas for Haiti's Internet Reconstruction*.

⁴⁵ 'Haiti Overview', *The World Bank*, 2021 <<https://www.worldbank.org/en/country/haiti/overview>> [accessed 14 May 2021].

COVID-19 and political instability in Haiti could see this date being extended.⁴⁶ In her work with the Radio Haïti archives, Laura Wagner found that most Haitians access the internet through mobile phones rather than laptops or desktop computers:⁴⁷ these user profiles should be considered and accounted for when developing the archive. Haiti's high illiteracy rate also proves challenging when considering website design: accessibility standards should be followed to encourage the use of iconography where appropriate, and attempts should be made to make most archive contents compatible with text-to-speech software where feasible. Standard accessibility design principles should also be followed, with high contrast colours used for text and alternative text available for images.

⁴⁶ 'Haiti Embarks on Massive Programme to Widen Internet Coverage', *Caribbean News*, 2021
<<https://www.caribbeannationalweekly.com/caribbean-breaking-news-featured/haiti-embarks-on-massive-programme-to-widen-internet-coverage/>> [accessed 29 October 2021].

⁴⁷ Laura Wagner, 'Forgetting Is Not Democratic: The Digital Archive of Radio Haïti-Inter: A Case Study', in *Decolonizing the Caribbean Record: An Archives Reader*, ed. by Jeannette A. Bastian, Stanley H. Griffin, and John A. Aarons (Sacramento: Litwin Books, 2018), pp. 625–32.

2. Literature review

Digitisation has the potential to radically change how archives serve the public, particularly in the Caribbean, where risk factors such as natural disasters, climate change, and insects put physical archives under threat. When considering the context of the Caribbean and Haiti in particular, we must also bear in mind the colonial history of archiving there and ensure that any digital archive we build will not perpetuate colonial tendencies and values. Digitisation has the potential to improve the accessibility of materials as well as preserving them, but it presents unique challenges which must be acknowledged and managed.

Public archives of literature do exist in Haiti, but as Rachel Douglas highlights, most of the country's literary archives are private collections.⁴⁸ Often, these are formed by the authors themselves, who have taken to rewriting as a method of preserving their work – especially evident after the 2010 earthquake. There is great potential for the digitisation of these private collections: with authors such as Dany Laferrière and Frankétienne publishing multiple versions of their work through the years, an archive which gathered these could prove a great resource for students and academics. However, private archives have their own challenges which can make it difficult for researchers to locate and work with them.

Private archives are also difficult to quantify. Often, they are formed by accident, when their previous owners die or a body or institute plans to discard records before offering them instead to citizens – in this way, untrained individuals find themselves thrust into the role of archivist with no preparation or warning. By consequence these archives are spread throughout the world: often collections are passed through families, and it can be near impossible to trace materials which have changed hands and crossed borders countless times. The situation is even more severe in the context of Haiti, with vast numbers of writers,

⁴⁸ Douglas, p.390.

journalists, and poets forced into exile under the Duvalier regime. Consequently, these materials are spread through the Haitian diaspora and beyond, making them difficult to quantify and evaluate. There are particular centres of the Haitian diaspora including the United States, Canada, the Dominican Republic, and France: when searching for private archives and their owners, it is worth focusing efforts on these countries in particular.

Furthermore, these private archives which are not always physical, can be deeply rooted in the local community. For example, the so-called ‘Codé affair’ in Martinique, whose legacy touches communities there to this day. In 1870, former slaves rebelled against the harsh living conditions of the post-abolition, where they were forced to continue to work on plantations. However, the narrative of the event was rewritten soon after; the murder of a conservative white planter—the eponymous Codé—allowed the rebels to be labelled as ‘monsters, bloodthirsty savages incapable of acquiring the civilising virtues of the new republican order.’⁴⁹ In examining the court documents used in the trial, Chivallon shows how archives were often used by colonial powers to assert and maintain control, effectively silencing the rebels and their true motivations. Even today, descendants of the rebels are often reluctant to admit to their heritage for fear of ostracism: Chivallon reports that the social repercussions were so great that children of the rebels eventually changed their names to avoid association. Consequently, it is difficult to uncover the testimonies passed through these families, which would potentially allow for an ‘unsilencing’ of the event, with the rebels finally, generations later, being given back their voices.

While not all literary artefacts have such dramatic connections, owners of private collections are often rightly suspicious of outsiders, fearing, amongst other consequences, the damage or even removal of the objects they hold. This reticence means it can be difficult to determine the volume and condition of the collections held. In her paper on private music archives in

⁴⁹ Chivallon, p.72.

Haiti, Rebecca Dirksen illustrates this suspicion of outsiders in the case of choral director John Jost, who took it upon himself to digitise the works of Haitian composer Justin Élie. Jost describes borrowing ‘one score at a time’⁵⁰ from Élie’s widow in order to photocopy them. This was an intensely laborious process, as at the time ‘a single business in Port-au-Prince had a photocopier appropriate for the job, and it was located some distance from the Élie family home’.⁵¹ Jost recalls that he was under great pressure to return the music as quickly as possible in order to keep the privilege of borrowing more. Working to preserve materials kept in private archives is a delicate balancing act, requiring not only knowledge of digitisation but of the local culture and an ability to establish relationships with those who may be wary of outsiders. Advances in technology have the potential to make it faster and easier to digitise private archives, with lightweight portable scanners and smartphones meaning that materials may not have to be removed from the owner’s home to preserve it.

We must consider the possibility, too, that such agreements may not be reached with private archive owners. It may be the case that only limited access to the materials is granted—for example, extracts of a work rather than the full contents—or access may be granted only to a national or regional audience; it may even be the case that access is refused outright. Additionally, where differing versions of published works are concerned, we will inevitably encounter questions of copyright. Haiti is a signatory of the Berne convention on international copyright,⁵² which stipulates that written works remain under copyright for at

⁵⁰ Rebecca Dirksen, ‘Haiti’s Hidden Archives and Accidental Archivists: A View on the Private Collections and Their Keepers at the Heart of Safeguarding the Nation’s Classical Music Heritage’, *Latin American Music Review*, 40.1 (2019), pp. 59–88 <<https://doi.org/10.7560/lamr40103>>, p.71.

⁵¹ Dirksen, p.71.

⁵² ‘Berne Convention’, *WIPO Lex*

<https://wipolex.wipo.int/en/treaties/ShowResults?start_year=ANY&end_year=ANY&search_what=C&code=ALL&treaty_id=15> [accessed 1 December 2022].

least 50 years after the death of the author;⁵³ in Haiti, this rises to 60 years.⁵⁴ While some of the materials we aim to archive will be in the public domain, many will remain under copyright and this could present challenges when determining if and how these works may be archived. Even where the owners of the physical materials agree to their archiving, we are ultimately bound by international law.

2.1 Risk factors in the Caribbean

As well as earthquakes and tropical storms Haiti is prone to landslides: sadly, another remnant of its colonial past. Decades of hillside subsistence farming have led to widespread soil erosion and frequent landslides, as well as the exodus of Haitian peasants to Port-au-Prince when their family land was no longer tenable. Extreme poverty led many to fell trees to make and sell charcoal, resulting in mass deforestation of the island: consequently, there are now frequent flash floods in and around the capital. In his aptly named book ‘Dirt’, Professor Montgomery characterises Haiti as a ‘modern example of how land degradation can bring a country to its knees.’⁵⁵ This has not only had significant consequences for the country’s environment and economy, but also for its cultural history: people, houses, belongings are all regularly lost to landslides and flash floods.

Insects also prove a difficult and consistent problem: in her paper on Haitian classical music archives, Rebecca Dirksen highlights how pests such as termites and silverfish plague private collections.⁵⁶ With most of these physical archives being composed of paper materials stored in wooden or cardboard boxes, they are an attractive option for these insects, who will quite easily eat their way through decades of cultural and historical documents. The insidious

⁵³ ‘Summary of the Berne Convention for the Protection of Literary and Artistic Works (1886)’, *WIPO Lex* <https://www.wipo.int/treaties/en/ip/berne/summary_berne.html> [accessed 1 December 2022].

⁵⁴ Boniface Alexandre, *DÉCRET DU 12 OCTOBRE 2005 SUR LE DROIT D’AUTEUR* (Haiti, 2005).

⁵⁵ David R. Montgomery, *Dirt: The Erosion of Civilisations*, 2nd edn (Berkeley: University of California Press, 2012), p.227.

⁵⁶ Dirksen, p.73.

nature of these creatures means the damage they cause is often discovered too late to be rectified, and the means of destroying the insects often causes irreparable damage to the materials themselves. While Dirksen's research focuses on archives of classical music, the same risks apply also to literary manuscripts – indeed, in some ways the risk is heightened, as often there exists only one copy of these literary artefacts. The nature of classical music as something to be performed necessitates multiple copies; with literary manuscripts or author's notes, there exists no such need, and consequently they are especially vulnerable to being lost.

Physical risk has been targeted in part by recent archive projects, for example, the reconstruction of Le Centre d'art in Haiti, which has been rebuilt with components such as rust-proof metal shelving in order to minimise potential damage. While these physical changes are not realistic for most private archive owners, guidance can and should still be provided on how to best protect and preserve these documents in the face of natural threats. Discussion of these issues highlights the need for international cooperation on these issues: already groups such as Archives Sans Frontières work to preserve information internationally, and to educate on and improve archiving standards.

2.2 Decolonising the archive

Without doubt, digitisation has the potential to improve the accessibility and posterity of literary archives. However, the colonial history of the Caribbean and Haiti in particular cannot be ignored. Haiti was first colonised by France and later occupied by the United States, with enslaved peoples kept by the French and British throughout the Caribbean. The archives relating to the country in these periods were almost exclusively kept by the governing powers, and they relate little to the culture of the countries they concern: instead, they are mostly impersonal documents such as sales ledgers and birth records. Even these can be difficult to find: in *Decolonizing the Caribbean Record*, Bastian, Aarons and Griffin point out that many historical records were considered too sensitive to remain in the ex-

colonies they concerned and were either appropriated or destroyed after the colony's independence; most of the archival documents left were considered of little enough importance that they were never sent to the governing bodies in the first place. This leads to an incredibly one-sided perspective of the historical context of these countries – the 'gaps'⁵⁷ in the archive that Rachel Douglas speaks of.

However, bias in the archive is not only an issue with the materials themselves. In her paper on feminist standpoint methodology, Michelle Caswell details how archivists' attempts to remain invisible and objective can in fact act to obscure their bias. She suggests that archivists attempt to engage with and examine their own biases rather than quashing them: in this way, they can be acknowledged, accommodated for, and minimised. Caswell also emphasises the need for communities to be involved in archiving efforts, and to avoid the historic power dynamic of archivist as appraiser.⁵⁸

As part of our efforts to build an archive which does not follow colonial tradition, we can look to other such archives throughout the world. For example, like that described in Ellen Cushman's article 'Wampum, Sequoyan, and Story: Decolonizing the Digital Archive' which describes an archive developed by a Native American community. In her paper, Cushman offers several guidelines to follow in attempting to build a decolonised archive. We will not cover all of them, instead focusing on those most relevant to the digital archiving project. The first, to move away from Western categorisations of time periods and their associated traditions—for example, labelling objects from non-Western cultures as Renaissance, Medieval or other eras which are specific to Western history.⁵⁹ In this way, we move the focus back to the cultures and objects being showcased and reduce comparisons

⁵⁷ Douglas, 391.

⁵⁸ Caswell, p.14.

⁵⁹ Ellen Cushman, 'Wampum, Sequoyan, and Story: Decolonizing the Digital Archive', *College English*, 76.2 (2013), pp. 115–135, p.119.

which often label these cultures as primitive or backwards. In this case, where time periods are given to objects in the archive, these should reference Haitian history and events, not those of other countries.

The second recommendation involves addressing the issues of appropriated artefacts in museums and other collections. The paper highlights the misclassification of indigenous cultures as ‘dead’,⁶⁰ a lie which allows museums and private collectors to obtain and showcase culturally significant objects under the guise of preserving them. The paper uses the example of Cherokee Wampum belts which serve as key records of the tribe’s culture and history: through the years several have disappeared, suspected to have been sold to private collectors. The debate around appropriated objects in museums is ongoing and is an issue present too in archiving. The move to digital will not sidestep these problems entirely, and we must still prioritise the preferences of the authors and collectors involved. The team working on the Cherokee language project encountered this dilemma: while they argued there would be benefits to moving the materials online to reach a wider audience, the Cherokee nation specified that only tribe members should have access to them. In the case of a Haitian literary archive, we must give the power over these decisions back to the communities involved: where someone does not wish to have their work kept in the archive, those wishes must be respected. We must seek permission and aim always to showcase the materials without exploiting them or their creators.

Finally, the project states that indigenous languages, and not English, should be primarily used.⁶¹ **In the Haitian context this is complicated slightly: while Kreyòl is spoken by the majority of Haitians, most Haitian literature is written in French, and this is the language of many of the materials we eventually hope to store in the archive.** A solution to this would be to offer users a choice between French and Haitian Kreyòl in the software interface. Even

⁶⁰ Cushman, p.120.

⁶¹ Cushman, p.121.

that remains an imperfect solution, with ongoing debates around the orthography used to represent Kreyòl and the potential of colonial legacies within.

Further, we may take guidance from Rebecka Taves Sheffield's article on 'Archival Optimism, or, how to sustain a community archives'.⁶² Sheffield establishes that maintaining a community archive is 'both a practical challenge and an ideological exercise':⁶³ while there must of course be motivation and ideals to drive the project, we must too accept that the reality of its creation and maintenance is consuming and sometimes tedious work. With regards to practical requirements, Sheffield describes a 'trifecta of necessary resources':⁶⁴ a space for the archival materials to be hosted, sufficient capital to cover operational costs and supplies, and relevant expertise to allow for sustainable practice. While physical archives need a physical space to hold them, digital archives are less rigid in their requirements. Indeed, Sheffield recognises the potential benefits of digital archives, stating that, 'For emerging and/or marginalised communities, the use of online spaces can remove some of the barriers to collecting that exist for physical collections.'⁶⁵ Digitisation, however, does not come without its own unique challenges: as Sheffield reminds us, digital platforms can be somewhat transient in nature, and 'communities that leverage free or low-cost digital technologies risk losing their work if and when the technologies become obsolete.'⁶⁶ It is clear, then, that the development of a digital archive must be a continual process: just as physical archives risk losing their host spaces (Sheffield uses the example of the Massachusettsan Sexual Minority Archives, which was almost shut down after the sale of

⁶² Rebecka Taves Sheffield, 'Archival Optimism, or, How to Sustain a Community Archives', in *Community Archives, Community Spaces: Heritage, Memory, and Identity*, ed. by Jeannette A. Bastian and Andrew Flinn (London: Facet Publishing, 2019), pp. 3–20.

⁶³ Sheffield, p.5.

⁶⁴ Sheffield, p.6.

⁶⁵ Sheffield, p.9.

⁶⁶ Sheffield, p.9.

the rental property from which it had operated for more than 40 years),⁶⁷ so do digital archives face antiquation and eventual inaccessibility.

It is not only the host of the archive which can be rendered outdated, but also the archive's structure and contents. Sheffield advocates for community archiving projects to change and adapt over time, lest they fail to serve the communities they were founded for; as communities change through generations, so must the archives reflect this growth. Amongst other methods, Sheffield suggests that community archives host workshops encouraging those who feel excluded from the archive to occupy it and to share their experience and testimonies⁶⁸ in order to examine and confront the biases in these archives, and to acknowledge 'community diversity without devaluing the important work of those who have come before.'⁶⁹ In following the advice and potential pitfalls described by Sheffield, it is hoped that we can establish sound archival practices which will ensure the success and longevity of the project.

Finally, we can examine the digital archives of Caribbean literature which are already established: for example, the Digital Library of the Caribbean which contains in its archives newspapers, maps, photographs and books. Also to be considered are Caribbean Quarterly and the Journal of West Indian Literature: academic journals which report on and record cultural developments in the Caribbean. The online journal sx salon is also a useful reference point: as well as literary discussions and reviews, it publishes poetry and prose by, and interviews with, Caribbean writers. Sx salon is not limited by its digital platform; rather, it embraces it as a way to further engage with diverse and diasporic Caribbean communities. While all of these institutions are necessary and admirable, they do not fulfil the purpose of this proposed project. The proposed archive aims to complement the collections and efforts

⁶⁷ Sheffield, p.7.

⁶⁸ Sheffield, p.15.

⁶⁹ Sheffield, p.15.

of these institutions, as all of them tend to archive finished, published works. The proposed archive would contain final versions, but also manuscripts, drafts, and writers' notes, which would both preserve these materials and allow access to them for the purposes of literary criticism, genetic criticism in particular. A similar project already exists in the form of Manioc, an online digital archive which includes notes and manuscripts of writers from the Antilles. The existence of this platform demonstrates the feasibility of the proposed archive, which would fulfil a similar purpose applied to the Haitian context.

3. Software engineering techniques

As this project focuses on the digitisation of literature and literary artefacts, we must carefully consider the platform on which the archive will function; that is, the software underlying it. To achieve accessibility requirements, the archive should be available online: it could take the form of a website or web application; additionally, it could be distributed physically to institutions within Haiti, as was done with the Radio Haïti archives.⁷⁰ All of these will require several components including a database, an accessible interface, and adequate security measures to prevent misuse. Though the project is not yet in development, we can consider how standard software development techniques can be applied in and adapted for this specific context.

As discussed in the introduction, we can assume that any future project would be the work of a small team of software engineers, or possibly even just one.

Agile is a popular method which works well to tailor the software to the requirements of the client. However, it requires constant client involvement throughout in order to properly evaluate the project progress and works best with teams of developers working together. It is well-suited to commercial software development, where its speed can quickly produce a product ready for deployment and which can deal with rapidly changing requirements.

This traditional approach is not suitable for situations which require rapid deployment or changing requirements; however, in this case, where base functionality is established and requirements are unlikely to change, it will remove the need for continuous communication with potential users and allow a sole developer to work methodically and thoroughly through the project. Here we will introduce some of the software engineering methods that will be

⁷⁰ Bastian, Griffin, and Aarons.

used; in a future chapter we will look in more depth as to how these could apply specifically to an online archive.

As stated in the introduction, the software development lifecycle can be broken down into seven phrases: Requirements Elicitation, Design, Implementation, Documentation, Testing, Deployment, and Maintenance. In this chapter, we will examine the key aspects of each stage and their application in the context of an archive for Haitian literature.

First, it is important that we establish the aims and scope of the project, taking into consideration the timescale and budget. Then, requirements elicitation techniques such as user stories, interviews, and wireframes will be used to establish a dialogue between the developer and the target users. In this way we will avoid working solely from the developer's assumptions of what the system should consist of and consider the requirements and preferences of the future end users. It will also allow any potential miscommunications or pitfalls between client and developer to be solved before the system has been implemented.

In the design stage, we will take the requirements established and look at how best to answer them in the software. Taking into account Haiti's high level of illiteracy⁷¹, the archive's design should focus on accessibility, with an emphasis on features such as iconography and compatibility with text-to-speech software: with these considerations, it is hoped the system can be accessible also to those with limited reading comprehension. A choice of languages should also be available, with both Haitian Kreyòl and French being represented. Established interaction design principles such as Fitts' Law⁷² and colour theory⁷³ will be followed in the hopes of better engaging with users, and the accessibility standards set by the World Wide

⁷¹ 'Haiti', *UNESCO UIS* <<http://uis.unesco.org/en/country/ht>> [accessed 17 May 2021].

⁷² 'Fitts' Law', *Interaction Design Foundation* <<https://www.interaction-design.org/literature/topics/fitts-law>> [accessed 17 May 2021].

⁷³ George Field, 'Color Theory', *Interaction Design Foundation* <<https://doi.org/10.5040/9781501371707.ch-002>>.

Web Consortium will also be consulted. Unfortunately not all accessibility technologies will be suitable for use with the archive; for example, text-to-speech software can greatly improve comprehension of websites and web applications, but major developers do not yet support Haitian Kreyòl and, as will be discussed later in the chapter, it is not financially feasible to implement this independently. When considering accessibility it is not only the features of the software we must consider, but its compatibility with older operating systems and hardware, some of which may no longer be supported by their developers. In addition, the archive should be compatible with mobile devices as well as desktops, as many Haitians access the internet through their mobile phones—albeit with limited speed and data capacity.⁷⁴ Haiti's internet infrastructure is lacking in comparison to other countries in the Caribbean;⁷⁵ therefore, we must focus on designing an archive which minimises the data to be transferred between server and client, and which offers several download or streaming options to best suit the client as well as clear and prominent information on file sizes.

While specific decisions about the implementation of the software must be made during development, there are certain recommendations which can be made at this stage. Various web frameworks and programming languages should be evaluated on their suitability for the given context and their compatibility with other tools we may wish to use. In addition, we should consider our reasons for digitising Haitian literary artefacts, as this will guide the information we collect and how we store it. The processes of digitisation and text encoding will play a key role in this project, and will inform the archive's design.

Evaluation of the design is an area which potentially could prove difficult, as testing the archive on-site in Haiti is an expensive and inefficient method. Instead, virtual machines could be used to simulate various environments and functionality can be monitored. For example, the archive's compatibility with mobile devices or older operating systems could

⁷⁴ Bastian, Griffin, and Aarons.

⁷⁵ *Ideas for Haiti 's Internet Reconstruction*.

be tested easily and without expense or travel. Standard benchmark tests can be run on the software to check for common errors, and volunteers could be recruited and observed while navigating the software to test its usability. If adequate functionality has not been achieved by the time of evaluation, techniques such as Wizard of Oz demonstrations⁷⁶ could potentially be used, where a third party controls the system as the user interacts with it to give the illusion of full functionality. Crowdsourcing is another avenue which could be explored, with groups of individuals paid to use the software and report back.

Maintenance is key to the longevity of software, and given limited budget anticipated for this project we must work to build a product which is robust and maintainable. Maintainability begins in initial development: code which is readable and well-structured is easier to maintain in the future. Documentation is key to the use and maintenance of the software, guiding users in successfully navigating the software, and allowing developers other than the original creator to easily understand it. Documentation has several different types, and the distinction between documentation written for developers and that written for users must be made to ensure accessibility.

While it is impossible to predict every challenge which may arise in the development of this software, we can anticipate and examine aspects specific to the Haitian context. In doing so, we hope to demonstrate that this project is both necessary and achievable.

3.1 Requirements elicitation

When designing any piece of software, we must consider the people we are designing it for. The requirements elicitation process, the first stage in the iterative software development cycle, allows us to gain essential information about our target users and their needs. The information gained at this stage will guide the project development and will ensure the final

⁷⁶ Paul Green and Lisa Wei-Haas, *The Wizard of Oz: A Tool for Rapid Development of User Interfaces* (Ann Arbor, June 1985).

product is both relevant and useful to the end users. There are a number of established techniques used in this process, some of which will be considered in detail in the following chapter.

3.1.1 User personas

Throughout the requirements elicitation process, we will speak to many potential end users to gather information about their needs and wants: here, we will aim to speak to students interested in or actively studying Haitian literature; academics with an interest in Haiti; Haitian authors themselves; members of the Haitian diaspora living in the US and other countries; individuals at institutions such as the Digital Library of the Caribbean, ANH, and MUPANAH; and, of course, Haitians currently living in Haiti.

One technique often used in this process is the creation of user personas. These profiles do not describe real end users; rather, they are invented profiles which amalgamate various users' experiences.⁷⁷ They are created with the intention of humanising the otherwise faceless requirements of the software, and to remind developers of the real human need at the heart of the project. In addition, they can prompt further considerations in the software's design such as accessibility requirements. The user personas suggested for this project are provisional and will benefit from being updated after surveys and interviews have been conducted.

Persona 1 – Emmanuel

Background

Emmanuel is a literature student at the University of Haiti in Port-au-Prince. He mainly accesses information through the university PCs and his smartphone. His internet connection at the university is relatively slow and often unreliable. His mobile phone plan allows him a

⁷⁷ Yvonne Rogers, Helen Sharp, and Jenny Preece, *Interaction Design: Beyond Human-Computer Interaction*, 3rd edn (Chichester: John Wiley & Sons Ltd, 2011), p.360.

moderate amount of data each month which he uses to supplement his studies. While the software he uses is generally up to date, the hardware he has access to is several generations behind the latest version and consequently it can struggle to load modern websites and apps. Some of his technology is no longer supported by the manufacturers.

Motivations

Emmanuel wants to be able to access authors' notes and manuscripts of the works he is studying, in order to better understand and criticise them. He would like the option to download the information provided as the university's internet connection is sporadic, but often the files are too big for his purposes. He would like to be provided options when downloading data; for example, choosing a version without images which has a smaller file size.

Frustrations

Emmanuel's internet connection is much slower than that of his colleagues elsewhere in the Caribbean and in the United States. Increasingly, websites are taking longer to load or cannot be loaded at all, especially ones which automatically play videos or audio and/or have many pop-ups or adverts. Emmanuel has pop-up and ad blockers on his hardware, but sometimes these stop the webpages from functioning properly. Furthermore, he has limited data available on his mobile phone plan each month so he must be careful which websites he visits as they can use large amounts of data. Many of the authors and materials he wishes to study are no longer in the country, and as a student he cannot afford to travel outside of Haiti. It is important for him to be able to access these materials locally, or online from his own home or workspace.

Persona 2 – Stéphanie

Background

Stéphanie is an elementary school teacher who lives in the US. Her parents were first generation immigrants from Haiti, so she is part of the Haitian diaspora. She mainly accesses information through her Apple MacBook, but sometimes uses her iPhone. She has access to high-speed internet at her home, and limited access at work. Her mobile phone plan limits her data usage each month, so she tends not to use the internet outside of her home or work. Her technology is a few generations behind the newest models and is not fully optimised, but is still supported by the manufacturers.

Motivations

Stéphanie's grandfather was an author, and consequently she holds many manuscripts and archival documents that have been passed through her family. She wants to be able to preserve them for future generations while still keeping them in her family. Additionally, she would love to find out more information about the materials and connect with other community archivists.

Frustrations

Stéphanie has young children and does not have much time to research organisations to whom she could submit the documents. She does not want to donate them outright to a museum or library as she would like to keep the physical copies to pass onto her children. Furthermore, she does not know which of the documents would be considered of interest by archivists and which would not. Unfortunately, the materials themselves are of varying conditions and are largely deteriorating: black mould is discolouring the paper, and silverfish have chewed the edges of many pages. Stéphanie has done her best to protect the materials from damp and sunlight, but she is unsure how to remove the mould or the insects without risking damaging the materials further.

Persona 3 – Chloe

Background

Chloe is an undergraduate student at the University of Glasgow. She mainly accesses information through her Samsung smartphone and her Microsoft tablet, but sometimes uses her laptop which runs Windows 10. She has access to high-speed internet connections in her accommodation and the university library, and her mobile phone plan offers her unlimited data each month. Her operating systems are the latest version, and her technology is current and supported by the manufacturers.

Motivations

Chloe has an interest in comparative literature with a particular interest in Haiti and the Caribbean. She wants to be able to compare different versions of works by Haitian authors, such as Frankétienne, to examine the purpose and effects of rewriting in Haitian literature.

Frustrations

There is no central location for Chloe to compare versions of these works, nor for her to look at manuscripts and authors' notes. She has access only to the PDF scans of materials supplied by her lecturer, and the resources at the university library. She cannot afford to buy multiple copies of each book to compare versions, especially as they are often difficult to buy in the UK. Consequently, it is difficult for her to consider these works through the lens of genetic criticism.

3.1.2 Surveys and questionnaires

Surveys and questionnaires are an excellent way to collect information from large numbers of people with relatively little cost and effort. In this case, we can survey a wide range of potential users of various demographics: while we will initially target authors and archivists,

valuable insights could also be gained from surveying academics and students in Caribbean studies at the University of Glasgow and further afield.

To keep participants engaged, surveys should ideally take no longer than five to ten minutes to complete; surveys which take longer than this risk increasing the non-completion rate of participants. Questions should be clear and unambiguous to ensure consistency across participants and to avoid biasing respondents to one result over others.

In the case of this project, several surveys would be proposed. The first survey would target authors and archivists and would aim to gain information about the materials they hold. Currently, there are no definitive statistics on the number and contents of these private archives, and while the results of this survey would by no means be exhaustive, it would give an initial estimate which could be used to guide the project. Afterwards, certain respondents could be interviewed to discuss their requirements to have their works used. Below are suggested questions for the survey.

1. Would you like to take part as a named participant, or remain anonymous?
2. Where is your place of residence?
3. What is the nature of the materials? For example: manuscripts, notebooks, etc.
4. Are you the owner of the materials?
5. What are the formats of the materials? For example, are they handwritten or typed?
Are they in notebooks or on loose sheets of paper?
6. Approximately how many materials do you have?

The second survey would target academics and students in the field of Caribbean studies. It would aim to garner information about the devices and sources most frequently used to search for and access information. Through analysis of this data, the archive's design can be optimised for the most common platforms and software, and the key features which attract users can be tracked. Below are suggested questions for this survey.

1. Would you like to participate as a named participant, or remain anonymous?

2. Where is your normal place of residence?
3. Which institute do you work or study at?
4. Which device do you use most often to carry out research? (Mobile, tablet, laptop, desktop, other).
5. Which websites or other sources do you use to find research materials?

3.1.3 Interviews

Rogers, Sharp, and Preece define four main types of interview: unstructured, structured, semi-structured, and group interviews.⁷⁸ Structured interviews employ a list of closed questions which are posed to the participant in a set order; in this way, interviews are standardised between participants. By contrast, unstructured interviews give more control to the participant: questions are usually open-ended, and participants can answer in as much or as little depth as they wish. Semi-structured interviews can be considered as a combination of the previous two: while the interviewer will cover the same topics with each participant, questions are open-ended. In group interviews, an interviewer will pose questions to a group of participants, guiding the discussion between them.⁷⁹ Each has its own merits, and the format chosen will depend on the context and aim of the interview. For this project, a variety of interview types would be recommended.

When interviewing authors and guardians of archival material, a structured or semi-structured interview style would ensure consistent responses and allow for easier analysis of data. The option of unstructured follow-up interviews with certain individuals could also be beneficial. When interviewing undergraduate students in Haitian or Caribbean studies, group interviews could encourage discussion and combat reticence in more reluctant individuals; this structure would also allow for comparison as to how different students access

⁷⁸ Yvonne Rogers, Helen Sharp, and Jenny Preece, *Interaction Design: Beyond Human-Computer Interaction*, 3rd edn (Chichester: John Wiley & Sons Ltd, 2011), p.228.

⁷⁹ Rogers, Sharp, and Preece, p.228-233.

information and their preferences when doing so. Depending on the stage of project development at the time of the interview, aids such as wireframes⁸⁰ or software demonstrations could be used to guide the discussion. It would be of further benefit to survey or interview individuals at organisations such as the Digital Library of the Caribbean or MUPANAH to discuss the technical requirements of the project and any considerations to be made.

Before the interview, the questions should be reviewed to ensure clarity and avoid bias where possible. The interviewer should be provided any relevant about the interviewees, and the aim of the interview should be made clear to them. Interviewers should also be familiar with appropriate probes⁸¹ to prompt individuals if necessary—these should not guide the participant to a certain response, but instead encourage them to expand on or clarify their answer.⁸²

3.1.4 Stakeholder analysis

Stakeholders can be considered as individuals or organisations who have a vested interest in the development of the project and will be affected by its outcome. During any software development project, stakeholders must be identified, consulted, and appeased. For this project, we propose as our provisional stakeholders: the various authors and guardians of the archival materials involved; organisations such as Digital Library of the Caribbean and MUPANAH; and other potential end-users such as university students and academics. There are many methods used to assess stakeholders, but the one we will consider for this context is the stakeholder matrix—this is a tool which aids in establishing the hierarchy of stakeholders. Any software project is limited by factors such as manpower, budgetary

⁸⁰ In software development, a wireframe can be considered a mock-up of an app or website design.

⁸¹ Probes are questions or prompts used by the interviewer to encourage participants to expand on their answers.

⁸² Rogers, Sharp, and Preece, p.232.

requirements, and time – not every potential feature can be implemented; thus, we must prioritise the needs and wants of those most important to the project. This hierarchy will determine how often different stakeholders are consulted about the project and the manner in which we do so.

The figure below is an example of a stakeholder matrix template. The axes track the stakeholder's *power* over the project and their *interest* in its development; as we will later see, these do not necessarily correlate, and we will consult and interact differently with stakeholders who lie at different points on each axis.

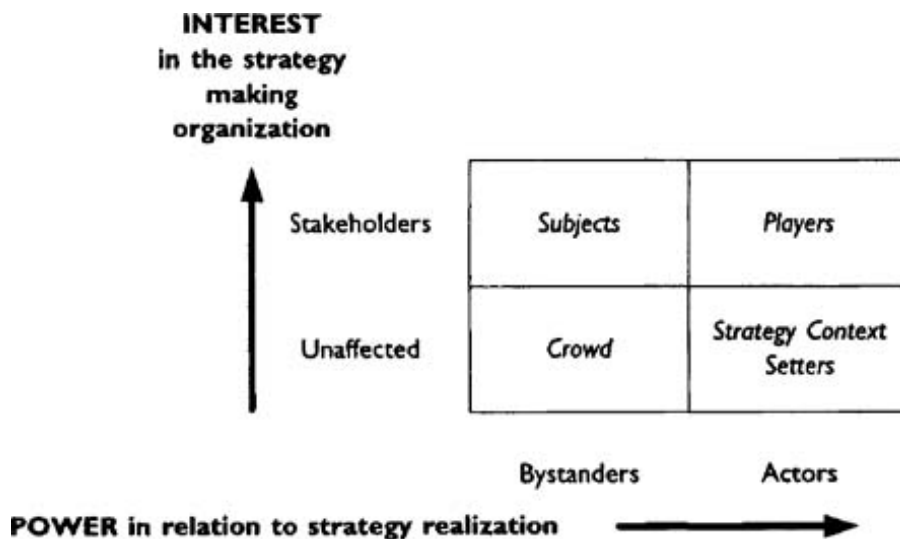


Figure 3.1. The power-interest matrix as described by Eden and Ackermann.⁸³

Founder of ProjectEngineer.net Bernie Roseke offers his own labels for these quadrants, which inform of how different stakeholders should be managed.⁸⁴

⁸³ Colin Eden and Fran Ackermann, 'Making Strategy: The Journey of Strategic Management' (London: SAGE Publications Ltd, 1998) <<https://doi.org/10.4135/9781446217153>>.

⁸⁴ Bernie Roseke, '3 Types of Stakeholder Matrix', *ProjectEngineer*, 2019 <<https://www.projectengineer.net/3-types-of-stakeholder-matrix/>> [accessed 17 February 2022].

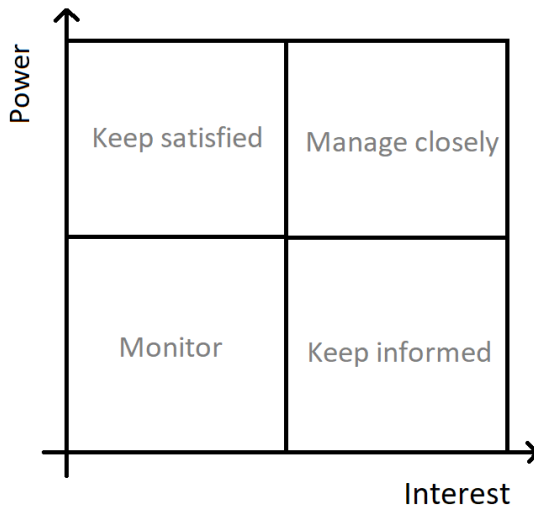


Figure 3.2 An illustration of management techniques for stakeholders within the power-interest matrix; image by author adapted from image on ProjectEngineer.net.

Low power, low interest stakeholders must still be considered and monitored, but they should be kept as a low priority. Low power, high interest stakeholders should be kept abreast of the project, but their influence should be kept proportionate to their investment in the project. High power, low interest individuals should be kept satisfied: they hold great influence over the project but are not directly involved in it. High power, high interest stakeholders must be managed closely as they are most influential to the project.

Below is an example of a power-interest matrix populated with the proposed stakeholders for this project. When examining the project through this lens, it becomes clear that tailored communications will be necessary.

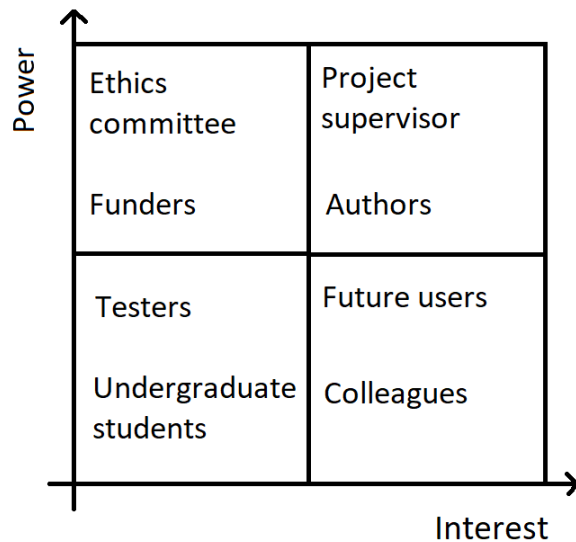


Figure 3.3 A power-interest matrix populated with provisional data.

For those who are interested in the project but do not hold much power over it, intermittent email updates and/or newsletters on the progress of the project should be sufficient. For those who hold more power, our approach must be more involved. The university ethics committee must be kept informed of any changes to the project and their approval must be sought before participants are contacted. While they are not directly involved in the project, their approval is essential for its completion. Perhaps the most influential stakeholders in this context are the project's academic supervisor and the authors and archivists themselves. While no stakeholder should be contacted to an excessive degree, these key stakeholders should be informed regularly of the project's progress and consulted when there is a problem or a milestone to be reviewed.

In all our interactions with stakeholders, it is important that we manage expectations about the software project to keep them realistic and grounded. It is essential that we maintain the distinction between what is feasible, what is agreed to be included in the finished product, and what could be implemented in the future.

3.2 Design

In the design stage of the software development cycle, we take the information gained in the requirements elicitation process and consider how they can best be implemented in the software solution. It can be tempting to rush through the design process to reach stages such as implementation, which yield more tangible results. However, the design stage can help in identifying areas of development which may be problematic, as the later in development a problem is found, the more expensive it becomes to rectify. In considering carefully the design and format of the software before implementing it, we hope to solve the most significant problems before they become ingrained. We must also consider the lifetime of the software – that is, how long after release it will be usable before becoming redundant. Software generally has a lifetime of 5 – 7 years before it needs significant refactoring; however, in order to reach this milestone, software must be comprehensive and well-structured as to be maintainable. If the design stage is rushed and implementation is carried out immediately, it can result in a product which is disorganised and difficult to work with.

In this section, we will first consider the languages to be used in the archive, discuss the controversies around various Kreyòl orthographies, and attempt to find a solution to the issues raised. The accessibility requirements of the archive will also be discussed as well as how they can be implemented, and any accessibility issues specific to the Haitian context. As Sir Tim Berners-Lee states, ‘The Web is fundamentally designed to work for all people, whatever their hardware, software, language, location, or ability.’⁸⁵ We must consider how best to design a product which can be accessed in the Haitian diaspora and beyond.

3.2.1 Languages

In designing the user interface for the archive, we must consider which language or languages will be used. It is relatively inexpensive to implement multiple language options

⁸⁵ World Wide Web Consortium, ‘Introduction to Web Accessibility’, *Web Accessibility Initiative*, 2015
<<https://www.w3.org/WAI/fundamentals/accessibility-intro/>> [accessed 3 April 2022].

in a website or application, and doing so can greatly improve the software's accessibility. Here we recommend the implementation of three languages: English, French, and Kreyòl. The use of English will allow access for students and academics across the world, as well as targeting the Haitian diaspora in the United States. The archive should also be fully operable in French; this is one of Haiti's two official languages, and is the language in which most Haitian literature is written: we can expect that most of the literary artefacts to be archives will be in French. The implementation of these languages is relatively simple: as prominent international languages they are usually accounted for in accessibility software such as text-to-speech and voice-to-text applications. Finally, the archive should be accessible in Kreyòl. While Haiti is officially bilingual, in reality only around 5-10% of the population are estimated to speak fluent French, with well over 90% considered to be monolingual Kreyòl speakers;⁸⁶ it would be remiss for an archive ostensibly aimed at Haitians to exclude this language. Furthermore, as will be discussed in this section, the history of the French language in Haiti means it is imperative that Kreyòl be given equal status to French and English: the colonial idea of French as superior to other languages is still pervasive throughout the Caribbean, and we must be mindful not to perpetuate this notion.

While we have established that the archive's interface should include Haitian Kreyòl, we must be sensitive to the language's orthographic origins. Since Kreyòl originated and evolved as a primarily oral language, there has historically been much debate over how it should be written. As Schieffelin and Doucet state, "... the development of an orthography for vernacular literacy has been neither a neutral activity nor simply about how to mechanically reduce a spoken language to written form."⁸⁷ Indeed, this is particularly

⁸⁶ Benjamin Hebblethwaite, 'Haiti's Foreign Language Stranglehold', *Foreign Policy*, 2021 <<https://foreignpolicy.com/2021/08/03/haiti-language-education-school-french-haitian-creole/>> [accessed 21 May 2022].

⁸⁷ Bambi B Schieffelin and Rachelle Charlier Doucet, 'The " Real " Haitian Creole : Ideology , Metalinguistics , and Orthographic Choice', *American Ethnologist*, 21.1 (1994), p. 176.

apparent in Haiti, where orthographic systems must not only work to adequately represent spoken Kreyòl but also to wrestle with the language's origins in colonial occupation: much of the debate centred around 'representations of self ("Haitianness") and representations of the nation.'⁸⁸—as we will discuss, these various orthographies represented differing views on Haiti's past, present, and future as a nation, and represented differing political and social interests.⁸⁹ We will here consider the three main orthographic systems explored by Schieffelin and Doucet and the accessibility limitations of a Kreyòl version of the archive software.

Each orthographic argument has its own merits, but each essentially works to answer the same question: to what extent should Kreyòl's orthography reflect its French origins? Kreyòl is believed to have developed on Haitian sugar plantations, born of interactions between French colonists and African slaves; as a result, Kreyòl has been viewed by some as merely dialect of French rather than an independent language. The pro-phonemicist orthographic argument aimed to address this notion and to promote Kreyòl as its own language. They argued that an orthographic system for Kreyòl should be 'completely independent from the French orthographic system'⁹⁰—they stated that the languages are distinct, and Kreyòl's orthography should reflect this. Instead, they prioritised a writing system which accurately represented the Kreyòl spoken by the Haitian people, and which was easy for Haitians to learn and to write. This system is the current standard in Haiti: used by the Haitian government and many Haitians; for this reason, it is the one which should be implemented in the archive. The pro-etymologist argument took a different view, arguing that Haiti's links to France could not be completely severed or ignored. They stated that Kreyòl and French would always co-exist in Haiti, and that Kreyòl should therefore stay 'as close as possible to

⁸⁸ Schieffelin and Doucet, p.186.

⁸⁹ Schieffelin and Doucet, p.177.

⁹⁰ Schieffelin and Doucet, p.186.

the French orthographic system’ to facilitate the learning of French by Kreyòl-speakers. They believed that a French-influenced writing system would act as an ‘orthographic bridge’ between the two languages, and argued the orthography must ‘reflect Kreyòl’s origin, which, for them, is predominantly the French language.’⁹¹ The third argument was represented by Pompilus and Lofficial – Haitian linguists and educators. They believed that ‘orthography should be phonemic *but* whenever possible should use the same conventions as the French orthography to represent sounds similar in French and kreyòl.’⁹² Like the pro-etymologists, they argued that both French and Kreyòl would always exist in Haiti, and positioned their orthographic system in response to their vision of a future Haiti which was completely bilingual. Even in 1994, Schieffelin and Doucet highlighted the problems with this argument – it attempted to use Kreyòl’s written system as a bridge between the past and future ‘at a time when the present itself is so full of conflict.’⁹³ Almost three decades later their argument is still applicable: Haiti remains in a state of turmoil. Since 2020 Haiti has seen a 180% rise in kidnappings for ransom⁹⁴ with journalists, doctors, and labourers amongst the groups targeted; gang violence has seen numerous civilians indiscriminately shot or wounded;⁹⁵ fuel shortages have disrupted access to key services such as banks and hospitals and the price of diesel, petrol, and kerosene have risen sharply;⁹⁶ and the Dominican Republic, inspired by Donald Trump, has begun work on a new border wall with Haiti in an attempt to hinder drug-trafficking.⁹⁷ Essentially, Haiti is a nation divided: the rift between

⁹¹ Schieffelin and Doucet, p.187.

⁹² Schieffelin and Doucet, p.187.

⁹³ Schieffelin and Doucet, p.187.

⁹⁴ Secretary-General United Nations Integrated Office in Haiti, *Security Council* (Port-au-Prince, 2022), 01584.

⁹⁵ United Nations Integrated Office in Haiti, 01584.

⁹⁶ United Nations Integrated Office in Haiti, 01584.

⁹⁷ Joe Parkin Daniels, ‘Dominican Republic Starts Work on Border Wall with Haiti’, *The Guardian* (London, 25 February 2022) <<https://www.theguardian.com/global-development/2022/feb/25/dominican-republic-starts-work-on-border-wall-with-haiti>> [accessed 21 May 2022].

French and Kreyòl speakers runs deeper than linguistics. Historically, French speakers have been of a higher economic and social class than monolingual Kreyòl speakers, and this gap is still felt today: research at the Autonomous University of Barcelona found that Haiti is among the most unequal countries in the world – second only to Namibia.⁹⁸ French language education in Haitian schools is generally poor, with many teachers lacking fluency, and students unable to access French media or books. After the first three years of their education, pupils are expected to continue almost exclusively in French, and as a result, only around 35% of Haitian students progress to secondary education.⁹⁹ Evidently, French speakers hold a significant advantage in Haitian society, and those who are not born into a French-speaking family have little chance of ever achieving fluency. Thus, any attempt to work towards a bilingual future in Haiti would need to address what Schieffelin and Doucet describe as the ‘dual culture systems existing in Haiti’¹⁰⁰: the fundamental socioeconomic inequality which has plagued Haiti for decades. Unfortunately, it does not seem that this inequality will be resolved in the near future.

While this project should use the standard Kreyòl orthography employed by the Haitian government, it is important to remember the history of this orthography and the debates behind it. Ultimately, we must accept that there is no neutral choice of orthography—whichever is used will have ‘international implications, at least at the symbolic level.’¹⁰¹ We must be sensitive to the historical implications of languages and orthographies in the Haitian context, and accept that we may need to make changes in the future.

⁹⁸ Evans Jadotte, ‘Characterization of Inequality and Poverty in the Republic of Haiti’, *Estudios Sociales*, 15.29 (2007), 8–56 <http://www.scielo.org.mx/scielo.php?pid=S0188-45572007000100001&script=sci_arttext&tlng=en>, p.18.

⁹⁹ Hebblethwaite, ‘Haiti’s Foreign Language Stranglehold’.

¹⁰⁰ Schieffelin and Doucet, p.188.

¹⁰¹ Schieffelin and Doucet, p.177.

3.2.2 Accessibility

It can be tempting to consider accessibility as a post-development requirement; something which can be dealt with in the implementation stage or can even be added after release. However, the World Wide Web Consortium – a community established by Sir Tim Berners-Lee in 1994 – states, ‘It is most efficient and effective to incorporate accessibility from the very beginning of projects, so you don’t need go back and to re-do work.’¹⁰² Given that accessibility is a priority in this project, we will consider it throughout the development cycle, and particularly in the design stage.

The World Wide Web Consortium (W3C) sets international standards for accessible web design. They believe the internet should be accessible to all regardless of disability, hardware, language, or location, and offer guidance and resources for developers to implement software solutions which can be used by everyone.

The Web Content Accessibility Guidelines (WCAG2) are internationally technical standards which web developers can use to ensure their software is accessible; the next iteration, WCAG3, is still in development with a view to be completed in the ‘next few years’.¹⁰³ The standards are stable throughout versions; it is likely this project will refer to WCAG2, but will be compatible with WCAG3 when it is released.

Under WCAG there are four principles of accessible design: Perceivable, Operable, Understandable, and Robust.¹⁰⁴ In order to be perceivable, the user must be able to see and understand the information presented by the webpage. To meet this requirement, we will make information and services available in multiple languages (English, French, Kreyòl) and ensure compatibility with text-to-speech and voice-to-text software where this is

¹⁰² World Wide Web Consortium.

¹⁰³ W3C Web Accessibility Initiative, ‘WCAG 3 Introduction’, *World Wide Web Consortium*, 2021 <<https://www.w3.org/WAI/standards-guidelines/wcag/wcag3-intro/>> [accessed 6 April 2022].

¹⁰⁴ W3C, ‘Accessibility Standards’, *Web Content Accessibility Guidelines*, 2007 <<https://www.w3.org/WAI/standards-guidelines/>> [accessed 6 April 2022].

feasible; this will allow visually impaired and low literacy users to interact with the archive. Furthermore, we must ensure that each page has an adequate contrast ratio: this ensures the text is legible against its background. WCAG2 stipulates that users should be able to change the colour of text and the page background: this accommodates both for users who require high contrast between text and background (older or visually impaired users), and for users who require low contrast between text and background (for example, those with dyslexia); taking into account Haiti's high illiteracy rates, it is critical that we accommodate for users with varying needs. Several pre-approved colour palettes covering a range of luminance contrast ratios could be presented to users to choose from; this would ensure accessibility while allowing the developer to ensure that all website elements are compatible and legible with the colours chosen—there exist many contrast-analyser tools which serve this purpose. The use of iconography is a controversial subject; while it is easy to assume that icons over text can improve comprehension and usability, this is not always the case. Icons, when used successfully, can simplify and streamline the software experience for users: they are becoming increasingly common in software and web design, particularly in mobile interfaces where space is limited. However, the same icon can hold various meanings in different cultures and contexts, and what is assumed to be intuitive by the developer is not always the case for the end user. Iconography can be a significant accessibility aid if used correctly, but we must ensure that those used are intelligible to Haitian users.

To be operable, a user must be able to navigate and operate the software. We must ensure compatibility with multiple forms of hardware: mouse, keyboard, touch screen, or a combination. Some users navigate solely using the keyboard, and the website's HTML must reflect this—all pages should be split into sections using the HTML header tag as this will allow users to easily understand and navigate the page's hierarchy. The HTML tags `<h1>` to `<h6>` are used to identify different levels of headings; for example, `<h2>` would be considered a subsection of `<h1>`; users can then tab through the page to reach the element

they are interested in or wish to interact with. This also allows greater comprehension and control for users who use screen readers.

To be understandable, users must be able to understand the information presented to them and how to operate the software's interface. When designing the archive, ease of interaction should be considered a priority: the interface should be kept simple and have a clear and organised structure. Any directions should be written in plain language without jargon, and diagrams or illustrations should be used for clarity where necessary. Written or video guides could also be considered where it is necessary to demonstrate how to carry out more complex tasks. Any errors should be caught and handled appropriately; users should be given a short, simple message explaining what has happened and what they should do to rectify it. Finally, the system should be thoroughly tested to ensure usability. This could take the form of observation testing, where users are asked to navigate the software and complete certain tasks while being watched by a researcher; this can help to highlight any areas which present particular difficulty. Potential testing mechanisms will be discussed in more detail in section 3.4 on software testing.

To be considered robust, a variety of assistive technologies must be able to interpret the software, even as these technologies are updated and changed. Given the rapid rate of software and hardware evolution, this requirement could prove challenging: as will be discussed in section 3.5, any software created will be subject to a limited budget for future maintenance and development. As far as possible, the software should be developed with maintainability as a key consideration; if the code is well-written, any future compatibility requirements will be easier to implement.

While the accessibility of the software can, to an extent, be testing through observation, each of these standards can also be evaluated using its relative 'success criteria' defined by W3C:

these are testable requirements which are not technology specific.¹⁰⁵ They are graded A, AA, and AAA, with AAA as the highest achievable level: if all pages meet the standard of A or above, the website can be considered accessible. As some newer technologies are not currently supported by accessibility software, W3C state that a website is not required to conform to AAA standards in every success criterion to be considered accessible. By ensuring the archive meets all the relevant success criteria before release, we can be sure that it will be accessible to most users. This can be done during the testing phase of software development, but it is recommended that the software's accessibility is tested continuously throughout development to save revision later in the process.

Another accessibility requirement specific to Haiti is the quality of internet connection. Despite common assumptions otherwise, Laura Wagner highlights that most Haitians do indeed have internet access: most commonly through their mobile phones, with a limited amount of data to be used within a set period.¹⁰⁶ In her work with the Radio Haïti archives, Wagner's team prioritised mobile accessibility and compatibility with major social media platforms, concurrent with the internet usage of most Haitians; this is an example which could be followed in the archive's development. W3C also provide guidelines for software design in contexts with limited internet connections, some of which could be implemented into this project. For example, the use of alt-text to describe images—this allows access for visually-impaired users and those who have turned images off in the browser to reduce data consumption; the decision not to implement auto-play features, allowing users to elect into any activities which have higher-than-average data consumption such as watching videos or listening to audio files. Where users are able to download content from the archive, the file size should be clearly displayed, and developers could consider offering multiple choices for

¹⁰⁵ W3C.

¹⁰⁶ Wagner, p.630.

files—for example, offering a lower-quality version of the file which is of a smaller download size. For an archive which aims to allow access to literary artefacts such as manuscripts, there are difficulties in presenting the data in a minimalistic way. While text encoding will allow users to access and navigate the contents of the documents, there are many holistic details such as paper colour and quality which arguably cannot be adequately described—these limitations will be discussed in more detail in chapter four. These issues can be mitigated, to an extent, by providing thorough and accurate descriptions, and offering the ability to download the documents in formats such as PDF so they can be accessed offline. While the Radio Haïti archives were audio files, we can follow their example in distributing hard copies of the radio archives to various institutions in Haiti. By giving physical copies of the archive to organisations in Haiti such as BNH and ANH we will further improve accessibility, as the materials can be accessed offline.

While ethical concerns should be a prominent force in our decision-making, we must also consider technological compatibility. Technologies such as text-to-speech applications have revolutionised internet accessibility for users with sight, literacy, or other limitations—they allow a user's device to read aloud a page's contents to them, including descriptions of any images (where these descriptions or alt-text are present). Unfortunately, there is currently little to no support for Haitian Kreyòl in text-to-speech software: large technology companies such as Microsoft, Google, and Amazon—all of whom offer their own text-to-speech services—do not presently support Haitian French or Kreyòl. If this was considered to be an essential component of the archive, a custom model could be considered—some companies offer this service on a subscription basis. However, any custom text-to-speech model would need to be trained with hundreds of hours of audio and respective transcriptions before being tested and evaluated—this process could prove to be expensive in both

monetary and labour terms.¹⁰⁷ In addition, custom models need to be maintained and recreated regularly as they lose accuracy over time—currently, Microsoft recommends that custom models be recreated completely every two years.¹⁰⁸ This would cause significant issues with maintainability of the archive; therefore, full text-to-speech support is not currently feasible for the Kreyòl version of the archive. For the English and French sections of the archive, there are many free or paid text-to-speech technologies available which are relatively simple to implement. However, there are many pitfalls with text-to-speech software, even with a widely supported language such as English or French. In the future, it is hoped that pronunciation guidelines can be implemented by content creators to guide the software in cases of ambiguity. In particular, the World Wide Web Consortium proposes integrating SSML (speech synthesis markup language) into HTML which would allow creators to specify how certain data such as figures and acronyms should be interpreted by the software, as well as allowing differentiation between heteronyms.¹⁰⁹ It is worth noting that this is not yet the industry standard and may eventually be overtaken by another solution. In the interests of long-term maintainability, we must consider carefully which text-to-speech solution we implement. We may have to sacrifice some functionality initially to ensure that we do not implement a solution which quickly becomes obsolete.

3.3 Implementation

The implementation of the archive is dependent on many factors, including the information gathered in the requirements elicitation stage and decisions made about the system's design.

¹⁰⁷ Microsoft Corporation, 'Custom Speech Overview', *Azure Product Documentation*, 2022 <<https://docs.microsoft.com/en-us/azure/cognitive-services/speech-service/custom-speech-overview>> [accessed 5 April 2022].

¹⁰⁸ Microsoft Corporation, 'Model and Endpoint Lifecycle of Custom Speech', *Azure Product Documentation*, 2022 <<https://docs.microsoft.com/en-us/azure/cognitive-services/speech-service/how-to-custom-speech-model-and-endpoint-lifecycle>> [accessed 5 April 2022].

¹⁰⁹ Web Accessibility Initiative, 'Specification for Spoken Presentation in HTML', *World Wide Web Consortium*, 2021 <<https://www.w3.org/TR/spoken-html>> [accessed 22 April 2022].

However, some recommendations will be made as to the web framework employed for the program, and the process of digitisation and text encoding will be discussed.

3.3.1 Software implementation

For the development of an archive which will be available online, a suitable web framework must be chosen—this provides the developer with the tools to efficiently create a web application. There are many web frameworks available to use, including Express, Django, and Rails—each has its own advantages, and whichever is chosen will depend on the priorities of the web application. For example, Django uses the Python programming language, which is easy to learn and widely used; in addition, it allows interaction with a database without requiring knowledge of Structured Query Language (SQL); it is scalable, allowing for future expansion and development; and it offers its own administrator interface, removing the need to develop one.¹¹⁰ Express has gained in popularity in recent years due to its compatibility with Node.js—a JavaScript runtime environment which uses asynchronous functions to improve performance and provide low-latency access to users. The developers of Node.js promote it as well-suited for the development of online libraries, which could potentially make it a suitable choice for this project.¹¹¹

In order for users to be able to efficiently search for entries within the archive, there will need to be a database containing information about all materials in the archive. A simple entity relationship diagram illustrates how this database will function. Each author listed will have one or more documents attributed to them; each document, in turn, can be assigned to one author only. If, during development, it arose that certain documents had several or indeed no known author, the model could be amended to allow each document to be attributed to several authors, or the attributes for the author entity could be changed to reflect the document's unspecified origin. In order to effectively distinguish between database records

¹¹⁰ 'Django', *Django Project* <<https://www.djangoproject.com/>> [accessed 5 June 2022].

¹¹¹ OpenJS Foundation, 'About', *Node.js* <<https://nodejs.org/en/about/>> [accessed 5 June 2022].

and retrieve information efficiently, each entity should be assigned a unique identifier (UID). Here it is proposed that the author and document entities be assigned a unique eight-character code: the `author_ID` will function both as the primary key for the author table and as the foreign key for the document table.

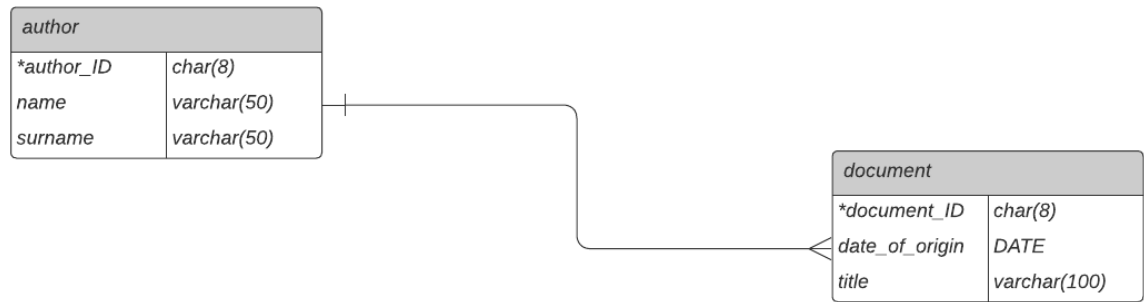


Figure 3.4 A provisional entity relationship diagram in crow's foot notation, showing the author and document entities and their respective attributes.

The author and document entities should, of course, be assigned more descriptive attributes—this will allow for better categorisation and searchability. For examples of these attributes we can look to those used by the Cullen Project, a University of Glasgow project which has digitised the letters of 18th century physician Dr William Cullen of the Royal College of Physicians of Edinburgh.¹¹² The document attributes include: language of document; date (day, month, and year; in addition, dates are categorised into levels of certainty—guess, inferred, and certain); and type (including those written by the author, dictated to a scribe, or printed). The author attributes include: title, maiden or birth name, occupation, and gender. These attributes or derivatives thereof could be used in the Haitian literary archive to allow for a more thorough and accurate search function, as well as better categorisation of documents. There are also features specific to this context that we may wish to record in the document attributes, for example, whether there is damage to the

¹¹² The Cullen Project, 'The Cullen Project | The Consultation Letters of Dr William Cullen (1710-1790) at the Royal College of Physicians of Edinburgh (RCPE)', *University of Glasgow* <<http://www.cullenproject.ac.uk/>> [accessed 5 June 2022].

document, and if so the severity and the type (for example, fire, water, insect). By storing additional information about the documents it is hoped to allow users to search not only for artefacts by or related to a certain author, but also by fields such as time period and the gender of the author. In addition, as will be discussed in more depth in the chapter on ethics, the context of these documents is critical to the understanding of them. Metadata such as dates and material type are part of the history of the documents and are key to providing a holistic understanding of them; while a digitised document can be considered a representation of the original, we must ensure that these representations are as accurate and rich as possible.

Another consideration when creating and managing databases is cybersecurity, and in particular SQL injection. SQL injection attacks are common and occur when a user enters an SQL query instead of a search parameter; if left unchecked, this command will be executed in the database.¹¹³ Though an archive may not seem an immediate target for hackers, the consequences of unauthorised access to the program could be devastating: without adequate protection in place, a malicious user could access confidential information or delete all entries in the database. Fortunately SQL injection attacks are relatively easy to prevent, with most programming languages now provide functionality to prevent hackers from exploiting this loophole: for example, PHP provides a function to create parameterised queries which this prevent the system from executing search box input.

3.3.2 Digitisation and text encoding

When planning the digitisation of archival documents, we must consider the intention behind the archiving of these materials. In the case of this project, we intend to digitise materials primarily to preserve them, and to enable textual analysis and genetic criticism of various iterations of Haitian authors' works; this means that simply hosting the documents as

¹¹³ 'SQL Injection', *OWASP Foundation* <https://owasp.org/www-community/attacks/SQL_injection> [accessed 6 June 2022].

scanned images will not provide adequate accessibility. However, the physical nature of the documents is also important, and we aim to create a digital copy of the physical document. For this reason, it is recommended that the scanned images are provided alongside transcriptions of the document's contents.

We must also consider how to make these images and transcriptions available to users. The limited broadband connections available in Haiti means that the file size involved is a more prominent consideration than it otherwise would be. While we may seek to provide high quality images of documents for the purposes of preservation and analysis, this could render them inaccessible to users with a limited broadband connection or restrictions on their mobile data allowance. One solution could be to host a low-resolution preview of the document on the web page, with the option to download a full copy of it in a choice of file formats. While it is not necessary to provide users with an exhaustive range of file formats, offering the choice between two or three will enable users to make a suitable choice according to their needs. Lossy image formats such as JPEG allow for the greatest compression of an image, with files being reduced to a fraction of their original size; however, as the name suggests, this comes at a cost to the quality of the image with some details being permanently lost. Lossless formats such as PNG preserve the quality of an image at the cost of a larger file size. Where the colour range of a document is limited, GIF can be considered—this is a lossless format with a smaller file size than either JPEG or PNG but is only capable of encoding in 8-bit colour. There are many other file formats which can be considered for use in this project, depending on the information to be stored.

For text encoding, XML is currently recommended by the Text Encoding Initiative,¹¹⁴ as it is platform independent and unlike HTML is extensible, allowing developers to define and use their own tags. XML encoding allows us to store contextual information about the

¹¹⁴ 'TEI: Text Encoding Initiative' <<https://tei-c.org/>> [accessed 14 June 2022].

document in a machine-readable manner, which will help to make the archive searchable. In addition, it will help to make the documents accessible to users who employ a screen reader or who use browser plugins which change the layout and font of text—for example, those designed to aid dyslexic users.

In the process of digitisation, documents are scanned or photographed using specialist equipment, before being processed to ensure quality and legibility. The equipment and settings used will vary depending on the materials and the environment they are in. Before the materials can be scanned or manually typed, they must be prepared. Often this process is more expensive than the scanning itself as it requires sorting large volumes of material. In this preparation stage, it should be determined which—if any—documents need special treatment. Documents of a similar nature should be grouped together to speed up processing, and they should be divided between materials appropriate for OCR processing and those which will need to be manually transcribed. The metadata for each document should also be created at this stage.

Metadata is split into three categories, descriptive, structural, and administrative. Descriptive metadata allows a resource to be searched for and identified; for example, a document title or author are considered as descriptive metadata. Structural metadata describes how the components of a digital object relate to one another; for example, the order of pages in a book. Administrative metadata relates to the management of a digital object; this may contain elements such as access rights and file type.¹¹⁵ Metadata should be created for every artefact to be digitised: this will ensure the collection can be organised and searched, and will contain vital information for the future management of these resources.

¹¹⁵ Gow, Ann, “Metadata, Access, Discovery, and Preservation.” University of Glasgow. 27 February 2020. PowerPoint presentation.

Where the digitisation of the artefacts is concerned, it is easy to assume that OCR technology will offer the fastest and most efficient solution for large volumes of material. However, in order for OCR to work effectively, text must meet several strict criteria. To be eligible, text should be in a clear and modern typeface, and the materials should be largely undamaged and legible; additionally, they must be able to be put through a sheet-feeder scanner. OCR is faster and cheaper than manual input but is generally less accurate. In particular, OCR struggles with discrepancies in character formation: for example, where there are fractures (where a character is broken into two or more parts) or ligatures (where two or more characters are joined to one): this means that older texts or ones where the print quality is inconsistent may not be suitable.¹¹⁶ Unfortunately, these requirements mean that most documents from private archives may be unsuitable. Furthermore, while OCR technology reduces the amount of human input required, it does not eliminate it entirely. After a document has been processed with OCR software, it will need to be manually reviewed to ensure accuracy in content and formatting.

If the source material is rare or fragile, is handwritten, or cannot be opened fully on a scanning bed or put through a sheet-feeder scanner, manually keying in the text is a more efficient option. We can anticipate that many of the artefacts we aim to archive will fall into this category: they may have significant structural damage (for example, rips or tears in the pages), or be in a language such as Kreyòl which may not be supported by the OCR technology used. Manual transcription of materials can be a laborious task, especially in cases where there are large volumes of text. If it is unsuitable for the primary researcher or an in-house typist to carry out this task, a third party can be considered for this task. There are various companies offering transcription services to a high standard of accuracy—up to

¹¹⁶ Gow, Ann, “Digitisation of Textual Sources.” University of Glasgow. 6 February 2020. PowerPoint presentation.

99.995%;¹¹⁷ often, the text is transcribed by two different typists before being compared by a machine to check for discrepancies. However, outsourcing this task is expensive, and prices rise for damaged artefacts or ones considered to contain specialised knowledge. Furthermore, it could potentially prove difficult to find a transcription company which offers services in French and Haitian Kreyòl.

The implementation of the system here implies the development of the archive software itself, as well as the consequent digitisation of materials. These must inform one another: the design and development of the software must be placed in relation to the digitisation process. Understanding the digitisation process, its products, and its limitations will guide us in deciding which materials to archive, and will allow us to build software which is well suited to host and distribute these digitised materials.

3.4 Testing

Testing is a critical part of the software development process, to ensure that the software is fully functional and useable by its intended audience. The rise of test-driven development has changed how software is written: while previously testing would have taken place near the end of the software development cycle, software engineers are now encouraged to test throughout development. If software is not tested throughout its development, it is likely that faults will only be found once the codebase is large and complex; this will make it much more difficult to find and fix any bugs, and we risk any solution being inelegant and inefficient. Code which has been tested throughout development is likely to be better structured, better written and more maintainable than code which was tested thoroughly only after its implementation. Testing is generally split into functional and non-functional testing: both of which will be discussed in this section. Functional testing aims to determine that the

¹¹⁷ Gow.

program works as expected and meets the established requirements. Non-functional testing establishes whether the program's performance is adequate and if it is usable.

It is worth remembering, however, that no matter how thoroughly we test, we cannot guarantee that the software will never fail—indeed, we should expect it to. As Dijkstra famously quipped, 'Program testing can be used to show the presence of bugs, but never to show their absence!'¹¹⁸

3.4.1 Functional testing

Functional testing is used to establish that the software functions as expected, and that it meets the requirements established earlier in the software development process. Functional testing can be carried out manually, but due to its repetitive nature it is faster and more efficient to use automated unit tests. The specifications and expected results of these tests are written by the developer; the testing tool then executes each test case and compares the result with that which is expected. These test cases should be written alongside the production code and be updated, removed, and added to as required. It is critical that as the production code is updated, the test cases are updated accordingly; this ensures that the tests being run are always relevant and accurate.¹¹⁹

According to software engineer Robert C. Martin, tests should abide by the acronym FIRST: they should be fast, independent, repeatable, self-validating, and timely.¹²⁰ While tests need not be as efficient as production code, they should still be capable of being run relatively quickly: if they become inconvenient and time-consuming to run, testing will become less frequent. Tests should run independently: they should not be reliant on one another. If Test B relies on Test A passing, it becomes difficult to pinpoint which section of code is causing

¹¹⁸ Edsger W. Dijkstra, *Notes On Structured Programming, Department of Mathematics* (Eindhoven, 1970), p.7.

¹¹⁹ Robert C. Martin, *Clean Code* (Crawfordsville: Pearson Education, 2009), p.131.

¹²⁰ Martin, pp.132-133.

the test or tests to fail. In addition, if functions are changed or removed their related tests should also be changed or removed; this is much more easily achieved if tests do not depend on one another. Tests should be repeatable: it should be possible to run the same test as many times as required to produce consistent results. In addition, tests should be able to run in any environment: if tests can only be run on one machine and no others, it can be expected that testing will not take place as frequently as it should throughout development. Tests should be self-validating: they should either pass or fail. In a software testing environment which may run several hundred tests at once, it is unreasonable to expect a developer to read through every test result to decipher whether or not the output is as expected. Self-validating tests allow developers to focus on the results of the tests and on the resolution of any errors. Finally, tests should be timely: they should be written as and when they are required. Martin recommends they are written just before the code they are testing; in this way, we avoid writing tests designed to pass, and instead write tests to ensure the code passes requirements.¹²¹

3.4.2 Non-functional testing

Where functional testing decides whether or not the software can perform a certain task, non-functional testing aims to determine how well the software does so. While functional testing can be automated, non-functional testing generally requires human input and oversight. There are several categories of non-functional testing which, among others, include assessing the reliability, usability, scalability, performance, and security of the application. While we will not discuss every facet of non-functional testing in detail, we will consider how some of these categories can be tested in the context of this project.

The accessibility of the software is a key consideration for this project and is a non-functional requirement which should be prioritised. During development, the accessibility of the

¹²¹ Martin, p.133.

software can be assessed using the W3C evaluation criteria discussed in section 3.2.2. It should be noted that a program's compatibility with these criteria cannot be tested by software and must be evaluated by a human tester familiar with the evaluation framework. To test the software's compatibility with different operating systems, virtual machines can be used. Several virtual machines can be run on a single computer concurrently, with each simulating a different test environment—this provides an inexpensive and efficient method of testing the program's performance under varying conditions.

There are many techniques to ensure the usability of the software. Observation testing can be a useful method for identifying tasks which users find difficult to perform. Under observation testing, users are asked to carry out specific tasks using the software and are observed either in person or remotely using screen capture software. They can also be asked to report back on their experience and to detail anything they found challenging or confusing about the software. A subset of observation testing, Wizard of Oz testing,¹²² can be employed when the system is not yet fully functional. In Wizard of Oz testing (so called for its resemblance to the 'man behind the curtain' in the 1939 film) users are given the impression that they are interacting with fully functional software. In reality, the responses are being generated by a human controller. This allows for meaningful testing of the proposed design and interface while the software is still in the early stages of development.

While we can assume that a certain number of testers could be recruited with relative ease in a university environment, they will lack the diversity required to ensure thorough testing. Crowdsourcing offers an inexpensive method of accessing a wide range of participants, with more diversity than could easily be achieved with local recruitment. While not suitable for every facet of non-functional testing, there are many aspects of testing which can benefit from crowdsourcing. A/B testing, in which different users are shown different versions of a

¹²² Green and Wei-Haas.

website or software interface, can benefit significantly from crowdsourcing. With A/B testing quantitative results are key, and the large numbers of respondents provided by crowdsourcing platforms enable developers to easily determine which variant is the most engaging. Crowdsourcing can also be significantly cheaper than employing in-person tests. A 2010 study¹²³ found that using Amazon Mechanical Turk to carry out an experiment gave the same overall results as the lab-based experiment, at one sixth of the cost.

However, there are significant ethical concerns emerging around crowd-sourced labour; in particular, that facilitated by Amazon Mechanical Turk. A 2018 study found that MTurk workers earned a median hourly wage of approximately \$2 per hour, with only 4% earning above the US federal minimum wage of \$7.25 per hour.¹²⁴ Furthermore, many MTurk workers are under or unemployed;¹²⁵ Burnette et al. report various participants experiencing financial distress after their submission was rejected, and express concerns that data reliability could be skewed by this financial need.¹²⁶ Other crowdsourcing sites such as Prolific stipulate a minimum payment per hour in the hope of mitigating these consequences.¹²⁷ If crowdsourced labour is used in this project, we must respect the participants involved: workers should be adequately compensated for their time, and the expectations of the researcher should be made clear to them. Where tasks or instructions are ambiguous, participants can become frustrated if their submission is then rejected. We must

¹²³ Rogers, Sharp, and Preece, p.448.

¹²⁴ Kotaro Hara and others, 'A Data-Driven Analysis of Workers' Earnings on Amazon Mechanical Turk', 2018 <<https://doi.org/10.1145/3173574.3174023>>, p.10.

¹²⁵ Ilka Helene Gleibs and Nihan Albayrak-Aydemir, 'Ethical Concerns Arising from Recruiting Workers from Amazon's Mechanical Turk as Research Participants: Commentary on Burnette et Al. (2021)', *International Journal of Eating Disorders*, 55.2 (2022), 276–77 <<https://doi.org/10.1002/EAT.23658>>.

¹²⁶ C. Blair Burnette and others, 'Concerns and Recommendations for Using Amazon MTurk for Eating Disorder Research', *International Journal of Eating Disorders*, 55.2 (2022), 263–72 <<https://doi.org/10.1002/EAT.23614>>.

¹²⁷ 'Pricing', *Prolific* <<https://www.prolific.co/pricing>> [accessed 18 May 2022].

remain transparent about the qualifications for payment and make tasks as comprehensive as possible.

In addition, crowdsourcing often presents problems with data quality, with some users selecting answers indiscriminately in order to finish the study more quickly. This can be mitigated somewhat through the insertion of specific questions designed to check whether a respondent is reading each question before responding—these are known as ‘attention tests’ or ‘honey pots’. To improve the chances of collecting meaningful data, crowdsourcing tasks must be carefully written to ensure that participants understand what is expected of them; tasks should adequately compensate participants to incentivise meaningful responses; and tasks should contain at least one test to ensure that respondents are not choosing answers indiscriminately. With these requirements met, crowdsourcing is more likely to produce a usable result.

The final aspect of non-functional testing we will consider is cybersecurity. Wherever information is being sent over the internet, we must adequately protect against malicious use. While a literary archive may not seem to be an obvious target for hackers, we have an ethical and legal responsibility to protect the information stored within—this will inevitably include personal data such as the names and email addresses of the archive’s administrative staff. Furthermore, unauthorised access to the software could cause untold damage: as mentioned in the previous section on implementation, a successful SQL injection attack could see the contents of the archive erased completely. While no system is completely impenetrable, good practice can ensure these risks are mitigated. The Open Web Application Security Project (OWASP), the world’s largest non-profit software security organisation, provides guidance and education on establishing and improving the security of online applications. Of particular note is their ‘top ten’ list, which details the ten most critical security threats currently facing online applications; they recommend that organisations use

this document as a ‘first step’¹²⁸ in producing more secure code and ensuring that web applications are adequately protected against threats. While this list is by no means exhaustive, it provides a solid grounding in cyber security. Throughout development, security must be a consideration: most programming languages now provide various functions to protect against data mishandling, and the appropriate use of these features as well as good coding practice will ensure that any software developed is adequately protected.

3.5 Maintenance and documentation

There is a significant need within digital humanities for lasting software which can aid in genetic criticism. A widely used program designed to aid in comparing versions of text, Juxta, was available for several years before being discontinued in 2020 due to a lack of funds. Unfortunately, this is not uncommon. It is recommended that software be rewritten every seven years or so to prevent obsolescence,¹²⁹ but this can often prove difficult for projects with limited budgets and manpower, particularly if the program has not been created with maintainability in mind. While every program will eventually reach the end of its lifecycle, ensuring that a program is well-written and easy to maintain can significantly extend this expected lifetime. In this chapter, we will examine the concept of maintainability and how it relates to this project. We will also consider the creation of software documentation, and how this can aid in the usability and maintenance of software.

3.5.1 Software maintenance

Like hardware, software becomes less efficient over time as the environment around it changes. It is considered to have a lifetime, after which point it must be changed or replaced. This lifetime depends on many factors such as the operating environment and the initial quality of the program’s codebase. While we cannot control every factor relating to the

¹²⁸ ‘OWASP Top Ten’, *OWASP Foundation*, 2022 <<https://owasp.org/www-project-top-ten/>>.

¹²⁹ Robert C. Martin, *Clean Code* (Crawfordsville: Pearson Education, 2009), p.xxi.

program's lifetime, software which is well written and designed to be maintainable will last longer before needing to be significantly refactored or replaced.

While maintenance is carried out after the software's release, the maintainability of the program is primarily determined during the development process. Good coding practices are essential in the development of software which is robust and maintainable. While it is not feasible to list every characteristic of 'good' code, there are several key elements which are essential.

First, code should have a considered design and a clear structure; this will make it easier to write, manage, and maintain; thorough planning in the requirements elicitation and design stages will help to ensure this. Each code module should perform only one function, and these modules should not be dependent on one another. This will make it easier to test, debug, and maintain the code. Duplication should be avoided as this can quickly lead to inconsistencies throughout the codebase. For example, if handwritten and typed documents were to be presented differently in the archive software, it would be impractical to write two versions of the archive's interface code, each with minor changes. Instead, a single version should be written to act as the basis of the interface, with additions for each document type being implemented through functions.

Second, code should be comprehensible: the purpose and function of each module should be clear to another developer. Often, maintenance is carried out by a person other than the original developer: in this case, we anticipate that the software will be managed by an organisation such as the Digital Library of the Caribbean. As Martin states, 'Making your code readable is as important as making it executable.'¹³⁰ If code can be easily read and understood, it will be easier for developers to implement new features or to find and correct errors. Making code readable need not be difficult: consistent formatting, sensible variable

¹³⁰ Martin, p.xxi.

names, and meaningful comments will help to ensure this. While the responsibility of code quality begins with the original developer, it does not end there: whenever code is being changed, whether a new feature is being added or a fault is being rectified, it is important that the new code integrates seamlessly into the old. If future developers fail to respect the style of the original code, the codebase will end up disorganised and difficult to read, and ultimately difficult to maintain.

Regardless of our efforts, it is inevitable that the software will eventually fail. All digital mediums, no matter how advanced, eventually become obsolete, and this must be a consideration in their use in preserving analogue media. The digitisation of archival materials can improve their accessibility and help to preserve them, but it is not infallible. Preservation is a continuous action: there must be a plan for long term management and storage of both the physical and digital forms of these materials. While digital files do not degrade as physical materials do, the software and hardware used to store and access them will change and eventually be replaced; the files must be updated accordingly lest they too become obsolete and inaccessible. For example, the information stored on a floppy disc is now inaccessible to most users: Sony, their last remaining manufacturer, discontinued their production in 2011, and internal floppy disc drives had become obsolete long before this point.¹³¹ From their invention by IBM in 1971,¹³² floppy discs had a lifespan of forty years; compare this to a manuscript from the 15th century—such as those documented in the University of Glasgow’s incunabula project—which can still be read and understood five hundred years after its creation.¹³³ However, herein we find one of the main advantages of digital media—its adaptability. While a physical manuscript cannot be meaningfully

¹³¹ IBM, ‘IBM100 - The Floppy Disk’, *IBM*, 2011

<https://www.ibm.com/ibm/history/ibm100/us/en/icons/floppy/transform/> [accessed 1 June 2022].

¹³² IBM.

¹³³ ‘Glasgow Incunabula Project’, *University of Glasgow*

<https://www.gla.ac.uk/myglasgow/incunabula/welcome/> [accessed 1 June 2022].

changed without compromising its integrity, a digital file can be transformed as many times as is required. There are no consequences to its duplication or transportation—if it must be moved to a different server or converted to another file type—it will be functionally identical to the original file. As long as the digital files are maintained and updated as required, they can and will outlast the software built to host them—and possibly their physical counterparts, too.

3.5.2 Documentation

Essentially, documentation details how a program works, any known faults and what has been done to fix them, and the history of the program with details of what has changed over time. Documentation should be created throughout the software development process and allows developers to better understand and maintain it after release. In addition, user documentation is essential in facilitating access to and use of the software.

Software documentation can take many forms, from detailed logs of the software's version history to simple comments in code. Often, programs are maintained by developers other than those part of the original project, and documentation allows them to quickly familiarise themselves with the code structure and contents. Good documentation saves time and effort, allowing developers to understand the program without having to read through the entire codebase. In keeping track of the software's known faults and their solutions, we enable developers to learn from others' mistakes and avoid repeating them.

Despite its importance to the legacy of the software, documentation is often neglected in software development, particularly outside of the private sector. In interviews with contributors to open-source software, Geiger et al. found that many developers feel documentation work is perceived by users as 'less valued, less important, and less

“technical” than coding new features or fixing bugs.’¹³⁴ Documentation is usually written after a new feature has been developed and is ready for release, and Geiger et al. report that it is common for documentation to be overlooked as developers instead move to the next feature to be implemented.¹³⁵ In addition, creating documentation requires a knowledge of technical writing, which some developers may find difficult. Geiger et al. report that of the eleven interviewees, only two stated that they enjoyed writing documentation, and had ‘extensive previous experience in other forms of writing, as well as having high competency in the English language.’¹³⁶ **It is clear that documentation must be a priority in this project, despite its frequent neglect in both commercial and open-source software development.**

While these kinds of documentation are aimed to inform future developers, there are also many types of documentation aimed at users of the software. So called ‘user documentation’ can include accessible summaries of the software’s features, as well as tutorials on how to use the software.¹³⁷ When looking to this form of documentation, it is important to remember the project’s context: as we aim to build accessible software, so too must we write accessible documentation. User documentation should be written in plain language without the use of jargon and should be available in any language the archive supports (we anticipate English, French, and Kreyòl). In addition, non-traditional documentation mediums such as video tutorials should be considered to widen access to those who may struggle with written instructions. To this end, we can consider either embedding videos in the archive’s webpages or upload them to YouTube—a platform widely used by Haitians.¹³⁸

¹³⁴ R. Stuart Geiger and others, *The Types, Roles, and Practices of Documentation in Data Analytics Open Source Software Libraries A Collaborative Ethnography of Documentation Work, ECSCW 2018 - Proceedings of the 16th European Conference on Computer Supported Cooperative Work (Computer Supported Cooperative Work (CSCW), 2018)*, p.793.

¹³⁵ Geiger and others.

¹³⁶ Geiger and others, p.791.

¹³⁷ Geiger and others.

¹³⁸ Wagner, p.630

Any documentation created should be stored in a universal file format for ease of access and should be included with any hard copies of the data.

4. The ethical concerns of digitisation

While the previous chapter on software development aimed to answer questions on the practical elements of the project's development, there are also many important ethical questions which arise when attempting to document a nation's literary heritage, particularly that of a former colony such as Haiti.

In his iconic essay on the subject, Derrida states, 'Nothing is less reliable, nothing is less clear today than the word "archive"'.¹³⁹ Those words were written in 1995, and now, almost thirty years later, they are more relevant than ever. Derrida argues that an archive requires a 'residence', a place where materials are gathered together. While this initially suggests a physical location, equally it can be argued that a digital archive can also offer this 'residence': an online archive is indeed a place where related materials are gathered and stored together, in a manner which is navigable and referenceable. In some ways, the materials are indeed scattered—the storage could be spread over several different servers, or if stored on a hard drive, each document may be split into pieces and deposited at random throughout the disc. However fragmented they may be in reality, to the user, they appear all in one place; perhaps this is the beauty of digitisation: it allows us to create the illusion of this singular 'residence' without being limited by it. While a museum collection must be toured around various locations, a digital archive can be accessed concurrently by people all over the world: it does not privilege one audience over another.

The 'guardians' mentioned by Derrida have changed, too—with the accessibility offered by the internet, an archive can now constitute the efforts of individuals and organisations all over the world. Community archiving efforts can include diasporic Haitians, whose voices may otherwise have been missed. Technology has granted us the opportunity to reimagine

¹³⁹ Jacques Derrida and Eric Prenowitz, 'Archive Fever: A Freudian Impression', *Diacritics*, 25.2 (1995), pp. 9–63, p. 57.

the concept of the archive: where they were once the realm of the privileged, they can now be built for and used by the communities they aim to serve. Where colonisers removed artefacts from their places of origin, digitisation can grant access to these materials from anywhere in the world. Regardless, it is important to state that we are not recreating or replacing these archival materials—rather, we are attempting to represent them as accurately as possible. Digitisation should only ever be used as a complement to physical archives; it cannot replace them.

In this chapter, we will aim to examine the legacy of colonialism in the Caribbean and consider how it will impact our work on this project. We will also discuss the impact of globalisation on minority cultures, and Haiti's misrepresentation in Western media. Finally, we will consider the limitations of digital representations of physical artefacts, and how these limitations are perceived by different cultures.

4.1 Legacies of colonialism

When considering the ethics of establishing an archive for literary artefacts, it is worth looking to the history of writing itself. Cuneiform script, established in Mesopotamia c. 3200 BC, is accepted to be the first example of a writing system in human history. While the system eventually evolved to a form complex enough to encapsulate religious texts and other writings, in its first five hundred years of existence it was used exclusively for accounting purposes, with symbols impressed into clay representing debts and payments, and goods distributed and received.¹⁴⁰ If we consider that the origin of human writing itself is in record-keeping, it is perhaps of little surprise that its history in Haiti and the Caribbean was also largely for administrative purposes. Key to any colonial power is good record-keeping: reports must be written, laws and directives must be communicated effectively and in a

¹⁴⁰ Denise Schmandt-Besserat, *Writing, Evolution Of*, *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*, Second Edi (Elsevier, 2015), xxv <<https://doi.org/10.1016/B978-0-08-097086-8.81062-4>>.

timely manner, and any stirring unrest must be closely monitored.¹⁴¹ Anything considered of importance was transported to the colonial governments, and after the emancipation of the colonies much was destroyed or repatriated to these governments. Unfortunately, the temperate conditions in the Caribbean and a lack of concerted archival efforts have meant that most documents related to everyday life in Saint-Domingue have been lost; consequently, most of the surviving archival records from this period are largely impersonal and mostly consist of reports which tell us little about the lived experience of slaves in Saint-Domingue. In his essay on archives in the French department of Guadeloupe, Laurent Dubois highlights this issue, stating, '[...] like most such material, they contain virtually no documents emanating from the majority slave population of the island or even from the educated gens de couleur'.¹⁴² Here we find the so-called 'silences' in the archives – the noticeable absence of information about ordinary Haitians.

These silences are found throughout the Caribbean. In her work in recording oral histories in Montserrat, Gracelyn Cassell highlights this disparity between archival documents and lived experience. In 1988 she interviewed a man called Thomas 'Sugar' Riley, a Montserrat resident who was an innocent bystander in a shooting by a British officer.¹⁴³ Despite Thomas spending five months in hospital with injuries which left him permanently disabled, the British National Archives have no apparent record of him; indeed, all archival accounts of the incident state merely that the officer's actions were found to be justified.¹⁴⁴ This case is

¹⁴¹ John A.S Aarons and Sharon Alexander-Gooding, 'Historical Developments in Caribbean Archives and Record Keeping', in *Decolonizing the Caribbean Record: An Archives Reader*, ed. by Jeannette A. Bastian, Stanley H. Griffin, and John A. Aarons (Sacramento: Litwin Books, 2018), pp. 11–53.

¹⁴² Laurent Dubois, 'Maroons in the Archives: The Uses of the Past in the French Caribbean', in *Decolonizing the Caribbean Record: An Archives Reader*, ed. by Jeannette A. Bastian, Stanley H. Griffin, and John A. Aarons (Sacramento: Litwin Books, 2018), pp. 411–30.

¹⁴³ Gracelyn Cassell, 'Capturing Personal Stories, Oral Histories, and Microhistories: A Case Study from Montserrat', in *Decolonizing the Caribbean Record: An Archives Reader*, ed. by Jeannette A. Bastian, Stanley H. Griffin, and John A. Aarons (Sacramento: Litwin Books, 2018), pp. 461–74.

¹⁴⁴ Cassell, pp. 472-473.

not unusual: archives routinely silenced the voices of the lower classes, allowing colonisers to perpetuate the narrative of locals as unruly and uncivilised—and therefore deserving of the harsh treatment bestowed upon them. While Cassell's work has not changed the records of the British National Archives, it has given a voice to Thomas, preserved his story, and offered a fuller and more realistic account of the 1942 incident.

While creating an archive for Haitian literary artefacts will not unsilence these colonial archives, it is hoped that it will ensure the adequate representation of Haitians in archives of the future. In working to preserve manuscripts, notebooks, and other literary artefacts, we ensure the preservation of Haitian voices for future generations. While we cannot change the past, we can work towards a better and more balanced future of archiving.

While the aim of preserving written testimonies is ostensibly an altruistic one, it is not without flaws. Historically, colonial governments favoured written artefacts over oral testimonies, and used written documents as a method of control over their subjects. We must ask, in prioritising the preservation of written artefacts, do we perpetuate this notion of the written testimony as greater than the oral? While physical artefacts face deterioration, oral testimonies are in many ways even more fragile—with increasing political instability in Haiti and thousands of Haitians leaving the country's capital,¹⁴⁵ we risk losing decades of traditional knowledge passed down through stories and songs as communities are forced apart. Perhaps the evolution of technology means we no longer have to make this choice. While the proposed archive aims to catalogue and preserve literary artefacts, it could potentially be expanded in the future to include other forms of media such as oral testimonies or videos. This perspective will be discussed in more detail in section 4.4.

¹⁴⁵ Etant Dupain and Eliza Mackintosh, 'Haiti: Gang Violence Leaves Nearly 200 Dead in a Month', *CNN*, 2022 <<https://edition.cnn.com/2022/05/31/americas/haiti-gang-violence-intl/index.html>> [accessed 3 June 2022].

Furthermore, while the history of writing in Haiti is complex, we cannot deny the country's rich and complex literary culture. While the testimonies of ordinary people were silenced under colonial rule, the terroristic regime of François 'Papa Doc' Duvalier in the 20th century saw widespread censorship of the press and the exile or execution of swathes of authors and journalists. Consider, for example, the case of Marie Vieux-Chauvet. A successful Haitian author, she was forced into exile in the United States after the publication of her work *Amour, colère, et folie* by a French publishing house in 1968. Viewed by the Duvalier regime as an attack on its policies and leader, Vieux-Chauvet's family feared retribution from Papa Doc's Tonton Macoutes; consequently, the author's husband travelled to Haiti and bought every copy of the book he could find before destroying them, and the publisher's remaining copies were purchased by her daughters a few years later. Consequently, the novel was believed to be lost for almost thirty years, with copies remaining elusive until the trilogy's eventual republication in 2005.¹⁴⁶ Vieux-Chauvet's example is just one of countless writers and journalists silenced under the dictatorship, and it highlights the fragility of all works of literature, even those purchased and printed by a foreign publisher. Now a member of the Académie française, Dany Laferrière is another example of an author who faced persecution under Papa Doc's oppressive rule. Forced to flee his native Haiti at the age of only twenty-three, he recounts his experiences in his semi-autobiographical works *Le Cri des oiseaux fous* and *Chronique de la dérive douce*: respectively, a novel set in the hours before the narrator flees to exile, and a selection of prose poems depicting the narrator's first year in Montreal. These works of Vieux-Chauvet and Laferrière, while not strictly autobiographical, provide crucial insight into life under the Duvaliers—testimonies the regime worked hard to suppress. These authors and countless others made significant sacrifices to inform the world

¹⁴⁶ Madison Smartt Bell, 'Permanent Exile: On Marie Vieux-Chauvet', *The National* (New York City, 14 January 2010) <<https://www.thenation.com/article/archive/permanent-exile-marie-vieux-chauvet/>> [accessed 2 June 2022].

of Haiti's plight; as academics, we owe it to them to ensure their work is accessible to future generations. In helping to preserve literary artefacts created during and after the dictatorship, we assist in the effort to unsilence this dark period in Haiti's history.

While Haiti is no longer under dictatorship, its political situation remains turbulent: before his assassination, President Jovenel Moïse faced widespread protests and calls to resign in a dispute over his presidential term;¹⁴⁷ Prime Minister Ariel Henry, who himself survived an apparent assassination attempt in January 2022,¹⁴⁸ is speculated to have been involved in Moïse's death.¹⁴⁹ While Henry had pledged to resign after national elections were held, he has not yet set a date for the vote. It is likely that many of the artefacts created in this period of social and political unrest will, in future, be considered historically significant, but like those of years past, they risk being lost to censorship or environmental damage. This risk is currently exacerbated by high levels of gang violence which has seen numerous schools and medical centres burned down, and thousands of Port-au-Prince residents leave their homes to seek temporary refuge elsewhere;¹⁵⁰ furthermore, Haiti's fuel crisis has led to numerous fires as fuel is increasingly stored in unsafe conditions: in December 2021, there were three fatal fuel-related fires reported in four days.¹⁵¹ While a digital archive will not solve these issues, it is hoped that its creation and maintenance will help to ensure that testimonies from historical events past, present, and future can be preserved for future generations.

¹⁴⁷ Rose Delaney, 'Dispute over Haiti Presidential Term Triggers Unrest', *BBC News*, 2021 <<https://www.bbc.co.uk/news/world-latin-america-56069575>> [accessed 3 June 2022].

¹⁴⁸ 'Haiti PM Ariel Henry Survived Assassination Attempt - Officials', *BBC News*, 2022 <<https://www.bbc.co.uk/news/world-latin-america-59863052>> [accessed 3 June 2022].

¹⁴⁹ Anatoly Kurmanaev, 'Haitian Prime Minister Had Close Links With Murder Suspect', *The New York Times* (Mexico City, 10 January 2022) <<https://www.nytimes.com/2022/01/10/world/americas/haitian-prime-minister-assassination-suspect.html>> [accessed 3 June 2022].

¹⁵⁰ Dupain and Mackintosh.

¹⁵¹ 'Third Fatal Fire Occurs in Haiti, Government to Halt Fuel Handling Authorizations', *The Haitian Times*, 16 December 2021 <<https://haitiantimes.com/2021/12/16/third-fatal-fuel-fire-occurs-in-haiti-government-to-halt-authorizing-companies/>> [accessed 3 June 2022].

Another element to consider is the removal of artefacts from their place of origin. Western nations, and Britain in particular, have a legacy of removing artefacts from their countries of origin in order to preserve them. Many of these artefacts hold great significance in their native cultures, and the debates around repatriation of such items are ongoing. The British Museum has faced criticism in recent years for their collection of objects from various indigenous cultures: in particular, the two moai from Rapa Nui which were gifted to the museum by Queen Victoria in 1869. In 2018 a formal request was made to return them to the island, as natives consider each not as an inanimate statue, but the ‘living incarnation’¹⁵² of the ancestor they were created to resemble. To this end, sculptor Benedicto Tuki has offered to carve another, identical, statue free of charge to replace Hoa Hakananai'a—the larger of the two moai.¹⁵³ However, the British Museum argue that by presenting the moai to the public they are not only preserving the statues, but increasing awareness and knowledge of Rapa Nui’s history and culture.¹⁵⁴ Some agree with this argument: Rapanui archaeologist Sonia Haoa says the British Museum’s moai are ‘the face of Rapa Nui abroad’, and highlights the role they play in promoting the island’s tourism industry, their main source of income.¹⁵⁵

Perhaps, then, we can view these artefacts not just as objects taken from their country of origin, but as cultural ambassadors which help to increase the visibility and understanding of the peoples they are from. It is important to keep this duality in mind when we consider literary artefacts in Haiti. Over the years, Haiti has had many of its resources exported for

¹⁵² John Bartlett, “‘Stolen Friend’: Rapa Nui Seek Return of Moai Statue’, *BBC News*, 2018 <<https://www.bbc.co.uk/news/world-latin-america-46222276>> [accessed 31 May 2022].

¹⁵³ Bartlett, “‘Stolen Friend’: Rapa Nui Seek Return of Moai Statue’.

¹⁵⁴ ‘Moai’, *The British Museum* <<https://www.britishmuseum.org/about-us/british-museum-story/contested-objects-collection/moai>> [accessed 31 May 2022].

¹⁵⁵ John Bartlett, ‘Easter Islanders Call for Return of Statue from British Museum’, *The Guardian* (Santiago, 4 June 2019) <<https://www.theguardian.com/culture/2019/jun/04/easter-islanders-call-for-return-of-statue-from-british-museum>> [accessed 31 May 2022].

trade—in the time of Saint-Domingue it was mainly sugar cane and coffee; after the nation gained its independence, large volumes of timber were exported to support the country's economy. The scars of these enterprises run deep through Haiti's landscape—years of exploitation have left a land which is deforested and eroded. When we consider how best to preserve the country's literary heritage, it becomes clear, then, that a priority must be to keep the materials in Haiti—we can no longer justify the removal of large numbers of artefacts from their native contexts, despite any goodwill behind it. Instead, we must work with the governments and people of these countries to help to preserve these items, without removing them. Efforts have already been made to enhance Haiti's archives, with Dr Rachel Douglas of the University of Glasgow working with the Digital Library of the Caribbean to stabilise and digitise the collections of MUPANAH and ANH¹⁵⁶—further funding of projects such as these are critical to the conservation of this aspect of Haiti's cultural heritage.

4.2 Cultural misrepresentation

Aside from the preservation of literary artefacts, another aim of this project is to increase the accessibility of them, in Haiti and throughout the world. In doing so, it is hoped to facilitate and encourage academic study into Haitian literature. However, globalisation brings with it certain risks, namely the appropriation and commercialisation of minority cultures and religions. While Western perceptions of Haiti have been heavily influenced by socio-political factors such as the AIDS epidemic and the Duvalier dictatorship, it can be argued that negative perceptions of the nation have been present in much more insidious forms for decades. William Seabrook's *The Magic Island* is credited with introducing the concept of zombies to the United States—in his sensationalist portrayal of Haiti, he details his induction to the religion by a Vodou priestess, complete with ritualistic sacrifices and blood-drinking. It later inspired the film *White Zombie*, the first feature-length zombie film to be produced.

¹⁵⁶ School of Modern Languages and Cultures, 'Grant Acquisition', *University of Glasgow*, 2020
<https://www.gla.ac.uk/schools/mlc/aboutus/news/headline_623556_en.html> [accessed 31 May 2022].

Arguably, this was the beginning of the gross misrepresentation of the concept of Haitian zombies in modern media.

Zombies in Haitian folklore are rich in history and symbolism: they are not the violent and bloodthirsty monsters of Hollywood fame. Rather, they are individuals whose *ti bon ange*¹⁵⁷ has been taken by a sorcerer, leaving them as a depersonalised body which can be put to manual labour.¹⁵⁸ The zombie has no memories, and is rendered completely obedient to its master until it is eventually—if ever—released from servitude. Often, the figure of the zombie is representative of exploitation, with their body put to work on plantation fields in scenes reminiscent of the slaves of Saint-Domingue. The zombie may also represent political oppression—in Frankétienne’s *Les Affres d’un défi*, the villagers live in fear of the sorcerer Saintil, who turns his political opponents to zombies; in this way, the novel functions as an allegory for François Duvalier’s rule,¹⁵⁹ particularly as Papa Doc modelled himself on the image of Baron Samedi, a *lwa* of Haitian Vodou. This nuance is lost in mainstream representations of zombies, which aim instead to shock and horrify audiences.

This problem is not exclusive to Haiti—indeed, many cultures throughout the world have fallen victim to it. Consider, for example, the *windigo*. Stripped of its origins in Algonquian culture, the creature has been quickly reduced to a generic antagonist which has featured in countless comic books, films, and video games. In Ojibwe culture, the *windigo* is representative of the dangers of greed and selfishness; stories involving *windigo* often ‘offer important lessons on how an Ojibwe person can live in a dignified and balanced way.’¹⁶⁰

¹⁵⁷ In Vodou, this is the part of the soul responsible for personality and willpower.

¹⁵⁸ Kaiama L. Glover, ‘Exploiting the Undead : The Usefulness of the Zombie in Haitian Literature’, *Journal of Haitian Studies*, 11.2 (2005), 105–21.

¹⁵⁹ Glover.

¹⁶⁰ Brady DeSanti, ‘The Cannibal Talking Head: The Portrayal of the Windigo “Monster” in Popular Culture and Ojibwe Traditions’, *Journal of Religion and Popular Culture*, 27.3 (2015), pp. 186–201
<<https://doi.org/10.3138/jrpc.27.3.2938>>, p.187.

Furthermore, the *windigo* has been used by indigenous groups to symbolise the destruction wrought upon native lands and people by colonisers, and the dangers of uncontrolled capitalism on modern society.¹⁶¹ However, its representation in mainstream media does not depict any of this cultural context; instead, much like the Haitian zombie, it has been simplified and commercialised to the point that it is only a superficial depiction of the original. In comparing these two elements of folklore, we highlight the strange duality of religions which are still actively practised, but which mainstream media regards as fantastic.

It is not only the horror genre which misrepresents Haitian Vodou: it is present too in children's media. *The Princess and the Frog* represented a milestone for the Disney corporation: it is the first of their films to feature an African American princess. Set in New Orleans, it was perhaps inevitable that Vodou would be mentioned: the religion is an intrinsic part of the city's history. However, instead of the representation some might have hoped for, objects and rituals associated with Haitian Vodou are repeatedly maligned in the film, associated with the main antagonist Dr Facilier. It is not explicitly stated that Dr Facilier is Haitian; indeed, the film struggles to decide on his identity, conflating several Afrodiasporic religions in its use of props and iconography.¹⁶² However, the film does at least draw inspiration from Haitian Vodou: the initial casting calls for Facilier referred to the character as Dr Duvalier, a decision which was changed only after criticism from an outside organisation.¹⁶³ In an interview with the Wall Street Journal, co-director John Musker explains that he thought it a 'fun name' and assumed the film's audience would not recognise it.¹⁶⁴ Whether or not this transpired to be true is immaterial: in this quip, Musker reduces the

¹⁶¹ DeSanti, pp.195-196.

¹⁶² Elizabeth Pérez, "'I Got Voodoo, I Got Hoodoo': Ethnography and Its Objects in Disney's *The Princess and the Frog*", *Material Religion*, 17.1 (2021), pp. 56–80 <<https://doi.org/10.1080/17432200.2021.1877954>>.

¹⁶³ Christopher John Farley, "'The Princess and the Frog': After Being Downsized, a Filmmaking Team Is Back on the Big Screen', *Wall Street Journal* (New York City, 6 December 2009) <<https://www.wsj.com/articles/BL-SEB-16284>> [accessed 4 June 2022].

¹⁶⁴ Farley.

Duvalier regime, which terrorised Haitians for almost three decades, to a mere footnote. The decision to code Haitian Vodou as a malevolent force in the film is perhaps one of ignorance rather than malice, but still the question lies: is this a responsible use of Disney's influence? Henry Giroux states that Disney holds 'enormous sway over the norms and values associated with U.S. and global popular culture'¹⁶⁵; therefore, it is not unreasonable to assume that *The Princess and the Frog's* treatment of Vodou has helped to shape the attitudes of individuals in the US and beyond.

Journalists and media correspondents are also guilty of misrepresenting Haiti. Consider, for example, the infamous case of American journalist Gabriel Mac (formerly known as Mac McClelland), who put a Haitian woman in danger by live-Tweeting about her ride to the hospital after being gang-raped. In a page which has since been deleted, his employer (magazine *Mother Jones*) shared the Tweets, praising his 'amazing real-time reportage'¹⁶⁶ and imploring readers to donate to the journalist in order to fund his trip. Mac was criticised not only for failing to obtain consent from the woman, now identified as K*, but for his characterisation of Haiti: in an open letter¹⁶⁷, thirty-six female journalists and researchers criticised the stereotypes employed by Mac and accused him of contributing to the 'continued marginalization'¹⁶⁸ of Haitian women.

In archiving Haitian literary artefacts we aim to preserve them, but we also aim to improve their accessibility and their reach. It is hoped that in making it easier to study and analyse

¹⁶⁵ Henry A. Giroux and Grace Pollock, *The Mouse That Roared: Disney and the End of Innocence*, 2nd edn (Plymouth: Rowman & Littlefield Publishers, 2010)

<<https://ebookcentral.proquest.com/lib/gla/reader.action?docID=500835>>.

¹⁶⁶ Max Fisher, 'The Reporter and the Rape Victim', *The Atlantic*, 25 July 2011

<<https://www.theatlantic.com/international/archive/2011/07/the-reporter-and-the-rape-victim/242445/>>

[accessed 16 May 2021].

¹⁶⁷ Jessica Coen, 'Female Journalists & Researchers Respond To Haiti PTSD Article', *Jezebel*, 2011

<<https://jezebel.com/female-journalists-researchers-respond-to-haiti-ptsd-5817381>> [accessed 16 May 2021].

¹⁶⁸ Coen.

versions of Haitian literature, we will encourage academic study in this area—potentially raising awareness of Haiti’s history and culture while encouraging people to think critically about the image the media portrays of the country. However, as seen with the given examples, there remains a risk that only certain elements will be chosen to represent the face of Haiti’s rich culture, reducing it yet again to a sensationalist and shallow portrayal.

4.3 Limitations of digital archives

René Magritte’s famous work *The Treachery of Images* is captioned ‘Ceci n’est pas une pipe.’ While initially this may seem nonsensical, it quickly becomes apparent that the artist is right—it is not a pipe; rather it is only a painting of one. In this work, Magritte ‘points to the unbridgeable gap between objects and their representation’,¹⁶⁹ an important consideration when examining the case for digital archives. It is important to bear in mind that when we digitise a text we are not replicating the physical object or transporting it—rather, we are transforming it into something new and separate; at best, the corresponding digital file can only represent the artefact it is based on. The digitisation of these artefacts is intended as an act of preservation, which aims to improve accessibility and to mitigate the effects of physical damage. However, the question remains: what is lost in the process of digitising? And does this loss matter? In this section we will consider these questions, as well as discussing which materials should be chosen for digitising, and the potential for the archiving of other forms of media in the future.

¹⁶⁹ Eric Rinckhout, *Magritte Unveiled*, ed. by Stephanie Lemmens, trans. by Mike Wilkinson and Clare Wilkinson, 1st edn (Antwerp: Manteau, 2017).



Figure 4.1 René Magritte, *The Treachery of Images*, c. 1929, oil on canvas, 60 × 81 cm, Los Angeles County Museum of Art.

One rudimentary form of archiving would be to take photographs, scans or photocopies of each object, which would then be stored in a repository online. Like John Jost and the music of Élie, this would serve the purpose of preserving the documents for future generations. However, in many cases, images alone cannot provide adequate representation. For many cultures, physical objects and locations are intrinsically linked to an object's significance. For the indigenous Wardaman people in Australia's Northern Territory, a formation known as the 'Moon Rock' is central to their creation story. The rock features paintings of animals and human faces, as well as imprints of human and animal feet. While to Western cultures these images would seem to be representative of the creation story, this is not the case: for the Wardaman people, these marks are the physical traces left when their ancestors entered the rock; they are the embodiment of their ancestors' spirits.¹⁷⁰ The same can be seen with the moai of Rapa Nui discussed earlier in this chapter; for these peoples, the physical object is sacred; a representation of it does not have the same meaning or significance. While literary manuscripts do not hold the same spiritual significance, the physical object holds a wealth of information which cannot be adequately contained in a photograph. The story of each document is found in its physicality—the ink which forms the words, the paper they

¹⁷⁰ 'Episode One', *The Secret History of Writing*, BBC Four, 28 September 2020.

are printed on, the thread it is bound with and the glue that is used—all these elements contribute to a full picture of the time and place that the artefact was created. An image can never fully replace a physical object, nor can it replicate the smell or feel of a document.

Furthermore, an online archive, while providing access to these materials throughout the world, will inevitably present them in a sterile online environment which cannot convey the context in which these documents were created. So much of Haitian literature is directly related to the nation itself—consider Dany Laferrière’s *Tout bouge autour de moi*, Yanick Lahens’s *Faillies*, and Frankétienne’s *Le Piège*, all written in the direct aftermath of the 2010 earthquake. A digital representation of the manuscripts of these works cannot fully convey the urgency present in them: the ink blots, the eraser marks, the pressure with which a pencil has been applied to the paper. Nor can it convey the fragility of Lahens’s yellow notebooks containing her future novel *Guillaume et Nathalie* which were almost destroyed during the earthquake.¹⁷¹ Regardless of the accuracy of digitisation attempts, they should only ever be used as a complement to physical archives, not as their replacement. While they can effectively convey many aspects of the original document, it is impossible to encapsulate every one.

4.4 Other forms of media

While this thesis calls specifically for the establishment of a digital archive for Haitian literary artefacts, there have been calls for the creation of audio archives in the Caribbean. In her essay on the subject, Elizabeth F. Watson states that ‘a considerable portion of the heritage of developing countries occurs in intangible forms such as music, languages, and other oral traditions’¹⁷² and this is true in Haiti, where traditional knowledge is still passed

¹⁷¹ Douglas, p.391.

¹⁷² Elizabeth F. Watson, ‘Breaking the Silence: The Case for Establishing Sound Archives in the Caribbean’, in *Decolonizing the Caribbean Record: An Archives Reader*, ed. by Bastian, Griffin, and Aarons, pp.523-571, p.525.

through songs and stories. In particular, Vodou songs are often used to teach younger generations of the nation's roots in slavery, and to teach them to serve the *lwa*. These songs are reflective not only of their religion, but of the place and people they belong to: each community has its own songs, which are constantly evolving and changing. As Benjamin Hebblethwaite states, 'songs are created, retained, transformed, and forgotten [...] it "is a continual process" in Vodou.'¹⁷³ In addition to the efforts made to record these songs in written form, the Digital Library of the Caribbean hosts a multimedia archive with audio and video recordings of these songs which may otherwise be lost.¹⁷⁴ The success of the vodou songs archive illustrates both the importance and necessity of such projects, and the feasibility of their realisation.

In addition, there is great potential for oral histories to be archived in the future. Through the story of Thomas 'Sugar' Riley we have seen the role of oral testimony in decolonising archives, and the importance of recording these microhistories. Oral histories are of particular importance in Haiti, which has a strong culture of storytelling; these stories, which have been passed down through generations, are used to impart morals and to caution against dangerous behaviour, as well as teaching Haitian customs and history. Author Évelyne Trouillot has expressed concern that these storytelling traditions are being lost in the rush of modern society, and believes that Haitians must fight to keep the tradition alive.¹⁷⁵ The ubiquity of technology means that recording these oral histories is now a much easier task. When Cassell conducted her interview with Riley in 1988, she was 'Armed with a

¹⁷³ Benjamin Hebblethwaite, *The World of Vodou Songs* (Philadelphia: Temple University Press, 2011).

¹⁷⁴ 'Vodou Archive', *Digital Library of the Caribbean* <<https://dloc.com/collections/vodou>> [accessed 26 November 2022].

¹⁷⁵ Institute for Educational Initiatives, 'The Intersection of Haitian Storytelling, Literacy, and SEL', *University of Notre Dame*, 2021 <<https://iei.nd.edu/initiatives/global-center-for-the-development-of-the-whole-child/news/the-intersection-of-haitian>> [accessed 4 June 2022].

temperamental camera and a not always reliable tape recorder'¹⁷⁶—developments in technology now mean that such interviews can be conducted remotely if necessary.

In her work in Haiti, Laura Wagner has found that most Haitians navigate the internet using mobile applications, rather than browsing, and has stated the likelihood that the project team will create a dedicated YouTube channel to host the Radio Haïti archives, as well as distributing physical copies to community radio stations and libraries.¹⁷⁷ This is a method which could potentially be used in the future if the literary archive were to be expanded. However, there are ethical considerations here, too. To ensure the accessibility of these materials we must ensure that they do not become locked behind paywalls or subscriptions which will render them out of reach for most Haitians. Furthermore, social media platforms are increasingly coming under criticism for their handling of misinformation and free speech. For example, earlier this year artists such as Joni Mitchell and Neil Young withdrew their music from the Spotify streaming service¹⁷⁸ following its defence of podcaster Joe Rogan, who is accused of spreading misinformation about the COVID-19 vaccine.¹⁷⁹ If the archive had used Spotify to host its podcast episodes or audio recordings, what would be the appropriate response? In refusing to address the issue, we validate Rogan's argument for free speech. In removing any archived media from Spotify we would make a stand against misinformation, but also reduce the accessibility of the media. In using external platforms for the hosting of archival media we raise the question of how far we implicate ourselves in

¹⁷⁶ Cassell, p.461.

¹⁷⁷ Wagner, p.630.

¹⁷⁸ Ben Sisario, 'Joni Mitchell Plans to Follow Neil Young Off Spotify, Citing "Lies"', *The New York Times*, 2022 <<https://www.nytimes.com/2022/01/28/arts/music/joni-mitchell-neil-young-spotify.html>> [accessed 6 June 2022].

¹⁷⁹ Reality Check team, 'Joe Rogan: Four Claims from His Spotify Podcast Fact-Checked', *BBC News*, 2022 <<https://www.bbc.co.uk/news/60199614>> [accessed 6 June 2022].

these platforms' views and controversies, and whether such affiliations are worth the improved accessibility for users in Haiti and elsewhere.

5. Conclusion

Archives in Haiti are at risk, under threat from a multitude of factors. Environmental factors specific to the Caribbean such as high temperature, humidity, and insects mean that paper-based materials are rapidly deteriorating. Various efforts are being made to improve the facilities hosting these materials: after its destruction in the 2010 earthquake, Le Centre d'Art in Haiti was rebuilt with a number of improvements such as rust-proofed metal shelving and an updated ventilation system.¹⁸⁰ However, the buildings hosting these archives are still at risk from the natural disasters which regularly strike Haiti; among them, earthquakes and hurricanes, as well as frequent flash floods due to the extensive deforestation of the island.¹⁸¹ So too are archives subject to manmade threats: the current political turmoil in Haiti is putting lives and infrastructure at risk, with widespread protests and gang violence forcing Port-au-Prince residents from their homes¹⁸² and seeing buildings, vehicles, and barricades set ablaze.¹⁸³ In light of these threats old and new, it is clear that something must be done to protect and preserve Haiti's archives.

While many of Haiti's archives are held in institutions, others are kept in private collections—as Rachel Douglas highlights, most literary archives in Haiti are private, and situated in the homes of the writers themselves.¹⁸⁴ Private archives remain difficult to quantify: while we know there exist significant archives of literary, musical, and historical

¹⁸⁰ Louise Perrichon Jean, 'The Archive Collection of Le Centre d'art in Haiti', *Caribbean Quarterly*, 62.3–4 (2016), pp. 457–71 <<https://doi.org/10.1080/00086495.2016.1260284>>, p.465.

¹⁸¹ Greg Beckett, *There Is No More Haiti: Between Life and Death in Port-Au-Prince* (Oakland: University of California Press, 2019), p.31.

¹⁸² Dupain and Mackintosh.

¹⁸³ 'Port-Au-Prince in Flames from Burning Vehicles, Buildings, Restaurant Fire', *The Haitian Times*, 2020 <<https://haitiantimes.com/2020/09/19/port-au-prince-in-flames-from-burning-vehicles-buildings-restaurant-fire/>> [accessed 1 June 2022].

¹⁸⁴ Douglas, p.390.

artefacts which have been handed down through families and acquaintances¹⁸⁵ we do not always know their locations or conditions. While it can be assumed that every country has private archives, their prevalence in Haiti can be traced—to an extent—to the Duvalier dictatorship of 1957 to 1986. Under the terroristic reign of Papa Doc and his son Baby Doc, thousands of Haitians were tortured or killed,¹⁸⁶ with citizens left fearing for their lives. Anyone considered to be critical of the government was at risk from Duvalier's militia, the Tonton Macoutes, forcing to many artists, writers, and journalists into exile in countries such as the United States and Canada. As a result, these private archives are scattered throughout Haiti and the Haitian diaspora, often without record of their existence or ownership. These archives too are at risk: from the environmental factors described, and from social factors such as their archivist's death. As a preliminary measure, this project proposes surveying Haitian authors and others in their social circles in order to better understand these private archives; in garnering more information about the structure, location, and composition of these archives, we will be better equipped to aid in their preservation.

While there are many methods of protecting and preserving the contents of physical archives, this thesis proposes that digitisation is used alongside traditional methods. Digitisation of these archives and the development of an online platform to host them would both improve accessibility to these materials and ensure their preservation in the case of physical damage. In addition, it is hoped that by increasing the visibility and accessibility of these materials, Haiti's perception in the Western hemisphere can be changed. Since its independence in 1804, Haiti has been maligned by international media. The American explorer William Seabrook is credited with bringing the concept of the zombie to the United States; his sensationalist account of his travels in Haiti, published as *The Magic Island* in 1929, painted

¹⁸⁵ Dirksen.

¹⁸⁶ 'Haiti: The Truth Must Not Die with Jean-Claude Duvalier', *Amnesty International*, 2014

<<https://www.amnesty.org/en/latest/news/2014/10/haiti-truth-must-not-die-jean-claude-duvalier/>> [accessed 31 May 2022].

the nation as one rife with cannibalism, blood rituals, and Vodou magic.¹⁸⁷ Unfortunately this legacy followed the nation to the 1980s when Haitians widely were blamed for the AIDS epidemic, with some speculating that it had been spread through Vodou rituals.¹⁸⁸ Since then, the narrative of Haiti has not improved: after the 2010 earthquake, ostensibly well-meaning ‘voluntourists’¹⁸⁹ and NGOs furthered the idea of the nation as helplessly impoverished and culturally bereft; in 2016, President Donald Trump referred to the country as a ‘shithole’.¹⁹⁰ Haiti does not generally fare well in historic or modern media: documentaries such as the BBC’s *The Misadventures of Romesh Ranganathan* paint the country as violent, depraved, and ultimately ‘freaky’,¹⁹¹ while popular films such as Disney’s *The Princess and the Frog* misrepresent the Vodou religion as malevolent and dangerous. While no one project can hope to undo decades of negativity, a digital archive could encourage greater interest in Haiti’s culture and history by facilitating access to materials otherwise difficult to obtain. Perhaps, like the moai of Rapa Nui, these literary artefacts can become cultural ambassadors of the nation and people they represent, encouraging greater understanding and empathy of a country so often maligned.

It is hoped that this greater accessibility to literary artefacts will also aid in the study of Haitian literature. While all authors rewrite their own works, this process takes on new meaning in Haiti, where writers often rewrite to a ‘near-obsessive degree’.¹⁹² Genetic

¹⁸⁷ Susan Zieger, ‘The Case of William Seabrook: Documents, Haiti, and the Working Dead’, *Modernism - Modernity*, 19.4 (2012), 737–54 <<https://doi.org/10.1353/mod.2012.0085>>.

¹⁸⁸ Farmer, p.225.

¹⁸⁹ Garland.

¹⁹⁰ Ali Vitali, Kasie Hunt, and Frank Thorp V, ‘Trump Referred to Haiti and African Nations as “shithole” Countries’, *NBC News*, 2018 <<https://www.nbcnews.com/politics/white-house/trump-referred-haiti-african-countries-shithole-nations-n836946>> [accessed 23 June 2022].

¹⁹¹ Antony Stewart and Eve Hayes, ‘The Misadventures of Romesh Ranganathan? Haiti Really Deserves Better than This...’, *Haiti Support Group*, 2018 <<https://haitisupportgroup.org/misadventures-romesh-ranganathan-haiti/>> [accessed 1 June 2022].

¹⁹² Douglas, p.389.

criticism, which has long been prevalent in French literary analysis, looks to the changes made by the author throughout the creation of their work. While genetic criticism traditionally only considers artefacts from before the work's publication, Douglas proposes applying this approach to the multiple published versions of Haitian literary works.¹⁹³ Through digitisation, we hope to increase access to these works and their associated artefacts—for example, manuscripts and authors' notes—in the hope of facilitating and encouraging this analysis of Haitian literature in Haiti and throughout the world.

However, while we have established the necessity of digital archives in Haiti, we must consider the practical constrictions of working there. By examining the proposed project through the lens of software engineering, we can identify many practical requirements specific to Haiti, and make recommendations accordingly. There are generally accepted to be six stages to the software development cycle, each of which have been considered in this thesis. The first stage, requirements elicitation, aims to establish the conditions which the software must meet in order to be functional. Many techniques are used in the field of software engineering, but here it is recommended: user personas be written to encourage the developer(s) to consider a wide range of potential end users; surveys and interviews be carried out to determine information about the demographics and requirements of potential users as well as their access requirements; and stakeholder analysis be carried out to better prioritise the hierarchy of needs.

Next, the software will be designed. In this stage we must consider our end users, and their requirements for the software. Internet access in Haiti is generally poor, with most Haitians using their mobile phones to gain access. With this in mind, it is essential that any software developed is compatible with mobile devices. In addition, these users' mobile data plans are generally limited, with individuals paying for a set amount of data to be used within 24

¹⁹³ Douglas, p.388.

hours:¹⁹⁴ it is important that the software fully supports the use of alt-text, for both visually impaired individuals and those who have turned images off in order to reduce their data consumption. In order to be accessible, the software should be available in at least three languages: English, French, and Kreyòl, with the standard Kreyòl orthography being used. The software should also be compatible with text-to-speech software wherever possible; though, as discussed, Kreyòl is not currently supported by most text-to-speech programs. By looking to the accessibility guidelines established by the World Wide Web Consortium, we can ensure that any software produced is accessible to as many users as possible, regardless of their ability or location.

Concerning the implementation of the software, certain web frameworks such as Django and Node.js are recommended for consideration due to their suitability for the project. Furthermore, the digitisation process has been discussed, with input methods such as optical character recognition and manual keying being evaluated for the given context, and the potential cybersecurity implications of the use of a database to store the digitised materials.

Non-functional and functional testing is essential to any project, and particularly one where we anticipate such variety in operating conditions. Techniques such as observation testing can provide valuable information about the usability of software but can present challenges when attempting to recruit a suitable range of testers. Crowdsourcing is an option providing access to wider demographics but has significant ethical and practical concerns attached. Where participants are treated fairly and steps are taken to ensure data quality, crowdsourcing can be an excellent method of testing various aspects of a software's design and function. Finally, the security of the software must be adequately implemented and tested, as any software available online will be almost certainly subject to cyberattacks in its lifetime. These attacks could take the form of vandalism where important files are deleted,

¹⁹⁴ Wagner, p.630.

or sensitive information such as administrative account details could be stolen. Using the information supplied by OWASP and other organisations, we can ensure that the archive will be adequately protected.

Lastly, the role of maintenance and documentation was considered. Maintainability is an essential attribute of any software, but particularly of programs which will have little support available to them after their release. Maintainability is generally determined during the program's development, and good coding practices can ensure that software can be effectively updated long after its initial development. Documentation should be created throughout the software's development and kept up to date after its release; this allows the history of the software to be documented and will aid in introducing new users and developers to the program.

As well as the practical aspects of the archive's creation, there are also ethical concerns to be addressed. The legacy of colonialism is still felt in the Caribbean, and particularly in archives, which historically have excluded and silenced people of colour. In attempting to digitise Haitian literary archives, we must be mindful of this legacy and respond to it appropriately. Colonial powers have traditionally removed artefacts from their native homelands, regardless of their cultural significance; here, digital offers the opportunity to increase accessibility to these materials and to preserve them without taking them from their communities. Digital archives, however, must still be decolonised. We can draw inspiration from other community archiving projects such as the Cherokee Stories and Songs DVD described by Ellen Cushman,¹⁹⁵ who offers guidance on reducing Western bias in community archives. Michelle Caswell's work on feminist standpoint methodology¹⁹⁶ is also relevant in this context, as she describes how bias in the archives is often hidden through archivists' attempts to remain objective. Caswell, like Cushman, encourages communication

¹⁹⁵ Cushman.

¹⁹⁶ Caswell.

with the communities involved, and establishes that the appraisal of materials considered for archiving is a task better suited to those in the community, rather than an outsider. These perspectives should guide us in our attempts to build an archive which better represents the people it aims to serve.

While this project aims to improve perceptions of Haiti, there is always the possibility that it will lead to appropriation and misuse of aspects of Haitian religion and culture. Unfortunately, a consequence of globalisation is the impact on minority cultures, with figures such as the Haitian *zonbi* and the Algonquian *windigo* stripped of their meaning and used as props in horror films, comics, and books. While this project aims to provide a fuller account of Haitian history and culture, there is a risk that only certain elements will be selected to represent the nation as has historically been the case.

When considering digitisation, there is also the question of what is lost when materials are digitised. Digitisation cannot replicate a physical object; rather, it can only create a representation of it. So much of Haitian literature is intrinsically linked with the country itself—consider Yanick Lahens’s novel *Failles*, in which the city of Port-au-Prince is personified as a woman and raped by the earthquake, or Dany Laferrière’s *Le cri des oiseaux fous* which details the fevered hours before a journalist flees Haiti. For many cultures location is central to an object’s significance, and a digital version cannot ever replicate this. It is important to acknowledge that despite our best efforts, we can only ever create representations of artefacts, not copies or replacements. In this vein, it is important to note that digital archives should only ever complement their physical counterparts; they cannot be used to replace them.

In a country such as Haiti, where so much of the language and culture is oral, it can be suggested that an archive for literary artefacts is not sufficiently representative of the population. While Haiti has a rich literary heritage which should be preserved and celebrated, there have been calls for audio archives in the Caribbean. These could be used to host a

multitude of cultural facets. In Haiti, the Vodou songs and dances associated with various communities could be recorded for education and posterity; further, as in the case of Thomas ‘Sugar’ Riley, it could be used to document the testimonies of Haitians who have lived through historically significant events. While this project currently aims to archive only literary artefacts, it could be expanded in the future to include other forms of media.

The archival materials held in Haiti’s institutions and in private collections are invaluable, and at risk of being lost forever. While archives in the Caribbean have historically been used as a colonial weapon, we have the chance to build new and better archives, which work *for* the communities they are part of, not against them. Archival digitisation projects focused on the anglophone Caribbean already exist—for example, the Leverhulme-funded Caribbean Literary Heritage project—but none target archives in Haiti, where arguably the need is most pressing.¹⁹⁷ Haiti is a chronically misunderstood country with much to offer the Western world, but only if given the chance to do so.

¹⁹⁷ ‘Caribbean Literary Heritage’.

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