Visitors' Experiences with Smartphone-based Interpretations in Outdoor Cultural Heritage Landscapes

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Abstract

This research critically assesses the role of smartphone-based Mobile Digital Interpretations (MDIs) in the outdoor cultural heritage experience. It moves beyond haptic interactions to consider the embodied and empathetic connections which exist in such experiences. Heritage experiences reflect the rich variability of human interactions with place because environmental, societal and technological aspects are incorporated with the subjective, intellectual and emotional characteristics of individuals. The thesis argues that MDIs must echo this understanding by integrating the embodied elements of these experiences into their development. The smartphone can then become a means of empowering the individual in the construction of her/his own understanding of the outdoor cultural heritage experience.

The research uses a multi-method approach which combines visual ethnographic practices, semi-structured user and stakeholder interviews and document analysis across several cultural heritage sites in the United Kingdom and Ireland. Drawing on the resulting dataset, the research articulates three key findings: (a) the introduction of MDIs in heritage contexts creates a ‘’hybridised’ place of heritage experience, which sees the addition of the various spaces beyond the physical (such as the virtual) that the user occupies; (b) mobile phones used to deliver MDIs in heritage contexts tether their user to the everyday, which may create tensions and conflicts in their experience motivations and aspirations; (c) the concept of ‘newness’ within MDIs requires rebalancing to take into consideration dimensions of ‘newness’ in relation to the heritage experience and not simply the technology.

The research proposes that there is a need for a new paradigm to understand the outdoor MDI heritage experience. It is necessary because the existing paradigm is ill-defined; whereby ‘mobile’ is adopted as a proxy for ‘engagement’ and there is a disparity between the imagined and lived experiences of the users. This thesis makes the case that a more holistic approach is needed which takes greater consideration of the complexity and unique attributes of individual heritage experiences. This holistic understanding repositions the smartphone as a factor in the experience but not an experience in its own right.

Dedication

To my parents, Brian and Kathleen.

Thank you.

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Chapter One: Introduction

This research is an in-depth exploration of how smartphones, when adopted as an interpretative medium, influence engagement with outdoor cultural heritage landscapes. In particular, it concerns smartphone-based applications that are developed to create an interpretative experience for the user. The research prioritises the study of the experience of the users of these applications and discusses them in relation to the context of their production and the implications of the technologies used.

The overarching goal of the research is to explore the experience that is created when a user's personal smartphone is incorporated into the outdoor cultural heritage experience, with particular emphasis on the embodied and empathetic element of the experience. It is important to acknowledge that throughout this research, the term 'outdoor cultural heritage' is shaped by the International Council on Monuments and Sites (ICOMOS) Ename Charter (2008) definition of 'cultural heritage sites'. The Ename Charter (2008) states that the term refers "to a place, locality, natural landscape, settlement area, architectural complex, archaeological site, or standing structure that is recognised and often legally protected as a place of historical and cultural significance" (ICOMOS, 2008:4); this definition is further discussed in Chapter 3.

Although mobile technology is a rich field of research, the main focus in this research is to investigate its influence on the interpretative experience of patrons to outdoor cultural heritage sites. Smartphones are a prominent component in the daily lives of users and influence how we live our lives. The Office for National Statistics (ONS, 2018), for example, stated that 78% of all adults used a mobile phone or smartphone to access the internet and it was for adults, with the exception of those aged 65+, the most popular device to do so. As a result, one might argue that smartphones play a significant role in the everyday life of adults up to the age of 65 and younger people. The manner in which we communicate, receive information and understand the world around us is influenced, shaped and mediated through these devices. Therefore, when adopted in the heritage context, the smartphone is not simply a platform with advanced technological capabilities, but one which has the potential to greatly enhance how people engage with a heritage site. The smartphone has many affordances that may be incorporated into the heritage experience. These affordances can be activated through a smartphone's own functionalities (such as the type of media), as well as through socially constructed behaviours (such as putting one's phone on silent mode in a theatre). This

research considers the implications of the smartphone and the associated affordances on users' engagement within the heritage experience. Engagement in this instance is not understood as merely interacting with the device (such as pressing controls on an interface) or being physically present on-site. Engagement is a much more nuanced and complex concept that includes deeper sensory involvement in the experience. This understanding of engagement in the outdoor cultural heritage context is intrinsically connected to place, and in particular the humanistic geography and environmental psychology approach to place put forth by scholars such as Tuan (1977) and Casey (1997). Experiences and engagement in outdoor cultural heritage landscapes are also experiences of place. As a result, to examine engagement and be responsive to the outdoor landscape context, sense of place is adopted as a lens through which to do the research. Sense of place represents the various processes that allow people to respond to places (Agnew, 1987) and this equates closely with engagement and the empathetic connections which exist in the outdoor cultural heritage experience.

The methodological and analytical approach taken in this study is inspired by ethnographic principles and the importance of studying the Mobile Digital Interpretation (MDI) experience within the context on which they are based (Delgado, 2015; Pink, 2007; Morley, 2006, Alfonso *et al.,* 2004). The research design is a multi-method approach grounded in qualitative research. The multi-method and multi-site frameworks used reflect the intricate and complex nature of the outdoor heritage experience. Methodologically, a focal point of the research was the in-situ walking interviews with participants as they used the MDI and recorded the experience through action cameras. The combined sensorial and visual ethnographic approaches were undertaken with the researcher being present to capture the evolving experience of the research participants. Several MDI experiences across the UK and Republic of Ireland were incorporated into the explorative stage of the research, prior to three being selected for detailed in-situ examination. These case-study sites were located in the Lake District, the Brecon Beacons National Park, and Navan Fort. Each site had a smartphone MDI for visitors to utilise, while adopting variations in approaches and interpretative themes. The in-situ walking interviews were supported by contextual interviews with stakeholders and post-experience interviews with participants. A detailed picture of the experiences was created, which allowed findings and conclusions to be drawn.

The research findings centre on three prominent themes in the experience: conceptualisation of the medium (such as perceptions of the experience due to the technology being adopted),

interpretive objectives (such as the connection between interpretative approaches in the MDIs and established heritage interpretative practices) and mobilities (such as the relationship between the device, the user and the landscape). The conceptualisation of the medium relates to approaches to engagement. This incorporates the pre-conception of equating 'mobile' with 'engagement', users' own perceptions of the smartphone MDI experience and the legitimacy of the smartphone as an interpretive medium. The interpretive objectives at the case study sites reflect how smartphone MDIs align with existing interpretative principles in the literature more generally. This includes aspects such as knowledge acquisition, behavioural approaches, and addressing emotional objectives. The third encompassing theme, mobilities, is an insight into the interconnected nature of the components which constitute the outdoor cultural experience, and how actions and behaviours of users are shaped through the MDI. Key outcomes centre on the co-presence of the device, the evolving peripatetic nature of the experience, materiality of objects, and the user's interpretive journey.

The findings which emerge in the research point towards broader theoretical claims relating to the adoption of smartphone-based MDIs in the outdoor heritage context. The embeddedness of the MDIs in interpretative strategy, for example, includes the conceptualisation and development of the MDIs, the 'imagined' experience the MDIs seek to foster, and how this aligns to established heritage interpretive practices. It also articulates how the intangible elements of place are accommodated through such interpretations. Considering sense of place, the complexity of this issue is highlighted and subsequently allows for critical reflection. This leads to re-imagining the paradigm for the MDI experience, looking at the effectiveness of the current paradigm, how it has evolved and where further development is required.

The issues raised above are investigated in the thesis. The following section outlines the aims and objectives of this research.

1.1 Research Question, Aims and Objectives

The research sought to answer the following question:

The heritage sector has witnessed a sustained increase of smartphone-based MDIs to enhance the experience of visitors. This is associated with the proliferation of smartphones in society. While studies have considered the design and functionality of such interpretations, there exists a lack of critical understanding relating to the role of MDIs in shaping the embodied

elements of the heritage experience. Using the outdoor cultural heritage experience as a context, the research, with an interest in the implication of the findings for design and heritage interpretative practices, asks in what ways do these forms of interpretation integrate into and influence the user's sense of place and embodied engagement within the heritage experience?

To effectively address this question the research comprised four aims and a series of linked objectives.

Aim One: Critically analyse contemporary smartphone-based MDIs applied to outdoor cultural heritage sites.

> Objective 1.1: Evaluate the current typology of MDIs and identify the most prevalent concepts for smartphone applications.
>
> Objective 1.2: Investigate the importance of engagement frameworks in the composition of existing MDIs.
>
> Objective 1.3: Evaluate how heritage organisations perceive on-site MDIs in relation to meeting specific engagement aims.

Aim Two: Critically examine methods in which people engage with outdoor heritage sites through smartphone-based MDIs.

> Objective 2.1: Evaluate the engagement practice with MDIs at outdoor cultural heritage sites within situated experiences.
>
> Objective 2.2: Analyse how the processes and products of the MDI experience align with the concept of sense of place.
>
> Objective 2.3: Critically reflect on how the development of an individuals' sense of place was influenced as a result of the MDI.

Aim Three: Investigate the inter-relationship between place, smartphone device and the user in the outdoor cultural heritage experience.

Objective 3.1: Examine how place is constructed in situated experiences within outdoor cultural heritage.

Objective 3.2: Analyse the impact of mobile technology on the process of 'place-making' within the outdoor cultural heritage experience.

Objective 3.3: Critically reflect on the dynamics and inter-play between the actors in such experiences.

Aim Four: Determine how effective outdoor heritage engagement can be enhanced using smartphone-based MDIs.

Objective 4.1: Critically reflect on the ways in which people engage with outdoor cultural heritage and theorise options to sustain this process with MDIs.

Objective 4.2: Investigate which actions can be taken to enhance integration between MDIs and heritage sites with more effective engagement-centric practices.

1.2 Significance of the Research

The significance of the research is situated in both the theoretical understanding and practical application of smartphone-based MDIs. Smartphones are ubiquitous in society and as a result the potential application of the technology in the museum and heritage sector may appear to be obvious. Studies such as Laudazi and Bocaccini (2014), for example, highlighted the perceived usefulness of MDIs and the opportunity this provides to heritage organisations. While heritage organisations and museums recognised the significant potential of this medium (see Staiff, 2010 and Rubino, 2011), there was and still exists a lack of understanding in relation to MDI development and its potential influence on the visitor experience.

The influence of MDIs on visitor experience is not confined simply to the function of the application, the capability of the technology or the haptic interactions between the software and the user. Success of an interpretive medium is not dependent solely on how it technically operates but in how it accommodates, supports and fosters engagement. Engagement is central to the visitor experience at heritage sites, reflecting sensory perceptual involvement with the production of emotive responses and empathetic connections (Bitgood, 2010; Ridge,

2013; Dinder *et al.*, 2010). Many studies have highlighted a need for greater understanding relating to the adoption and influence of such digital interpretation on the user's heritage experience. Wang *et al.* (2011:24) suggested, for example, that "research focusing on the design of mobile systems should extend beyond the focus on functionalities to include a broad view", including the habits and cultures of the users. Similarly, Philström (2008) and Kleijen *et al.* (2004) have addressed the technology-focused nature of research relating to mobile technologies indicating that "hedonic or experimental aspects should not be overlooked" (Kleijen *et al.*, 2004:215). Moreover, as Pura (2005) noted, there is a need to understand the end-user, their perceptions and emotions related to the use of the technology (see Rasinger *et al*., 2007). This research aims to contribute to understanding this issue in the context of outdoor cultural heritage landscapes.

The relationship between a smartphone's role in society and its associated affordances requires greater understanding if it is being co-adopted by the visitor as an interpretative mechanism for the individual heritage process. Paolini *et al.* (2013:287), for example, noted MDIs "unique ability to meet other needs of the museum's mission. These include offering greater possibilities for extending outreach, improving the quality and accessibility of interpretation and education, and connecting platforms to create a whole greater than the sum of its parts" (Paolini *et al.*, 2013:287). While this positive interpretation of the medium is inspiring, it does not negate the need for critical understanding. Alternative studies, such as Jansson (2007), refer to mobile technology as the 'decapsulation' of the tourist experience. Furthermore, Jansson notes that the "media saturation of the late modern society might provide resources for the intensification of touristic experiences…the mediaisation can also break this magic [of the experience], abolishing the boundaries between tourism and everyday life" (Jansson, 2007:19)(own brackets). Building on Jansson's (2007) insights, Wang *et al.* (2014) acknowledged that "the sense of adventure and escape is diminished due to a better sense of place and the reconnection with the everyday living environment" (Wang *et al.*, 2014:14).

The smartphone creates unique opportunities and challenges in the experience. The smartphone has reshaped the manner in which people interact, communicate and obtain information (Wang *et al.,* 2011), which aligns to key aspects in the heritage process. According to Cameron and Kenderdine (2007), learning in the heritage experience is, for example, considerably more than an amalgamation of a user's known information within

unknown information; active participation from the individual is critical. Similarly, individuals experience a process of geographic knowledge acquisition and representation as they move within the site (Tussyadiah and Zach, 2012). The presence of a smartphone MDI in the experience will therefore influence the process, and it is this influence the research seeks to explore.

In exploring the influence of smartphone-based MDIs in the outdoor cultural heritage experience, the existing schema or paradigm for these interpretations is an important focus point. For example, it is critical to appreciate the manner in which the spontaneous and organic nature of the user's lived experience aligns with the envisaged or preconceived experience by the organisations responsible for the MDIs (see Facer *et al.,* 2004). Especially as Michaelis *et al.* (2007) have noted that while digital technologies provide the framework for MDI engagement, its success is dependent on the subsequent design. A challenge of which is the level of control or agency the visitor has in the experience, with organisations aiming to balance the unique organic nature of each experience while maintaining authority over the interpretation.

As the aforementioned studies indicate, the use of the smartphone in the heritage context is not simply the interactions of a user and a piece of technology but part of an entwined, complex and connected network. This needs to be unpacked and understood in order to better accommodate engagement and the user's heritage experience. To achieve this, sense of place is adopted as a lens. This is a concept that embodies the various elements that allows the individual to respond to spaces and places, capturing the rich variability of human interactions with spaces. This is significant as it adopts a holistic view of the experience and the phenomenon surrounding it. In the approach, agency is given to the individual's empathetic connections. Ultimately, the research moves beyond the functionality of the MDI to explore the various processes and affordances that exist in the MDI heritage experience.

1.3 Thesis Synopsis

This thesis is arranged in four sections, each building upon the previous. It begins by providing context into this thesis, the current typology of the interpretations and the existing understandings relating to the subject matter (Chapters 1, 2 and 3, respectively). In response to these chapters, the methodological approach and research design is defined (Chapter 4).

This provides a framework for the actions taken to address the questions, aims and objectives delineated in the previous chapters. The third section presents the findings which emerged from the fieldwork (Chapters 5, 6 and 7, correspondingly). The final section reflects on the findings and looks at the critical issues relating to the research which materialised, as well as providing an understanding of the implications of the research for practice and key concluding thoughts (Chapters 8 and 9).

On a chapter by chapter basis, Chapter Two contextualises smartphone-based MDIs and outlines their evolution. This includes defining an understanding of smartphones in the first instance and then their adoption in interpretative practice. In the same manner that smartphones have changed how people interact, think and communicate on a daily basis, these changes also occur when the device is used to provide interpretation for a heritage experience. The everyday usage of the smartphone and the individual's behaviour with the device are influential forces regarding the adoption of the smartphone as an interpretive medium. This is addressed through key elements relating to their adoption in the heritage context, such as the communication structure adopted, personalisation of the visitor's experience, as well as the relationship between physical and virtual spaces.

Chapter Three addresses engagement, particularly sense of place and emotional connections in the heritage experience. Engagement is much more than mere presence at the heritage site but is a form of sensory perceptual involvement. Focusing on related literature the chapter explores this topic and considers the application of a smartphone interpretation within it. As a result, virtual place-making is considered alongside physical place-making, as the smartphone MDI provision creates a hybridised landscape wherein the user is co-present in both the physical and virtual space. Sense of place is adopted as a lens throughout the research to explore the aforementioned emotive and empathetic connections in the experience. An environmental psychology and humanistic geography understanding to sense of place is embraced, due to its commonalities with the heritage experience, particularly the attention given to identity, dependency and attachment (Stedman, 2001; Shamai, 1999). Sense of place resides in the individual but cannot be removed from the social or material context in which it occurs.

Chapter Four provides the methodological design and the development of the research approaches. The empirical inquiry consisted of a multi-method and multi-layered approach in

order to capture the subjective elements of the visitor experience. The approaches are supported by ethnographic principles and incorporates contemporary methods of inquiry, such as the incorporation of action-cameras. The chapter outlines the research methods used, their rationale and the practicalities of their application. Alongside this, the ethics associated with the research are recognised. The chapter also presents the associated techniques used for the analysis of the collected materials. The research design centres on three phases: exploration, in-situ investigation, and contextual study. Each phase was devised to be flexible and responsive to the previous phase. The practical strategy is stated alongside the outline of the research paradigm and design. This includes the logistics of the research and the data analysis plan. The measures, approaches and sensitivities addressed in the research methodology provide a foundation for confidence in the findings which emerged.

Chapter Five marks the first of the three findings chapters. This chapter centres on the perceptions and approaches to heritage engagement through smartphone MDIs in relation to the medium. In doing so, the chapter presents the challenges faced by stakeholders in the development, deployment and adoption of such interpretations. The chapter highlights the impact of conceptualisations of the MDI experience on the visitor experience. An all-inclusive approach to engagement emerges as a vital requirement in the development of such interpretations. The chapter highlights discrepancies between the experience of the user as imagined by the producers of the case study MDIs and the lived experience of participants. These discrepancies are presented through the various approaches to multimedia in the respective MDIs (such as text, video and audio, as well video reconstructions). Overall, audio was regarded by participants as the most effective medium as it blended into their in-situ experience better than other forms, and this is unpacked in the chapter.

Chapter Six moves beyond the medium and media to focus on the interpretative objectives in the MDI experiences. The complexity in adopting and re-contextualising the smartphone as an interpretative medium is revealed in this chapter, when considering the device within the research objectives relating to behaviour, emotion, and knowledge acquisition. It is revealed that the MDIs with their multimedia capabilities and associated interpretative messages have prompted and embellished emotional connections to the site. In addition, it shows how traditional interpretative techniques (such as incorporating surprising or unique content) can be successfully adopted within the smartphone MDI experience. When considered within heritage interpretation objectives the intricacy of the experience becomes apparent. This

relates particularly to key themes in heritage discourse, such as how identities are represented and the various narratives which can be attached to heritage sites.

Chapter Seven explores issues of mobility, action and behaviour within the MDI experience as a means of understanding the relationship between the device, the user and the heritage landscape. This includes framing the landscape as a hybridised creation, wherein it is a product of several landscapes (such as the material physical landscape and the virtual informational landscape of the MDI). The importance of holistic thinking in relation to the deployment of smartphone MDIs emerges through understanding the interweaving of the networked factors which constitute the experience. The portable nature of the MDI is assimilated into the interpretive process through integrating with the mobility of the individual. The MDI also supported users' embodied experience by fostering felt connections through accentuating intangible elements of the heritage experience, however, affordances such as battery life similarly shaped the users' experience. While the MDI may be more accommodating to the individual than other forms of media, in the outdoor heritage experience the MDI is still a constructed interpretation which creates specific behaviours for moving through, acting on, and interpreting the landscape.

Chapter Eight builds upon the three previous findings chapters to bring together central themes which emerged. The chapter addresses three specific areas, reflecting how the MDIs are embedded within interpretive strategy, the accommodations for sense of place in the experience, and a final component on considering a new paradigm for the heritage MDI experience. The embeddedness of the MDI is a reflection on the amalgamation of existing approaches in interpretation and the unique challenges and opportunities presented by the medium. This includes considering sense of place and the components of place identity, dependency, and attachment. Reflection on how these aspects are accommodated and supported through the MDIs are addressed, while considering broader aspects of polyvocality and representation. The uniqueness of the smartphone MDI heritage experience prompts discussion relating to the consideration for a new paradigm. Signs of maturity relating to the development of such interpretations requires a reconsideration of approaches and understanding, a particular area to address is the role of newness in depictions smartphone-based MDIs.

Chapter Nine is the final chapter, which brings together the various points and arguments which were presented. The chapter considers the aims and how they were met through the research. As a result, the chapter addresses the implications of the research for practice, relating to both MDI design and heritage interpretative practice. This also provides scope to reflect on the limitations and boundaries of the current research and postulate on potential areas for future research which emerge from the findings. These concluding thoughts incorporate the findings of the research with broader themes which emerge as a result.

Chapter Two: Contextualising Smartphone based MDIs

This chapter will contextualise the use of Smartphone based MDIs in outdoor cultural heritage. The aim is to provide a foundation of understanding on which to explore the research questions relating to the influence of smartphone-based MDIs on sense of place. To achieve this, the chapter will focus on two specific areas relating to the research. The first area is concerned with the smartphone as a communicative device and the societal impact it has had. The second relates to mobile digital interpretations in the museum and heritage context, the evolution of this interpretative form and common interpretative techniques they adopt.

To meet the aims outlined above, the chapter will consist of three sections. It will begin by addressing smartphones explicitly, discussing the development of the device in both a technological and a cultural sense (Section 2.1). The cultural and societal impact of the smartphone is significant in understanding the implication of the adoption of the device as an interpretative medium. Internet usage for example has largely shifted from the computer monitor or laptop screen to the smartphone. This is indicative of the role the device plays in the daily life of users and how it has changed how we obtain information and communicate. Digital media, incorporating the smartphone, is used to help establish and maintain identities and communities (van Dijk, 2007). The role of the smartphone in relation to identity and community aligns with the heritage experience, particularly sense of place (Chapter 3).

Through adopting smartphones users have authority in the creation and production of digital media. This not only enhances the engagement of the user but also impacts how users see the world as a result. Due to the influence of the device on society, how it has changed how people communicate and interact with each other, objects, and spaces, its potential for the heritage interpretation is substantial. This is explored in Section 2.2, focusing on the delivery of interpretative content, the role of physical and virtual spaces and the personalisation potential of the interpretation.

The final section of the chapter builds upon the societal influence and impact of the smartphone (Section 2.1) and the potential application of the device within the interpretative experience (Section 2.2). Through these previous sections, it is possible to define smartphone based mobile digital interpretations. In defining smartphone MDIs, it is also necessary to contextualise this form of interpretation in respect of previous forms of mobile digital

interpretation within the heritage sector. Through considering mediums such as audio-guides and PDA tours, the approaches used for smartphone MDIs are highlighted, helping us to illuminate the uniqueness of the medium (Section 2.3).

2.1 Smartphone Adoption and Mobile Media

The term 'smartphone' can be ambiguous, but the consensus is that it reflects mobile phones (or cell phones) which possess computer functionality (Want, 2009; Yuan, 2005). More specifically, a smartphone is powered by a complete operating system (OS) that can accommodate advanced applications (Greaney, 2011; Chun and Maniatis, 2009). The word smartphone, the amalgamation of smart (referring to computer technology) and phone (the abbreviation of telephone), originated in the 1980s (Oxford English Dictionary, 2018), however, the exact emergence of the first smartphone is contested and dependent on interpretation of the term. Smartphones diverge from mobile phones with their computational functionality. Features on the device, beyond standard telephony and text messaging, therefore, distinguishes smartphones from mobile phones. This classification is indistinct however, and as a result the emergence 'smartphone era' is contested. According to Greaney (2011), the smartphone era began in 1992 with the IBM 'Simon' (Figure 2.1), yet for others it was with the development of the Nokia 9000 Communicator in 1997 (Meyers, 2011). This debate includes interrogating the differences between smartphones and mobile phones. Current conceptualisations and understandings of the smartphone come from the release of the Apple iPhone in 2007 (Figure 2.1) and the Google Android platform in 2008. The smartphones used by participants in this study are reminiscent of these later iterations of the smartphones; such as the iPhone, which has a touch-based interface and multi-touch functionality but no physical keyboard (Figure 2.1) (see also Figure 5.7).

Figure 2.1 shows both devices which have been credited with beginning the smartphone era: the IBM Simon® and the Apple iPhone®. The variation between both models represents the risk of obsolescence in creating content on smartphones as a result of technological advancement. As was the case with previous forms of heritage interpretation, what was once new will soon be old. Along with the rate of technological development, the profound role smartphones play in the everyday life of individuals cannot be understated. This sentiment was iterated by Tim Cook, Apple® CEO, at an event marking the billionth sale of an Apple iPhone® in 2016. Nine years after the launch of the iPhone, Cook stated that "it's [iPhones]

become more than a constant companion. iPhone is truly an essential part of our daily life and enables much of what we do throughout the day" (Apple Inc., 2016). As contemporary audiences have such a deep

Figure 2. 1 The IBM 'Simon' (Left) and 1st Generation Apple iPhone (Right)

connection to the smartphone devices, this connection is similarly expected to be seen when adopting it as part of a heritage experience (Johnson and Witchey, 2011). The conceptualisation of smartphones in the everyday lives of users is an influence on the interactions with smartphone-based MDIs for heritage experiences. The emergence of the smartphone and the subsequent societal implications of the technology will be the focus of the next section.

2.1.1 The Rise of the Smartphone

Although the current conceptualisation of the smartphone is born from the Apple iPhone and subsequent Google Android devices in the late 2000s, the first smartphones, as mentioned above, can be traced back to the 1990s with the IBM Simon (released 1992) and Nokia 9000 Communicator (released 1996). The IBM Simon boasted a monochromatic touchscreen and stylus, while the Nokia 9000 communicator hosted a similar display but with the inclusion of a full QWERTY keyboard and navigational buttons. The smartphone market then progressed into the early 2000s with similar trends found in various devices, such as the Ericsson GS88. This device featured the amalgamation of cell phone capability with PDA functionality. At this point, bespoke operating systems began to be developed (i.e. Palm OS, Windows OS and Blackberry OS), supporting functions such as email, fax and web-browsing on devices.

Smartphone designers also grappled with various iterations of keypads and primitive touchscreens that required a stylus-operation.

In 2007 Apple® released the iPhone, containing similar functions as the aforementioned smartphones but with multimedia utilities (for example, the integration of the Apple iPod® Media player), no keypad, and a touchscreen interface that was finger-friendly, thus negating the need for a stylus. Apple and Google Android continued to gain prominence while other manufacturers failed to keep up, and although devices with keypads were still produced for a period, they gradually disappeared to be replaced by touchscreen interfaces. The standard form of a smartphone device now mirrors the initial iPhone, a rectangular object with a prominent touchscreen and a limited number of, if any, buttons on the front. Smartphones are now established as the most used consumer electronic device. For example, in the United Kingdom in 2015 smartphones surpassed laptops for the first time as the most popular device for accessing online content (Ofcom, 2016). 91% of the UK's 41 million smartphone owners aged 16-75 use their device daily (Deloitte, 2017), with the UK being identified as 'a smartphone society' (Ofcom, 2016) (Figure 2.2).

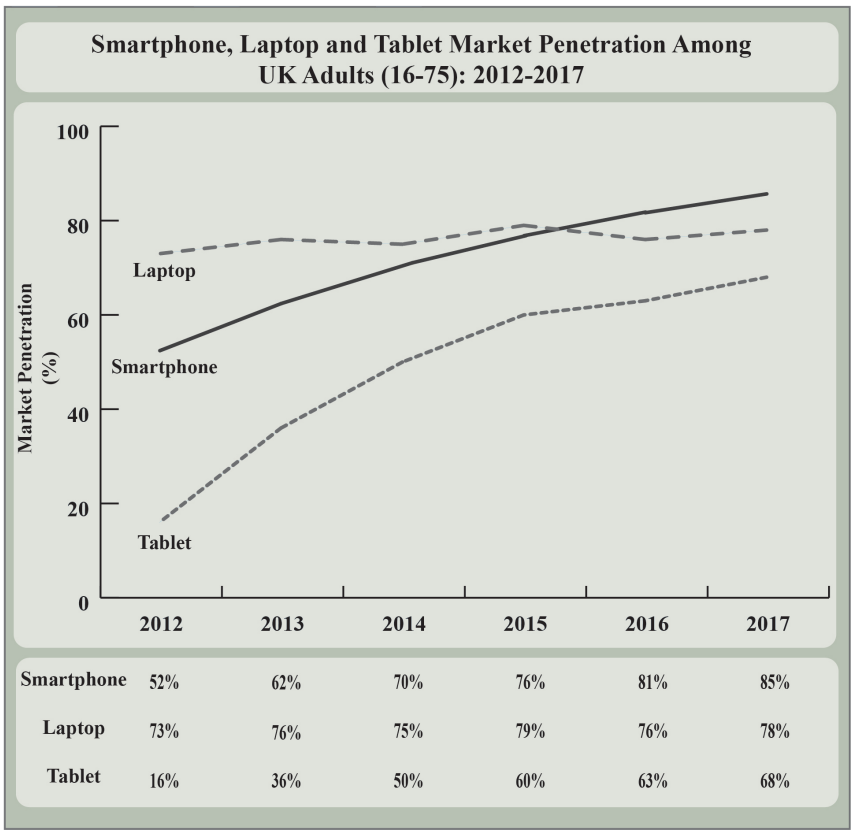


Figure 2. 2 Smartphone, Laptop and Tablet penetration in the UK (Source: Deloitte, 2017)

Initially, uptake of the device was higher amongst younger generations. In the UK, for example, uptake by individuals aged 16-24 increased from 52% in 2010 to 93% in 2015 (Deloitte, 2017). Similarly, there was a 47% increase in uptake by 25-34 year olds during the same period (92% in 2015 from 45% in 2010) (Deloitte, 2017). While the younger demographics were early adopters of the technology and reflect higher usage figures, there has also been a marked increase in the number of older demographics embracing smartphones. As noted, 52% of 16-24 year olds were using smartphones in 2010, however, only 9% of 55-64 year olds did so in the same period. However, in 2016, Ofcom's 'Media Usage and Attitudes' report the rise in smartphone usage within older demographics, reporting that 56% of 55-64 year olds in the UK in 2015 owned a device (Ofcom, 2016). This is in-keeping with data from the Office for National Statistics (ONS,2018) which found that smartphone and mobile phones were the most popular devices for accessing the internet amongst adults with the exception of those aged 65+ who preferred tablet devices. Similar trends are also evident in other countries, with the pattern of smartphone usage in the United States being similar to that of the UK. Nielsen (2016) and Pew Research (2016) for example, note the early adoption by younger demographics, the subsequent rise amongst older demographics and a national average of smartphone usage in 2016 as 77%. The scale of adoption of the device, particularly in regard to age demographics is important to acknowledge when considering heritage audiences during the development of smartphone-based MDIs.

2.1.2 Digital Media, Smartphones and the Societal Impact

Smartphone technology and digital media are omnipresent in today's society. Bollini *et al.* (2014) mark the iPhone 3G (released in 2008), with its natively equipped Global Positioning System (GPS), as the beginning of the 'mobile revolution' which has altered the habits and behaviour of users, especially noting its influence on how we interpret the spaces we inhabit. They have become ubiquitous in daily life and this has coincided with the increased prominence of digital media. In society, people are not merely using digital media but inhabiting it (Maushart, 2010). This reflects the development of internet usage and the advancement towards Web 3.0 which is led by the progression of geolocation features, the social dimension of interactions (social media) and the semantic organisation of knowledge (Bollini *et al.*, 2014). Internet usage has largely moved from the first screen (the computer monitor or laptop screen) to mobile devices. Ofcom (2016) reported that users in the UK now

spend twice as long online with smartphones than on a personal computer or laptop, reflecting the progression of making the internet pocketable (Husson, 2014).

As van Dijk (2007:2) acknowledges, digital media is therefore not a 'passive go-between' but ''intrinsically shapes the way we build up and retain a sense of individuality and community, or identity and history." This statement reflects the multi-way communication channels that are facilitated by digital media, and smartphones. It is a new structure for presenting and understanding, a structure that mediates and shapes. This new structure is witnessed in the heritage context with emphasis on elements such as ubiquitous connectivity, co-production and online participation (Lewi and Smith, 2016). As Giaccardi and Palen (2008:282) report, it presents opportunities for new ways of "exploring and articulating a community's relations with physical and social settings", enabling a method of social production of heritage. The social production of heritage through digital media aligns with understandings of participatory convergent culture, whereby the production and consumption of content is co-joined (Jenkins, 2008).

Participatory convergent culture enables "average citizens to participate in the archiving, annotation, appropriation, transformation, and recirculation of media content" (Jenkins, 2008:554). The coming together of various functions within the smartphone MDI supports the creation and production of content, echoing participatory convergent culture. Particular focus is placed on the role of the user in this media production and consumption. Staiff (2016) recognised this merging of technology and body (user), noting that this relationship was once the remit of science fiction but has now become an accepted, lived reality. The series of technological-enabled engagements the user has with the media content increasingly shapes how they interpret and see the world. The merging of the body and technology has never been more prominent than is witnessed in the adoption of the smartphone, as seen in the societal impact of the device (Section 2.1).

Smartphones, like all products, evolve over time and as a result so do the users' perceptions and expectations of the product. These devices are created and consumed within a context. The series of interactions that the smartphone facilitates and the possibilities these enable determines the context of the device for the user. For example, the mapping functionality within the smartphone produces new ways for users to see, act and move in spaces. Similarly, the contextualisation of the device will reflect the meaning the owner affixes to it. Nieminen-

Sundell and Väänänen-Vainio-Mattila (2003) recognised this aspect and noted that in certain cases the meaning of the product can be so unique that it becomes a cultural artefact. Notably, as the study by Nieminen-Sundell and Väänänen-Vainio-Mattila (2003) pre-dated the smartphone's rise to prominence, a bicycle was quoted as an example of a cultural artefact and not the smartphone. Many of the factors Nieminen-Sundell and Väänänen-Vainio-Mattila (2003) outlined as making a bicycle a cultural artefact are also valid in relation to the smartphone. For example, smartphones, similarly to Nieminen-Sundell and Väänänen-Vainio-Mattila (2003) description of bicycles, elicited strongly opposed or passionately loved stance of consumers upon introduction (for example, 'Cheers and Tears for Apple's iPhone' [BBC News, 2007]). Both were seen as controversial ('Mobile Phone: Ear Tumours Risk' BBC News, 2004); grandiose ('iPhoneX: Most expensive Apple phone is also easiest to break' [The Guardian, 2017]); and also, dangerous ('The Smartphone Danger: Psychologists quickly learning how dangerous Smartphones can be for teenage brain' [The Statesman, 2017]). This aligns with the work of Pantzar (1997) (Figure 2.3), which presented the change in perception of the mobile phone following the launch phase. Most notably it marks the progress of the mobile phone being seen as an expensive accessory (Passion and Fever, Figure 2.3) to an everyday essential (Lifestyle and Adaption, Figure 2.3). The new iterations of smartphones also reflect the process of products adopting shifting meanings post-launch. As Keogh (2012) states, the iPhone has required us to think and rearticulate personal relationships to media and technology, as well as reconsider individual notions of identity, individualism and sociality.

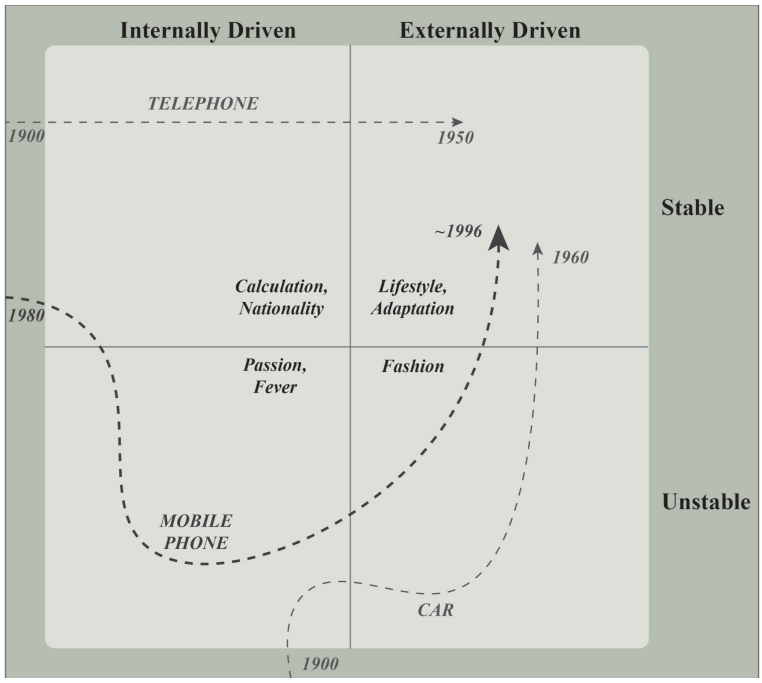


Figure 2. 3 The Domestication of Everyday Life Technology (Pantzar, 1997)

2.2 Situating Smartphone MDIs in the Heritage Context

The smartphone has reshaped the manner in which people interact, communicate and obtain information (Wang *et al*., 2011). As a result, their potential application in the museum and heritage context appears almost obvious. MDIs have the potential to provide added value to the users' heritage experience. This can be achieved through stimulating engagement, increasing motivation, and arousing curiosity, while permitting immersion in the learning environment (Costabile *et al.*, 2010). Interpretation of the medium in the manner which Costabile *et al.* (ibid.) suggests accommodates the sensory perceptual involvement concept of engagement. Traditionally, earlier, non-smartphone MDIs possessed didactic communication models, whilst the multi-way communication possibilities of smartphones presented opportunities for more embodied engagement (Section 2.3). Embodied engagement, that is a holistic individual experience, encompassing the users' intellectual, emotional and social experiences with place, reflects the theoretical capabilities of smartphone MDIs. The smartphone MDI has the capacity to support embodied engagement through enabling empathetic connections to place and evoking emotive responses (such as feelings of attachment or belonging) (Ridge, 2013; Bitgood, 2010; Dindler *et al.* 2010).

2.2.1 Information, Interpretation and the Communication Structure

The existence of heritage sites offers opportunities to portray the past in the present, providing infinite time and space in which the past can be experienced through the prism of the endless possibilities of interpretation (Nuryanti, 1996). It is important to consider smartphone-based MDIs and digital media more broadly in relation to interpretative messages. To accommodate the actions, behaviours and expectations of patrons in relation to heritage sites, particularly users in new spaces, significant amounts of information and interpretation are required. Through MDIs, the required interpretative message is provided instantly and in context, which is a significant aspect of the interpretative process (Markwell, 2004; Han *et al.,* 2014; Olsson and Väänanen-Vainio-Mattila, 2011). As Bollini *et al.* (2014) outline, effective communication for interpretative storytelling or narration involves contents, emotions, intentions and environments. Parallels can be drawn immediately between the aspirations of heritage interpretation and the potential of smartphone technology. Tilden (1957) for example, famously noted that the aim of heritage interpretation was to 'provoke, relate and reveal'. These points can be mapped directly to Wang *et al.*'s (2011) understanding that

smartphones have changed how people 'interact, communication and obtain information' (see also Section 2.3).

Heritage experiences, through the communication of interpretation, aim to develop embodied sensuous and situated experiences for patrons (Cant and Morris, 2006). This involves creating intersections between the interests and preferences of the visitor and the knowledge presented at the site. Much research has emphasised the relationship between behaviour, knowledge and sensory experiences within heritage environments (for example, Mitsche *et al.*, 2008; Pierroux *et al.*, 2007; Longhurst, 2000; Csikzentmihalyi and Hermanson 1995; Borgman, 1995 and Teather, 1991). In relation to digital interpretations specifically, for example, Cosgrove and Daniels (1988) examined the layers of social and cultural meaning which could be discerned via visual interpretation and contextual investigation of symbolic imagery.

A distinction must also be made between the range of smartphone applications which are developed for heritage sites. Some applications are sources of mTourism, designed to serve as site information and promotion but not a heritage interpretative experience. mTourism (referring to the use of mobile technologies in the tourism field [Egger and Jooss, 2010]) emerged from eTourism (ICT and technologies for tourism, see Lassnig and Reich, 2009) and the proliferation of the smartphone market. A 2014 study by Schieder *et al*., which analysed 115 smartphone applications available for UNESCO World heritage sites, highlighted the scale and scope of mTourism applications (Schieder *et al.,* 2014). For example, only 31.3% of analysed applications included material for educational purposes, reflecting that they were not necessarily designed to be heritage interpretative experiences. To support this point, in relation to the contents and functions of the applications, there was little variation between the applications and conventional tourist guides. Scheider *et al.* (2014:16) noted in conclusion that "the world heritage character of a place does not seem to have a considerable impact on the content, design or other features of the application".

The difference between these forms of applications reflects Tilden's (1957) principles for interpretation, specifically that information, as such, is not interpretation. Interpretation is revelation based upon information, but both should be viewed as separate but linked entities. Applications such as the National Trust App (Figure 2.4) or English Heritage Day's Out application reflect the mTourism formatted smartphone applications and are not devised as interpretative experiences. The National Trust app (Figure 2.4), for example, uses an

interactive map and GPS functionality to allow the user to locate their nearest National Trust site. When a site is identified by the user, visitor information such as directions, on-site facilitates and opening times are provided. Alternatively, the 'What's on' option (Figure 2.4B) allows users to identify and receive information on events happening at National Trust properties within their locale. While these applications are functional, serve a distinct purpose, and are helpful to patrons planning a visit, they do not provide a smartphone-based interpretative experience.

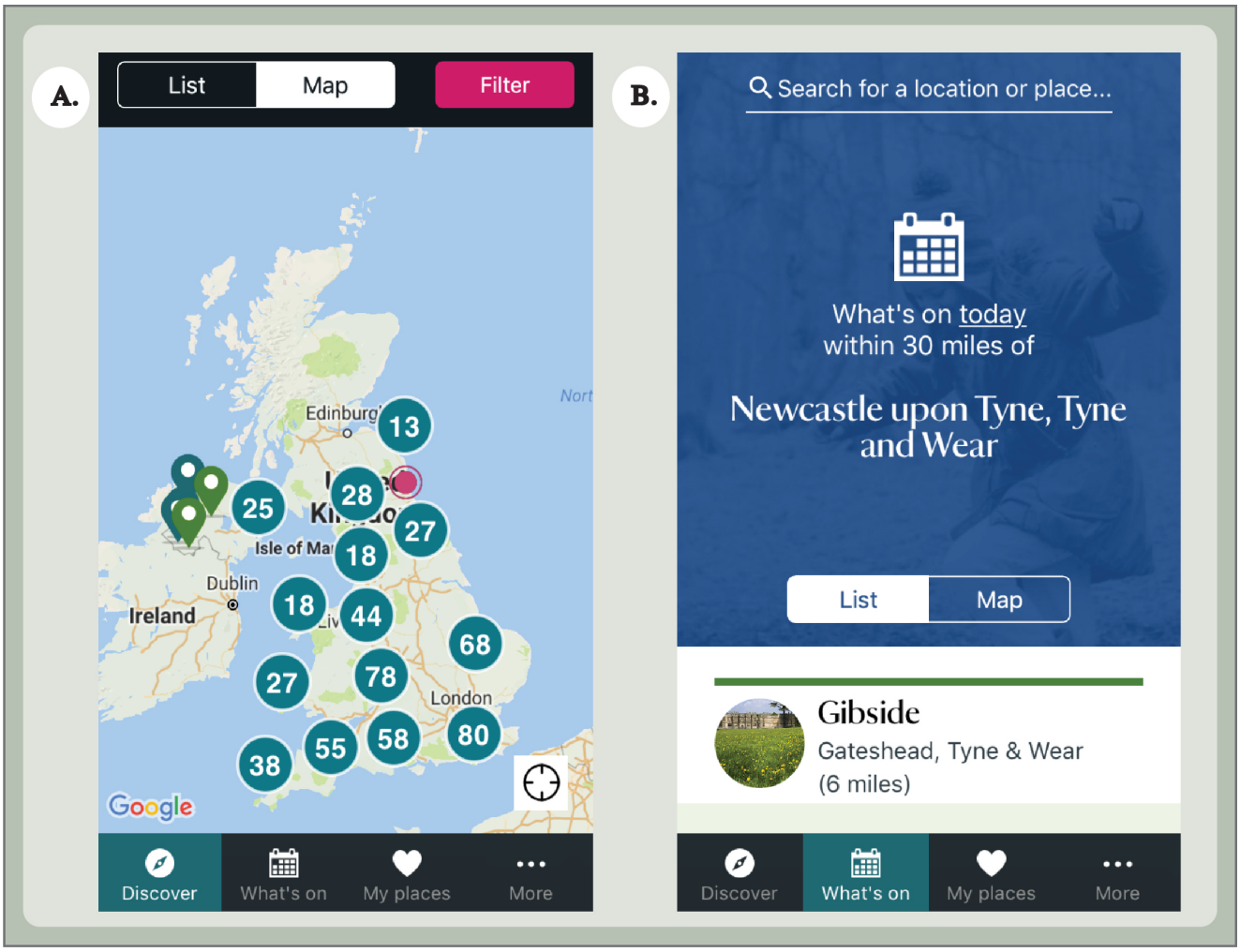


Figure 2. 4 The National Trust App

2.2.2 The Physical and Virtual Space

The adoption of a smartphone-based MDI in a museum or heritage setting can be viewed as a complex network of interactions (Gammon and Burch, 2008). The device must facilitate and support the interactions which occur to achieve the ambition of the interpretation. These

interactions occur in both physical and virtual spaces. This creates a hybrid landscape in which the MDI facilitates and supports the interactions to allow the user to achieve their ambitions in the experience. Gammon and Burch (2008) mapped out the various nodes of interactions in the museum context (Figure 2.5).

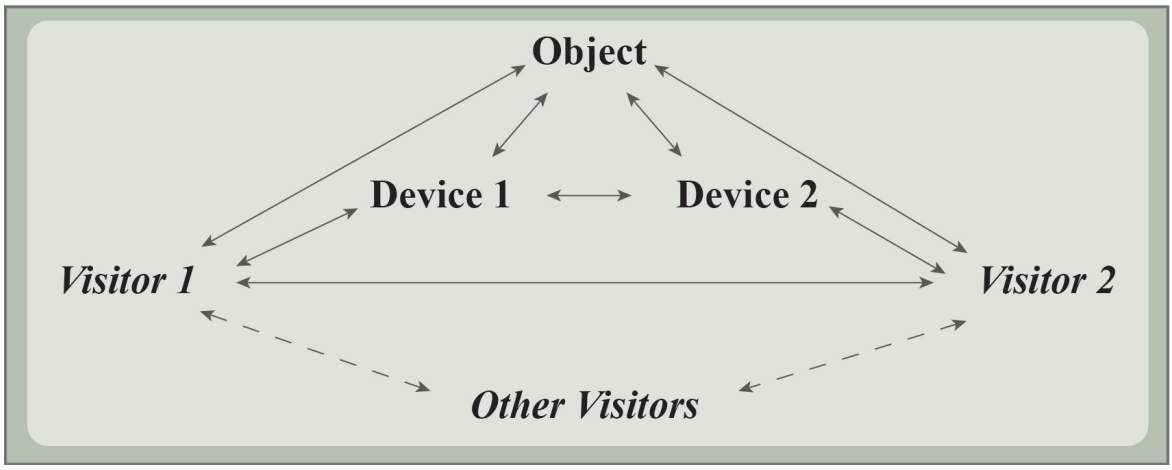


Figure 2. 5 Interaction nodes in the Museum (Gammon and Burch, 2008)

This reflects the physical and virtual interactions that occur and are similar to those that occur in the smartphone MDI heritage experience. Physical interactions, such as between visitors, between visitors and the object or device, are consistent across outdoor heritage and museum spaces. Similarly, the same virtual interactions exist, such as between the object and the device (for example, Bluetooth connectivity) or the visitor and the device (for example, accessing interpretative content of the object through the device). Something which is lacking in this model, however, is the role of place or the context in which these interactions occur. This is even more prominent in outdoor heritage landscapes, where a large number of the interactions are place-based, and the location itself is an important motivation in the experience. This research aims to unpack these interactions with a greater focus on place, particularly the intangible elements of place. While studies such as Gammon and Burch (2008) acknowledge the role of place to an extent, this is primarily in the form of place as a physical space (such as an exhibition space or arrangement). There is a need to understand the intangible interactions of place that occur in such MDI experiences. Elements of sense of place need to be incorporated into understandings of these digital heritage experiences. Mazel *et al.* (2012) arrived at a similar understanding, stressing that mobile engagement tools should not be conceptualised as autonomous environmental devices.

When considering the role of place within the MDI experience, the hybridised space which melds the virtual and physical landscapes needs to be considered. Place is not simply where you locate yourself, but, through the emergence and prominence of mobile technologies such as the smartphone, is a hybrid state between the physical and the wirelessly co-present context (Wilken, 2015). As suggested, the role of place is not as prominent in the consideration of such digital experiences. The physical and virtual were perceived as separate entities. Munster (2006:86), for example, stated on virtual spaces that

> "more than any other quality or dimension associated with digital technologies, has promised to leave the body and its 'meat' behind, as minds, data and wires join together in an ecstatic fusion across the infinite matrix of cyberspace."

By considering the experience in the hybrid landscape, the physical and virtual co-exist, thus the 'body' is not left behind. The process of walking in the outdoor cultural heritage landscape with an MDI highlights this concept. The user moves through the landscape and simultaneously, via the MDI they are using, traverses the virtual space created by the application. Their changing location is generally visually represented by the movement of an icon generated through GPS, reflecting the user's position. The use of a mobile phone in the public space was described by Katz (2003) as a 'choreography' and this term could also be applied to individuals' actions in the hybridised space formed by smartphone-based MDIs in outdoor heritage landscapes. There is a connection between the virtual and the material, incorporating the felt and lived body in this instance. The individual, according to Keogh (2014) must be equally attentive to the actual and virtual spaces. If this equilibrium is disrupted, for example by the user paying greater attention to the smartphone interface, their contributions to the physical or actual space is obscured.

2.2.3 Personalisation and the Individual Experience

One of the prominent aspects of smartphone-based MDIs is the potential for personalisation. As each visitor has their own device, which can be viewed as a portable computer, they can access the information and interpretation as and when they wish (Gammon and Burch 2008). However, it is important to note that personalisation has always been an element of the heritage experience, regardless of interpretation medium. For example, Staiff (2016:127) notes that visitors have "always subverted authoritative accounts as their own lived

experience becomes the template for their own on-site meaning-making" (See also: Morkham and Staiff 2002, Saipradist and Staiff 2008). Personalisation in this instance incorporates not only flexibility in interpretation depth or scale, but also the interpretative narrative the user wishes to pursue. Smartphone MDIs are therefore responding to personalisation that is carried out organically by the user in-situ. This aligns closely with the computing concepts of soundly assimilated technology, similar to the ideas of situation-aware content (Alfaro *et al*., 2005), or context aware computing presented by Pfiefer *et al.* (2009). The idea of soundly assimilated technology refers to not only location-based content but also a technological vision where the technology itself disappears in the background, while allowing significant innovation. In this way the user develops their unique experience under a framework determined by the heritage organisation. This indicates a need for greater contextual awareness, beyond location awareness. As noted, the resource (MDI) is there to facilitate the exhibit or experience, not to be an experience in its own right. By building the virtual into the real, the real is enhanced, but conversely, by drawing upon the physical, there is the opportunity to make the virtual more tangible and intuitive (Raptis *et al.*, 2005). It is paramount that smartphone MDIs are not treated as autonomous environmental devices, fabricating an intrusive experience (Mazel *et al*., 2012), but as artefacts situated within the environment and visitor experience.

Heritage site visits are a personal experience encompassing both cognitive and emotional aspects, and many frameworks for involvement have noted this interchange between personal, social and physical contexts (e.g. Falk and Dierking, 1992 and Laaksonen, 1994). In such instances, however, the visitor is often incorrectly conceptualised as a uniform entity devoid of any socio-cultural context (Dindler and Iverson, 2009). The smartphone-based MDI has potential to counter this perception of the homogenous visitor as it can enable users to engage with the various connected elements in the experience and in theory contains something for all requirements (Tallon, 2012 and Davies *et al.*, 2013). This also aligns with the understanding of heritage locations as an organic, experimental product in many regards, whereby the effectiveness of the heritage process is dependent on the lived experience of the user on site (McCabe and Foster, 2006).

This premise of personal experience and interpretative experiences controlled by the individual, is supported by Mortara *et al.* (2013), claiming that the trend with interaction paradigms is towards interactions which are 'as natural as possible'. Gaver *et al.* (2003) reached a similar conclusion stating that the ambiguity at heritage sites is an opportunity,

impelling self-interpretation and offering potentially deeper affection towards the site. Parry (2008) also recognises this perception and indicated that while constructing new pathways through sites is not novel, digital media interpretations of this nature can enable this more acutely and encourage it. In this instance, it is not just a process of empowering the visitor on-site but reconceptualising the role of the heritage site through digital media and interpretations. In the adoption of such interpretations, the site is reconfigured, rewired, re-located and reconnected (Staiff, 2016) which leads to the site being 'de-aggregated and decentred'. This aspect reflects the discussion in the previous section (Section 2.2.2), which investigated the impact of smartphone and digital media in society, and how they have come to reshape understandings. The digital and material spaces are fused entities and not dual opposites (Arthur, 2008). Yovcheva *et al.* (2012) suggest that the significance of digital media and interpretations for patrons' embodied experience at heritage sites, leads to a need for a complete rethink and reconceptualization of the heritage site. Thus, in the same manner that Mortara *et al.* (2013) highlight the need for 'as natural as possible' interactions, and McCabe and Foster (2006) stress the 'totality of the lived experience', Hillis (1999 and 2009), similarly to Yovcheva *et al.* (2012), emphasises the requirement of incorporating digital media and MDIs into the understanding of the heritage experience. The digital interpretation medium is not simply an instrument disconnected from the user but constitutive parts of the embodied spatial, social and aesthetic experience (Yovcheva *et al.,* 2012).

2.3. Foundations for Smartphone MDIs

As section 2.1 outlined, the heritage visitor experience has seen the adoption of various technological devices to aid patron engagement and assist the interpretation process. The majority of these adoptions are initially led by large museums and then filter down to smaller institutions. These adoptions reflect societal trends connected with technology. The impact of the smartphone (Section 2.2) indicates why the adoption of this medium was favoured by many organisations within the museum and heritage sector. A study of UK museums in 2012 by the Museum Association and Fusion Research reported that while only 1% of museums had a fully developed mobile strategy, 50% were in the development process. It was at this period that smartphone adoption was expanding rapidly within the museum and heritage sector, being recognised as the new leading edge in interpretation (Wallace *et al.*, 2012). There have been various iterations of mobile digital interpretations in the heritage and museum context, each one reflecting a specific period, a snapshot of society and highlighting

the advancement of technology. Smartphone based MDIs in particular however, reflect the paradigm shift in information provision that is occurring in the heritage sector.

What we consider to be smartphone-based MDIs are shaped by conceptualisations of the technology both in and out of the heritage context. MDIs build upon not only understandings of smartphones in society, but also previous interpretation practices and considerations that have been adopted over generations. One common conception of smartphone MDIs for example is that they are a method for engaging younger audiences (Michaelis *et al.*, 2012). This is a consequence of their initial uptake and adoption by younger audiences in general. Conceptualising the interpretation in this manner, as purely for a specific demographic can be potentially exclusionary for other demographics and contradicts the theoretical perception of uniqueness and personalisation the MDIs afford the user. It is possible that a significant period of time may pass before the implications of contemporary interpretative mediums, such as smartphones, are truly understood; at which point profitability and entrenched conventions may control development (Mann *et al*., 2013). Considering this, however, we can be reasonably confident that the understandings and knowledge garnered through previous interpretative mediums, such as handheld audio-guides, play a role in shaping smartphone MDIs as effective heritage experiences.

2.3.1 Defining Smartphone based MDIs

'Smartphone based Mobile Digital Interpretations' is the term used in this research to collectively address forms of interpretation that are available to visitors through their smartphone device. The term 'Mobile Digital Interpretation' can be broken down to its component parts: 'Mobile' in that it is capable of being moved; 'Digital' in regard to its electronic and computerised nature; while 'Interpretation' broadly reflects the task of communicating an understanding of the heritage environment. Interpretation is a complex and nuanced concept, various definitions of which were outlined by Rahaman and Tan (2011:103) as seen in Table 2.1 below. Interpretation is further unpacked in chapter 3.

Table 2. 1 Understandings of Interpretation by Rahaman and Tan (2011:103)

Source and Affiliation		Definition of Interpretation
Heritage Scholars	Uzzell	Interpretation is that it opens a window on the past.
	Harrison	The art of presenting the story of a site to an identified audience in a stimulating, informative and entertaining way to highlight the importance and provoke a sense of place
	Beck and Cable	Interpretation is an educational activity that aims to reveal meanings about our cultural and natural resources
	Moscardo	Interpretation is a special kind of communication
	Howard	Interpretation is deciding what to say about heritage, how, and to whom.
	Goodchild	Interpretation is, in fact, only one aspect of the broader topics of presentation, supplementary education and visitor satisfaction.
Interpretation Associations/ Authorities	Interpretation Association, Australia	Heritage interpretation is a means of communicating ideas and feelings which help people understand more about themselves and their environment
	The National Association for Interpretation, USA	Interpretation is a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource
	The Association for Heritage Interpretation, UK	Interpretation is primarily a communication process that helps people make sense of, and understand more about, your site, collection or event.
	ICOMOS Ename Charter	Interpretation refers to the full range of potential activities intended to heighten public awareness and enhance understanding of cultural heritage site.
	ICOMOS Charleston Declaration	Interpretation denotes the totality of activity, reflection, research and creativity stimulated by a cultural heritage site.

'Mobile Digital Interpretation' was adopted during this study as it draws direct connections to heritage interpretation specifically. It is a term commonly used in the cultural heritage sector, such as museums and heritage spaces. Gammon and Burch (2008: 43) for example, speak of "designing mobile digital interpretation that works for visitors". Similar iterations of 'Mobile Digital Interpretation' have been used in other studies, such as 'Mobile Digital Technology', 'Mobile Engagement Tools' and 'Mobile Digital Storytelling' (Lewis *et al.*, 2010 and Bidwell *et al.*, 2010).

It should also be noted that the term 'Smartphone-based Mobile Digital Interpretation' is inter-changed with 'application', or the shortened form 'App', in this research. Application or 'App' refers to the software application that the user can download and access on their smartphone device. In the context of this research, the 'Apps' contain interpretative content for a specific site. The term 'App' is generally accepted to denote software for mobile platforms or devices, an interpretation deriving from the launch of the Apple App Store in

July 2008 (Apple Inc., 2008) The first common use of 'app' as shorthand for 'software application' occurred in 1985, when Apple® released the MacApp programming tool. It was not however, until after the launch of the Apple® App store in July 2008 that 'app' became commonly understood to refer to software designed for mobile platforms and devices. Applications that are developed to run on a specific mobile platform and devices (such as the Google Android® platform or the Apple® iOS platform) are known as native apps; native in that they are created to be 'native' to that specific platform. It is these native applications that are the focus of this study, despite there being other variations of applications. The most notable variation to native apps in this context are web-apps, which are applications that function within the (mobile) web browser. Web-apps are cross-platform, non-native and if responsive, can adopt variation in design depending on the mobile device on which it is accessed.

2.3.2 The evolution of Pre-Smartphone Mobile Interpretation

There has been a long relationship between digital technology and interpretation in the cultural sector. Regardless of the technology adopted, however, certain challenges still persist, particularly surrounding the expectations of visitors, and also the time-limited nature of digital technologies. As Yi-Qing (1984:54) noted, "what is new today will be old and past in the near future". While there have been many technological advancements since Yi-Qing reached this conclusion, the sentiment is still relevant to current conceptualisations of digital interpretations. Additionally, while these challenges, for example visitor expectations and the time-limited nature of digital interpretations, persist across the various iterations of digital interpretations, each iteration brings its own unique challenges, as outlined in Section 2.2 with specific reference to smartphones.

Within the heritage and museum sector the most prominent form of MDI was, and still is, the audio-guide. In the 1950s a multi-lingual audio-tour was provided for visitors to the 'Vermeer: Real or Fake' exhibition at the Stedelijk Museum (Amsterdam) using radio technology (see Proctor, 2013). In the evolution of MDIs from this pioneering example to present day manifestations, the audio-tour is a consistent medium. It was a trend which was accommodated through 'made-for-museum' devices. These 'made-for-museum' devices were specially designed and hosted interpretation, via an audio-tour, on a specialist device that the visitor would obtain from the museum. The device was loaned to the user for their experience

in the museum but was then returned. Museum specific devices still exist and are utilised by museums and heritage sites despite the proliferation of personal devices. The challenges of adopting personal devices and their effectiveness in museums and heritage sites is illuminated in the decision by certain institutions to still produce these 'made-for-museum' devices for patrons.

The emergence of personal devices, such as 'Personal Digital Assistants' (PDAs), mobile phones and subsequently smartphones, was perceived to be a paradigm shift beyond 'made-for-museum' devices and this has occurred to an extent. At the turn of the 21st century, Cheverst *et al.* (2000) and Grinter *et al.* (2002) for example explored the possibilities of PDA technology within the museum and heritage context. Bath (2006) identified the growing trend and potential of personal devices and MDIs in heritage interpretation. The work by Bath (2006) specifically recognised devices such as the Palm Pilot® and the Apple Newton® as containing features that constitute the core functionality of current smartphone-based MDIs such as text, audio, video capability and camera functionality. The timing of Bath's publication, prior to the upsurge of the smartphone mass market, provides an excellent example of the shift in dynamics and re-imagining of MDIs in a relatively short period of time. One of the most prominent shifts in MDIs was that visitors were now bringing their own devices to the experience (BYOD). This model was not supported within museums for many years however, and the continued presence of 'made-for-museums' shows the imperfections with the BYOD model despite many of the purported benefits such as personalisation (Section 2.2.3).

Although the adoption of personal devices reduced costs for museum and heritage organisations, it also introduced new dynamics into the experience (Jones, 2014). The alteration from providing a Mobile Digital Device with pre-loaded content to designing content for a mobile platform for the user opened new avenues and methods for disseminating interpretative messages. Early iterations of these interpretations included media forms such as podcasts, in audio or video formats, eBooks and PDFs which mirror the traditional analogue guidebook. Through mirroring traditional practices such as analogue guidebooks, the interpretative media was still didactic, providing messages to the user but not having the capability or functionality to receive feedback. It was a linear system of communication between the museum or heritage site, via the interpretation, to the consumer. Over time however this progressed into more immersive content with the new range of media that could

be hosted on devices. This allowed for greater flexibility in the delivery of interpretative messages. The introduction of smartphones and other devices with similar capabilities (that is, Tablets) reflected the progression to more immersive content and a potential solution to the still prevalent issue of didactic communication within the digital interpretations. The smartphone allowed 'content specialists and experience designers to focus on what is truly transformative and memorable for the museum constituents' (Proctor, 2015:501). In doing so, elements such as the personalisation of the heritage experience and embodied engagement could receive greater attention in the imagined experiences created in the interpretations.

While each iteration of digital interpretation has its own implications on the users' heritage experience, there are consistencies in the experiences across mediums regardless of the technology. In the case of this research for example, the focus is on smartphone-based MDIs for rural cultural heritage landscapes. The common scenario being that the user adopts the MDI to receive interpretation as they walk around a heritage site. The interpretation includes both practical advice on orientation (that is, directions) and interpretation of the landscape and various site features. There are numerous examples of this activity in other non-smartphone mediums. Cardiff's Forest Walk (1991), an audio-walk at the Banff Centre (Alberta, Canada), for example, used a cassette deck and headphones. While this activity centred on art practice the audio-walk involved similar processes as the smartphone MDI experiences being studied. The cassette tape provided audio directions, observations and interpretations of the space to the user, akin to what a user has come to expect with the developed smartphone-based MDIs. Similarly, the Tate Modern supplied PDA tours for patrons (Fisher, 2002). The Tate Modern tour was available on PDA devices and visitors noted how easy it was to decipher the functionality and operate it (Fisher, 2002). The tour was founded on standardised web conventions that were already familiar to the individual. This reflects the progression to more response and immersive interpretative experiences through the development of digital interpretation tools and practices (Norman, 1988).

Conclusion

This chapter has explored the evolution and contextualisation of smartphone-based MDIs. The current typology of smartphones can be seen as the evolution of mobile phones coupled with technological advancement. Present conceptualisations of the smartphone reflect a touch-based interface with multi-touch functionality and no physical keyboard. A key

distinction between smartphones and mobile phones is that smartphones possess computational functionality. It is this enhanced functionality that has helped lead to their prominence in society and as an interpretative medium for heritage experiences.

A common misconception regarding smartphone MDIs was that they were predominantly a means for engaging younger generations in heritage experiences. Although younger generations were early adopters of the devices, smartphones are now highly popular amongst all demographics. This is an important consideration when contemplating the society's relationship to smartphone MDIs. Developing smartphone MDIs as a means for engaging younger audiences potentially limits the effectiveness of the interpretation for other demographics.

Given the influence of the technology in society the potential for co-opting this for heritage interpretative experiences is clear. The smartphone has changed how people interact, think and communicate. These changes emerge in the heritage experience with smartphone MDIs when, for example, considering navigation. The MDI presents the user with another landscape to navigate, a virtual landscape of the MDI outlining interpretative points. As a result of this, the MDI fosters a digitally hybridised landscape that melds together the physical and virtual landscapes. Navigation therefore occurs in both landscapes simultaneously, which becomes pivotal in how users interact, think and communicate in the heritage landscape.

MDIs can provide interpretative content instantly, regardless of location. As a result, they influence how users perceive heritage places in-situ while receiving associated interpretative messages. In addition, these interpretative messages can be more emotive than previous mediums. The multi-media facility of the smartphone allows features such as sound-effects, videos, images, and Augmented Reality (AR) to be incorporated alongside interpretative messages. When considering the application of smartphone-based MDIs for heritage experiences, personalisation is also a common component. Personalisation has been a familiar area of study within the heritage experience (see Morkham and Staiff 2002, Saipradist and Staiff 2008), and smartphone MDIs create opportunities to accommodate this more deeply within the user experience. The enhanced computer functionality of smartphones allows this greater personalization through the ability to contain many different narratives and approaches which can address specific themes and aspects, depending on the individual. This greater flexibility in the experience thus makes it more personable, especially in comparison

to previous interpretative mediums (such as guidebooks or ‘made-for-museums’ audio-guides). The smartphone MDI can be contextualized by considering these previous forms of interpretation. Many of the approaches and techniques are a continuation of the mobile interpretations which have gone before. However, the uniqueness of the smartphone MDI becomes evident when it is considered alongside other previous forms of digital interpretation for the heritage experience. Digital interpretation for the heritage experience is explored furthered in the next chapter, which focuses specifically on engagement and sense of place in such experiences.

Chapter Three: Engaging with place and sense of place in Outdoor Cultural Heritage Landscapes

This chapter explores place-making and engagement in outdoor cultural heritage sites. It builds upon the previous chapter (Chapter 2) by considering connections with place and provides a framework of understanding which allows the subsequent influence of the MDI to be uncovered through the research. As Chapter 2 acknowledged, smartphone MDIs have become a prominent feature in the heritage sector with many purported benefits such as the potential to stimulate engagement (Costabile *et al*., 2010). However, a greater critical reflection on engagement is needed in order to adopt a more nuanced definition which goes beyond attendance at the heritage site to reflect sensory perceptual involvement. The research is therefore a continuation of studies such as McCullough's (2004) which highlighted the relationship between place and the increase of technologically augmented physical landscapes.

As noted in Chapter 1, the term 'cultural heritage sites' used in the research emerges from the International Council on Monuments and Sites (ICOMOS) Ename Charter (2008). While cultural heritage sites reflect a certain physicality and are acknowledged for their cultural or historical significance, cultural heritage more broadly is a fragmented domain. This fragmentation emerges particularly with the postmodern turn towards the increasing recognition of intangible historical elements beyond physical artefacts. The English Heritage definition of cultural heritage, for example, reflects this turn towards more intangible components stating that it relates to "inherited assets which people identify and value as a reflection and expression of their evolving knowledge, beliefs and traditions" (English Heritage, 2008:71). Additionally, the term 'landscape' is often used throughout this thesis. The term is used as a representation of place and should be understood in the same manner as place in this thesis (Section 3.1 and 3.2). Landscape is used to aid clarity, as Creswell (2004:17) noted, "landscape is an intensely visual idea. In most definitions of landscape, the viewer is outside of it". While the experiences highlighted in the following chapters (Chapters 4-9) occur in place, the term landscape is commonly used to assist the visualisation of the experience being referred to.

This chapter consists of three sections which explore three approaches to understanding and engaging with place in cultural heritage landscapes. The sections focus on: the approach to

place adopted in the research (Section 3.1), the concept of sense of place and its relevance to this outdoor cultural heritage study (Section 3.2) and finally, the notion of digitally hybridised places (Section 3.3). Overall, this chapter justifies using sense of place as a lens through which to explores the intricacies of the smartphone-based MDI heritage experience.
Place in this research is understood in relation to its connection with emotion, meaning and the senses, which aligns closely with the embodied heritage experience. Section 3.1 provides a foundation for this approach to place by addressing key aspects of it, such as the relationship between space and place. The section also gives a broad overview of place definitions and the evolution of the approach taken in this research (Section 3.1.1). The humanistic approach to place is defined in Section 3.1.1, while Section 3.1.2 presents the commonalities between this approach and engagement with outdoor cultural heritage. Elements such as embodiment, affect, emotion and experience are discussed in the heritage context.

Section 3.1, by providing a foundation for understanding place and engagement with outdoor heritage landscapes, lays the platform for Section 3.2 to explore the concept of sense of place. Sense of place is understood as the umbrella term that reflects the various processes that allow people to respond to places. This is explored in relation to the heritage context and is considered via three primary components: place identity, place attachment and place dependency. Heritage sites can be actively shaped through awareness of place attachment, identity and dependency processes. This can encourage a more defined sense of place which people actively construct through engagement.

The chapter concludes by considering virtual and digitally hybridised places (Section 3.3). This incorporates the understanding of place and engagement with place outlined in the previous sections but focuses more specifically on the digital. This is an important consideration as the research is concerned with the influence of smartphone-based MDIs in the heritage experience. Chapter 2 highlighted the prominence of smartphone technology and the key aspects of smartphone-based MDIs in relation to outdoor cultural heritage. This research seeks to explore how the adoption of smartphone devices augments places and influences heritage experiences.

3.1 Place-making and Engagement in heritage landscapes

In this research, the interpretation of place, place-making and engagement in outdoor cultural heritage stems from an understanding of place in relation to the senses, emotions and meanings that are ascribed to them. This is established in prominent studies in relation to place, such as those by Tuan (1977) and Casey (1997). These studies, with their focus on the sensuous and affective components of place, relate closely to the concept of 'sense of place'. Sense of place, including the works of Tuan (1997) and Casey (1997), are investigated in greater detail in the next section (Section 2.2) but it is important to first provide a foundation to the concepts of place and engagement in the outdoor heritage context. This section therefore introduces various approaches to understanding place, the connections between these understandings and the heritage experience, and the relationship between visitor engagement and heritage landscapes. This will ground the intricacies of the notion of sense of place and present its applicability as a lens through which to explore the influence of smartphone-based MDIs in outdoor heritage landscapes.

3.1.1 Understanding of Place

Place is not a term confined to geographic studies or a simple marker of a physical location but is a concept embraced by various disciplines and across disciplines. This research, concerned with smartphone-based MDIs and attention to place-connections in the heritage experience, is an example of the inter-disciplinary nature of the term.

Given the nature of this research, the terms space and place are viewed with a philosophical and humanistic geography lens. In this research, space is not what, for example, lies at the other side of the Kármán line (as in outer space) or a reference to a specific volume, but a theoretical concept aligned closely to place. Lefebvre (1991) describes various forms and conceptualisations of space, including absolute space and social space. Social space is particularly interesting as it reflects a human connection to space, such as how meaning and attachment are given to certain spaces. This understanding of social space closely resembles how place is commonly defined and understood. Harrison and Dourish (1996) for example, differentiate between space and place by describing place as spaces where there is human meaning attached. Place therefore is a space that is influenced or associated with human practices, behaviours and social influences. As Harrison and Dourish succinctly define the variation, "we are located in 'space', but we act in 'place'" (Harrison and Dourish, 1996:69)

The attribution of meaning therefore transforms space to place. Lainer and Wagner (1998) likewise acknowledged space, place and the role of social aspects to bind and define them. Space, according to Lainer and Wagner (1998), supports and stimulates social and individual connections and behaviours. In doing so, the space becomes place (Erickson, 1993).

Ciolfi and Bannon (2007) discuss designing hybrid places. This resulted in an outline of the assorted interpretations and conceptualisations of place which exist in various fields and disciplines. Though they considered architecture, planning and environmental studies (citing studies such as Cullen (1971), Alexander (1979) and Gehl (1987)) common strands relating to place were the aspects of form, space and human behaviour (Ciolfi and Bannon, 2007). In addition, by incorporating understandings from anthropology, geography and philosophy (citing studies such as Tuan (1977) and Casey (1997)), greater attention can be paid to human behaviour and how meaning and significance are ascribed. These elements (i.e. form, space, human behaviour, meaning and significance) also align with what Davies' (2004) regarded as 'certainties about place'. Table 3.1 is adapted from Davies (2004:403) outlining what he believed to be the five certainties of place.

Table 3. 1 Certainties of Place (Davies, 2004:403)

Position	There is typically a sense of position or location.
Physicality	There is a physicality attached to place, a landscape containing the built and natural environments
Change	Places are not stagnant, they change over time and this change helps enforce attachment to them.
Community defined	Places are defined by the people who live in them, with the meaning of place changing as the communities with it change
Individual	Every individual has personal places and they apply their own conditions for identifying specific places. These conditions emerge from personal experiences and histories.

As Table 3.1 shows, Davies (2004) incorporates both the tangible and intangible elements of place. Place is more than a location or a material entity, it is also personal concept which reflects personal biographies and histories. The certainties of place provided by Davies (2004) reflect the various approaches to place mentioned previously. Like Cullen (1971), Davies (2004) includes the physical and material understanding of place. As well, through the inclusion of community defined and individual interpretations of place, he echoes the philosophical considerations introduced by scholars such as Tuan (1977). According to

Spretnek (1997), these latter approaches to place—with their attentiveness towards aspects like attachment—reflect a reality of place that was denied by the earlier more rigid, spatially defined views of place.

Tuan's (1977) humanistic approach to place aligns closely with the aims and objectives of this study as outlined in Chapter 1. As Tuan (1977) acknowledged, perceiving space and place from the humanistic perspective is about understanding the feelings and emotions of an individual towards spaces. Building upon Davies' (2004) five certainties of place (Table 3.1), Tuan's (1977) approach to place puts greater emphasis on the individual, community and change components of place (Table 3.1) over the spatial and physical factors. Tuan (1977:406) illustrates this by considering ego-centric and ethno-centric representations of spaces (Figure 3.1). These different representations of spaces centre the individual and community in each instance.

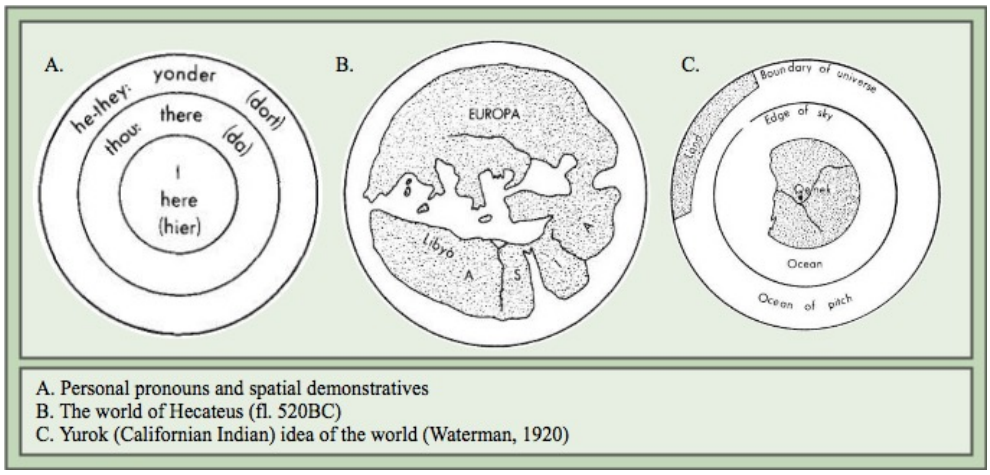


Figure 3. 1 Ego-centric and Ethno-centric representations of Place (Tuan, 1977)

Spaces and places are thus defined by the significance and meaning ascribed to them by humans. Individuals are bound to places, not simply by the material properties they contain, but by the symbolically charged nature of these material properties. While what comprises place is distinctive for each individual, symbols and meanings are often collectively shared or communal. Gupta and Ferguson (1992) for example, noted how remembered places (such as outdoor heritage sites) often serve as symbolic anchors for dispersed people. Gupta and Ferguson (1992) use the idea of 'homeland' to reflect the individual, yet communal understanding of place put forth by Tuan (1977). Homeland, according to Gupta and Ferguson (1992:11), "remains one of the most positive symbols for mobile or displaced

peoples" but on an individual level the relationships to and contextualisation of it can vary greatly.

As reflected in the work of Tuan (1977), this humanistic approach to place is about the sensuous and affective components of place and as such aligns with understandings of the heritage experience and engagement in heritage landscapes (Section 3.1.2). Within the heritage context, Rossou (2007:276) stated that "it is not only what appeals to the eyes but also all the other senses." A discussion relating to the senses and sense of place occurs in Section 3.2, but it is significant at this point to acknowledge the parallels between this approach to that of place and embodiment. Thrift (2003) delineated the connection between embodiment (and aspects such as affect) and place. As Hubbard and Kitchin (2011) argue, Thrift's (2003) work on non-representational theory stems from the view that encounters (for example, with spaces) cannot be effectively conveyed through language and discourse. They state, "being 'in place' involves a range of cognitive (mental) and physical (corporeal) performances that are constantly evolving as people encounter place" (Hubbard and Kichin, 2010:6). The next section (Section 3.1.2) continues this discussion of empathetic connections in the heritage experience and approaches to engagement with heritage landscapes.

3.1.2 Engaging with heritage places

The understanding of place, relating to the affective and embodied components as much as the materiality of the landscape, aligns closely with the heritage experience. While studies such as Light and Prentice (1994) and Adie and Hall (2017) consider heritage patrons through audience segmentation and demographics, there is a rich discourse relating to the unique, embodied and affective elements of the heritage experience. Dallen (1997) for example, drew parallels between the emotional connections to places and personal heritage. Similarly, Harrison (2013) acknowledged heritage to be a personal activity, incorporating the cognitive and emotional aspects of the experience. Emotions in the heritage experience are important as "they provide a natural means for the brain and mind to evaluate the environment within and around the organism, and respond accordingly and adaptively" (Damasio, 2003:54). Correspondingly, Uzzell and Ballantyne (2007) recognised how an individual's attention, memories and experience in heritage experiences are influenced by the affective responses that occur during the visit. As a result, emotions, feelings and affect help shape and define interpretations of places, whether in an everyday context or a specific heritage landscape.

Other studies have also highlighted the correlation between understandings of place and heritage. The 'emotional heritage experience' (Biran *et al*., 2011) and the 'personal heritage experience' (Timothy, 1997) are prominent examples of this connection. Both studies recognise emotive responses, place connections and place attachment and the role they play in an individual's heritage experience. The personal heritage experience (Timothy, 1997) in particular is interesting as it presents the individuality of the heritage experience. The feelings and emotions that emerge in the experience are mediated by the individual. As Schorch (2014:25) outlined "feelings have an inherently hermeneutic quality linking the conditions and processes of meaning-making in an embodied way, as we witness the interpretative sections". The personal nature of the heritage experience and associated uniqueness of each individuals' interpretation (McIntosh, 1999) brings focus to notions of identity in the heritage experience. Yu Park (2010) addressed the role of identity in the heritage experience, noting how it is linked not only to material aspects but the socio-psychological testament of identity. This socio-psychological explanation of identity encapsulates the aforementioned aspects of individual emotions, empathetic connections and 'embodied meaning' (Johnson, 2007). Being aware and responsive to these aspects allows for a "more nuanced view of the human experience" (Schorch, 2014:24), which is important in relation to the aims and objectives of the research. An attentiveness and sensitivity towards the felt and embodied connections is paramount to effectively illuminate and understand the influence of smartphone MDIs on the users' outdoor heritage experience.

Another key term in this research is 'engagement'. It has been adopted in the heritage context to reflect physical attendance at a location. However, this is an over-simplification which can be much more nuanced and complex than this interpretation suggests. Engagement in the heritage context, and the definition embraced in this research, relates to the "deep sensory-perceptual, mental and/or affective involvement in the exhibit content" (Bitgood, 2010:10). Effective engagement is therefore closely aligned to the meaning-making process and embodiment. Ridge (2013) adopts a similar understanding of engagement when discussing deepening cultural heritage engagement through crowd-sourcing. This definition is also supported in the 'Culture and Sport Evidence' (CASE, 2011) provided by the Department for Digital, Culture, Media and Sport (UK Government Agency). Aligning with the views of Bitgood (2010), the CASE interpretation centres on aspects such as attendance, participation, decision-making and production. Csikszentmihalyi and Hermanson (1995) also incorporate the mental and affective aspects of engagement in the heritage and museum context by

acknowledging the importance of the users' past experiences, knowledge and inclinations. This relates to the user motivations in the heritage experience, which according to Dindler and Iverson (2009:1), is "a central aspect of understanding how exhibition spaces may engage visitors".

Building upon this understanding of engagement and the role of embodiment, Harris (2015) argues that the ICOM definition of museums was outmoded because it did not incorporate the embodied presence of visitors, but instead viewed museum institutions as "an empty container with sharp boundaries between it and its users. None of its meanings seem to be drawn from an interface with people" (Harris, 2015:101). Correspondingly, Schorch (2014:33) claimed that "senses, feelings and embodiment interact with narrative in the quest for meaning". These understandings show the obvious importance of embodiment in engaging with heritage places and museums. They speak to the interconnectedness of the body (Merleau-Ponty, 1968) as well as self-presence (Leahy, 2012). Leahy (2012) is particularly pertinent in the context of this research. She highlights self-presence through walking, how walking facilitates forming connections to place and the role it plays in experiences of place.

The outdoor cultural heritage experience is much more than passive interactions with space or interpretative content. It is non-linear and allows the fluid interchange of understanding and emotion. Walking through a landscape supports the formation of experience. Patullo (1997) for example, acknowledges how heritage trails aided a more profound sense of place and community. Similarly, Hayes and MacLeod (2007:49) note the "very clear potential that exists for heritage trails to augment the visitor experience" referencing Pine and Gilmore's (1998) four realms of experience to assist more active interactions in heritage trails (Figure 3.2).

The understanding of Hayes and MacLeod (2007) and Pine and Gilmore (1998) provides an encompassing view of the heritage experience. Pine and Gilmore (1998) note that the most effective experiences are those that embrace all the elements. The basis for this being that by addressing all the elements the experience becomes more available to the individual and reflective of their activity systems. Pierroux *et al.* (2007) for example, stated that the museum and heritage experience was an amalgamation of two activity systems: the individual in their everyday actions and the objects in the museum and heritage space. A key element of the

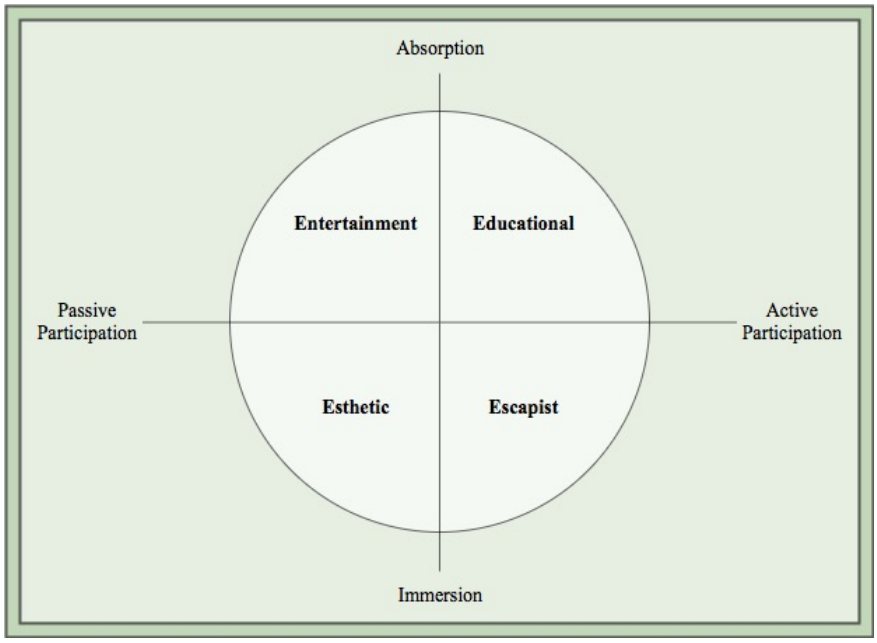


Figure 3. 2 Four realms of experience (Pine and Gilmore, 1998)

experience is how these two activity systems interact. In this research, the process of walking through the outdoor heritage landscape is pivotal for the above interaction. This is akin to Malpas' (2008) view of place as existential ground, which, as Giaccardi and Palen (2008) clarify, "is where our experience and enduring relations with physical and social settings shape and define our sense of belonging, identity and culture" (282). The users' experience evolves and is formed as they walk through the landscape. Their understanding and empathetic responses are dependent on their own individual representations and the connections they make with the elements they encounter.

The above section explored the various approaches to place and outlined the perspective taken in this research. Parallels were drawn between the perspective of place and the outdoor heritage experience. This provides a foundation from which to address sense of place, which is the focus of the next section.

3.2 A Sense of Place

Sense of place, made prominent by Tuan (1977), is a laden interdisciplinary term which encroaches upon various subjects from human geography to phenomenology, via social anthropology and environmental psychology. The adoption of the concept in various disciplines has resulted in the lack of a clear definition, yet the broad consensus across these disciplines is that the term relates to the subjective and emotional attachment to place (Agnew, 1987). This is an elementary definition, void of the holistic, social and contextual

nature of the concept in many respects. This definition will be expanded upon in this section, acknowledging the interplay of the many variables which contribute to the perceived sense of place of visitors.

The concept, which has close associations with the philosophies of topophilia and *genius loci*, can be viewed as the encompassing terming for both. Topophilia, translated as 'love of place', provides a description of the theory which relates to the sensitivities, interpretations and attitudes that affectively bond people and place (Tuan, 1977). While the term *genius loci* relates to a somewhat divine understanding of place and the human relationship, the expression is used to define the unique qualities of places that are believed to emanate from the presence or guardianship of a supernatural spirit or an inherent spiritual power (Jackson, 1994). Sense of place can be situated between both models, incorporating the rather tangible stance of topophilia with the more intangible nature of *genius loci*. The concept can be understood to be the embodiment of the various processes that allows people to respond to places and serves as a holistic approach, capturing the rich variability of human interactions with space.

In the same manner that there is no exact definition of sense of place, a general consensus does not exist either on the appropriate approach to take when examining the concept. As a result, it will be examined by the most applicable method to the objectives of the study, in this instance the approach put forward by humanistic geographers and environmental psychologists. This approach frames sense of place around individual identity which provides a useful method to exploring the complexity of the MDI experience in outdoor cultural heritage. Stedman (2003:672) noted the importance of the individual in the fostering of sense of place at locations, claiming that the concept was not intrinsic to the physical space but "resides in the human interpretation of the setting which are constructed through experience with it". This relates to experience as a subjective mental state felt by patrons during an encounter. Sense of place resides in the individual, for a visitor in a cultural heritage site objects are merely passive entities. To be deemed of any significant worth or value they need to be activated and assigned symbolic personal meaning (McIntosh 1999).

This individual identity approach to understanding sense of place can be sub-divided into three aspects, relating to the cognitive, conative and affective processes (Shamai, 1991). Under the overall arc of sense of place, the cognitive variable relates to place identity or

individual perceptions and beliefs (Twigger-Ross and Uzzell, 1996), the affective is associated with place attachment (Low and Altman, 1992), whilst the conative is understood as place dependency, representing behavioural intentions and commitments (Jorgenson and Stedman, 2001). These variables are interchangeable and there is the potential for varying levels of importance. Awareness of this multidisciplinary aspect is imperative so as not to obscure the relationships between the elements which all contribute to the perceived sense of space. Jorgenson and Stedman (2001:317) claimed that "by understanding the cognitive, affective and conative structure of sense of place, researchers are better placed to explore the potential for complexity in the concept. This is particularly important when this complexity bears on the development and evaluation of communication and/or behaviour change strategies". Therefore, in the following section the three aspects (place identity, place attachment and place dependency) will be outlined and examined within the context of outdoor cultural heritage sites.

3.2.1 Place Identity

The first of the three primary processes which cumulatively reflect sense of place is place identity. This relates to the way in which people view themselves within places. Place identity should be viewed as a sub-culture of self-identity and therefore susceptible to influence and change over time (Proshansky *et al.,* 1983). The individual's pre-formed experiences and conceptions relating to place identity are a powerful guidance in fostering sense of place. The assigning of personal worth through created associations with past experiences can result in contesting views as objects and sites are susceptible to multiple meanings. A patron may however interpret an object in an entirely different manner than was intended (Beeho and Prentice, 1995). As repositories of history and memory, places can enhance identity through encouraging the provision of meaning, knowledge and understanding relating to previous activity, both in the form of natural and human processes. The dimensions of time and space are inseparable, "there can be no personal biography of 'what' happened 'when' without a sense of place in which they happened" (Ryden, 1993: 56). In this manner, by becoming part of the everyday, cultural heritage designation acts as a powerful conceptual tool and indicator of place identity.

Heritage sites are manifestations of identity and their value is only ascertained and intelligible because they are recognised and identified by others in society (Mason, 2005; Lidchi, 1997).

Although the meaning can be contested both in relation to the communities involved and the individual, this is not a justification for individuals to decipher their own understanding. A communication system or narrative has to be agreed upon and shared with others for it to work, similar to the concept of the 'ideal' visitor or for whom the experience is meant (Lindeaur, 2006). Kong (2001) noted that the principal cause of heritage contestation was related to place identity. Sites of consumption designated as heritage by some may be a sacred space for another community. Heritage designation plays an important part in place identity as it helps to articulate identities and to strengthen understanding of the space, enabling potential place identity. However, the effectiveness of this rests with the individual.

A lot of what constitutes identity or culture can be locked up in a landscape or space, this is then expressed as local character. Local character is the expression of identity and culture within a space and can be manifested within physical objects present in the space. It is evident that identity and character of the physical landscape are intertwined with the culture (Roe, 2012). Chigbu (2013) noted, when studying rural sense of place, the major value hidden in the estates of rural people with a strong connection between the sensory and the physical. In the context of heritage sites, the active process of making place and subsequent formation of character is not confined to the present but also the past. This character is developed from people constructing places through the investment of human meaning. Place is therefore not an inert and historic form (Yeoh and Kong, 1996) but a 'process of becoming' (Pred, 1984).

Similarly to local character, place distinctiveness is another subset of place identity. This expresses the way in which individuals distinguish themselves through place. It relates to a sense of specialness and Relph (1976) regarded place distinctiveness as "unquestionably about difference". Association with different places can aid the sense of being through distinctiveness. This association extends not only to the physical space but also to the intangible cultural elements. Cultural heritage sites thus act as a foundation for the intangible in the physical space. The process of legitimising a place or identity allows individuals to associate with the space and in doing so enables them to distinguish themselves from others (Twigger-Ross and Uzzell, 1996).

Through the possession of a particular set of qualities a space can represent or embody the essence of a specific identity, culture or tradition. Places are not merely objects, but objects for subjects; with sense of place being the structure of feeling towards such subjects whilst

reinforcing the social-spatial definition of place from the inside (Graham and Howard 2008). Place is to be viewed as a symbolic locale with significant value attached. Acting as an extension of self or community identity it is more than just a physical boundary. People themselves draw together the elements which make up place and this led Stewart (1996) to suggest the concept 'livedness of place', relating to places as they are experienced through everyday life. The connection arising from identification within place is bound by the physical world in which it is set, with meaning tied to specific features and places (Kyle and Chick, 2007). The study by Kyle and Chick (2007), about the Centre County Grange Encampment and Fair in Pennsylvania (USA), highlighted that the physical space provided a spatial context for individuals to celebrate their relationship with one another. The strength of which was evident in the consistency of their outlooks relating to place. The physicality of space therefore is important as it gives form and structure to the meaning and identities contained within.

Imbued with human meaning and identity, if the site is not maintained in the manner which represents this identity it has the potential to be redefined, losing its distinctiveness and subsequent place identity. Once the distinction of a place is created or evident, the subsequent evolution of the landscape can be deemed as a potentially negative manifestation. Identified as a threat to the predetermined understanding it discounts in many respects the dynamic nature of ecological processes and cultural developments. Despite cultural landscapes being "the result of consecutive reorganisations of the land in order to adapt its use and spatial structure better to changing societal demands" (Antrop, 2006:22), transformation can be viewed as corrosive. Maintaining place distinctiveness and identity can thereby become increasingly strained as the distance widens between the meaning and the physical characteristics of the setting.

3.2.2 Place Attachment

Place attachment reflects the affective aspect relating to sense of place. In the context of outdoor cultural heritage sites this relates specifically to the connection which exists between people and places (Low and Altman, 1992). Many have acknowledged the close relationship of place attachment and heritage, categorised by respect and affection to selected places, artefacts or practices which embody the bygone era in some manner (Harvey 2001 and Harrison 2013). Attachment encompasses not only the affective response to the physical

features of a site but also attachment due to social or cultural associations. To understand this process the idea of 'home' is a prime example. Relph (1976) acknowledged it as the place of greatest personal significance and the central reference point of human existence. Relating to the fact that home is representational of a positive emotional bond developed between an individual and a physical location. The individual thereby relates to the physical features as reference points to past experience and memory; influenced by the symbolic meanings they derive from the landscape which supports ideas of place continuity and attachment. Previous experiences in specific environments create a lens through which meaning is attributed. This suggests that place attachment is yielded more through individual behavioural processes and personal experiences than deterministic elements of the landscape. In the study by Eisenhauer *et al.* (2000), 36.9% of respondents cited family and friend related reasons when asked why a place held special meaning. In comparison, 34.2% stated environmental features or characteristics. It is not a reflection on the physical space solely but the prominence of place attachment through associations and the substantial meaning that individuals have assigned to it. This justifies the individual identity approach to sense of place adopted in this instance; highlighting the precedence of the individual over the deterministic value of the environment.

In support of this, a study by Hidalgo and Hernandez (2001) concluded that the social dimension of place attachment was just as powerful as the attachment to the physical elements in the landscape. Both of which can be viewed as a palimpsest, wherein they are susceptible to change and evolution over time. Historical ties to place are a prominent example of attachment through social associations within the heritage context. They can serve to sustain personal identities and a sense of self in places. Kyle and Chick (2007) noted that individual place attachment was strengthened with the memory of ancestors occupying the same spaces, in other words the family history developing a collective identity within a particular place. Place attachment such as that established through ancestral lineage thereby plays an important role in the reaffirming of habitus by re-articulating a sense of the past (Brett, 1996) and a sense of place.

Arising from the symbolic meaning ascribed to features in the natural environment, place attachment fits within the framework of the meaning-mediated model. It is proposed in this model that patrons yield meaning about the environment in ways which reflect their personal social and cultural experiences. A study by Davenport and Anderson (2005) at the Niobara river landscape (Nebraska, USA) highlighted the influence cultural experiences have on place

attachment. After being educated on the ecological uniqueness of the area, attachment to the landscape amongst several of the participants increased because the value of the site was effectively communicated to them. There was also a recorded distancing or detachment from the landscape when knowledge of government regulations increased. As a result, even though the physicality of the landscape provides an element of immutability, attachment is dominated by human behaviour and the process of individual meaning negotiation.

In the examination of place attachment within the heritage context it is also important to address the role of place continuity. The term relates to the way in which place supports an individual's sense of continuity, acting as a memory aid in many respects. Twigger-Ross and Uzzell (1996), building upon the identity process theory of Breakwall (1992), claimed that place continuity could be separated into two variations. The first is place-referent continuity, relating to continuity via places that have significance for the individual and also place-congruent continuity, representing the maintenance of continuity through characteristics of place which are generic and transferable. Many have recognised the physical environment and more specifically historical environments in relation to continuity, specifically place-referent continuity (Graham *et al*., 2009 and Twigger-Ross and Uzzell, 1996). Devine (1994) for example highlighted the role of historical sites in Ireland for preserving the continuity of the group identity. As recognised as an aspect of place attachment, historical ties can sustain identities, with ancestral lineage being a prime example of place continuity (Kyle and Chick, 2007). Heritage sites can support a sense of place by reinforcing continuity over time through offering ideas of place that are agreeable with the patron's idea of 'self'. Patrons' attachment in outdoor cultural heritage sites is mediated through previous experiences and these memories are awoken through physical artefacts or features present. This process subsequently reinforces attachment and the individual identity.

In discussing attachment and continuity, it is important to also address that standardisation of place can also occur, wherein people do not make this connection with a location and subsequently become detached from it (Relph, 2000). Standardisation of place meaning can occur given the malleable nature of the meaning process in individuals and also as a result of typical ecological processes on-going within environments, such as building construction. The people-place relationship is thereby a two-way phenomenon, each aspect being mutually dependent on the other. Chigbu (2013) noted that in the rural environments of Uturu (Nigeria) natural features are exploited without regards to sustainability or preservation, stating that

people do not view hills, streams, valleys and other natural features as the physical manifestation of their culture. Roe (2012:198) also acknowledged the potential of attachment being destroyed by those wishing to exploit potential functions, claiming that "the cultural service of sense of place associated with particular landscape morphology will also disappear." In heritage sites therefore, continuity can be viewed as an important concept to aid attachment to place but also as a method of preservation.

3.2.3 Place Dependency

Following from place identity (Section 3.2.1) and attachment (Section 3.2.2), place dependency is the remaining aspect of sense of place from the individual identity approach adopted. It is important to reiterate that these three aspects are closely linked, and the importance of each aspect varies. Defined as place dependency, the attribution of meaning or importance to physical artefacts within spaces allows individuals to identify with values and practices within a defined setting. Individuals will form stronger connections to places when that place enables them to achieve their personal goals. The designation of cultural heritage sites and the interpretation made available is therefore an influencing factor in this attribution of meaning and the fostering of place dependency. This fits with the definition of heritage as a process (Harvey, 2001) or the act of passing on knowledge (Smith, 2006). The concept of places with little or big sense (Ryden, 1993) highlights for example the influence of heritage designation and the role it plays in maintaining place dependency. Heritage sites are identified as places of big sense and places of little sense being the opposite, defined as unpretentious and derived from the routine localised experience. These places of little sense are a vernacular heritage, that of the common people in many respects, each unique and "as distinctive as the dot which marks the location on the map" (Ryden, 1993:61). Heritage sites may assist in facilitating sense of place through supporting or inspiring place dependency. Although, it is dependent on the individual in each case and how responsive they are to the interpretation provided.

Heritage sites play an important part in strengthening dependency, acting almost as the curator of sense of place through enhancing the people-place relationship with the provision of knowledge and understanding. Outdoor cultural heritage sites are derived from surviving memories or artefacts of the past and the meaningful organisation of such spaces provides a source of emotional safekeeping, desire and identity. The representation of the site therefore

can be susceptible to the objectives of the site management as it may be manipulated for heritage tourism, the economic activity based on the premise of attracting patrons to a location through socio-cultural assets (Fyall and Garrod, 1998). Sites, according to Fyall and Garrod (1998), are created to serve contemporary demand, with visitors motivated by nostalgia for the past and a desire to achieve their personal goals. Those responsible for the site thereby attempt to recreate the original and include modification to meet the needs of patrons. The important constituent being authenticity or at least the perception of it (Chhabra *et al.*, 2003). It would appear throughout history people have treasured specific material aspects of the past for the purpose of fabricating ideas on a specific identity. The managers of heritage sites thereby are prominent actors in the fostering of dependency through being responsible for mediating the cultural context of the site.

It is important to note that visitor interpretations are important to help patrons achieve their goals and enhance place dependency. Patrons are sensitive to context, actively processing information, questioning events within the setting and should not be viewed as passive receivers of the information. This focus from the transmitter standpoint is a shared feature of many early communication models within museum, galleries and heritage sites (Mason, 2005). The transmission model for example views audiences as being injected with the message which subsists entirely external to them (Hooper-Greenhill, 1994). A more applicable approach is the concept of 'mindfulness' (Langer, 1989 and Moscardo, 1996) and can be facilitated by the interpretation provided creating a greater sense of appreciation and understanding. Mason (2005) noted in relation to interpretation panels at heritage sites that if they are omitted people will leave the site knowing little more than when they arrived. This would be a missed opportunity, with Mason (2005) acknowledging that although some may hold the cultural capital to feel prepared to make sense of what they encounter this is not the case for all. Interpretation which aids the cognitive experience and in so doing facilitates the felt-life requirement of heritage experiences is expressed by McIntosh (1999) as 'insightfulness'. This is the end state of personal insight gained from heritage visiting, relating to the subjective embodiment of the individual. Patrons obtain emotionally charged value-laden perceptions into the nature of the context provided and experience the setting in relation to their own personal agenda.

Place dependency in heritage sites can also be achieved through the manner in which messages are delivered, taking advantage of behavioural intentions and commitments. Sense

of place is a subjective practice but the individual can be aided to a degree, which allows the heritage site to convey or enforce certain meanings (Jordan and Weedon, 1995). In outdoor cultural heritage sites it may not be transparent given the enhanced scale and the perceived freedom of movement this creates; nonetheless it is developed by the various points of heritage interest embedded within the landscape. Meyrowitz (1985:36) acknowledged that "it is not the physical setting itself that determines the nature of the interaction, but the patterns of information flow". The way in which people move through and experience rural heritage landscapes is axiomatic in many respects of the museum experience, particularly in the theoretical and methodological frameworks adopted. These constructed spaces are developed to suggest ways of seeing the world through controlling movement, manipulating space and controlling fields of vision (MacDonald, 1997 and MacLeod, Hank and Hale, 2012). The process of routing patrons in a certain manner or withholding specific information to create a climaxing moment in the experience can be facilitated by MDIs. This will influence how the site is understood and perceived, all the while facilitating place dependency by aiding the individual in realising their goals of identity within the space.

Hay (1998) noted that a sense of place, if allowed to fully develop, can provide feelings of security, belonging and stability. Identifying with, dependency of, and attachment to place are all pivotal to sense of place. It is important to note that agency in relation to the concept in this instance was given to the individual, thus the perceived sense of place may be as diverse as the sites themselves. This was a valuable approach to take however as in understanding sense of place as the zenith of place attachment, dependency and identity it provides a foundation to explore the complexity within the concept. Jorgenson and Stedman (2001, 317) noted that 'this is particularly important when this complexity bears on the development and evaluation of communication and/or behaviour change strategies.' In the examination of the influence MDIs have on the concept, the understanding of sense of place outlined will provide an apt framework.

From the view point of individual identity, sense of place thereby resides in the individual but the social context and the physical space in which it is set cannot be separated from this process. These aspects can influence the individuals' perceived sense of place by assisting the fulfilment of one or several of the primary components which make up the concept. Outdoor cultural heritage sites can be actively shaped, through awareness of place attachment, identity and dependency processes to encourage a more defined 'sense of place' with which people

will actively engage. The physical setting in this respect is the harbourer of meaning but not the influencer. Yeoh and Kong (1996) noted that "thinking historically is no luxury in the understanding of place, neither is thinking geographically in the pursuit of historical knowledge." Place constrains and enables our actions and likewise our actions construct and maintain places (Sack, 1997). All of which highlights the laden inter-disciplinary nature of the concept, but clarity can be achieved by examining the influencing elements using the foundation of individual identity.

3.3 Virtual, digital and hybrid landscapes

Building upon the understanding of place and sense of place outlined in the previous sections (Sections 3.1 and 3.2), it is imperative to consider the role of virtual and digital components in such considerations. As the previous sections allude to, place is much more than a physical entity; rather it is a rich complex network of interactions. The inclusion of technology, and in this research especially communication technology like the smartphone, influences and changes the interactions which shape representations of place. This section addresses virtual and digital representations of place and focuses specifically on the intersection between the digital and physical components- or the ‘hybridised’ representation.

3.3.1 Virtual and Digital Places

Pavlovskaya (2016) stated that as digital technologies spread places are being constructed in the cyberspace as much as they are outside it. Ciolfi (2004) also noted that smartphone devices and the media space they create can be regarded as places themselves. This definition is justified when one considers the conceptualisation of place outlined in sections 3.1 and 3.2. It reflects studies by Harrison and Dourish (1996), Relph (1981) and Tuan (1977) where place is understood as the location of social interactions. Therefore, it can constitute non-physical or actual spaces such as online or virtual. In relation to the emergence of digital and hybridised places, Marino (2015:1) stated that “it is imperative to apprehend these concepts of space and place with new empirical and theoretical approaches that look at the contamination between online and offline.” In the context of the outdoor cultural heritage experience, this research seeks to explore this ‘contamination’ or influence between online and offline places.

Ciolfi and Bannon's (2007:163) propositions of what it means to 'augment' a space through technology provide a foundation for understanding the relationship between virtual and physical spaces. The propositions are as follows:

1. it means changing its physical features by means of new materials for handling, visual and auditory information displays;
2. it means affecting one's personal experience through providing the possibility for new activities and modifying existing ones, evoking individual responses and memories;
3. it means engendering and supporting new chances for social interaction, communication and collaboration;
4. it means that the new system will impact the culturally influenced qualities of an environment or even change them to some extent.

The prominence of communication technologies, online communities and cyberspace has disrupted the conventional understanding of space, place, border and territory (Khan *et al*., 2012). This also includes outdoor heritage landscapes. As Roussou (2007:279) stated, "the best virtual heritage worlds, similarly to the best museums, must seek to promote different modes and levels of interpretation by subtle juxtaposition of experience". Digital technologies can also foster a "living and sustainable relationship with heritage", by creating communication and interaction spaces that sustain not only the physical setting but also the social dimension of heritage (Giaccardi and Palen, 2008:283). Similarly, Dundes (1980) regarded the connection between technology and place to be vital and "an exciting source of interpretation for the new generation of folklore" (Dundes, 1980:17). As a result, one can equate the understanding and formation of place, because it shapes and is shaped by the social connections it facilitates (Section 3.1.1), and digital spaces.

The representations of places in virtual spaces is an important aspect to consider because place is not confined to a physical or geographical boundary. Place is a construction of representations and this can include virtual representations. In the context of mapping, whether analogue or digital, to visualise something 'means to bring it into existence'. To exclude something from the map means to "marginalize this phenomenon's ontology with a subsequent epistemological, theoretical, and political marginalization" (Provlovskaya, 2016:157). The same can be said when considering smartphone-based MDIs in the outdoor cultural heritage experience. A mapping or way-finding component is common and as a result

the users' representation of the material place is influenced by the overlaid virtual representation of the map or interpretative content. Past, present and future place-making can be altered by the representation and visibility, or lack thereof, of specific aspects of the landscape. This has always been a factor of cartography and it endures into digital and virtual representations of places. Maps act not as representations of place, but as producers of the places they are related to (Crampton, 2009). The discussion on representing places in digital form extends beyond cartographic representations of material or physical objects to also include identities and communities. Digital representations of places, such as those posted online for tourism, contribute to what Saltzman and Svensson (2007) regard as the 'mindscape'. This reflects the relationship between representations and people or places (Ronström, 2008). The difficulty in digital representations of this nature however is that presenting a community often results in oversimplification where, "normative categorisations…consequently exclude certain members of the community" (Cocq, 2013:10). This creates a digital interpretation that homogenises place and does not reflect the rich variability that exists.

The interaction between the virtual and physical space is seen in how one shapes the other. An example of this is what Cocq (2013) calls the spatio-temporal matrix. Cocq (2013) argued that, contrary to general assumptions, virtual environments are space-bound and time-bound. Pavlovskaya (2016) agrees by highlighting the tension which exists in understandings of place-making between *Chronos* (time, history) and *Choros* (place and space). In the same way that actions in the physical landscape can be influenced by users' access to virtual spaces, access to these virtual spaces is dependent on where the user is and the time at which they are trying to access it (Christensen *et al.*, 2011). Cocq (2013) uses the example of cultural events to show how physical actions influence online spaces, particularly how representations and accounts of the event are created by attendees. To relate back to sense of place (Section 3.2), it is as Ryden (1993:56) stated: "there can be no personal biography of 'what' happened 'when' without a sense of place in which they happened". The above serves to introduce digitally hybridised place and the overlaying of digital landscapes upon the material landscape, which is more fully addressed in the next section (Section 3.3.2).

3.3.2 Digitally hybridised places

As the discussion in this section has alluded to, virtual and physical place are not distinct entities. Both are integrated to varying extents and subsequently shape each other. In the outdoor heritage experience with smartphone MDIs, the user occupies both the physical and virtual place, that is the material landscape and the virtual place created through the MDI. As a result, a hybridised landscape is formed in the experience because it is an amalgamation of the physical and virtual. This is a dynamic field of potentiality (Flynn, 2008). The hybridised place created through the smartphone MDI is akin to what McDonald (2006) regarded as a 'blended service' in that "the virtual and actual spaces are complementary, influenced by the number and diversity of new technologies" (McDonald, 2016:112). To illustrate this, whilst studying hybrid place-making in libraries Bilandzic and Johnson (2013:263) identified that "digital components are used to make physical architecture reflect, communicate and better highlight particular aspects of the contextual and situated social space". This understanding of hybridised place similarly reflects the connection between the tangible and intangible elements of heritage interpretation. Beck and Cable (2002) acknowledged that tangible elements of place within the museum and heritage context lay a foundation for the intangible and the revelation of meaning. Particularly important here is the interdependent relationship between the intangible and tangible. This connection between the tangible and intangible in many ways reflects the relationship between the digital and physical space in hybrid place-making.

Considering, digitally hybridised place, Meyrowitz (1985:vii) stated that "the evolution of media decreased the significance of physical presence in the experience of people and events". Cocq (2013) supports this sentiment by claiming that "detachment from specific spatial locations is even stronger today, enhanced by even more flexible modes of accessibility in time and space, thanks to laptops, tablets, and WiFi" (Cocq, 2013:4). What these statements neglect however, is the body as an affective vehicle (Flynn, 2008), self-presence (Leahy, 2012) and the interconnectedness of the 'body' (Merleau-Ponty, 1968). While users may access events or communicate with people in different spaces, the user is still present in a physical space. As Hamman *et al.* (2006:5) described, it relates to "re-centring the corporeal body as an affective vehicle through which we sense place and movement". This reflects the humanistic approach to place as a multisensory experience (such as the visual, aural and tactile elements) discussed in Sections 3.1 and 3.2. Users therefore

occupy a digitally hybridised place by being connected to virtual places in instances such as the ones Meyrowitz (1985) and Cocq (2013) allude to, however the affordances of the virtual environment cannot be seperated from the physical, and vice versa. Keogh and Richardson (2018) acknowledged this in relation to attentiveness and the use of casual mobile games in daily lives. The affordances of both spaces are an important consideration in this research. How the user occupies and negotiates the digitally hybridised place—which reflects the virtual environment created through the smartphone MDI and the physical space they simultaneously inhabit—will be formative in their overall heritage experience.

Concepts such as 'ubiquitous computing' advocate the seamless integrations of the digital into the physical space, but as Bilandzic and Johnson (2013:263) stated, 'designing hybrid spaces is finding ways that physical as well as digital affordances become culturally embodied elements of the space". This is a critical consideration as no element in the heritage experience can be removed or subtracted. As section 3.1.2 recognised, the heritage experience is a fluid interchange of emotion and understanding; an embodied process centred on the experience of the senses and meaning-making. Therefore, the digital elements are as much a part of the experience as the material and physical. It is critical to also acknowledge that while the smartphone MDI may play a prominent role in the experience, it is also not autonomous (Brizard *et al.*, 2017). The inclusion of new media or technologies in places does not remove the materiality of human existence in a placec but "they do change the way in which space, time and place themselves appear, and are understood, and so too, the way in which human existence appears, is understood, and is experienced" (Malpas, 2007:7). Malpas (ibid.) outlined the transformative power of new media and technologies in heritage specifically by showing the potential for enhanced engagement in heritage interpretation. Parallels are drawn by Malpas (ibid.) between the potential of new technology and the interpretative principles outlined by Tilden (1957:7), most notably those that "relate what is displayed or described to something within the personality of experience of the visitor".

The prominence of communication technologies has also reshaped how identities are articulated, sustained and disseminated across physical space. This is important as place identity is a key component in sense of place, as discussed in Section 3.2.1. Bachin (2015) for example, addresses the importance of images disseminated through information technologies in how cities brand themselves and partake in digital place-making. This in turn influences how they are perceived by others, most notably in attracting tourism. On an individual basis

studies such as Marino (2015) have shown how migrants have used communication technologies to support and sustain their identities. Firstly, the technology "transgresses the symbolic boundaries" (Morley, 2000:3) which once would have stood between the migrant and their homeland. Secondly, for migrants in a new location the technologies allow them to foster 'digital togetherness' relating to "a specific sense of belonging and identity that is based on sharing personal and private experiences, such as being online, being Italian, and speaking the same language" (Marino 2015:6). The virtual places created through communicative technologies, such as the smartphone, defies geography and serves as a resource for maintaining identity. Place can be redefined through the inclusion of communicative technologies. Through decentralisation and the offer of alternative channels of communication, these technologies can empower and support identities in places where they were not initially present.

In the context of outdoor heritage experiences with smartphone-based MDIs, a key aspect is walking through the physical space whilst also being present in a virtual space created through the MDI. A contemporary example reflecting a similar practice with digitally hybridised place is the Pokémon Go mobile game. Hjorth and Richardson (2017) explored it in relation to place-making and digital wayfaring. Players move through physical space while their smartphone overlays the physical environment with virtual elements. As a result, the application "creates new modes of engagement that entangle attention and distraction in ways that can be understood as 'ambient'" (ibid.) (see Hjorth and Richardson (2014) on ambient mobile play and daily life). Particularly pertinent to this research is their conclusion that given the interchange between online and offline, virtual and physical, such hybrid domains "must be examined in terms of the relation between the representational and nonrepresentational in the constitution and experience of place" (Hjorth and Richardson, 2017:9). As outlined in this chapter, this is the approach taken to understanding place. The following chapter (Chapter 4) outlines its incorporation into a research framework.

Conclusion

This chapter outlined ideas surrounding (a) engagement with place in the outdoor cultural heritage context, (b) the notion of sense of place, and (c) conceptualisation of digitally hybridized places. All sections highlighted that understandings of place centre on the senses, emotions and meanings that can be ascribed to place (Section 3.1.1). While space may be viewed in the abstract, place is a 'real' and 'felt' concept. This presents place not simply as a

geographically identified location or a physical entity, but as a concept that is imbued with human meaning. Place is similarly defined across various disciplines and fields. This chapter engaged, for example, with notions of place in Lefebvre's (1991) work on social space, Laine and Wagner's (1998) use of place in relation to the binding ability of social aspects on place, and Tuan's (1977) felt and emotional understanding of it.

This humanistic approach to place and sense of place is particularly pertinent to this research because of its commonality with understandings of engagement in the context of outdoor cultural heritage. Heritage engagement incorporates sensory perceptual involvement and this echoes embodiment and meaning-making. Additionally, engagement with outdoor cultural heritage also includes notions of identity, individuality and attachment. These characteristics speak directly to sense of place, as outlined in Section 3.2. Sense of place is defined as the embodiment of various processes that allow individuals to respond to places; this can be further acknowledged through ideas of place identity, place dependency and place attachment. These aspects reflect the cognitive, conative and affective processes of the individual. Sense of place resides within the individual and cannot be separated from the social context and physical space in which it occurs.

Also, given the focus on the influence of smartphone-based MDIs, the consideration of place in relation to virtual environments and digitally hybridized place is an important aspect (Section 3.3). As Ciolfi (2004) noted, the media spaces created by smartphone devices can be regarded as places in themselves. This is due to the social interactions they facilitate which relates to understandings of place and the social dimension to place addressed in the earlier sections of the chapter (Sections 2.1 and 2.2). The digitally hybridized place element is particularly pertinent as it also underpins the practice of adopting a smartphone-based MDI in the heritage experience. In the latter, the physical landscape is overlaid with a visual representation and the individual therefore simultaneously occupies both places, negotiating their overlapping and diverging elements. As a result, their thoughts, actions and behaviours are negotiated in this hybridised place.

Chapter Four: Research Development & Methodology

This chapter outlines the methodological approaches adopted to achieve the aims and objectives of the research. A chronological approach is adopted in this chapter in response to the complexities of the study, highlighting the process undertaken and the adaptations employed through the course of the research. Following the approach to the methodology (Section 4.1), which outlines the underpinning theoretical foundations, the design of the qualitative study is presented along with the associated dynamics (Section 4.2). This emphasises the comprehensive and multi-sourced examination which was devised to reach the core of the issues associated with the research. The latter section of this chapter addresses the analytical methods and subsequent issues relating to triangulation, validity and reflexivity (Section 4.3).

To effectively explore the influence of smartphone-based MDIs on the perceived sense of place within outdoor cultural heritage, the study focuses on two elements: affective engagement with place and memory, and the affordances of the smartphone. This research is an investigation of the meaning-making process, through the inherently subjective concept of sense of place. Chapter 2 outlined the adoption of smartphone technology and also the influence of the device in the broader societal level. The ubiquity of the smartphone and its significant impact in day to day life means it will inevitably be an influencing factor in the on-site experience. As discussed in the previous chapter (Chapter 3), sense of place is a term relating to the character or identity contained within specific places, whether this is derived from human perception, features within the environment or a combination of both. The smartphone must also be taken into consideration in this scenario as it is another feature in the environment, a feature with specific affordances. The research therefore must facilitate the two components effectively.

In terms of understanding sense of place, this research grants agency to the individual rather than the deterministic nature of the landscape. This facilitates the incorporation of the technology and its implications on the users' experience into the research. Casey (2013) for example, stated that places were merely locations where human interactions occur, and this is reflected in the agency given to the individual in this research project. In relation to this, Malpas (2008) noted that "it should be possible to record, reproduce, apprehend, and articulate that sense or meaning independently of the actual location as such." This is a

significant point which will be further explored in following chapters as the applications developed for outdoor heritage sites should be the product of the identified 'meaning' or 'sense' which they represent. However, this understanding neglects the benefits of conducting analysis with regards to sense of place in-situ. When analysing the influence of MDIs, it is vital to assess them within the context they are based, which will be discussed further in the forthcoming sections of this chapter.

The methods adopted and outlined in this chapter, such as case-studies, self-reflective visits, go-along interviews and exploring the wider context, combine to offer an approach for studying the intangible embodied components of the experience. The focus on the phenomenon surrounding the MDI experience allows an understanding into the embodied experience, drawing parallels to non-representational theory (Thrift, 2007), and presents an avenue for exploring the influence of smartphone MDIs in the outdoor heritage experience. Thus, it is possible to have confidence that the research will be able to address the aims and objectives outlined in Chapter 1.

4.1 Approach: Foundation & Paradigm

The overarching theme of the research question is engagement within cultural heritage sites, focusing specifically on the influence of MDIs. As outlined in Chapter 3, this is concerned with aspects such as emotional responses, fostering empathetic connections and sensory perpetual involvement as a whole (Ridge, 2013 and Dindler *et al.*, 2010). The methodological foundation therefore must have the capacity to cater for these components within its core, addressing the cognitive and affective engagement aspects which make up the perceived sense of place. In light of this, given the initial parameters based on the aims of the study and the intricate nature of the subject, the methodological design is multi-method and predominantly qualitative in its nature. The approach is a participant led enquiry, utilising ethnographic approaches which are influenced by the fundamentals of phenomenology. Denscombe (2008:77) noted the applicableness of phenomenology for the examination of sense of place claiming that it is not dependent on an understanding of participants' 'socio-cultural lifeworld' in order to realise the structure within which they experience locales. The phenomenological foundations of the method will be humanistic, in-keeping with the agency to the individual stance towards sense of place and displays, providing clear parallels to the traditional ethnographic approaches of observation and interviewing.

Ethnography is a relevant method of enquiry, due to its overarching commitment to cultural interpretation (Punch, 2005), and it being the process through which understanding, knowing and knowledge are produced. Sensorial ethnography, more specifically, is beneficial for studies of cultural heritage as it is part of understanding the past, engaging with the present and imagining the future (Pink, 2008). This understanding aligns with cultural heritage interpretation outlined in Chapter 3. The fundamentals of how issues are learned, understood and represented are paramount in the sensorial ethnographic approach, which corresponds with the aims of the research.

The predominantly ethnographic approach to the study is applicable to not only understanding sense of place or engagement in the heritage context but is also a method which has been successfully adopted in studies concerned with the technological and user experience. This relates to the field of Human Computer Interaction (HCI). It has been over three decades since Winograd and Flores (1986) claimed that designing for the full range of human experience may well be the theme for the next generation of discourse about software design. The aim of the ethnographic research method is similar to what Wright and McCarthy (2008), writing in the HCI context, define as 'knowing the user', catering for the full range of human experience as Winograd and Flores (1986) state. In approaches to understanding and interpreting HCI, three broad approaches were proposed by Batterbee and Koskinen (2004). They were identified as measured, empathetic and pragmatist approaches respectively, and it is the latter which is most applicable in this instance. The pragmatist approach represented a holistic view of the user experience, covering the uniqueness of the individual experience and accounting for the inseparable elements within it. HCI shows a commitment to the analysis of people as continuously engaged and making sense of experiences in light of personal history and anticipated futures (Wright and McCarthy, 2008).

The methodological approach must effectively capture the heritage experience and the technological experience, with the common frame of reference between these two aspects being the user. This is supported through the agency given to the user and the first-person methodology adopted in the research. First-person methods are important as they reflect the lived experience, as well as the associated cognitive and mental aspects. The approach supports the subjective elements of the experience in that the 'subject', the MDI user in the case of this research, can provide their own account of their experience(s) (Varela and Shear, 1999). These methods support the understanding of users, which subsequently aids the

understanding of the technology and the heritage experience. The subjective nature of first-person method is regarded as positive as no method is neutral, and the hermeneutical aspect that is unavoidable is counteracted by the interpretation coming from the first-person. The first-person approach is adopted in the in-situ investigations and self-reflective visits, undertaken in the exploration phase before conducting research with participants. The self-reflective element is important as it provides the researcher with a framework for the phenomenological study with participants; as the process can be too broadly unconstrained otherwise (Thompson and Thompson, 2008). The self-reflective visit repositions the researcher in the subsequent observations of participants, as they have improved mental models of the social phenomena and qualia, and greater ability to be reflexive to other experiences (Corti *et al*., 2015). As Weger and Wagemann (2015) noted, without this, psychological phenomena would be reduced to much less than they actually are and subsequently only reflect behavioural phenomena only. The first-person approach is paramount therefore in the aim of understanding and exploring sense of place in the MDI experience, particularly the participants' experience in the case study sites.

4.1.1. Case Studies

A case study approach was adopted in this research, with an outline of the case studies provided in section 4.2.2. One of the strengths of conducting case study research is that it allows the gathering of knowledge pertaining to complex social phenomena. As Yin (2003: 2) stated, the case study approach "allows investigators to retain the holistic and meaningful characteristics of real-life events." This aligns with the research question as the focus of the study is on the user's in-situ experience of MDIs. Thus, the ability to capture and observe real-life events is pivotal and case studies effectively illuminate decisions or sets of decisions relating to this specific context (Schramm, 1971). Case studies as an empirical method of inquiry work well when there is no clear set of outcomes. This approach facilitates natural and unabridged occurrences. The approach additionally allows for the inclusion of a vast spectrum of sources, aiding the richness of the data, whilst also attending to issues such as triangulation (Mason, 1996). Using a case study approach makes it possible to observe the 'characteristics of real-life events' as Yin (2003) stated, which can be supplemented by documents, artefacts or interviews to obtain a fuller picture through the lens of a specific context. As a result, the case study approach is the most applicable method for this research as it accommodates contextual conditions more so than other methods.

A multiple-case strategy was deemed most appropriate given the nature of the research. There were numerous reasons for this decision, but the primary justification is that conducting multiple case studies stands to strengthen confidence in the subsequent results (Yin, 2003). There is the possibility of direct replication within each case study despite the variation in contexts. Therefore, the external generalisability of the conclusions is much greater than with a stand-alone case study. Although the practicalities surrounding multiple case studies are greater, especially with the limited time and resources of the project, the benefits of the approach through the depth and scale of data produced justifies the undertaking. The multiple case study approach quells fears surrounding the uniqueness of the data produced from a single case study and with more case studies incorporated this disadvantage is lessened further. As Peräkyla (2004:296) argued "the comparative approach directly tackles the question of generalisability by demonstrating the similarities and difference across a number of settings." In light of this, and weighing up the logistics of conducting the study, the multiple case study approach in the project consisted of three case studies across the United Kingdom. These case studies centred on three MDIs entitled: *Discover Navan Fort*, *Cumbrian Heritage Trails* and *Walking with Romans*. These MDIs and their respective sites are outlined in the design outline (Section 4.2.2).

4.1.2 Go-Along Interviews

Building upon the foundations of phenomenology and the principles of sensory ethnography (Section 4.1), 'Go-along' interviews with visual ethnography (Section 4.1.3) were included in the fieldwork. 'Go-alongs', also referred to as walking interviews (Kusenbach, 2003), 'walking with' (Morris, 2004) or 'participation-while-interviewing' (Baerenholdt *et al*., 2004), take inspiration from the common qualitative and ethnographic processes of interviewing and observing. Utilising the strengths of both methods, the dual-action approach compensates for their respective limitations (Groschel, 2015). For example, in observational studies participants are less likely to comment on what is actually occurring and the interview element balances this through the provision of access to the lived experience. The go-along interview method also gives greater independence and agency to the participant, in-keeping with the objectives of the study.

The inspiration for this method stems from the mobilities turn (Buscher and Urry, 2009) as movement related activities need to be examined through approaches which are sensitive to

this practice. Ingold (2004) similarly acknowledged that locomotion, not cognition, should be the starting point for studies involving perpetual activities. This is an important aspect in examining beyond how people 'see', as people are literally in touch with their experience. The physical act of being in-situ cannot be undervalued. This is attributed to the traditional ethnographic practice of observing but builds upon it to identify the commonalities between biography and place (Kusenbach, 2003). Walking, as a sensory physical activity, acts as the gateway to a greater understanding of the experience and memory of the individual. The place and the experience are determined through the movement and consumption of space. This idea of place-making is central to the walking process (De Certeau, 1986).

In outdoor heritage sites the individual's actions and behaviours are more than just a connection between two objects- the user and the landscape. Both these objects are part of the embodied sensuous experience. Mobilities reflect this networked relationship, whereby dynamisms enable and are enabled by the user actions and behaviours. The MDI experience does not occur in a vacuum and the actions of the users in the space illuminate the influence of intangible and tangible relationships in the experience. A study by Pink (2007) regarding the development of a community garden project highlighted the meaning behind routes and the manner in which individuals navigate space. The pathway within the garden was commissioned by the committee responsible for the project and changed the way the garden was experienced. Through controlling or altering mobility, the embodied experience of the user was altered. Similarities can be drawn between this and mobile interpretations which incorporate a navigational element, either directly through the provision of a GPS element or indirectly through suggesting specific features. It is important to engage and be present within this experience, witness the process and connections with mobility, particularly when the focus is on mobile devices. Anthropological research has noted this aspect for some time, stating the importance of being present with the subject, with enhanced comprehension and understanding being the result (see Turner *et al*., 1986, Spindler and Spindler, 1985, and Denzin and Lincoln, 1994).

In assessing sense of place, the individuals' experience is intrinsically linked to concepts such as place attachment, identity and dependency (Chapter 3). One of the benefits of the 'go-along' interviews which reflects this is what Kusenbach (2003) identified as 'perception'. This relates to the participant's knowledge value and how it guides the experience. The 'perception' element is achieved through walking interviews as the interview takes place in-

situ and agency is given to the participant. The participant guides the experience through the site and allows the researcher to observe the practice whilst interviewing to delve further into the understanding of experience. This allows greater understanding of sense of place, and gives greater control to the participant when compared to traditional interview techniques. The freedom to traverse the site gives the perception of control to the participant as they direct the route taken. The line of questioning, although related to the aims of the study, is flexible and a product of the experience provided by the participant. In a conventional interview the answers to interview questions are as much a product of the question as of the insight or unique opinion of the participant (Wateron and Watson, 2015). The 'go-along' approach mitigates this limitation. It allows the researcher to gain an enhanced understanding of the identities, moralities and values of the individual, through not only interviewing but observing the participants' process and movement at the same time. The ability to link these connections potentially to locations further assists the objectives of the study, especially those concerned with the deterministic influence of the landscape. Additionally, it is easier for participants to convey their experience and opinions as it is occurring.

Kjeldshov and Stage (2012) outline the origins of such ethnographic based studies, particularly first-person methodologies relating to mobile devices within the HCI field. The study references examples of its deployment in industrial settings (Nielsen and Søndergaard, 2000 on error diagnosis in waste-water treatment plants) and the medical sector (Tang and Carpendale, 2008) amongst others. Although the nature and context of these studies varies from this particular research project, there are clear commonalities, and similar justifications for adopting such methods in the first place. This study is concerned with the individuals' experience of a MDI in-situ, thus a methodological approach which caters for capturing this process is vital. It mirrors what Kjeldshov and Stage (2012) concluded about the examples outlined in their study, referencing Rasmussen (1983 and 1986), that interfaces should be designed to improve operators reasoning about the domain in operation. There is clear value and ambition in such studies and approaches to understand the in-situ process that occurs with a mobile device. This strengthens the case for adopting such an approach, through the successful application of these methodologies to address similar research objectives across varying contexts.

4.1.3 Visual Ethnography

There is no defined methodology for assessing sensory landscape; capturing internal emotions and thoughts stimulated through engagement with environments is a difficult process. This relates to all senses as well as the reflective and active mind. Tuan (1977:77) for example noted that place achieves concrete reality when our experience of it is 'total'. The 'go-along' interview supported through visual footage serves as a catalyst for understanding such processes, in an approach known as visual ethnography. Variations of this method have been noted as the ideal technique for studying issues concerning interpretation of space and place (Pink, 2007).

Visual ethnography is another facet of the multi-method approach, used to support the observation process of the 'go-along' aspect (Section 4.1.2), and document the experience for post-interaction analysis. The premise is that through wearable visual capture devices (action-cameras) participants can record the experience (Figure 4.1). This provides an account of the experience and the participant process, including elements that were undetected by the

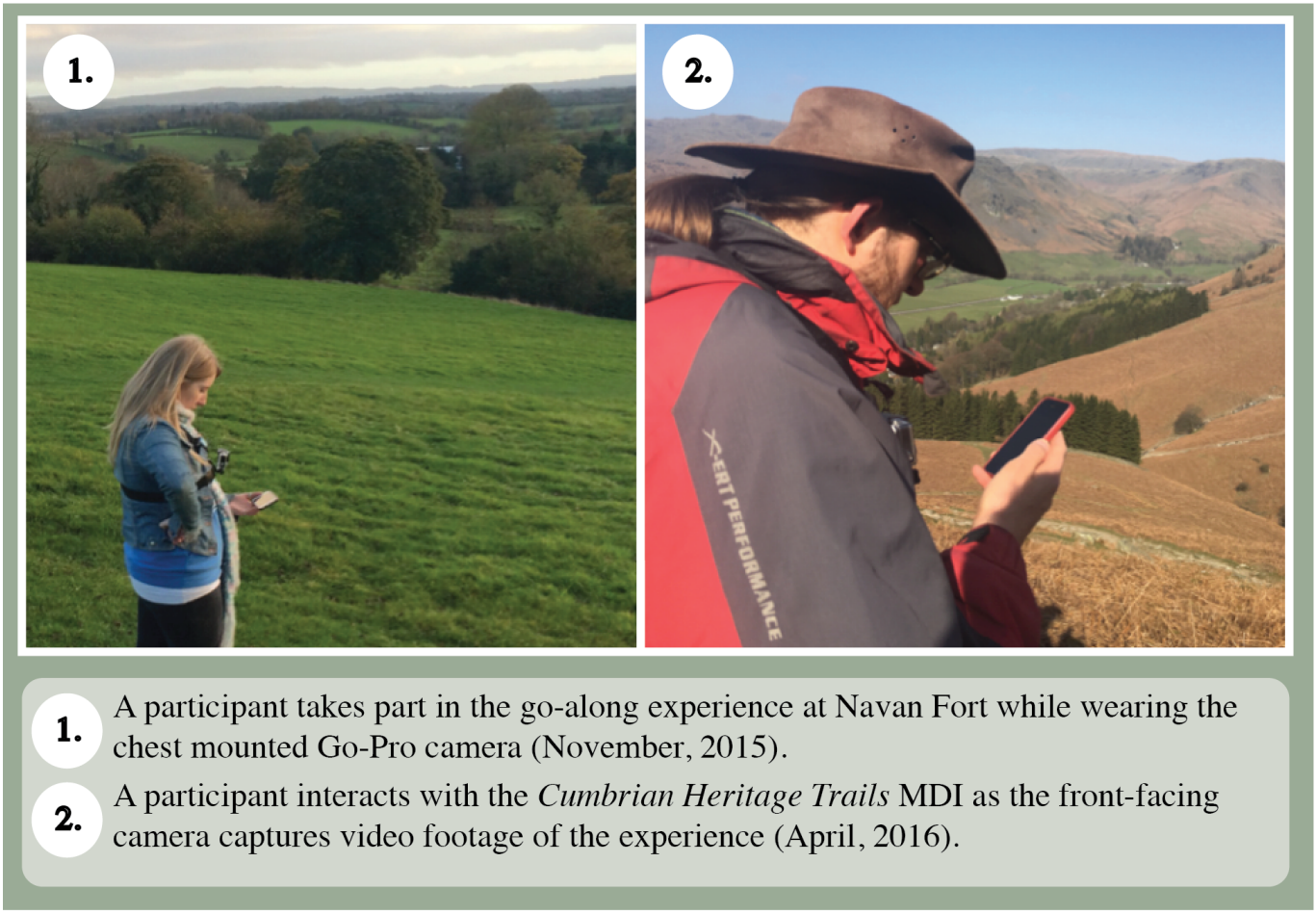


Figure 4.1 Participants wearing the action-camera during their experience

researcher in the initial, in-situ observation, such as small interactions with the smartphone. Drew *et al.* (2006) acknowledges this as a key component of visual ethnography: the access to behavioural detail that it affords the research, enriching understanding of actions more so than traditional ethnographic approaches. The idea of walking with a video implies that the participant and the researcher are engaging in a developing experience, continuously evolving and forming. As the physical act of moving through the space occurs, the thoughts and opinions of the participant will progress correspondingly. The video capture will be pivotal in connecting the elements of the sensuous experience acknowledged by the participant and the tangible world it is situated in and created from. Pink (2008) noted that adopting this approach is an effective medium for representing people's experiences of how changing immaterial elements of our environments become engraved in our material environments.

Similar to this research, many studies adopting visual ethnography have included contexts where movement was pivotal to the experience (such as Delgado, 2015, Choi, 2006, and Alfonso *et al*., 2004). This visual component of these studies took the form of a hand-held camera, which subsequently presents a series of limitations and issues. Primary concerns are, for example, if the participant sees the researcher actively filming the experience the responses are likely to be altered, movement will be restricted through the process of holding a camera, and the filming by the researcher may not necessarily pick up the element being discussed by the participant. Clark and Emmel (2010) noted that they omitted the use of video capture as it may compromise the experience through making the individual feel self-conscious or uncomfortable. While other studies (such as Luvaas, 2017) adopted still photographs to counteract this and suggested participants took photos during the process. Implementing wearable technology, that the participant can affix to their chest and have no further interaction with, addresses many of these issues and still provide effective data to satisfy the research aims. The self-conscious element of being filmed is dismissed as the participant will not be present on the filming except for the audio recording. This audio element however would occur regardless of the video capture component and the individual is briefed on these aspects prior to participating.

This visual research approach has close connotations with the concept of techno-anthropology proposed by Morley (2006). The term relates to the application of ethnographic approaches in the examination of communication technologies. Techno-anthropology, according to Rose (2012), can be viewed as the convergence of three themes- materiality, affordance and re-

contextualisation. Materiality in this instance relates to the focus on the visual object, focusing critically on not only the content being provided but the device that it is being provided on. Rose uses the term 'affordance' to represent the inter-relationship between the technology and the user. Value of the object, or the MDI in the case of this study, is dependent on it being activated by an individual. As a solitary item the device is redundant, and it is only through practice that the objects are of any worth. This follows on to re-contextualisation, referencing that through usage and varying cultural contexts the meaning of the object is transformed. Smartphones are a prime example of this. Many studies have highlighted the changing nature of smartphone usage, beyond the conventional telephone function (Charlesworth, 2009 and Gökcearslan *et al.*, 2016).

The appositeness of this approach in the context of the research is not only validated through the communication technologies element but also through its posturing towards 'objects'. In Chapter 3 'objects' were referenced in relation to physical characteristics of heritage landscapes and the subsequent meaning-making process. Similarly, in the techno-anthropology context, objects (predominantly communication technologies) are also the focus of the meaning-making process. This is apparent in Arjun Appadurai's 'The Social Life of Things' (1988), credited by Rose (2012) as being the foundation stone of this contemporary concept. Appadurai (1988:2) references "the inter-calibration of the biographies of persons and things"; claiming that, theoretically, "human actors encode things with significance" but from a methodological standpoint it is "the things-in-motion that illuminate their social context" (Appadurai, 1988:5). These views correlate directly with this study, highlighting the importance of context [i.e. the outdoor heritage landscape] in the human interaction with communication technologies.

Following on from this, the work of Rose (2012) and Thomas (1991) helped shape the methodological design implemented in this study. In particular, thoughts around 'form' were utilised, such as the visual form (content provided), the presentational form (the content on the screen) and the materiality of the smartphone itself. The experience undertaken can be examined through the material qualities that the participant emphasises when they interact with the object. This was first trialled in the self-reflective exercise at numerous sites using the associated MDIs and was also integrated into the interview process with the in-situ participants.

4.1.4 Semi-Structured Interviews

Semi-structured interviews were another important component of the research process. This approach helped mitigate a key limitation of traditional interviews, whereby the interviewer dictates the agenda and is thus responsible for what information is produced. Bauer (1996) stated that in interviews the researcher intrudes on the information in three ways. Firstly, by selecting the theme and topic, then through the subsequent ordering of questions and finally in the language used to convey the question. This question-and-answer approach to interviews, although it may appear limiting, is important in order to ensure that the interview effectively addresses the aims and objectives of the study. Consequently, it is imperative that the researcher dictates the topic of the interview. The nature of this study suits the semi-structured approach as it is less constrained and veers into the narrative approach of interviewing. This narrative approach is when "the agenda is open to development and change, depending on the narrator's experience" (Hollway and Jefferson, 2000:31).

As acknowledged, the individual experience is pivotal to the research question, and as a result the methodology is centred around this. Agency is given to the interviewee in the in-situ investigation, as they lead the experience on the site. Therefore, the post-experience interview takes the form of a semi-structured interview and has similarities to the narrative approach as it will be dependent on the events which occurred during the participants' experiences. This is a justification for not adopting traditional interviews as it would fail to capture the uniqueness of each participants' experience. The semi-structured interview provides the opportunity to capture the distinctiveness of the experience within a framework that correlates with the aims of the study. Semi-structured interviews such as those adopted in the project yield a large amount of data but the data is coproduced, by the interviewer and the interviewee. According to Whyte (1984:99), "in research we want the informant to talk about things of vital interest to them, but we also need their cooperation in covering matters of importance to us that are possibly of little interest to the informant".

There is an attempt when devising the semi-structured interview to elicit stories from participants. This moves beyond recounting the experience they just had with the MDI into thinking about their past experiences of, for example, smartphone usage. In doing so, it provides an insight into their background and subsequently helps understand what constitutes their sense of place. Past experiences are vital in how meaning is constructed, especially

within heritage environments. By eliciting stories pertaining to past experiences, particularly those related to similar contexts, it will help reveal the complexities of the lived reality and understand the motivations behind their observed actions. The story will be highly dependent on the nature of the individual in each case however, varying greatly in relation to what and how it is delivered. It is important also to acknowledge sensitivities and the negotiation of power relationships in the interview. Many people may feel, for example, that they lack the capital to relay the account, judging it to be unworthy or not interesting enough to warrant telling. Conversely, significant value lies in this, as the manner with which it is told, the emphasised elements and the specific details communicated all represent the teller (Hollway and Jefferson, 2000:35). The story often tells more than the participant suspects and it is these instances that are vital in garnering knowledge on the individual, the observed experience and the relationship to place. As a result, these interviews provide rich descriptive data which will allow the analysis of the phenomenon surrounding the MDI experience.

4.2 Design Structure

This section outlines the design of the research, built upon the methodological approaches addressed in the previous section (Section 4.1). The section takes the form of three sub-sections which reflect the chronological and practical approaches taken in the research. Firstly, it the explores the phases of the research (Section 4.2.1) which provides the scope and framework for the subsequent in-situ (Section 4.2.2) and contextual (Section 4.2.3) investigations that occurred around the three case-study sites.

4.2.1 Exploration

The initial phase of the methodology design, the exploration phase, aimed to identify and select the applicable sites to address the research aims and objectives. A specific selection criterion was established in order to ensure effective sites were chosen. The primary component was the presence of a smartphone-based MDI for visitors to utilise in outdoor heritage sites. It is important to also acknowledge the focus in this study is on outdoor cultural heritage landscapes. There are numerous reasons for this decision. Primarily the decision stems from the current lack of critical understanding on the influence of mobile interpretations in such settings (See Section 1.2). Secondly, the close connection between the heritage experience and leisure activity was an important avenue to consider in this research, particularly when concerned with perceptions towards place. Therefore, conducting the research in

outdoor heritage landscapes instead of more urban or built environments was important to help address the aims of understanding how MDIs influence place engagement and sense of place. Thirdly, the juxtaposition between the everyday space the user occupies with their device (such as urban environments) and the outdoor cultural heritage landscape would help further illuminate the intricacies of the connection between the mobile device, the user and the landscape. This was supported by findings from numerous studies which have considered the implication of smartphone media in urban settings, such as Pucci *et al.* (2015) Waal (2014), Iveson (2009) or Wilken (2008), for example, who outlined the complexity of place and everyday mobile phone usage in cities.

There is no database relating to smartphone MDIs for outdoor cultural heritage sites, therefore, through data-scraping, it was necessary to collate a rudimentary dataset relating to heritage sites in general. This dataset was garnered from the primary sources for smartphone applications, the Apple App Store®, the Android Marketplace® and the Google Play Store®. A result of which was a raw dataset containing in excess of one thousand entries, based on a trawl using broadly associated terms for example, a keyword search containing: Heritage, Trail and Interpretation. Confident that the dataset contained enough potentially suitable sites, the records were then categorised to omit those that did not correlate with the research aims. Initial filtering, which centred around removing duplicates or applications which had no connection to heritage sites, reduced the numbers significantly (circa. 200 records from the initial 1000). Many smartphone applications are multi-platform, therefore accessing multiple sites returned multiple instances of the same application. It is important to note that at this stage of analysis the applications had a UK and Ireland focus, as this was the location the various App stores were accessed from. At this preliminary stage sites were not omitted due to location, but this consideration was taken into account when making the final decision on specific case-study sites due to the logistics of non-UK study.

Following this, more specific parameters linked to the fundamentals of the research were applied. The function of the application was pivotal, many applications relating to heritage locations serve as a practical tool for visitors such as providing basic information relating to amenities and other services available and are devoid of on-site interpretation. In order to match the research aims and objectives effectively, it was vital that the interpretation provided through the smartphone application had a strong connection to the physical act of being on the site. Many smartphone MDIs of this nature can be categorised primarily into two fields, those that offer both on-site and off-site interpretation or solely off-site interpretation. Cases containing exclusively the latter were subsequently omitted from the selection process (as seen in Section 2.2.1).

In order to provide focus to the study, applications which provided interpretation relating to outdoor heritage in natural environments were given prominence over those situated in predominantly urban settings. This aided the compatibility and comparability between the sites. Additionally, the juxtaposition between this form of heritage landscape and the everyday spaces the participants inhabit will further illuminate the influence of the MDI on the experience. Applying these parameters to the study gave confidence that the remaining potential cases were comparable enough to be utilised in a case study with an in-situ investigation to address the aims of the study. The remaining applications were researched further, and more practical parameters applied to the decision-making process. These parameters included scaling potential case studies to a national (UK and Ireland) level and also, where attainable, download numbers of the respective applications were examined to ensure an engaged audience that could be utilised in the research.

Once a shortlist was developed, visits occurred to the sites which aligned closest to the research from the desk-based analysis. This was vital to achieving a fuller understanding of the applications before recruiting participants. In addition to ensuring the app functioned as designed in-situ, the site visits included a self-reflective element. These self-reflective visits helped formulate the questions surrounding the experience which were used in the 'go-along', post-experience and stakeholder interviews. The self-reflective visits were crucial in modifying the nature of the enquiry and led to a more focused approach to the case study sites. The in-situ aspect of the study was paramount to the effectiveness of the data, therefore in the selection of sites it was vital that a field-visit occurred. This provides a foundation for the deeper exploration of the MDIs within the context of sense of place. A total of 10 applications were studied as part of the self-reflective visits (Figures 4.2 and 4.3). Figure 4.2 shows the location of three sites that were subsequently chosen as case studies and explored in the in-situ investigation (Section 4.2.2), while Figure 4.3 outlines the location of the additional seven sites visited during the self-reflective phase of the research.

The benefit of the self-reflective approach was acknowledged in the discussion of first-person methodologies (Section 4.1) and relates to the view of Feld and Basso (1996:91) who stated that 'as place is sensed, senses are placed; as places make sense, senses make place.' The self-reflective practice addresses this directly; actively studying the site provides a heightened knowledge of issues associated with MDIs and the embodied sensuous experience at outdoor cultural heritage. Weger and Wagemann (2015:39) support this by stating that "a

Figure 4.2 The location of the three sites chosen for in-situ investigation

psychological phenomenon cannot be understood without calling on our own first-person experience to begin with". The self-reflective element allows further exploration of the data available in relation to the phenomenon being studied. It acts as a guide to the understanding of other individuals' experiences in the same context, particularly the subjective components of the experience. This relates to the sensory ethnography approach incorporated within the research framework, which involves employing not only practical steps but also conceptual ones. In this instance the conceptual elements include the self-conscious enabling of the senses throughout the research process. The use of visual ethnography alongside this practice compliments the process of post-reflection and highlights moments that were not immediately evident on site. It provides greater depth than just information relating to the physical environment, to identify the logistics of the participatory action research elements. Being aware of the context of the study it raises questions regarding the participants' experience, both in relation to the digital interpretation and the in-situ experience that may not have been

evident. It also serves to ensure the applicability and appropriateness of the physical environment in relation to health and safety concerns.

Figure 4.3 The other sites included in the exploration and self-reflective phase of the research

4.2.2 In-Situ Investigation Sites

As noted in section 4.1.1, a case study approach was adopted in the research, which took the form of an in-situ investigation and supporting contextual investigations (Section 4.2.4). These case studies were selected after the exploration phase, when informed decisions could be made regarding the most applicable sites to address the aims and objectives of the research. The chosen sites were all based within the United Kingdom and reflect prominent approaches to MDIs in this context (such as audio, video and text media). The MDIs and sites chosen for the case study analysis were:

Table 4.1 In-Situ Investigation Sites

Case Study:	App Icon:	Name:	Location:	Dates on site:	
				Start:	End:
1		Discover Navan Fort	Navan Fort, Co. Armagh Northern Ireland	09/11/15	17/11/15
2		Cumbrian Heritage Trails	Lake District, Cumbria, England	20/04/16	30/04/16
3		Walking with Romans	Brecon Beacons National Park, Trecastle, Wales	24/08/16	01/09/16

Case Study 1: Discover Navan Fort

The *Discover Navan Fort* MDI provides interpretation of Navan Fort, a prehistoric site located just outside Armagh City (Northern Ireland). The site has been the location of several archaeological finds and evidence indicates occupation of the site from as far back as the Neolithic age up until the early Christian period. The site is also of significant mythological importance, regarded as Eamhain Mhacha (translated as 'Macha's twins', with Navan being an anglicisation of 'An Eamhain') and celebrated as the legendary capital of Ulster in the Ulster Cycle (one of the four cycles of Irish mythology).

The MDI consists of 12 geo-triggered, interpretative points located throughout the large circular enclosure of the fort. The interpretative points are delivered in the form of video, predominantly in a talking-head format with an interpreter guiding the user through the site. In addition, the videos also contain historic images, re-constructions and re-enactments. The interpretation is available in both English and Irish (Gaelige) formats, reflecting the lead partner in the project, Cairde Teo, a local Irish language social enterprise.

The project was supported by Macha Media, in relation to media and content development, with app development from Digital Key Ltd. *Discover Navan Fort* was part of the Eamhain Macha Heritage Apps project, which received funding from the Heritage Lottery Fund for the creation of two Bilingual geo-based mobile interpretations. The other application was 'Cu Chulainn's Challenge', an interactive game for children to learn about the history and

mythology of the site. The site is maintained by the Northern Ireland Environment Agency (NIEA), who also have several interpretation panels on the site. In addition, there is an interpretive centre attached to the fort, Navan Fort Visitor Centre, which is under the control of the local council (Armagh City, Banbridge and Craigavon Borough Council). Neither of these two bodies were involved in the Eamhain Macha Heritage Apps Project or the *Discover Navan Fort* MDI specifically.

Case Study 2: Cumbrian Heritage Trails, Lake District, Cumbria, England

The *Cumbrian Heritage Trails* MDI, launched on the 11th June 2014, provides 'fascinating stories, facts and insights on walks and trails around Cumbria' (Apple Inc., 2018a). The app combines the history, landscape and wildlife of Cumbria into an interpretative guide throughout the county.

The Cumbrian Heritage Consortium are responsible for the *Cumbrian Heritage Trails* MDI. The consortium is a partnership between three museums in Cumbria: Tullie House Museum and Art Gallery (Carlisle), Lakeland Arts (Kendal and Bowness) and the Wordsworth Trust (Grasmere). Technical development of the application was provided by Surface Impression Ltd. The application was part of the 'Treasures of Cumbria' project, which aimed to 'record, share and debate what people value about Cumbria' (Treasures of Cumbria Ltd., 2015). Funding for the project came from Arts Council England, who also support the consortium through the Renaissance Major Grants Programme.

The 6.4mb MDI consists of eight trails throughout Cumbria, providing interpretation of the natural and cultural landscape via a series of walks and trails. Interpretative points are overlaid on a GPS enabled map, allowing the user to follow their real-time movement and access interpretative text and images. As the trails were dispersed across Cumbria, the focus within the in-situ investigation was on two particular trails. These were the trails associated with a consortium partner, the Wordsworth Trust, entitled the 'Alcock Tarn Loop' and the 'Coffin Walk'. This made the research more feasible logistically and allowed the effective input of the consortium stakeholders, the Wordsworth Trust. The Alcock Tarn Loop leads users on a circular loop from Grasmere, including interpretative points such as Woodsworth Cottage and the man-made Alcock Tarn to which the route owes its name. While the Coffin Walk trail is a trail linking Grasmere to the nearby village of Rydal. The interpretation of the

Coffin Walk also incorporates the life and times of William and Dorothy Wordsworth who traversed and wrote about the same walk.

Case Study 3: Walking with Romans, Brecon Beacons National Park, Trecastle, Wales

Walking with Romans, launched on 30th July 2013, centres on Y Pigwn Roman marching camp and Waun Ddu Roman Fortlet in the Brecon Beacons National Park. Located in the west of the National Park, near Black Mountain and the village of Trecastle, this MDI addresses the Roman heritage and legacy of the area.

The MDI guides the user through the 'bare landscape with little at-a-glance evidence of human activity' (Apple Inc., 2018b). In total the trail is approximately four miles, incorporating stops along the Roman road, the Y Pigwn camp and Waun Ddu fortlet. The terrain is relatively flat, with slight climbs to reach interpretative points off the road (most notably the summit of Y Pigwn). Mobile phone connectivity on the site is limited and users are advised to download the application in advance. Once downloaded, there are no additional downloads required within the 133.5mb application.

The user journey, in allowing them to follow in the footsteps of approximately 5000 Roman soldiers, who occupied the landscape and stayed there overnight almost 2000 years ago, is aimed to be both 'entertaining' and 'educational' (Apple Inc., 2018b). The MDI consists of 15 geo-triggered interpretative points along the landscape. These points are predominantly audio interpretation but additionally include AR reconstructions and video footage from the landscape. Audio is the primary medium and is centred on a conversation between a tour guide (Rory) and a Roman soldier (Primus). The content is delivered in a light-hearted manner, in which an explanation for the Roman occupation of the landscape is provided, alongside insights into the daily life of a Roman Soldier and the reasoning behind the camps.

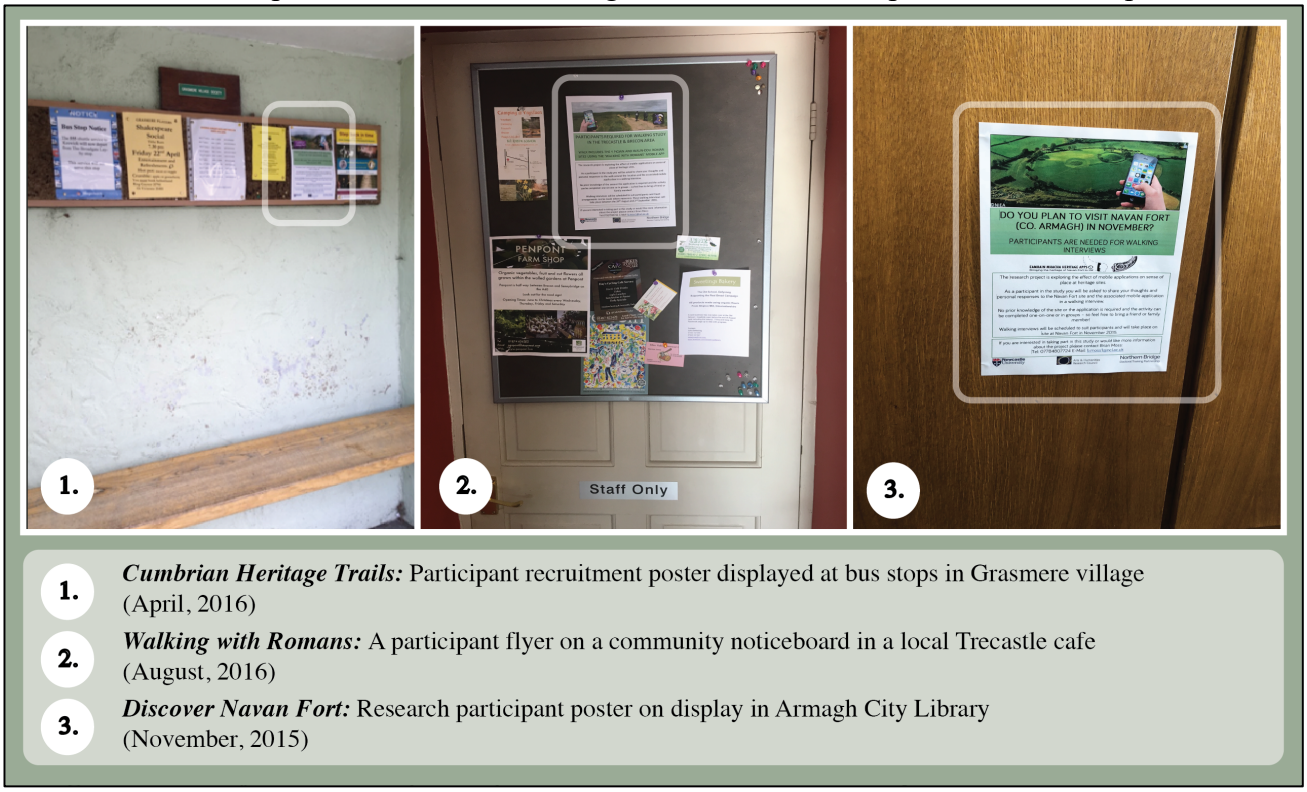
The MDI, in addition to the in-situ interpretation element, also has 'Before your visit' and 'After your visit' sections for the user. The 'Before your visit' section outlines important information such as how to access the site (including transport links), on-site requirements (such as clothing) and more novel components such as 'Dress your Roman' in which the user selects the uniform colour of the Roman soldier avatar in the interpretation. The 'After your

visit' section provides external links to learn more about Romans in Carmarthenshire, alongside links to social media platforms.

The MDI was led by the Brecon Beacons National Park, in conjunction with Living Data @ McLays Ltd., who were responsible for the design of the application and associated content (such as the animated reconstructions). To ensure historical accuracy within the experience, consultancy was provided by Dr Kate Gilliver (Cardiff University). *Walking with Romans* is part of the Romans in Carmarthenshire Project, a collaboration between National Trust Wales, Carmarthenshire County Council and Brecon Beacons National Park. The MDI was funded through the Romans in Carmarthenshire project, which in turn was funded through the European Regional Development Fund, which supported the Cadw (Welsh Government Historic Environment Body) Heritage Tourism Project. In addition, match funding was provided through the Fforest Fawr Geopark and National Grid.

4.2.3 In-Situ Investigation Process

Conducting the in-situ investigations at these sites involved several considerations in order to be effective. Firstly, in relation to participants, of critical importance was to identify the most suitable demographics for the effective completion of the study. It was decided that all individuals who expressed an interest in being involved could take part, with the exception of



1. ***Cumbrian Heritage Trails:*** Participant recruitment poster displayed at bus stops in Grasmere village (April, 2016)
2. ***Walking with Romans:*** A participant flyer on a community noticeboard in a local Trecastle cafe (August, 2016)
3. ***Discover Navan Fort:*** Research participant poster on display in Armagh City Library (November, 2015)

Figure 4.4 Call for Research Participants across the three case study sites

children (under-18) and vulnerable adults (this include adults who are unable to care for themselves or protect themselves from serious harm or exploitation, as defined in Section 59 of Safeguarding Vulnerable Groups Act 2006). This decision was based on ethical and safety concerns more so than the implications of addressing the research question. The recruitment process occurred through liaising with the gatekeepers of the various sites and displaying flyers and posters were displayed in prominent locations around the study areas (Figure 4.4) in the period leading up to the in-situ investigation. Information was also circulated through social media platforms and associated networks.

Prior to taking part in the study, individuals were provided with information that highlighted what the process involved and expectations from them. Individuals were also given the opportunity to opt-out at any stage of the process. As the potential existed that the individual would be sharing potentially sensitive information with the interviewer, the participant was informed of the processes put in place to ensure privacy, anonymity, confidentiality and safety where applicable. In addition, individuals were informed about the option to not answer any question which they felt uncomfortable in addressing. This was important as it helped build confidence between the participant and the researcher. The building of rapport through this process helped assist the subsequent in-situ investigation and post-experience interview.

Correspondingly, the approach of the walking interview was outlined to create a familiarity with the process before conducting the study. This limited the potential negative influence of the 'go-along' component on the experience of the individual. Issues such as confidentiality and recording of information were addressed at this stage also to ensure the individual is comfortable with the outlined program and that confidentiality, where possible, was ensured. Participants were introduced to the action-camera and any questions surrounding this aspect were also addressed. The primary concern was if their face would be recorded, but as the camera was front facing it was primarily only their hands that would be captured, unless of course they were in a group. Similarly, these discussions were conducted while the participant attached the camera to themselves. This served as an unofficial form of on-boarding with the technology, the brief period of discussion while wearing the camera before starting the experience, allowed the participant to become familiar and subsequently less conscious of its presence. This aided enhanced participation of the respondent, especially important as the study is participant-led. The individual shows rather than solely describe through this approach and provides opportunity for the serendipitous to occur when agency is with the

participant. In addition, the ability to place memories or experiences in a spatial context aids the articulation of points. This increases the detail of the data collected by the researcher, resulting in greater understanding and insight.

Conducting the interview whilst in-situ helps connect place, actions and memory. These are prominent components in assessing the influence of MDIs on sense of place in outdoor heritage sites. The interview is determined by being in-situ, specifically by the actions of the participant and the memories which arise from the process, and the space in which it occurs. A list of topics and open-ended questions were developed in concurrence with this however, to ensure that the primary topics of the study are addressed. This was to aid the process of triangulation, and as a method of stimulating the interview, especially in the initial stages (Figure 4.5). The participant may require a small adjustment period to the situation and some basic questions were asked around the general topic of the study to initiate the views of the individual. The interview is semi-structured, but utilisation of questions was dependent on how forthcoming each participant was in each instance (Figure 4.5). When applied, the questions were relevant to the aims of the study but presented in an open-ended manner so as to ensure that participants acknowledge and are reflecting on their own experience, not what they believe the researcher wishes to hear.

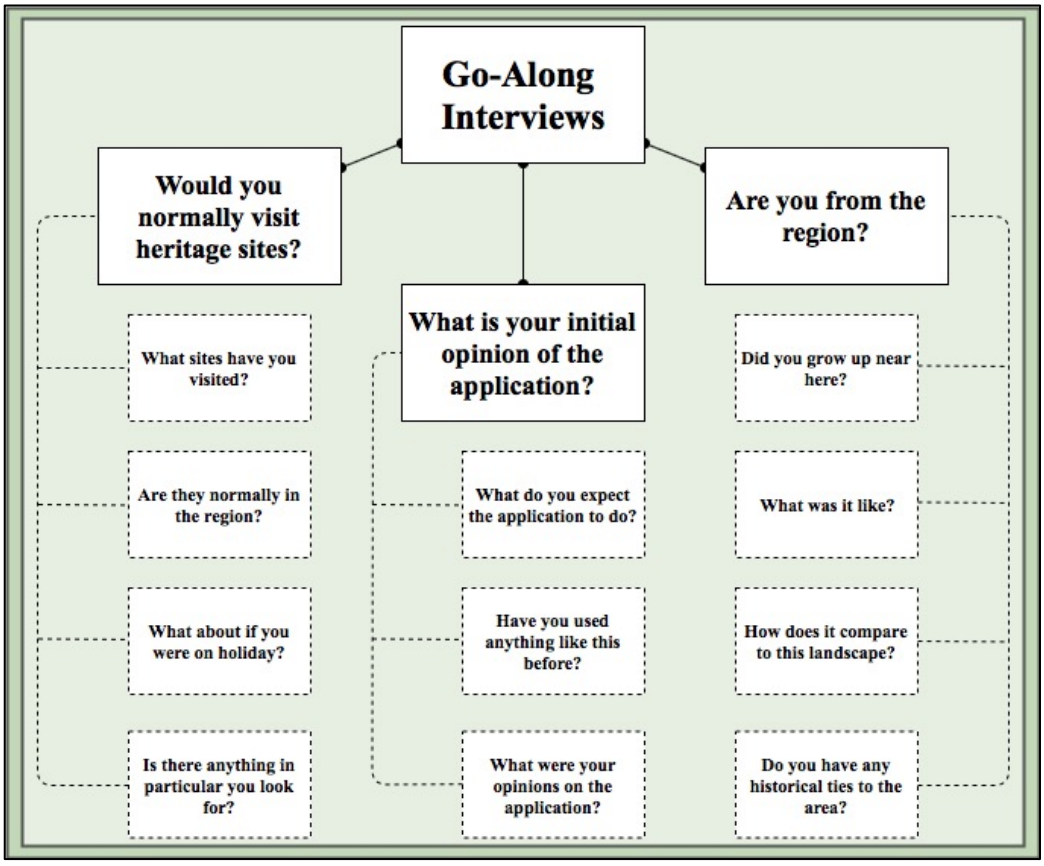


Figure 4.5 Example of 'Go-Along' Interview Questions

Immediately following the in-situ experience, an interview was conducted with participant which involved a tracking map exercise. While the on-site 'go-along' interviews were concerned more with the process undertaken and decision-making, this semi-structured interview served as an umbrella for the overall research context. The participant was asked to reflect on the experience but also discuss broader questions regarding views on heritage environments and personal smartphone habits (Figure 4.6). In some cases, there was overlap between the topics addressed in this interview and topics discussed in the in-situ experience. The tracking map component consisted of an aerial map of the site to coincide with the interview process. The map element was incorporated as a useful tool to stimulate conversations and assist in understanding the interpretative experience of the participant. The map was utilised as an opportunity to annotate the site with their personal views and opinions. As Beyer and Holtzblatt (1997:97) state 'the actions people take in doing their work reveal their strategy, their intent and what matters to them.' The process of annotation was to assist 'the conceptualisation of personal memory' (Van Dijck, 2007:155) and encourage highly

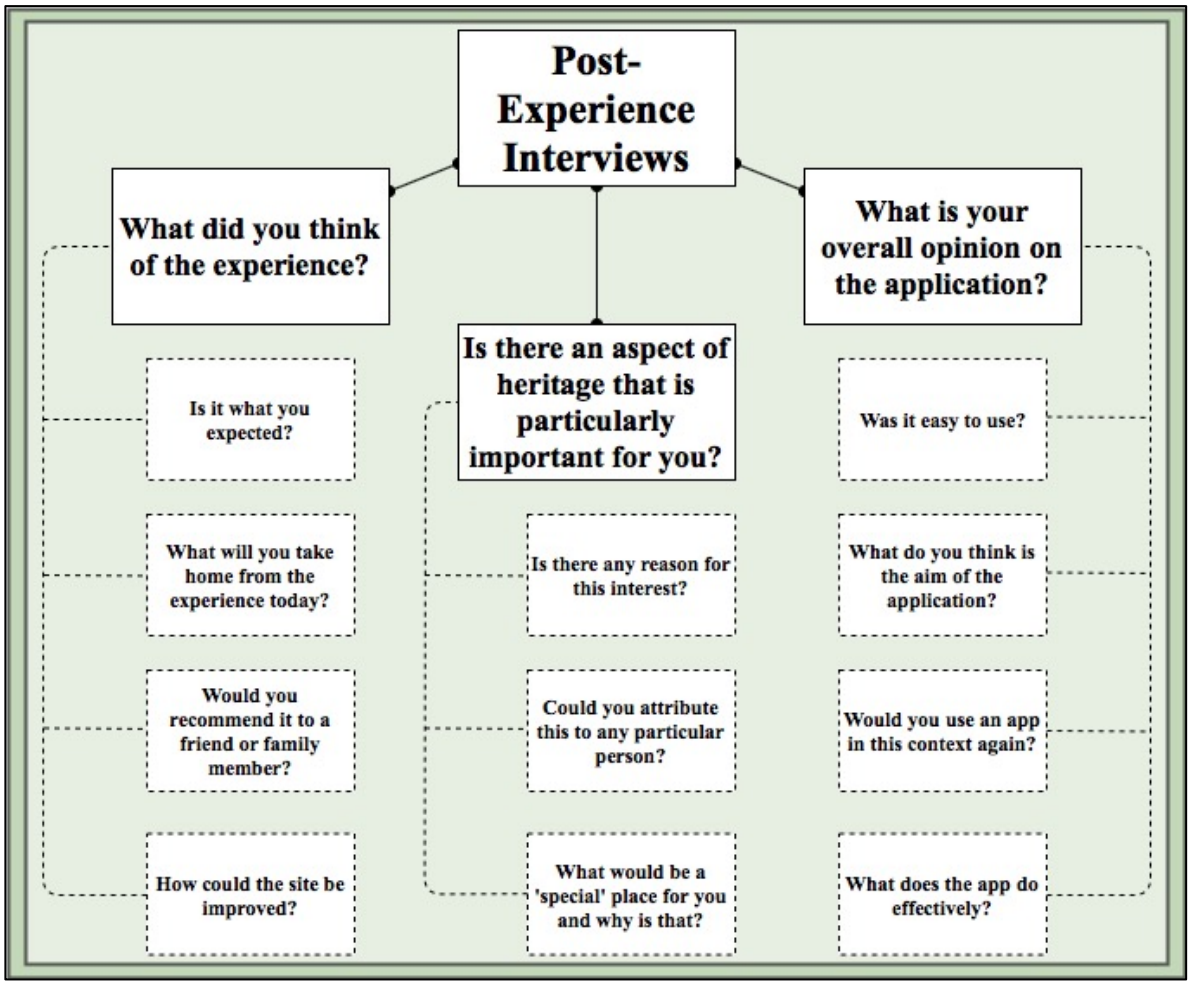


Figure 4. 6 Example of Post-Experience Interview Questions

unique individual responses that the questions may not have provided an opportunity to present. The process of actively reflecting on the site and the experience in this manner gives more knowledge pertaining to the individual and the experience.

Participants were not given instructions for their annotations, beyond basic indication that this was an opportunity to mark any feelings or opinions they had regarding their experience. This provided an insight into their interpretation of components relating to the study, such as ideas around sense of place, the interpretation offered and the manner in which it was provided. It also serves as a simple method to address engagement with the interview process. Participants had the opportunity to state their views as opposed to explicitly stating them in the interview.

The semi-structured, post-experience interview with a tracking map element is vital for the process of triangulation between the various participants and the various case study sites utilised in the study. The in-situ experience, although some scripted questions were used, hinged on the spontaneous and the decisions taken by the individual. Therefore, they must be accepted for what they are on an individual basis, however, interviewing the participant immediately afterwards allows for a line of questioning which can be maintained across participants and sites.

4.2.4 Contextual Investigation

The contextual investigation is an important part of the research as it helps to provide clarification for phenomena observed during the participant MDI experiences. The MDI experience is an experience constructed by the organisations and agencies responsible for them. Therefore, to get to the core of the research aims it is necessary to examine the wider context surrounding the MDIs, such as their formation and development. As a result, stakeholder interviews and document analysis were conducted and incorporated into the research.

The interviews with stakeholders were semi-structured in their approach, akin to the post-experience interviews with participants (Section 4.1.4). The line of questioning however differed from that of the participant experiences. This is due to the fact that the objectives of the stakeholder interviews are different and serves to add context to the case-studies. As noted in the case study design discussion (Section 4.1.1), the benefit of the case study approach was

the ability to acquire knowledge from numerous sources under the overall framework of a site. The stakeholder interviews are a prime example of this, as they provide knowledge relating to the site, the MDI and the visitor experience. This was vital in drawing conclusions from the observed practice of participants. Through interviewing stakeholders associated with the case studies chosen, it is possible to identify the aims and objectives of the MDI project and uncover decision-making processes which occurred in the published MDI. As well as looking at the practical parameters associated with the application it was also an opportunity to address the dynamic between stakeholders, particularly the heritage organisation and the software development organisation. This collaboration between stakeholders is important to understand the decisions made in the development of the application. Furthermore, the stakeholder interview caters for knowledge collection on specific themes relevant to the study, beyond the practicalities of the project, such as theoretical issues associated with visitor interpretation and sense of place (Figure 4.7). The stakeholder interviews therefore benefit the project in two specific ways. They provide valuable contextual information pertaining to the development of the application; while also allowing the examination of themes that have

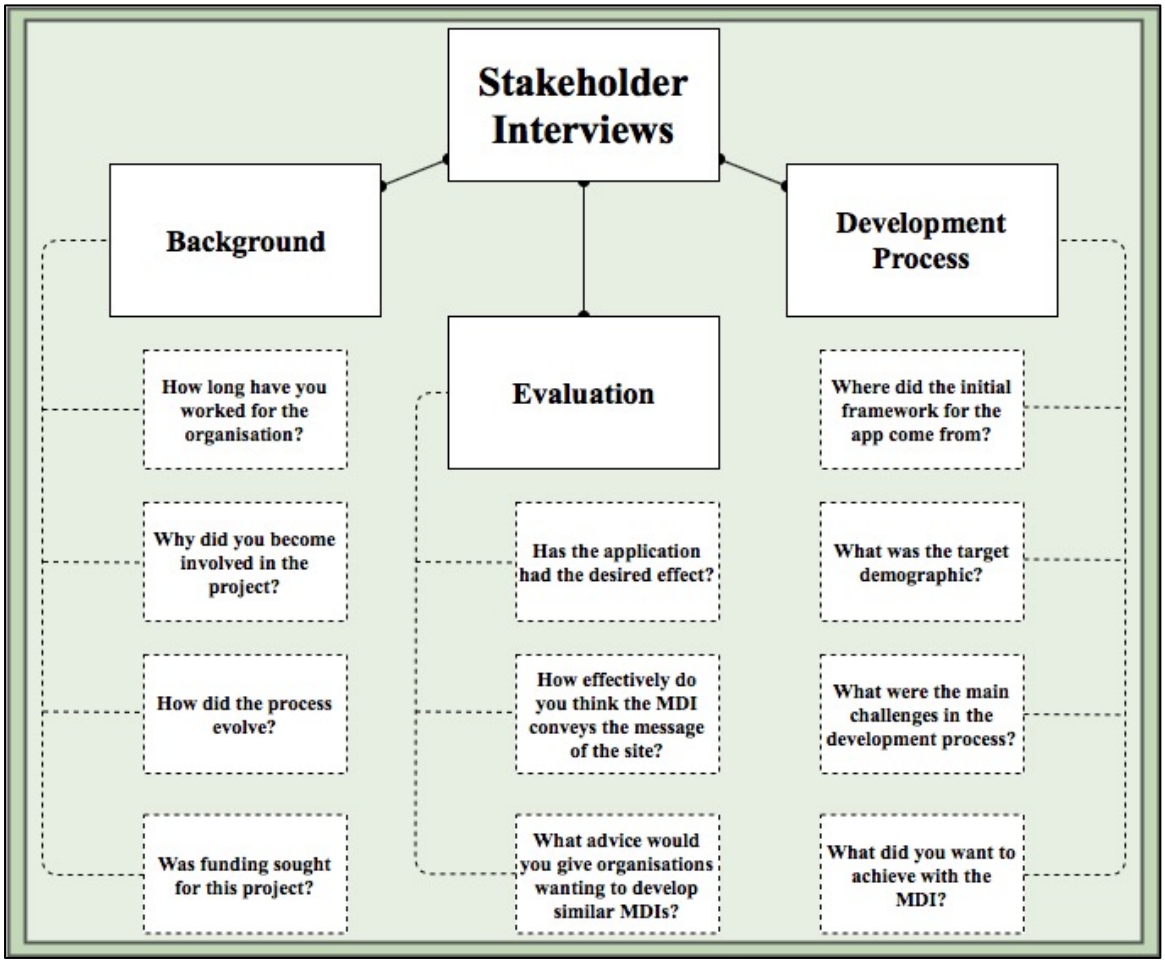


Figure 4.7 Example of Stakeholder Interview Questions

emerged from the in-situ investigation. It is possible to work retrospectively, through the line of interview questioning, to see how the decisions in the development process influenced the lived actions of participants in-situ.

Document analysis was also conducted to supplement the data collected through the exploration and in-situ investigation stages of the research and to coincide directly with the stakeholder interviews. The primary purpose of this was to obtain metadata around the individual case studies (Bowen, 2009). The documents relating to the sites and in particularly the MDI project (such as tendering documents) give an insight into the project and outline ambitions. Where possible, design briefs and post-project evaluations were incorporated. As a result, it is possible to initially see how much emphasis, if any, was placed on the embodied experience of patrons, and how this was consequently catered for within the MDI. Documents of this nature also help to assist in understanding the dynamics between the respective stakeholders involved in the project. This is important to consider, especially identifying where specific elements of the MDI originated from if they emerged as a prominent part of the participant experience.

As well as strengthening the context of the case study and the analysis conducted, the documents are valuable as they serve as a snapshot of a particular period within the project (Bowen, 2009; Patton, 1990). It is possible to appreciate progression in views, approaches and objectives from the initial tender documents to the post-project evaluations. These serve as excellent source material to understand the overall process and provide a foundation to think critically regarding the adoption of MDIs in this context. When analysing the data collected from the in-situ participants it is possible to refer to these documents to see how specific elements of the interpretation were formulated and see if the interpretation of participants aligned with the proposed intentions of the stakeholders. It is also important to note that many of the MDIs adopted in the study have been in circulation for several years. Therefore, in interviewing individuals who have been involved in the project their recollection of the project is highly likely to not be as vivid or as detailed. This is one of the challenges of the project which could not be mitigated (Section 4.3.3) but through the associated documents it is possible to triangulate responses to achieve a richer understanding.

4.3 Examination: Strategy and Analysis

The next stage of the research, following the collection of data, was to analyse it and generate outcomes. This phase is regarded as the examination phase and incorporates strategies involved in conducting the design and subsequent analysis of collected data. To begin with, a clear strategy was necessary for the in-situ investigation with participants at the case-study sites. One of the primary considerations relating to research strategy, and especially the case-study sites, was logistics. As noted in Section 4.2.1, the location of the respective sites was incorporated into the later sections of the selection criteria. As all the sites were UK-based (Figure 4.2) the logistical implications of the study were reduced but there were still numerous factors which had to be addressed. It was imperative to work with the associated gatekeepers of the case-study sites to ensure access was possible and that the study would not impact upon other patrons on the site. This also included the ethical considerations of the study, especially with the practice of action-cameras to capture the individual experience. To combat this, notices were placed at the entrance point for the various sites to inform other patrons about the research. These aforementioned notices informed individuals that any concerns about the research could be addressed with the researcher and video capture halted if required. To ensure the measures taken were appropriate, ethical approval for the study was sought from Newcastle University.

The nature of the sites involved in the study coupled with the activity undertaken in the research prompted a defined period for conducting the in-situ analysis of the visitor experience using the MDI. The areas are remote and often exposed to extreme weather conditions, particularly in the winter. Therefore, the studies could only be safely completed between late spring and late autumn (Table 4.2). Even if some of the chosen sites could be safely accessed in the winter months, the potential to recruit a significant number of participants was severely limited during these periods. This was confirmed by gatekeepers who provided information about the most appropriate times to conduct the study in order to have the best opportunity to recruit as many participants as possible. The health and safety of all parties involved in the research was paramount. All the sites chosen as a case study had undergone a pre-study site visit to ensure it was suitable and practical issues such as how safely patrons could navigate the location were considered. Additionally, to this, the practical considerations incorporated into the research

strategy involved making sure there was adequate sunlight to limit risk and in cases of adverse weather conditions the decision to proceed was made by the respective participant.

Table 4. 2 Participant schedule for the three case study sites

Discover Navan Fort					**Cumbrian Heritage Trails**					**Walking with Romans**				
Date: Nov. 2015	**No. of Participants**	**Participant Code(s)**	**Age Range**	**Duration (mm:ss)***	**Date: Apr. 2016**	**No. of Participants**	**Participant Code(s)**	**Age Range**	**Duration (mm:ss)***	**Date: Aug. 2016**	**No. of Participants**	**Participant Code(s)**	**Age Range**	**Duration (mm:ss)***
9th	1	DNFP1	25-44	45:23	20th	1	CHTP1	25-64	89:01	24th	2	WWRP1 WWRP2	44-64 44-64	95:21
11th	1	DNFP2	25-44	47:07	21st	2	CHTP2 CHTP3	25-44 25-44	58:59	26th	2	WWRP3 WWRP4	25-44 25-44	78:50
12th	2	DNFP3 DNFP4	0-24 25-44	21:53	25th	1	CHTP4	16-24	42:37	29th	4	WWRP5 WWRP6 WWRP7 WWRP8	25-44 25-44 16-24 16-24	89:45
14th	1	DNFP5	25-44	37:43	26th	1	CHTP5	25-44	48:37	30th	2	WWRP9 WWRP10	24-44 65-74	75:51
15th	2	DNFP6 DNFP7	25-44 25-44	29:52	27th	2	CHTP6 CHTP7	65-75 44-64	62:42					
17th	1	DNFP8	45-64	43:53	30th	1	CHTP8	25-44	77:25					
					30th	1	CHTP9	45-64	80:28					

*Duration represents time recorded on the action-camera of the Go-Along experience. All participants also completed a post-experience interview that is not included in this time.

Building upon Table 4.2, in total 27 participants took part in the go-along experiences on site and a post-experience interview afterwards. Across the three case study sites there was a mixture of solo experiences (9 of 27 participants), experiences in pairs (14 of 27 participants) and group experiences (4 of 27 participants). There was also a gender balance throughout the research, with 14 male and 13 female participants. There was equal representation at the Navan Fort and Brecon Beacons sites, while the study involving the *Cumbrian Heritage Trails* had five males and four females. Participants also represented a range of ages, however the majority of participants were aged 35-44. All the participants were from the same region

as the respective site, although some identified as being non-local. Of the 27 participants who took part in the go-along experiences, only 11 had been at the site previously.

For the elements of the study that did not require the researcher to be in-situ, a base was established at Newcastle University; this included the exploration phase (with the exception of the self-reflective visits), a selection of stakeholder telephone interviews (Table 4.3) and the subsequent analysis of data collected. All the data collected was collated and integrated into the NVivo® program. The package was utilised as it allows for effective analysis of qualitative data across various mediums, facilitating cross-compatible analysis between the video, audio and text sources. This was paramount as it allowed the integration of the action-camera footage, audio from the participant and stakeholder interviews, and the contextual documents to be collected into a centralised program where they could be analysed together. Before analysis could be conducted the data sources were all transcribed. This occurred within the NVivo program, all interviews were transcribed verbatim and any dialogue in the video footage was similarly transcribed verbatim. In the video footage motions and actions were also noted. This was one of the primary reasons for adopting a visual ethnography approach, as the video generated allowed for the capture of the small moments of interaction and behaviours between the individual, the smartphone and the environment. Effectively capturing this could not be completed by any other form.

Table 4. 3 Schedule of stakeholder interviews

MDI:	Date:	Name & Role:	Organisation:
Discover Navan Fort	10/11/15	Antaine Ó Donnaile, Director	Macha Media
	17/11/15	Seán Ó Maoilsté, Irish Language Development Officer	Cairdé Teo
Cumbrian Heritage Trails	28/04/16	Jeff Cowton, Curator	Wordsworth Trust
	07/07/16	Peter Pavement, Director	Surface Impression Ltd.
Walking with Romans	31/08/16	Melinda Russell, Director Leanne Gamble, Interactive Media Developer	Living Data @McLays
	01/09/16	Suzanna Jones, Interpretation Officer	Brecon Beacons National Park

Keeping with the protocol of the NVivo® program, the transcribed sources were then coded. Specific segments of the transcribed data were assigned a category or topic, referred to as 'nodes'. In the creation of nodes within the transcribed material a grounded theory approach was adopted, one of the two primary approaches for analysing qualitative data (Gray 2004), the other being content analysis. No criteria were outlined prior to the analysis and all the subsequent themes outlined in following chapters emerged from the data. This is in-keeping with the definition by Strauss and Corbin (1998:23) which states that themes are "discovered, developed and provisionally verified through the systematic data collection and analysis of data pertaining to that phenomenon." This analysis of the data is similar to inductive reasoning as the interpretations are derived from the data and not essentially sought. In every instance where a topic or factor presented itself in the transcriptions it was coded with the associated node to acknowledge its position (these included codes such as: expectations, weather, history, family and GPS). Many pieces of data were coded with several nodes and no limitations were placed on this or on the number of nodes created. This process was completed for all the transcribed text relating to the collected data. For the video footage specifically, behavioural patterns, such as movement while the interpretation played, how the participant held the device, and movement throughout the site were also coded. The outcome of this was the ability to collate sets of data relating to specific emerging themes. Additionally, it is possible to see where each instance emerged and analyse the connections between the various references.

Once all sources were coded, these datasets relating to particular elements could be further analysed and subsets created. This process of initial coding, which Strauss and Corbin (1998) refer to as 'open coding', is the first of three stages in using grounded theory for qualitative data analysis. Further analysis, known as axial coding, occurred after the open coding, which involved identifying the relationships between the elements or categories created. This allowed for the final stage, selective coding, where principal classifications are unified to produce a theory, the results of which serve as the basis for the succeeding findings chapters (Chapters 5, 6 and 7).

4.3.1. Triangulation

Triangulation is required to strengthen confidence in the data collected and the findings of the research. It serves as a means of overcoming any potential bias or weakness within the

research, both in relation to methodological and personal contexts. There are various triangulation sub-divisions (such as methodological, data, investigator and theoretical investigation (Denzin, 1970)) but in this study, methodological and data triangulation are the key sub-divisions which must be acknowledged. As well as eliminating or reducing bias triangulation allows for an increased probability of generalising the study results. This is because the data was collected from different methods and different angles, which is the basis of both data and methodological triangulation (Decrop, 1999). A multi-method approach was taken to the data collection, as outlined above, which allowed for triangulation to occur through using various methods to address the same aim. In this instance, this included methods such as semi-structured interviews (Section 4.1.4), 'go-alongs' (Section 4.1.2), tracking maps (Section 4.2.3) and document analysis (Section 4.2.4). Every method has limitations but through the multi-method approach, such as that implemented in this study, it is possible to effectively mitigate these potential weaknesses. Similarly, data triangulation occurred by collecting data over different times (Easterby-Smith *et al.*, 1991). In addition to the variation in methods, for data triangulation various case studies were assessed and within each case study triangulation also occurred through the participants involved.

4.3.2. Validity and Reflexivity

Validity is an important aspect of qualitative research, especially research concerned with subjective concepts such as sense of place in the case of this research. According to Winter (2000) validity in research is concerned with two aspects, firstly, the accuracy of tools used in the collection process and, secondly, whether these subsequent tools are actually measuring what they are supposed to measure. More specifically this relates to internal validity, whereby the approach adopted addresses the aims and objectives of the study. Using the multi-method approach to investigate the research question from various angles strengthens the validity of the collection process and the research overall. Aspects such as the self-reflective site visits ensured that the case studies adopted could effectively address the aims of the research. Furthermore, these visits inspired many of the questions which were incorporated into the semi-structured interviews and 'go-along' interviews, all of which assisted in the validity of the research.

Reflexivity in this case concerns the researcher's position within the study. This has been addressed in depth within the 'go-along' section (Section 4.1.2) and there are numerous

instances of catering for reflexivity within the research. In the aforementioned ‘go-along’ aspect, for example, the participant has agency over the experience and leads it. This aids the research through aligning with the aims of the study and also lessening the authoritative figure of the researcher. The participant is able to control the length of the experience, as well as other factors such as direction and utilising the mobile device. Other issues associated with reflexivity within the research include the analysis of the data. Significant time was spent examining the concept of ‘sense of place’ prior to the analysis of the data collected, and there is potential concern that this will direct the subsequent analysis. This is even more prevalent as grounded theory was the chosen method of analysis. However, by following the stages of open-coding, axial coding and selective coding (Section 4.3 and Strauss and Corbin, 1998) there is confidence that all the subsequent findings are not a product of content analysis but are a result of what emerged from the data.

4.3.3. Research Challenges

A key challenge which had to be addressed, particularly in relation to stakeholders, was that many of the applications being discussed were published several years previous. This raised several issues, such as the individuals responsible for the development of the application had moved on to new positions and thus unavailable to contribute to the study or that the intricacies of the project were not as fresh in the minds of stakeholders. In cases of the latter, there were measures taken to improve this, such as obtaining documents pertaining to the project and MDI in order to triangulate responses. This was furthered by attempting to interview as many associated individuals as possible.

Underpinning the methodological approaches adopted, especially for the in-situ element, was making the participant central. Assigning agency to the individual in this instance is a key strength of the framework adopted, but with this there are several challenges and issues which must be considered. For the in-situ element specifically, the freedom of the participant results in the potential for unique occurrences and therefore the researcher must be flexible to respond to situations which arise. In several cases throughout the investigation, participants brought a friend or family member along. This was acceptable and in cases encouraged, however, this altered the dynamic of the process and the subsequent conversations which occurred. In such instances, the researcher took a step back from the participants and observed the dynamic of the individuals within the context. In addition, the post-experience interviews

occurred simultaneously with all present. This allowed for a flow of dialogue and enabled the individuals to interact but conversely responses may have been constrained as a result.

Additionally, participants were briefed on the project and informed at the beginning of the in-situ element that there were no constraints on issues such as direction or time. As a result, the experiences were of varying lengths, some participants were more willing to spend significant periods on site and taking part in the study than others. In the subsequent analysis of the data, however, there was no clear relationship between the length of the experience and the richness of the knowledge obtained from it, a similar conclusion to Pink (2009). This was also mitigated further through the additional methods employed such as the post-experience interviews and annotated site maps.

Similarly, there was issues underpinning the use of action cameras to capture the experience. It is important to think how collecting data through the use of video effects "sensation, perception, cognition, experience, consciousness and subjectivity" (Packer and Crofts-Wiley, 2012:11). The in-situ investigation is concerned with capturing the experience of individuals using MDIs in heritage environments. Therefore, by utilising another digital device (Go-Pro® action camera) to capture this it is vital to consider how this will influence the experience. As outlined in section 4.1.3 the use of video in this study is building upon successful approaches taken by others. Peräkylä (2006) for example, championed micro-analysis of video recordings in ethnographic contexts, claiming that the method, when adopted to study greetings, raised questions pertaining to the normative structure which would not have been acknowledged otherwise. These studies serve as a foundation for the method adopted in the study and the use of Go-Pro® action cameras specifically have proven to be effective. Evers (2015:3), for example, in adopting Go-Pro® devices in a study exploring issues of masculinity in surfing claimed that it "helps shape the vision, sound, interpretation, as well as knowledge, emotions and effects."

Conclusion

To conclude, this chapter outlines the development of the research and the methodology adopted. A multi-layered and multi-method approach was adopted in this empirical inquiry to effectively capture the phenomenon associated with the research question. Through the approach section (Section 4.1) an argument is put forward to justify the inclusion of each

specific method, followed by the practical application of said methods (Section 4.2) and subsequent analysis (Section 4.3). The research builds upon various ethnographic principles and uses contemporary methods of enquiry within this framework.

After outlining the paradigm of the research, the chapter addresses the process applied in each of these approaches and the oppositeness of case study research in each instance (Section 4.2). The methodological design was viewed in three distinct phases, the exploration, the in-situ investigation and a final contextual study. These phases occurred chronologically similar to the ordering of this chapter. Each section is responsive to the previous and flexible to occurrences within the data collection, particularly in the case of the in-situ investigations. The self-reflective visits, for example, in the exploration phase shaped the experience with participants.

The latter section of this chapter addressed the practical strategy implemented to carry out the design framework and the subsequent analysis of data collated (Section 4.3). A case is also made for the decisions taken in the methodology through addressing issues such as triangulation, reflexivity and validity. The chapter effectively outlines the actions taken to address the aims and objectives of the study, showing the basis for the design and detailing the practical application of it creating potential for future replication. This allows for an outlining of the findings in the succeeding chapters, confident in the methods applied to generate effective outcomes in the research.

Chapter Five: Smartphone Medium and Media: Perceptions and Approaches to Engagement

This chapter focuses on the influence of perceptions and subsequent approaches to engagement with smartphone MDIs. In doing so, it problematises the challenges facing stakeholders and users in relation to the development, deployment and adoption of smartphone-based MDIs.

Outdoor cultural heritage experiences involve more than the passive interactions of an individual with an interpretative platform or space. There are significant meaning-making and sensuous components at play, as outlined in Chapter 3. The experience process is non-linear, a fluid interchange of understanding and emotion. Interpretation through smartphone-based applications is uniquely positioned, in comparison to other forms of existing interpretation, to cater effectively for this process (Mohammed-Amin *et al*., 2012). This was an aspect specifically outlined in the design of this research, assessing the functionality and usability components of the technology in terms of providing opportunities to accommodate engagement. Therefore, understanding how stakeholders, both the heritage organisations wishing to develop this form of interpretation and the application developers tasked with creating it, understand this technology and subsequently implement it in their sites is pivotal on the influence the MDI will have for in-situ users.

It is not solely the functionality of the MDI which influences engagement, but also perceptions relating to the smartphone as an interpretative medium by all relevant parties. These relevant parties include those involved in developing the smartphone interpretation (producers) and also the user (consumer). To investigate this, the chapter will focus on three interrelated aspects of this discussion. It will begin by considering the equating of 'mobile' and 'engagement' by heritage agencies developing MDIs (Section 5.1). This incorporates the development process and the lived experiences of participants, to address the perceptions surroundings the interpretation as a result of the medium. It stems from a prevailing premise that due to the nature of the device, as an agile, responsive communication tool, that engagement is achieved automatically. The section builds upon the framework for engagement in Chapter 3 and how this understanding aligns with the observed MDI experience. It incorporates how the device fits within the activity system of the individual, the 'imagined' user and homogenous representations of the individual. While the discussion

focuses primarily on the heritage agencies responsible for the respective MDIs, it incorporates the lived experiences of users to illustrate the implication of these aforementioned perceptions of engagement.

The lived experience and engagement are unpacked further in Section 5.2, with the problematising of users' perceptions and framing of the smartphone MDI experience. This centres predominantly on the use of the smartphone in the heritage context instead of the everyday context the user is familiar with. The implications of usage across the heritage and everyday contexts is addressed by looking at how the device is reframed and viewed in relation to other forms of interpretation. The tension between the technology and the nature/leisure activity is also considered in this section. It is an element which permeated the user experience; reflecting also the repercussions of the Bring-Your-Own-Device (BYOD) concept.

The chapter concludes by discussing smartphone MDIs as legitimate forms of interpretation in the outdoor heritage context (Section 5.3). It is a thread that is acknowledged in the previous sections of this chapter (Section 5.1 and Section 5.2). The discussion takes the perceptions of both the producers (heritage agencies, Section 5.1) and consumers (users, Section 5.2), and considers the representation and portrayal of smartphone-based MDIs. In doing so, it acknowledges the development process and the consideration for interpretative messages with the technical capacity of the device. The existing knowledge and self-identification of the user is also used to illustrate the challenges of legitimising smartphone MDIs as interpretation mediums in the heritage experience. It also addresses the importance of place in the experience and how the subsequent integration of the MDI, with associated media, influences the perceived legitimacy of the interpretation.

5.1 'Mobile' as 'Engagement': Conceptualising the Smartphone MDI Experience

A key component to emerge immediately from the research was the use and understanding of 'engagement' in the smartphone MDI context. This emerged in several ways and centred around a series of propositions: for example, how does the user define their own engagement, how is users' individuality catered for, how successful is the interpretative content in engaging various demographics and how do the organisations define MDI engagement

specifically? This frames the discussion in the following section, highlighting the impact of smartphone-based MDIs on the understanding of engagement in the heritage experience.

The concept of engagement, and more specially engagement with mobile devices has been outlined in Chapters 2 and 3 respectively. Those chapters addressed the theoretical understandings and limitations which have emerged in relation to engagement with and the adoption of mobile devices as interpretative mediums. One aspect which emerged in the aforementioned chapters and was also borne out in the research was the equating of 'mobile' with 'engagement'. The conceptualisation of the technology and experience by relevant stakeholders are driving forces behind the subsequent influence of the smartphone MDI on the individuals' experience. Many matters surrounding the adoption of MDIs are not necessarily the fault of the device in regard to its technical capacity, but in how the MDI was adopted and designed for the user.

Suzanne Jones, Interpretation Officer for Brecon Beacons National Park and responsible for *Walking with Romans*, discussed the conceptualisation of mobile digital engagement in the heritage context as follows:

> Technology has taken off in interpretation, but the content has been poor and there have been really few interpretative apps out there. They have got carried away with gadgets and gizmos and completely bypassed the interpretative planning process. I think that is one of the reasons it [*Walking with Romans* MDI] did win the award [AHI Discover Heritage Awards 2015]. It's not the best animations, it's not the fanciest app, but it did follow the interpretative planning principles (Jones 2016, pers. comm., 1st Sept.).

This statement highlights a common assumption maintained by several participants in this research project, namely the perception that engagement is achieved instinctively because of the medium. It indicates a technology-led approach to design thinking for smartphone-based MDIs, focusing on the technology more so than the context which it is being designed for. Jones (2016, pers. comm., 1st Sept.) while discussing *Walking with Romans* highlights that the effectiveness of the MDI experience derives from the focus on interpretative messages, more so than the technical capacity of the device.

As Costabile *et al.* (2010: 33) noted, smartphones in the heritage context "stimulate engagement through arousing curiosity and permitting immersion in a learning environment." Engagement does not equate with just using a device, in the same manner that, as mentioned before (Chapter 3), physical attendance in a heritage site is not necessarily engagement. Museum and heritage experiences for example are regarded as the amalgamation of two activity systems (Pierroux *et al.,*2007); which are the activity system of the individual in their everyday actions and also the objects in the heritage and museum space. Pierroux *et al.* (2007) suggest a key visitor motivation is this requirement to re-think and re-contextualise the heritage and museum objects within their own activity system. In many respects, this is how smartphone-based MDIs have been perceived by stakeholders. Smartphones are highly personalised devices, therefore key components in the activity system of the individual. Through technological capability (such as smartphone applications), heritage objects can be reconceptualised to fit within the activity system of the individual.

In relation to engagement with MDIs it is apt to address the interpretative objectives and how the user is 'imagined' in the MDI experience. The concept of an 'imagined' user is a common approach in design practice, mainly to create a "substance and rhetorical force to competing discourses relevant to the design issues in question" (Ivory and Alderman, 2009: 137). This research involving smartphone MDIs considers the identification of a perceived or desired user of the MDI for the MDI heritage experience. The practice of conceptualising an 'imagined' user has grounding in both computer science and heritage interpretation, making it particularly relevant to this research.

In 1983 for example, Rich discussed the perceived homogeneity of the user in relation to human-computer interaction, making the claim some 35 years ago that the user interface should be tailored to the individual instead of "some abstract 'typical' person" (Rich, 1983: 199). This has commonalities with 'imagined' visitors and individual experience in heritage discourse and management. Heritage based studies, such as Poria *et al.* (2006) and McIntosh (1999) theorise the importance and uniqueness of the individual heritage experience, and Not and Petrelli (2014) acknowledge this in relation to digital cultural heritage specifically. Other heritage studies approach the imagined user through audience segmentation and demographic attributes (See Adie and Hall, 2017; Light and Prentice, 1994). In the understanding of the 'imagined' user it is also important to acknowledge the 'imagined' self. The term in this instance refers to the manner in which the user self-identifies, and how this conforms with the

heritage interpretation, bringing ideas of individuality and personalisation to the heritage experience.

Adopting both these concepts, the imagined user and imagined self, and examining them in relation to the lived smartphone MDI experiences allows for further understanding of engagement with mobile interpretations in this context. As stated, the 'imagined user' is a premise that is considered by both the primary producer (stakeholder) and consumer (the user) in the MDI experience. The communication between the producer and consumer via the MDI is not one of direct transmission; but the stakeholders' 'imagined' user has a significant impact on the subsequent user experience and engagement with the interpretation.

The project goals and interpretative objectives of the three in-situ investigation sites give an indication of the 'imagined' user in each instance. The Brecon Beacons National Park employed their *Walking with Romans* MDI:

> …to open the Roman heritage at Y Pigwn and Waun Ddu to a wider audience by making it easier to access (physically and intellectually) and more enjoyable increasing the number, length and value of visits. (Jones, 2015:1)

Similarly, the ambition behind the *Discover Navan Fort* application, as stated in the independent evaluation (CEA Consultants, 2014) for the Eamhain Mhacha Heritage Apps was:

> …to engage young people between the ages of 16 - 19 years with their heritage and train them in the use of the latest technology in order to produce multi-media elements that would be shared with the general public free in perpetuity (CEA Consultants, 2014:5).

The *Discover Navan Fort* application was just one facet of the Eamhain Macha Heritage Apps project, which included another 'media-scape' MDI aimed at under-16 children on the site. As mentioned earlier, the lead stakeholders, Cairde Teo, are an Irish Language Social Enterprise and the project was devised in accordance with their aims and values.

The *Cumbrian Heritage Trails* application likewise was an element of the much larger 'Treasures of Cumbria' project with this encompassing ambition:

> To excite visitors to become interested in and actively engaged with their heritage and explores ways by which we can reach out to communities and begin a dialogue with local people on their own terms (Cumbria Museums Consortium, 2014:18)

These statements of intent help contextualise the experiences and provide an insight into the perception of engagement and the 'imagined' user from the perspective of the relevant stakeholders. The *Walking with Romans* MDI was for a 'wider audience' and Jones (2016, pers. comm., 1st Sept) elaborated on this to define the imagined users as 'active families'. The acknowledgement of easier access to the site, not only physically, but intellectually presents an awareness of the role of knowledge provision in engagement within the experience (Chapter 6). While *Cumbrian Heritage Trails* and the *Discover Navan Fort* applications also adopted MDIs to engage visitors, the *Discover Navan Fort* MDI was aimed towards young adults and adults specifically. The terminology used in both these statements is interesting as *Discover Navan Fort*, for example, addresses the imagined self in relation to engaging the user with 'their heritage'. It is a sentiment also shared by *Cumbrian Heritage Trails* as reflected by the aim of the project to 'reach out' and 'begin dialogue' with local people 'in their own terms'. The statements in relation to *Cumbrian Heritage Trails* and *Discover Navan Fort* frame the MDIs as experiences for local people and local communities not necessarily visitors to the area. This is important because if tailored to a specific group, community or identity it will influence engagement, particularly feelings of belonging or non-belonging on the site.

Visitors' engagement with the smartphone-based MDI is dependent on the stimuli it presents. The nature of this engagement, facilitated by the smartphone-based MDI, subsequently helps shape the users' heritage experience, but engagement is not dependent solely on the smartphone MDI. The smartphone interpretation may play a prominent role in the experience, but it is not autonomous (Brizard *et al*., 2007). No element in the experience can be fully removed or subtracted from the heritage process; echoing engagement as an all-inclusive approach (Chapter 3), beyond passive activity, to cater for the embodied elements of the experience, the senses, sense of place and meaning-making.

The stakeholders' understanding of the technology in this context therefore, their imagining of the user experience, and the interpretative planning process are all paramount to the effectiveness of the engagement (Howard, 2003). As Jones noted, technological approaches have taken greater precedence than the interpretative planning process in relation to smartphone MDIs within the heritage sector. Thus, the nature of the collaboration between the stakeholders (mainly a heritage organisation and a private design company) has a significant impact on the MDI engagement.

In the case of *Walking with Romans*, the audio aspect was viewed by the organisation [Brecon Beacons National Park] as one of the elements that was required for 'an enjoyable visitor experience' (Jones 2016, pers. comm., 1st Sept.). The somewhat traditional response of using audio, reminiscent of the audio-guides adopted at heritage sites in the past, was acknowledged as 'not the most cutting edge of techniques' (Jones 2016, pers. comm., 1st Sept.). It is an approach that is supported amongst heritage interpretation handbooks, for example in the 'Interpretation: Good Practice Guidance' document, produced by the Heritage Lottery Fund (HLF, 2013:14), cited several advantages of audio content. These advantages include 'encouraging visitors to look and listen at the same time' and that they 'can be very evocative, especially if the presentation makes good use of sound effects and creative editing.' Therefore, despite smartphone MDIs being a relatively new approach to interpretation in comparison to the traditional audio-guides the same approaches and techniques are adopted.

In the interpretative planning process however, there are limitations. While variations of the 'imagined user' exist, with demographics such as 'young adults' (*Discover Navan Fort*) or 'active families' (*Walking with Romans*) the characterisations are nonetheless rather homogenous understandings of the individual. A common conception with smartphone-based interpretations specifically is that they are means for attracting and engaging a younger demographic (HLF, 2012). *Discover Navan Fort* acknowledged this explicitly. There is quantifiable merit to this: Ofcom reported in 2015 that 93% of 16-24 year olds in the UK have a smartphone (Ofcom, 2016). However, there is also an increasing trend in relation to older demographics and smartphone uptake (47% in 2010 to 56% in 2015 amongst 55-64 year olds; Ofcom, 2016). Deliberately framing the interpretation through the lens of the medium may have unintended influences on the user experience, the most notable being that it can alienate users who do not identify as 'young adults'. On the *Cumbrian Heritage Trail* for example one participant asserted that:

> CHTP6: I mean these things are made to try and get younger people interested so I don't think it is necessarily for people like us.

It is important to note, however, that the *Cumbrian Heritage Trails* did not specify that the interpretation was solely for younger audiences, nor is there any evidence to suggest it was formulated with this in mind, but this perception was held by the user nonetheless. The homogeneity is not just a resulting perception as a result of the medium (smartphone) but an issue in heritage interpretative planning broadly. Homogeneity of users was not an area of initial focus in the research, but it emerged repeatedly in the observations and interviews with stakeholders. In the context of smartphone-based MDIs for outdoor cultural heritage sites there is a deficiency in the representation of voices for people of colour, women and limited mobility or sensory deficiency users. Suzanne Jones, for example, noted specifically the lack of representation of females in *Walking with Romans*:

> In hindsight, there are things I would do differently, one of the pieces of feedback we got was that there were no females. Ladies weren't talked about. Where were the women during this? What was the woman's role? It is written just about men which is a thing that I have taken from this (Jones 2016, pers. comm., 1st Sept.) (Figure 5.1).

Figure 5.1 The male Roman soldier, Primus, in the 'Walking with Romans' MDI

The lack of voice given to marginalised sections of society and minority groups is clear in relation to smartphone MDIs and to a similar extent, heritage interpretation more broadly. Studies such as van Eeden (2007) on gendered tourism spaces; King (2008) on cultural heritage and minority representation; and Bautista & Ripoll (2013) on heritage interpretation, mobile devices and individuals with limited mobility or sensory deficiencies are all testament to the lack of representation evident in the sector which still prevails in contemporary interpretations. This is an aspect which needs greater attention, particularly when concerned about personalisation, embodied connections and the individual experience.

The individual at the heritage site and the smartphone-based interpretation can be viewed as being in partnership, co-operating in the construction of engagement. This cooperative approach is similar to considerations in museum education, which has advanced beyond the traditionalist behaviourist paradigm of knowledge presentation and consumption (Falk and Dierking, 2000) (Figure 5.2). The benefits of framing the relationship between the individual and the smartphone MDI as a partnership requiring cooperation, engagement, and the

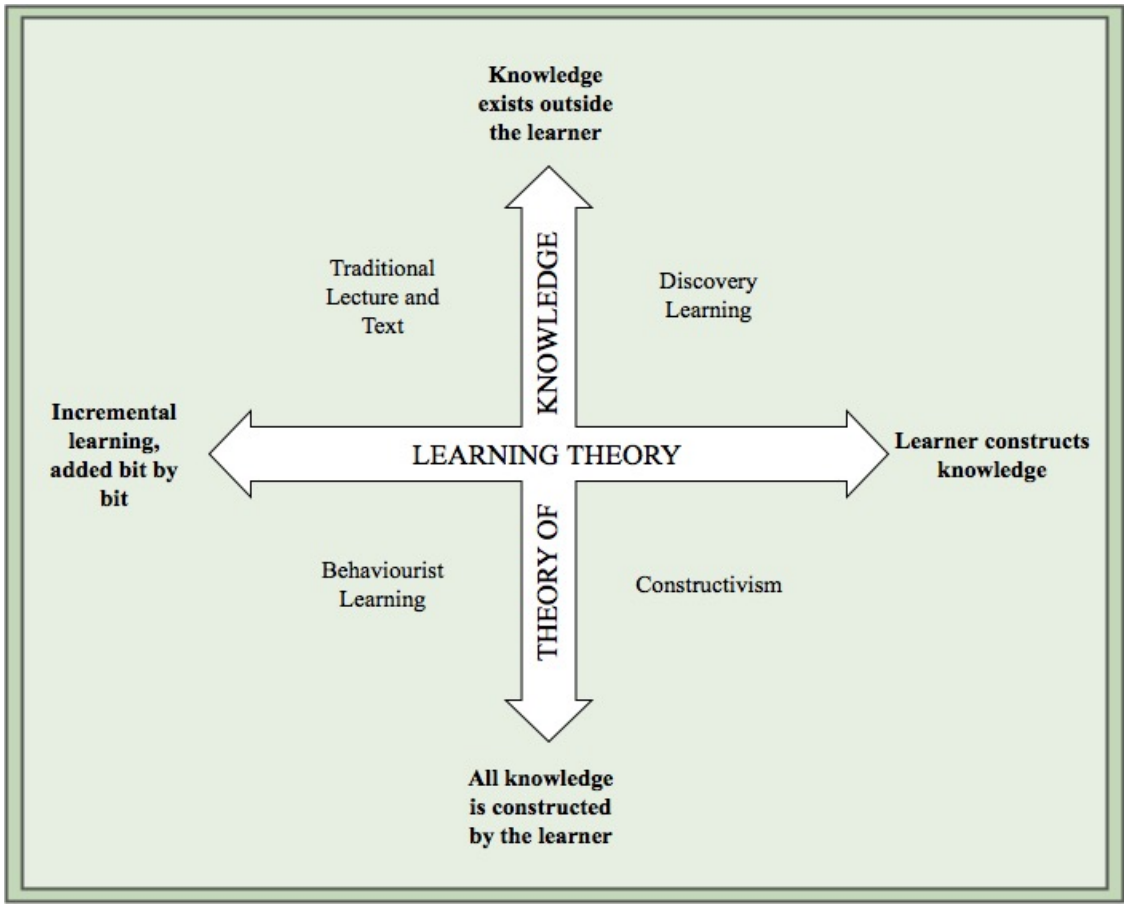


Figure 5.2 Theory of Learning and Knowledge Model (Hein, 1995:24)

construction of an understanding is reflected in Philosophical Hermeneutics by Gadamer (1976). This work acknowledges that meaning-making is the process by which the learner finds the ways that new ideas intersect and connect with their own existing understanding. Smartphone interpretations therefore serve to empower the individual in the construction of their own understanding. Framing the relationship between the individual and the smartphone MDI in this cooperative manner opens the experience to more interactive engagement with

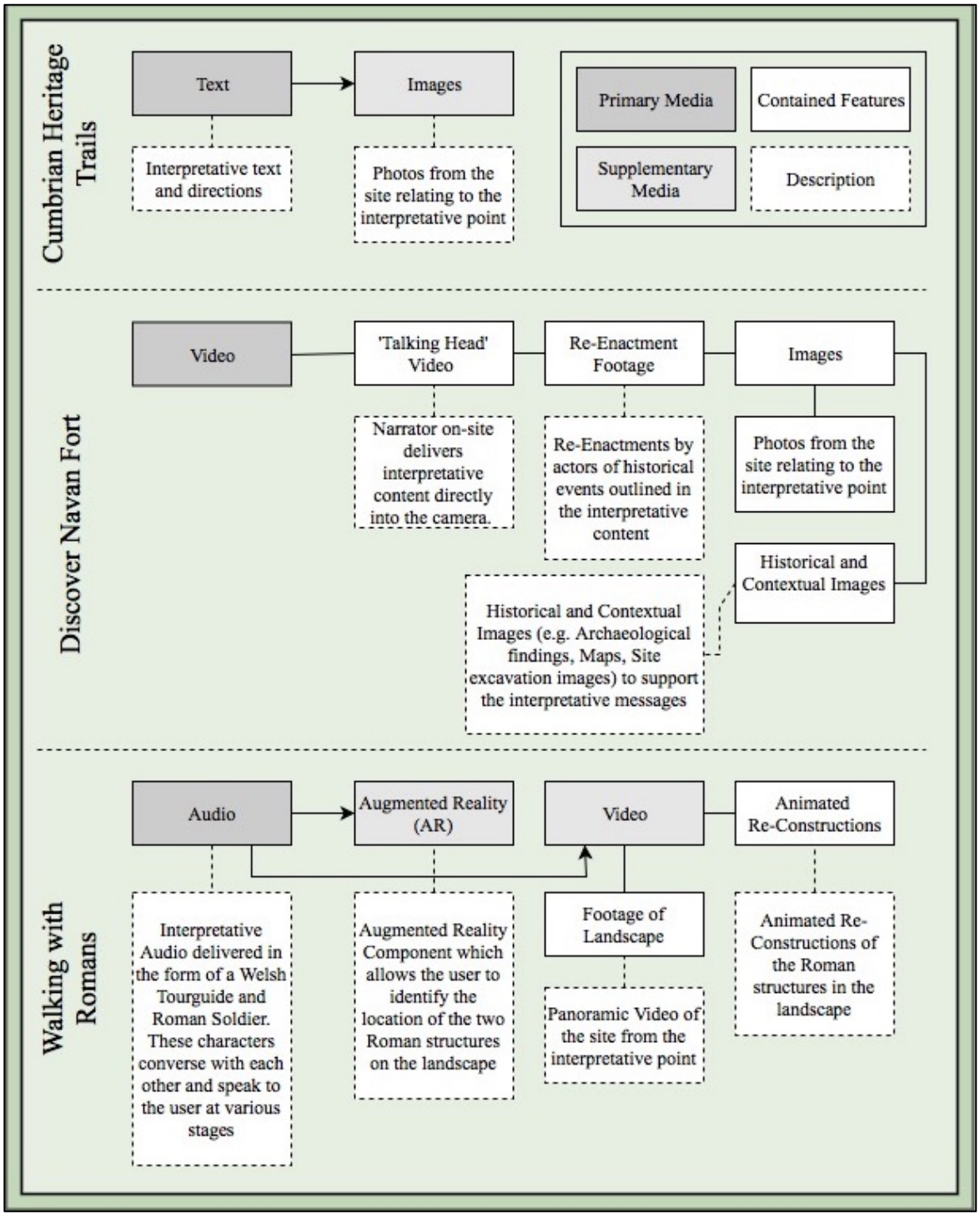


Figure 5.3 Schematic of the media incorporated in the MDIs used during the in-situ investigations

unanticipated constructs (Dindler and Iverson, 2009), supporting the meaning-making process and not simply a production-consumption model.

In the interplay between the user and the device, and how engagement is fostered in this relationship the multimedia approaches contained within the respective MDIs are a factor for consideration. All the MDIs used in the in-situ investigations had one leading medium which was the principal method for conveying the interpretative messages (Figure 5.3). For example, *Walking with Romans* in the Brecon Beacons National Park used audio as the primary media but was supported through video and Augmented Reality (AR) elements. *Cumbrian Heritage Trails*, covering a range of heritage trails in the Cumbria region, adopted text as the main medium supported through visual images. *Discover Navan Fort* in County Armagh (NI) used video as the leading media on the smartphone MDI. These varying media provide the opportunity to analyse the engagement through different media in the smartphone-based MDIs for outdoor cultural heritage.

Addressing the choice of media within the smartphone MDIs, attentiveness towards the digital interpretation by the participant was a factor which emerged consistently across all in-situ investigation sites. It is an aspect that echoes media multitasking, interpreted by Zhang and Zhang (2012) as the meeting of a medium with other media and non-media, akin to what Galani *et al.* (2013) regarded as hybrid digital ecologies. In the case of smartphone-based MDIs in heritage landscapes, it is concerned with how individuals respond to multiple sources of information, and where the smartphone MDI is positioned in relation to these various sources.

At Navan Fort with *Discover Navan Fort* attentiveness to the video playing decreased as the experience went along. This was discussed and acknowledged by participants explicitly but also evident through behavioural cues that became apparent through analysis of the action camera footage collected (Figure 5.4). Earlier in the experience, participants stood and watched the entirety of the interpretative video. However, as the experience progressed participants were more likely to begin walking while the video was still playing. The pattern of behaviour described can be attributed to several factors. To begin with, other aspects, such as the landscape, can be deemed of greater significance by the individual than the content being provided by the MDI. While individuals can process several sources of information at the same time, endogenous attention indicates that the mind of the individual can govern the

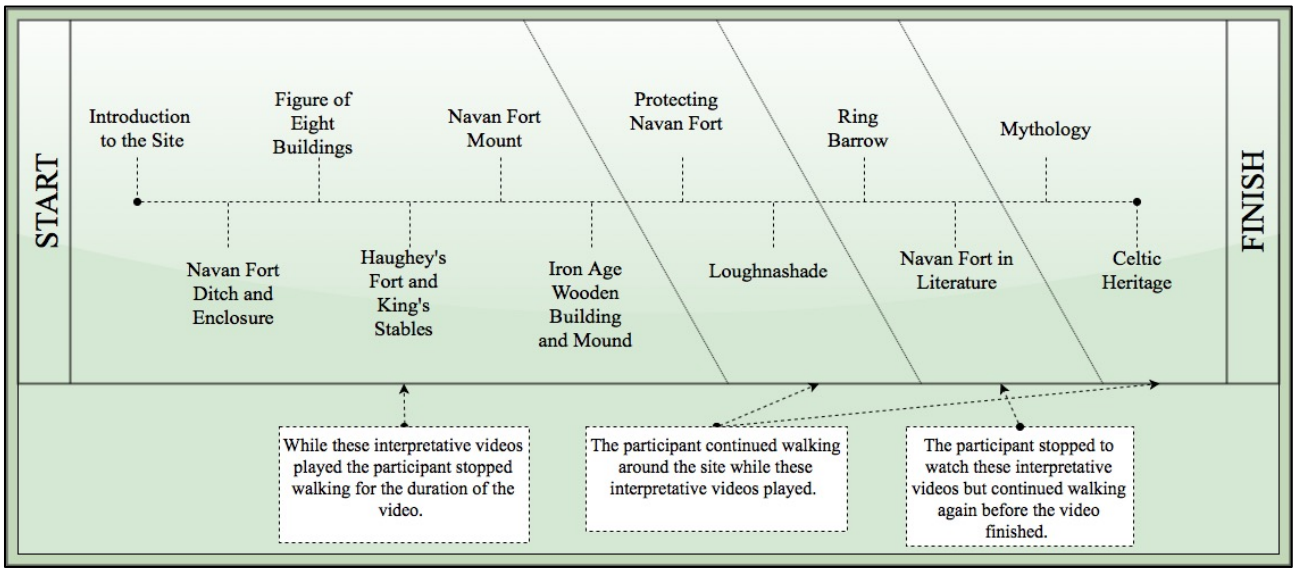


Figure 5.4 Change in walking behaviours by DNFP1 in relation to the interpretative videos viewed on site.

allocation of attention and respond to the stimuli it chooses (Aagaard, 2015). Therefore, in certain cases, as the experience progressed the stimuli of factors, such as physical features in the landscape, were greater than the stimuli being presented by the MDI.

It may not necessarily be the case that the physical landscape offered greater stimuli in comparison to the MDI. It could instead be a reflection on the individual's response to the interpretative messages triggering a lack of stimulation. The next chapter addresses the role of interpretative messages in this context specifically (Chapter 6) and this is an aspect which can explain the responses to the MDI observed. An example of these behavioural responses is presented in Figure 5.5. The image at the top shows the participant at the early stages of the experience, holding the smartphone with two hands, cupped on each side in a manner akin to how one would might carry a precious or delicate object. This is in stark contrast to the second image which shows the same participant during the latter stages of the experience. The cupped hands have been replaced by a sole hand holding the device somewhat precariously, supported by a finger on each side.

Figure 5.5 Participant holding the smartphone at Navan Fort. (Top: The participant holds the device with both hands at the beginning of the experience. Bottom: The participant, in the latter stages of the experience, holds the device with one hand)

In relation to understanding attentiveness and the behavioural responses of participants is the specific media employed in Discover Navan Fort. As noted, later in the visit, participants would begin walking again whilst the interpretative point video was playing despite stopping and watching the full video earlier in the experience. The interpretative point was delivered in the form of a video that could not be skipped once it started. Therefore, although the participant began walking again before the video ended, and was not looking at the device screen, they were still receiving the entire audio but not necessarily the accompanying visuals from the video. This reflects also how individuals operate the smartphone MDI so that it meets their desires and expectations for the experience, that is the capacity to receive the interpretative information whilst still walking and looking around the landscape. These aspects show how equating the 'mobile' smartphone device as an automatic form of

engagement can have subsequent influences on the heritage interpretative experience of the user. To explore this further, the following section (Section 5.2) will explicitly address the user and their perceptions and framing of the Smartphone MDI.

5.2 User perception and framing of the Smartphone MDI experience

While stakeholders can aim to accommodate the user as much as possible (Section 5.1) there also needs to be a form of 'buy-in' or investment from the individual into the interpretative MDI experience. As Farman (2013:127) stated, "just as place that is interacted with becomes a lived space, so a database that is interacted with becomes a lived narrative." This sentiment emerged in various forms through the lived experiences of participants and highlighted various components which can constrain the users' investment in the MDI experience. A prominent aspect of the impact of the smartphone-based MDI for outdoor cultural heritage sites is not necessarily the functionality or media adoption but how this functionality and media is interpreted by the visitor at the site. This section focuses on this aspect and frames the discussion which follows.

The visitor's personal smartphone acts as a link between the everyday and the heritage visit, and the ways in which it is used in this context varies dramatically across users. The overlaps between the heritage space and the everyday space that the user operates their device in is an important aspect to interrogate further. The prior experiences of the individual with other forms of mobile interpretation in this context, for example, help shape what the individual understands as the smartphone MDI experience. Additionally, everyday device usage may be presented as a challenge for the MDI experience; as actions, responses and behaviours within the device may not be consistent across both spaces (i.e. the everyday and heritage spaces). This relates to the internal tension that exists for individuals in this clash between the use of the technology and nature/leisure activities.

Individuals in the research recognised the difference between how they used their device during the heritage experience and their everyday usage of the device. As a result, the current considerations of smartphone MDIs, discussed by participants, as a heritage interpretation medium drew closer parallels to existing forms of heritage interpretation than the social or everyday applications within their devices. It suggests that, although the user is using their

own device in the experience, when used in the context of a heritage environment for a heritage experience, it is re-framed by the user as an interpretative medium.

The following discussion between a pair of participants (DNFP6 and DNFP7) at Navan Fort, who undertook the experience together, reflects the consensus across all the in-situ investigation sites that the smartphone is re-framed by its context. It typifies this re-framing of the device and tendency to align the smartphone MDI with previous MDI heritage experience. When asked how often they (DNFP6 and DNFP7) used their phones and what applications or functions were used most DNFP6 and DNFP7 responded:

> DNFP6: Constantly! Mainly messaging and contacting people. I use it for work a lot as well.
>
> DNFP7: Yes, too much at times. For me it is Facebook, BBC News and just the actual phone function I suppose.

Later in the post-experience interview, when discussing previous experience with applications in this context, both these participants stated they had never checked to see if an application was available for a heritage site they were visiting. After this DNFP6 and DNFP7 stated previous experiences with interpretations:

> DNFP6: I've never used an app [for a heritage site] before, but I have used the tape guides with headphones.
>
> DNFP7: I hadn't used an app for anything like that before either but again I have used the tape thing. I think it can work quite well. I've used it when we visited the Reichstag in Germany. It was very informative and quite accurate. That was because you were walking at your own pace, I guess.

From the first exchange, the participants outline their key functions within their smartphone devices. One indicates (DNFP6) it is used mainly for work and contacting people (via text messaging). The other participant (DNFP7), also references the communication aspect mentioning: social media (Facebook®), a news source (BBC News®) and basic call-making capabilities. Apart from the news source, none of the functions the participants outline though

are features which are prominent or key to the functioning of smartphone-based Heritage MDIs. Call, text or social media capability is not a significant component of the applications used in the study. In the *Discover Navan Fort* application used by the participants (DNFP6 and DNFP7) there is no social-media component. In contrast, *Walking with Romans* (Figure 5.6) shows the common extent of social media integration into smartphone-based Heritage MDIs, containing links to external social media platforms.

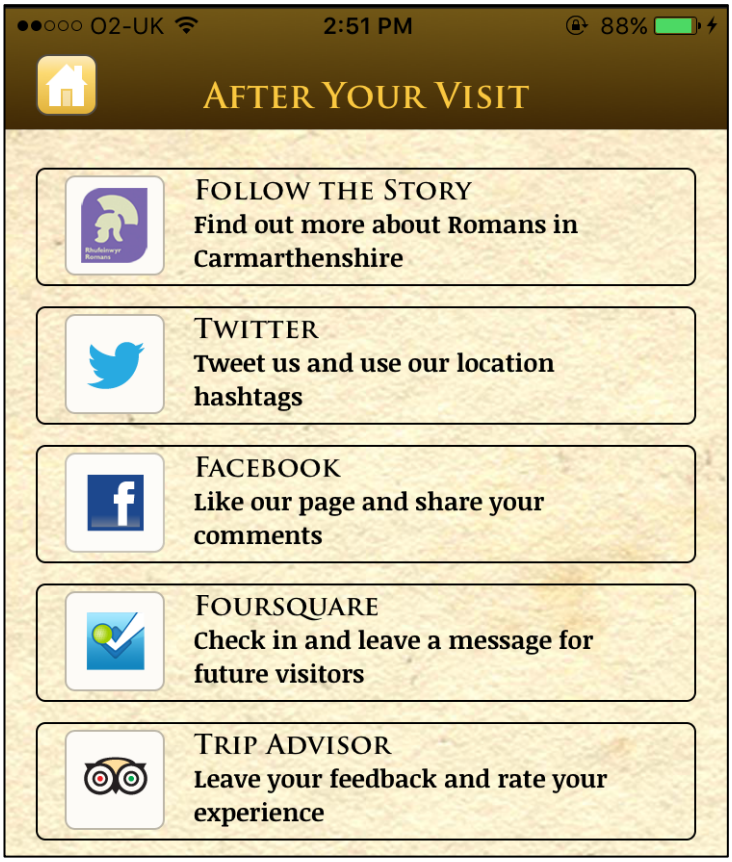


Figure 5.6 Social Media options incorporated into the 'After you Visit' section of the 'Walking with Romans' Application

As the experience of DNFP6 and DNFP7 shows, there is a disconnect between the common everyday functions the individual uses on their device and the functions of the smartphone heritage MDI. DNFP6 and DNFP7 based their understanding of smartphone MDIs on forms of heritage interpretation they had encountered in the past (for example, 'tape-guide with headphones', DNFP7). This reflects an understanding on the part of the participant that the smartphone application they used was a legitimate form of heritage interpretation (See section 5.3). Participants recognised the different context of the smartphone applications devised as heritage MDI experiences (such as the *Walking with Romans*, *Cumbrian Heritage Trails* and

Discover Navan Fort applications) and the applications they use on their smartphones on a daily basis.

The finding that participants recognise the smartphone MDI as a specific heritage experience and not another standard smartphone application also raises the impact of the Bring-Your-Own-Device approach (BYOD) (Figure 5.7). BYOD (also referred to as Bring-Your-Own-Technology (BYOT) and Bring-Your-Own-Phone (BYOP)) has been embraced by the tourism industry and cultural organisations adopting mobile interpretations. BYOD is noted as one of the innovative technologies that has revolutionised the hospitality and tourism industries (Biligihan and Nejad, 2015). This conclusion was reached through the understanding of innovation modes by Sorescu *et al.* (2011) who argued that, amongst other components, BYOD created more value for customers. The device has the technological capacity, while also being familiar and personal to the user. Therefore, BYOD mitigates unfamiliarity issues and the need to learn a new piece of technology to benefit from the experience.

BYOD has been framed as a method for enhanced engagement as a result of the familiarity and the personal aspect (Shim *et al.*, 2013) but this influence may have been overstated. While BYOD might blur the line between the social and heritage contexts of using their device, it may not be necessary to do so at all times. As the example of DNFP6 and DNFP7 with *Discover Navan Fort* showed, the benchmark or point-of-reference in relation to the smartphone MDIs was the audio-guide and not applications outside of the heritage context. Therefore, whilst BYOD has advantages such as technical capacity and audience availability, as an approach to enhance engagement its influence must be questioned; particularly in relation to the tension between adopting technology and the undertaking of a leisure or nature activity.

Figure 5.7 Participants using their own Smartphone devices during the In-Situ Investigations. Top: Discover Navan Fort Application; Middle: Walking with Romans Application; Bottom: Cumbrian Heritage Trails Application.

This tension is not a contemporary one but predates the advent of the smartphone (see Shultis, 2002; Volti, 1995; and Hill and McLean, 1999). Cuthbertson *et al.* (2004) and Wattchow (2001) for example, hypothesised that technologically mediated nature risked destroying meaningful engagement and the very essence of the natural experience. The nature of the sites being researched (that is, outdoor, rural, cultural heritage), as illustrated in Figure 5.8, increased the juxtaposition between the technology and the natural environment. These sites' lack of physical features, particularly urban or explicitly people-made and the perceived 'naturalness' of them contrasts with the daily spaces in which many of the participants work

Figure 5.8 The rural locations used in the study. Top: The path on the Alcock Tarn Loop, following a period of snowfall with raindrops on the Go-Pro camera with Participant 7 (Cumbrian Heritage Trails Application); Middle: The large enclosure of Navan Fort (Discover Navan Fort Application); Bottom: Participant using their device for the 'Walking with Romans' application in the Brecon Beacons National Park.

and live in. The preconceived image of the environment (a 'destination image', del Bosque and San Martín (2008)) informs certain expectations of the experience in advance. These conceptualisations of the destination image, and the activity the user anticipates undertaking, are important as these acts are significant factors in the individual's overall satisfaction regarding the experience (Sherif and Hovland, 1961). Participants across the three in-situ investigation sites acknowledged this tension between the adoption of the smartphone MDI and the nature/leisure activity, for example:

> DNFP4: Well I would say, I started to go out to Navan Fort a few years ago just to walk around it… I mean if I had a bad day at work, I would go out there and dander

> [walk] around it to clear my head, and it always seems to work. If I went out to just clear my head, I wouldn't bother with the app at all.
>
> CHTP7: I am one of these people who would prefer to be out by myself. The whole point of going for a walk is to get away from that stuff.
>
> WWRP8: It [the smartphone] does distract from the experience. I find, sometimes, it is just nice to put your phone away or just leave it at home. To not get text messages when you are out on a walk, not get phone calls. Just turn-off and you know, I quite consciously leave my phone behind when I'm walking.

This tension was common amongst participants across all the in-situ investigation sites, despite participants also stating their close relationships and usage behaviour with their personal smartphone devices. The association of physically walking on-site aligned to the users' perception of the 'experience' more so than their use of a smartphone (Section 7.1). The use of the term 'that stuff' by the participant (CHTP7) using the *Cumbrian Heritage Trail* application is an interesting and revealing example. In the context of the conversation 'that stuff' encapsulated everyday activity, including the use of the smartphone. The adoption of a smartphone for the experience is presented in this instance as a tethering object that maintained the link between the heritage experience and everyday life for the users. This tethering between the two worlds (the heritage experience and the everyday), although presented as a positive attribute of BYOD, conflicts with understandings of leisure activity and tourism behaviour in natural settings.

Leisure activity, as defined by Mannell and Iso-Ahola (1987), is formed on two inseparable motivational forces, seeking and escaping. In the context of this study, the participants viewed the experience of walking around the outdoor cultural heritage landscape as seeking recovery from everyday activities (Sluiter *et al.*, 1999) and equally a form of escapism. As WWRP8 claimed, "just turn-off and you know, I quite consciously leave my phone behind when I'm walking". This sentiment emphasises the role of new locations or behaviours (i.e. walking) as a motivating factor for individuals. This supported research by Thayer *et al*. (1994) and Gulwadi (2006), who explicitly acknowledged the role of 'natural' settings. While this study was concerned with the role of the smartphone MDI in place attachment to the heritage

landscape, paradoxically, the influence of the smartphone in preventing detachment (Meijman and Mullder, 1998) from the everyday space the individual occupies appears just as impactful in this case.

Although there are instances where the smartphone does not react in the desired manner or meet the expectations of users, this did not interfere with the user's connection with the landscape. The relationship between the user and the landscape was maintained in spite of the pressures the device may have placed upon it. Individuals responded positively to the environments and acknowledged a sense of value in these locations (the three in-situ investigation sites). The interactions of DNFP4 with the device at Navan Fort, who was accompanied by DNFP3, highlight this (Figure 5.9). The general functionality of the device that the user is familiar with is not met initially. The participant is witnessed trying to complete gestures, such as tap (Figure 5.9A & C) or pinch and zoom (Figure 5.9B), features that are not incorporated into the functionality of the MDI. The participant being familiar with

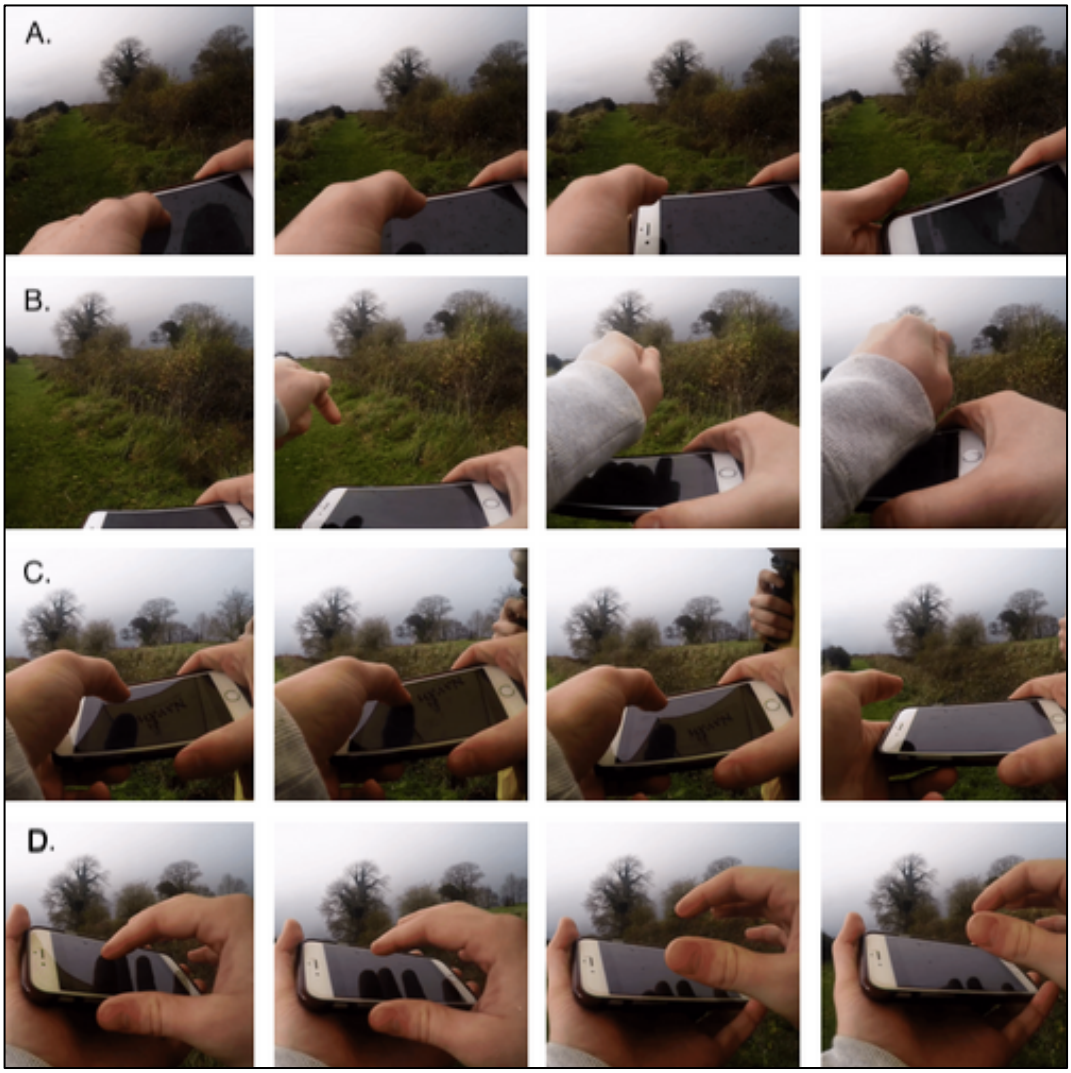


Figure 5.9 Participants interactions with the Discover Navan Fort MDI (collected from participant DNFP4 Go-Pro footage)

the operational system of the device then wipes the screen (Figure 5.9C) under the impression that the justification for the lack of feedback from the MDI was due to moisture on the screen and not the functionality of the MDI (due to the geo-triggered nature of the MDI).

Over the course of the experience the user adapts to the functionality of the MDI, so the initial difficulty is overcome. It doesn't inhibit the overall connection to the landscape, as reflected in DNFP4's comments in the post-experience interview:

> DNFP3: I think the layout of it, it looks like a sacred place, if that makes sense.
>
> DNFP4: It's not like walking into a normal field there is something about that whenever you are walking up towards, you see the mound in front of you, it looks impressive.
>
> DNFP3: Even if you are driving along the road and you see Navan fort alongside you can tell.

The participants' everyday device usage became a challenge in relation to the MDI experience when there was a clash between the functionality of the MDI, and the common functionality to which the user was accustomed. Despite this challenge, any lasting impact on the relationship to the site appeared minimal, the participant still spoke highly of the site in post-experience discussions (see above). This was consistent across all the in-situ investigation sites, despite technical or functional issues during the course of the experience, the participants still responded positively about the landscape. Additionally, there was no significant variation in positive responses to the landscape between those who struggled more with the MDI and those who did not.

> WWRP6: I'm quite familiar with using apps on iPhones and it follows the patterns of other ones. I guess if you were my mother you might be struggling a bit more. There is a help thing on there as well, I think.

This reflects the issue of contextualising the heritage MDI experience. A distinction is made between the aspects of the environment and the use of the smartphone. The variation in

responses to questions surrounding future use of smartphone MDIs and questions relating to the site support this claim.

5.3 Legitimising Smartphone MDIs as an Interpretative Approach

A closely related element to the perceptions and assumptions associated with smartphone MDIs and engagement (Sections 5.1 and 5.2), is whether smartphone MDIs are viewed as a legitimate medium of heritage interpretation. The question being raised is primarily that, by adopting the smartphone as the interpretative medium are heritage agencies conceptualising MDIs, not as a medium for heritage interpretation, but rather as a method for reaching or connecting to visitors? This is significant as it places the device outside of the heritage interpretation sphere and instead situates it in a technological, software space.

Cumbrian Heritage Trails, for example, was developed as part of the much larger Treasures of Cumbria project, which included a consortium of museums and cultural organisations within Cumbria. In relation to the use of media and the process behind the development of the MDI, the curator for one the partners (Wordsworth Trust), Jeff Cowton, stated:

> We got instructions of what we were to do - to go out and do a series of narratives with pictures and directions - which is just what you expect it to be and somehow these mysteriously ended up in this app. (Cowton 2016, pers. comm., 28th Apr.)

This scenario is representative of many MDIs developed in the heritage sector. The MDI was developed as an additional add-on to the much larger Treasures of Cumbria project which gives an indication of the regard for the smartphone MDI as an interpretative medium. As Cowton (2016, pers. comm., 28th Apr.) stated, 'we got instructions of what we were to do', which indicated this MDI was developed within a framework or structure based on predefined technology-led decisions. There is a disconnect between the interpretative content and the delivery through the MDI, with the interpretation being developed within a one-size-fits-all approach. This process does not reflect heritage interpretative planning and suggests that the smartphone MDI was not regarded by stakeholders as a legitimate or serious method of heritage interpretation but simply as an add-on to the much larger project.

Furthermore, the technical development process also called attention to perceptions of the smartphone-based MDI as a form of heritage interpretation. The *Cumbrian Heritage Trails* application, is the only one not to incorporate audio or video into the MDI, however, the initial project specification outlines ambitions to do so:

> Tour content is harvested from the main site map, and includes text, images and video. (Cumbrian Museum Consortium, 2013:8)

The company responsible for developing *Cumbrian Heritage Trails*, Surface Impression Ltd., also outlined their plans to achieve this:

> The app will synchronise with the data you hold on your web server and repackage it for the activity. To achieve this we will build, or help your developer build, up to three connector scripts…Images, video and audio will be brought into the phone without mediation through scripts, but this will happen at installation/launch rather than en-route so people do not get stuck when in areas of poor connectivity. (Surface Impression Ltd, 2013:2)

This did not transpire as the final application does not reflect these ambitions (Figure 5.10). The intention of the stakeholders in this instance was not to develop a solely text-led

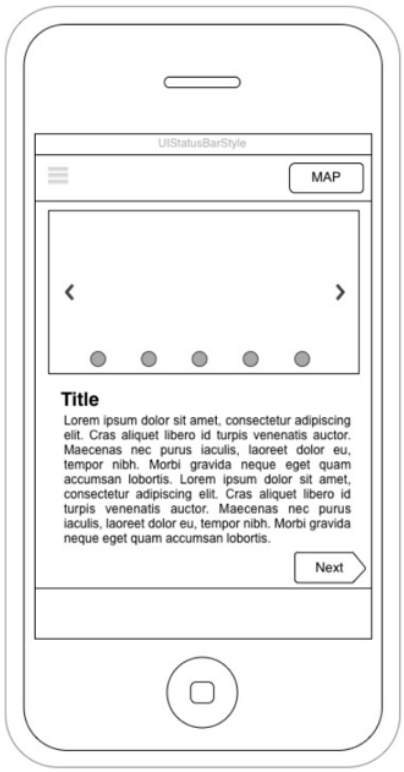


Figure 5.10 Wireframe for the Cumbrian Heritage Trails Application (Credit: Surface Impression Ltd.)

application but to have multi-media and features like those of the other two in-situ investigation sites (*Walking with Romans* and *Discover Navan Fort*). The key issue is not the variation of the MDI from initial conception to delivery, but the reasons behind this variation. The gap between the scaled back version that was released for the public, and the initial multimedia rich conceptualisation, highlights the influence of technical and commercial development on the development of the interpretations. The delivery of the interpretative content was shaped by the limitations associated with the development of the MDI, which gives an indication toward the dominant aspect in the relationship between the content and the device.

The legitimising of smartphone-based MDIs is also supported through the approach adopted in the development of *Walking with Romans*. In contrast to the *Cumbrian Heritage Trails* MDI, the focus to the application was not the technological capacity of the device but prioritised the interpretative messages. The sentiment is reflected in the following statement:

> Unique amongst interpretative applications and although it does not use the most cutting edge of techniques, it brings together different interpretative media and integrates all the elements required for an enjoyable visitor experience. (Jones, 2015:1)

The approach of 'not using the most cutting edge of techniques' was regarded as a positive element by participants, reflecting the conceptualisation of smartphone MDIs in this specific example. Applying techniques and features merely because the potential exists within the technology to do so was, therefore, considered as a negative approach, overshadowing initial intentions and disrupting effective visitor experiences. This approach shows a maturity in the thinking around MDIs, progressing from the initial exponential adoption of MDIs in the heritage sector as a result of societal trends (Chapter 2), to thinking more critically about the medium and the interpretative planning process in this context.

Insights from participants during the experiences with *Walking with Romans* application reflected this:

> WWRP5: The odd animated bit to show you what it looked like when it was there because when it was described what I had in my head wasn't what the picture was like at all

> WWRP7: So, I think that and seeing the visualisations in-situ are what make it really good. And the authenticity as well.

The adoption of multimedia, such as the combined use of audio and video at applicable stages throughout the experience were advantageous in portraying cultural heritage not clearly visible in the landscape. It highlights that when used in specific instances, each form of media, can be a beneficial component of the heritage MDI experience. There was a clear tension at play between participants preconceived ideas surrounding using the smartphone MDI and the predominantly rural landscape with limited features. However, the strategic deployment of video reconstruction elements at various sections of the MDI experience were acknowledged as a positive inclusion by participants, despite an overall preference for audio media (Figure 5.11). The use of media plays an important part in how the interpretation is perceived.

The successful integration of the media into place was an important factor in the heritage experience for participants and how the MDI was perceived as an interpretative medium. Individuals draw together the elements which make up place and the heritage experience, defined by Stewart (1996) as 'livedness of place', therefore the additional adoption of a specific media will subsequently influence this process. The perceived legitimacy of the interpretation is dependent on how effectively it integrates into place. At the two in-situ investigation sites that used text (*Cumbrian Heritage Trails*) and video (*Discover Navan Fort*) as the primary driver of interpretative messages, for example there was a preference by participants for audio content instead of the primary media adopted (DNFP1, DNFP2, DNFP3, DNFP5, DNFP6, DNFP7, CHTP1, CHTP3, CHTP4, CHTP7 & CHTP8).

Using the video led *Discover Navan Fort*, for example, participants noted:

> DNFP1: Sometimes the visual video went on a little long. I wanted to really look back at the map to see, so I could walk and listen to it sometimes rather than stand and watch.

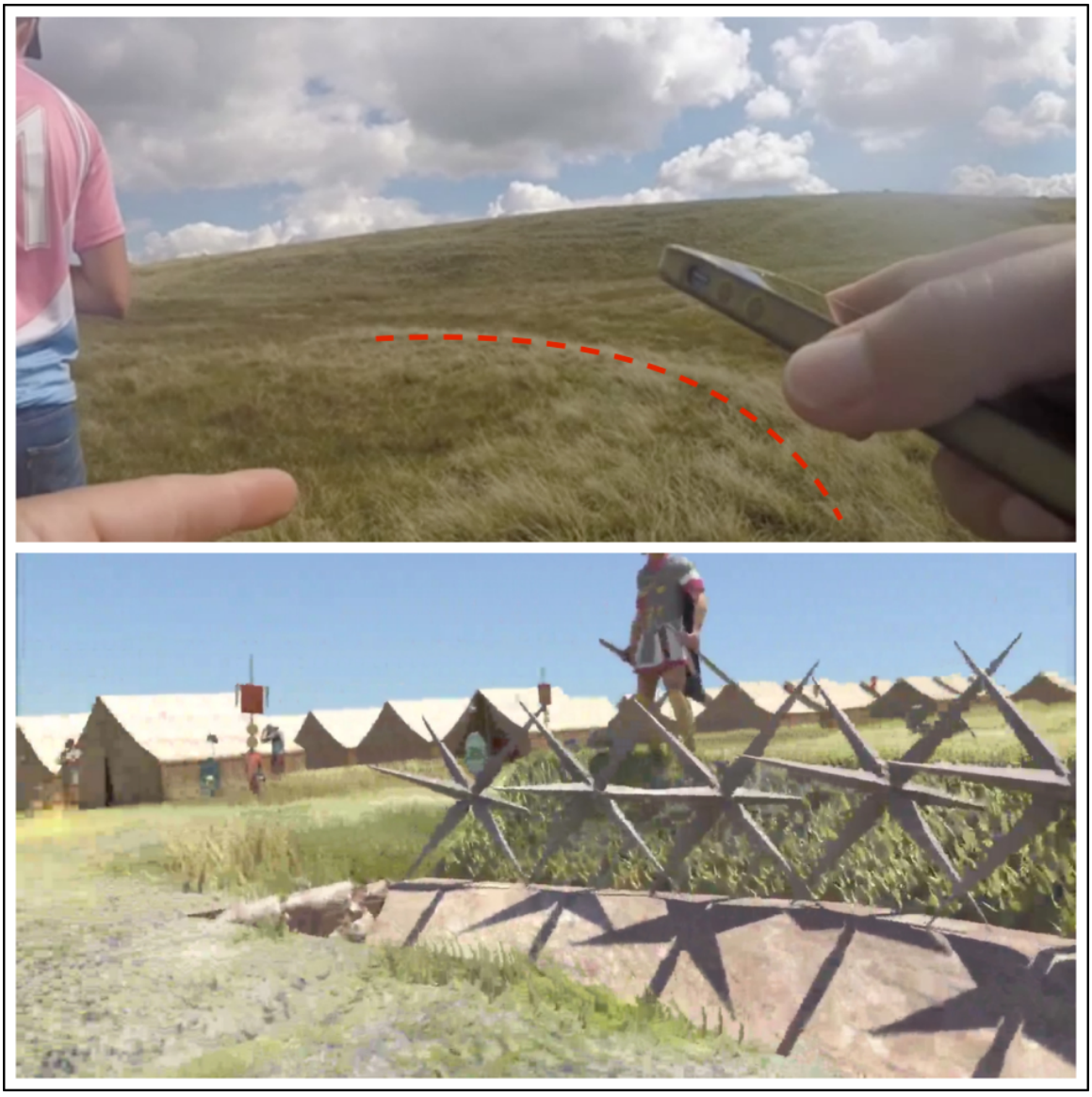


Figure 5.11 Video Reconstruction in Walking with Romans.
Top: Image taken participant go-pro camera footage, the location of the Clavicula feature is noted in the foreground with a dashed red line. Bottom: The accompanying video reconstruction depicting how the Clavicula would have looked in that location during occupation of the camp.

> DNFP2: I would like to jump between the guidance, the film, the map and still be able to hear the audio. I'd like the audio to continue running if I wanted to go back to the map and have a look.

Cumbrian Heritage Trails which was primarily text-based, a participant stated:

> CHTP7: I don't know, I don't think I would prefer video but audio I would be quite up for - like doing an audio, listening as we are walking around - yeah, I think that would

> be quite interesting because you are not then - like you can still experience the landscape…So yeah for an outdoors one definitely audio over video.

It is important to state that audio was also regarded as the most preferable approach by participants using the audio-led *Walking with Romans* (WWRP1, WWRP2, WWRP4, WWRP5, WWRP7, WWRP8). This indicates that the preference for audio in the *Discover Navan Fort* and *Cumbrian Heritage Trails* MDIs respectively is not necessarily a response to something other than the video or text media presented in those MDI, but a general opinion that audio is the most applicable method.

Responses around the use of the audio in the *Walking with Romans* MDI for example included:

> WWRP2: You are walking and just absorbing it.

> WWRP4: I like how it gives you the points so it doesn't interrupt you too much and you can just listen to it as you go. The pinpoints are well spaced as well so they are like natural breaks.

> WWRP5: I enjoy it [the audio content], in fact I think I'd like a little bit more.

The overall conclusion that audio was the most suitable media for adoption in smartphone-based MDIs in outdoor cultural heritage sites arises from a sense that audio integrated best into place. This was revealed in-situ and confirmed in the responses from the participants (stated previously). The experience with the application and the experience of the place were viewed as separate entities, which demonstrates the premise of legitimacy in relation to smartphone MDIs. This is clearly demonstrated by CHTP7's comment, 'you can still experience the landscape', when remarking a benefit of audio over the text-based *Cumbrian Heritage Trails* application. The comments by the participants with the audio-based *Walking with Romans* also reiterated the effectiveness of the media integration into place. WWRP2, for example, noted that 'you are just walking and absorbing it'. The text and video-based approaches (*Cumbrian Heritage Trails* and *Discover Navan Fort*), however, provided less cohesion between the physical landscape and the smartphone MDI. Although the video and

text media provided interpretative messages to assist users in interpreting the landscape, the use of this media failed to integrate into the in-situ experience to the same extent as the audio.

The time spent consciously focusing on the different forms of media was viewed as a distraction from the on-going experience they were simultaneously accessing. Users valued the interpretative messages they received (CHTP1, CHTP2, CHTP4, CHTP6, CHTP7, CHTP8, DNFP1, DNFP2, DNFP3, DNFP6 and DNFP7) but the media chosen (video and text) was seen as distracting from the in-situ experience. The use of audio however did not avert the view of the individual and allowed for greater flexibility, enhancing, rather than distracting from the heritage process. The response to the MDI as a legitimate method of interpretation became apparent in the actions and behaviours of the individuals in response to the medium. The integration of the media (video, audio and text) and the medium (smartphone) into place, is vital as place constitutes, not only the material, but also the intangible elements associated with the location (Chapter 3). Wilken (2005) noted that actions and interactions in landscapes are crucial to our negotiation and experience of place. The expressions of the landscape and the appositeness of media included an element of action, the flexibility in being able to 'walk and listen' as opposed to 'stand and listen'. This finding challenges the narrow classification of audio-guides as 'non-personal' interpretative media (Moscardo *et al.,* 2007). Although the classification relates to the assistance of 'a human to help the tourist at a cultural heritage site' (Pendit and Zaibon, 2013:347) defining audio-guides as 'non-personal' omits the embodied personal experience of the individual which can be assisted through the audio, as was the case in this study and others, such as Galani *et al.* (2013). This disconnect between the embodied personal experience and the adopted medium, reflect the issue of legitimacy of the smartphone and associated media within the experience.

As the audio media appeared to intrude less into the heritage experience, participants appeared less critical of this content, the medium and the media. Margailt (2015a) noted similarly that audio was preferable as it relaxes demands on the users' visual attention, while video causes the individual to 'unconsciously let go [of] our perception of absolute control over our environment' (Margailt, 2015b). The audio content assimilated with the space the user occupied, while the video and text content drew attention to a specific point, in this instance the smartphone screen. In doing so, the content and the media came under greater scrutiny by visitors as it demanded greater attention from them. It called attention to itself in a manner that the audio did not. In this scenario, the audio was presented as more location

sensitive and assimilated better with the overall experience. In comparison, for example, a participant (DNFP5) at *Discover Navan Fort* noted that with the utilisation of video media, "it's just you could be standing in any direction facing anything, so I don't see how it links together."

Whilst the audio integrated into place better there were limitations. The audio of the *Walking with Romans* used locative language, directing the view of the user to various points on the landscape. At the entrance to the Y Pigwn Roman fort the audio in Walking with Romans states:

> The camp is situated, as you can see, in a nice and secluded area…just in front of you, just beyond the opening you will notice there is evidence of a curved piece of rampart with the palisades in front of it…the camp also has excellent security. Notice the row of Romans standing guard.

Due to the aural nature of this there is the potential for significant disparity between the image conjured in the mind of the individual by the audio, and the space the user is occupying. The inclusion of a video reconstruction (Figure 5.11) in this instance by enabling the user to make a connection between the place that is and, importantly in the heritage experience, the place that was. This helped visitors achieve their goals relating to knowledge acquisition associated with the historic landscape (Section 6.2).

In discussing the premise of the smartphone MDI as a legitimate means of interpretation, it is important to also acknowledge that users who expressed existing knowledge or familiarity with the site found it difficult to let the MDI guide the experience. This was evident across the three in-situ investigation sites. While it is not surprising that individuals who had no prior experience of the site appeared to follow the MDI more closely than their experienced peers, it had implications for the subsequent experiences of individuals.

To illustrate this, individuals who had prior experience on the site had to re-contextualise their experience of the site, factoring in the inclusion of the MDI in this instance. This framed the users experience of the smartphone in a certain light, in the same manner that audio and text content resulted in greater scrutiny. In this instance the smartphone was the unfamiliar component in the experience, as the user already had experience with the landscape. The MDI

therefore occupied a space in the interplay between the device, landscape and user where it had to almost justify its inclusion in the experience. CHTP1, for example, was 'very familiar' with the trail but this was their first time to include the *Cumbrian Heritage Trails* application into their visit. At a point in the experience CHTP1 encounters a fork in the path (Figure 5.12). One trail is incorporated into the MDI (Figure 5.12B), while the other trail (Figure 5.12C) is the one CHTP1 normally takes. After consulting with the application (Figure 5.12A) the user decided to take the route they are familiar with, intentionally going against the advised MDI route and consequently missing an interpretative point as a result.

Figure 5.12 Decision making by CHTP1 using Cumbrian Heritage Trails

CHTP1 explained their decision-making process behind this decision immediately afterwards:

> I mean usually I'd go up here [their usual trail] but it is not necessarily saying that way I don't think. It doesn't matter too much about that kind of thing. Yeah it does say I am going off the path, but I suppose I need to hit these markers?

The user in this instance was challenged by the initial inclusion of the MDI to the experience. In re-contextualising the experience now with the adopted MDI, CHTP1 still decided to continue with their familiar route instead of the trail marked out within the application. Due to their previous knowledge and experience of the site the user had to negotiate between their known route and the potential return by taking the alternative route suggested by the application. CHTP1 self-identified that they had enough knowledge relating to the site to not follow all the behavioural prompts provided by the MDI.

The level of knowledge relating to the site and how this influences users' self-identification within the MDI experience also impacts on the interpretative content. This relates to the inter-play between the individual and the smartphone as an interpretative medium. Individuals who profess a familiarity with the site or the theme of the interpretative content position themselves differently in the MDI experience to those who acknowledge no prior knowledge or experience.

Most notably, those who had knowledge of the site and/or theme positioned themselves as an interrogator of the MDI and more specifically the interpretative content. It is a variation in the interpretation of the MDI within the heritage experience, based on previous experience and knowledge. When the interpretative content did not reinforce the existing narrative held by the individual, the user challenged the accuracy and reliability of the content in a manner that was not existent in the responses of first-time visitors. DNFP8 is one such example who responded to an element of the *Discover Navan Fort* interpretative content stating that "an awful lot of the content is speculation about what things would have been like 2000 years ago". This highlights the inter-relationship between the user, the landscape and the device. It appears from this research that if the interpretative content on the device does not align to the existing connection between the user's self-identity and the landscape, instead of this being a moment of introspection for the individual it results in the user questioning the validity of the content.

WWRP3 similarly noted in response to the *Walking with Roman*s interpretative content relating to the success of the Roman invasion:

> Well I mean they say the Welsh warriors kept the Romans from going any further inwards. I understand that Cardigan and some of Pembrokeshire and north Wales was not really - the Romans didn't make inroads in those areas. According to Castles History- which is a beautiful old twenty volume history book I've got- it says in that the Romans, who wrote the history of course, said they were fearsome. Fearsome warriors, and they couldn't make inroads into it.

This statement shows the role of self-identification within the narrative, incorporating also perceived knowledge of the site and response to the interpretative content within the MDI.

WWRP3, who identified as Welsh and lives locally, referenced an alternative source that aligns more with their identity and connection to the site. A sense of pride accompanied WWRP3 as they recounted the 'fearsome' 'Welsh warriors' who fought against the Romans; the Roman occupation of the site being the main theme in the Walking with Romans. Although they did not dismiss the Roman narrative presented in the MDI, they did not regard this theme as part of their own heritage or identity. Despite acknowledging a strong fondness for the landscape at various points in the experience, the Roman occupation of the same space did not resonate with WWRP3 and the interpretative content did not change this perception for the individual.

A distance between the interpretative content and the user was established from the beginning when the individual did not identify with the theme presented through the MDI and this was not resolved over the course of the experience. Relatedly, WWRP4 accompanied WWRP3 on the experience and identified similarly. When asked at the end of the *Walking with Roman*s experience how they would describe the location to someone who had never been they responded:

> WWRP4: It's rugged, really rugged. I'd say it is untamed by man.

This statement was made towards the end of the 90-minute on-site experience, which explicitly addressed the Roman settlements on the landscape, at one stage involved walking along a raised section of earth that is the remains of a rampart. A prominent aspect of the interpretation theme was that these relics (Y Pigwn and Waun Ddu) are still present on the site today, despite being hastily constructed around 70AD (Jones and Mattingly, 2002) (Figure 5.13).

These moments contextualise the role of the smartphone MDI in the experience and how this influences the inter-relationship between the device, landscape and user. Individuals had strongly held views on their identity, the identity of the landscape and the connections between these two aspects. These connections, if not necessarily accurate and subsequently challenged by the interpretative content, were ignored by the user. It highlights how the smartphone MDI is perceived as a legitimate source of heritage interpretation. Although maturity in thinking towards MDIs, such as in *Walking with Romans*, and a transition towards

greater focus on established interpretative planning principles is likely to assist in the legitimising of the smartphone MDI.

Figure 5.13 Outline of the Y Pigwn Roman Camp still visible on the landscape

Conclusion

The understanding of engagement is an influencing factor in all stages of the smartphone MDI experience, from the development and deployment (stakeholder perceptions and approaches) to adoption and consumption (users' conceptualisations and responses). A key message to emerge from this chapter is the impact of conceptualisation of the heritage MDI experience by all involved parties. For example, the chapter highlights the implication of equating the use of mobile technology as engagement, with a focus on the development and implementation of the MDI. This is supported by considering the MDI in relation to the interpretative planning process and considerations surrounding the legitimacy of the smartphone as a form of heritage interpretation.

A case is made for an understanding of engagement as an all-inclusive approach and highlights the pitfalls of technology-led decision making in relation to engagement through smartphone-based MDIs. This is supported through the investigation's in-situ findings relating to the influence of the development and design process on the lived experience of the individual (Section 5.1). Allowing the technological capacity of the device to shape the experience is problematic, particularly given that previous experiences with non-smartphone-based MDIs shape current expectations of the smartphone MDI experience (Section 5.2).

The use of audio was regarded as the most effective medium for the delivery of interpretative messages. It was perceived as less intrusive into the on-site actions and behaviours of the user, plus appeared familiar in the heritage setting due to individuals past interactions with heritage audio interpretations. The MDI is contextualised and made sense of through the relationship between the user and the landscape. Place was an important aspect in how the MDI was perceived and its legitimacy as an interpretative medium was recognised through how successfully it integrated into place. As a participant (CHTP7) using the *Cumbrian Heritage Trails* MDI stated, 'you can still experience the landscape', when discussing the advantage of adopting audio over video as the media in such experiences. Similarly, the role of place also was a factor in the attentiveness of the user towards the MDI over the course of the experience. The issue of user attentiveness also emphasised the perception and engagement with the MDI, the chosen media and the interpretative messages contained within it.

A lot of challenges surrounding engagement in the heritage experience and the use of smartphone MDIs in this context emerge from the conceptualisations of the experience by all relevant bodies (stakeholders and users, producers and consumers) more so than technical capacity of the technology. Individuals reconceptualise their device as a heritage interpretation medium, separating to a degree the use of the device in the everyday context and this heritage context. There are challenges to this scenario however, such as functionality cross-over between the everyday usage and the native smartphone MDI. Similarly, the nature of the heritage experience as a nature and leisure activity generates a tension in using the smartphone. Users acknowledged motivations for the visit as an opportunity to have an experience that separated from everyday actions and activities, however the technology in this instance tethers the two worlds which some individuals found problematic.

These findings rearticulate the requirement for an all-inclusive approach to engagement and how smartphone MDIs align with understandings of engagement. This discussion is continued in the next chapter (Chapter 6) which addresses interpretative objectives in relation to the interpretative content contained within smartphone MDIs.

Chapter Six: Interpretative Objectives and Themes within Outdoor Heritage Smartphone MDIs

Interpretation is communication. As Ham (1992: xviii) stated in relation to interpretion, it is more than having knowledge, it is "knowing about communication and being able to recognise and explain the qualities that make it work best." This chapter will explore this premise, looking at the role of, and approaches to interpretation with smartphone MDIs.

Interpretation plays an important role in the heritage experience (Poria *et al*., 2006), with interpretative content and objectives connecting the individual and the heritage landscape (Graham, 2002). Interpretation assists the visitor in recognising and appreciating the value of the location (Li, 2003). Peter Pavement, Managing Director of Surface Impression Ltd., the company behind *Cumbrian Heritage Trails*, stated in relation to smartphone MDIs:

> It is about interpretation, so if you have the app you have the access to that interpretation and what you are seeing. If you don't, you don't…a key point of museums in a way is to create meaning for things and that is what they do. They interpret that world for the visitors and I guess this interpretation [*Cumbrian Heritage Trails* App] takes that world out onto the landscape. (Pavement 2016, pers. comm., 7th July)

How interpretation is expressed through the smartphone MDI has a significant influence on the heritage experience of the user. While the smartphone by its design is already a communication device, it is reimagined in this instance as an interpretative medium, occupying the vacant role of a human interpreter.

Therefore, through taking three prominent aspects of interpretation as parameters, knowledge acquisition (Section 6.1), behavioural intentions (Section 6.2) and emotional objectives (Section 6.3), the effectiveness and influence of the smartphone MDI in relation to the interpretative experience can be addressed. These three specific aspects are common principles of interpretation which also emerged in the in-situ experiences with the respective MDIs. The three aspects relate closely to learning, behavioural and emotional objectives which are devised to provide a framework for the interpretative process (see HLF, 2012; Silberman, 2006; Beck and Cable, 1998).

Beck and Cable (2002:25) noted that "information from the tangible lays the foundation for bringing in the intangible, revealing the meanings of the site, and addressing one or more universal concepts." It is a sentiment that aligns with Tilden (1957) who stressed the importance of interpretation, that it was more than just presenting information, and akin to Ham's (1992) outlining of the interpreters' role in communication mentioned previously. All these understandings of interpretation point towards the components of knowledge, behaviour and emotion in the heritage experience.

Across the three sections of this chapter there are prominent overlaps with the four aspects for effective thematic interpretation outlined by Ham and Weiler (2004:4), which are:

1. decide in advance what the theme is;
2. be able to express the theme in a way that compels the audience to pay attention to it;
3. weave into the presentations selected factual material that supports and strengthens the theme;
4. hold the audiences' attention by presenting the theme and supportive information in an artful and entertaining way.

The decision to have a specific theme for example is an issue which is raised by users in relation to knowledge acquisition in the experience (Section 6.1). The theme adopted in the interpretation may not necessarily align with the users' self-identification or be easily anchored to the physical landscape. This can have a subsequent influence on the effectiveness of the interpretation for the user. In addition, the multimedia capacity and perceived technological capability of the device fostered various behaviour and emotional responses in users. Using sound effects for example (Section 6.3) in an artful way was a perceived benefit, while other forms of media such as video were challenged as they required attention from the user towards the device. The challenges and opportunities of adopting smartphone-based MDIs in this experience are complex and unique. The nuances of which will now be unpacked through addressing the MDIs in the context of the interpretation objectives outlined.

6.1 Knowledge Acquisition through Mobile Interpretation

In the heritage experience, the role of knowledge provision, learning and education has been noted (See Smith *et al.*, 2017; Corbishley, 2014; Molyneaux and Stone 2003; Waitt, 2000;

and Millar,1989). Knowledge provision plays an important role in establishing the connections between people and places (Weiler and Ham, 2001) and smartphone MDIs as an interpretative medium can therefore facilitate this process. Enhancing the users' knowledge of the site fosters stronger connections to the site. This includes assisting the individual assign value and worth to the experience, and also helping them to identify with the location and the associated heritage. Tisdell and Wilson (2005:292) noted that in the heritage context educational activity "is necessary to provide meanings and relationships to people about the places they visit and about the things they see and do there". Participants during the in-situ investigations with the respective MDIs were also aware of the importance of knowledge provision in relation to unlocking their heritage experience. The vast majority of participants, for example, noted the expectation that they would leave the site having acquired knowledge and understanding about it.

The discussion in this section will be framed on the mobile, digital heritage experience, building upon existing understandings of knowledge provision in heritage interpretation. In particular it will present two premises which emerged from the on-site observations: the expectations and perceptions of the smartphone MDI as a knowledge source; and the implications of the interrelationship between the interpretative thematic content and the physical landscape.

There was a common expectation amongst participants in the in-situ investigations for a knowledge component within the interpretation, with the nature of the medium heightening these expectations. Table 6.1 shows examples of this across the three in-situ investigation sites:

Table 6. 1 Examples of user expectations related to knowledge provision

	Participant	**Expectation**
a.	WWRP5 (At the beginning of the in-situ experience)	I imagine it highlighting points of interest that you might not know were there and then to give you more information that you couldn't have perhaps gained without it.
b.	DNFP4 (Post-Experience Interview)	I kind of just thought it would be, very similar to what it did I suppose. Whenever you were walking around the site and got to certain locations it would bring up stuff. I wasn't expecting videos and I certainly wasn't expecting re-enactments! But I was expecting

		more like information or the sort of things you would find on the signs but maybe more detailed, just literature you could read.
c.	DNFP5 (Post-Experience Interview)	No, I kind of think it delivered what I wanted, it told me stuff about it you know with the app and everything. I actually wanted to learn something when I was there, so I wouldn't have a wasted day.
d.	CHTP8 (Post-Experience Interview)	I didn't really know what to expect from the app maybe it would provide some very basic information that I found useful. There wasn't a terrible amount of detail in some respects but there were some useful facts at points that helped me make sense of the place.

Users, as shown in Table 6.1, had a general expectation that information provision or knowledge acquisition would be a component of the MDI experience. More specifically, it gives an indication on the role of knowledge acquisition and the credence afforded it in the heritage experience, as DNFP5 (Table 6.1 Comment c.) equated not having learned something as being a 'wasted day'. In addition, through using a smartphone MDI there was an enhanced expectation regarding the level of information that would be provided. As Table 6.1 Comment a. suggests, the expectation existed that the MDI would provide knowledge that would not be gained without it. DNFP4 (Table 6.1 Comment b.), expected the information on the MDI to be more detailed that the interpretation panels; and CHTP8 (Table 6.1 Comment d.) remarked about the lack of detail contained within the *Cumbrian Heritage Trails* MDI. This indicated specific knowledge acquisition expectations as a result of the medium being adopted and the perceived capabilities of the device.

Heritage interpretation to be effective is required to be at the appropriate level and depth for the user (Goodwin, 1986), and this is also the case in relation to the smartphone as an interpretative medium. The MDI has to theoretically inhabit the design space whereby it offers enough depth in the interpretative content so as to provide adequate substance for a meaningful experience, and help establish the connections between place and person, without overwhelming the individual. DNFP8 noted with regard to Navan Fort:

> I suspect most people would get more out of the site if they didn't try and put across quite so much information in such a packed way.

The participant (DNFP8) was overwhelmed by the information, which they perceived to be 'too dense'. As a result of this, along with their desire to receive the information, DNFP8 repeatedly replayed the interpretative videos during the experience. This is a clear implication of adding significant amounts of interpretative content to the MDI. Although the device has the capability to host this content, the user had to go through the process of repeating videos while on site to effectively engage with the content, which they found overwhelming.

Associated with the delivery of large amounts of interpretative content is the capacity of the device to deliver multiple interpretative themes. While it is not possible to cater for every specific theme in relation to a site, participants had the aspiration that the themes would be aligned closer to their own motivations, interests and identity. A perception appeared to exist in participants that the device could cater for all themes and aspects of the site. This perception is a reflection on the proliferation of information communication technologies and the internet in society generally. Works such as Webster (2014) on theorising the information society or Brabazon (2006) on 'the googling effect' are a testament to this concept as they show user expectations and dependency on immediate sources of information. As Sparrow *et al.* (2011) addressed, the internet which stores vast magnitudes of information has become a primary form of transactive memory for individuals and that accessing it, due to devices such as the smartphone requireing little effort on the part of user.

As a result, there was a disparity between the interpretative objectives of the stakeholders and the users. The Brecon Beacons National Park employed *Walking with Romans* to specifically address the Roman heritage at Y Pigwn and Waun Ddu (Jones, 2015). However, they did not necessarily correlate with the ambitions of some users in-situ. For example, WWRP3 and WWRP4, while using the MDI discussed whether the bird spotted in the sky was a buzzard or a red kite, approached this topic stating:

> WWRP3: I think that would be quite a nice addition to the app as well, to talk about the wildlife. I think it is always good isn't it, especially if it is an app for families- to educate in all areas really. Another thing that would be nice would be to talk about the droving, there is a long tradition of droving sheep. There used to be shepherds but of course they didn't have lorries, so they would have drove them hundreds of miles to market across all the mountains.

> WWRP4: One thing I'd like to include is that this used to be forestry and I'd want to hear more about that.

In this instance, as the interpretative content did not align with the knowledge ambitions of the users and subsequently these user expectations were not met. Users have an understanding when entering such environments that the landscape is a palimpsest. Therefore, while the MDI may provide a clear understanding of one specific aspect of the site's history (such as the Roman occupation in the *Walking with Romans* MDI) the user does not always leave the experience feeling they have achieved a full representation of the place. The space the user occupied appeared in many cases to be the motivational driving force for many participants in relation to their interpretative needs, more so than a particular narrative or theme. This finding is in keeping with the findings of Galani *et al.* (2013), who similarly noted the inclusion of information that reflected other aspects of the landscape fostered a more holistic form of interpretation.

Advancing the discussion in relation to modular content relating to the broader context of the landscape, the importance of the relationship between knowledge acquisition and the physical location of the user must be considered. Participants had the perception that the smartphone MDI will not only be a source of knowledge provision but that this knowledge would be location specific. It is a perception which emerges from the mobile nature of the medium and the perceived device capabilities. As CHTP8 noted in relation to the *Cumbrian Heritage Trails* app (Table 6.1), "there wasn't a terrible amount of detail in some respects but there were some useful facts at points that helped me make sense of the place".

A component which emerged in relation to making 'sense of the place' was the role of explorative learning in the MDI experience. As the name suggests, this form of learning allows the individual to discover links between their existing understanding and new content or unfamiliar concepts (de Freitas, 2006). The interpretative content within the MDI facilitates this, providing the user with opportunities to partake in this form of learning.

Across the three in-situ investigation sites there were numerous examples of this form of learning taking place. In the *Walking with Romans* MDI, for example, after an interpretative point, participants were seen to engage with the theme by devising further questions relating to the interpretation they just received. These questions were later addressed at a following

interpretative point. It was an intentional interpretative approach used by stakeholders to create a 'cliff-hanger' moment between stops which made the content more engaging (Jones 2016, pers. comm., 1st Sept.). Figure 6.1 shows a conversation between WWRP6 and WWRP7 after the first interpretation point entitled 'clothing':

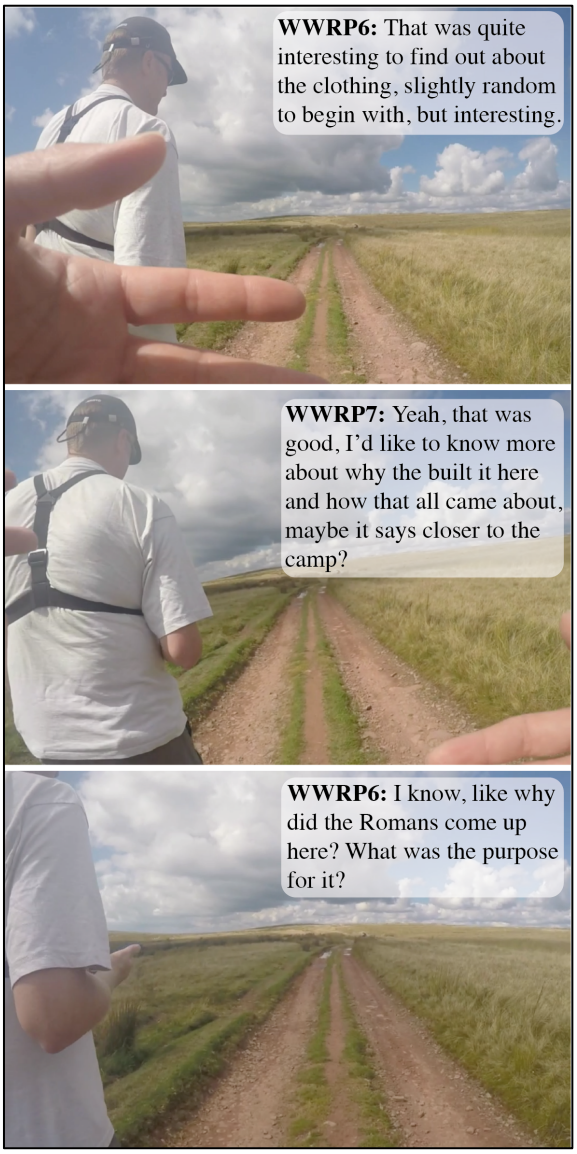


Figure 6. 1 WWRP6 and WWRP7 discuss the interpretative content

WWRP6 and WWRP7 discuss some topics that they are interested in and that are a response to the interpretative content they just received (Figure 6.1). The participants are curious about the location of the camp on the site, its origins and purpose. These are aspects which are later addressed in the experience. WWRP6 and WWRP7 receive this information at interpretative points 3 ('Why were the Romans here in 70AD?') and 4 ('Why build a marching camp?') respectively.

This approach fostered positive connections with the heritage interpretation and the user, particularly between groups of participants as it inspired conversations from these moments, where thoughts and ideas could be explored and expressed. The process of questioning, hypothesising and then discovering appeared to work effectively in the *Walking with Romans* MDI experience.

There were examples of the MDI also inspiring and providing opportunities for explorative learning beyond the in-situ experience, reflecting the post-visit element of the heritage experience. CHTP5 and CHTP6 for example, were a local couple who at the beginning of the experience conceded that they were not sure about the appropriateness of a smartphone MDI in the heritage experience. However, in their post-experience interview they responded positively to the inclusion of the MDI in their experience, particularly referencing the interest it inspired. While annotating a map of the route they took, many of the comments related to aspects which piqued their curiosity and elements they wished to find out more about (Figure 6.2).

After annotating the map at various points, reflecting the location of interpretative points, the participants note at the bottom:

> Generally, [*Cumbrian Heritage Trails*] really good app" (Figure 6.2, Point H)

The explorative learning process and how the MDI piqued the curiosity of the participants became further apparent as they discussed their annotations:

> CHTP5: I liked the app actually, I did like the app! [Surprised Tone]
>
> CHTP6: Well there are others, we could do some of the others. It would be interesting to do the Alcock Tarn one.

Later in the interview the subject emerged again:

> CHTP6: Well we learned stuff and we have done that walk dozens of times - As I say, I do fancy doing the Alcock tarn one [trail].

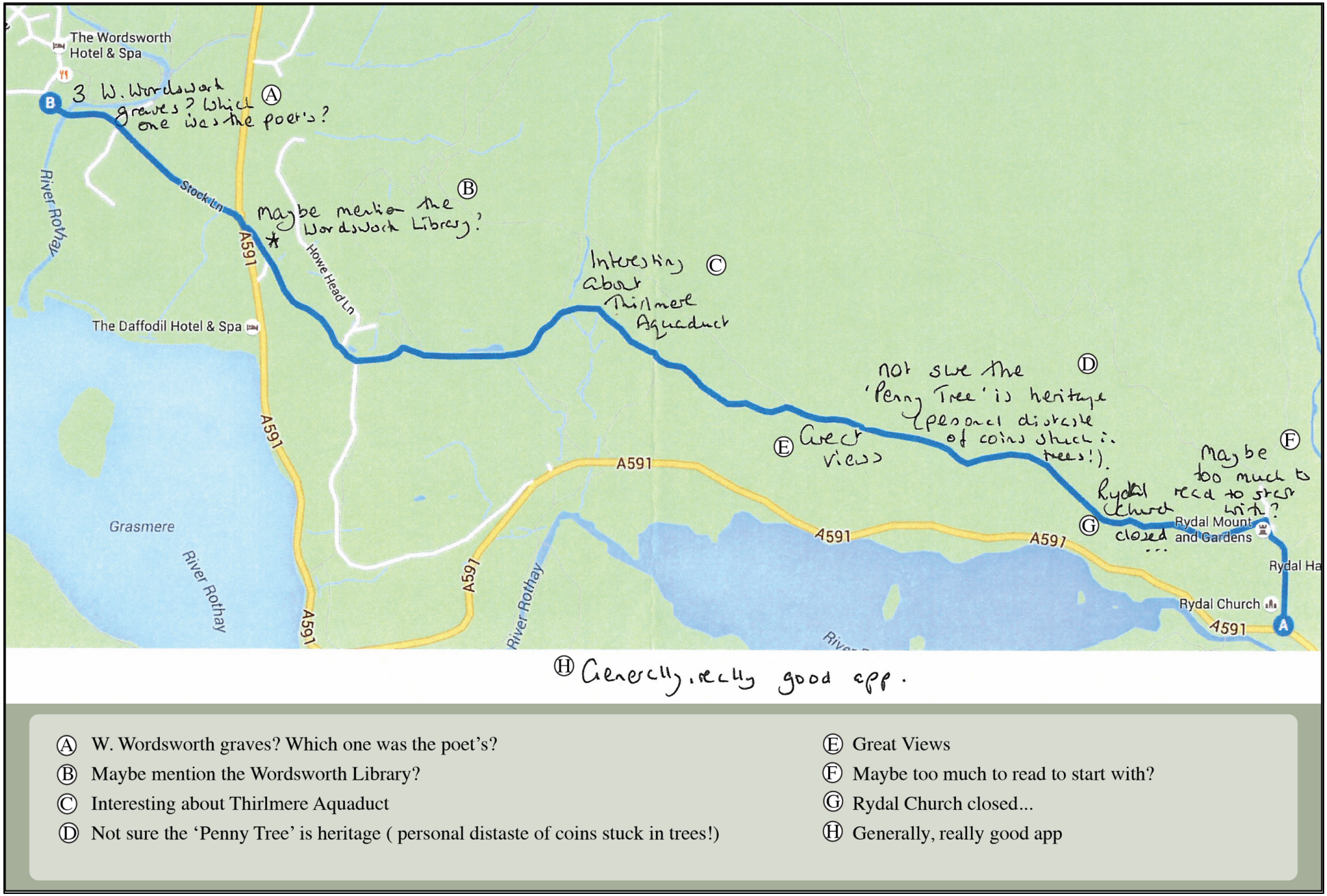


Figure 6.2 Annotated map completed by CHTP5 and CHTP6 after their experience with Cumbrian Heritage Trails

> CHTP5: Yeah, I do think I would do them again knowing they are there. If I was on my own I would probably look at it before and then check things when I got to them with the phone instead of carrying it all the time but because it was new I kind of had too.

It was a reinforcement of the influence knowledge acquisition and interpretative content had on the users that they wanted to do further trails. Stating that although they had done that trail several times it was during this new experience, with an MDI to accompany them, that they 'learned stuff'. This is an example of the influence that their imagined experience, defined by apprehension, resulted in a lived experience in which they were seeking further engagement with the interpretation and interpretative themes.

This disparity between the physical location and the interpretative content was another aspect of the interplay between the various components of the experience that was impactful on the participants. The *Cumbrian Heritage Trails* MDI on the Alcock Tarn Loop highlights this as during the trail there is an interpretation point as users make their descent from the tarn adjacent to Greenhead Ghyll. This interpretative point focuses on the poem 'Michael' by William Wordsworth (1800), which contains the following lines:

> In all the neighbourhood: —yet the oak is left
> That grew beside their door; and the remains
> Of the unfinished Sheepfold may be seen
> Beside the boisterous brook of Greenhead Ghyll.
>
> (William Wordsworth, 1800)

The subsequent interpretative text available on the MDI for this point was as follows:

> In 1800, William Wordsworth published the poem 'Michael' in his second edition of Lyrical Ballads. The poem is based on the fictitious story of a Grasmere shepherd named Michael. The ruins of Michael's fold can still be seen at the foot of Greenhead Ghyll. Greenhead Ghyll, as a whole, was Michael's supposed sheep pasture. Wordsworth first read 'Michael' to his friend and fellow Lake poet Samuel Taylor Coleridge at the foot of this hill.

Although the interpretative text provides knowledge about the site, which was responded to positively by participants (CHTP3, CHTP4, CHTP7 & CHTP8), no user was able to identify the location of the site despite the interpretation referencing that it was viewable from their location. This created a disconnect between the interpretative content and the space the user was occupying. The individual in this instance failed to have their goals of the interpretative experience met by not being able to link the provided knowledge with the location (discussed further in Section 7.2).

The *Discover Navan Fort* and *Cumbrian Heritage Trails* MDIs centred the majority of their interpretative points on physical features in the environment (for example 'Navan Fort Mound', *Discover Navan Fort* or 'Penny Tree', *Cumbrian Heritage Trails*). Through this approach, the interpretation was effective in responding to the users' interests, via the physical environment. The physical features on the landscape provided a structure for anchoring interpretative points as these physical features were also aspects which would capture the attention of the individual. However, some areas at the sites adopted in this study contained limited physical features. For example, two primary physical points in *Walking with Romans* MDI are not immediately evident on site (the settlements of Y Pigwn and Waun Ddu) (Figure 6.3). The implication of which is the requirement of approaches within the MDI to foster engagement between the user, the landscape and the interpretative content, when the common link of physical features is missing; an element which explored furthered in Chapter 7 (Section 7.3).

Figure 6. 3 View from inside the Y Pigwn rampart, facing south-east.

6.2 Behavioural Objectives and the Smartphone Device

Tilden noted in 1957, "the chief aim of interpretation is not instruction but provocation" (Tilden, 1957:9), and provocation was an observed component in the lived experience with the MDIs, stemming from behavioural objectives of stakeholders. This section will address behavioural objectives and provocation in relation to transmedia interpretation, that is the strategic amalgamation of various media to foster a deeper form of engagement for the user beyond multimedia adoption, and smartphone medium. This will be done by addressing two aspects which emerged in the in-situ investigations.

The first relates to the delivery of interpretative messages that surprised the individual and contributed to the perceived uniqueness of the site. The second focuses on interpretative content that conveys contemporary aspects of the location, particularly in relation to endangerment and conservation.

The assembly of multimedia approaches, interpretative messages and the uniqueness of the site occurred through the MDI to achieve certain behavioural objectives in the experience. The emergence of these various factors was most prevalent in the use of 'surprise' as a tool in the MDI heritage experience. In this instance, 'surprise' follows the understanding of Ludden *et al.* (2007:356), whereby "a surprise is elicited when the apparent familiarity is proven wrong". Similarly, CHTP5, a participant using *Cumbrian Heritage Trails*, understood surprise as "anything out of the ordinary". The discussion which follows unpacks the impact of these elements with regard to the individual's engagement in the MDI heritage experience. Through the various types of media that will be addressed, the key finding in relation to surprise and the smartphone MDI heritage experience is how these elements assisted in conveying a sense of uniqueness about the location.

Across the three in-situ investigation sites, elements which inverted the 'apparent familiarity' or surprised the individual, subsequently altered the behaviour and provoked a response from that individual. This was evident through the text and image approach of the *Cumbrian Heritage Trails* application, the video (including images and audio) approach with the *Discover Navan Fort* MDI and the predominantly audio method, supported by AR elements, of the *Walking with Romans* experience. Many participants (WWRP1, WWRP3, WWR6, WWRP7, DNFP1, DNFP2, DNFP5, DNFP6, DNFP8, CHTP3, CHTP4 and CHTP5)

unambiguously used variations of the term ‘surprise’ (that is, ‘surprised’, ‘surprising’) when responding to their unfolding experience with the respective MDIs, signalling the impact of this approach. In the context of these interactions with surprising content it is important to acknowledge that it represents unanticipated information or features, not necessarily content that would be deemed shocking or controversial.

The aspect which surprised the participants most commonly was content relating to something which appeared as unique to the site. This interpretative content was then enhanced by the particular media approaches adopted in the respective MDI to convey this uniqueness. The Barbary Ape (*Macaque Sylvanus*) skull (Figure 6.4) mentioned in the *Discover Navan Fort* MDI illustrates this point. The skull was found during excavations of the site and highlighted the significance of the location in later prehistory. Lynn (2003) claims that the ape was most likely brought to the Northern Irish site from the Mediterranean as a prestigious gift for the site’s occupants at the time. This interpretation of the skull is presented to the user during the interpretative video and supported by the accompanying image of the excavated skull (Figure 6.4). This piece of content, surprised individuals, ignited conversations and piqued curiosity. The apparent familiarity was disrupted, which was reflected in the triggered responses of the in-situ participants.

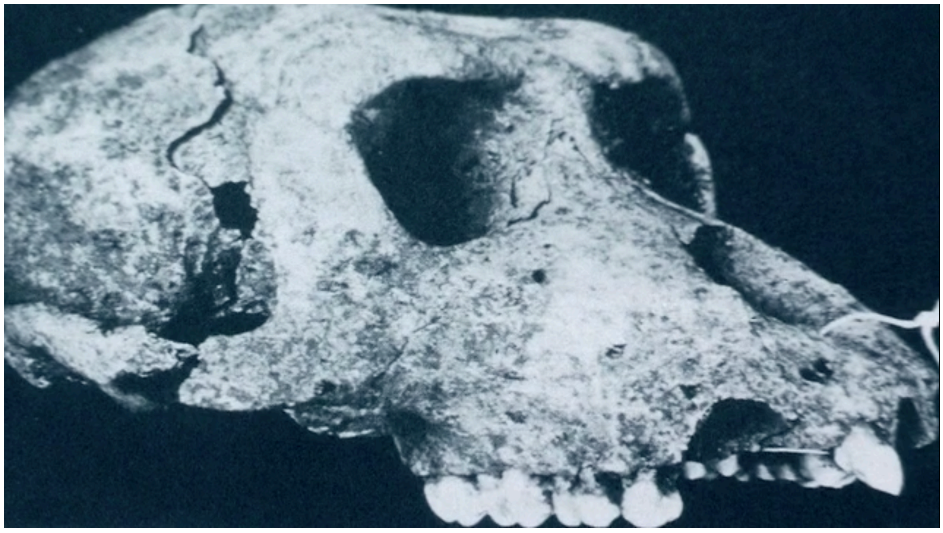


Figure 6. 4 Still from the Discover Navan Fort MDI showing the excavated Barbary Ape Skull (Original Image Credit: British Museum)

As the video of the interpretative point played and the image of the skull (Figure 6.4) appeared DNFP6 and DNFP7 had this brief exchange:

DNFP6: Of a who?

DNFP7: I don't know

DNFP6: Hmm… that's quite cool!

DNFP7: Maybe it was a gift or something? I wonder if they have it in the exhibition centre?

DNFP6: It might tell us. It is pretty cool looking.

The above interaction shows the thought process of the participants (DNFP6 and DNFP7) as they try to unpack and make sense of the information they were receiving. Initially, DNFP6 and DNFP7 were surprised and unsure if they heard the interpretation correctly ("of a who?", DNFP6). The exchange then proceeded to enquire if it would be viewable in the nearby exhibition centre. The content and image capture the attention of the user, piquing their curiosity and fostering motivation to view the skull in the exhibition centre. This shows how the interpretative content and the MDI influence users' behaviour. It also illustrates the argument of Lindgreen and Vanhamme (2003) that surprise can be used as a tool of engagement, leading to greater recollection and recognition. Recollection and recognition was evident in the post-experience interviews and annotated maps developed by participants. DNFP3 for example, while making a reference to the ape skull on their annotated map, stated the following:

> I would know a wee bit about it [Navan Fort] but there is a lot of stuff on the app that I wouldn't have known. It goes into a good bit more detail on stuff I would have known, I would have known more of the mythology of it more so than the likes of the barbary ape skull that was found, other than the app I wouldn't have really known that.

Through the inclusion of this content the assumed norm is disrupted, and this resonated positively for users of *Discover Navan Fort*. The site is presented as encompassing or offering more than the users initially expected which elevated the site's status. The presentation of apparently unique content therefore encourages the user to place greater value on the site. As

noted at the beginning of this section the approach of surprising the user is not new, as the Canals River Trust (2014:4) also suggested that when developing interpretation, you should 'try and surprise people'. From the response of users during the in-situ investigation it can be concluded that this approach transcends media, and that the smartphone MDI can accommodate and facilitate this interpretative technique. This is supported by Witcomb (2013a and 2013b), who noted that the use of surprise in such contexts leads to unsettlement which may foster empathy in the experience.

The transmedia nature of smartphone interpretations presents the opportunity to develop further engagement through focusing on behavioural responses. The use of sound-effects to enhance the interpretative messages contained with the *Walking with Romans* application illustrates this point. In the interpretative point related to the 'Size and Composition of the Legion' the audio content recites the following as the sound of marching footsteps plays in the background:

> You should have heard how it sounded, 5000 sandals hitting the ground at the same time. The sound of 5000 shields hitting against 5000 sets of armours. (*Walking with Romans* MDI)

This approach is an empathetic technique to make people feel like they were on the site while the Romans were there and this specific point in the experience captured the attention and provoked a response from users. Comments such as 'helps you picture it' (CHTP3) and 'brings the whole thing to life' (CHTP4) reflected the sentiment of participants in relation to this content. The approach utilised the capabilities of the device, creating engaging content which was responded to positively by individuals in-situ (see Meyer (1956) and Huron (2006) in relation to musical emotion). The straight path the users were following, synonymous with Roman infrastructure, was elevated by the inclusion of the footstep sound effects. The provoked response facilitated by the interpretative content and supported by the accompanying sound-effects served an important role in fostering the hybridised space, melding the occupied space of the user and the interpreted heritage landscape, reflecting what the site would have been like during the Roman occupation.

The *Discover Navan Fort* application illustrates the role of the smartphone MDI in conveying interpretative content relating to contemporary issues with the location, especially those

around conservation and endangerment. A specific interpretative point in the *Discover Navan Fort* experience was dedicated solely to the recent conservation struggle of the site. In recent years, there were issues around the conservation of the site with the encroachment of an adjacent quarry threatening its future (Figure 6.5). Community action from groups including Cairde Teo Ltd., the social enterprise who are also responsible for *Discover Navan Fort*, resulted in the halt of this threatened intrusion and the site was saved. This piece of recent history is not, however, discussed in interpretative panels located throughout the site, which are maintained by the Northern Ireland Environment Agency (NIEA). As Cairde Teo Ltd. has no authority over the content of the existing interpretative panels, adopting the smartphone MDI was a method of providing on-site interpretation without being physically intrusive.

Figure 6. 5 Navan Fort and adjacent quarry

The nature of this content regarding conservation threats particularly resonated with participants during the in-situ experience. Contemporary information was an aspect that many participants expected the MDI to include (DNFP1, DNFP2, DNFP5, DNFP6 and DNFP7), and its inclusion assisted those individuals in achieving their personal goals for the experience. As one participant (DNFP1) stated during the experience and before they reached the interpretation point which discussed the contemporary history of the site:

> DNFP1: I would be interested to hear about you know about what is happening with the site at the minute. I suppose it would be interesting to know, I'm just assuming that it is National Trust or someone that is looking after it [Navan Fort], but it would be quite nice if that was it. Tell me who owns it and what's happening, how long it is protected for and that kind of stuff.

The addition of this information not only met the expectations of users, but also provoked a behavioural and emotional response in the individual. The information relating to the site's endangerment came at an interpretative point which was at the later stages of the experience. A narrative had already been established at this juncture; participants had learnt about the significance of this site for centuries and its role as one of the most important historical locations in Ireland (Lynn, 2003). The interpretative points within the MDI prior to this point provided a case for the value and worth of the site, with interpretative points discussing previous occupation and the significance of the site to past peoples. Individuals are then confronted by the very real threat imposed on the site and the realisation that the site was almost completely lost. This somewhat jarring inclusion jolts the user into an affective response. Emotions have been noted to play an important role in the heritage interpretative experience, due to the influence they have on individual's attention, memories and experiences (Uzzell and Ballantyne, 2007) (discussed further in Section 6.3).

All the participants in the in-situ investigation responded in some capacity to the information relating to the recent conservation struggle of the site. DNFP6 for example stated the following during the post-experience interview:

> DNFP6: You could tell it was a special place when you were in it, it was in the air you could feel that about it and I think it was quite telling the context that it has arrived at now in terms of the quarry and the houses and the farms right up against it. I don't think that should have been allowed at the time it was developed.

As this statement came in the post-experience interview it shows that the message resonated with the individual. The participant regarded the fort as 'a special place' and acknowledges sentiment associated with *Genius Loci* ('Spirit of Place'; see Barnes, 2004), in that the

perceived specialness of the site ‘was in the air’. They then concluded by addressing the quarry and their opinion that it should not have been allowed. The inclusion of this content and the response it fostered in the participant reflects parallels with the understanding of sense of place outlined in Chapter 3. Particularly, as it addressed elements of place attachment and place distinctiveness, important components in fostering sense of place; while the participant also recognised the distinctiveness and value of the location when challenged by the prospect of its destruction.

Similarly, another participant (DNFP2) made the following remarks in-situ when given this contemporary information relating to the threat to the site:

> DNFP2: I think that [information relating to the conservation and nearby quarry] is quite good in terms in setting this site in the contemporary... I have known about it [Navan Fort] for a long time and haven't been but also didn't realise it was actually endangered at a point. There are pieces of information that you do sort of feel he is giving you a bit of knowledge that wouldn't necessarily be freely available or given out you know? I haven't seen it on the last board [Interpretative panel] I looked at and I can't imagine it was said on one of the boards that there were activists working with the quarry land.

Again, as with DNFP5, the participant DNFP2 highlighted the value of the information regarding the endangerment of the site. It demonstrated the significance of including current information about the site in the individual’s experience. The current information draws a link between the past and present occupation of the site, addressing factors of emotional engagement with heritage outlined by Uzzell and Banatyne (2007). They argued that “as time separates us from past events our emotional engagement is reduced” (Uzzell and Banatyne, 2007:507). The contemporary information helps bridge the chronological narrative for the individual, minimising the gap between the initial occupation of the site in the Neolithic period (circa. 4000-2500BC) and the real-time space the user is occupying.

Additionally, the responses by participants on receiving the interpretation relating to the endangerment facing the site reflected the cognitive empathy acknowledged by Kidd (2015) in relation to online museum games. Kidd (2015) for example, outlines her experience with

Ngā Mōrehu [The Survivors], a game available online through the Te Papa Tongarewa [The Museum of New Zealand] website. The game-play is formed around the user adopting the role of a Māori child and making decisions which will subsequently shape the child's life during the early twentieth century. Despite the varying subjects- a Māori child in the twentieth century and an ancient ceremonial mound in Northern Ireland- there are parallels in the responses conjured through the digital experiences. At the end of the experience, Kidd (2015:28) surmised that 'despite my efforts to support the best of all possibilities, I cannot save her from hardship". This reflection and provoked response at the end of the experience with Ngā Mōrehu is echoed in the experience of participants forced to reflect on the prospect of the Navan Fort site potentially being lost. It is especially heightened as it occurred after a period of receiving interpretative messages in-situ relating to the value and cultural importance of the location. The subsequent impact is both 'uncomfortable and alienating in its affects' (Kidd, 2015:28).

6.3 Emotional objectives in the MDI experience

The heritage experience can be understood as both the material and socio-psychological testimony of identity (Yu Park, 2010) with the latter component encapsulating the individual's empathetic connections. These empathetic connections are closely associated with the concepts of the 'personal heritage experience' (Timothy, 1997) and the 'emotional heritage experience' (Biran *et al.*, 2011). Both of which acknowledge the role of place attachment, place connection and emotive responses for the heritage visitor. As a result, stakeholders in heritage interpretative planning identify emotional objectives they wish to achieve in order to help the individual meet their personal motivations (Veverka, 1994). Table 6.2 shows examples of emotional objectives highlighted by stakeholders at the three in-situ investigation sites in relation to the MDIs:

Table 6. 2 Emotional objectives highlighted by stakeholders in the three in-situ investigation sites

	Study Site	Emotional Objective
a.	Navan Fort	We thought that after they [Armagh Rhymers] left and the council took it over and kind of turned it into Navan Fort, rather than talking about Cu Chulainn and everything that happened at Navan Fort, the Celtic festivals, the focus had changed to Indiana Jones. To be honest it is not what Navan Fort is about, it is not what Armagh is about. So, we thought this [Smartphone Application] was an ideal way of getting the

		local people to take an interest in their heritage and mythology of the area.[1]
b.	Walking with Romans	Provide pre-visit information – Visitors will arrive in the correct location with the appropriate equipment and feel confident to explore these remote sites safely.[2]
c.	Cumbrian Heritage Trails	A series of walks which linked places of interest and places of memory.[3]

(Source: [1] Ó Moaliste2015, pers. comm. 17th Nov.; [2] Brecon Beacons National Park, 2015; [3] Cowton 2016, pers. comm. 28th Apr.)

As shown in Table 6.2, the stakeholders were strongly aware of the importance of emotional and empathetic connections in the experience. The *Cumbrian Heritage Trails* MDI seeks to connect 'places of memory', the *Discover Navan Fort* application serves to engage local people 'in their heritage' that was potentially being removed, and the *Walking with Romans* MDI shows awareness of the importance of emphasising the element of memory and instilling confidence in the MDI user.

In the context of this research, involving the influence of digital interpretations in the heritage experience, the framework for emotional and empathetic engagement derives from the work of Galani *et al.* (2013). This approach in examining the interaction between empathetic design and mobile interpretation, acknowledges the requirement for a 'design space'. Within this design space, individual's agency is considered within the broader holistic context, which includes the technological, environmental and personal. This empathetic design allows the user to respond with their individual subjective perspective (see Wright and McCarthy, 2008). Adopting the understanding of empathetic engagement design and mobile interpretation, the discussion will now turn to contested notions in this context. This was a phenomenon which emerged from the in-situ investigations and shows how emotional connections can be fostered through the smartphone MDI. Similarly, it also presents a case for the interplay between the user and the device, representing lived examples of empathetic design, showing the individual subjective perspective and the position of the smartphone MDI in the experience.

There are two strands in relation to this topic. The first is the use of smartphone MDIs to convey a particular narrative or identity position (stakeholder led), and the second is how this negotiation of contested identities is manifested through the MDI for the user. Both strands were evident to varying extents with both the *Walking with Romans* and *Discover Navan Fort* applications. Using the *Walking with Romans* MDI for example some participants negotiated their ideology of being Welsh and how this was presented with the focus of Roman occupation of the site. As Osmond (2002) claims, the Welsh identity seems to centre on their locality in the first instance more so than a collective 'Welsh' identity, citing the Welsh term 'Bro' relating to a village or area that translates to 'one's native region'.

Correspondingly, framing of identity was also a key factor at Navan Fort with *Discover Navan Fort*. The experiences in relation to the *Discover Navan Fort* MDI will serve as the focus for unpacking the discussion as well as the motivations and objectives of the primary stakeholders responsible for the MDI (Cairde Teo Ltd.) (Table 6.2).

Discover Navan Fort acted as a non-physical method of representation, ideological promotion and language preservation on site. In addition, the experience was designed to support the advancement of the Irish language in the region, the interpretative experience being provided in both English and Irish (Gaelige). Cairde Teo Ltd., an Irish language social enterprise, through making a provision for the Irish language on-site, draw a connection between the physical site and the Irish language. This can be viewed as an act of preservation: by developing an association between the site and the intangible, the language is safeguarded through the physical site.

In addition to the Irish language, the MDI focuses on elements of Irish mythology. Strong connections are made in the MDI between the site and key figures in Irish mythology, most notably the warrior hero Cu Chulainn (see Parkes, 2004) (Figure 6.6). The importance of Cu Chulainn, not only in Irish mythology but also in the collective Irish cultural identity, is revealed in a statue entitled 'The Dying of CuChulainn' used to commemorate the Easter Rising on the spot where it began in 1916 (symbolising 'dying for Ireland', Turpin and O'Toole (2015)) (Figure 6.6). In doing so, a link is fostered between cultural nationalism and Irish independence. Williams (1983) wrote extensively about this topic, addressing the role of ancient Irish mythology and the revolutionary ideology in Ireland between 1878-1916. The continuation of this ideology is still prevalent today and is woven into the fabric of the Irish

cultural identity. Given the political situation in Northern Ireland, alongside issues of identity and the contested nature of representation, the MDI experience produced strong empathetic connections for users.

Figure 6. 6 Depictions of Cu Chulainn

The case surrounding the interpretation within the *Discover Navan Fort* MDI shows the role MDIs can play in presenting and negotiating contested narratives. The interpretation through the MDI, with the inclusion of the Irish mythological elements are a reflection on the stakeholders' heritage and identity. The pre-existing interpretation of the site by the local council, in the view of the MDI stakeholders, ignored not only the important history of the site, but in-doing so ignored the place communities for whom this history is a significant part of their identity. The perceived misrepresentation of the site as a motivating factor for the adoption of the MDI echoes the reference to 'control of the territory' (Graham and

McDowell, 2007:344) in relation to heritage narratives and ideological politics in Northern Ireland.

The use of culture, such as the case of the Irish language and Irish mythology in the case of *Discover Navan Fort* MDI, act as identity resources to define and maintain territory. It is reinforced by O'Moaliste's comment that it is 'not what Navan Fort is about, it is not what Armagh is about' (O'Moaliste 2015, pers. comm., 17th Nov.). The incentives of the stakeholders to develop the *Discover Navan Fort* MDI reflect the motivations stated by Graham and McDowell (2007), emphasising the contested nature of heritage narratives in the region and the role the sites play in being spaces of identity for specific communities or ideologies.

The smartphone MDI acts as a non-physically intrusive medium for a section of the community to establish their own narrative in relation to the site. This presents the smartphone MDI as a tool in heritage dissonance (Tunbridge and Ashworth, 1996) and as a means for circumventing the authorised heritage discourse (Smith, 2006). When O'Moaliste stated that the MDI was borne out of existing interpretation reflecting 'not what Navan Fort is about', it resonated with Smith's (2006) framing of heritage as a process for negotiating social and cultural values. This is reinforced by studies such as Paasi (1999), in relation to the interconnections between identity and territory, and Yiftachel and Ghanem (2004) regarding ethnocracy and the perception of territory as a nation's homeland.

The dissonance evidenced through the creation of the *Discover Navan Fort* MDI is a struggle over power, and memory. As McDowell (2008: 43) stated, "those who wield the greatest power can influence, dictate or define what is remembered and consequently what is forgotten." The implications of the struggle over power and memory on the site were subsequently borne out in the experience of users with the application. The elements surrounding the Irish mythology and the broader cultural identity produced significant empathetic connections within individuals, adding another layer to the heritage dissonance occurring with the interpretation of the site.

Although the *Discover Navan Fort* MDI incorporated other aspects of the Navan Fort heritage (e.g. Iron Age Wooden Buildings and Mound), it was the interpretative messages surrounding the mythology and the availability of an Irish language interpretation particularly which

triggered users to comment on their sense of belonging and to hypothesise about the motivations behind the interpretation. All participants acknowledged these elements in some capacity; those who viewed those aspects as parts of their own identity remarked positively about their inclusion. DNFP3 and DNFP4, who used the Irish language interpretation during the experience (which contains the same content as the English language interpretation), noted in the post-experience interview:

> DNFP3: I'm interested in the Irish language it all kind of links in together - the Irish language, the heritage and culture. So, to me anyway, the app, the fact you are able to do it English or in Irish, is important and that's what interests me.

> DNFP4: There is a connection there [Navan Fort] with, I suppose, what I'm about - the language, the culture, local history, mythology. It is all part of my heritage and background, so I would feel a link to it. The other thing is, it is a wee bit, not spiritual, but there is something separate about it. Whenever you are there you feel in tune with nature - that's how I feel anyway.

Many participants were not as explicit in relation to this aspect, but still referenced ideas of identity, connections to the site, and the relevance of the interpretative messages addressing the broader Irish cultural identity. After the interpretative point concerned with the mythological elements, DNFP7 claimed:

> It is nice to know things about where you are from and your own background, especially if you are from the area or region.

The participant makes the link between the content and their 'own background'. It denotes a connection between the interpretation they received, the site more broadly and their idea of self. The sentiments expressed show a sense of place that was outlined in Chapter 3, particularly, a sense of belonging in the site. DNFP3 drew links between the interpretation they received about the site and their language, heritage and culture, while DNFP4 addresses similar aspects and includes local history and mythology. The participants DNFP3, DNFP4 and DNFP7 identified the site as part of their 'background'. Rose (1995:98) interprets this

sentiment in relation to place and identity as "a feeling that you belong to that place...you feel comfortable, or at home, because part of how you define yourself is symbolised by certain qualities of that place". This reflects not only identification with a place, a sense of belonging, however, it is also possible that conversely non-identification and a subsequent sense of displacement may emerge among some people.

This sense of displacement raised by Rose (1995) was also evident in the MDI experiences. Users who did not identify with the interpretative messages were not subsequently apathetic to the content but instead expressed sentiments of non-belonging. DNFP5 explicitly noted during the experience that 'this isn't a site for me, I don't think I belong here.' When discussing this in the post-experience interview DNFP5 expanded upon the point to state:

> I didn't really identify with it to be honest… probably because it is so far away from where I'm from I'd say. It depends what way you identify yourself and [your] culture… I think it [culture] all builds together and makes you part of who you are. Culture can be really a funny thing. It's not just one or the other.

This comment highlights how the interpretative content can also create alienation on the site and foster notions of non-belonging. After explicitly mentioning non-belonging during the experience, DNFP5 expressed that this emerged through identity and culture. The individuals' negotiation of identity does not stem from the physicality of the site, but the interpretative content provided in the MDI. Gillis (1994) addressed the inescapably selective nature of heritage and how it serves specific interests or ideologies in the present. This was evident from both the stakeholder and user standpoints. The aims and objectives of the MDI are a reflection on the stakeholder's ambitions in relation to presenting a specific ideology. It was an aspect that was most explicit in the *Discover Navan Fort* MDI. While similarly, the specific interests of the user and the role they play in the heritage experience was also evident during the study.

Content surrounding the interpretation of identity can be polarising in its influence and content of this nature in MDIs raises the idea of 'historical ecumenism' (Longley, 2001) in smartphone MDI interpretation, and interpretation more broadly. In theory, by incorporating other narratives, the risk of excluding certain individuals is diminished. DNFP8, who identified themselves as being local to the area but originally from England, expressed similar

views to DNFP5 in relation to the interpretation, and was critical of the representation of the site through the MDI. For example, DNFP8 highlighted the connections made between this site (in Northern Ireland) and other sites in the Republic of Ireland:

> There was reference to the royal sites in the other provinces [of Ireland] at least three times. [DNFP8 laughs] Three times is over the top, most of the information is too compact and yet that one kept coming up time and again.

Additionally, the inclusion of an Irish language interpretation raised concerns about the intentions behind the interpretation:

> Given that Irish, in an earlier form, would have been the language of the inhabitants I can see the relevance. I just wonder is it the best way to do it, to offer an Irish language version. It suggests to me here mixed motives.

In the post-experience interview, DNFP8 spoke directly to the concept of historical ecumenism and representation:

> In the 1980's at the height of 'The Troubles', there was fairly widespread assumption in parts of the community that this [Navan Fort] was something primarily of interest to one section [of the community] and not the other…One needs to be a little bit careful in the way it [interpretation of the site] is managed, and that would be one reason for going a little bit easy on the Irish.

In heritage representation, particularly in Northern Ireland, the act of appealing to a specific community or ideology has been criticised (Wing, 2010 and Boyce, 2001). DNFP8 also alluded to it by remarking on the implications of having an Irish language interpretation of the site. It is important to acknowledge however that this process of historical ecumenism was a key motivation in the creation of the *Discover Navan Fort* MDI. The stakeholders (Cairde Teo Ltd.) claimed when the site went under the control of the local council the narrative of the site changed so as not to appeal to a specific community, in which it became "not what Navan Fort is about" (O'Moaliste 2015, pers. comm., 17th Nov.).

In summary, this research shows, partly through focusing on Navan Fort, how smartphone MDIs can assist in the fostering of belonging through interpretative content that appeals to certain ideologies. In doing so however, this can also alienate users in-situ who do not align with the ideologies presenting in the interpretative narrative. While the concept of historical ecumenism may prevent this alienation, it is also likely to limit the effectiveness of the interpretation in evoking the sense of belonging felt by other users.

Conclusion

This chapter explored the role of interpretative content on the smartphone MDI experience and the implications they have on the individual occupying the hybridised landscape. Framing the chapter around common objectives of heritage interpretation, the influence of the smartphone as an interpretation medium become apparent. The unique challenges and nuances in the heritage experience as a result of the device being adopted are borne out through this approach.

The emotional component of the experience was explored, beginning with an exploration of the emotional objectives of the respective experiences and the understanding of empathetic design in heritage environments (see Galani *et al*., 2013). This addressed how the user's personal subjective perspective related to contested identities on site. The influence of the interpretative content was clear in relation to how it prompted and embellished personal memories for users, adding value and depth to memories through increased understanding of the site. As Ham and Weiler (2004) acknowledged, thematic interpretative content is a fundamental structure for attitudes and mental constructions in the experience. The interpretative content could also be polarising in its effects, such as in matters of identity, depending on how the user identified themselves.

The influence of the MDI interpretative content was noted, alongside the multimedia capacity, in how it provoked a response in the individual and the impression this had on their heritage experience. The delivery of interpretative content in-situ relating to contemporary information about the site helped bridge the gap between past and present. The research showed how the user is prompted by content which can be viewed as slightly uncomfortable or jarring, especially when dealing with the endangerment and conservation of the site. In

doing so, this approach helped the user ascertain value through the perceived uniqueness of the landscape.

The research suggests that expectations for knowledge provision are higher as a result of the smartphone medium used (6.1). Due to these heightened expectations, greater emphasis is placed on how the MDI responds to the material landscape, including how it assimilates with the physical space. This included both how the interpretative content addresses material objects in the landscape that are not related to the interpretative theme, and also how the interpretative content integrates with the material landscape to accommodate knowledge provision. The responses to the MDI in relation to knowledge expectations reflect Packer and Ballantyne's (2004) position on learning and the leisure experience, in which that users will invest effort in learning when it is perceived fun and relaxing, not when it is difficult and effortful. When the MDI does not assimilate with the individuals perceived experience therefore, the knowledge acquisition and subsequent learning process is made more difficult.

In looking at behaviour and emotional objectives, alongside knowledge acquisition in this chapter, an understanding of how interpretation is manifested through smartphone-based MDIs and the implications of this. In particular, it shows the complexity in adopting and re-contextualising a communication device as an interpretative medium.

Chapter Seven. User Mobility and Actions in the Smartphone interpretative experience.

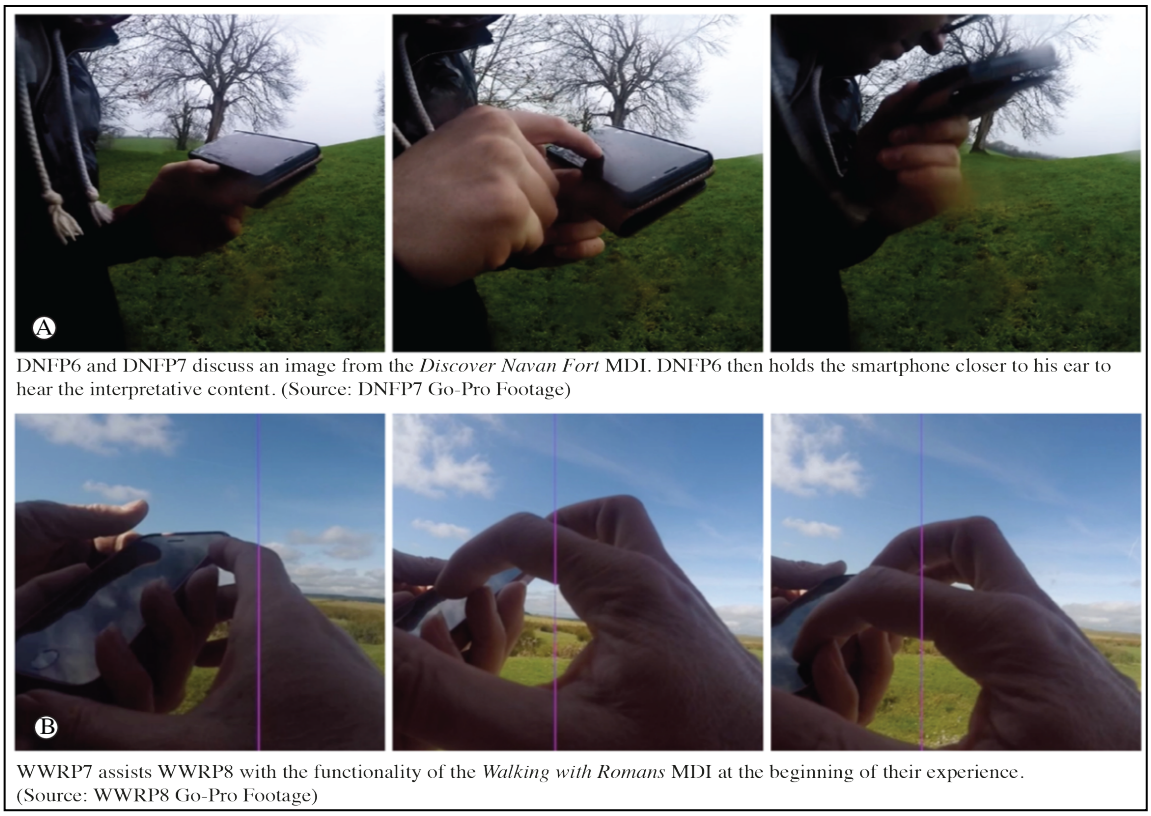
This chapter will explore the actions and behaviours of individuals in the hybridised heritage landscape, as a means to understanding the interplay between the various factors which make up the MDI heritage experience. The landscape in the MDI heritage experience can be understood as a hybridised landscape. This reflects the various landscapes beyond the physical that the individual occupies during their outdoor cultural heritage experience, such as the informational landscape presented through the smartphone MDI. In the heritage experience, the hybrid landscape is viewed by the user as a lived, dynamic field of potentiality (Flynn, 2008), incorporating the physicality of the landscape, the content of the MDI, and the users' previous experiences and spatial representations. While there are connections between the physical landscape and the informational MDI landscape (that is, aspects that feature in both landscapes (Section 7.3.1)), the hybrid heritage landscape is the domain of the individual. This landscape is negotiated by the user; the process of understanding, interpreting and acting in this hybridised landscape come from the individual and its social context. As Goffman (1972) makes clear, these actions and movements of the individual expose the implications of cultural production and social interactions. Action and movement are not simply venturing from point A to point B but a framework for interpreting social fabrics (Rashid and Bindajam, 2014).

The foundation for this chapter therefore, centres on mobilities. This is not simply the movements and actions of the user in the heritage landscape but the dynamisms which enable and are enabled by these actions. "The mobilities paradigm emphasises that all places are tied into at least thin networks of connections that stretch beyond each such place and mean that nowhere can be an `island'" (Sheller and Urry, 2006:209). The MDI heritage experience similarly cannot be regarded as an 'island' as the understanding of engagement and sense of place (Chapter 3) stresses the role and influence of the individuals' memory and past experiences in the heritage experience.

Building on the theoretical influences underpinning mobilities, outlined in studies such as Urry (2007), Sheller and Urry (2006), Cresswell (2010) and Hannam *et al.* (2006), the two primary influences in relation to this research are objects that move (such as the individual and the smartphone) and the role of the corporeal body as an affective vehicle. The movement

of objects is not only concerned with moving objects but the interconnected nature of the objects and how they influence each other (Creswell, 2010). This is addressed in all sections of this chapter, as it addresses the interconnections between the mobile individual and the portable smartphone interpretative medium. While the corporeal body and affect, relating to emotional geographies and place-making, correlates with the aforementioned understanding of engagement. As Sheller and Urry (2006:216) noted, it is "not only ways of getting as quickly as possible from A to B. Each means provides different experiences, performances, and affordances."

The smartphone, not only as a mobile object, but a communication device that has fostered strong connections in how people act and behave, plays a significant role in the mobility of the heritage experience. Primarily, smartphone devices and the media spaces they create can be regarded as places themselves (Ciolfi, 2004). This is justified by the conceptualisation of place by Harrison and Dourish (1996), Relph (1976) and Tuan (1977) who proposed that place is the location for complex social interactions to occur, which can constitute the virtual, media space as well as the physical. The mobile phone creates hybrid geographies (Berry and Hamilton, 2010) as the telecommunication infrastructure overlays private and public spaces, and as a result change the manner in which people perceive place and interact with each other



DNFP6 and DNFP7 discuss an image from the *Discover Navan Fort* MDI. DNFP6 then holds the smartphone closer to his ear to hear the interpretative content. (Source: DNFP7 Go-Pro Footage)

WWRP7 assists WWRP8 with the functionality of the *Walking with Romans* MDI at the beginning of their experience. (Source: WWRP8 Go-Pro Footage)

Figure 7. 1 Participants interact during their experiences

(Ito and Okabe, 2005) (Figure 7.1). Figure 7.1, for example, shows participants who completed the experience in pairs interacting with each other while discussing various elements within the MDI. Weight (2007) identified this phenomenon as hetero-technologies, because the mobile phone was able to insert different meanings to established understandings. This is noted in the adoption of the smartphone as an interpretative device in heritage landscapes.

In addition, smartphones and technologies are embedded in everyday life to such a degree that they are not only a place for complex social interaction or meaning making, but also a source from which meaning can be gathered (Hjorth *et al.*, 2012). This is noted in the adoption of the smartphone as an interpretative device in the heritage experience, the device is re-contextualised by the individual from their everyday exchanges to interacting with it as an interpretative medium. As the Social Construction of Technology (SCoT) model indicates, objects take on various meanings depending on the context in which they are used (see Bijker, 2009 and 2001, Klein and Kleinmann, 2002 and Fulk, 1993). The re-contextualisation is not clear cut however; behaviours, experiences and interactions with the device in the everyday still influence how the device is used in the heritage context. While looking at mobility and modernity in heritage and tourism, Staiff and Bushnell (2013) acknowledged that life, nature and technology are inseparable.

This chapter, therefore, will explore user's actions and behaviours on site, using the foundation of mobilities as a means to draw understanding through the various connections which exist in the MDI heritage experience. To do this, the chapter will take the form of three sections. Firstly, the discussion will centre on device co-presence in the heritage experience and users' movement (Section 7.1). This will address the role of the device in accentuating intangible cultural heritage elements and the impact this had on place-connections. In the adoption of the device in the mobility system of the user, a negotiation of priorities occurs, whereby the user makes decisions between practical components of the device (such as battery life) and access to the interpretative content. This access to interpretative content is explored further in Section 7.2, which relates to the interpretative points within the MDIs and the influence of their ordering on the mobility and experience of the user. In particular, it will look at the influence of authored linear narratives and the choices the user has in accessing the interpretative content. The final section of the chapter (Section 7.3) problematises the role of physical objects in the landscape and the impact of their inclusion or exclusion from the MDI.

This relates closely to the discussed understanding of moving objects in mobilities. The mobility of the user was influenced by the representation, or lack thereof, of objects in the material and virtual landscapes.

7.1 Movement in the Heritage Experience and device co-presence

In the interweaving of the individual experience the environment and the various networks which exist, the role of the MDI is a factor to be considered. It is a factor alluded to by DNFP1:

> You are on something and underneath that there was a whole Royal ceremony…I was standing on a massive piece of history, all that time ago these people built this thing underneath me…[you] put yourself in that place when all that was happening. To completely immerse yourself in it and when you do you really appreciate what you are walking on.

In this instance, interpretative content within the MDI supported the individuals felt connections while being present and mobile in the landscape. As reflected in the quote, DNFP1 acknowledged that the interpretative content helped them to appreciate what they were walking on. Human corporeality and felt connections were fostered through being present and mobile on the site with the MDI. The additional component of adopting a mobile device for the experience and the smartphone being co-present in the landscape creates new approaches to moving, acting and thinking. It reiterated Flynn's (2008) understanding of the body as the interpretative constraint and enabling condition, and also reflected the value in 'bringing the data [the individual] closer to the point of generation' (Fincham *et al.*, 2010:8) There was clear value in being in the landscape which is being interpreted. This will be discussed further in this section, with specific relation to the role of the MDI.

The presence of the smartphone was advantageous as it helped to accentuate and draw attention to intangible cultural heritage elements as the above statement by DNFP1 noted. CHTP2 using *Cumbrian Heritage Trails* on the Rydal coffin route also expressed this point:

> This was Dorothy's [Wordsworth] route as well on the way to Ambleside…This is on the back of the history of [William] Wordsworth using it as his favourite walk, the

> coffin story as well. Apparently, it is one of the ones he [William Wordsworth] would walk the most.

In this case the trail taken by the participant was the same route taken by the two main protagonists (William and Dorothy Wordsworth). The presence of the device in this instance supported the felt connections experienced by the user. Through being portable and present the device not only integrated with the mobility of the user but enhanced it by providing awareness of the parallels between the user's actions and the similar actions of William and Dorothy Wordsworth on the same trail. This was also achieved using a different form of interpretative content in *Walking with Romans*, where the use of sound effects to reflect the marching of the Roman Army as the individual also 'marched' along the same road (Section 6.2).

The portability of the device allows for the accommodation of interpretation into the mobility system of the user. Through the semantics of movement, the inter-play between the various components which make up the MDI experience became apparent. The actions of the individual are a response to the features (both tangible and intangible, physical and virtual) that they encounter and negotiate. As space becomes place when it is interacted with (Lentini and Decortis, 2010), movement serves as an expression of these interactions. Users' mind-set surrounding mobility in the heritage experience, reflects the associated nature of consciousness and space (Flynn, 2008), in which one shapes the other. Building upon the tension between the adoption of the technology and the leisure aspect of the experience (Section 5.3), as Ciolfi (2004) noted, the relationship between behaviour and environment is not a stimulus response mechanism but instead a process interweaving the structural properties of space and the individual's experience of it.

During the in-situ investigations and post-experience discussions, users echoed the importance of mobility (primarily walking) in their experience and reflected on the interweaving of their experiences and the structural properties of the landscape. The act of walking was significantly more than a physical activity: users addressed elements of human corporeality in relation to movement and what this meant for their individual heritage experience. When asked about their highlights of the experience, CHTP1 and CHTP2 using *Cumbrian Heritage Trails* for example, noted:

> CHTP1: I think if that walk up to Alcock Tarn wasn't there people would make a path to it.

> CHTP2: I can't complain about the walk, I don't have anything to say for the worst but the best? That walk in general.

Similarly, individuals using the *Walking with Romans* and *Discover Navan Fort*, acknowledged mobility and how it embodied the interweaving of the space and the individual experience. DNFP5 noted:

> I mean if I had a bad day at work I would go out there [Navan Fort] and dander [walk] around to clear my head, and it always seems to work.

WWRP1 and WWRP2 self-identified as being avid walkers. Speaking for both of them, WWRP1 mentioned:

> For us it is about getting out and getting on a route. We mostly just look at the OS maps, make a decision based on that and go.

When asked what WWRP1 and WWRP2 look for while identifying walks they acknowledged the importance of views, stating a preference for walks with peaks or ridges. Additionally, another important aspect for WWRP1 and WWRP2 was a sense of solitude while on the walk, noting a desire for routes which were not highly promoted or frequented.

The responses indicated the importance of mobility, movement and activity for users taking part in the experience and reflects the mobilities paradigm, the multiple and diverse connections including movement that are intangible; not secured to a place but in a fluid state (Urry, 2007). The responses shine a light on the presence of the MDI, that the smartphone interpretation is not the only motivating factor or ambition in the experience. The body in this context is therefore both an 'interpretational constraint and enabling condition' (Flynn, 2008:451), and acts in space as an interpretative and expressive device.

To support the contextualisation of mobility within the individual heritage experience, the manner in which the participant translated the structural properties of the landscape (such as

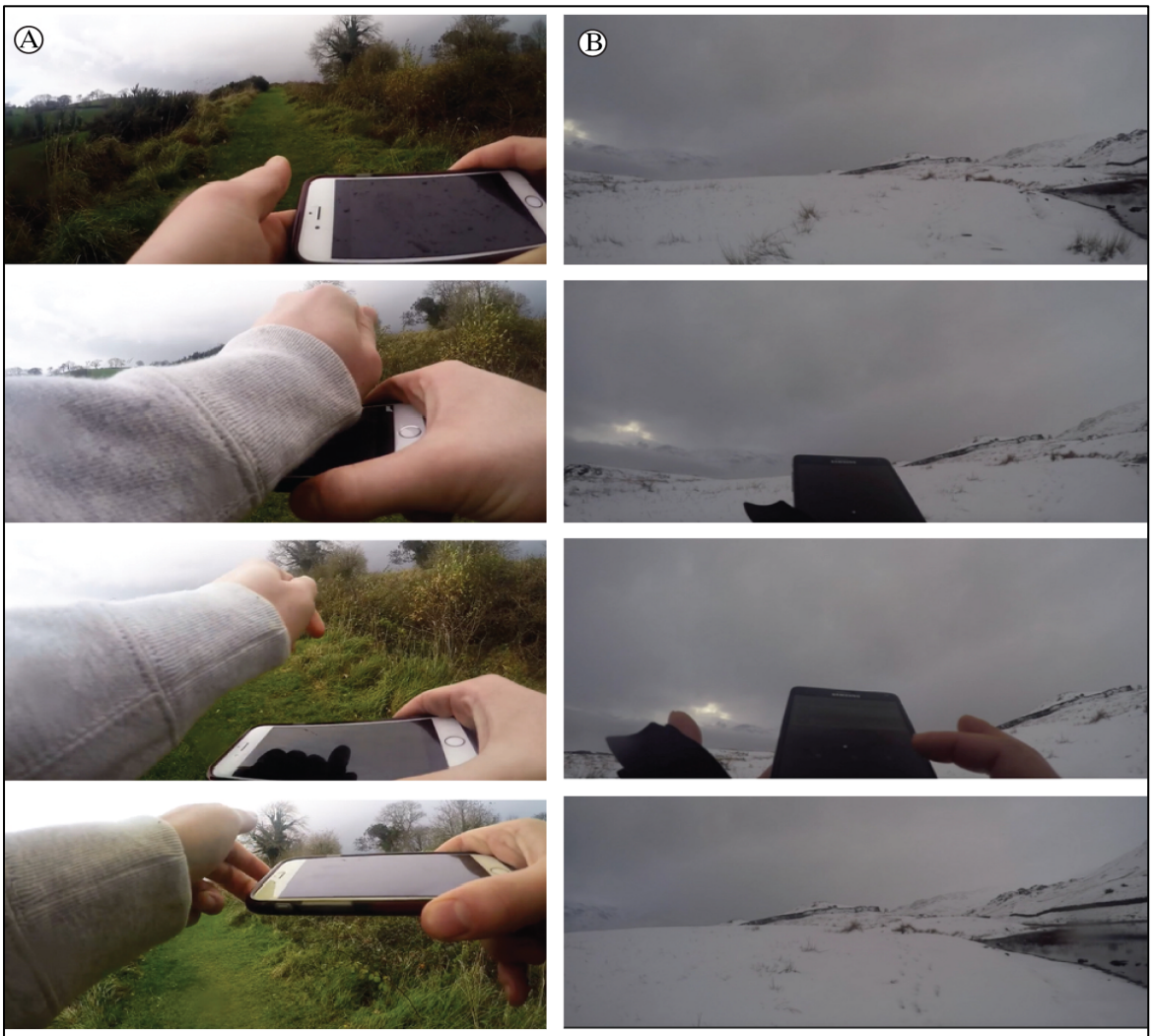
the terrain) s/he are moving through is also significant. The manner participants spoke about the terrain reflected the interweaving of their own experience and the material landscape. There were several distinct commonalities in the way participants spoke about the various sites despite their geographical differences, variation in MDI approaches, and the interpretative themes addressed at each location. Terminology, such as that relating to the 'great views' and the ruggedness of the landscape for example, was common across the three sites. This highlights the significance of the environment in the individual experience and behaviour. Furthermore, it is supported through the use of more emotive terms such as 'beautiful' (*Cumbrian Heritage Trails* and *Walking with Romans*) or 'sacred or spiritual' (*Walking with Romans* and *Discover Navan Fort*), which indicates place connections and felt connections by the participants.

In relation to environment and terrain responses, a nodal element of this is the influence of weather conditions and seasonality. McGookin *et al.* (2017) discuss seasonal content in mobile interpretation and raise an important point surrounding specific content in relation the season it is being accessed in. Over the course of the in-situ investigations for example, there was a variety of weather conditions (Figure 7.2a and 7.2b) that influenced mobility and behaviour on site. Moreover, the conditions influenced the user's interaction with the device and environment. Individuals using the *Discover Navan Fort* MDI on site for example had to contend with occasional high winds and rain. As a result, they were observed holding the device closer to their ear to hear the interpretative content clearly, or cleaning rain droplets from the screen (Figure 7.3a). Participants also noted that they cut short their visit due to the weather conditions (DNF3, DNFP4, DNFP5, DNFP6 & DNFP7), with DNFP5 stating as they summarised their experience:

> It was nice, it would be a lovely spot especially in nice weather, you know going for a walk?

In the same manner that the individuals remarked the importance of the 'great views' in their experience, the weather conditions also influence behaviour and responses on site (Figure 7.2). These responses are both tangible, in how long the individual partook in the in-situ experience, and intangible, in how the individual framed their experience as a response to the weather. DNFP5's statement reflected this intangible, felt connection as the participant

indicates the value of the experience would be greater if the weather conditions were more favourable.



DNFP4 wipes raindrops of the screen during their experience at Navan Fort using *Discover Navan Fort*.

CHTP7 using *Cumbrian Heritage Trails* on their smartphone during snowfall at Alcock Tarn.

Figure 7. 2 Responding to weather conditions: A. (Left) Rainfall at Navan Fort; B. (Right) Snowfall at Alcock Tarn

As a result of the role the device played with accentuating the intangible elements of the heritage experience, and the challenges of the landscape and seasonality, a factor which permeated the experience was user's practical concerns relating to the device. CHTP8, for example, expressed concern regarding phone signal following a previous experience with a smartphone in a similar context:

> I couldn't get signal, I couldn't get the App to work. I think it wasn't an actual App but it was sort of set of webpages, so you needed 3G internet and I couldn't get that, so I spent most of the walk just fussing about the smartphone.

Similarly, DNFP6, using *Discover Navan Fort*, and WWRP4, using *Walking with Romans*, stated common concerns regarding the adoption of the smartphone which were reflective of sentiments expressed by participants across the investigation sites:

> DNFP6: The main one is data usage, especially something with videos. I imagine it is going to take quite a bit depending on [mobile data] contracts and things like that you know?
>
> WWRP4: The fear is, especially in places like this, is that the battery on your phone or something will not last and then what do you do.

As the responses from participants reveal, the primary concerns centre on phone connectivity, data usage and battery life. It should be noted that such factors were also identified by developers across all the in-situ investigation sites and actions were taken to try and ensure that these would not impact on the experience. *Cumbrian Heritage Trails* for example had information regarding this in the 'Before you go…' section of the application:

> Some of our trails may take you to areas with little or no phone signal, making it difficult to use the map to navigate or download images. To combat this, we suggest you preload the map and images, so they are available offline.
>
> Using location services and GPS can have a significant impact on a device's battery life, so it's important to use them in the most efficient manner possible. Please ensure you leave enough power to make an emergency call, should you need to.

Therefore, despite measures being taken by the developers to try and ensure such issues were unlikely to impact on the users' experience and also individuals citing their close familiarity to their device (thus being aware of its capabilities), an apparent anxiety still existed in relation to these issues in the context of the experience. The co-presence of the device, and the role of mobility in the experience brought challenges for the individual user as there was the need to negotiate between a series of competing priorities. These priorities include for example the smartphone as the source of interpretation but also the security it provided to the user during the experience. Therefore, battery life was a concern to the user when the device was adopted as an interpretative medium and additionally a guide through the landscape. The

connectivity and phone signal acted in the same regard as battery life but there was also the additional component of non-visible infrastructure in the experience. This is reflected in the users negotiating between walking to certain locations under the pretence of obtaining interpretative information only to be denied by the lack of signal to access it when at the location.

This negotiation of priorities coincided with enhanced device dependency, which emerged from the device being the more familiar element in the experience. The outdoor cultural heritage landscape was unfamiliar to the users in most cases, varying considerably from the everyday environments in which they use their smartphone. In an attempt to overcome this unfamiliarity, users demonstrated enhanced dependency and reliance on the device, which in turn focused greater attention on the capabilities of the device, such as battery life and connectivity. The user viewed the smartphone as the means for unlocking an understanding, both of the physical space they are occupying and also as a heritage experience. While studies undertaken by Gutierrez *et al.* (2010) and Nagata *et al.* (2016) in relation to Mobile Pedestrian Navigation (MPN) tools highlighted the ability of users to re-contextualise their use of technology, the same ability was not realised by participants in this research. The co-presence of the device in the unfamiliar context (an outdoor cultural heritage landscape) fostered an anxiety and apprehension for users which was manifested in enhanced device dependency.

7.2 The Peripatetic MDI Experience and the Ordering of Interpretative points

This section will address action and behaviour of in-situ users, focusing on the nature of the MDI experience which can be regarded as peripatetic. The term peripatetic, which emerged from the Aristotelian practice of walking and teaching (Mayhew *et al.*, 2011), aptly reflects both the physical and interpretative journey of the in-situ MDI user. The heritage experience is not formed solely in the moments of interaction with a series of objects, whether real (physical objects in the landscape) or virtual (interpretation points on the MDI), but instead is a cumulative and holistic process. The basis for the heritage experience is the series of interactions, the movement from location to location, or object to object. This reflects the understanding of sense of place (See Chapter 3), in as much that sense of place resides in the human interpretation of a setting which is constructed through experience with it (Stedman, 2003).

The manner in which the individual moves through and experiences the heritage landscape is axiomatic in many respects to the museum experience, particularly performative museology (Kirshenbatt-Gimblett, 2000). The performative museology approach echoes the peripatetic nature of MDI heritage experience, through its shift beyond a collection of objects to account for the social and corporeal practices which occur in the space (Leahy, 2012). Although this approach has shifted the focus from the object to the individual, and addresses a more holistic understanding of the experience, these spaces (heritage landscapes or museums) are still spaces constructed by the relevant stakeholders. In the MDI experience, the construction of space is made most apparent in the ordering of interpretative points. The way in which the respective MDI stakeholders develop the interpretative points within the MDI cultivates suggested ways of seeing and experiencing the landscape. Through controlling movement, manipulating space and controlling fields of vision (MacLeod, Hank and Hale, 2012; MacDonald, 1997) the MDIs can convey and promote certain meanings (Jordan and Weedon, 1995).

Founded on the understanding that the experience is a peripatetic process, the ordering of the interpretative points, be they in a pre-defined order or not, plays a significant role in the formation of the individual experience. As Meyrowitz (1985:36) stated, "it is not the physical setting itself that determines the nature of the interaction, but the patterns of information flow". It is therefore, not solely the manner in which individuals are navigated through the space by the MDI which influences their experience, but also how they are navigated through the information itself (Galani and Chambers, 2004).

Cumbrian Heritage Trails and *Walking with Romans* adopted a defined series of interpretative points, creating an authored linear narrative with the user following a trail consisting of a progressive series of interpretative points (Figure 7.3). A key benefit of this approach is that it allows the visitor to understand the heritage interpretation of the landscape through arranging a disjointed set of objects or locations into a curated, coherent whole (Suh *et al*., 2009). In contrast, *Discover Navan Fort* used a non-defined arrangement of interpretative points, consisting of 12 interpretative points located throughout the large circular site, with no defined ordering to the points (Figure 7.4). Both approaches to interpretation points must be considered within the context of the experience and the affordances acting upon it. These affordances are both internal, reflecting the use of the smartphone, and external, such as the role of the physical landscape.

Figure 7. 3 Linear Trail of the Rydal Coffin Rydal, Cumbrian Heritage Trails

Figure 7. 4 Interpretative points on the Discover Navan Fort MDI

The physicality of the outdoor heritage landscape also acted as an affordance upon the narrative structure, and shaped the linear narrative approach witnessed in both *Walking with Romans* and *Cumbrian Heritage Trails* (see Dovey and Kennedy, 2006). The materiality of the landscape influenced how the narrative was expressed within the MDI. The two trails within *Cumbrian Heritage Trails* used by participants (the Alcock Tarn and the Rydal Coffin Path) followed well defined trails that already existed and were commonly traversed by visitors (Cowton 2016, pers. comm., 28th Apr.) (Figure 7.5). Similarly, the *Walking with Romans* application with numbered interpretative points, made use of an existing trail, centring on the straight Roman Road and incorporating elements such as the raised parameter of the Yu Pigwn fort (Figure 7.6). The structure of the interpretative points not only responded to the material landscape but aligned with the interpretative theme which revolves around the Roman Road. The act of walking the road is a pivotal component of the desired experience. The presence of existing trails as a basis for the MDI experience with *Cumbrian*

Heritage Trails and *Walking with Romans* aided the sequential approach to the structuring of interpretative points, especially as many of the interpretative points centred on physical aspects of the landscape (such as the 'Penny Tree' in *Cumbrian Heritage Trails*).

Figure 7. 5 The trail of the Rydal Coffin path, part of the Cumbrian Heritage Trails. CHTP5, Go-Pro Footage

Figure 7. 6 The Roman Road on the Brecon Beacons National Park landscape. WWRP2, Go-Pro Footage

Although not in the same manner as *Walking with Romans* and *Cumbrian Heritage Trails*, the physical landscape was an affordance acting on the *Discover Navan Fort* MDI. Several of the *Discover Navan Fort* interpretative points were positioned at locations which were also prominent in the landscape, such as large and small mounds or along the not clearly defined paths (paths on the site that are identified as being areas of cut grass) (Figure 7.7).

Figure 7. 7 The landscape at Navan Fort, showing the large mound and paths

The location of the interpretative points in relation to physical features on the landscape indicate the role of the physical space on the narrative structure, but the circular and enclosed nature of the site illustrates this even further. Aintaine O'Donnaile (2015), responsible for the media in *Discover Navan Fort*, acknowledged that the rationalisation for the approach was based on the shape of the enclosure and the mobility of user within it. O'Donnaile (2015, pers. comm., 10th Nov.) stated in relation to the interpretative points:

> There is no order to it [*Discover Navan Fort* Interpretative Points], you don't need to do it in any particular order, but you do have to go to certain locations according to the map to unlock it.

The fact that the *Discover Navan Fort* interpretation points were developed to be stand-alone enables the user to create a unique on-site experience in the formation of their interpretation narrative. The user has the choice of which points to visit, which interpretative content to unlock and in which order to do so. The individual is not confined in the experience in relation to movement by the requirement to activate the content in a predetermined order. In comparison to the ordering of interpretative points the individual in this approach can take a more active role in the construction of the narrative. Toolan (2001) recognises this narrative approach as 'active narrative nodes', reflecting the choice the user has in the interpretative points and the order in which to do so, while Galani *et al.* (2013) also outlined the benefit of modular content that removed the interdependencies of linear narrative. As O'Donnaile

(2015, pers. comm., 10th Nov.) stated, ‘there is no particular order to the interpretative points’, but all the interpretative points centre on the heritage of the site (Navan Fort). This approach is not native to MDIs or mobile interpretations as Copplestone and Dunne (2017) noted that in “traditional heritage galleries”, discrete narrative sections are presented around a central theme.

While the modular approach may be theoretically advantageous (Copplestone and Dunne, 2017; Bembeneck, 2013; Toolan, 2001) and also a consequence of the environment (O’Donnaile 2015, pers. comm., 10th Nov.), the lack of structure was unsettling for some users during the in-situ investigations.

> DNFP2: I think at the start it could have said… it was good the guy welcomed you, but I think he could have said there you know along the lines of 'take whatever path you want' or something.

A caveat of the MDI which is likely to accentuate users being unsettled was that the MDI did not give any information on the theme of each interpretative point within the application (Figure 7.4). The responses and trails taken by participants over the course of the experience illustrate this point (Figure 7.8, the interpretative points have been labelled alphabetically to aid discussion). The intricate network of paths overlaid upon each other highlights the variation in movement patterns between the 12 interpretative points at Navan Fort. The ‘Start’ (A), situated at the immediate entrance, is the only point which was unlocked in the same order by all participants. This interpretative point welcomes visitors to the site but does not give indication of a suggested route or information on the interpretative content positioned throughout the site, as DNFP2 noted. The result was that individuals had limited information to determine the elements of their interpretative experience. The lack of information was an aspect commonly addressed by participants, post-experience:

> DNFP1: I find it quite good, but I find it quite hard with the direction thing, they [interpretative points] really should be numbered. You spend a lot of time looking around and it looks good on the screen but I'm in a field.

DNFP8: My first and most important thought is you do really need to be given a sequence to go around this spot. The second is that some of the spots are in the middle of nowhere which seems a little bit peculiar.

Similarly, the omission of information on the theme of each interpretation point was recognised by participants. DNFP6 and DNFP7 noted this when discussing their thoughts on improvements to the experience:

DNFP6: I think if you were able to tap into [*Discover Navan Fort*] and say pick your topic you could go in and get another window to find out more information about it.

DNFP7: Plus, we didn't have time to do them all but if I was told what each of the stops was about I might have decided what I wanted to see.

Furthermore, with each interpretative point being stand-alone underneath a broader interpretative arc (the heritage of Navan Fort), the lived experience of participants suggests that a more structured approach to the narrative would have been advantageous from an interpretative narrative viewpoint. The variability in unlocking the interpretative points prevented the formation of a coherent interpretative narrative for some individuals. For example, the stops entitled 'Navan Fort Ditch and Enclosure' (B), 'Figure of Eight Buildings' (G) and 'Navan Fort in Literature' (C) provide contextual information regarding the site, which participants believed would be advantageous at the beginning of the experience to provide a foundation for the user to consider using (Figure 7.8). The aforementioned interpretative points (B, C & G) were the final points unlocked by DNFP8 which meant that their immediate on-site response to those interpretative points was as follows:

Interpretative Point 7 for the user-
[Interpretative Video 'Figure of 8 Buildings' (Point G) plays]
DNFP8: It would have made more sense to have learned that at the beginning than a bit late! Alright let's go down this way.

Interpretative Point 8 for the user-
[Interpretative Video 'Navan Fort in Literature' (Point C) plays]

Interpretative Points:

- (A) Start
- (B) Navan Fort Ditch and Enclosure
- (C) Navan Fort in Literature
- (D) Mythology
- (E) Celtic Heritage
- (F) Ring Barrow
- (G) Figure of Eight Buildings
- (H) Haughey's Fort and Kings Stable
- (I) Navan Fort Mound
- (J) Iron-Age Wooden Building and Mound
- (K) Protecting Navan Fort
- (L) Loughnashade

Stop Order:

	1	2	3	4	5	6	7	8	9	10	11	12
DNFP1	A	B	G	H	I	J	K	L	F	C	D	E
DNFP2	A	B	H	I	F	J	K	L	E	D	G	C
DNFP3&4	A	B	C	G	F	I						
DNFP5	A	C	J	L	K	F	D	I				
DNFP6&7	A	F	K	L	J	I	G	H	B			
DNFP8	A	D	E	K	L	J	I	G	C	B		

Figure 7. 8 Participant routes at Navan Fort

> DNFP8: Yes, clearly, I've gone around this in the wrong direction {laughs} which is interesting in itself because not given the clue as to which way round you should go!

The perceived freedom of the experience through the approach must be weighed against the effectiveness of the interpretative points being capable of providing an overall coherent narrative. As Copplestone and Dunne (2017) noted, building on the work of Barthes (1978), narrative structure is not focused on individual components but the inter-relationships between each section.

The ordering of interpretative points, one succeeding the other, in *Cumbrian Heritage Trails* and *Walking with Rom*ans appeared logical and straightforward to interpret for user in comparison to *Discover Navan Fort*. The authored linear narrative and sequential ordering of points was something that users were expecting of their heritage experience (CHTP1, CHTP2, CHTP5, CHTP7, WWRP2, WWRP6, WWRP7 & WWRP8); as CHTP5 stated, "it did what you expect, I suppose". *Cumbrian Heritage Trails* and *Walking with Romans* corresponded with the individuals' previous heritage experiences by being digitally mimetic to older media forms (Bounie *et al*., 2013). Although the experience broadly matched the individuals' expectations of the experience, expressions of ambivalent feelings towards the MDI were also apparent, revealed expressed through the 'I suppose' by CHTP5.

A sense of apathy was also reflected in behaviours towards the device, most notably the lack of interaction with the interpretative content. These sentiments towards the MDI stemmed from the digitally mimetic approach adopted by the developers and the user's desire for 'something different' or 'something more' (CHTP7) from the experience as a result of the medium being used. The apparent affordances of the device were not reflected in the MDI experience. Others within the museum and heritage sector have acknowledged this tension in the narrative structure of digital experiences. Parry (2007) recognised the digitally mimetic practice and that, despite the adoption of interactive technologies (such as smartphones) and their creative or multimedia capabilities, narrative structures have remained relative linear and dependent on the approaches which have gone before.

The ordering of interpretative points in *Cumbrian Heritage Trails* and *Walking with Romans* reflected Hayles (2008) understanding of passive media. It aligns with passive media as it required little effort for the individual to access the interpretative content and additionally the

user has no potential to partake in constructing the narrative. Where it diverges however, is the consideration for walking as an activity and the peripatetic nature of the experience. Although the narrative only comes alive through the individual walking through the landscape and engaging with it, the users' involvement in the construction of the narrative does not go beyond this. The active nature of the media ends at the point of activation, the narrative structure or content are not influenced by the individual beyond this point.

The insights derived from observances of the non-sequential approach at Navan Fort also highlighted the complex interactions between the individual, the device and the landscape in the MDI experience. The movement of users through the site and their lived experience was the culmination of their negotiation between the MDI and the landscape. Additionally, a design decision to not include the titles of interpretative points within the navigation of the MDI highlights the influence of stakeholder decisions, and more broadly the affordances of the smartphone, can have on the lived experience of the individual.

7.3 User orientation and the presence of objects in the landscape

The concluding section of this chapter is concerned specifically with user orientation and the presence of objects in the landscape. How the user orientates themselves and spatially interprets the landscape, reflects the role the physical environment plays in the experience. As noted throughout this study, the environment in the heritage experience is pivotal: "Place and space surround us. They help constitute our actions and they constrain and enable us" (Sack, 1997: 60) (see Chapter 3 on the understanding of sense of place). There is the added caveat in this instance however, that an MDI is incorporated into the spatialisation and orientation process.

MDIs in the outdoor heritage context conventionally incorporate an element which caters for the spatial awareness and orientation of visitors. Mobility through the site and locating various points of interest are a common framework in the MDI heritage experience (Sections 7.1 and 7.2). To achieve this, orientation and spatial awareness are assisted through the integration of a navigational component, which can take various forms. Across the three in-situ investigation sites for example, these forms included an interactive map (Figure 7.9A), verbal prompts or written directions (Figure 7.9B).

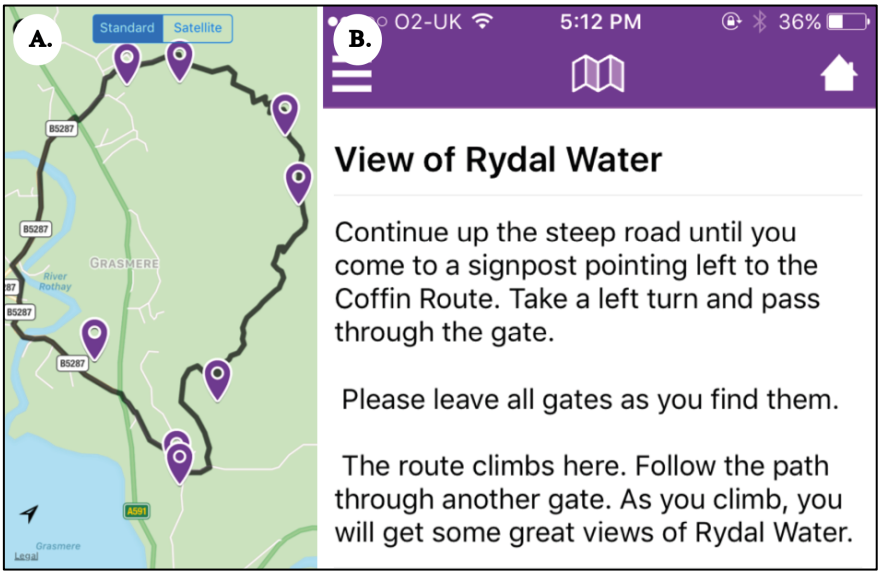


Figure 7. 9A (Left) Interactive mapping element in Cumbrian Heritage Trials; B (Right) Example of the textual directions in Cumbrian Heritage Trails

The orientation of the user in the landscape plays much more than a practical role in the experience, as according to Ambrose and Paine (2006: 43), orientation helps to place the visitor in a 'calm, receptive mood'. It is this psychological component to orientation and spatial awareness which is of particular interest, as it addresses the empathetic and effective components of the experience. Ambrose and Paine (2006) for example, referencing the museological context, acknowledged the importance of an 'entrance hall' which orientated the visitor both physically and psychologically through their visit, acting as a bridging point between the everyday experience and the museum experience. The lack of a clear physical bridging point between the everyday and the heritage spaces (Section 5.3), as a result of using their own smartphone, provided unique challenges in psychologically orientating the visitor in the experience.

Physical objects in the landscape accentuated the significance of the dialogue between the device and the landscape on the users' experience. The orientation of users in-situ related closely to the posturing towards material objects in the landscape. The users' experience varied depending on whether these objects were also incorporated into the MDI or not. As a result of using an MDI, orientation also had to occur in the virtual landscape of the MDI as well as the physical. The orientation of the user was assisted when there was cohesion between the landscape and the MDI, through the objects also being present in the virtual MDI landscape. The synergy between these facets (objects present in the landscape and also represented in the MDI) was a positive outcome in relation to the spatial awareness and

orientation of the user. Posturing towards objects in the landscape was deemed by Flynn (2008:499) as central to the meaning-making process, claiming that the "tactile apprehension of rocks and artefacts are processes for producing spatialized understandings".

The 'Invalid Pool' on the Alcock Tarn Loop with the *Cumbrian Heritage Trails* application (Figure 7.10) illustrates the influence of the cohesion between the physical objects and representation within the MDI. The stop is approximately 680 metres from the previous interpretative point ('The Forest Floor') and occurred on average 13 minutes after the 'Forest Floor' interpretative point. The user traverses the landscape, ascending to Alcock Tarn (after which the trail is named) to approach the Invalid Pool. The feature acts as a beacon on the landscape for the user. Given the uniqueness of the feature and the lack of similar elements

Figure 7. 10 The Invalid Pool on the Alcock Tarn Loop, Cumbrian Heritage Trails. CHTP8 Go-Pro Footage

prior to this in the experience, the Invalid Pool captured the attention and piqued the curiosity of participants. The interpretative content relating to the Invalid Pool within the MDI was effective as it responded to the user's curiosity surrounding the feature, which predominantly centred on how the feature came to be in the landscape. The cooperative nature of the relationship between the features and the MDI was positive: while the interpretative content assisted in the individual's understanding of the feature, in turn the feature also helped make

clear the worth of the MDI, showing it to be a means of unlocking an understanding of the landscape.

When the object is only represented in either the landscape or the MDI there is also a noticeable effect on the individual's experience. At Navan Fort, the Prayer Tree (Figure 7.11), for example, was not incorporated into *Discover Navan Fort*. Prayer trees are an ancient tradition in the UK and Ireland, believed to be from pagan times, whereby pieces of cloth or other small artefacts are affixed to the branches of a tree as a physical representation of the prayer or wish (see Simon (2000) on tree traditions and folklore in North-East Ireland).

Figure 7. 11 The Prayer Tree at Navan Fort. DNFP3 Go-Pro Footage

The same behaviour and processes that prompted the users to stop at the 'Invalid Pool' in the *Cumbrian Heritage Trail* were present at Navan Fort. The physical feature of the Prayer Tree acted as a beacon on the landscape, attracting the user's attention and piquing their curiosity was also evident although a different conclusion was reached in these instances, as the features were not incorporated into the MDI. Figure 7.12 shows one participant's interaction with the Prayer Tree, highlighting the user's curiosity about the feature and a missed opportunity in the interpretation to address it.

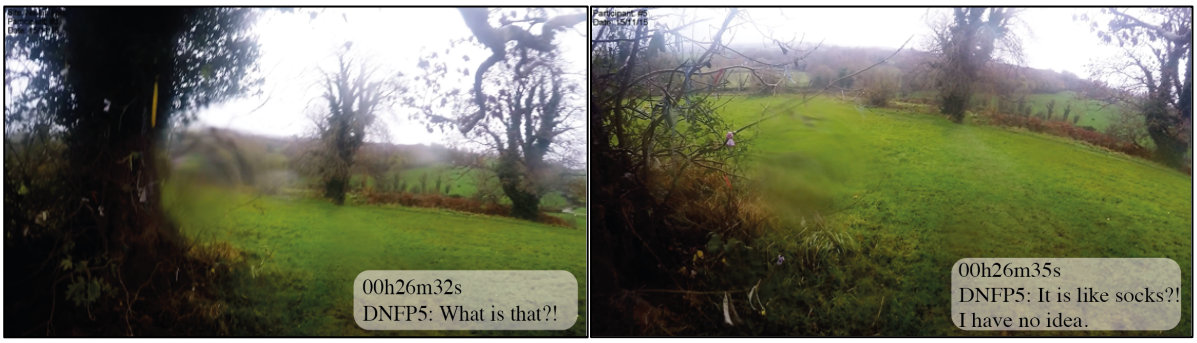


Figure 7. 12 DNFP5 responds to the fabric attached to the Prayer Tree at Navan Fort

The material presence of the Prayer Tree prompted specific movement patterns in the space, as users gravitated towards it. However, this conflicted with the user's movement through the virtual landscape which had omitted the Prayer Tree. The lack of continuity between the physical and virtual landscapes was made clear by such instances.

The presence of physical features as a visual trigger for interpretative content also raised the role of GPS technology as a non-visual method of orientating the user. GPS is an element which draws links between the physical and virtual landscapes and was incorporated into all the MDIs that form part of this research. A navigational component was a prominent expectation of users across the various sites (DNFP1, DNFP2, DNFP3, DNFP5, DNFP6, DNFP7, CHTP1, CHTP2, CHTP3, CHTP6, CHTP8, WWRP1, WWRP2, WWRP3, WWRP5, WWRP8), reflecting the role of the MDI not only as an interpretative platform but a tool for orientating and way-finding. As a method of way-finding and orientation, the GPS presented the users with a representation of their location in relation to the site and the virtual interpretative points within it. Offered in the form of an ego-centric map, the user could track and plan their movements, both in relation to the site but also between the interpretative points. One of the benefits of this approach is the low barrier of entry for users. As Pfeifer *et al.* (2009) noted, the location of triggered content provides the technophobic visitor with a complete tour without the requirement of interaction with the device. The core functionality of the ego-centric map, which tracked the user's location through GPS, was a continuation of mapping practices that have become standard in smartphone devices such as Google Maps, and was therefore easily comprehended by users (Dickinson *et al.*, 2014 and Samet *et al.*, 2012).

While users were familiar with the GPS component, a limitation of the approach as a method for bridging the virtual and physical landscapes emerged through the accuracy of the GPS.

When a physical feature of the landscape coincided with the interpretative point on the MDI that the GPS was navigating the user towards, the requirement for accuracy was not as pronounced. However, with a lack of a physical feature to serve as the beacon the experience with the GPS component was less effective.

Figure 7.13, for example, shows the location of several interpretative points within *Walking with Romans* along with the routes taken by WWRP1, WWRP3 and WWRP5. After interpretative point 5 ('Head up the Hill') the user leaves the straight Roman road, which they had been following since the beginning of the experience, to navigate towards point 6 ('Making Camp'). While points 1-5 were easily distinguishable as being at different points along the Roman Road, point 6 required the user to be dependent on the GPS element as they went off the road and onto the pasture (Figure 7.6) in search of point 6, which was not associated with a physical feature on the landscape. The irregular routes taken by participants between interpretative point 5 ('Head up the Hill') and interpretative point 6 ('Making Camp') (Figure 7.13), highlights the difficulty users had in trying to locate the interpretative point while relying on the GPS component and without a physical feature for assistance. The disparity between the user paths between these interpretative points (Figure 7.13, Points 5 and 6) and the relatively uniform spatial patterns of points that were associated with the materiality of the Roman Road (i.e. Point 2 ('Size and Composition of Legion') and Point 3 ('Why were the Romans here in 70AD?')) further accentuates the role of physical features to assist in the way-finding process.

The difficulty in orientating towards points was a result, not just the lack of an associated material feature in the landscape, but the relative inaccuracy of smartphone GPS. The GPS element alone was not reliable enough for users' spatial awareness in the landscape, as according to Zandbergen (2008) 8m is the median error, while other studies indicate a range varying from approximately 5-10m (US Gov., 2017; Miller, 2012; Von Watzdorf and Michahelles, 2010). Referring to Figure 7.13 and also Figure 7.14, focusing on points 5 ('Head up the Hill'), 6 ('Making Camp') and 12 ('Back on the Roman Road'), the close proximity of these points coincided with the inaccuracy of the GPS resulted in the triggering of the incorrect interpretative point. In several instances the user would receive a notification that they had reached point 12 ('Back on the Roman Road'), given the close proximity of the points, despite their previous interpretative content being at point 4 ('Why Build a Marching Camp?'). This highlights the benefit of what Pfeifer *et al.* (2009) describe as context-aware

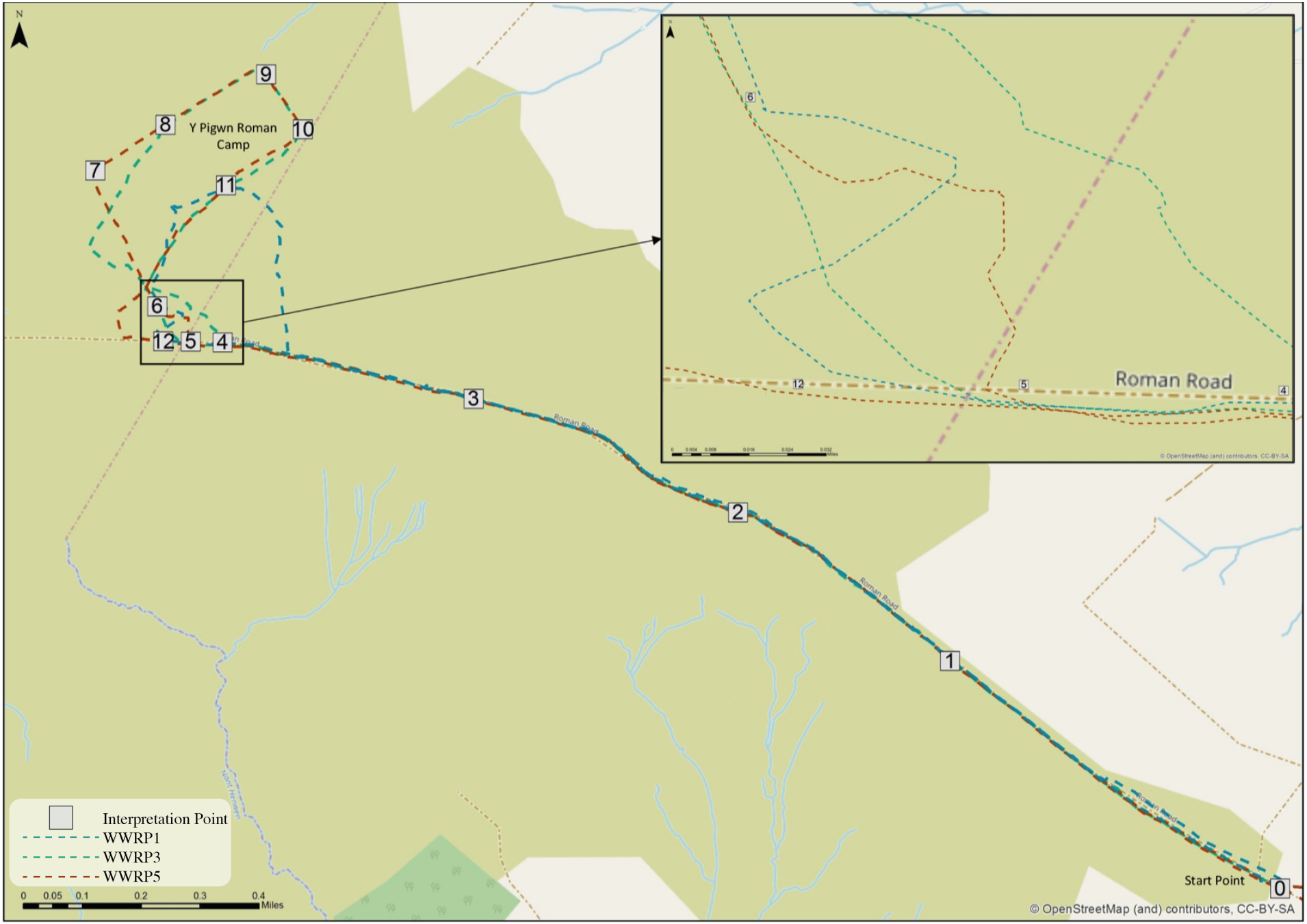


Figure 7. 13 Movement patterns of WWRP1, W1WRP3 and WWRP5 using Walking with Romans

computing, after they observed similar difficulties in the *Colloden Battlefield* MDI. To mitigate the potential for the visitor to not fully benefit from the narrative, due to the inaccuracy of the GPS and thus receive interpretative content out of sequence, the *Culloden Battlefield* MDI was more contextually aware, basing triggers not only on location, but also on the last piece of interpretation the visitor received (Pfeifer *et al.,* 2009).

The requirement for the MDIs to be more context-aware was also expressed through orientation at the interpretative point. While the MDI may help navigate the user to the interpretative point, they may not be orientated in the correct direction whilst there. In instances where the interpretative content related to physical features in the landscape this was not an issue for users, however with *Discover Navan Fort* many of the interpretative points discuss features in the distance (Figure 7.15). The consequence of this is that the user was unable to identify the correct direction, despite being in the correct location. The individual could orientate to the interpretative point, but as the point addressed aspects not in the immediate vicinity or clearly visible the participant struggled to identify the exact aspect

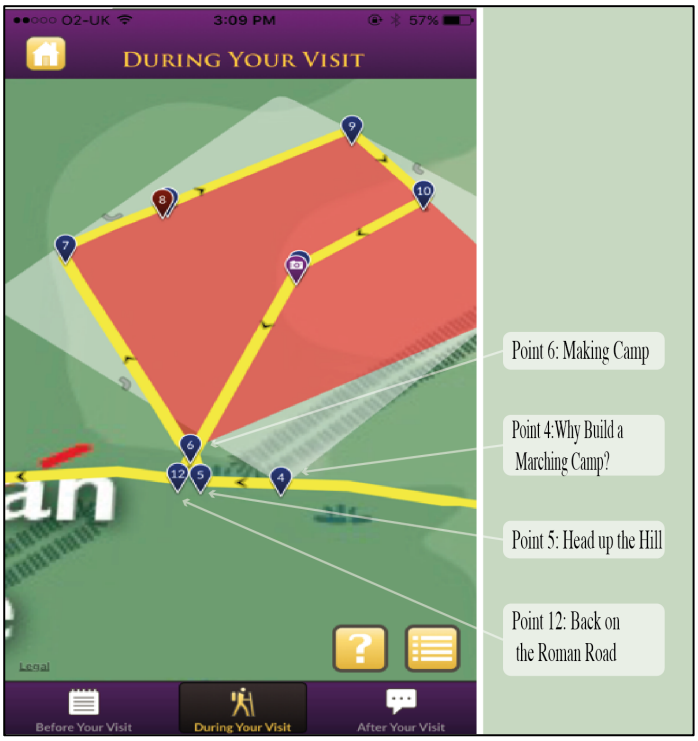


Figure 7. 14 The location of interpretative points on the Walking with Romans MDI, showing the close proximity of points 5,6 and 12

being discussed (Figure 7.15). The interactive map within the application assisted the user in reaching the locations which had interpretative points, but the ego-centric map, using the device's GPS did not include the capability for further orientation. As a result, participants were confused by references within the interpretative videos to certain directions (North, East, South and West etc.) when they did not know the direction they were currently facing. Suh *et al.* (2009) identified this issue with mapping components within mobile phone guides for cultural heritage, concluding that "it may not provide the best interaction for helping users understand their location" (Suh *et al*., 2009:13).

The lack of coherent correspondence between the MDI and the physical landscape resulted in dislocation from participants, such as circling and moving around an interpretative point with the ambition of trying to trigger it or facing in the wrong direction to the feature being discussed in the interpretation. Requiring the user to perform in such a manner strained the relationship with the MDI and fostered sentiment that is not conductive to engagement. Participants noted feelings of frustration for example with the MDI because of this practice, evoking emotional responses which do not align with positive place connections. This highlights the importance of effective correspondence between the device and the landscape given the implications it has on the users' in-situ actions, behaviours and subsequent experience.

Advancing the discussion around the impact of effective correspondence between the landscape and the MDI, and the impact on individual engagement, the interpretation panels at Navan Fort present an interesting case. The interpretation panels on the site had no formal connection to the application and were developed by the Northern Ireland Environment Agency (NIEA). Similarly, NIEA had no input into the *Discover Navan Fort* application. The interpretation panels prompted the same responses to physical objects on the landscape except there was the added complication in that the panels were also an interpretative medium (Figure 7.16). The presence of two forms of interpretation, created further caveats to the MDI experience, as the application was functioning within a 'hybrid (digital) ecology' (Galani *et al.,* 2013), reflecting the various media individuals adopt as part of their experience (Crabtree and Rodden (2008)). This stresses the importance of contextualising the MDI within the broader heritage experience. As McCabe and Foster (2006) noted, the effectiveness of the heritage experience is dependent on the lived user experience.

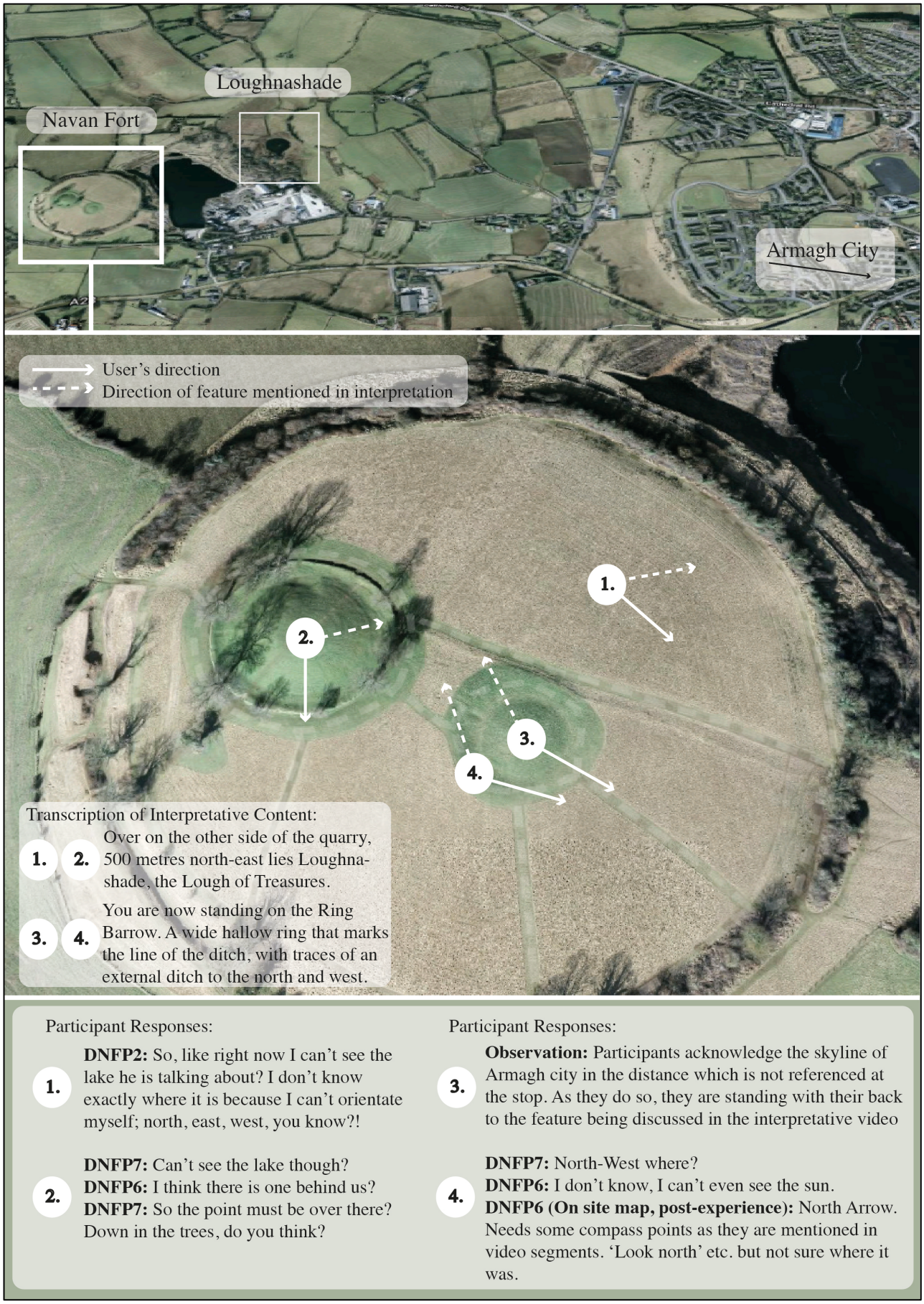


Figure 7. 15 Examples of participant orientation at various points with Discover Navan Fort

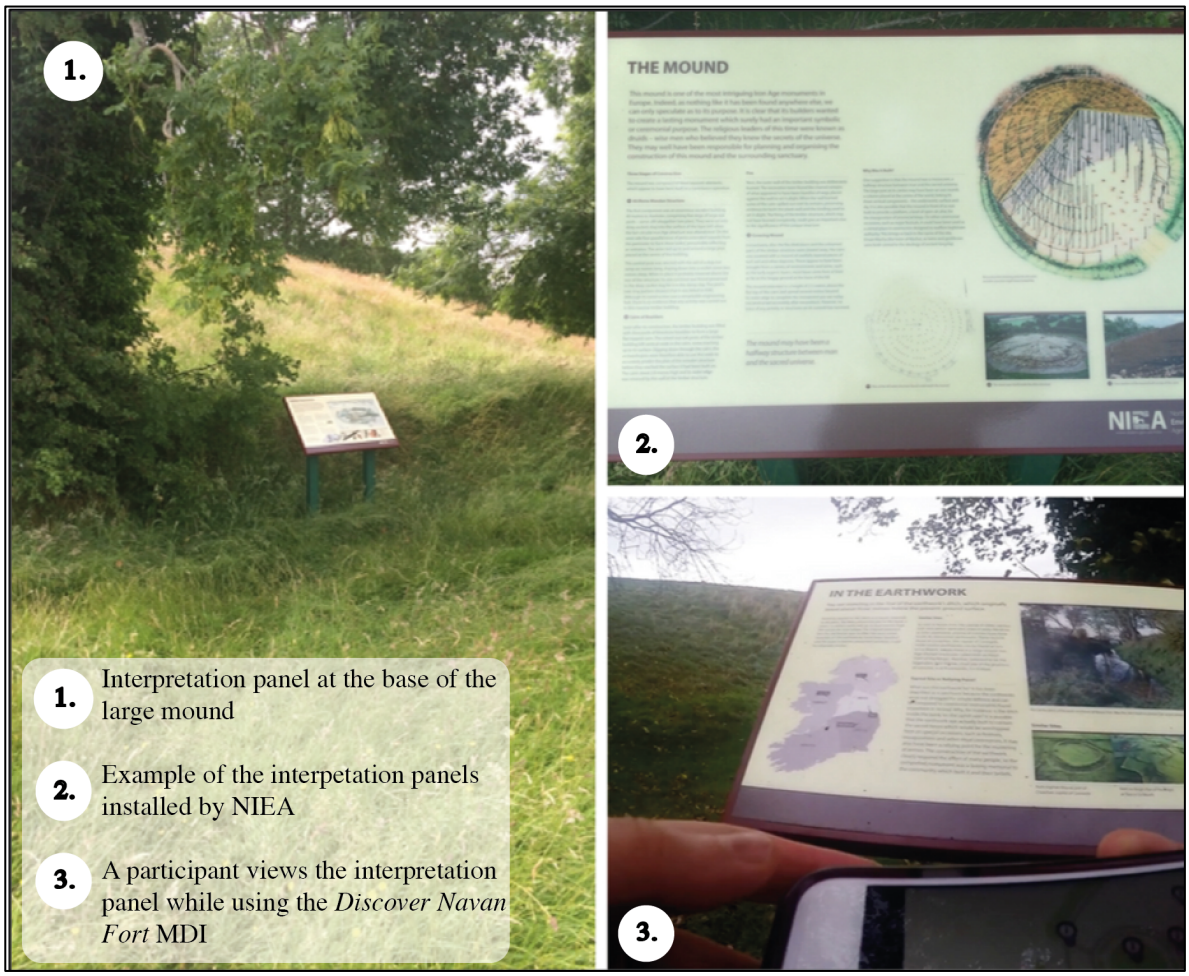


Figure 7.16 Interpretative panels at Navan Fort.

Interpretation panels are the most prominent form of interpretation available in outdoor cultural heritage landscapes (Moreira, 2012) and therefore participants assumed that the location of an interpretation panel indicated value in those specific areas. While there were sections in which the interpretative points on the MDI aligned with the interpretation panels (such as at the large and small mounds), for the majority of virtual interpretation points there was no parallel between their location and the interpretation panels. Participants believed they were being coerced into visiting specific areas, to unlock content which was not near an interpretation panel or did not have a clearly defined relationship with that specific location. As DNFP4 stated:

> I felt like I was deliberately going to a place because I saw it in the app rather than maybe just walking around and them saying something. It felt like you were constantly looking for a place.

As the interpretation panels and the MDI did not work in partnership with each other, the virtual points on the MDI were challenged as it did not align with the physical markers on the landscape. This is supported by the role of physical objects in the landscape discussed previously. Similarly, as the interpretative content was not the same between both interpretative mediums, this fostered a sense of doubt in the user surrounding receiving the most complete or accurate representation of the site. The position of the MDI in the experience and more specifically the role it takes as an authoritative voice is raised in this instance and it is an element discussed further in the next chapter (Chapter 8).

In contrast to *Discover Navan Fort*, the *Walking with Romans* experience only had one interpretation panel at the beginning, and this explicitly referenced the MDI (Figure 7.17). The connection between both mediums (the interpretation panel and the MDI) served several functions for the user. It helped establish a tangible link between the MDI and the physical space, relating back to the importance of psychological orientation of the experience. In addition, it acted as a means of legitimising the MDI. Promoted through the established and conventional medium of interpretation panels, the relatively contemporary smartphone MDI gained credence.

Figure 7. 17 Interpretation panel at the beginning of the Walking with Romans experience, including reference to the application

The cohesion between the interpretative panel and *Walking with Romans* was regarded by participants as a positive element. The panel supported and promoted the MDI, which linked both forms of interpretation and fostered a more holistic representation of the interpretation on the site. While conversely the disconnect between the MDI and interpretation panels at Navan Fort resulted in users having to decode the relationship between the physical and virtual interpretation points.

Conclusion

This chapter focused on the connections with mobility and heritage experiences using MDIs. As noted at the beginning of this chapter, the landscape can be viewed as hybridised, consisting of various layers beyond the physical. The most notable addition being a virtual, informational landscape provided by the MDI. Through looking at the variation of actions and behaviours as users negotiate this hybrid landscape, the 'lived, dynamic field of potentiality' which Flynn (2008) discusses is borne out. In light of the findings outlined in this chapter there are two primary messages which emerge, firstly is the unique challenges and opportunities associated with MDI adoption in the outdoor heritage experience; and also, the importance of thinking holistically about the heritage experience, being sensitive to the interweaving and networked factors which constitute the experience.

As Chen and Chen (2010) indicated, what visitors associated as 'quality' in the experience is much more associated with the process during the visit than the amount of heritage information presented. The portable nature of the MDI assimilated with this process by integrating into the mobility system of the individual and supported the body as an affective vehicle by fostering felt connections through accentuating intangible elements of the heritage experience (Section 7.1). Within this however, there are unique challenges associated with adopting the smartphone as an interpretative medium in the heritage context. Concerns such as battery life and connectivity resulted in users having to negotiate priorities between the interpretative content and the practical facets of the device. As Ito *et al.* (2005) stated, mobile phones are a cocooning technology as they allow a personalised portable media ecology, but in this research this close personal connection and the role it plays in the actions of the individual resulted in heightened device dependency. It reflects how embedded smartphones have become in the mobilities of users, the devices are regarded by users as an extension of themselves (Plant, 2001).

The peripatetic nature of the MDI experience reflects the cumulative nature of the heritage experience and the importance of the process users go through (Section 7.2). Studies such as Marshall *et al.* (2016) noted the importance of the sensorial experience of being in the landscape over the acquisition of knowledge, therefore the structure of the MDI experience is just as significant as the interpretative content contained within it. The ordering of interpretative points not only influences the mobility onsite but also the network of interpretation. The narrative is determined through the points and additionally the user's felt connections in response to the interpretation. The presentation of the interpretative content is not the only important factor for users, but the experience which surrounds this presentation (Pine and Gilmore, 1998). The networked factors at play in the experience were evident through looking at the mobility system of the individual in relation to the interpretative points (Section 7.2). The actions, movement and thinking of users in the experience was shaped by how the virtual landscape of the MDI mapped upon the physical space they were also occupying. As Packer and Ballantyne (2004: 54, own brackets) claimed, "leisure settings [such as the outdoor heritage experience] provide an important medium through which people can acquire information, develop new ideas and construct new visions for themselves and society".

Building upon the ordering of interpretative points, is the effect of orientation in the experience. This includes orientation in the hybrid heritage landscape, the virtual landscape (provided by the MDI) and the physical landscape. The orientation is also psychological, as it reflects the posturing towards objects, be they material or virtual. As Section 7.3 discussed, whether or not objects are represented in both the physical and virtual landscapes will influence how individuals will perceive and respond to them. This phenomenon heightened the interconnections between the landscape and the MDI, and stressed the role of the individual in negotiating between the two landscapes when the connection was not evident to them. The findings in this chapter, point towards the level of input and influence the user has over their own experience. The influence of the MDI in the mobility system of the individual was evident in various forms. While the MDI may be more accommodating to the individual than other forms of media, reflecting the "re-centring of the corporeal body as an affective vehicle through which we sense place and movement" (Hannam *et al*., 2006:5), in the outdoor heritage experience the MDI is still a constructed interpretation which creates specific manners for moving through, acting on and interpreting the landscape. This is an aspect which will be discussed further in the next chapter (Chapter 8).

Chapter Eight: Critical Issues in the provision of Smartphone MDIs for the Outdoor Cultural Heritage Experience

The research, as presented in the three previous chapters (Chapters 5,6 and 7), has identified the complexity of adopting smartphone-based MDIs in the outdoor cultural heritage context. The merging of the physical and digital landscapes is at the core of the issues outlined, highlighting the inability to interrogate the physical or digital landscapes as separate entities. The digital landscape, comprised of the MDI interpretative messages and the affordances of the smartphone, is intertwined with the physical context the user occupies.

Experiences of places are transformed by 'always on' connections (De Souza E Silva, 2006), such as the connection provided by the smartphone in the instance of this study. To investigate this further, three facets have emerged as significant dimensions of the heritage MDI experience. These facets include how MDIs are embedded in institutional interpretative strategies (Section 8.1), how they accommodate components related to sense of place (Section 8.2) and further contemplations on a new paradigm in the outdoor heritage MDI experience (Section 8.3).

The first section of this chapter considers the embeddedness of smartphone MDIs in an institutional interpretative strategy. While Chapter 5 focused on the smartphone as a legitimate form of interpretation and the similarities and differences between the smartphone MDI and existing forms of interpretation, this discussion can be furthered by considering how MDIs are incorporated in institutional interpretive strategies. This will progress the discussion of MDIs by considering how the uniqueness of the medium and the affordances of smartphones interface with the interpretative strategy for such MDI heritage experiences. The affordances of the smartphone, such as the significant role it plays in the everyday life of users or its functional elements like GPS accuracy, are not merely affordances but also constitute components of the interpretative experience. This highlights the high degree of embeddedness in the interpretative strategy and how smartphone MDIs can be accommodated within the experience. Authenticity in the heritage experience and how this is cultivated through the smartphone is an important part of the interpretative strategy and the subsequent experience of the individual. An argument can be made for greater attention to the dimensions of user experience as part of an interpretative strategy. This would shift the focus beyond understandings of user experience as being predominantly defined by the MDI functionality

and usability. This is in-keeping with previous points made throughout this thesis advocating a more holistic thinking in the development and deployment of MDIs in heritage contexts.

The second section of this chapter advances the proposition for a more holistic approach to MDI adoption by discussing the accommodation of sense of place in the smartphone MDI experience. By focusing on the three primary components of sense of place, place identity, attachment and dependency (see Chapter 3), the section explores how these elements were accommodated or not within the individual experience. Of particular note is the role of the interpretative content in fostering a sense of place. This includes a reflection on how the material objects in the landscape are enhanced through meaning engendered by the MDI, particularly the interpretation of intangible heritage, and the strengthened emotional engagement this creates among visitors. The potentially polarising influence of the MDI's capacity to communicate place identity is also acknowledged, as a sense of belonging for one individual may be experienced the opposite way for another. This raises questions about developing interpretations for 'local' communities and how articulating a particular place identity aligns with the perceptions of smartphone MDIs ability to cater for multiple parallel co-existing meanings.

The chapter concludes by building upon the previous two sections to consider the potential for a new paradigm for the outdoor MDI visiting experience. This new paradigm addresses the dependency on using BYOD as a proxy for personalisation and adopting new understandings to bridge the disconnect between the imagined and lived heritage experiences. Similarly, there is a requirement to consider context-awareness in the MDI experience, beyond reliance on location-awareness to achieve this. Location-based actions in the MDI, for example walking to an information point, had a significant influence on the felt connections of users if these actions did not have the anticipated pay-off. The chapter concludes with a reflection on the role of 'newness' in the smartphone heritage experience and articulates the need to develop a responsive paradigm that matures together and changes with technological advances.

8.1 The embeddedness of Smartphone MDIs in Interpretative Strategy

The previous chapters have presented examples of the capacity of smartphone MDIs to accommodate and embellish established interpretative approaches. For example, Section 5.3 outlined the influence of adopting established mobile-guide practices to help legitimise the

smartphone MDI as an interpretative medium. Similarly, Section 6.2 addressed the use of recognised interpretative approaches, such as surprising the visitor, and the capability of the smartphone to embellish the approaches further. While the ability to adopt and enhance established interpretative practices is a positive component of the MDI experience, how the MDIs are embedded within interpretative strategy needs further reflection. This section critically addresses this embeddedness, focusing particularly on pertinent aspects that emerged from the findings presented in Chapters 5, 6 and 7. These aspects specifically relate to the role of authenticity in the MDI experience, the inclusion of smartphone affordances as part of the interpretative experience, and the implications of the discourse about smartphone MDIs being centred on user-device connections instead of its relation to the broader interpretative strategy.

Projecting or presenting a sense of authenticity within the MDI is an important component of embedding the MDI into the interpretative experience. Authenticity is a fundamental aspect of the heritage experience, supported by a rich body of literature (see Reisinger and Steiner, 2006; Chhabra *et al*., 2002; Waitt, 2000; McIntosh and Prentice, 1999). In the context of this research, authenticity refers to both the overall heritage experience, but also the ability of the smartphone MDI to be perceived as an authentic interpretative medium. The study of authenticity in relation to MDIs in the outdoor heritage context however is limited. The thesis argues that a reason for this lack of further analysis of the role of authenticity in this context, is the limited discussion of the embodied nature of the outdoor heritage experience more broadly. The embodied personal experience in relation to the MDI experience is a significant component of this research (Chapter 3) and authenticity is closely entwined with this concept. As Kidd (2011) noted, any account of authenticity is subjective, and the perceptions of 'authenticity' are important to the individuals' meaning-making processes.

The subjective nature of authenticity, as addressed by Kidd (2011), was displayed in and supported through this research. Participants acknowledged, for example, a greater sense of worth in the interpretative messages when they perceived them to be 'authentic'. In relation to this, Petrelli *et al.* (2013) argued that authenticity or 'aura' cannot be transferred to digital, because the latter is limited by the lack of materiality. This understanding by Petrelli *et al.* (2013) however, is a one-dimensional interpretation of 'digital', that neglects the hybridised experience and the connections within it. As this research has outlined (in Chapters 5 and 7), the MDI heritage experience is a holistic experience which cannot be clearly divided into its

digital and material components. In the empirical work, the digital aspects of the MDI also contributed to the perceptions of authenticity in the individuals' experience. The tone of the audio content, specifically what participants identified as a 'local voice' was a prominent example of perceived authenticity. *Walking with Romans* and *Discover Navan Fort* respectively adopted audio in the experiences and were recognised by participants as using local voices. Local voices in this instance comprised the accent of the narrator, which was perceived by the user to be reflective of the local area. It was regarded by participants across those two sites as a positive, affirmative element in their personal experiences.

This positive response by participants to local voices is in-keeping with Jones' (2009) view of authenticity at heritage sites, which placed significant emphasis on social biographies, and argued that "authenticity is enormously enhanced by the participation of concerned communities (source communities, local communities and so forth)" (Jones, 2009:143). Similarly, the work of Mazel *et al.* (2012) with mobile phone interpretation of Rock Art in Northumberland (UK) acknowledged the value of local voices in the interpretative process, the benefit of local communities in providing context, and how this approach helped to positively shape personal narratives. The emphasis on authenticity was clearly articulated in the *Discover Navan Fort* MDI as it was developed by a local social enterprise (Cairde Teo Ltd.); it contained an interpretative point which addressed the actions of the local community in the conservation of the site and included a narrator who had a perceived local voice. While in *Walking with Romans* there is no direct reference made to concerned or local communities in the audio content, a form of authenticity was similarly achieved through the use of perceived local voices in the interpretation. The use of local voices was an intentional approach adopted by stakeholders to foster a sense of authenticity in the interpretative messages. As Correa *et al.* (2010: 833) detailed on narrated content, "through the narrator is the subject and it is also subjective". The developers of *Discover Navan Fort* stated in relation to the narrator, "it was to try and evoke the mythology and the old history of the stories we were telling…to create an atmosphere" (O'Donnaile 2015, pers. comm., 10th Nov.). There are parallels between this interpretative approach by developers and McDonald's (2011) rationalist approaches to authenticity, whereby the authenticity of an object is defined on the basis of its origins. The object in this instance is the interpretative message, while the origin is the local voice the user listens to and engages with the message. In delivering the interpretative message through a perceived local voice the information is reimagined as a

form of local knowledge, thereby fostering a greater sense of worth and value of the content among the users of the app.

Furthermore, the affordances of the smartphone play a role in how it is embedded in MDIs. Although users adopt their personal devices as the interpretative device for their heritage experience, the affordances of the device are often overlooked. The heritage experience does not occur in a vacuum, nor is it confined to the parameters of the respective heritage site. Similarly, the user's expectation for the smartphone MDI are not confined to the heritage experience. The empirical research has indicated that the boundary between the everyday space and the heritage space is blurred. This is exacerbated by the fact that participants often continued to use their personal smartphone. The level of performance of and effort required to use the device, that is the level of easiness involved (Venkatesh *et al.*, 2003), emerges from its everyday usage. However, as observed during the research, this is not directly mapped over onto the interpretative space of the MDI. Functionality is an easy to demonstrate example, as it carries across spaces: the normal everyday usage of the smartphone and the in-situ heritage interpretation. During the in-situ investigations participants were observed using common gestures within the Apple iOS operating system. These gestures, such as pinching and spreading two fingers on the screen to zoom in on the geo-centric map, aligned with common mapping applications users were familiar with in the everyday context (such as Google Maps©), but the same functionality was not available within the MDIs. Users are accustomed to personalised experiences with their smartphones. Layouts, existing applications and social networks for example are maintained and used to their own unique preferences. While the device remains the same for the user, the application being adopted is an interpretative medium by an organisation or agency to aid interpretation. Although much of the functionality remains constant between the interpretative MDI and common everyday applications, where inconsistencies occur, this research suggests, the impact on the experience can be highly disruptive. In these instances of functionality break-down, such as trying to get a certain response from the application which, however, is not included in the actions within the MDI app, the user's attention shifts from the heritage experience to an affordance of the device. This highlights that the overall affordances of the smartphone are another component of the interpretative experience, even when they are not consciously included (or excluded) from the MDI app.

When there is an over reliance on an element in the MDI experience the affordances and subsequent implications on the individuals' experience are intensified. This is typified in the outdoor heritage context in the adoption of GPS technology for the MDI experience. Although the GPS element was deeply embedded into the interpretative strategy for the case study sites, the implications of affordances relating to this element were also significant features in the participants' experience. The impact of GPS was outlined in Chapter 7 focusing on *Discover Navan Fort* which utilised GPS as the primary method for users to access interpretative content. In the case of *Discover Navan Fort*, and additionally in *Walking with Romans* and *Cumbrian Heritage Trails*, the GPS component is positioned as a facilitator in the landscape. This facilitation relates to linking the user, the physical landscape and the interpretative content. The interrelationship between the components of the experience are supported through the smartphone MDI and the GPS element. This includes facilitating the navigation of the physical landscape, unlocking an interpretative narrative, and subsequently fostering emotional connections during the experience.

Ego-centric maps (*Walking with Romans* and *Cumbrian Heritage Trails*) and geo-triggered content (*Discover Navan Fort*) were central parts of the interpretative strategies incorporating GPS technology, but affordances such as the inaccuracy of these elements can be distracting for the interpretative experience and undermine its usefulness. This is particularly pertinent when considering the embodied nature of the experience, as participants acknowledged feelings of frustration at the MDI when the geolocation component did not work as anticipated. Sentiments, such as confusion or frustration experienced by the participants, do not assist the fostering of positive place connections or attachment. The MDI and its affordances are a prominent aspect of the individual's heritage experience when adopted. The MDI is not an add-on to the experience or simply a tool adopted by the individual, but is a fundamental and influential actor in the heritage visitation experiences at the three case study sites. This recognition relates back to how user experience is imagined by the MDI producers, and the recontextualisation of a primarily personal device as an interpretative device (Section 5.1), reiterating the importance of holistic thinking in the adoption and development of such interpretations. As Chapter 2 outlined, the smartphone is a cultural device with loaded meaning and this meaning still persists despite being co-adopted by an individual for the heritage interpretative experience.

A key aspect of the holistic approach to smartphone MDIs is the emphasis on interpretation-driven instead of technology-driven decision-making. While the functionality of the MDI comes from the smartphone, the goal of the experience emerges from the interpretative strategy. Focusing on the technological capacity of the device as a motivation for the MDI interpretative experience is a reductive exercise. As noted previously, the inaccuracy of GPS technology for example omitted the impact this would have on the embodied experience of users. Similarly, the GPS technology shaped how users interacted and interpreted the physical environment. Galani *et al.* (2013) noted relatedly, that content needs to balance the requirements of specific situations (interpretative content) and also generic information (general way-finding). All the components in the experience are connected, therefore the technological decisions within the MDI subsequently influence the user experience and the engagement with the landscape. This research argues that the MDI, the user and the landscape are in an interdependent relationship. As Keogh (2014) noted, the user must be equally attentive to the actual and virtual spaces. Reiterating the hybrid landscape, considerations on the interaction between the user and the device solely does not capture or reflect the linked connections which occur in the experience. As outlined in Section 2.2.2, the nodes of MDI interactions in the museum context reported on by Gammon and Burch (2008) omitted the intangible elements of place and place-based connections. Technology-led decision making in the development of smartphone MDIs prioritises the focus on user-device interactions, subsequently neglecting the context of place. The personalised, embodied interpretative experiences that smartphone MDIs are purported to facilitate (Tallon, 2012 and Chapter 2 of this research) cannot be achieved without an awareness or sensitivity to all the elements of the experience. These sensitivities reflect 'natural as possible' (Mortara *et al*., 2013) aspirations that are dependent on the various connections and context which surround the interactions between the user and the smartphone.

As the discussion on authenticity and the accommodation of the smartphone affordances alluded to, the smartphone MDI experience is one of significance imbued and embodied meaning, beyond mere interactions with a piece of technology. This leads us to re-consider the development of smartphone MDIs, particularly by applying an interpretative strategy that reflects the broader holistic experience rather than focusing on user-device connections only. Cameron and Kenderdine (2007) reported, for example, that the active participation of the individual is critical and is much more than just the amalgamation of the user's known information with unknown information or informal learning. The onus of achieving this

amalgamation in the first instance rests with the organisation to accommodate the role of the individual in the MDI experience. Digital technologies provide the framework to achieve this, but success is dependent on the subsequent design of the MDI (Michaelis *et al*., 2002).

This research (as presented in Chapters 5, 6 and 7) supports Petrelli *et al.* (2013) and their view on the 'information over object approach'. This approach, which is largely concerned with providing information to the user but neglects the other elements of the experience. Petrelli *et al.* (2013) challenged this common approach to digital experiences, acknowledging particularly the lack of materiality and limited tactile interactions in such experiences. These variables consequently limit the emotional, affective and sensational elements of the experience (Petrelli *et al.*, 2013). By focusing on 'information over object' the experience is modelled as interactions between the user and the device. Centring the attention on this one connection (between user and device) sets distinct boundaries for the MDI experience. Although the other variables in the experience, such as the act of walking through the physical landscape, still exist, the potential impact they can have on the user's experience is not addressed, as they are not fully incorporated into the imagined MDI experience. The findings of this research (Chapters 5, 6 and 7) present the implications of not considering the networked components in the experience, beyond the connection between the user and the device. An approach that focuses on the relationship between the user and device in MDIs, akin to the 'information over object approach', creates a distinct technology-oriented experience within the heritage experience. Instead of the experience being one coherent whole, the smartphone MDI is positioned as a detached component of the overall experience or a sub-experience. This tension emerges from the analysis of the fieldwork that indicates that users did not view the smartphone MDI as a distinct experience in its own right. Rather, users' motivations aligned with general heritage interpretative goals ('learn about the place') and leisure-related activity ('go for a walk') at large. Despite this, the coordinated nature of the visits as part of the research project, when users talked about their motivations it became clear that they had not travelled to the site to engage solely with the smartphone MDI.

This is not to devalue the importance of ensuring smooth interaction between the device and the user; as Chapter 5 discussed, the functionality of the MDI is a key component in the heritage MDI experience. This thesis argues however, that a fuller considering of a broader set of elements of the experience (such as the tangible and intangible elements of place) would lead to an improvement of the overall experience. The interactions between the user,

the smartphone MDI and physical objects in the landscape typify this premise. For example, the functionally of geo-triggers may reduce screen-time and avoid shifting the focus of the individual away from the landscape towards the smartphone. The research however, through engaging participants in-situ in their evolving experience, uncovered the mediation that occurs between the digital and physical landscape. This resulted in instances whereby participants had to decide between their own experience and perception of spatial features, and that of the interpretative content and the guidance put forward by the MDI.

8.2 Accommodations for Sense of Place in the Smartphone MDI experience

This research has acknowledged the agency of the individual throughout the heritage experience. The notion of sense of place as discussed in Chapter 3 is one that centralises the user in the concept. Identity, attachment and dependence on place are more than connections to the materiality of the place but the connections fostered and materialised within them. The numerous expressions of identity and attachment users acknowledged during the in-situ experiences are a testament to this concept. Participants, for example, discussed their Welsh identity whilst learning about Roman occupation through *Walking with Romans*, expressed feelings of belonging and non-belonging using *Discover Navan Fort,* and acknowledged attachment in the practice of walking in the footsteps of William and Dorothy Wordsworth using *Cumbrian Heritage Trails*. The presence of the smartphone MDI in each experience helped shape the users' perceived sense of place.

Through its presence, however, the MDI also creates a hybridised landscape (Chapter 7). Subsequently a hybridised form of sense of place (due to the inclusion of the smartphone) is also created. This is the focus of this section, addressing key components of sense of place and seeing how they are accommodated in the smartphone MDI heritage experience. As noted previously (Chapter 7), virtual environments can be understood as places in the same manner physical environments become places. Both are defined by the human connections that are formed within them (Ciolfi, 2013; Northcote, 2008; Brooke and Oliver, 2003). Virtual environments have a sense of place akin to the sense of place of material landscapes. Aptly, Lehman and Conceição (2010) defined the attachment fostered in virtual environments similarly as a 'sense of presence'. 'Presence', as conceptualised by Lehman and Conceição (2010), is an interesting term in this context as it encapsulates the role of the smartphone within the physical landscape and the creation of a hybridised experience. The presence of the

virtual landscape provided through the MDI had a significant influence on the perceived sense of place of participants.

A key aspect of the virtual landscape of the MDI was how it communicated the intangible components of place. The smartphone MDI experience served as a bridge between the intangible representation of the landscape and its tangible features. This is important as it is closely aligned with place identity and self-identity in the individuals' sense of place. Objects in the heritage landscape need to be activated and assigned symbolic, personal meaning to be deemed of significant worth or value (McIntosh, 1999). The smartphone MDI therefore, through the provision of interpretative messages, acted as a bridging element between the tangible and intangible, whilst giving the individual an opportunity to engage with and define the value of the location. The interpretative content, focusing mainly on intangible cultural heritage elements, was interwoven into the physical landscape as a result of the MDIs. The MDI accommodates the 'intimately conjoined' (Kurin, 2004) tangible and intangible elements of heritage landscapes. As Kurin (2004:70) explained, "among many local and indigenous communities, particular land, mountains, volcanoes, caves and other tangible physical features are endowed with intangible meanings that are thought to be inherently tied to their physicality". This was evident across the three case study sites. Immediate parallels can be drawn to participants' reflecting on the inspiration for William Wordsworth's poetry while looking at the mountains and lakes of the Cumbrian landscape (using *Walking with Romans*). Similarly, as one of the participants (DNFP1) remarked while using *Discover Navan Fort* app and walking up the raised embankment at Navan Fort, "you are on something and underneath that there was a whole Royal ceremony…I was standing on a massive piece of history, all that time ago these people built this thing underneath me".

It is often the intangible elements of place that engender the value of a place (Isar, 2011) and the interpretative messages from the MDI are therefore vital in making space for the intangible elements in the individual's experience (Chapter 6), and subsequent supporting sense of place. This emerges from the subjective nature of place identity and self-identity (Chapter 3), especially the susceptibility of these elements to change over time. It is an element that is also reflected in the work of Amakawa and Westin (2018) in relation to the *New Philadelphia* MDI; the intangible elements in the experience of *New Philadelphia* brings into relief the identity of the physical landscape. Similar to the observed experiences with *Discover Navan Fort, Cumbrian Heritage Trails* and *Walking with Romans,* emotional

responses and deeper cultural meaning for users were achieved through *New Philadelphia.* AR was used in both *Walking with Romans* and *New Philadelphia* for example, to emphasise the disparity between the present landscape, in which some structures are no longer standing, and its once populated state. Speaking on a broader scale, Ehrhardt and Gross (2000) talking about place based web resources for historic buildings also concluded that a strong sense of place could be fostered through media such as animation, sound and virtual reality more so than text and photographic approaches.

The interdependent relationship between the tangible and intangible elements of the landscape as it comes to the fore through MDIs has also implications for the preservation and safeguarding of the intangible. The smartphone MDI experience, through the interpretative messages, place the intangible elements in a physical, material space. As a result of being affixed to the tangible, intangible cultural heritage elements and identity resources increase their capacity to be safeguarded and protected (Stefano *et al.*, 2014). Reflecting on the interdependency of intangible and tangible cultural heritage, Bouchenaki (2003) supports this understanding in noting the importance of materiality in safeguarding intangible heritage and the requirement for 'translation' of intangible heritage into a material form. The MDIs, through a series of interpretative points delivered via a range of media (such as audio, video and text), serve as a form of 'translation' in this context intangible aspects of the landscape assume materiality not only through the actual MDI but also through the specific locations in the physical landscape in which these respective points are anchored to. Ruggles and Silverman (2009: 97) similarly stated the necessity of creating suitable conditions for the enactment of intangible heritage, specifically addressing the importance of "ensuring a physical locale for ritual movement and performing arts, craft production, and valued landscape experiences". The smartphone MDI in the outdoor heritage has the capacity to accommodate this enactment of intangible heritage by guiding the individual through the landscape and at various points putting forward interpretative messages.

Given the smartphone MDIs' ability to draw the participants' attention to the intangible cultural heritage of the landscapes in the in-situ investigations, it is important to address 'whose' cultural heritage is being communicated and promoted through the interpretation. This reflects not only 'who' is represented in the intangible cultural heritage, but also the identity and sense of place that is being promoted and associated with the site. Throughout this research, this element was observed in several forms such as: the influence of how

stakeholders 'imagined' the experience in the production stage on participants' lived experience of the MDI (Chapter 5); the definition and adoption of specific interpretative objectives for the experience (Chapter 6); and also, the adoption (or not) of polyvocality in the MDI heritage experience (Chapter 7). The analysis of the empirical materials demonstrated that the MDIs are a reflection of the stakeholder's perception of the intangible cultural heritage, and subsequently the identity of the site and the sense of place. As a result, specific identities are promoted through the MDI. The articulation of identities in the MDIs to reflect specific communities or groups has a significant influence on the opinions of participants.

Places, however, do not contain a single identity and are home to numerous internal conflicts (Massey, 2010). Smartphone MDIs are purported as vehicles for communicating multiple identities and being capable of reflecting the uniqueness of each individual experience, as discussed in Chapter 2 (see also Morkham and Staiff 2002; Saipradist and Staiff 2007). Similarly, the research recognised that identity communicated through the MDI was highly influential in the visitor's experience. As Mason (2005) stated, individuals can be members of more than one community or group simultaneously. The ways in which individuals will respond will depend upon which affiliation is called to the fore in a given moment. Given that the smartphone MDI joins the user on their heritage experience, the affiliations called to the fore are affected by the provision and communication of the interpretative messages. This was witnessed in the polarising sentiments, for example, expressed by participants using *Discover Navan Fort.* Users who identified with the narrative were highly engaged and responsive to it, while those who did not identify with the narrative were not simply apathetic to the experience but unambiguously noted feelings of non-belonging and a sense of displacement.

The promotion of a specific sense of place through MDIs, is often underpinned by the motivation among stakeholders to develop MDI for local people and local communities. *Discover Navan Fort* and *Cumbrian Heritage Trails* framed their respective MDI experiences as being primarily for local people and local communities. The *Discover Navan Fort* stakeholders in particular were explicit in their adoption of the MDI as a means of presenting a more accurate representation of the place identity, the local character and the local communities' attachment to it. The premise of developing such interpretations for 'local' people and communities is interesting as the interpretation becomes a flag in the sand to designate the site as incorporating the motivations and aspirations of the 'locals'. Alongside the interpretative messages discussed, an approach to achieve this was in the provision of

audio content that adopted ‘local voices’. The powerful implications of this on the user experience was addressed in chapter 5 and other works have outlined the influence of audio on eliciting powerful identity responses. The Digital Library of Appalachia, for example, is a digital web archive that uses audio recordings of oral histories and music to express the region. According to Seggern *et al.* (2010), the facilitation through audio media of local oral histories, first-person perspectives and powerful personal elements demonstrates the distinctive character of the region. Presentation of place in this manner is an expression of identity and distinctiveness, which gains influence in how non-local visitors respond to it as much as local people. Relph (2008) came to the same conclusion when ascertaining place distinctiveness as being unquestionably about difference. The site becomes more unique and meaningful to the individual when there is a sense of territory or ownership over the landscape. In turn individuals foster a greater association with the place and it allows them to distinguish themselves from others.

This distinctiveness through differentiation is compelling when considered alongside smartphone-based MDIs. While this form of distinctiveness is founded on a sense of ownership and difference, MDIs are conversely hypothesised as the medium through which it is possible for a site to be polyvocal and cater for multiple identities. *Discover Navan Fort* showed the importance of place distinctiveness and how closely it is aligned to sense of place. The polarising responses to feelings of belonging and non-belonging being particularly prominent in the lived experience. Critical reflection is therefore needed in representing place distinctiveness with MDIs, particularly in relation to engendering negative connotations of non-belonging and if these negative connotations are something which should be accepted or avoided. This also raises further broader theoretical questions surrounding place identity and representation. Most notably in relation to how sites are interpreted, and the mediation of positive visitor experiences over potentially challenging visitor experiences.

The interpretation offered through *Discover Navan Fort* was a reflection of the stakeholders’ view of heritage and sense of identity. As discussed in Chapter 4, Cairde Teo Ltd., an Irish language social enterprise, developed the application as a means for local people to learn more about and appreciate their heritage. This is to facilitate a form of place continuity. According to Wang (2015), building on the work of Breakwell (1986), continuity reflects the motivation to maintain a continuous sense of identity across time and situation. The standardisation of place-making, as perceived by the stakeholders, impeded the unique

distinctiveness and identity of the Navan Fort site. This was based on subduing the mythological and cultural context of the site by the local council. In doing so, it also weakens place continuity as the connection between people and place is lessened over time. The MDI was viewed as a method of representation and continuation of a specific type of identity. In providing interpretative messages reflecting the mythological and cultural context of the site to inform and educate the local community, the link between the people and place is sustained and maintained. As Ujang (2012:158) noted, "to ensure identity is to ensure continuity in the physical and social together with meanings and attachment held by the people". This process of place continuity occurs in the backdrop of the perceived standardisation of the site by the local council.

As this research has shown, smartphone MDIs through the interpretative messages they present and the manner in which they present them, influence the inherently personal concept of 'sense of place'. Place attachment for example (as explored in Chapter 3) emanates from the personal experiences and behavioural processes of the individual, more so than the deterministic elements of the landscape. Seggren *et al.* (2010:281) also acknowledged this in relation to sense of place and digital web resources, claiming that the multimedia approach (such as text, visual, audio and geospatial) help establish "unique character and a distinctive identity for that place". As a result, the smartphone can 'speak' directly to the individual in a personal and affective sense through the interpretative messages it contains. This is enhanced with the unique capacity of the device to embellish interpretative messages in a manner previous forms of interpretations are unable to achieve due to limited modality and, in the case of traditional audio-guides, computational capability. As the research has identified, however, this ability can also have a negative effect if it adversely impacts on the user's experience instead of enhancing it, and, thereby, detracts from their connections to place. Given the particular focus of this research on outdoor heritage landscapes, the sense of place influenced through the MDI is extenuated further than in other contexts, such as museum buildings. The MDI is both co-present and a necessary aspect in the user's experience. While the experience is structured around a series of interactions with objects and features in the landscape, there is also a significant amount of time spent moving between the objects within the landscape. The experience is, therefore, constantly evolving, and it is in these in-between moments that users reflect, ponder and, when in groups or pairs, discuss the interpretation. The always on and accessible nature of the MDI has the capacity to be available and support visitors in such moments of contemplation. This is not to devalue the influence of the physical

landscape in the experience, but to highlight that in relation to addressing elements of identity and attachment specifically the MDI interpretative content is in a position to speak directly to these affective elements in the experience.

8.3 Considering a new paradigm for the outdoor MDI visiting experience

The research raises questions in relation to the appropriateness of the existing paradigm for the outdoor MDI experience. More specifically, it highlights the ill-defined nature of this paradigm and how this is subsequently influencing the adoption and effectiveness of MDIs within this context. This is illuminated through the disparity between the imagined and lived experiences of participants on site, presenting the disconnect between the producer (heritage stakeholders) and consumer (the user) (Chapter 5). The empirical material of this research suggests that the current paradigm for the MDI visiting experience centres on an awareness of smartphone MDI potential but an inability to effectively execute it. One of the significant aspects of the MDI experience for example is that it is both polyvocal and yet unique to the individual. The research, however, suggests that digital interaction is used as a proxy for this unique and polyvocal promise (by often equating 'mobile' to 'engagement', see section 5.1) without clear application of the interpretative process.

A central premise that optimises this existing paradigm is personalisation. Personalisation is connected to the uniqueness of each user and each user's experience. Dallen (1997) for example attributed personal heritage to emotional connections to places. Personalisation is a component which has been presented in numerous studies as a benefit of smartphone adoption in context, as outlined in Section 2.3.1. The smartphone MDI is positioned as being responsive to the unique, organic and personal nature of each users' experience. The important differentiation being that this form of personalisation is more than access to "information and interpretation as and when they [the users] wish" (Gammon and Burch 2008:37); instead, it provides support for the user to practice the interpretative narrative she/he wishes. It is the latter, the interpretative narrative, which aligns with the unique, individual, heritage experience. Personalisation in this manner incorporates the cognitive and emotional aspects of the experience, framing heritage both as a personal activity and a process (Harrison, 2012).

This research, through the responses and observed behaviours of participants across the three in-situ investigation sites, reveals the current limitations in relation to personalisation within the experience. The research found, for example, that users reframing their smartphones as an interpretative device results in the utilisation of their personal device to turn what is designed as a public interpretation into a personal interpretive experience. Personalisation in this scenario, however, is limited to the familiarity afforded through using their own device and not necessary the emotional or cognitive aspects of the experience. The form of personalisation observed through the respective MDIs contrasts with Witcomb's (2007) claim that heritage, through adopting such technologies, is becoming more polyvocal and catering to the uniqueness of each experience. Mohd *et al.* (2018), for example, adopted the BYOD approach for the mobile guide at Kuching Orchid Garden (Kuching, Malaysia); the justification for doing so being a correlation between an unfamiliar guide and a negative visitor experience. When reflecting upon the BYOD approach, Mohd *et al.* (2018) recommended that it should be used widely as it benefited learnability and device control. These conclusions are technology-centred which omit the complexity and the holistic nature of the MDI experience. It is widely accepted that technology should not be a barrier in the experience and, in this respect, Mohd *et al.* (2018) rightly acknowledge this alongside other studies (such as Othman, 2012 and Bartneck *et al.,* 2006) that also support this understanding. However, adopting BYOD to enhance device control and address unfamiliarity focuses the experience on the technology and not the individual. In this context, technology is viewed as accountable for the overall experience, reflecting Sola's (1997) concept of the 'technology trap' in museums, whereby museum professionals and interpreters are guided by technology rather than deploying the technology according to their goals. Participants demonstrated the positive effects of smooth device control in this research (see chapter 5) in that they could operate their smartphone devices with confidence. However, the same device functionalities were not entirely mapped across applications used by the participants on a daily basis and the respective MDIs. This, subsequently, impeded the user experience. Therefore, while a correlation may exist between an unfamiliar guide and a negative visitor experience conversely a familiar guide does not always equate to a positive visitor experience.

Furthermore, the disconnect between personalisation and effectively catering for it within the MDI experience is also demonstrated by Mohd *et al.* (2018). Mohd *et al.* (2018) acknowledge the importance of personalisation and reference aspects such as BYOD and various interface sizes to accommodate it within experiences. This approach and understanding of

personalisation aligns primarily with accessibility preoccupations and overlooks the individuals' unique, empathetic experience. The outlook promoted by Mohd *et al.* (2018) reflects the established paradigm surrounding MDI adoption and personalisation in terms of interpretation. In essence, a dominant focus on functionality and accessibility to address the need for personalisation shows a device-centric approach which neglects the unique embodied personal experience of the user.

The GPS capabilities of the device are another example of the misappropriation of personalisation for device-centric approaches. GPS is an approach adopted to assist with context-awareness. The only context being provided however is location, which is a reductionist approach to context. Alletto *et al.* (2016:244) acknowledged this, stating that a common approach to address the variation in each individual's interest within museum and heritage spaces was to develop digital services (such as MDIs) and "to configure these services as location-aware services, i.e. applications driven by location information, in particular, by user movements in the environment". In the outdoor heritage context specifically, Suh *et al.* (2011), in their testing of the prototype of a mobile heritage guide, suggested the incorporation of a GPS-based map of the environment in response to users' desire to get a better 'sense of the location'. Location, however, does not reflect context fully and as a result does not cater for the individuality of each user's experience. The research findings align with the insights from previous studies such as Pfeifer *et al.* (2009) that highlight the inaccuracy of GPS-triggered content. In several instances the participants in the research received incorrect interpretative content as the MDI tracked their physical journey but not their interpretative journey. Location-motivated actions in the MDI (such as specific trails around a site) need to have an effective payoff for the individual and be viewed as a benefit to the users' experience.

The individual and personal experience is limited within MDIs when context-awareness is constrained to only being facilitated through location. Context-awareness is linked to location; Schilit and Theimer (1994) for example noted that context-awareness related to changes in the 'environment', however, my research findings reveal that it is more than this. Context-awareness is more encompassing and relates to intuitive computing that emulates human interaction (Abowd *et al.,* 1999). Jailani *et al.* (2015) adopted an adaptive context-awareness approach in an attempt to achieve a more intuitive experience, building upon previous context-awareness studies in the heritage sector such as Raptis *et al.* (2005) and Roffia *et al.*

(2005). The Jailani *et al*. (2015) study considers elements such as user interests, learning to understand the user, user location, feature detection and interpretative messages. Consideration of various contextual components, such as those included by Jailani *et al*. (2015), afford a more customised and favourable experience that context-awareness is asserted to create (Cheverst *et al*., 2000 and Kaasinen, 2003) and go some way to materialising the 'zero interface' concept, whereby user needs are met with minimal impact on their attention (Salmon Cinotti *et al*., 2004).

Another component of the MDI paradigm in the heritage context is the challenge of its 'newness'. Two key questions arose around the role of 'newness' in providing a smartphone-based MDI during the research: firstly, why it is attractive and, secondly, whether it is helpful to have this 'newness' element as part of the paradigm. Innovation and ambition to keep pace with societal technological trends in the heritage and museum context provides an opportunity to explore 'newness' in the MDI paradigm. Innovation and 'newness' are not just elements of the MDI paradigm, but a component of digital adoption in the museum and heritage sector more broadly (Bakhshi and Throsby, 2012). Bertacchini and Morando (2013), when hypothesising the future of museums in the digital age for example, outline how object engagement is being reshaped by digital adoption, including the 'public good' and 'experience good' characteristics of digital adoption.

The 'newness' component of the MDI experience reflects the general life cycle of new technology. Applications in the heritage context are often presented as offering an alternative or something different for both the organisation and the visitor. The potential to enhance experiences, the perceived requirement and attractiveness of the technology are often stated as key motivations for digital adoption (Dumitrescu *et al.*, 2014 and Gombault *et al.,* 2016). There is also an ambition to stay "on the top of the curve" and "a fear of being left behind if they [museum and heritage agencies] don't seek to adapt to current trends" (Horwitz-Bennett, 2010:26), which aligns with the technology life-cycle model (Moore, 2014). To progress the adoption of new technology, Moore (2014:14) highlights the importance of showing "that the new technology enables some strategic leap forward, something never before possible, which has intrinsic value and appeal to the non-technologist". This resonates with how smartphone MDIs were discussed by academics and practitioners when the technology first emerged (Chapter 2). Hyperbolic language was used to address the potential for digital technologies in the heritage sector, and mobile digital technologies more specifically. Staiff (2016), for

example, spoke of sites being ‘rewired and reconfigured’ as a result of digital interpretations and Yovcheva *et al.* (2012) noted it required a ‘complete rethink’ of heritage sites.

The findings of this research, however, clearly highlight that the smartphone is not ‘new’ to the user. This is a point acknowledged throughout the research; Section 2.3, for example, addressed the role of the smartphone in society and users’ everyday activities, while Chapters 5, 6 and 7 presented instances where this subsequent connection to the smartphone influenced the in-situ interpretative experience. As Hjorth *et al*., (2012: 195) stated, “technologies are embedded in everyday life which results in new technologies and media not only being a site for meaning-making, but also a place where meaning can be gleamed”. This familiarity with the smartphone is especially relevant when considering the visitors’ first time on a site. In these cases, as there is no benchmark for the experience at the location, the experience is inextricably linked to the MDI if the visitor chooses to use it. The ‘newness’ in this scenario is the heritage landscape the visitor is present in, not the smartphone-MDI. The pervasively quotidian nature of mobile digital technology in mediating tasks, such as visiting a heritage site, has an increasingly profound effect on the experiences surrounding it (Ash *et al*., 2018). This echoes the autonomous nature of smartphone MDIs and the presentation of smartphone MDIs as an alternative to traditional interpretation. In doing so, it sets an unhelpful representation of the MDI as the ‘other’ and an experience in its own right, aligning with the social construction of technology perspective outlined in Chapter 2. Objects take on various meanings depending on the context they are adopted in; and in this context the smartphone being re-contextualised as an interpretative medium for an outdoor cultural heritage interpretative experience.

Exploring further the premise of ‘newness’ and considering Moore’s (2014) technology life-cycle, Jones (2014) noted that the proliferation of applications, and more specifically AR applications, in the heritage context has been driven by commercial and business purposes instead of users. This aligns with the ‘early majority’ component of the technology life-cycle, the need to keep up with the current trend, echoing technology-led decision-making, an aspect which emerged throughout the research (see Section 5.2). Interviews with MDI stakeholders from the respective case-study sites shed further light on smartphone MDI ‘newness’ and how it is currently positioned within the MDI experience. Melinda Russell, Director of LivingData@McLays, the company responsible for the development of *Walking with Romans*, stated:

> We have now got to the point where there are far too many inferior apps out there which I think is unfortunate and saturating the market. When you go 'there is an app for that' they are like 'yeah, really' [unenthusiastic tone] where as if they are perceived as high quality it is 'oh really? Tell me more about it!' [enthusiastic tone]. It is almost like you want some kind of grading of apps. Until now the grading has basically been on free and paid for. (Russell 2016, pers. comm., 31st Aug.)

Not only do these comments reflect Jones' (2014) point on the proliferation of applications but also the impact this has had on opinions and perceptions towards smartphone MDIs. The newness component reflects smartphone trends and the proliferation of the technology and MDIs without effective knowledge of their influence (Mann *et al*., 2013). The value of 'newness' is both relative; it is also a challenging proposition in the heritage context which is effected by financial cuts. Current digital trends in the museum and heritage sector show the temporal nature of the technology, with new frontiers constantly being identified. The 2010 Horizon Report: Museum Edition (2010) for example stated that mobiles were a 'technology to watch'; six years later virtual reality, location intelligence and information visualisation were identified as the emerging trends in 2016 (Horizon Report: Museum Edition, 2016).

The paradigm shift, however, should not only be limited to the specific aspects addressed in this section. This research suggests that MDIs will benefit from a paradigm that emerges from within the heritage site context rather than being borrowed from the museum context. The adoption and expectation of technology, and more specifically smartphone MDIs, varies between the museum and heritage context. Smartphone applications are now normalised in museums and less so in outdoor cultural heritage landscapes. This relates to museum spaces generally being more innovative in the adoption of new technology and approaches than outdoor heritage sites. The extent of which can be viewed in academic literature relating to the subject. Parry (2005), for example, outlines the history of museum computing and notes that museum computing is now recast as 'digital heritage'. Understandings of digital heritage and outdoor digital heritage emerge from the museum computing context, as the earliest examples of mobile digital interpretation emerged from the museum context.

The variation between the indoor and outdoor spaces is an important consideration in thinking about the outdoor heritage MDI experience. The indoor museum space has affordances that

are unavailable in the outdoor heritage context. The space within indoor museums provides a more accommodating environment to adopt new technologies. Way-finding concerns are not as prioritised as they would be for a visitor in a remote landscape for example, while a lot of the infrastructure required (such as wi-fi connectivity) are already established within several museum buildings. Similarly, there are different motivations and expectations between the indoor museum and outdoor cultural heritage spaces. The importance of the landscape and the leisure activity component for example as outlined in Chapter 7 typify these differences between contexts. It is important to acknowledge the variation between these spaces when considering the MDI paradigm, given that thinking and inspiration surrounding the adoption of smartphone MDIs in the outdoor heritage context is shaped by the existing adoption of the technology in museum spaces.

Conclusion

This chapter builds on the findings of the previous chapters to explore further what the MDI heritage experience entails and the implications on the embodied experience of the user. The adoption of the smartphone creates new methods for thinking about, acting and doing in the heritage experience. This emerges from the unique affordances of the smartphone, most notably the role it plays in the everyday actions of users. Kopomaa (2000) and Lindhorn *et al.* (2003) proclaim with reference to smartphones that users do not only carry a smartphone but a 'piece of society'. The intertwined network of connections, across the everyday and heritage landscape contexts, provides a profound influence on the experience of the user. The smartphone connects both spaces and leaves the user occupying a place between both; this place is akin to the hybrid landscape discussed previously. When individuals use their smartphone in the heritage context, the highly personalised device they use on a daily basis is simultaneously an interpretative medium. The affordances of the smartphone, such as its owners' everyday usage behaviour, are a part of the interpretative experience and therefore should be a consideration within the interpretative goal of the MDI.

The complex network that encapsulates the MDI experience is evident when considering aspects such as authenticity. While Petrelli *et al.* (2013) highlight the limitations of digital tools to project authenticity, this thesis presents cases where this was achieved in the MDIs. This includes use of a local voice for example grounded the MDI experience in place, as it 'spoke' to the user in a manner they felt reflected the location. This is an acknowledgement of

the need to think contextually about the experience, making links between voice and tone with the wider geographical and cultural context in which it is situated. The research supports Kidd's (2011) perceptions of authenticity, as participants' actions and responses reflected the subjectivity of the concept and how it is closely attached to the individuals' meaning-making process.

Authenticity is also an important aspect of developing a connection to place and a sense of place. The perception of authenticity assisted attachment, dependency and identity connections between participants and the respective sites studied. This is particularly important in relation to the intangible elements of the experience, which appeared to acquire greater influence on individuals when their articulation was perceived as authentic by the visitors. The authenticity and authority of the interpretation were highlighted in the participants' expressions of feelings of belonging or non-belonging in the spaces as a result of their experience with the MDIs. The notion of the 'authentic voice' in the interpretation emerged as significant aspect of the experience, especially in relation to how this conveys a particular narrative and the subsequent implications this singular narrative has on the experience of the individuals. MDIs positioned as local interpretations for example serve as expressions of identity and distinctiveness, but this distinctiveness occurs through differentiation. The differentiation, however, can also be in contrast with the perceived unique capacity of mobile digital interpretations to offer plurality of interpretations to visitors.

This raised the need to consider a new paradigm for the outdoor MDI visiting experience, which was addressed in the final section of this chapter (Section 8.3). A consideration for a new paradigm is required based on the existing ill-defined nature of the current paradigm, especially the disparity between the imagined and lived experiences of visitors that engage with MDIs. A key aspect of this is personalisation in the experience, which had been largely delegated to the device due to the fact that it was the visitors' personal device. The limitation of the existing paradigm is noted also in the articulation of the connections between location-awareness and context-awareness as means to delivering interpretive content. Location-awareness is advantageous but does not account for the overall context of the visit; thinking more holistically about the experience and incorporating more context into the development of the experience would benefit the users' experience. As noted throughout the previous chapters, the ambition would be to effectively connect all the various components in the

experience, including the smartphone, and refrain from turning the smartphone itself into the experience.

Chapter Nine: Conclusions

This chapter draws together the arguments and points made throughout the previous chapters to allow for reflection and evaluation of the aims and objectives of the research. To reiterate, the aims for this research were as follows:

> *Aim 1. Critically analyse contemporary smartphone-based MDIs applied to outdoor cultural heritage sites.*
>
> *Aim 2. Critically examine methods in which people engage with outdoor heritage sites through smartphone-based MDIs.*
>
> *Aim 3. Investigate the inter-relationship between place, smartphone device and the user in the outdoor cultural heritage experience.*
>
> *Aim 4. Determine how effective outdoor heritage engagement can be enhanced using smartphone-based MDIs.*

To address these aims, a foundation was provided in the opening chapters which related to the typology of MDIs and engagement in the outdoor heritage context (Chapters 2 and 3, respectively). These chapters established an intellectual framework which was combined with the methodological approach (Chapter 4) to allow confidence in the exploration of this topic and ability of this research to address the stated aims. Chapter 4 explained the rationale for the multi-method approach, which combined visual ethnographic, semi-structured user and stakeholder interviews, and document analysis components. The diverse, yet interconnected nature of the points within these chapters highlights the complexity of the topic, and the challenges in productively researching such subjective phenomenon. The chapters acknowledge, for example, the implications of attitudes towards the technology and the socially constructed uses of it (Chapter 5), the influence of interpretative themes on engagement (Chapter 6) and the role of mobility in the outdoor heritage experience (Chapter 7).

The focus of the following section is on the overall outcomes of the research and how they align to its aims (Section 9.1). This allows for considerations of the boundaries of the

research, such as the temporal nature of digital interpretations (Section 9.2), as well as outlining avenues for further investigation (Section 9.3). Additionally, given the nature of the research, there are several implications and potential applications for the research in practice that require addressing (Section 9.4). This includes actionable elements that enhance the interpretative experience for individuals, particularly in relation to their embodied experience. The chapter, and this research, concludes with some overall thoughts relating to the research topic (Section 9.5).

9.1 Summary of Research Findings

The research set out to examine the influence of smartphone-based Mobile Digital Interpretations on visitors' experiences in outdoor cultural heritage landscapes. A particular interest in this context was the connection between MDIs and sense of place. The key findings, presented in relation to the aims and associated objectives, are addressed in this section.

Aim 1. Critically analyse contemporary smartphone-based MDIs applied to outdoor cultural heritage sites.

This aim is foregrounded in Chapter 2, is further elaborated in chapter 3, and is then re-addressed in the discussions within Chapter 8. To understand the influence and phenomena associated with using a smartphone as an interpretative medium in outdoor cultural heritage landscape it is necessary that we review the theories and practices that underpin these interpretations. As Chapter 2 outlines, the practices that inform the application of MDIs in this context stem from two primary sources: previous media adopted for the interpretative experience (such as hand-held audio guides); and the social and cultural phenomenon surrounding the smartphone. In a 'smartphone society' (Ofcom, 2015), the conceptualisation and adoption of the technology in the heritage sector is connected to the wider context in which the devices are being used. Instances of this are apparent, for example, in the widely-accepted expectation of the smartphone as an interpretative medium for accessing younger demographics. However, the potentially short-sighted nature of this approach is also highlighted. For example, the research showed how users outside of the desired demographic respond to the interpretation as a result, viewing it as 'not for them'. The temporal nature of the interpretation and how this frames practice is also addressed, reflecting on the role of

technological advancement and the ever-developing device capabilities. This point is addressed in Chapter 2, which outlines the typology and evolution of MDIs within the heritage context and is then further reflected on when considering the nature of outdoor heritage interpretation and fostering a new paradigm for this experience (Chapter 8).

The nature of the engagement with the smartphone MDI helps shape the user's heritage experience; however, the research confirms that engagement does not depend solely on the smartphone MDI. No process in the heritage experience can be removed or subtracted. The heritage experience reflects the rich variability of human interactions with place, incorporating for example, technological, environmental and social aspects along with the subjective intellectual and emotional components of the individual. Strategies for the adoption of MDIs therefore must echo this and provide space for the embodied elements of the experience. A case is made in Chapter 5 that the user and the device should be viewed as co-operating in the construction of engagement. This promotes strategies beyond the more traditional behavioural paradigm of content consumption and reframes the smartphone as a means for empowering the individual in the construction of their individual understanding.

Another key point to emerge from this aim was the influence of pre-existing conceptualisation of the MDI experience among heritage staff. The institutions' perception of mobile technology as a proxy for engagement is a primary example of the influence such preconceptions have on the experience. Through framing the MDI in this manner, engagement is centred on technology-led approaches instead of the all-inclusive, holistic understanding of engagement and sense of place outlined in Chapter 3. This can be problematic in the MDI experience because, as the visitor engagement analysis highlighted, non-smartphone based interpretative experiences shape users' expectations of the smartphone-based MDI experience. Interpretative strategies which reflect previous interpretative mediums can be adopted effectively in the experience, in particular the use of audio as a means of communicating interpretative messages. Audio was perceived by participants to integrate more effectively in their experience than text or video-based strategies (such as those adopted in *Cumbrian Heritage Trails* and *Discover Navan Fort*). This is supported by audio-guides being a familiar interpretative medium that participants remembered using in the past. The *Walking with Romans* app moreover, deliberately maintained established interpretative strategies by prioritising interpretative messages over the technical capacity of the device. In certain instances, however, the value of the advanced

and novel technical capability of the device was apparent, most notably in the AR component in the *Walking with the Romans* app, which showed users the site as it is believed to have been in the past.

Aim 2. Critically examine methods in which people engage with outdoor heritage sites through smartphone-based MDIs.

This aim has been addressed at various points throughout the thesis. Chapter 2, for example, tackled the current typology of MDIs in the heritage context. Similarly, Chapter 5 explored how strategies of engagement are influenced by perceptions of the medium and Chapter 7 focused on the influence of mobility on engagement. Chapter 6, however, contains the key discussion relating to this aim and associated objectives. The chapter explored smartphone MDIs through an established rubric of heritage interpretation objectives, that is, emotional, behavioural and knowledge objectives. This spoke directly to issues related to interpretative strategies, institutional perspectives, user's responses to the interpretative content and, the application of traditional interpretative approaches within the smartphone medium.

What emerges immediately from this aim is the influence of the smartphone as an interpretative medium when considered within established heritage interpretation and engagement strategies. In particular it presented an insight into the role the medium has on fostering, supporting and enhancing the emotional objectives of the experience. This occurred on several levels: the interpretative content for example, supported connection to personal memories for participants by providing a deeper understanding of the site; the multimedia capability of the device was able to provoke a behavioural and emotional response in the individual. The most prominent example of an emotional response could be observed arising from the presentation of surprising or jarring content, such as that relating to the endangerment of the site. This provoked a response among the participants as both the content and its delivery through the MDI made a case for the value and uniqueness of the site. The traditional interpretative engagement strategies were supported, facilitated and enriched through the capability of the device to present images, audio and sound-effects, and reconstructions of the site relating to the interpretative content.

A chief component of engagement within the MDI heritage experience is knowledge provision. The research suggested that this content enables the user to foster stronger

connections to the site. The uniqueness of the smartphone medium and the affordances of the technology became apparent through this component. The research showed that users had higher expectations in relation to the knowledge provision as a result of the medium. The perception was that the MDI could present a varied and detailed range of interpretive content. This was juxtaposed in certain cases with the thematic interpretative approach adopted in some of the MDI experiences, most notably *Walking with Romans*. It is not feasible to address every aspect of this finding, but what does become apparent is the role of place in the experience. The expectation for knowledge is a consequence of perceptions of the device's capability but also due to participants' motivation to find out more and connect with the landscape. In relation to this, the research evidences the potential benefit of modular content as opposed to thematic content within MDIs. The research showed that a primary motivation for visitors was to engage with the landscape and the thematic content did not give them a full representation of this landscape.

Aim 3. Investigate the inter-relationship between place, smartphone device and the user in the outdoor cultural heritage experience.

Place has been a core aspect of the research and is a key component throughout this thesis, as is evident in Chapters 5, 6 and 7. In relation to this aim specifically, Chapter 7 addressed notions of mobility in the MDI experience and presented an analysis of the inter-relationship between place, the smartphone and the user. Mobilities, such as how the visitor moves through the landscape, reflect the complex relationship between place and the smartphone. This discussion also incorporates the virtual places created through smartphone MDIs, which frame the user as occupying a hybrid heritage landscape.

The multimedia approaches in the smartphone MDIs both structure and reinforce a sense of place. An important example of this is in the articulation of intangible cultural heritage through the medium. By being mobile and portable, the MDI was able to integrate into the mobility system of the user. Through the interpretative messages (such as in relation to William and Dorothy Wordsworth in the *Cumbrian Heritage Trails*) and the use of sound-effects (the marching of Roman soldiers in *Walking with Romans*) for example, felt connections to the landscape were fostered by the participants. Through analysing this relationship, it becomes clear that the smartphone is not the only motivational factor or ambition in the experience: but that place is also a priority for visitors.

The research demonstrated that consideration must also be given to the everyday contexts in which users interacts with and use their device. The research found that behaviours, experiences and interactions with the device in the everyday shape how it is used in the heritage landscape. The analysis showed that the use of a familiar device in the unfamiliar place of the heritage site resulted in greater device dependency and a sense of anxiety (relating to connectivity and battery life); participants experienced tension between using their device in the everyday manner and its new role in supporting their understanding of a historic place. There are clear links between place, the smartphone, and the user, most notably in the location of interpretative points. This incorporates the use of GPS, geo-triggered content and the anchoring of interpretative points to material objects in the landscape. The users' self-orientation and patterns of movement in the landscape expose the inter-relationship between place, device and user.

The research found that in the three case study MDIs the relationship between place and the smartphone MDI was interdependent. This suggests that an effective dialogue between both components is essential in fostering an effective experience for the user. Participant responses to the MDI and the landscape were dependent on whether or not the landscape feature was present in both the physical space and the virtual space of the MDI. Physical objects or prominent features in the landscape acted as beacons for the user. When the MDI reflected the physical appearance of the sites, the effectiveness of the MDI for the users' experience was realised. Conversely, if an object was present in the physical or virtual space only a negotiation had to occur in the mind of the participants. This presents a case for the MDIs to be not only location-aware but also context-aware, a point which is supported by the analysis of the GPS data from participants reflecting their movement through the space and interpretative points. The basis for the experience is a series of interactions, from location to location, from interpretative point to interpretative point. This peripatetic approach aligns with the understanding of the heritage experience as a process, formed over a series of interactions not only specific moments. The acknowledgement of this reiterates the importance of thinking holistically in relation to the adoption of smartphone MDIs in the heritage context. The powerful role that place plays in users' expectations, motivations and experience needs to be reciprocated and supported through the MDI.

An aspect which requires further attention with regard to this aim is the role of the heritage experience as a nature/leisure activity. Users across the three case study sites noted the importance aspect of this in their experience, and as a result a tension developed between the outdoor heritage experience and the use of their own smartphone, which continues to tether them to their everyday activities during the visit. Strategies for development of MDIs must reflect this aspect of the experience and is another consideration for a more holistic approach to engagement, catering for the rich variability of human interactions with space.

Aim 4. Determine how effective outdoor heritage engagement can be enhanced using smartphone-based MDIs.

As Chapter 8 summarises, the adoption of smartphone MDIs in the outdoor cultural heritage context comprises a complex set of practice; the full ramifications of which, I argue, are not fully understood by those developing MDIs. Those responsible for the development of such interpretations should be aware of the influence the medium has on the experience, both in terms of how it can strengthen, support and enhance place connections, but also how it can foster non-belonging and promote specific narratives and ideological positions, such as at Navan Fort with *Discover Navan Fort*. The influence of non-physical representation and expressions of power in the experience are of particular interest here, as discussed in Section 8.1. This has ramifications for the heritage experience, heritage discourse and organisational practices.

A primary implication of this research is the articulation of a new paradigm in the heritage experience to respond to the medium and the affordances that are associated with it. It is in particular reference to the premise of the 'personal' experience, specifically if this personalisation was related to the visitor's individual heritage experience or personalised components on their smartphone. This was an aspect acknowledged in Chapter 2, which discussed understandings of smartphone MDIs, and also in Chapter 3, which explored individuality in the experience and engagement. Chapter 8 discusses this further, building on the findings outlined in previous chapters. The research suggests that the common perception that MDIs afford greater agency and freedom to the individual do not often align with the reality of the experience. There is a degree of freedom and agency in the experience, but this occurs within the framework that the organisations devise in the development of the application.

Smartphones, in theory, enable a shift away from didactic communication models to multi-way communication, reflecting its perception as the leading edge in interpretation (Wallace *et al.*, 2012). Key theories relating to this perception, such as communication models, personalisation, place-making and design thinking are drawn on to further understand the practice of deploying MDIs in Chapter 8. Personalisation and how this caters for individual identity for example, is a key issue in the adoption of the technology and is also a prominent aspect of the heritage experience. The medium allows for the site to be 'reconfigured, rewired and re-located and reconnected' (Staiff, 2016) to reflect the needs of the individual. However, as Chapter 8 argues, this all occurs within parameters designed by the heritage organisations. The research raises questions of critically reflecting on the theories and practices which underpin the adoption of this medium, and relevant interpretative media in the heritage context.

9.2 Boundaries of the Present Research

Reflecting on the boundaries of the research, it is important to recognise the limitations acknowledged in presenting the research development and methodology (Chapter 4). An immediate concern is the number of in-situ investigation sites. Due to time and logistical constraints associated with the research, only three sites could be investigated effectively. While a larger number of sites would assist the research further, there is confidence in the validity of the data collected and conclusions reached as supported by the triangulation of the research (Section 4.3). In addition, the scope and depth of data generated in each of the three in-situ investigation sites, allowed the exploration of the nuances within the experiences more deeply and more effectively than it would have been possible with additional sites in the same timeframe. The focus of the research was the influence of MDIs on the individual's sense of place, therefore this approach with fewer sites but greater attention and agency to the individual is justified.

Another consideration was that established methodological approaches were not viable in the context of the research undertaken. In-depth descriptions from observations for example would not suffice on their own in relation to meeting the aims of the research; as a result, more contemporary approaches were required to address this issue. This is reflected in the adoption of go-pro action cameras to capture the evolving experience of participants. Furthermore, these methods also echo new forms of expression, both in relation to the user

and the researcher. The implications of these methods were a concern in the research. The impact of the camera on the user's response was a central concern but previous studies, such as Peräkylä (2006) and Evers (2015), supported its adoption. Extensive efforts were made to mitigate the influence of the video-recording on the participant's experience. This included the use of a chest harness over clothing, thus lessening attention towards the device, and also the fact that the camera was not filming the user directly but facing forward.

An element that was characteristic of the ethos of this research was the fact that agency in the in-situ research was handed over to the user. The potential risk involved in this approach was relatively high but given its prospective benefits and the desire to address the lived user experience, the associated risk was necessary. As it turned out, a primary strength of the research framework was the agency given to the individual. The unique and spontaneous experiences recorded through this approach are pivotal when addressing the aims of the research. Being a responsive researcher to these occurrences, and the accompanying methods to the in-situ go-along experience, (for example, the post-experience interview) mitigated the negative impact of actions in-situ (such as cutting the experience short). To reflect the lived experience, the participant had to be comfortable and aware that they could control the length of the experience. There was no indication from the research, or other studies such as Pink's (2009), that the richness of the experience was influenced by time spent on-site. Also, as a result of the nature of the experience it is not possible to maintain full anonymity of individuals as the sites were open to other visitors at the same time. This was something that the research had to be aware of but it did not have significant implications as the topics discussed during the experience did not involve sensitive material.

Finally, a key boundary of the research was the temporal nature of smartphone MDIs in the heritage and museum context. As discussed in Chapter 8, the MDIs adopted in the in-situ investigations were developed 2-3 years previously. This had implications on gathering contextual documents relating to the respective MDIs or contacting individuals involved in the development process, as they often had moved organisations or could no longer accurately recall the intricacies of the project. The diverse types of data collected relating to the respective MDIs studied in the in-situ investigation mitigated the influence of this, but nevertheless it points to a key factor in the development and analysis of MDIs in this context. The rate at which the MDI development projects emerge and then fade from memory reflects the project nature of the interpretation and makes it difficult for critical analysis to take place.

Often, the technological component or trend is surpassed by another, which then becomes the focus of attention. This is an element which is pivotal in relation to the adoption of smartphone-based MDIs in the heritage context: the lack of critical reflection on the implication of approaches is superseded by a constant desire for innovation in the experience promised by a specific technology.

9.3 Avenues for Future Investigations

The abovementioned limitations provide an initial focus for the potential directions of future research. An immediate area of further research relates to the production of digital interpretations in the heritage context, particularly addressing production values. A study which tracks stakeholders in the development, adoption and maintenance of the interpretation, would give a valuable insight in relation to this. It is highly pertinent. As this research indicates, a large number of the challenges with the effectiveness of the interpretation and user experience is a response to the actions and perceptions of the relevant stakeholders. The production values associated with digital interpretations in the heritage context are a prominent component which needs further analysis. While this research has highlighted the influence of production values on the experience, further analysis is required to address the issues and challenges which emerge within organisations in relation to digital adoption. As the research has illustrated, the implications of MDIs are not exclusively connected to the technology adopted but how specific technologies are adopted and perceived. It is with this understanding that addressing the structures within heritage organisations would be beneficial. As has also been noted, many of the issues associated with MDI development have been acknowledged in other research, however are still prominent in product development. This is also symptomatic of the fact that research on MDI is often reported in the format of a single case study which dilutes its potency. The disconnect between these two aspects needs to be examined in order to ensure more effective adoption of digital technologies within the heritage sector.

Considering the exploration of placemaking and identity through digital interpretation, it would be worthwhile to consider foreign or non-local visitors; those who are visiting the site outside of what Lotman (1984) regards as their own ‘semiosphere’. This would provide an insight into the expectations and motivations of such visitors to the site, addressing how they differ from local visitors. It would also present avenues for accommodating local and non-

local visitors through the interpretation. Further, it highlights the nuances relating to identity and representation in such experiences. Given that participants within the study lived in the region, although some identified as not being local, there were certain cultural touchstones or collective memories which shaped their responses to the interpretation and the site. The case of identity at Navan Fort for example, and the feeling of belonging or non-belonging this fostered would be an interesting issue to further explore with foreign visitors. This would also interrogate how foreign visitors respond to the representation of the site through the MDI, looking at authenticity and authority in the experience, given a potential lack of known context around the specific heritage. An alternative approach to this is to widen the geographical scope of the research beyond the UK. The findings in this research could be further validated by conducting the research in other cultural spheres, such as in Southeast Asia, Latin America or Sub-Saharan Africa. This would be advantageous in critically reflecting on the adoption of digital interpretation and would also contribute to understanding of heritage visitors. This would offer an insight on how to overcome the homogenous understanding of the user which is created in the development of such interpretations, as addressed in chapter 5, and also accommodates the new paradigm for heritage experiences given the proliferation of technological device in society and heritage spaces.

The research has been exclusively concerned with smartphone-based MDIs in the outdoor heritage context; this can also be reciprocated in other heritage or museum spaces or with other forms of digital interpretations. This research was concerned with the influence of a smartphone as a medium specifically and provides a framework, through addressing the cultural and technological affordances of the medium, to produce new understandings of the components that are hosted within it. The range of elements that are incorporated into MDIs could be further explored through the lens of sense of place and engagement, which was used in this research. Although the MDIs in the study incorporated many of the elements, the three in-situ investigations addressed audio, video, text and other components such as AR for example, this could be further synthesised to analyse specific components.

As noted throughout the analysis chapters (Chapters 5, 6 and 7) and discussion chapter (Chapter 8), there is greater need for the representation of multiple perspectives, including minority voices. The research aimed to move discussions beyond the homogenous understanding of the visitor, to address the individual specifically. It would be advantageous to extend the research by exploring the experience of underrepresented groups with these

MDIs as a means to highlighting the limitations in current approaches and to provide insights into how a greater variety of individuals or groups can engage with MDIs at cultural heritage sites.

9.4 Implications of the Research for Practice

Given the nature of the research subject and considering the development and adoption of smartphone-based MDIs for the outdoor cultural heritage context, the insights generated are relevant for the ongoing development of MDIs. The research sought to explore the embodied and sensuous connections which occur in the heritage experience and focus on the influence of smartphone MDIs within these connections. The basis for the research was a lack of critical understanding of this topic, a desire to accommodate the holistic nature of the experience, and particularly place-based connections into the MDI experience. This section will therefore outline how some of the findings in this research can be utilised in practice.

A key aspect to emerge from this research in relation to practice is that the matters surrounding the adoption of the MDIs are not necessarily to do with the technological capacity of the device, but in how it is designed and developed for the user as part of an MDI strategy. MDIs are not autonomous in the experience, and no element can be fully removed or subtracted from the individual's heritage experience. This aligns to the fact that engagement is not achieved instinctively because of the medium. Relatedly, this raised important issues surrounding targeting specific demographics through the adoption of smartphones as an interpretative medium. Smartphones are now ubiquitous across all ages and therefore conceptualising the user as a younger person may limit the effectiveness of the interpretative experience and content. The point of reference for individuals in this research for smartphone MDIs was not applications they use daily outside of the heritage context, but the audio-guide. Many of the features that participants listed as their key functions for everyday usage (such as social media, news and communicating with friends) were not features that were key to the respective smartphone MDIs studied. While the affordances of the device are a necessary consideration in the experience, basing the interpretative experience on technology-led decisions of the smartphone is not effective in catering for the uniqueness of the heritage experience and the interpretative ambitions of patrons.

Multimedia was seen to be effective in portraying cultural heritage, particularly intangible heritage which was not clearly evident in the landscape. The combined use of audio and video reconstruction within *Walking with Romans* is a notable example of the advantages of this approach. Audio was the preferred media stated by participants, building upon their contextualisation of the experience being reminiscent of past experiences in similar circumstances with audio-guides. Additionally, time spent focusing on the device was perceived as a negative aspect, distracting from their on-going experience. The use of audio accommodated this better than other forms of media, by not averting the view of the individual and offering a greater deal of flexibility in allowing the user to receive the interpretative messages without having to focus on the device. When adopted in specific instances each form of media can be beneficial to the heritage MDI experience. There is no perfect solution which will be applicable to all sites, the MDI is required to be a reflection of the uniqueness of each location. This is an important aspect in moving beyond technology-led decision making and towards a place-based, holistic understanding of such interpretations.

While expectations from the experience with the medium were higher, due to the perceived potential of the smartphone, the expectations for the heritage interpretative experience were consistent with established understanding on visitor expectations in the heritage experience. A knowledge and learning component, for example, was common across the three in-situ investigations conducted. Interpretative planning for the MDI experience, therefore, needs to accommodate these established features of heritage interpretation. Opportunities for explorative learning and content which provided surprises were positive elements noted by participants. The core principles of heritage interpretation are a prominent aspect of the MDI experience and cannot be neglected because of the medium being used. In addition, the medium can enhance the content. The use of sound-effects was a noticeable example of this as it was used to embellish the interpretative messages and engage the individual with the content. It is important to also acknowledge that other genres of smartphone heritage applications are in place. There are smartphone-based MDIs in the heritage and museum context which have a specific focus on immersive or mixed reality experience (such as applications that function as games). These genres can be effective in achieving aims relating to fostering a specific experience and aspects of these approaches can be successfully adopted in the outdoor cultural heritage context. It is important however, that smartphone-MDIs are clear for the user on their aims, ambitions and the experience they aim to offer.

A final aspect, which is important for practice, is the materiality of place. This relates to the hybrid landscape, the accuracy of the navigational component (most notably GPS), and the role of physical objects. The location-awareness of the MDI was not enough to ensure an effective interpretative narrative; a more context-aware approach is required. The physical landscape, trails and objects are affordances which act upon the narrative structure. Synergy between these material objects and the interpretative points in the MDI were seen as positive in relation to the spatial awareness of the user, as well as presenting a clear interpretative narrative.

9.5 Closing Remarks

Finally, it is appropriate to return to the developments which have emerged through the research. As the previous section (Section 9.4) suggested, the study has significance for the practice of producing smartphone-based MDIs in the heritage sector. The study also has impact more broadly within the digital heritage field. This is especially the case given the temporal nature of digital interpretations that has been witnessed in the sector over the previous decade, coupled with the rate of technological advancement. A number of the most relatable findings to the broader sector are summarised below:

- Understandings, conceptualisations and the knowledge base for MDIs and digital projects for outdoor heritage landscapes emerge from Museum Studies. While there are significant overlaps in both interpretative spaces (museum and outdoor heritage spaces), the nature and leisure activity components are more prolific in outdoor heritage landscapes. This brings specific motivations for users and challenges in the development of the interpretation which diverge from issues raised in Museum Studies.

- Attention must be drawn to the development of the applications and the subsequent dynamics of power and authority in the experience this creates. As Hea *et al.* (2017: 337) stated, "the industry still lacks a common consciousness for the whole: technology is not a goal on its own, but a simple tool for creativity and the protection, documentation, visualization, and interpretation of cultural heritage". Despite significant discussion among scholars within the museum and heritage sector, the

technology-led practice prevails, as was made clear in this research.

- Adoption of smartphone MDIs without a clear understanding of their influence or best practice has played a part in shaping the current challenges associated with the MDI experience. These challenges include factors which were evident in the research, such as legitimising the MDI as an interpretative medium; awareness of the broader context of the experience; and how to assimilate the MDI into this process. It is not possible to discuss the physical and digital as separate entities. Experiences of place are transformed by 'always on' connections, such as that enabled by the smartphone (De Souza E Silva, 2006). The digital, virtual contexts are intertwined with the present physical context occupied by the user.

- Two of the MDIs adopted in the research, *Discover Navan Fort* and *Cumbrian Heritage Trails*, are no longer available to users from the Apple iTunes store since the launch of iOS11 (19th September 2017). Any users using a smartphone device with the iOS11 operating system or above cannot access the interpretation as the respective applications were not maintained or updated to support these systems. This demonstrates stakeholder perceptions of smartphone-based MDIs. The research highlights the temporary nature of MDIs and that they are viewed as a means to access and connect with visitors, but not necessarily to serve as a serious form of interpretation. This is supported by MDIs being funded as part of a project and having no scope for maintenance or potential legacy post-project. As a result, this also raises questions relating to the cost benefit of smartphone MDIs for the heritage and museum context.

- Many visitors using a smartphone MDI do not often have a benchmark for the experience at the location without the MDI, therefore the experience is inextricably linked to the device. The pervasively quotidian nature of mobile digital technology in mediating tasks, such as the heritage experience, has an increasingly profound effect on the phenomena surrounding it (Ash *et al.*, 2018). This competes with the experience of the individual. The individual is at the location for the heritage experience using a smartphone MDI, not there necessarily to take part in a smartphone MDI heritage experience.

- Smartphone MDIs in the heritage context are often presented as offering an alternative or something different for visitors, but this is not necessarily a major concern for the user, whose ambitions are to engage with the site. As noted, these applications cannot be viewed as autonomous or an experience in their own right, and yet presenting them as an alternative to traditional interpretation does just this and sets an unhelpful representation of the mobile technology as an 'other'. This research advocates that MDIs should be viewed as a new method for delivering the core principles of heritage interpretation. This does not limit the potential or creativity offered through the technology, but the foundation should align with established and well-tested heritage interpretation frameworks.

To conclude, this research demonstrates the interconnectedness of the various components which constitute the outdoor heritage experience and reinforces the need to think holistically about the adoption of smartphone-based interpretations in this context. The research advocates for reframing the smartphone in the outdoor cultural heritage context as a means for empowering the visitor in the construction of their individual understanding.

Appendix One: Example of Information and Consent Form for Walking Interviews

Information for Participants

Title of Study: Engaging with Cultural Heritage Sites through Smartphone based Mobile Digital Interpretations

Introduction and Purpose
My name is Brian Moss. I am a Doctoral Researcher in Media, Culture, Heritage at Newcastle University, UK. I would like to invite you to take part in my research study, which is concerned about the influence of smartphone based mobile applications on sense of place within outdoor cultural heritage sites. This project is funded through the Arts and Humanities Research Council (AHRC) Northern Bridge Doctoral Training Partnership.

Procedures
If you agree to participate in my research, I will conduct, at a time of your choice, a walking interview on site in Trecastle. The interview will involve questions about your personal thoughts and responses to the experience, sense of place and the use of mobile technology. It should last approximately 2 hours. With your consent, you will wear a video camera to record the experience and the interview will be audiotaped. This is to accurately record the information you provide and document the experience for analysis. If you agree to wearing the video camera and being audiotaped but feel uncomfortable at any time during the interview, the recording can be paused at your request. Or if you don't wish to continue, you can stop the interview at any time. I expect to conduct only one interview; however, follow-ups may be needed for added clarification. If so, I will contact you by e-mail/phone to request this.

Risks/Discomforts
If any of the research questions make you uncomfortable or upset you are free to decline to answer any questions you don't wish to, or to stop the interview at any time. No responsibility is taken for any loss or injury whilst on site conducting the interview.

Confidentiality
Your study data will be handled as confidentially as possible. If results of this study are published or presented, individual names and other personally identifiable information will not be used, unless you give explicit permission for this overleaf. To minimize the risks to confidentiality, all data will be securely stored and access limited to the research team.

Collected Materials
The collected materials of this study will be used for academic purposes, such as a PhD thesis submitted to Newcastle University, UK, as well as other academic publications and presentations in both paper and digital/online formats. The findings of the research may also appear in professional publications, and popular outlets such as online forums.

Rights
Participation in research is completely voluntary. You are free to decline to take part in the project. You can decline to answer any questions and are free to stop taking part in the project at any time. Whether or not you choose to participate in the research and whether or not you choose to answer a question or continue participating in the project, there will be no penalty to you or loss of benefits to which you are otherwise entitled.

Questions
If you have any questions about this research, please contact:
Brian Moss
Tel.: 07927939732 E-mail: b.moss1@ncl.ac.uk.

Consent

Title of Study: Engaging with Cultural Heritage Sites through Smartphone based Mobile Digital Interpretations

I, the undersigned, confirm that (please tick box as appropriate):

1.	I have read and understood the information about the project, as provided in the Information Sheet dated _____.	☐
2.	I have been given the opportunity to ask questions about the project and my participation.	☐
3.	I voluntarily agree to participate in the project.	☐
4.	I understand I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn.	☐
5.	The procedures regarding confidentiality have been clearly explained (e.g. use of names, pseudonyms, anonymisation of data, etc.) to me.	☐
6.	I give consent to be audio recorded and for the production of a video recording of the visit.	☐
7.	I give ownership of the data collected via the wearable technology to the researcher and research project.	☐
8.	The use of the data in research, publications, sharing and archiving has been explained to me.	☐
9.	I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form.	☐
10.	Select only one of the following: • I would like my name used and understand what I have said or written as part of this study will be used in reports, publications and other research outputs so that anything I have contributed to this project can be recognised. • I do not want my name used in this project.	☐ ☐
11.	I, along with the Researcher, agree to sign and date this informed consent form.	☐

Participant:

_____	_____	_____
Name of Participant	Signature	Date

Researcher:

_____	_____	_____
Name of Researcher	Signature	Date

Appendix Two: Example of Information and Consent Form for Interviews

Information for Participants

Title of Study: Engaging with Cultural Heritage Sites through Smartphone based Mobile Digital Interpretations

Introduction and Purpose
My name is Brian Moss. I am a Doctoral Researcher in Media, Culture, Heritage at Newcastle University, UK. I would like to invite you to take part in my research study, which is concerned about the influence of smartphone based mobile applications on sense of place within outdoor cultural heritage sites. This project is funded through the Arts and Humanities Research Council (AHRC) Northern Bridge Doctoral Training Partnership.

Procedures
If you agree to participate in my research, I will conduct, at a time of your choice, an interview in person. The interview will involve questions about your role in the development of the 'Walking with Romans' Smartphone Application, personal thoughts on the experience, sense of place and the use of mobile technology in this context. It should last approximately 1 hour. I expect to conduct only one interview; however, follow-ups may be needed for added clarification. If so, I will contact you by e-mail/phone to request this.

Risks/Discomforts
If any of the research questions make you uncomfortable or upset you are free to decline to answer any questions you don't wish to, or to stop the interview at any time.

Confidentiality
Your study data will be handled as confidentially as possible. If results of this study are published or presented, individual names and other personally identifiable information will not be used, unless you give explicit permission for this overleaf. To minimize the risks to confidentiality, all data will be securely stored and access limited to the research team.

Collected Materials
The collected materials of this study will be used for academic purposes, such as a PhD thesis submitted to Newcastle University, UK, as well as other academic publications and presentations in both paper and digital/online formats. The findings of the research may also appear in professional publications, and popular outlets such as online forums.

Rights
Participation in this research is completely voluntary. You are free to decline to take part in the project. You can decline to answer any questions and are free to stop taking part in the project at any time. Whether or not you choose to participate in the research and whether or not you choose to answer a question or continue participating in the project, there will be no penalty to you or loss of benefits to which you are otherwise entitled.

Questions
If you have any questions about this research, please contact:
Brian Moss
Tel.: 07927939732
E-mail: b.moss1@ncl.ac.uk.

Consent

Title of Study: Engaging with Cultural Heritage Sites through Smartphone based Mobile Digital Interpretations

I, the undersigned, confirm that (please tick box as appropriate):

1.	I have read and understood the information about the project, as provided in the Information Sheet dated _____.	☐
2.	I have been given the opportunity to ask questions about the project and my participation.	☐
3.	I voluntarily agree to participate in the project.	☐
4.	I understand I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn.	☐
5.	The procedures regarding confidentiality have been clearly explained (e.g. use of names, pseudonyms, anonymisation of data, etc.) to me.	☐
6.	I give consent to be audio recorded during the interview.	☐
7.	The use of the data in research, publications, sharing and archiving has been explained to me.	☐
8.	I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form.	☐
9.	Select only one of the following: • I would like my name used and understand what I have said or written as part of this study will be used in reports, publications and other research outputs so that anything I have contributed to this project can be recognised. • I do not want my name used in this project.	☐ ☐
10.	I, along with the Researcher, agree to sign and date this informed consent form.	☐

Participant:

_____	_____	_____
Name of Participant	Signature	Date

Researcher:

_____	_____	_____
Name of Researcher	Signature	Date

Appendix Three: Example of Recruitment Flyer

PARTICIPANTS REQUIRED FOR WALKING STUDY IN THE TRECASTLE & BRECON AREA

WALK INCLUDES THE Y PIGWN AND WAUN-DDU ROMAN SITES USING THE 'WALKING WITH ROMANS' MOBILE APP

The research project is exploring the effect of mobile applications on sense of place at heritage sites.

As a participant in the study you will be asked to share your thoughts and personal responses to the walk around the location and the associated mobile application in a walking interview.

No prior knowledge of the area or the application is required and the activity can be completed one-on-one or in groups – so feel free to bring a friend or family member!

Walking interviews will be scheduled to suit participants and travel arrangements can be made where necessary. These walking interviews will take place between the 24th August and 2nd September 2016.

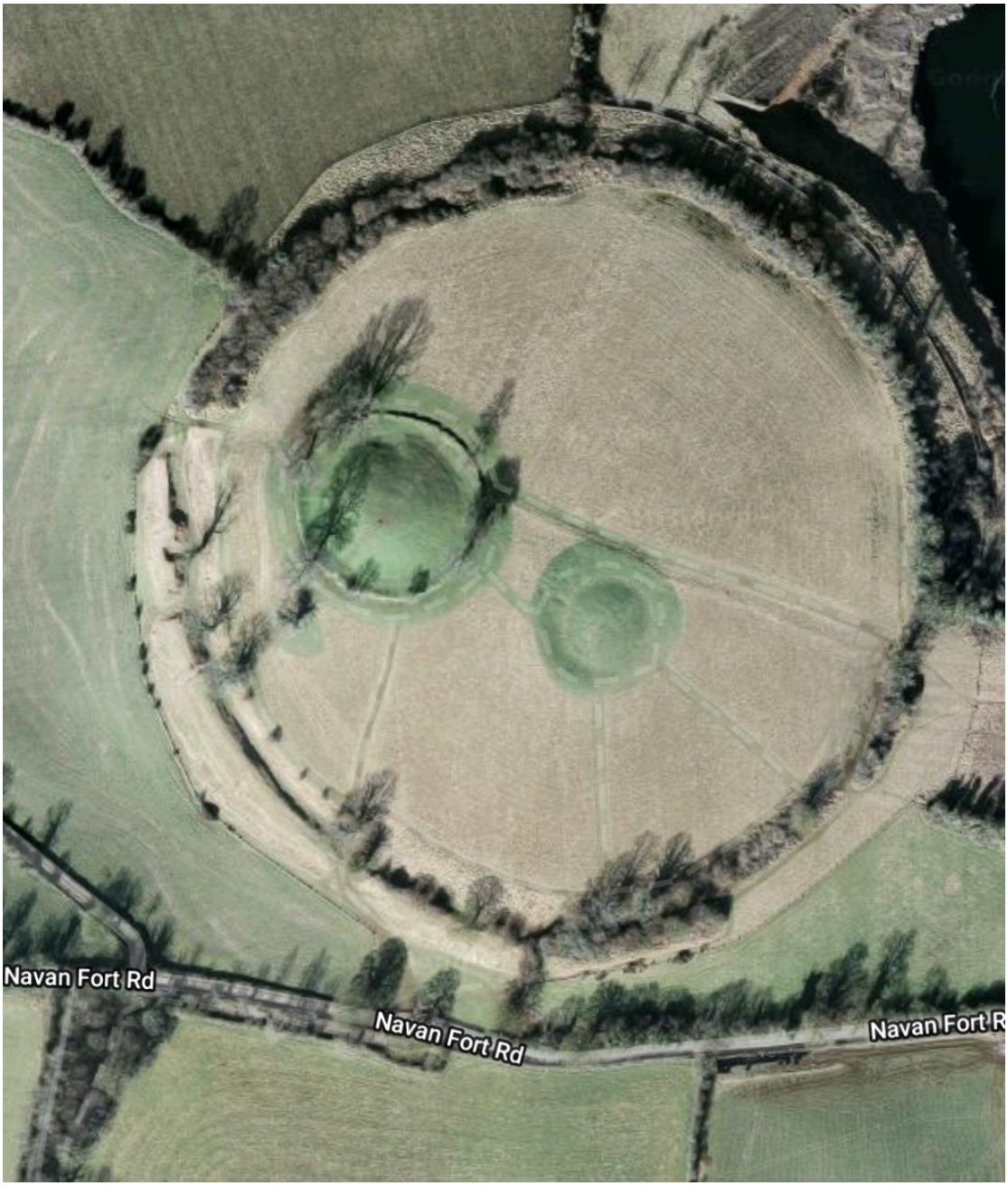
If you are interested in taking part in this study or would like more information about the project please contact Brian Moss:
Tel:07927939732 E-Mail: b.moss1@ncl.ac.uk

Newcastle University

Arts & Humanities Research Council

Northern Bridge Doctoral Training Partnership

Appendix Four: Navan Fort map participants were offered to annotate



_____ _____

Name of Participant Date

Appendix Five: Example of Heritage Organisation Stakeholder Interview discussion questions

Resources:	Audio Recorder (Inc. Lapel Mic); information sheet and consent form
Theme	**Questions**
Introduction	How long have you worked here?
	What is your role in the company?
	Why did you become involved in the project? Past experience?
	How did the process evolve? - Why was the decision made to pursue a mobile app?
	How did the partnership with the app developers come about?
	Was there consultation with any other organisation?
	How was funding sought?
	How was the communication between stakeholders?
Site	Did you have any preconceptions on the project?
	How familiar were you with the use of mobile digital interpretations prior to this?
	What is the lasting message from the site? - was this successfully conveyed in the app?
	What identity do you think the site is associated with?
	What is the value of this site/ What makes it unique?
	What does Sense of Place mean to you and how would you describe the sense of place of the site?
Development Process	What were the aims of the application? What did you want it to achieve?
	Where did the initial plan for the application framework originate from?
	Expectation of this application?
	Important of a factor was the location of the site to the development of the app.?
	What other applications (if any) were you inspired by/took influence from?
	What was the target audience/demographic? (If any)
	How was the length of time required for the app guide decided?
	Was there a discussion relating to charging for the app?
	Overall how long did the process take?
	What were the main problems during the development process? Challenges?
App features	Bi-Lingual - How important was this and were considerations made to facilitate this?
	Overall are you pleased with the application?
	Are expectations heightened by having to download it to their own device? Is there feedback from visitors on this?
	How were decisions made on technical elements of the application?
	How was the content provided? Was the application built around the content provided or vice versa?
	What were identified as the 'must have' elements? And why?
	What are the most and least effective elements of the application? Where there other features tried and then removed?

	Any consideration to just put the app on one platform?
	Why app over optimised website etc.?
	Was there any evaluation process during development/release?
	What were the outcomes of this process and how did it influence the application?
Theory/Future Development	Any specific heritage interpretation models incorporated into the development?
	How effectively do you think the app conveys the message of the site?
	How much emphasis was placed into the embodied sensuous experience of the user?
	Was sense of place considered? What measures were taken to facilitate the intangible elements of the experience within the app?
	How was this addressed through the application?
	How influential is the application to the experience?
	How was the response from users?
	In your opinion, how much agency is to be given to the individual or should the app lead the experience?
	Any plans to develop it further?
	Anything you would do differently?
	What do you think are the important issues to consider in applications of this nature?
	Who should lead the development of such apps? The organisation or the developer or collaborate fully?
	How do you see these apps evolving? Key trends?
	What is the take home message of the site and do you think is reflected in the app?
	Has the app had the desired effect? - How did you measure the success of the app?
	What other forms of digital interpretation are available at the site?
	How experienced were the team in relation to developing MDIs?
	What advice would you give to similar organisations looking to develop mobile applications?

Appendix Six: Example of Application Developer Stakeholder Interview discussion questions

Resources:	Audio Recorder; information sheet and consent form
Theme	**Questions**
Introduction	How long have you worked here?
	What is your role in the company?
	Why did you become involved in the project? Past experience?
	How did the process evolve?
	How did the partnership with the heritage organisation come about?
	How was funding sought?
	How was the collaboration between stakeholders?
	Did you have any preconceptions on the project?
Site	How familiar were you with the site prior to the project?
	What do you think is the lasting message from the site?
	In your view, what is the value of this site?
	What does Sense of Place mean to you?
	In your experience, what sort of place is this site? From your experience in working in this project, why would people relate to this site?
Development Process	What were the aims of the application?
	Where did the initial plan for the application framework originate from?
	Expectation of this application? (Designers/Clients)
	Important of a factor was the location of the site to the development of the app.?
	What other applications (if any) were you inspired by/took influence from?
	What was the target audience/demographic? (If any)
	How was the length of time required for the app guide?
	Was there a discussion relating to charging for the app?
	Overall how long did the process take?
	What were the main issues during the development process? Challenges
	Bi-Lingual - How important was this and were considerations made to facilitate this?
App features	Overall are you pleased with the application? Please give an example of an aspect that you are pleased about.
	Are expectations heightened by having to download it to their own device? - is this omitted through not charging for the content?
	How were decisions made on technical elements of the application?
	How was the content provided? Was the application built around the content provided or vice versa?
	What were identified as the 'must have' elements? And why?
	What are the most and least effective elements of the application? Where there other features tried and then removed?
	Discussion on charging for the app or providing it free? Was this an issue?
	Any consideration to just put the app on one platform?

	Why app over optimised website etc.?
	Was there any evaluation process during development/release? Would you be able to provide this to me?
	What were the outcomes of this process and how did it influence the application?
	Any specific heritage interpretation models incorporated into the development?
Theory/Future Development	How effectively do you think the app conveys the message of the site?
	How much emphasis was placed into the embodied sensuous experience of the user?
	Was the intangible experience of the site considered?
	How was this addressed through the application?
	How influential is the application to the experience?
	How was the response from users?
	How much agency is to be given to the individual or should the app lead the experience?
	Any plans to develop it further?
	Anything you would do differently?
	What do you think are the important issues to consider in applications of this nature?
	Who should lead the development of such apps? The organisation or the developer or collaborate fully?
	How do you see these apps evolving? Key trends?

Appendix Seven: Example of Walking Interview discussion guide

Resources:	Go-Pro /Audio Recorder (Inc. Lapel Mic) / GPS /Consent form /Outline of Research & activity
Lead-in questions	**Follow-up questions**
Are you from the region?	Did you grow up near here? Where? What was it like? Does it compare to this landscape? What about historical ties to this area?
Would you normally visit heritage sites?	What heritage sites have you visited? Are they normally in the region? What about on holidays? Is there anything in particular you look for? (Specific type of heritage/the views/walking path etc.)
Have you been to the site before or is this your first time?	If 1st time: What are your initial opinions? What were you expecting? If not 1st time: What were your previous visits like? Who was with you and what was the experience like? Why did you decide to visit or participate in this study? (identifying motivations likely to tell a lot about anticipated experience)
Initial opinion of the application?	(When setting out on the walk) What do you expect the application to do? Have you used anything like this before? If so where? And what were your opinions on it? Any particular elements that worked best or not at all etc.?
Do you have a smartphone?	How often do you use a smartphone? What particular features do you use most? Do you download apps prior to visiting sites or check there is one available? Is there an expectation for this? Do you have issues using your smartphone in this context? Would you be influenced by having to pay for the app content? Changing expectations based of free/pay-per-view content? What would you like the app to do that it currently doesn't?
How much do you know about the history of this site?	This will likely be addressed in previous questions
How would you describe this landscape?	Addressing the physical attributes of the site. Follow this by asking about any expectations of the experience given the location
In relation to cultural heritage is there anything you are particularly interested in or that is important for you?	Is there a particular reason for this interest or importance in X aspect of cultural heritage? Any particular event or person trigger this interest in heritage?
What do you like about the site/experience so far? (If anything)	What would be a 'special' area to you? And what about it makes it special? Are any of the same factors evident here?
How would you describe this place in your own words?	Why do you say those specific words?
As we continue to walk around the site are your	If so how/why? What about feelings of pride or belonging/non-belonging or attachment? And why is this the case?

opinions altered from initial impression?	
(During the walk general questions about the functionality of the app etc.as they occur)	
Post Walk	
What did you think of that experience?	Was it what you expected or not? Is there anything you will take home from today's visit? What is it? Would you come again or recommend to friend or family member? What was the best/worst thing about the experience? How could the site be improved?
What is your overall opinion on the application?	Was it easy to use? Is it what you expected? Were there parts of it liked best? Is there anything you think the app does effectively or ineffectively? Would you use an app in this context in the future again? What do you think was the aim of the application? How important of a factor was the application to the overall experience?
Has your assumption of this site changed since visiting and using the application?	How would you describe this site to someone else? Does the application assist in this perception in any way? What stood out for you in the visit/site? Sis you feel any personal connection, when/where – please give me an example? (MAPS) Would you have any problems with the removal of this site? Do you think it is important to maintain it? Is there any value in this site?

Appendix Eight: Selected examples of Self-Reflective visit notes from Navan Fort

Pre-Visit

- Have passed this site numerous times but have never been to it. No specific reason to not attend this site before today or any significant draw to visit.
- Aware of it due to connection to Irish mythology – Understanding of the connection to the province of Ulster –the seat of the high king of ulster – not sure how I necessarily identify with this site beyond the fact that I live in Ulster.
- No particular feelings of attachment to the site, never visited it before so have no experiences to build upon and historical ties are limited to the fact that the site is a prominent location in the early history of the region.
- Arrived at the car park for the heritage interpretation centre – busy car park – feeling that I was potentially missing out only visiting this site now – slight guilt of not being aware potentially of my own heritage/history
- Relaxed atmosphere – children running around the centre – fantastic weather – positive experience
- Wicker-Willow Arch near the entrance to the site – felt like a portal through time – after walking along a gravel path felt as though this was the initial stage of being immersed in something more

On-Site

- Image used is a silhouette of the rounded embankment and trees – sun in centre and green ring around this – fits with mystical/mythological impression of the site – is the green ring symbolic of the round fort or is it a fairy ring or just a design feature?
- Map on application highlights potential trails – these coincide with the outline of the fort – 11 points of interest are located on the map – I make my way up the embankment and up the hill – the points are not numbered or no specific route is defined – I begin walking in the general direction of one point – unaware of what to expect
- See other people using the application and viewing the site
- Rural setting – grass is growing on the site – no real signs of maintenance – helps with the perception of rural/freedom and also idea of being a part of the period of the fort as there is no significant modern intrusions – sun shining and can hear birds singing

whilst walking through long grass – very enjoyable – seeing the city in the distance further enhances these feelings of freedom/relaxation - removal from this.

- Story of the name Eamhain Macha (translated as Macha's Twins) – Celtic mythology – macha was a woman who lived with the warrior cu chulainn – was challenged to race the kings horses whilst she was heavily pregnant – she won the race giving birth to twins on the finish line – having to do this she cursed the ulster warriors and they then lost a war to queen Maeb of Ireland – Not sure of the historical accuracy of this! but giving the location and the sense of mythology professed it is a novel story – peaked interest – video reconstruction of the race etc
- Intriguing – says we know how it was created but we don't know why it was developed – gives ideas about this – wooden structure destroyed, trumpets given to lake as sacrifice – mount buried remnants of the wooden structure – this was at period of meteorological changes and it is possible crops were failing and this was all to appease their pagan gods – again this all adds to the mystic of the site and the app firmly plays on creating an aura and sense of specialness – this was the final point on the map and I return to the road

Post-Visit

- Felt I had responsibility during the visit and the app interjected at various moments to inform me
- I left with feelings of satisfaction, curiosity and attachment – the intriguing nature of the site and how the information was provided encouraged this process
- The fact that there was no paywall to the site was also a positive as it controlled expectations and despite using a developed mobile application having no payment to view the site created a sense of greater connection to the site as it was rural and felt more 'real' – paying I feel would create greater expectations and a more 'manufactured' experience
- Aware of the strong Irish connections between mythology and 'Irish identity' – it felt a part of my greater identity – would not claim historical ties or that it was tangible but sense that these people are somehow my ancestors – the interpretation created feelings of this anyway – this was a sentiment shared with American tourists to the site

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