

DIGITAL FUTURES: AUGMENTED REALITY IN ARTS AND HERITAGE

RESEARCH PARTNERS:

**RESEARCH CONDUCTED BY THE UNIVERSITY OF SURREY IN
PARTNERSHIP WITH SMARTIFY & WATTS GALLERY - ARTISTS' VILLAGE**

Project Team

University of Surrey⁺

Professor Caroline Scarles (Principle Researcher)
Ms Husna Zainal-Abidin
Dr Etienne Bailey
Dr Helen Treharne

Watts Gallery – Artists' Village⁺

Mr Alistair Burtenshaw (Director)
Dr Cicely Robinson (Brice Curator)
Ms Susanna Plummer (Head of Marketing & Communications)

Smartify⁺

Ms Anna Lowe (co-Founder)

Scarles, C., Zainal-Abidin, H., Bailey, E. & Treharne, H. (2019). Digital Futures: Augmented Reality in Arts and Heritage, University of Surrey (in partnership with Watts Gallery – Artists' Village & Smartify).

Acknowledgements⁺

Current research funded by Industrial Strategy via Innovation Voucher Scheme (University of Surrey). Previous funding for research on Let's Explore from AHRC/NESTA, EPSRC MILES and InnovateUK/iCURE.



Content

1 DIGITAL IN THE ARTS: THE CURRENT STRATEGIC DIRECTION	4	3 MANAGEMENT, TRAINING AND SUPPORT FOR VOLUNTEERS AND VISITORS	26
1.1 Arts Council England’s 10-year Strategic Framework	5	3.1 Cost structures and ensuring accessibility	27
1.2 The government’s Culture White Paper and strategic priorities for the arts and culture	7	3.2 Encouraging repeat visitation	27
1.3 The role of augmented reality in today’s arts and culture landscape	8	3.3 Increasing Accessibility: Multiple Voices in Art	28
1.3.1 The increasing role of augmented reality in arts and culture	8	3.3.1 Extending Public Engagement with Art	28
1.3.2 Government commitments to the development of digital arts and culture	9	3.3.2 Multiple Voices of Art	29
1.3.3 Augmented Reality - Smartphone and application-based digital technologies	10	3.4 Volunteers as Gatekeepers: training and support in introducing AR to visitors	30
1.4 Future trends in UK arts, heritage and culture	11	3.4.1 Introducing AR solutions: Signage and Communications	32
1.4.1 Key drivers of thriving arts organisations for the 21st Century:	11	3.4.2 Training and Support Measures for Volunteers	33
1.4.2 Future government priorities for UK arts and culture	11	3.4.3 Digital Ambassadors	35
1.4.3 Unleashing the creative potential of augmented reality in the arts:	12	4 CONCLUSIONS	36
2 UNDERSTANDING THE ROLE OF AUGMENTED REALITY IN ENRICHING THE VISITOR EXPERIENCE	13	4.1 Visitor Perspective on Opportunities for AR (Smartify)	37
2.1 Personal experiences and evaluations of technology	14	4.2 Training and Support in Adoption of AR (Smartify) Solution	37
2.1.1 From Audio Guides to Augmented Reality	14		
2.1.2 Ease of use of technology	16		
2.2 AR as Facilitating Visitor Autonomy and Personalised Journeys	17		
2.2.1 Visitor Autonomy	18		
2.2.2 Opportunity for Personalised visits	20		
2.3 The Smartify app: Multi-sensual encounters and multi-faceted content	21		
2.3.1 Multi-sensual encounters - bringing exhibitions to life:	21		
2.3.2 Multi-faceted content	23		
2.4 Encouraging Sharing and Social Exchange	23		
2.4.2 Extending Visits Beyond the Gallery	24		
2.5 Accessibility	24		

1 DIGITAL IN THE ARTS: THE CURRENT STRATEGIC DIRECTION



Over the past decade, the Government, Arts Council England, and other key organisations involved in the arts and culture, have made significant headway in promoting cultural education, skills development, diversity in the workforce, and the use of augmented reality in the UK. This report contributes to this work by providing an overview of the role augmented reality can play in enriching the visitor experience as they engage in digital journeys through exhibitions.

Section one of this report summarises and reviews the core strategic directions pursued by the government and Arts Council England, and the current state of play in the promotion of a healthy, sustainable, and equitable arts and heritage culture here in the UK. To date, these organisations are united in their strategic outlooks, seeking to: (1) embed cultural experiences within children's

education, both within and outside of the school; (2) improve access to skills development and clearer pathways for talent; (3) promote publicly-funded culture that reflects the diversity of the UK population; and (4) develop the innovative role of digital technologies and augmented reality in the arts and culture space.

Finally, this section will outline the rising importance and significance of digital technologies, both in supporting the artistic process and in enhancing the user experience of arts and culture audiences in galleries and museums. Future trends in both the strategic development of arts and culture in the UK, and the deployment of augmented reality within this space, will be highlighted in order to provide a forward-looking perspective on the strategic priorities and technological innovations of museum and art galleries.



1.1 Arts Council England's 10-year Strategic Framework

With the publication of 'Great Art and Culture for Everyone - 10 Year Strategic Framework', Arts Council England¹ put forward a series of five clear goals that set out the recommended strategic direction to be taken for the arts, museums, and libraries in England from the period 2010 to 2020². As the national development agency for the arts, museums and libraries in England, Arts Council England's core duties involve the development of arts and culture for local regeneration, the development of talent and innovation, improvements in health and wellbeing, the delivery of essential services, and attracting tourists.

Reflecting its strategic outlook, Arts Council England has focussed efforts over the past decade on enhancing visitor experiences of, and access to museums and libraries. The organisation has placed a strong emphasis on the role of museums in playing an important role to support learning, provide knowledge to young people, and stimulate experiences and access to artistic and cultural collections from around the world. The organisation has equally sought to enhance access to libraries, providing creative spaces for children and young people, and offering free access to a range of media and literary sources, including books, films, music and the Internet.

1.1 Arts Council England's 10-year Strategic Framework ⁺

Central to its strategic vision, Arts Council England has outlined a set of five goals that have combined to form central directions of movement in the financial, organisational, and societal development of arts and culture in England over the past decade. These include:

(1) Promoting excellence in the arts, museums and libraries:

- o Investing in ways that encourage artistic and cultural excellence in arts organisations and regional museums.
- o Using collections schemes and cultural property functions to enable high-quality collections to enter public ownership and be more widely accessed.

(2) Delivering equal opportunity to experience and be inspired by the arts, museums and libraries:

- o Investing in arts and cultural organisations that are committed to equality and diversity and its application in the production of their work.
- o Working with the library network to increase access to arts and culture.



(3) Embedding resilience and environmental sustainability into the arts, museums and libraries:

- o Enabling more private sector giving by helping organisations to build their fundraising capacity.
- o Providing support to arts and cultural organisations to capture and use data to improve resilience, build new markets and explore new sources of income.

(4) Promoting diversity and skills development amongst leadership and the workforce in the arts, museums and libraries:

- o Supporting the arts and cultural sector to invest in an appropriate professional workforce and in leadership development.
- o Providing young people with opportunities to gain employment and progress in the arts and culture.

(5) Ensuring that children and young people are exposed to culture, and gain from it as audiences or as people with a talent to pursue:

- o Working with the Department for Education, funded organisations and artists, schools, cultural partners, local authorities, and higher and further education institutions to ensure a coherent, national approach to the provision of high-quality art, museums and libraries for children and young people.

Delivering on these goals has been a key strategic priority of the work conducted by Arts Council England, in conjunction and in complementarity with the key strategic priorities laid out in the government's 'Culture White Paper'³.

1.2 The government's Culture White Paper and strategic priorities for the arts and culture

The strategic direction put forward by Arts Council England (ACE) is supported by the Government, in the form of 'The Culture White Paper'⁴. This sets out the government's goals in the promotion of arts and culture in the UK, showcasing clear complementarity with the strategic vision of ACE. The Government goals put forward for promotion of UK arts and culture hinge on three main pillars.

(1) Embedding cultural experiences within children's education, both within and outside of the school:

- o This involves providing a broad and balanced curriculum that promotes experiencing and understanding of culture within an educational context. With the National curriculum, school children are able to study a range of subjects, including art and design, music, drama, and dance, with new gold-standard GCSE's and A levels in these subjects.
- o The government funds national youth companies for dance and musical theatre, and the Heritage Schools Programme, which helps children engage with the history of their area through local archaeology, buildings and monuments.

(2) Better access to skills development and clearer pathways for talent:

- o The promotion of specialist training and career development by cultural organisations, and their improving relationship with the higher education sector.
- o The government's 'Music and Dance' scheme provides means-tested support to make sure that talented children and young people from diverse backgrounds receive the training they need to succeed in careers in music, dancing and acting.

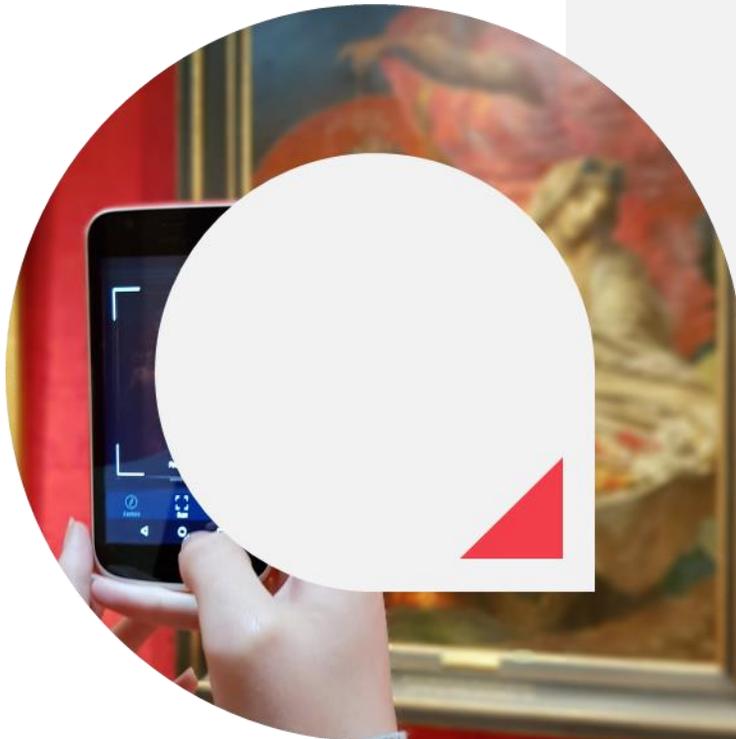
(3) Publicly-funded culture that reflects the diversity of the UK population:

- o In attempts to address low levels of diversity, Arts Council England, with government guidance, launched The Creative Case for Diversity, asking organisations which it funds to make their work more reflective of the communities they serve.
- o The government is also promoting leadership in the arts to reflect minority ethnic backgrounds and disabled populations.

As demonstrated, both Arts Council England and the government's Department for Digital, Culture, Media and Sport (DCMS), have been committed to delivering on a series of complementary goals over the last decade

1.3 The role of augmented reality in today's arts and culture landscape

1.3.1 The increasing role of augmented reality in arts and culture⁺



As part of the strategic direction for the arts and culture in England, digital technologies and augmented reality (AR) are playing an ever-growing role in supporting both the creation of art and the enhancement of the user experience in museums and art galleries. This sub-section outlines the current state of play and development in the use and adoption of a variety of AR in the arts and culture landscape.

As specified in Arts Council England's 10-year strategic framework document⁵, the fusion of the arts and culture with digital technologies and AR is coming increasingly to the fore, with numerous institutions now using novel technologies and digital infrastructure to reach audiences both in the UK and abroad. Arts Council England has invested, and continues to invest money from government and the National Lottery in support of arts and culture in the UK, working towards the development of digital art, the increased public use of digital services, and the distribution of quality

arts collections. In line with its strategic direction, the organisation is committed to the adoption of digital technologies in a number of key areas:

In relation to delivering equal access to experience the arts and culture (goal 2), ACE has committed to:

- o Invest in the capture, creation, production and distribution of arts and culture through digital technologies and platforms.
- o Support arts and cultural organisations to catalogue, link and archive digital content for current and future audiences, and form partnerships that will help more people access arts and culture on digital platforms.

In relation to developing skilled leadership in the workforce (goal 4), ACE is committed to working with partners in building digital skills across the arts, museums and libraries, and to respond to new ways of working such as creating new digital services that involve communities and assist digital users.

1.3.2 Government commitments to the development of digital arts and culture⁺

The government's Department for Digital, Culture, Media and Sports has also made significant headway, as outlined in The Culture White Paper, in developing the role of digital technologies and AR in the arts and culture space⁶. This has occurred in the following key areas:

- o Digitising public collections - many national and local institutions are actively digitising their public collections or screening content online. The National Theatre's NT Live program, for instance, saw cinema broadcasts reach an audience of 1.2 million people in 2014/15. The Royal Opera House also shows live performances of opera and ballet productions to thousands across the UK. Furthermore, the British Museum is making substantial efforts, as part of its Google Cultural Institute, to bring its cultural artifacts to a global public.

- o The use of virtual reality - with the use of virtual reality, the Natural History Museum is able to showcase the depths of the prehistoric seas, and the experience of a Bronze Age site to visitors.

- o Digital volunteers and digital war diaries - amongst other organisations, the National Archives engaged digital volunteers, or 'citizen historians', in a project to digitize diaries from the First World War, inviting people from around the world to share their knowledge and memories of the war and its colonial-era implications.

Digitisation in the sphere of arts and culture has a range of benefits, not least the access it gives to millions of people who are unable to physically visit a collection or performance, with the opportunity to experience content remotely. The Royal Shakespeare Company and the National Theatre, for instance, are among 60 organisations developing immersive digital exhibitions allowing online audiences to experience the performing arts in 360 degrees. Furthermore, digitisation will allow institutions to gather data about the people using their collections and their interests, leading to greater personalization and tailoring of visitor experiences of museums and art galleries.





1.3.3 Augmented Reality

- Smartphone and application-based digital technologies⁺

Alongside the digitisation of art collections and the use of virtual reality, the use of Smartphones and associated applications, and their adoption in the arts and culture space in the form of augmented reality (AR) is on the increase. In an age where the UK has an online audience of approximately 50.4 million people, with 76% of adults owning a Smartphone and 80% using the internet on a daily basis, Smartphone based technologies are transforming the relationship that cultural organisations have with the public, and the relationships that publics have with museum and art gallery collections⁷.

The use of internet-based smartphone and tablet technologies are today on the rise amongst younger and older generations. Data taken from OFCOM's Children's Media Literacy research showed that in 2017, for those between the ages of 12 and 15, 83%

owned their own Smartphone, 55% had their own tablet, and 74% had a social media profile⁸. Furthermore, OFCOM's Adult Use and Attitudes Report found that 39% of those aged 65-74 reported using a smartphone in 2016, an 11% increase on 2015⁹.

The adoption of AR smartphone-based technologies is especially on the rise within the context of museums, art galleries, and festivals. Examples include the 'Made in Corby' arts and cultural project (2016/17), and the National Portrait Gallery's 'Smartify' smartphone application. The Smartify smartphone app is an excellent example of the use of augmented reality technologies being fruitfully applied to the art gallery space. The app allows art gallery visitors to scan paintings using their phone's camera function, and then learn more about the piece of art through the provision of information via video, audio and text¹⁰. Indeed, the focus of this report will be on research conducted in partnership with Smartify, in partnership with Watts Gallery – Artists' Village and the University of Surrey.

1.4 Future trends in UK arts, heritage and culture

1.4.1 Key drivers of thriving arts organisations for the 21st Century⁺

The development of the arts and culture is an evolving process that is marked by a series of identifiable trends and actions developed by the UK government, Arts Council England, and other key organisations in the arts and heritage space.

In light of these forward-looking ambitions, a report published by Arts Council England sought to develop a model to identify qualities that distinguish arts organisations that will 'thrive' in the 21st Century from those that will merely 'survive'¹¹. According to this report, those arts organisations that currently thrive, and will be most likely to thrive in the future, are commonly distinguished by:

- o A willingness to establish relationships with organisations whose core expertise is substantially different to their own, since this is seen to facilitate the exchange of ideas, expertise and people, and also changes the cultural reach and 'footprint' of organisations. In doing so, organisations gain access through co-operation to talent, or to resources, or to audiences, which would otherwise be closed to them.
- o The development of a clear understanding of the types of innovation, creative output, and organisational structures that best suit an art organisation's position relative to its audiences and to other organisations.
- o The incorporation and uptake of augmented reality and associated enabling technologies.

1.4.2 Future government priorities for UK arts and culture⁺

In line with the government's goals for the promotion of UK arts and culture as set out in the 'Culture White Paper', the Department for Digital, Culture, Media and Sport (DCMS) put forward a series of key actions that influence existing and future trends in the development of the arts and culture in England¹². These include:

- (1) Embedding cultural experiences within children's education, both within and outside of the school - the government has been involved in establishing a new cultural citizens programme, with the support of Lottery distributors, to create new cultural opportunities for young people from disadvantaged backgrounds.
- (2) Better access to skills development and clearer pathways for talent - the government will continue to work with Arts Council England to better understand the barriers to under-represented groups becoming professionals in the arts. The DCMS will also seek to promote strategic development, amongst Arts Council England and Historic England, which support cultural organisations to make the best use of apprenticeships and help with skills development and career choices.
- (3) Publicly-funded culture that reflects the diversity of the UK population - the government will continue its efforts, working with Arts Council England, Historic England, and national museums and galleries, to develop and disseminate strategies for tackling the lack of diversity in leadership across the cultural sector.



1.4.3 Unleashing the creative potential of augmented reality in the arts⁺

Alongside key drivers and government priorities for arts and culture in the UK, the government has set a clear vision in its ‘Culture is Digital’ report, for the role of digital technologies and augmented reality moving forward. In particular, this includes a series of key objectives for further developing digital infrastructure in the creation of art, and in enhancing user engagement with museum and arts collections¹³ :

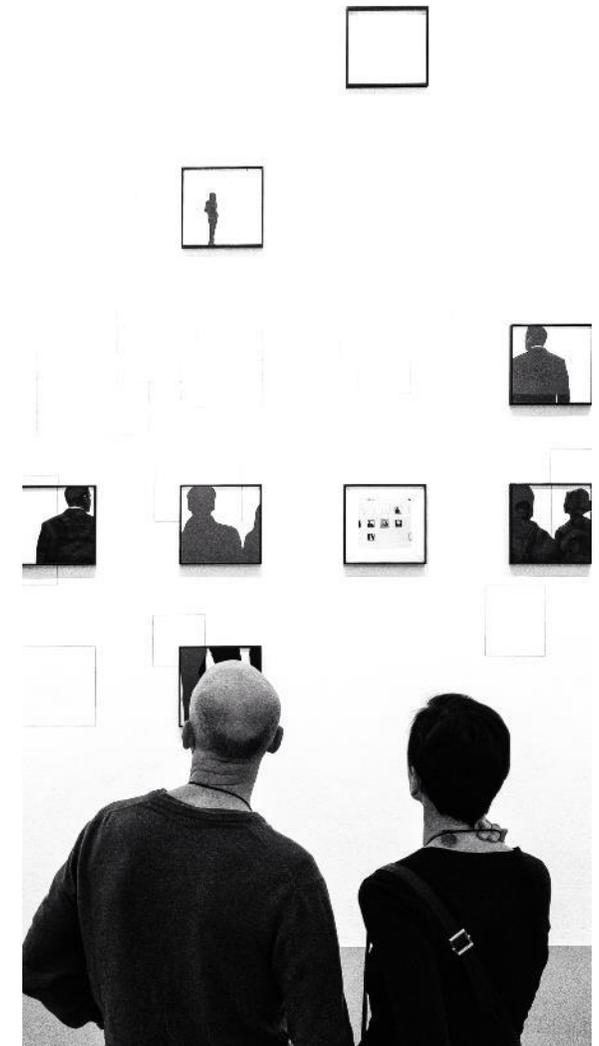
- o The government is seeking to make the UK one of the world’s leading countries in the digitisation of public collections and the use of technology to enhance the online experience of users.

- o Online curation will lead the way in unlocking access to cultural experiences and audience reach using social media to showcase digitized material to a much broader demographic base.

- o Bringing together the digitisation of public collections with AR smartphone and application-based technologies will help to further increase audiences’ understanding and engagement with museum and art gallery pieces. The Smartify app - which allows users to scan and identify artworks, providing information about them, and allowing users to build their own personal gallery - is spreading its reach internationally to the Netherlands, France, America and Russia.

- o Developing an ‘archive ecology’ - the National Archive will continue to deliver on its digital strategy to embed digital across the whole organisation and support the digital archiving of collections.

- o Digital Catapult Centres in the North East and Tees Valley, Yorkshire, Northern Ireland, Sussex and London are accelerating the adoption of advanced digital technologies, including the development of augmented reality platforms by the creative industries.



2 UNDERSTANDING THE ROLE OF AUGMENTED REALITY IN ENRICHING THE VISITOR EXPERIENCE

Section two of this report summarises the key findings that have emerged to date in relation to research conducted on visitor experiences of Smartphone application-based technologies in the art gallery space (otherwise known as augmented reality, or AR). The research underpinning this report was conducted in partnership between Smartify, Watts Gallery – Artists’ Village and the University of Surrey. Findings also draw upon previous research conducted in partnership with Watts Gallery – Artists’ Village, The Lightbox, Brooklands Museum and the University of Surrey.

The report draws findings from a series of visitor trials conducted over two research periods. The first, Let’s Explore, involved interviews with 40 visitors to gallery sites at partner organisations in 2014-16. Let’s Explore was a prototype augmented reality digital solution offering visitors the opportunity to scan art through image recognition technology to access multiple layers of additional multi-media content via mobile devices (tablets/smartphones). The second, draws on interviews with 12 visitors, 13 volunteers and 22 staff members, all of whom have experienced use of Smartify at Watts Gallery – Artists’ Village in 2019. Smartify is a leading social enterprise with over 1

million users worldwide. It is an application-based digital technology used with Smartphones and tablet devices which also allows visitors of art galleries to scan paintings using their phone’s camera function, and then learn more about the piece of art through the provision of information via video, audio and text. In addition, the app offers curated tours within galleries. It is a universal platform through which subscribers can access details of all Smartify partner organisations collections, trending artworks and artists, and find information on other galleries and exhibitions through the ‘explore’ function.

The sub-sections that follow highlight the key themes that emerged from the interview process, and include transcribed participant extracts to exemplify the main themes outlined below. In combining the data from the two research periods, we share advancements in visitor and gallery behaviours, expectations and experiences with digital technology (in the form of mobile technology, predominantly smartphones) over this time period. These will be highlighted throughout the report.

2.1 Personal experiences and evaluations of technology

2.1.1 From Audio Guides to Augmented Reality⁺

Respondents all expressed a familiarity of use with audio guides as a primary form of interpretation within their gallery visits. This section outlines the key differences in experiences between this more traditional form of interpretation with that of their experiences with augmented reality in the form of Let's Explore and Smartify.

The ability to select content according to personal preference, to pause and modify the playtime of the app-based guide was seen as a positive change to more conventional audio guides. This suggests a increased willingness to engage with an interpretation solution that offers a more flexible, dynamic means of engaging with additional information provided in contemporary AR Smartphone and application-based technologies. For example: *"I don't always use the audio guides when I go round exhibitions because sometimes, they seem to just get in the way and actually it tends to slow me down a bit because I feel I need to listen to everything"* (V5), or *"you're kind of, constrained in terms of where you are and what you hear"* (V11). Likewise, V12 suggests: *"I did use it, but again, not consistently because it (only) related to some things I wanted to find out about"*.

Points of feedback were centred on perceptions of the adverse effects of audio guides and related AR replacements. For some, the amount of information available from audio guides can be somewhat overwhelming: *"Sometimes I've followed the audio guides you get given in particular places. I find them a bit too much information sometimes"* (V16). Likewise, V1 suggests audio guides become a distraction: *"Sometimes it's too intense...I want to appreciate with my eyes. Mostly, I like background information, but sometimes the two together is too much. I find the audio guide would sometimes be a distraction from just looking"*. Such distraction extends from the level of content to the logistics of handling such devices as: *"they're good, but they're a wee bit cumbersome and it's a wee bit fiddly trying to listen to it at the same time...just the big handheld things, because often when you go to galleries, you've got other things to hold...so that's an extra thing"* (V3 & V4).

For others, they are seen as isolating, with the potential to cut off the audio guide user from other visitors and museum and gallery guides: *"I don't like audio guides particularly because I find them isolating and I don't like necessarily being in a gallery with audio guide users particularly if it is a busy exhibition"* (V15).



2.1.1 From Audio Guides to Augmented Reality ⁺

- In relation to navigating gallery space, some visitors felt that audio guides were not an effect solution to managing visitor flow as: *“People all go in at the same time and they start their recordings at the same time and they are all at the painting at the same time and its terrible...you can’t see the painting because everyone is at the same place at the same time”* (V14). Such experiences were felt to obscure views and create overcrowding within gallery spaces, particularly at principle sites.
- It is, however, important to recognize the range of visitors’ needs as, some visitors were less willing to engage with such technology given their self-prescribed identities as ‘technophobes’ or ‘dinosaurs’ (generally those belonging to an older generation) who are less well acquainted with, and deterred by, Smartphone and application-based devices. The notion of being a technophobe is captured well



in a quote by V17, who states: *“I don’t have a smartphone, I don’t have an iPad, I got a kindle for Christmas, but I am not a huge techno”*. Furthermore, the following extract from V18 exemplifies the reticence some older generations may feel towards modern technologies and change that they bring about: *“I think you’ll always find dinosaurs like me who are frightened of the change...(but) I think for most people it’s an excellent idea”*.

- Despite a number of older interviewees expressing a reluctance to engage with unfamiliar and novel audio guide systems in art galleries and museums, OFCOM’s Adult Use and Attitudes Report from 2017 found that 39% of those aged 65-74 reported having used a smartphone in 2016, an 11% increase on 2015. This suggests a trend toward greater familiarity and engagement with Smartphone-based devices amongst older age groups, despite reticence and lack of engagement still present for some.

2.1.2 Ease of use of technology⁺

Despite some visitors expressing slight trepidation, there was an overwhelming general willingness to trial the AR solutions of Let's Explore and Smartify. Such engagement, and associated results, challenge perceptions of generational stereotypes of technology engagement as despite some having had no previous experience of engaging with such AR solutions, all of those approached were willing to try this new approach to interpretation. The key findings highlight the need to ensure intuitive user interfaces with minimal levels of user knowledge of technology as all respondents felt that, given some time and hands on use, they would acclimatise to the technology relatively smoothly and effortlessly: *"it's just getting used to it. It's like anything. Once I'd done it two or three times, I got the hang of it. I understood that it doesn't happen instantly, which, quite often, we have this thing about technology, you know, with your phone, you're thinking 'why won't it do that?'. If you just wait, it happens. So, once I got used it, I found it really easy"* (V19).

○ There was a general consensus that the AR solutions were easy to use once participants had had some time to get used to its format, structure, and functionality. This is particularly the case for the most recent trial with Smartify as this offers a sophisticated, intuitive user interface. This, combined with the increased presence and use of smartphones over the research period, suggests that, given some initial time spent familiarizing oneself with these aspects of the app, its functioning in a live setting was seamless for some. As V20 states: *"well, it's relatively easy to use, you know...I mean with (names another gallery), you had to punch in a number, whereas this is purely interactive so that's good"*. For others, the app's ease of use helped her engage more intently on the available content: *"I wasn't focused on the app thinking 'oh god, where has it gone? What am I doing?', I was really into the content"* (V31). The importance of ease of use is further emphasized by V9 and V10 who highlighted the importance of the *"point and shoot"* to access additional layers of content through the camera

function. For V1 such ease was exemplified as *"it was really intuitive...it didn't need a lot of explanation on how to use it"*. Without many 'click throughs' the app was felt to be *"very easy to use"* (V1).

○ In addition, visitors highlighted the importance of seamless access to ensure high levels of satisfaction during their visit. For example, *"it doesn't seem to be dragging or anything like that, it moves and uses very nicely"* (V1). Likewise, V2 commented: *"the fact that it's so simple...there's no time lag...so as soon as it scans, if it's on a database, it's up straightaway, which I think it great because if it took ages to load, I'd be really irritated and I would just think, 'stuff this' because it's almost instant, I think that's really, really impressive"*. Such responses are supported by both staff and volunteers and highlight the need for not only an intuitive solution, but also a seamless interaction generated by strong signal from either visitors' own 4G/5G connection, or through wi-fi infrastructure provided within the gallery.

o The use of visitors' own smartphones was a significant advantage as in the original Let's Explore research, visitors were also able to use handheld mobile tablet devices, which for some became a challenge. First, some visitors expressed concerns around a Smartphone or tablet device slipping out of a user's hands, particularly for elderly gallery visitors who may be experiencing arthritis: *"It's difficult to hold. It slips through your fingers. Someone who's a bit older or has arthritis or anything like that, it needs a handle"* (V35). In this case, ease of use becomes problematic for an older sub-set of the visitor population, and may be ameliorated through additional apparatus, such as a retrofitted handle, or a case that allows for the electronic device to be carried around one's neck: *"I was holding it very carefully...when we went to the cathedral in Canterbury, the audio tours, they hang around your neck and it's easier"* (V49). In using visitors' own device, Smartify not only removes concerns of damaging gallery property, but also ensures that visitors engage with the AR solution in a format already tailored to personal preferences of font size, audio levels, or use of voice recognition technology.



2.2 AR as Facilitating Visitor Autonomy and Personalised Journeys

 A work around to the issue of overcrowding is embedded in the very AR technology itself, and relates to the autonomy that users have through the Smartify app. An important theme emerging relates to the desire, amongst art gallery visitors, for greater freedom and flexibility in shaping their gallery experiences. In particular, the ability to have greater autonomy over the use of the Smartify audio guide application was seen as an essential part of creating an individual and personalised visitor experience.

2.2.1 Visitor Autonomy⁺

○ Visitors appreciated the autonomy of being able to choose the order in which they moved around the gallery, accessing information on paintings they chose to augmented, thereby determining the order of their visit according to the piece of art that they were interested in receiving more information about: “This works very differently...you can explore the spaces as you want to explore it rather than being led round like cattle” (V14). As V11 commented: “I could wander around in any order I like. Just really the ability to learn more about what you’re look at without having to walk around with a crib sheet”... “once you’ve grabbed the image, you can stand anywhere...I just found it liberating that I could wander at will, there was no feeling of need to be a strict order and the convenience of getting the information right in front of me”.

○ Visitors appreciated being able to ‘jump’ tracks on their audio devices, alongside functions such as pausing audio materials, and turning content on and off when desired: “there were one or two I wasn’t particularly interested in, so I just moved on and held it up to the next one. I didn’t bother pausing, just walked on...I like the fact that you can just do that” (V20). Likewise, for those more familiar with the gallery, or those who have a particular interest, “didn’t feel like I was having to...snap every picture as we got to it” (V1). Such choice and control enables visitors to focus their attention on their preferred areas of interest. For example, “it allows you to focus on the one picture actually...that’s quite an interesting thing” (V3 & V4). This facilitates the potential for greater engagement with exhibits on display. As V5 suggests: “somehow you get a better idea of what you are looking at....actually, I think you pay more attention to the picture, when you’re scanning it and looking at text and everything”. Likewise, V7 & V8 shared that “if I’d just been walking around and wasn’t using the phone, I might just skip a load of them, but you...you were more intrigued to find out the information about the picture”.



○ Being able to access content in different mediums, such as audio and text, and switch between them at one’s own pace was also seen as a desirable feature of the combined Smartphone and Smartify AR experience: “it’s informative and sometimes I prefer listening to reading. That’s just the way I prefer, so that’s what I like about this. I like the fact that you can do it at your own pace and mix it up...and do it at my own pace and be wherever I wanted to be. That’s what I liked about it” (V22). As such, autonomy arises as visitors are able to select which format of information they engage with according to their interpretation preferences.

2.2.1 Visitor Autonomy ⁺

○ An important consequence of AR solutions in this context was the increased dwell-time and 'slowing down' of visits reported by visitors. For many, engaging with AR-based visual and textual information about art pieces in a Smartphone or tablet format led to a beneficial slowing down of the visit, increasing people's dwell time, and resulting in a more enriching and comprehensive visitor experience: *"I think it slowed me down...sometimes you think 'oh yes' and on you go, but because you were standing there and it showed you pictures of something else I read more than I would have done"* (V21). For V9 & V10, like many others, this extended their visit not only by providing further information, but importantly, by enabling the creation of space alongside the exhibits to read and engage at their own pace: *"I'm a slow reader, so why I stand in front of a painting to read the plaque....when it's a busy day...I'm feeling like I'm getting in the way of other people wanting to read and (with this) it's not the case, because...you don't have to stand in the place....i could read in my own time, so I had a bit more...time to reflect as well"*.



2.2.2 Opportunity for Personalised visits⁺

Visitors responded positively to the opportunity afforded by the AR solution to engage in specifically curated tours according to preference (i.e. art history) and many commented on the ways in which this could be further enhanced.



- Smartify currently offers specifically curated tours within galleries that facilitate visitors' navigation for those interested in particular artists, or an art historian perspective. As, V1 commented: *"I really like the cross referencing....especially with my studies of art history, I'm also wanting to look at art in perspective. At times, there was also the offer of a curator audio guide, which is really good"*. Such tours hold the potential to bridge knowledge across art collections, through artists lives, motivations and influences, and provide insights that can prompt both return visits as well as visits to other galleries of potential interest.

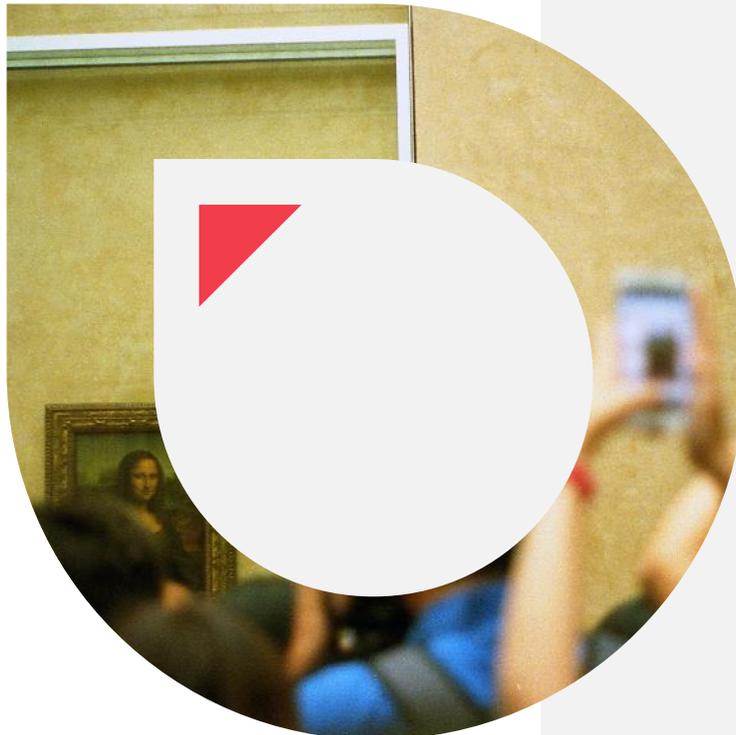
- Beyond this, findings also suggest that some visitors would favour personalised AR art gallery journeys that are tailored to varying depths of knowledge about art, different times of the week, and different life stages. For instance, V32 points to the need for information that is tailored, in depth and content, to different age groups: *"I think what you're doing here is something which is for pedestrian types, like me... you need something for connoisseurs, you need something for children...It needs to be able to bridge those areas. It might be that not everybody wants everything"*.

- In view of this last point, AR-based visitor experiences targeted and tailored to children and young families were perceived as being of particular value as this reflects the importance of intergenerational communication and learning in gallery spaces. This includes experiences for children focussed around interactive tasks and fact-based educational trivia related to art pieces through a software application: *"trivia, or random facts, things like that, something to make it a bit more fun, because...at the moment, it's very useful for adults, but children probably not as much"* (V24).



2.3 The Smartify app: Multi-sensual encounters and multi-faceted content

2.3.1 Multi-sensual encounters - bringing exhibitions to life⁺



Through a combination of audio, text, and visual mediums, the Let's Explore and Smartify app AR experiences were seen by some visitors to bring the gallery art to life, and enliven the artistic pieces through the availability of background information in a variety of formats: *"It brings everything back into life again and makes it more interesting and more attractive"* (V24). When viewing the art on her screen's device, V25 commented: *"Seeing an image on that, it's clearer. It feels more three-dimensional. Even the black and whites come to life"*. This suggests that the AR-based Smartify app serves to embolden the pieces of art and breathe new life into them for the visitor.

- The combination of audio and visual (photos and videos) elements on the AR solution was seen as especially beneficial: *"when I walked through...I suddenly hear something and that was amazing"* (V24), or *"my brain works better, it will stick with me more, if I hear it rather than if I read it"* (V19). Likewise, V5 commented: *with an audio file, you can look at the picture while you're listening, whereas with a text file...you tend to be looking down and looking back up...if you can get text and audio in, that's great"*. These excerpts suggest that having an audio element to the AR experience can facilitate the process of taking in information, and add to the enjoyment of the experience. Video elements were also seen to be a valuable aspect of the Smartify app, enhancing the visitor experience and deepening understanding around particular art pieces.



○ For some, the multi-sensual format resulted in a deeper learning experience, with participants being able to tease out the finer details of a particular art piece, or historical point. This is captured in an excerpt by V26, who comments on learning about George Frederic Watts, a highly esteemed painter of the Victorian era, and figurehead of the Watts Gallery – Artists’ Village: *“I liked learning extra things, I liked learning more about Watts’ background...because he came from quite a strict religious background and that was quite good to know and then obviously in that Chaos picture...there is the figure coming out as evolution...it’s the idea that he’s moved on, but also where he gets all of his images from”*.

○ Nevertheless, some respondents expressed a self-consciousness when listening to audio as they felt this would not be acceptable or courteous in a gallery space unless using headphones or holding a phone to one’s ear. For example, V11 commented: *“I didn’t use the audio for the simple reason that I think it would be intrusive, in the gallery, unless I...had earbuds. It just might detract from other people’s enjoyment”*. V12 shared that they were a *“bit embarrassed to switch it on”*. Likewise, V3 & V4 commented: *“we were a bit reluctant to play that because, clearly, it would disturb other people”*. Such concerns were also shared by staff and volunteers and research did identify a slight increase in visitor conversation during the course of the trial¹⁴. Such reflections highlight the need to advise and reassure visitors on arrival of the ways in which audio can be accessed without providing disruption to other visitors. The role of volunteers in this is explored in further detail in section 3.

2.3.2 Multi-faceted content⁺

- The layering of information relating to artworks was highly valued by gallery visitors using the Smartify app and Let's Explore. Information regarding not only the artwork, but also information about the artist, and the history of the Watts Gallery – Artists' Village, provided for a depth of visitor experience unparalleled to that of a conventional art gallery and the information cards that sit next to artworks: *"I found it was brilliant...it certainly gives more content than on the labels...the nice thing was it did explain where the paintings had been on loan from. I thought that was very good"* (V27). Furthermore, and in relation to the potential for personalised tours, V20 comments here on the value of learning about the history of a painting, and her desire to know more: *"I think it's quite interesting also, to know the history of the painting itself. It tells you it was painted in 1890, but what's happened to it since then? I'd love to know that"*.
- There was consensus amongst visitors that up-dating the content of the app over time, in line with potential changes in the artworks and physical content of the gallery space, would garner greater interest from prospective visitors and repeat visitors who may be visiting the Watts Gallery – Artists' Village on multiple occasions for an AR experience: *"If you change over time, especially oral elements, then it gives you extra reasons to come, another reason to visit if you change some of the displays"* (V28).

2.4 Encouraging Sharing and Social Exchange

 Many visitors commented on the opportunity the AR solution holds for increasing social exchange within visiting groups and across generations and different interests. For example, V1 commented that *"if I was going with...my mum, I would be sharing things with her. She might download it as well, but I would also be quite comfortable saying 'let's both do the audio tour', and we'd go round and move through together, or you know, close to each other....I can definitely see it as a sort of interactive thing while we we're both looking up things on my phone"*. For V2, as an individual using the app, it holds the opportunity to share vignettes of information uncovered: *"I can imagine that if I was going round the gallery with a friend and I had the app and they didn't, and it told me something interesting, I would probably then speak about that to my friend, saying look what I've just discovered about this. So, it's just a positive thing"*. For others, the app was utilized by one member of the group, but the information was drawn upon by others through ad-hoc requests for information: *"we go at our own pace anyway, so apart from a couple of times when interestingly I was asked about something, so I could scan"* (V12).

2.4.2 Extending Visits Beyond the Gallery⁺

As identified above, respondents expressed value in being able to access the AR content relating to the art gallery beyond the exhibition space when they had returned home.

- For some, the benefits of social exchange arise after the visit as *“it’s also a lovely talking point afterwards, isn’t it? If you’ve both been through it (the gallery), using the app and you’ve got it to discuss over lunch, which is...something that happens anyway. So, this is a useful tool”*. Likewise, many visitors commented on the potential to reflect on their experiences at a later date through the ‘favourite’ function as they build their own profile. For some this inspired their own artistic expressions as: *“I’m interested in writing poetry, which can be inspired by art...there’s a few things I found really inspiring, so if...we were able to access that again, I would really like that...if I go home then and it’s something that’s inspired me to write...then not only can I see it visually, (but) I have an...audio of something that I might not have picked up the first time”* (V3 & V4). As V6 surmised: *“I would say the greatest value is being able to reflect afterwards, actually, more than the experience you are getting at the time”*.

- Such sharing and socializing of experience extends to the opportunities AR holds to highlight favourites and save information and images of exhibits. For V1 this was exemplified as: *“I really liked that I could favourite things, because I know that you can’t take pictures in this gallery and you can’t take them in a lot of galleries....you sort of...forget what you’ve enjoyed, so having it on there as a favourite and then being able to look up the artist, or look up elsewhere maybe there work is...I really love the idea that I can build up a profile of all my favourite things and look back on them”*. For others, such as V3 & V4, functions such as the social media share option, enables wider connection and sharing of their experience: *“since you can do it immediately, you can share it on WhatsApp or whatever, it’s just nice to have that connection”*. Likewise, V1 commented: *“when I see...beautiful images, or they remind me of people, or I just think other people would like them, then, yes, I can share them with people”*.

2.5 Accessibility

- The familiarity of younger age groups with today’s novel AR technologies is seen as an important element in encouraging and attracting younger generations to art galleries. Since this demographic is seen to bond with technology as if it were ‘second nature’, participants felt that they would more easily engage with the Smartphone/tablet-based visitor experience: *“With the younger generation, who we want to attract to places like this, they’re used to it (technology) (V22)”* ... *“I think a young persons (guide) would be fantastic, which, perhaps, used a little bit more in terms of technology or used quite a lot of video”* (V19).

2.5 Accessibility ⁺

○ Nevertheless, despite such perspectives, with a growing percentage of 65-74 year olds reporting having used Smartphones (2017), and their exposure to such devices through younger family members (their children and grandchildren), the familiarity of older generations with these devices and their engagement with augmented reality experiences in galleries may be on the rise.



○ Whilst hardware was provided to visitors (in the form of Smartphones and tablet devices) during the Let's Explore initial research, the rise of smartphone use between research periods was clear as all respondents had their own smartphone to use during the Smartify evaluations. As visitors commented, there is a distinct preference for using personal devices, in particular their own tablet computers and headphones: *"I would want to be able to plug in my own in-ear headphones, I have got quite a big head and I've got quite a lot of hair and I find most headphones are quite uncomfortable"* (V17) ... *"If it's a downloadable thing that you can have on your (own) tablet, if you have it on you, I think that would be really good, because the difference with being given one at the door as well, it's like you feel like you have to use it"* (V47). This suggests that having the ability to download the app and use it on one's own hardware is overwhelmingly preferable.

○ Issues of visual and hearing impairment were problematic for some users: *"If you haven't got very good eyesight and the writing is a bit small...too small for me"* (V30), or *"I would've liked a bit of volume control because once or twice I was struggling to hear it"* (V48). Despite these issues, the functionality of the Smartify app and Let's Explore (allowing users to adjust the audio volume, or use alternative visual mediums aside from text) allowed for a number of work-arounds to impairment challenges: *"If people are having problems reading, you have also got the visual content that is good...I think it's really useful for people like that"* (V18). Consideration of user sense impairment was embedded in the Smartify app, allowing those with different impairment types to use a medium (audio, videos, text) that best suits their needs. In the future, there is significant opportunity to further tailor tours and associated content to different visitor needs.

3 MANAGEMENT, TRAINING AND SUPPORT FOR VOLUNTEERS AND VISITORS



Section three of this report draws on recent data from visitor and volunteer evaluation workshops conducted in June 2019. The workshops were centred on developing a better understanding of the opportunities and challenges to adopting augmented reality-based visitor experiences to local and regional art and heritage centres. In particular, these recent workshops consisted of a series of focus group interviews with staff and volunteers at Watts Gallery – Artists’ Village with a view to facilitating the development of a set of user support guidelines from both a staff/volunteer and visitor perspective. The following sections share the main insights from these workshops, highlighting a number of management, training and support issues that arose, and steps that could be taken to ameliorate both volunteer and visitor augmented reality art gallery experiences. Central to this section is that the adoption of an AR solution should be *appropriate* to an organisation, tailored to visitor needs and all changes should be fully supported with clear training and information sharing amongst organisational stakeholders.

3.1 Cost structures and ensuring accessibility⁺

○ For some visitors, the importance of offering and maintaining a free app service was seen as paramount to attracting visitors and enhancing perceptions of the Watts Gallery – Artists’ Village as a space that offers extra value and additional stimulus to the visitor experience: *“As long as it’s free. I mean one of the attractions of this, you know, by the good grace of the benefactors, is it’s free and not much is free”* (V20) ... *“I think that was the impression that we didn’t have to pay...so it was a bonus. I think that’s really important...a free exhibition”* (V29).

○ Despite strong feelings around provision of a free app service, it should be noted that some visitors expressed willingness to pay a nominal fee for the Smartify app for temporary exhibitions or to access more detailed information otherwise unavailable through an entry level app. This was partly dependent on the app having a broader functionality and use beyond the Watts Gallery – Artists’ Village space: *“If you paid for the app and it worked all around the country on all the different exhibitions, that would be understandable if you paid a subscription of say, £3-10, a month or something, or even 50p every single time you go to an exhibition”* (V47).

3.2 Encouraging repeat visitation⁺

○ A number of management issues arose amongst discussions and interviews with Watt’s gallery volunteers and staff members. For instance, developing add-on, or additional supporting content for temporary exhibitions, could encourage a greater number of repeat AR visits to the gallery: *“If we went here to have tea then we would go into the gallery and my sister would say, oh lets have another look, so people do come again and of course, we have got rolling exhibitions so people are coming again to see new exhibitions in the exhibition gallery...maybe this would be useful, special ones done for the exhibition because to be honest, tour guides at the moment only do the Watts Collection and we have been told not to do the exhibitions and to leave people to explore for themselves”* (V30). The development of temporary exhibits in conjunction with the respective digital content, whilst resource intensive, could serve to attract repeat visits to Watts Gallery – Artists’ Village, particularly amongst those with prior experience with the AR experience.

3.3 Increasing Accessibility: Multiple Voices in Art⁺

“information should be accessible to all. This is a way of tailor making it, which is very clearly saying, look this is for you too” (S9).

Accessibly, diversity and inclusion are central to current policy and strategy priorities within the arts and heritage sectors. As such, it is important to identify the opportunities afforded by AR solutions, such as Smartify, to facilitate wider audience engagement. As S9 commented: *“it does open the gallery up to a wider audience in terms of accessibility. So, I think we need to be very careful that the content we put on it does just that and it is not (only) serving the audiences who already have this...this is crucial to open it up to other audiences and I think it seems like that can be done quite easily”...“that’s what is exciting about it, from families to any disability, any background, that there is something for you”*. In addition to the reflections on the opportunity AR affords in opening gallery spaces further to those with visual or hearing impairments, the following considers the means through which different ‘voices’ of art can facilitate opportunity for wider public engagement.

3.3.1 Extending Public Engagement with Art⁺

Accessibility also extends to the opening of gallery spaces to visitors who would not normally visit for a range of reasons such as perceived intimidation of art institutions and associated discourses and etiquette. As S9 shared: *“it’s a way of very simply giving you prompts to engage with the collection. Rather than saying, let’s go in-depth and rather than assuming someone has pre-existing knowledge of art, it’s going back to the very...basics of how you engage with art”*. As such, content can be curated and uploaded in tours that meet the motivations, needs and requirements of different audience segments. From art history and specialist art tours, to tailored community group tours, family tours, school tours related to national curriculum, and general entry-level access information, content can be curated to address all audience needs. As S1 suggests, the focus on accessibility prioritises ensuring art is open for all and that *“it won’t seem so intimidating to people who don’t know Watts and are coming to find out more”*. Rather, *“you are providing options, so that a really wide range of interest groups can engage...to whatever level best suits them” (SC)*.



3.3.2 Multiple Voices of Art⁺

With the flexibility and locally held ownership and curation of content, significant opportunity opens through the Smartify AR solution to increase the range of voices of art as appropriate to different audiences. In the case of Watts Gallery – Artists’ Village, this can range from enhancing content and tours through the inclusion of audio and narrative recorded and scripted by art specialists, academic experts and curators, but importantly can extend significantly into areas of non-traditional voices of art that reflect the ways in which other stakeholders in the organisation engage with, and share their passion for, the gallery. For example, volunteers could share their interpretations of favourite works, artists from the Art for All project and other community projects can share the inspiration and motivation behind their work. Extending this further, there could also be the opportunity to curate tours that share the legacy of the built structures of the gallery and the heritage underpinning it, or through contributions from local community members to compliment curator narrative, share the ways in which the gallery and the work by George F. Watts and Mary Watts has shaped the identity of the surrounding community and landscape.

While there are organisational requirements that will underpin the development of such content (i.e. branding, tone, etc.), an AR solution such as Smartify opens significant potential for embracing the wider ways in which art embraces, shapes and influences a wide spectrum of society, *“so it’s not something that has been made for people, but with people for people”* (S12)



3.4 Volunteers as Gatekeepers: training and support in introducing AR to visitors⁺

The importance of volunteers in the context of this research cannot be understated as they act as gatekeepers and enablers of the AR solutions. This was recognized across all research participants – volunteers, staff and visitors. As SC recognized: *“the first person you meet, to talk to, is a volunteer. They are in the gallery spaces, they are there to answer questions, they’re there to enhance visitors’ experience, they’re there to support them as they go round the spaces and ensure that they know where they’re going and orientate them”*. As such, it is key to both the visitor experience and volunteer support that solutions are identified to assist in the comfort and confidence of volunteers with introducing the Smartify app to visitors. A number of key challenges and opportunities can be highlighted from the recent volunteer and staff workshops.

Of particular note is the difference in volunteers’ levels of familiarity and use of smartphone technology. During research with Let’s Explore, a distinct apprehension and hesitation underpinned

volunteers’ response to the prospect of introducing such technology to the gallery. Many questioned the introduction of technology as replacing the need for volunteers, the impact AR would have on disrupting the visitor experience. As S11 shared: *“from speaking to one of the volunteers earlier this week, one of their concerns was as a tour guide, would they be less purposeful or there would be less demand from them and would people want that face-to-face interaction anymore”*. While the frequency of such responses has since given way to an increased familiarity, acceptance and use of smartphones, an on-going awareness that such apprehension persists, albeit to a lesser extent, amongst volunteers and as such, the introduction of any technology solution that influences the relationship between volunteers and visitors should be managed sensitively.

As SC commented; *“Smartify can’t answer questions and it can’t have a reciprocal conversation. So, I think it will impact on the dynamics slightly, but for those visitors that want to engage and have a discussion or*

have specific questions, the volunteer still remain that first port of call”. Likewise, visitors shared the continued need to engage with volunteers as *“I still like to go and talk to people. Yes, I still like it when there’s people there or I can say...’excuse me, where is this art, please?...yes, just talking to people about...how long has this been here, or it’s been very popular. I think, as helpful as technology is, I still like to talk to people”* (V1). V9 & V10 also commented: *“you still need people there. I mean, this thing may not be able to answer all your questions anyway, so you may want to ask something specific that wouldn’t be available other than (from) someone”*.

As such, it is vital to reinforce the multiple potential engagements with technology and continued engagement with volunteers and, as with all forms of interpretation, there exists a multiplicity of preferences as to how this is realised. It is therefore important to ensure the appropriate adoption of technology according to organisational requirements¹⁵.



3.4 Volunteers as Gatekeepers: training and support in introducing AR to visitors⁺

While not all volunteers had their own phone, there was an overwhelmingly positive response to the Smartify solution as opening new opportunities for visitor engagement. While some volunteers commented that it would not be something they would use themselves due to limited engagement with smartphone technology, many echoed the responses of visitors (see Section 2), highlighting key areas such as ease of use, giving visitors choice and control in their visit, increasing dwell time by providing additional layers of information to that already on offer, and extending the experience through post-visit reflection on favourites.

Such thoughts are shared in the following extracts:

- **Ease of use**

“I find it really quick and fast, it’s really useful, really good...it’s like, wow, one sec, then it suddenly comes” (VO6)

“it’s very responsive. What I’ve done is easy” (VO13)

“I found it easy to use and a quick way to get information about paintings” (VO3).

- **Visitor choice and control and overcrowding**

“it’s like a direct choice then, like od you want the hard copy, or do you want to try the digital? And so, it’s just giving people an extra choice” (VO1)

“it could be useful when it’s really busy. When it’s busy, there are a lot of people staring at the image and the (current) explanation is really tiny” (VO6).

- **Increased dwell time through additional layers of information**

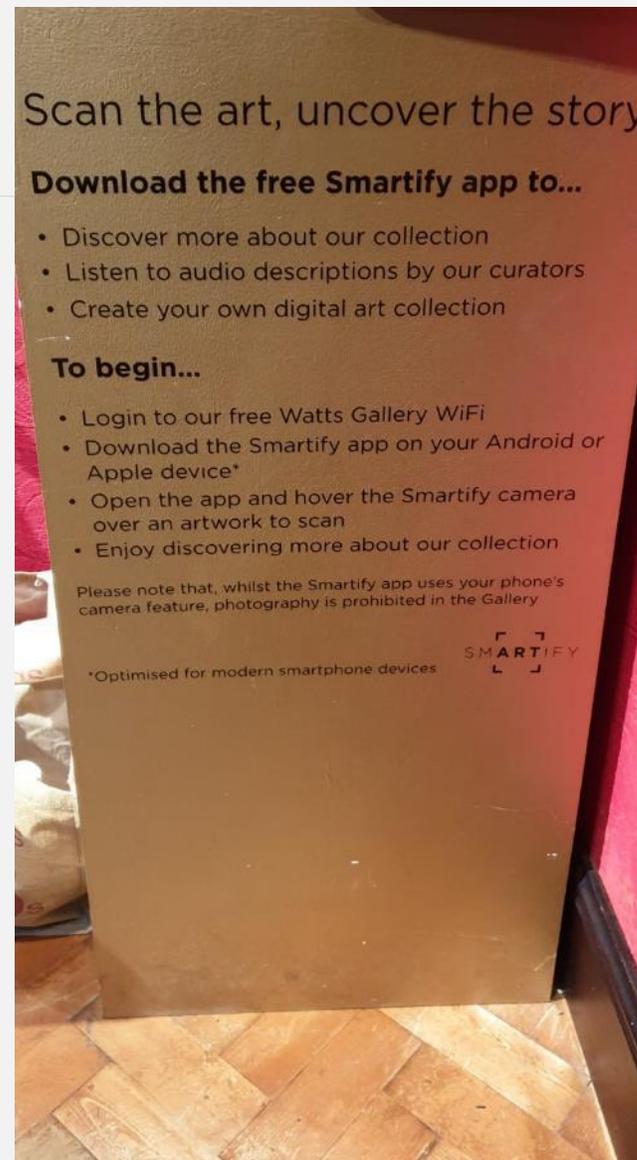
“I felt every person that came in...people were taking much longer than they had before...just...sitting in the space”...“the seats aren’t usually taken, unless someone is doing some sketching, but all the seats were taken (with) people sitting down. And they were just raving about how brilliant it was and (how) it had enhanced their visit...they were able to just press the button and the information was there for them” (VO1 & VO2)

- **Post-visit reflection on favourites**

“I love the fact you’ve got the paintings on your phone, you can reflect on them later on in the day” (VO8)

3.4.1 Introducing AR solutions: Signage and Communications

The welcome into Watt's Historic Gallery and Studio are a crucial aspect of the visitor experience, and there is clearly a substantial amount required of the front desk team as they provide information on the site and exhibitions. While existing Smartify signage at the front desk of the main shop and entrance, and in the gallery spaces should remain, it became clear that few visitors engaged with it meaningfully as they remain unaware of Smartify when they arrive at the main gallery sites within the Artists' Village. Overwhelmingly, the feedback on the existing signage is that it is not highly visible and most people miss it entirely both at point of sales as well as coming into the gallery itself. In the gallery itself, attention is taken with the welcome the volunteers provide and so eyes do not fall to either the small logo on the door, or the subtle signage within the entrance. Key to the success of signage and supporting communication from the front of house team (both staff and volunteers) therefore becomes reliant on identifying an effective, but non-intrusive visual communications, and ensuring staff and volunteers understand the rationale for introducing the AR solution and the benefit it brings to visitors, volunteers and staff, is essential to ensure the organisational wide adoption of the technology.



3.4.2 Training and Support Measures for Volunteers



○ The role of the volunteers in the gallery spaces as gatekeepers and stewards becomes crucial as this is emerging as a critical point of direct introduction of the app (with the other signages prompting a relatively subconscious awareness). This is recognised by volunteers as: *“I think it’s down to us in terms of communication”* (V1 & V2). While some, such as VO1 & VO2 found that it *“(slotted) naturally into my welcome...you know ‘have you downloaded the app?...I just opened the app and showed them how easy it was to use”*, not all volunteers felt this confident. It is therefore vital to ensure volunteers are supported through training and additional information to ensure confidence in such introductions to visitors. The following serve as recommendations to facilitate this¹⁶.

○ Volunteer Briefing and Demonstration sessions

Due to the vast number and range of requirements of volunteers, it was deemed ineffective to have designated Smartify/AR training workshops. Rather, a range of engagement opportunities exist as follows:

- *In-app guidance for volunteers and visitor* - training prior to gallery attendance could also occur as a feature of the app itself, allowing prospective visitors to download and complete a.

short training course covering the main features and user functionality of Smartify, thereby mobilizing and empowering the visitor prior to gallery attendance

- *Informal volunteer briefing sessions* - volunteers and staff identified the opportunity in ‘volunteer briefing’ prior to volunteers starting shifts as the opportunity to introduce the app and answer any questions volunteers may have. As VO1 & VO2 suggest: *“we have a briefing...when the volunteers come in and you have your briefing just before you go on (to the gallery floor)...so...that would be a good place to start”*. As VO7 and VO13 shared, the importance of learning together in small groups supported by someone who is already familiar with the app became vital: *“it’s quite useful if you’re with a couple of other people...and you do it together”* (VO7), and *“if you’re in the situation and you’re going around with someone who’s well versed in the use of it, it does help rather than just crib sheets”* (VO13). This active engagement and visualisation approach was felt to best support volunteer learning. Likewise, VO5 suggests that *“when coming on duty, you could always recap with a staff member”*.

3.4.2 Training and Support Measures for Volunteers ⁺

- The importance of consistency across all briefings was highlighted as important by volunteers to ensure clarity in knowledge and information shared with visitors: *“to ensure complete coverage of all the volunteers and responding to all their different levels of technological comfortableness....we have to be consistent in offering explanation of Smartify at every briefing”* (VO1 & VO2).

- Development of supporting volunteer guide

Given the diversity of volunteer engagement with regard to frequency of volunteering and levels of comfort in using technology, all volunteers felt that the introduction of a brief, easily accessible volunteer introduction document / crib sheet would further support their engagement with the app. In particular, this pertains to the following aspects of training and information provision for visitors:

- *Smartify at Watts Gallery – Artists’ Village (or other specific organisation):* a short, brief overview of why the app and the opportunities it brings has been introduced to the gallery.

- *Photography in the Gallery:* overwhelmingly, there is concern around how volunteers know that visitors are using the app as opposed to simply taking photographs. Many expressed concern about how to best approach visitors to ensure no photographs are being taken as this can be a cause of discomfort and ambiguity for volunteers. Guidance is therefore needed on how to know whether visitors are using the app or taking photos and how to approach visitors in such situations (e.g. no photography allowed, but please use our Smartify app to save high-quality images of your favourite work). This could include looking for additional content appearing on people’s Smartphones phones and being aware that visitors using the app are more likely to engage with their phone for longer. Volunteers could include advice on how to encourage those who would like to take photographs to use the app to save ‘professional, high quality’ images and take these away (incentive for use).
- *Copyright reasons for some content not being available on the app:* being transparent about restrictions caused by copyright limitations is

important in managing visitor expectations and providing volunteers with a clear rationale as to why particular images and content are not available on Smartify.

- *Providing an overview of functionality in each section of the Smartify app:* provide a brief overview of the key functions available in each of the ‘explore’, ‘scan’ and ‘profile’ areas of the app.
- *Communicating the key advantages of Smartify for visitors:* being able to save images and extend a visit; having access to audio and video resources; being able to personalize one’s journey through the gallery using the app; being able to use one app across a range of art galleries; an app that is free to download in less than two minutes.

Distribution methods: this volunteer user guide could be distributed and delivered in several formats, including: (1) Softcopy -online as part of volunteer website, attachment to, or part of regular email update; (2) Hardcopy - on the noticeboard in the volunteers’ kitchen, or distributed at volunteer briefings¹⁷.

3.4.2 Training and Support Measures for Volunteers ⁺

An example of the volunteer briefing document is provided in Appendix 1.

- Developing a visitor Information sheet/board - a key recommendation coming from volunteer and staff feedback is for the development of an easily accessible, one-sided information leaflet for volunteers to share with visitors. As VO8 identified, *“many of the volunteers who are older (or) not familiar with the app...may not be comfortable showing visitors how to use it. So, to have a little pamphlet, or something that could be handed out to visitors would be really useful”*. For those less comfortable engaging in a verbal introduction of the app, a leaflet, pamphlet, or board format could be made available to either assist in the introduction of the app to visitors, or to enable volunteers an alternative option of doing this personally to overcome this challenge. This should be simple, highly visual step-by-step instructions with limited text to ensure immediate engagement and access to information in a meaningful and effective manner.

- The information provided is to support volunteers and visitors in this endeavor were highlighted as:
 - A brief overview of each section of the app – in particular, what to do in ‘scan’ view, what information is available in ‘explore’, and how to ‘like’ and then access one’s ‘profile’.
 - Being able to like and store images - getting over the ‘no photography’ rule.
 - A brief note that there will be ‘x’ number of images that do not appear due to copyright issues of paintings on loan.
 - An infographic style guide, to communicate more about Smartify in the simplest form possible.
 - Step by step instructions on how to download Smartify for both iPhone and Android users.

An example of the supporting visitor information sheet/board is provided in Appendix 2.

3.4.3 Digital Ambassadors

- ▶ Given the importance of ensuring advocacy in the adoption of the AR solution organisational wide, discussions have also highlighted the importance of identifying a digital ambassador who is able to work alongside staff, volunteers and visitors, to support the integration of the technology on site. Ambassadors should be trained and confident in the use of Smartify and importantly, should be effective in sharing their knowledge whilst empathizing with the range of different experiences and opinions of such solutions across the volunteer community. Suggested responsibilities could be, for example, pairing with those less familiar and experienced to conduct one to one, or small group, hands-on training on how to download, activate and share the app with others in order to bring them up to speed with the functionality of the app. Likewise, such introductions could be given during new volunteer induction.

4 Conclusions

Over the past decade, the Government, Arts Council England, and other key organisations involved in the arts and culture, have made significant headway in promoting cultural education, skills development, diversity in the workforce, and the use of augmented reality in UK galleries and museum spaces.

Arts Council England (ACE), with its publication of 'Great Art and Culture for Everyone - 10 Year Strategic Framework' (2010-2020), put forward a series of five strategic goals, centred around: (1) promoting excellence and equal opportunity in the arts, museums and libraries; (2) embedding environmental sustainability, diversity and skills development into the arts, museums and libraries; and (3) ensuring that children and young people are exposed to culture. The Government's 'Culture White Paper' supports these goals, showcasing clear complementarity with the strategic vision of ACE.

Central to this strategic vision has been a clear focus on the development and implementation of augmented reality within the arts and museums space in recent years. Digital technologies and



augmented reality (AR) are now playing an ever-growing role in supporting both the creation of art and the enhancement of visitor and volunteer experiences in museums and art galleries. The Smartify app is a sector-leading example of the use of augmented reality being fruitfully applied to art gallery spaces. The app allows gallery visitors to scan paintings using their

phone's camera function, and then learn more about the piece of art through the provision of information via video, audio and text.

This report draws on research conducted through two principle projects, the first, Let's Explore and the second, the recent implementation of Smartify at Watts Gallery – Artists' Village. The aim of the research was to better understand the opportunities and challenges to adopting augmented reality-based visitor experiences for local and regional art and heritage sites. Findings are taken from 40 visitor evaluation interviews (Let's Explore), and 12 visitor evaluation interviews, 13 volunteer evaluation interviews and a series of 4 workshop focus groups with staff at Watts Gallery – Artists' Village. All findings serve to, first, facilitate a deeper understanding of the opportunities AR holds to enrich the visitor experience, and secondly, to support the development of user support guidelines and recommendations for future practice from both a staff/volunteer and visitor perspective.

4.1 Visitor Perspective on Opportunities for AR (Smartify)

Key findings from this research intervention suggest that facilitating the adoption and use of AR for visitors can be achieved by: (1) facilitating greater autonomy, choice and control within the visitor experience, (2) opportunity to increase personalization within visitors experience (3) enabling multi-sensual encounters with art through curated content in a range of formats, including: text, audio, and video; (4) promoting greater access to the AR experience for younger populations, as well as for more elderly people who may be less familiar with Smartphone/tablet and application-based technologies, (5) elevation of multiple voices appropriate to different visitor requirements, (6) facilitation of intergenerational learning opportunities, (7) providing user support for downloading the Smartify app; (8) maintaining a free app service with opportunity for payment for temporary exhibitions with further detail.



4.2 Training and Support in Adoption of AR (Smartify) Solution

For Watts Gallery – Artists' Village staff and volunteers, the deployment of AR could be facilitated through a number of management, skills and training issues, such as: (1) addressing safety matters in relation to Smartphone/tablet devices; (2) providing a visitor information sheet so that volunteers feel comfortable introducing Smartify to visitors; (3) deploying 'digital ambassadors' to train those volunteers less familiar with and experienced in using the Smartify app; (4) developing a two-page volunteer user guide or crib sheet to provide further detail in the training and support of volunteers and staff on matters such as photography in the gallery, copyright issues, and communicating the functionality and benefits of Smartify to visitors.

Central to all findings was the underpinning confirmation that for any AR solution and associated content, it is vital to ensure that the implemented technology is *appropriate* for an organisation and associated visitor needs.



APPENDIX 1



VOLUNTEER GUIDE

Volunteer Guide⁺

INTRODUCING SMARTIFY TO WATTS GALLERY

This guide is your introduction to Smartify. It will tell you all you need to know about what Smartify is, how it works and how you can support visitors to Watts Gallery who would like to use it. While not all visitors may wish to download and use the app, it is important that we are all aware of what it is and how it can enhance a visitors' experience should they wish to use it.

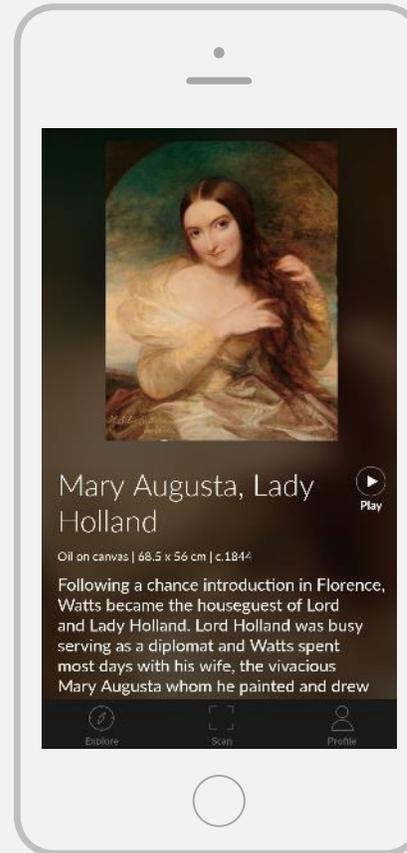


WHAT IS SMARTIFY?

- Smartify is a social enterprise with a mission to help people make meaningful connections with art.
- Using image recognition technology, Smartify instantly identifies artworks by scanning them on your smartphone. The app then returns information about the work, including video, audio and text.
- All information shown within the app is provided by Watts Gallery and Smartify does not claim any copyright.
- Smartify is available at a growing network of partner venues, including some of the world's most popular museums such as: The National Gallery; The National Portrait Gallery; Tate Britain; Louvre; Rijksmuseum; and many more. The app is developed as a platform with the goal that it can be used easily by numerous museums of all sizes and locations.
- Once downloaded, visitors can use the Smartify app across all partner venues where Smartify is available, not just Watts Gallery.
- Smartify is currently used by over 1 million people in collections across the world. The app users range in age, interests and gender but most use the app to get quick information about art.

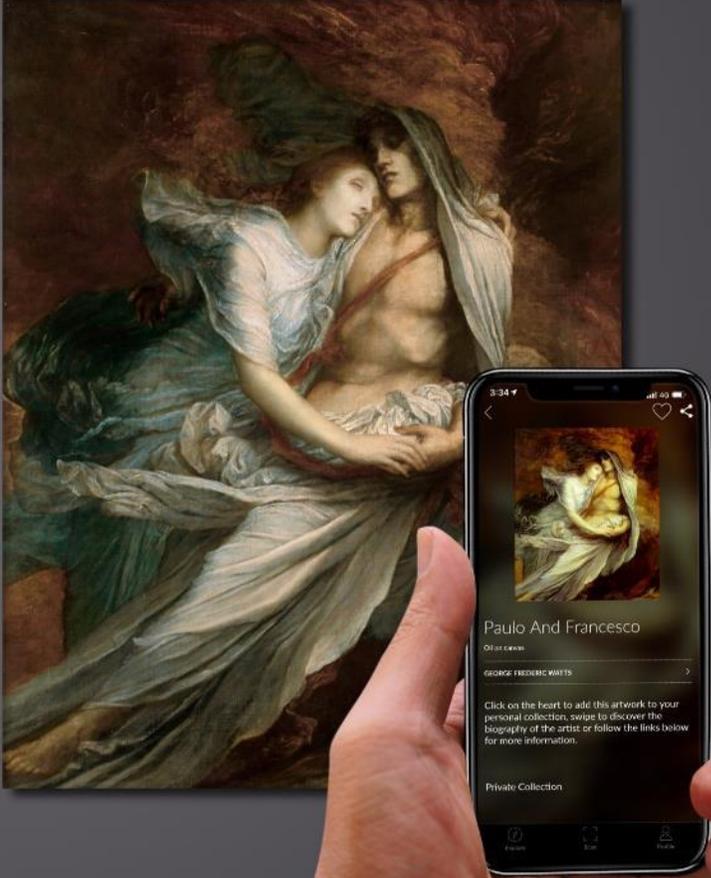
WHY USE SMARTIFY AT WATTS?

- As we know, visitors experience exhibitions in many different ways. Smartify provides a digital interpretation solution that visitors can choose to engage with. It is intended to work alongside existing interpretation boards and volunteer knowledge and expertise.
- The use of augmented reality provides a range of multi-media content which visitors can choose to access as they walk through the gallery (e.g. audio recordings, additional information on paintings)
- “I am thrilled that Watts Gallery – Artists’ Village has this unique opportunity to work with Smartify and the University of Surrey to bring cutting-edge digital technology to our historic gallery spaces for the first time. The app is a leader in sharing rich interpretation with museum and gallery visitors and will be an added layer of information to enhance our visitor’s experience of the Artists’ Village,” Alistair Burtenshaw, Director of Watts Gallery



HOW DO VISITORS DOWNLOAD SMARTIFY?

- Smartify can be easily downloaded through Watts Gallery Wi-Fi or via 4G before arrival, or upon arrival at Watts Gallery.
- Search “Smartify” on the Apple app store (iPhone) or Google Play store (Android). Alternatively, scan the QR code to instantly access the app.
- Once located, click ‘install’ and ‘open’ once installation is complete.



SMARTIFY

download the app,
scan the art,
uncover the story.

Download on the App Store GET IT ON Google Play

Paulo And Francesco
GEORGE FREDERIC WATTS

Click on the heart to add this artwork to your personal collection, swipe to discover the biography of the artist or follow the links below for more information.

Private Collection



HOW DO VISITORS USE SMARTIFY?



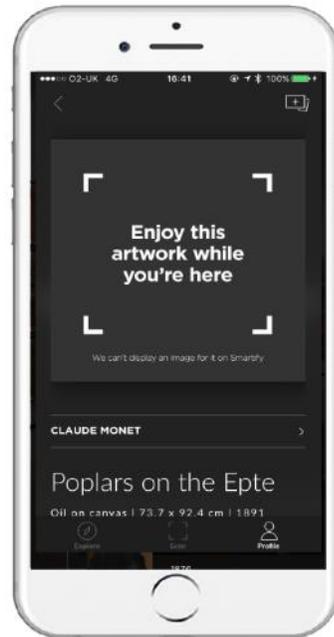
- Smartify can be easily downloaded through Watts Gallery Wi-Fi or via 4G before arrival, or upon arrival at Watts Gallery.
- Search “Smartify” on the Apple app store (iPhone) or Google Play store (Android). Alternatively, scan the QR code to instantly access the app.
- Once located, click ‘install’ and ‘open’ once installation is complete.

HOW CAN VISITORS USE SMARTIFY TO ENHANCE THEIR EXPERIENCE?

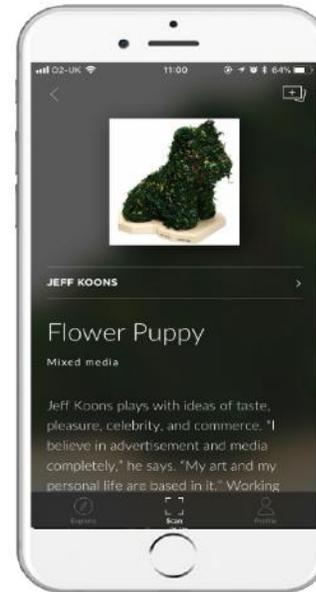
Below are the key functions of the Smartify app. There are three main buttons located at the bottom of the screen; Explore, Scan and Profile.

1. Scan art

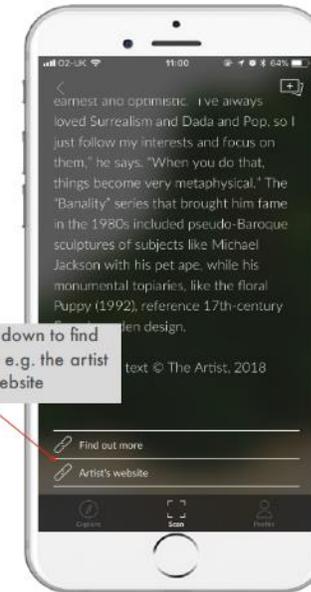
- Follow in-app links to our website



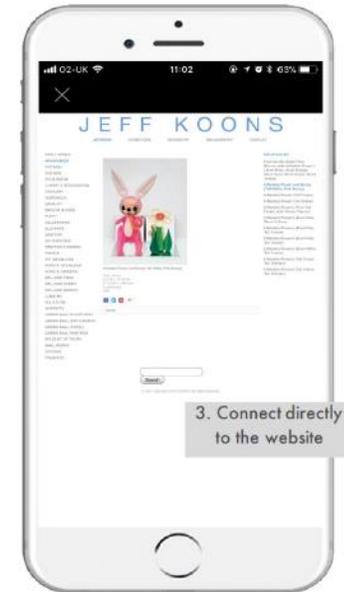
1. Scan an artwork



2. Scroll down to find hyperlinks e.g. the artist website

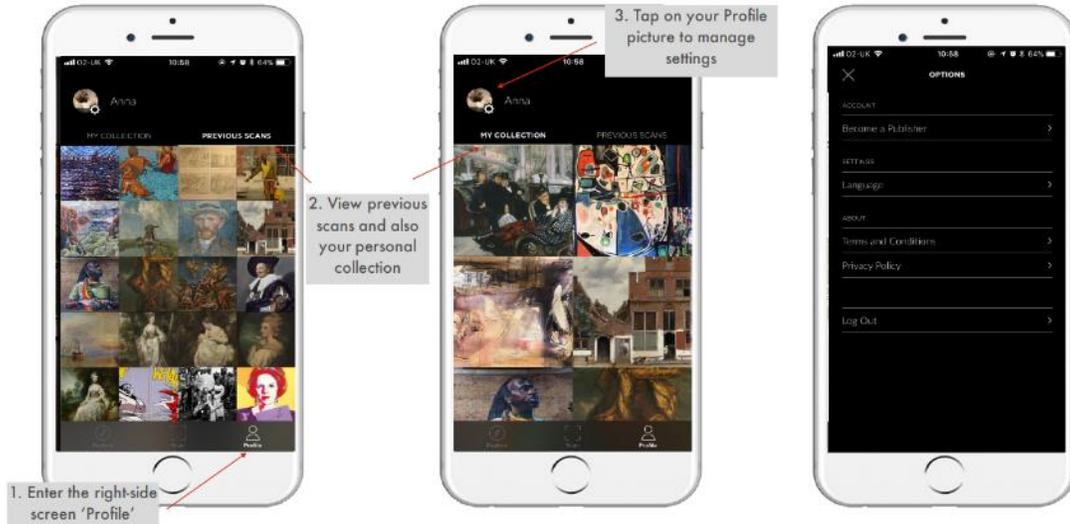


3. Connect directly to the website



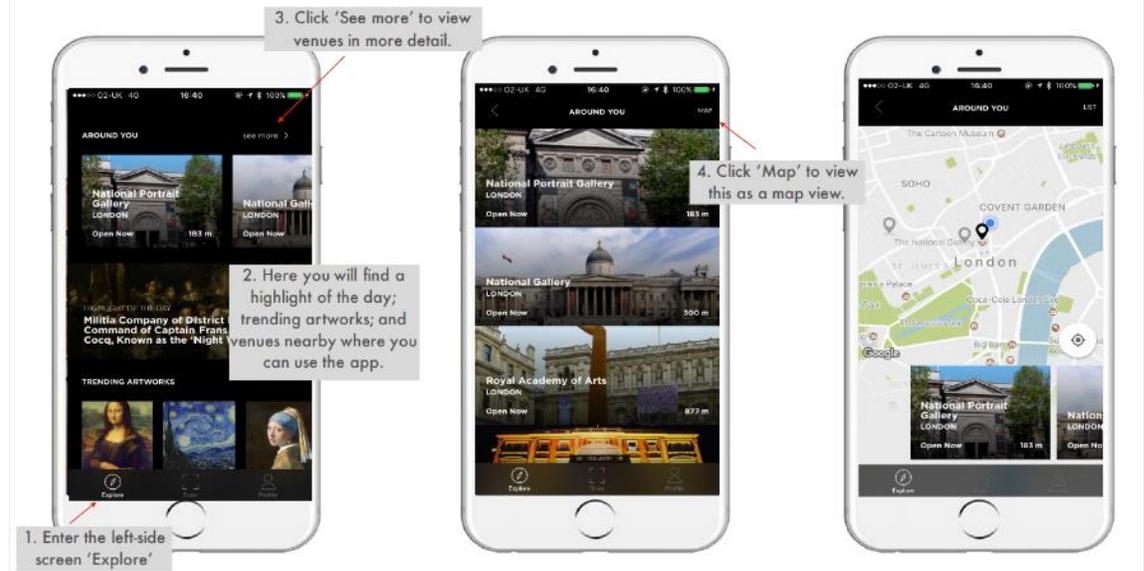
2. Profile.

Access past scans and save favourite artworks.



3. Explore.

Learn more about us and other relevant museums and artwork



DO VISITORS HAVE TO SHARE PERSONAL DATA?



- Users are not obliged to share personal data. They can download and use the app without signing up and enjoy the basic scan and discover features.
- By signing up, users can save their personal collection, and access their favourite artworks across any device.
- By signing up, visitors allow the app to collect anonymous data. Smartify uses data to train its algorithm to help recommend new artworks, artists and exhibitions that users might like. This is similar to Spotify's 'Discover' playlists which suggest new songs based on previous listening, thus tailored to taste.
- Smartify also counts how many times artworks are scanned to allow the art venues to understand what the most popular artworks in their collection are.

WHY DOES SMARTIFY NEED ACCESS TO THE CAMERA AND LOCATION?



Camera:

Smartify uses image recognition technology to instantly identify artworks. When users hold their camera up to a painting it takes a visual 'finger print' and matches it with the Smartify database.

Location:

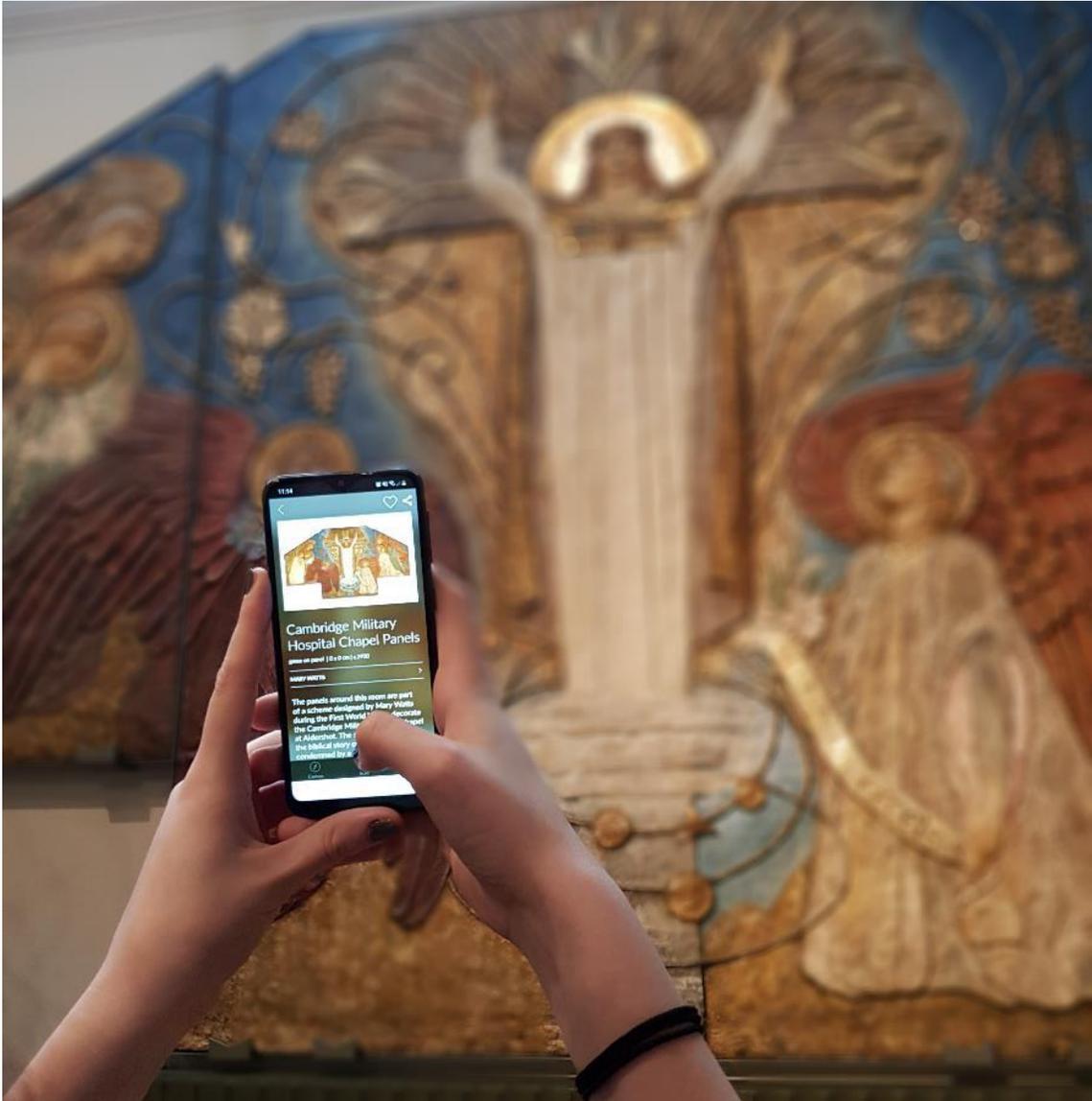
Location is use for two technical functions. First, it helps speed up recognition by alerting the algorithm which part of the database to search. Second it allows the app to show users the museums and artworks closest to their location.

Location is only used when the app is open.

PHOTOGRAPHY IN THE GALLERY

Whilst Smartify uses the phone's camera feature, photography is prohibited in the Gallery. You might feel that it would be confusing to know whether a visitor is using Smartify or taking a photograph. Here are several tips to help you when you find yourself in this situation: :

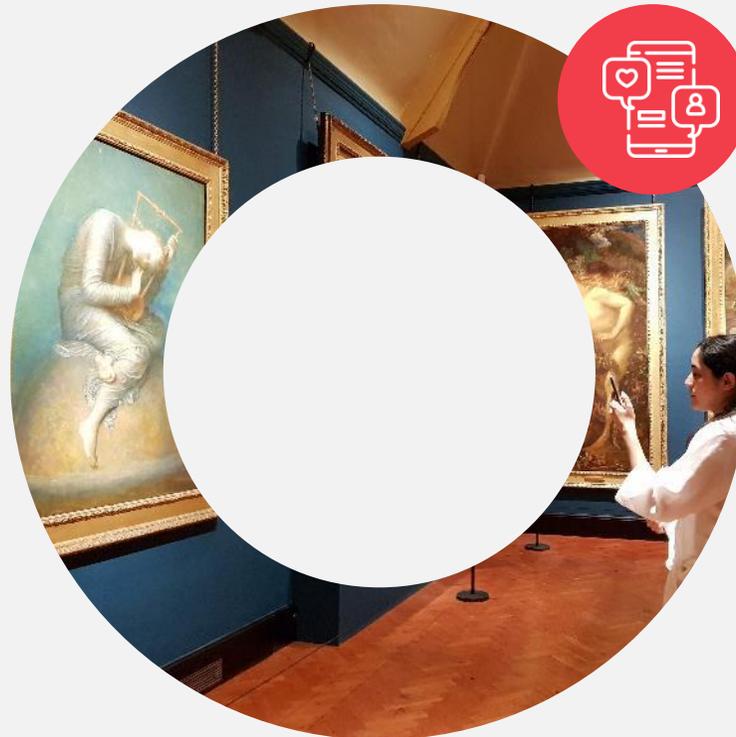
- Look for additional content appearing on visitors' smartphones that would indicate the use of Smartify. Note that visitors using the app are more likely to engage with the phone for longer as they read the additional information. Taking photos is perhaps done more 'sneakily'.
- Don't be afraid to approach visitors. You could ask, "I see you are using our new Smartify app, what do you think of it so far?"
- You could advise visitors who would like to take photographs by encouraging them to use the app to save 'professional, high quality' images and be able to take them back home.
- A simple advice of "no photography is allowed, but please use our Smartify app to save high-quality images of your favourite work" would work wonders.



KEY ADVANTAGES OF SMARTIFY FOR VISITORS



Feedback are always welcomed! Please share your experiences as a volunteer and user of Smartify with us.



- Save favourite works and see previous scans.
- Access to additional information through audio, videos, and tours.
- Discover more artworks, museums and trending artists.
- Personalise visitor's experience (listen at an appropriate level, read at appropriate font size, link to existing voice recognition, etc)
- Smartify can be used across a range of art galleries around the world.
- All of this is FREE to download in less than 2 mins!



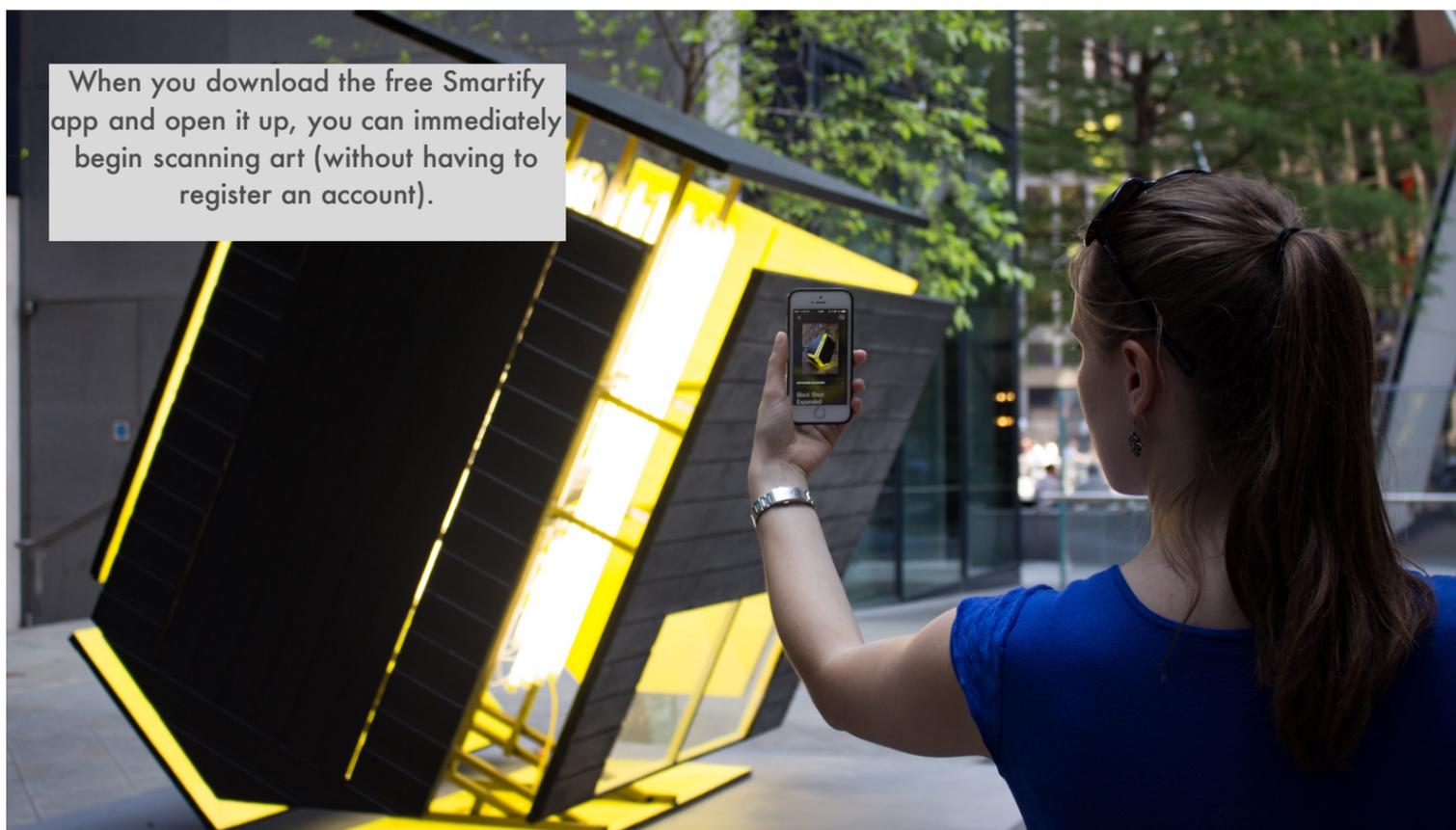
APPENDIX 2



VISITOR INFORMATION SHEET/BOARD

Smartify

Scan the art, uncover the story



Downloading Smartify allows you to discover more about our collection, listen to audio descriptions by our curators, and create your own digital art collection.

To begin

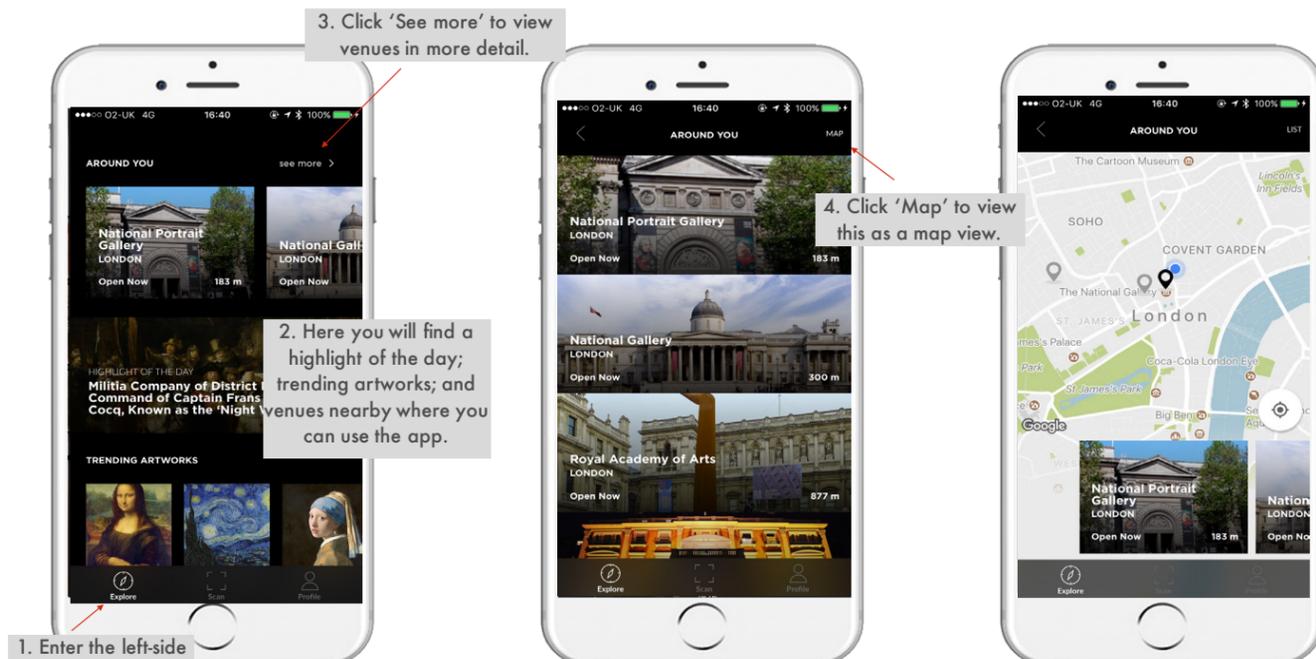
- 1 Login to our free Watts Gallery WiFi
- 2 Download the Smartify app on your Android or Apple device*
- 3 Open the app and hover the Smartify camera over an artwork to scan
- 4 Enjoy discovering more about our collection

Please note that, whilst the Smartify app uses your phone's camera feature, photography is prohibited in the Gallery.

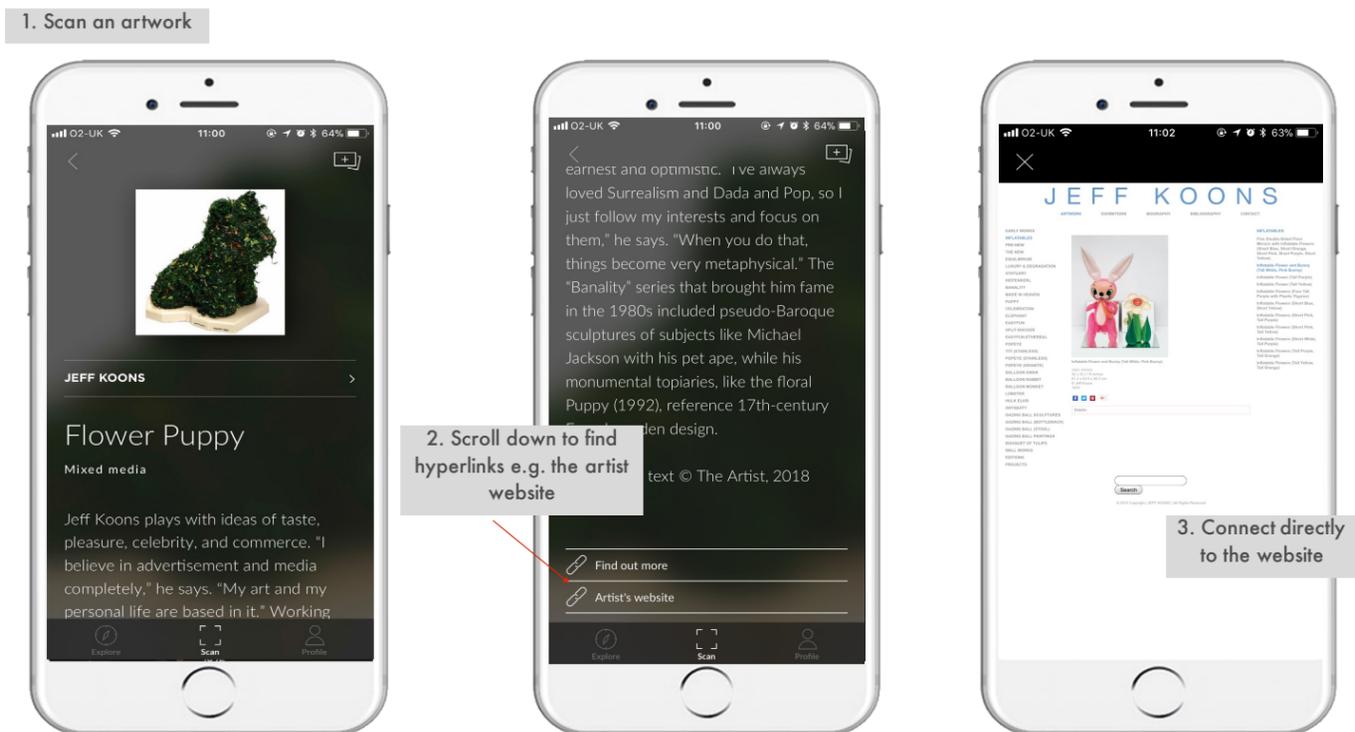
*Optimised for modern smartphone devices

User Guide

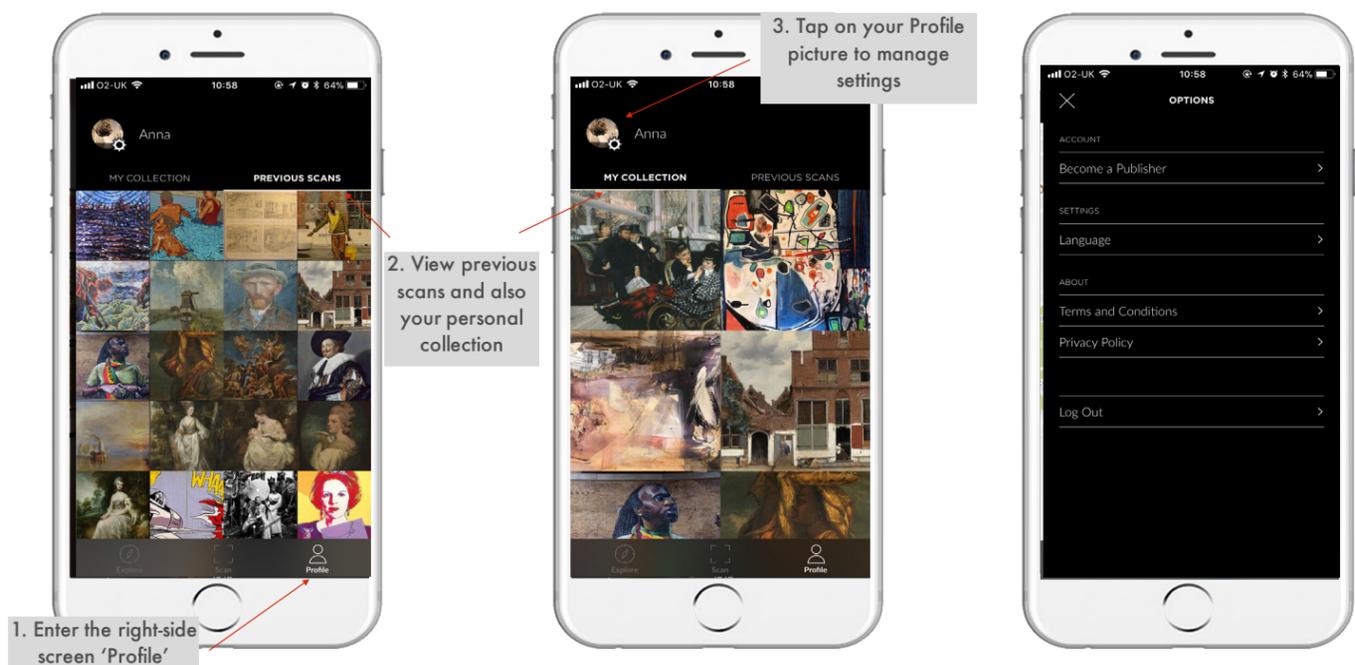
Learn more about us



Follow in-app links to our website



Save favourite artworks in your personal collection



DIGITAL FUTURES: AUGMENTED REALITY IN ARTS AND HERITAGE

RESEARCH PARTNERS:

**RESEARCH CONDUCTED BY THE UNIVERSITY OF SURREY IN
PARTNERSHIP WITH SMARTIFY & WATTS GALLERY - ARTISTS' VILLAGE**