# Measuring the Economic Value of Digital Culture:
# A Case Study of the Art UK Platform

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# Acknowledgments

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## Executive Summary

Cultural institutions face challenges in measuring their value to the public when the services they produce are not mediated in markets and where prices are not observed. Such is the case for museums and art galleries in the UK, where entry is in many cases free of charge. As a consequence, the benefits of investing in cultural institutions may be implicitly valued at zero in Social Cost Benefit Analysis (SCBA), leading to suboptimal decision-making. This is why DCMS's Culture and Heritage Capital (CHC) Programme aims to place public investment in culture and heritage assets on a more sustainable footing by ensuring decisions are based explicitly on the economic, social and cultural contribution they make to society.

One way of doing this is through the use of non-market valuation techniques, such as contingent valuation to measure the welfare benefits of cultural and heritage services. This aims to reveal the shadow price of services by asking consumers what they would be willing to pay were these services traded in a hypothetical market (Sagger et. al., 2021). These can be used to produce value estimates which can be used in SCBA.

While a rapidly growing evidence base attempts to estimate the willingness to pay for a range of cultural services using contingent valuation techniques (Bille, 2024), the quantitative evidence base on the value of digital cultural services remains thin (Kaszynska et. al., 2022). This is despite the fact that digital services account for a significant and growing part of the cultural consumption basket (Ateca-Amestoy and Castiglione, 2023).

The few experimental studies that have been published using contingent valuation methods for digital culture (Lawton, Fujiwara and Hotopp, 2022; Arber et. al, 2023) report a number of methodological challenges, including:

- the problems the public appear to have in estimating the value of digital services separately from the value of underlying physical services that are distinct but associated with them;
- the demands imposed on consumers in being asked to estimate their willingness to pay for digital cultural services that are still in their infancy and with which consumers are relatively unfamiliar; and

- the cognitive difficulties involved when users more generally of cultural assets are asked to consider their non-use value to them separately from their use value.[1]

This last example may be quantitatively important as contingent valuation studies of physical cultural and heritage sites typically conclude that non-use value accounts for a significant part of their overall value proposition (Bakhshi et. al., 2015).

The DCMS and AHRC have made the valuation of digital cultural and heritage assets a priority within the CHC Programme, recognising that digital technologies are transforming the way the public engages with culture and heritage and the way organisations are changing their delivery models (Kaszynska et. al., 2022). (See also here). In this study, we aim to address the aforementioned challenges through undertaking a contingent valuation survey of UK-resident users of the Art UK platform.

Art UK brings together artworks from every public collection of art in the UK. The charity's mission is to open up the UK's national collection of art for enjoyment, learning and research. Almost 3,500 collection venues (including museums, universities, libraries and national organisations, such as the National Trust) are represented on the website. The vast majority of these institutions could not show their art collections online on their own, with an estimated 90% of the art across these collections being in storage or not easily publicly accessible. The Art UK platform is rich in story content, learning resources, public engagement offerings as well as opportunities to buy merchandise and prints on demand from the participating collections through the Art UK shop. There are currently over 300,000 artworks by 54,000 artists on the platform. In 2023, the total number of users visiting Art UK was 5.3 million (of which 2.3 million were UK users), showing growth of 13% year-on-year. There were 6.8 million sessions and an estimated 17.3 million page views. (Art UK, 2023).

By working with Art UK, we are valuing services where the user base is engaged and familiar with the digital offer and where through careful use of questions eliciting survey respondents' reasons for their answers, we are able to more confidently delineate the non-use value estimates from use values. Recognising that the non-use values of those using the Art UK platform may reasonably differ from members of the public who do not use the platform (yet for some reason would still be prepared to support its upkeep), we conducted a separate valuation survey of non-users. Like our survey of Art UK users, we restricted our sample to UK-resident non-users.

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[1] Non-use value refers to the benefits that individuals derive from the assets, without their engaging with them personally, either directly or indirectly, and use value refers to the benefits they derive through using the assets.

We found that 51.3% of Art UK users said that they were either willing or maybe willing to pay a monthly subscription fee to ensure Art UK could continue to operate and offer its services in the face of hypothetical funding cuts. Art UK users were recruited either through a pop up that appeared while they were visiting the website or through a general population survey asking if they had engaged with Art UK in the last five years. They were asked to think only about what Art UK meant to them (use value) when answering the question. The mean average willingness to pay for users was £3.69 per month with a median of £0.22. These average values may strike readers as low when compared with, say, the typical subscription fees charged by commercial providers of cultural services. However, the average figures are calculated on the basis that the 48.7% of Art UK users – who currently enjoy a free service – who said they were not willing to pay had a WTP of £0. In fact, the 51.3% of users who said they *were* willing to pay had a mean average WTP of £7.19.

Of the Art UK users willing to pay a monthly subscription, 24.9% said they would be willing to pay in addition an annual donation to support Art UK's educational, research, community, and cultural tourism services (non-use value). The mean average contribution was £8.92 per year and the median £0 (though the non-use value estimates for users are necessarily tentative given the smaller sample sizes). These average values are again computed on the basis that the 39.1% of users who were willing to pay a monthly subscription but not an additional annual donation had a WTP donation of £0. In fact, the 24.9% who said they *were* willing to make an annual donation had a mean average value of £22.95.

For the non-users, also recruited through the general population survey, the question was focused on the willingness to pay an increase in annual council tax to support the continued existence of Art UK. Among this group, over half said they were willing or maybe willing to pay the increased tax, which suggests a very significant part of the general public appreciates the wider societal value that a digital culture resource like the Art UK platform brings. Non-users had a mean average willingness to pay of £5.67 per year and a median of £0.63, again computed on the basis that the 45.1% of the population not willing to pay the increased tax had a willingness to pay of £0. In fact, the 54.9% of non-users who said they *were* willing to pay had a mean average of £10.33.

These WTP estimates can be scaled up by the relevant population to give aggregate welfare values for the non-market benefits of the Art UK platform. This is easier to do in the case of users where we have good data on the numbers visiting the website; in contrast, it is less clear what population to use for aggregating the non-use value for non-users. Annex D presents an indicative estimate of £71.4 million for the use value per year enjoyed by Art UK's UK-based users. Note even this does not capture the whole value of Art UK: only those elements the contingent valuation is designed to capture.

Stated preference exercises such as the contingent valuation surveys we use are beset with possible biases. As well as deploying best practice measures that are adopted by researchers to mitigate against these, such as oath commitments and cheap talk entreaties to reduce bias arising from incentive incompatibility and a payment card elicitation method with an open-ended 'other' option to address anchoring bias set by the payment range, we undertook a number of steps to clean the data by removing from the sample inconsistent responses. These consistency checks reduced significantly the sample sizes for both users and non-users, and may have introduced some selection biases, but result in a higher quality dataset. As is standard, we use multivariate regression analysis of factors known from other studies to influence willingness to pay such as income, demographic variables and measures of individuals' cultural habits and experiences to confirm that our results are consistent with economic priors.

All in all, our results add to the small but growing evidence base that through careful sampling strategy and questionnaire design, contingent valuation techniques can be used to estimate the economic value of digital cultural services, and that - in the case of Art UK - these estimates, both use and non-use value, are evidently significant in magnitude.

# 1. Introduction

This research, undertaken by the Creative Industries Policy and Evidence Centre (Creative PEC) and the Department for Culture, Media and Sport (DCMS), and funded through DCMS's Culture and Heritage Capital (CHC) Programme, explores the value of the Art UK platform to UK residents.

Art UK brings together artworks from every public collection of art in the UK. The charity's mission is to open up the UK's national collection of art for enjoyment, learning and research. Almost 3,500 collection venues (including museums, universities, libraries and national organisations such as the National Trust) are represented on the website. The vast majority of these institutions could not show their art collections online on their own, with an estimated 90% of the art across these collections being in storage or not easily publicly accessible. The Art UK platform is rich in story content, learning resources, public engagement offerings as well as opportunities to buy merchandise and prints on demand from the participating collections through the Art UK shop. There are currently over 300,000 artworks by 54,000 artists on the platform. In 2023, the total number of users visiting Art UK was 5.3 million, growing 13% year-on-year. There were 6.8 million sessions and an estimated 17.3 million page views. In 2023, 58% of Art UK's users were from overseas (Art UK, 2023).

Research on the value of the Art UK platform is of general interest because there has been a shift towards digitalisation of culture and heritage assets in recent years (AHRC/DCMS, 2021, Kaszysnka et. al., 2021). For instance, as early as 2019, 70% of museums in England reported that they published content on free platforms, 69% digitised some or all of their collection and 20% provided online interactive tours of in real life exhibitions (Nesta, 2019). This 'pivot to digital' received a boost in the COVID-19 pandemic, where restrictions to physical attendance and in-person experiences caused significant financial strain on cultural institutions, threatening the preservation and accessibility of their assets (Kidd et. al., 2021; Noehrer et. al., 2021). Digital technologies provided museums and galleries with a means of engaging their audiences remotely and expanding access to otherwise distant audiences, redefining how culture and heritage are shared, preserved, and consumed.

Consistent with this, digital experiences have become more important in the way the public engages with culture and heritage. In a cohort study of adults in the first UK-wide lockdown in 2020, as many as 13% - 17% of individuals reported to be looking at art, paintings, and photographs online on a weekly basis (Creative PEC/Intellectual Property Office, 2020). This experience was mirrored in Art UK, where website visits increased by 39% between March 2020 and March 2021, of which around 40% was driven by non-UK residents.

The valuation of benefits and costs plays an important role in investment decisions. However, many cultural institutions, including Art UK, face challenges in measuring their public value when the services and benefits they produce are not mediated in markets and prices are not observed; in other words, there are non-market benefits. In these cases, the value of these institutions goes well beyond their acknowledged contribution to national accounting measures like gross value added, as their content can enrich lives, bring joy, educate, inspire and create new opportunities for individuals and society (DCMS, 2023).

As such, this research contributes to DCMS's CHC programme, which aims to place public investment in culture and heritage on a more sustainable footing by ensuring decisions are based on the economic, social and cultural contribution the sectors make to society. The CHC Framework sets out DCMS's ambition for a transformational change to assessing value for money of culture and heritage, via more robust appraisal and evaluation. This includes improved articulation of the value of these sectors, following best practice guidance set out in HM Treasury's Green Book.

Without explicit attempts at valuation, the benefits associated with culture and heritage risk being implicitly valued at zero in exercises like social-cost benefit analysis (SCBA), potentially leading to suboptimal investment decisions. This is why the CHC Framework is designed to move appraisal beyond standard accounting measures of economic contribution alone, to measure more comprehensively the impact that culture and heritage has on the public's welfare. Its aim is to develop a formal approach to measuring the benefits of cultural and heritage to society, which can sit alongside other approaches for natural, human, social, manufactured and financial capital (Porritt, 2005). This will help to ensure the non-market benefits of culture and heritage are valued and assessed equally (alongside more traditional market benefits), using economic methodologies recognised in HM Treasury's Green Book.

This study employs contingent valuation to capture the non-market benefits of Art UK to UK residents. This survey-based technique aims to reveal the shadow price of cultural services offered by the Art UK platform by asking consumers what they would be willing to pay were these services traded in a hypothetical market. The value estimates presented in this paper are consistent with HM Treasury's Green Book, and provide evidence of the benefits that a digital culture platform, such as Art UK, confers on people, in terms of the change in their welfare brought about by its work. This is both in terms of the benefits to Art UK users, but also the non-use value to those who do not use the platform, yet who may nonetheless derive welfare from knowing the platform exists (existence value) and knowing that other people are able to use it, both now (altruistic value) and in the future (bequest value).

Survey respondents from the user population were recruited both directly through a pop-up on the Art UK website and through self-identifying as such in an online general population panel. Non-users were recruited from the online panel.

While there is now an extensive body of evidence that contingent valuation techniques can be used to estimate the non-market benefits of cultural and heritage institutions delivering services in physical venues, estimating the non-market value of digital assets is challenging for a number of reasons. These include the difficulties for individuals of estimating the value of digital services separately from underlying offline services that are distinct but related to them; the demands imposed on consumers in being asked to estimate their willingness to pay for digital cultural services that are still in their infancy and with which consumers are relatively unfamiliar, as well as the cognitive difficulties involved when users more generally of cultural services are asked to consider the non-use value of the services to them separately from their use value.

For all these reasons, contingent valuation estimates for digital culture and heritage assets are likely to be subject to greater bias and be noisier than for physical assets (Arber et. al., 2023). In this case, it becomes even more important to ensure survey design involves steps to mitigate against these problems, drawing on lessons learned from the previous literature. In this study, oath commitments (i.e., asking respondents to agree to promise that they will respond to questions honestly) and cheap talk entreaties (i.e., a script that explicitly describes response bias and asks respondents to avoid it) are used to reduce bias from incentive compatibility (Lawton et. al., 2019). An open-ended payment card to address anchoring biases, and familiarity questions to ensure that respondents have understood the questions being asked of them are also included.

The Art UK platform provides an opportunity to estimate the non-market value of digital assets where the aforementioned challenges facing contingent valuation of digital assets are in principle partly sidestepped: Art UK is an institution whose services are to all intents and purposes 100% digital i.e., it has no real life offer;[2] where the user base is engaged and familiar with the digital offer; and where through careful use of questions eliciting survey respondents' reasons for their answers, we are able to more confidently delineate the non-use value estimates from use values.[3]

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[2] Of course, the Art UK platform is built on the physical assets of the participating museums and collections. The valuation scenario presented to respondents in which hypothetically as a result of financial constraints Art UK would be at risk of closure explained that this would not impact the physical galleries and museums which would remain open as normal. However, as we shall see, in the event as many as 40% of users and non-users who said they were or maybe willing to pay to support the continued provision of Art UK's services said that their willingness to pay was not just for Art UK, but also an expression of their support for museums and galleries. We removed these responses from the sample.

[3] As with all economic valuation studies, the value estimates for Art UK we present do not capture all the welfare (market and non-market) benefits. Therefore, when using these values readers should interpret them in the context of Art UK's wider value proposition and also ensure they do not double count benefits when combining the estimates with other estimates of Art UK's value.

## 2. Literature Review

Contingent valuation surveys are used to elicit monetary values for non-market goods by directly asking respondents their willingness to pay (WTP) for a particular change, via a hypothetical scenario e.g., fund-raising to support the continued existence of a particular culture or heritage site.

While a rapidly growing evidence base has attempted to estimate the WTP for a range of cultural and heritage services using contingent valuation techniques (Kaszynska et. al., 2022, Bille, 2024), the quantitative evidence base on the value of digital cultural services remains thin. This is despite the fact that digital services account for a significant and growing part of the cultural consumption basket (Ateca-Amestoy and Castiglione, 2023).

Though falling short of a full contingent valuation study, an early Arts Council England (ACE) survey of the public's engagement with digital culture found that 32% of respondents agreed that they would be willing to pay for arts and culture online if they 'got something extra e.g., exclusive content or access offline' (Arts Council England, 2010). Self-identified consumers of digital culture were further asked what they would be willing to pay for various categories of digital content: the WTP estimates ranged from £3.04 for a phone app that provided location-based information regarding archives to £7.89 for an online theatre performance.

In 2020, DCMS commissioned a Rapid Evidence Assessment (REA) of economic valuations that had been conducted in the international academic and grey literature over the previous 20 years, including those undertaken as part of its CHC Programme (Lawton et. al., 2020). At that point, three digital contingent valuation studies were identified, all relating to Public Service Broadcasting. Since that REA was published, a trickle of contingent valuation studies relating to digital assets have started to appear.

Lawton et. al., (2022) conducted a contingent valuation study to estimate the non-market value of the British Film Institute's (BFIs) Britain on Film (BoF) Programme, which prepares, stores and maintains film collections. BoF also provides a national archival online collection of digitised British film and television, with the majority of content free-to-watch for the UK public. Users reported to have a mean average WTP value for a monthly subscription of £3.21 to access the BoF content (use value) and a mean average monthly top-up donation of £2.26 towards the BFI's research and archive work (non-use value). The wider public who had not used the BoF platform reported as being willing to pay a mean average of £4.68 as an annual donation towards BoF digital content and £3.44 towards the BFI's research and archive work (non-use value).

Arber et al (2023) attempted to measure the economic value of the digital offers of four regional museums in England to individuals self-reporting to be users in a general population survey. 'Digital offer' was defined as the free-to-access online content provided by these institutions. A monthly subscription fee payment vehicle for continued access to the digital offer was chosen to elicit respondents' WTP. The results ranged from a mean average WTP of £3.27 in the case of the Derby Museum and Art Gallery, to £4.93 in the case of the Foundling Museum, which is slightly lower than what respondents had been willing to pay to physically visit an art gallery in an earlier study (£5.40) (Lawton et. al., 2021). Taken together, these results tentatively suggested that contingent valuation techniques may have some validity in digital cultural contexts, though the paper recognised that research in this area was still in its infancy, and further work was needed, in particular to probe what users were in fact valuing.

More recently, consultants Alma Economics were commissioned by the Arts and Humanities Research Council's *Towards a National Collection (TaNC)* Programme to estimate the economic value of a hypothetical unified digital collection of cultural heritage assets in the UK (Alma Economics, 2024). Their approach involved using contingent valuation surveys to elicit respondents' willingness to pay to support the future development, maintenance, and free accessibility of a unified digital collection of cultural heritage assets for the UK. They found that the service was valued to differing extents by three different groups:

I.   The general population, consisting of individuals with either a general interest in cultural heritage collections or no or little demonstrable interest in these collections, were willing to pay a mean average WTP (via an increase in annual taxes) of £8.02 per year.
II.  Academics and researchers, who might use the unified collection as part of their research, claimed they were willing to pay a mean average WTP (via a monthly subscription to access the service) of £13.32 per month.
III. Individuals with a "special interest" in cultural heritage, identified through referrals from cultural heritage organisations, were willing to pay a mean average WTP (via a monthly subscription to access the service) of £3.24 per month.

Contingent valuation has also been used to estimate the value of digital assets outside of culture and heritage. For example, Coyle et al., (2020) estimated willingness-to-accept (WTA) values for giving up access to a range of free online services, such as Facebook, WhatsApp, Netflix and online search. WhatsApp and online search in particular elicited high WTA estimates, with averages of £1,774 and £2,998 per year respectively.

Similarly, Brynjolfsson et al., (2019) estimated WTA values for free to use social media platforms (Facebook, Instagram, Snapchat, Skype, WhatsApp, digital Maps, LinkedIn, and Twitter) for a sample of university students in the Netherlands. Respondents were

asked how much they would be willing to accept for giving up each of the social media platforms for one month. WhatsApp again elicited the greatest WTA average of €535.73 per month, as respondents reported this was their main communication format with friends and family.

These studies suggest that despite the survey design challenges, respondents appear to be able to provide equivalent monetary values for digital services even if they are provided for free.

# 3. Data and methods

Our data collection strategy involved two different groups of survey respondents (adults aged 18+). The first group of "users" were recruited through a pop-up window on the Art UK platform. The second group was recruited through a general population survey administered by the Behavioural Insights Team on behalf of DCMS: the sample comprised of respondents who self-reported as having, or maybe having, engaged with Art UK in the past 5 years (which added to the group of users above) and those that say they hadn't ("non-users"). The fieldwork was undertaken between 8th March and 11th April 2024.

An online survey instrument was designed to capture information about respondents' usage of Art UK, their cultural and heritage consumption, their willingness to pay for different aspects of its work, their socio-demographic characteristics, and other information. Specifically, following the introduction which set out the aims of the survey and an attention check aimed at routing out respondents who were evidently not paying attention, the questionnaire was split into six sections:

- **Art UK participation**: asked respondents what they knew about the Art UK platform and how, why (and why they had not) engaged with it in the past five years.
- **Attitudes**: asked respondents about their cultural and heritage consumption history and their attitudes to arts and cultural activities.
- **Art UK description**: presented respondents with information about Art UK and invited them to spend a few minutes on the platform to understand its functionality and content. In this section, respondents were also asked how familiar they were with this information beforehand.
- **Willingness to pay**: a hypothetical scenario was presented to respondents whereby the challenging economic and financial situation meant that Art UK suffered significant cuts to its funding. For users, it was explained that as a result of these cuts, Art UK would be at risk of closure, meaning that the services, activities and programmes offered on the platform would cease to exist unless more funds were

raised via a monthly subscription.[45] Users saying they would or may be willing to pay a monthly subscription were further asked if they would or may be willing to pay an additional annual donation to support Art UK's educational, research, community and cultural tourism services.[6] For non-users, it was explained that Art UK's services, activities and programmes would cease to exist unless more funds were to be raised via an annual increase in council tax.[7]

- **Wellbeing**: "Asked" respondents about their levels of subjective wellbeing: their life satisfaction, momentary wellbeing ('happiness'), eudaimonic wellbeing and perceptions of their health. It asked them to imagine how their wellbeing along these dimensions would change were they to engage with the Art UK platform at randomly presented frequencies for fixed (30-60 minutes) periods of time. This approach was designed to enable analysts to estimate the impact on wellbeing of a higher frequency of engagement with Art UK, whilst controlling for other factors.

- **Post experiment questions**: closed the survey by asking respondents a range of questions on their socio-demographic characteristics (age, gender, ethnicity, (dis)ability, UK region/nation, employment status, education, income, etc.,).

## 3.1 Consistency checks and data cleaning

The data collection yielded a total of 6,062 responses from both users and non-users. Prior to analysing the data, however, we took a number of steps to clean this dataset.

A first step involved excluding so-called 'speedsters' from the baseline dataset. The questionnaire was designed to take around 10-15 minutes to complete, allowing for the fact that respondents were expected to spend a few minutes on the Art UK platform to (re-)familiarise themselves with it. Respondents completing the questionnaire in an implausibly short space of time, which we judged to be seven minutes, were dropped from the sample. This is greater than the four-minute threshold adopted in Lawton et. al.,'s (2022) film archive study but shorter than the ten minutes in Arber et. al., (2023). This resulted in 2,686 respondents being dropped from the baseline dataset. In Annex A, we show that our

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[4] It was also noted that in this hypothetical scenario the galleries and museums represented on Art UK would remain open as normal.

[5] The verbatim wording was "Would you be prepared to pay a **monthly subscription fee**, even if only a very small amount, in order to support the **continued existence of Art UK** to ensure they could continue to provide the **full range of services, activities and programmes currently offered?** *The offer would be updated with new content on a regular basis, and you would be free to cancel the subscription at any time."*

[6] The verbatim wording was "Alongside the subscription fee, would you be willing to pay an additional **annual donation** to support **Art UK's educational, research, community and cultural tourism services, now and in the future?"**

[7] The verbatim wording was "Would you be prepared to pay an increase in your **annual Council tax**, **just for yourself**, even if only a very small amount, in order to support the continued existence of Art UK to ensure they could continue to provide the **full range of services, activities and programmes currently offered?** *The offer would be updated with new content on a regular basis."*

average willingness-to-pay estimates when using higher thresholds of 8, 9 and 10 minutes do not vary greatly.

A seven-minute threshold may appear high to some readers, but we believe is warranted given that non-users in particular will have been less familiar with Art UK's offer and may therefore have been inclined to rush through questions without due reflection.[8] For example, we found that non-users tended to spend much less time completing the questionnaire than users (Figure 1), when arguably, even allowing for the shorter length of their questionnaire, they might have been expected to spend more time exploring the Art UK website before answering the questions.
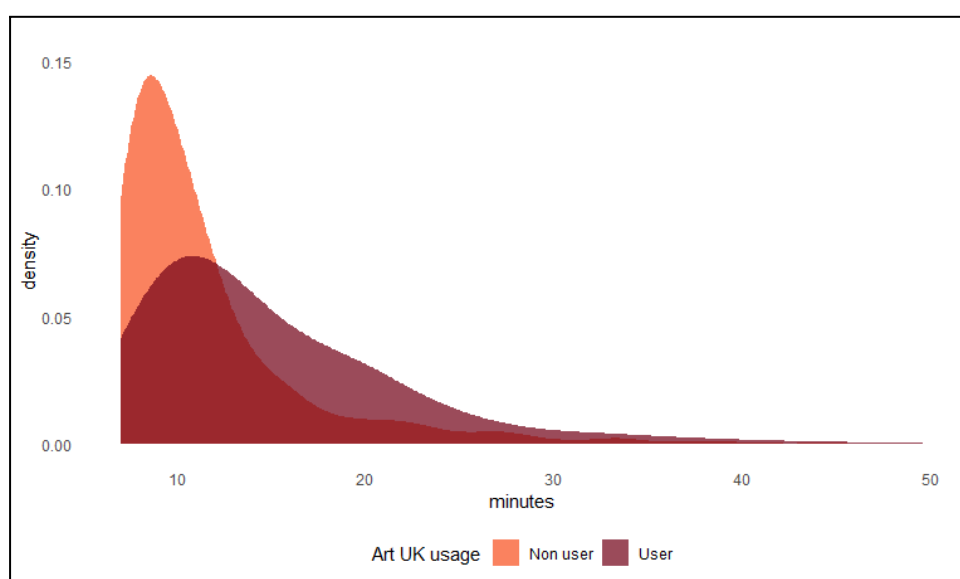


Figure 1– density plot of questionnaire duration: usage and users

Studies using surveys to estimate both the use and non-use values of cultural and heritage services face a basic problem that survey respondents may struggle cognitively to consider the difference between the two (Bakhshi et. al., 2015). For this reason, we introduced a further layer of cleaning by removing from the dataset respondents who gave responses that were 'inconsistent' with the use and non-use valuation scenarios with which they were presented. Specific questions were inserted in the questionnaire to enable this. We applied the following procedure:

1. All survey respondents were asked how realistic they found the valuation scenario they had been presented with. Those who selected "Not at all realistic" were removed from the database;

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[8] Lawton et. al., (2022) picked a survey completion threshold of 4 minutes in their study of the value of a digital film archive which we believe is too low given the cognitive challenges involved in completing a contingent valuation questionnaire.

2. Those who said they were or maybe willing to pay a monthly subscription, annual donation or council tax increase and gave a monetary figure were asked about their main reasons for saying so.[9] One of the options stated: "I don't believe I would really have to pay". Following standard practice, as these respondents' answers are not incentive compatible, they were also removed;

3. Another option given for a main reason to pay was "My willingness to pay is not just for Art UK, but also an expression of my support for museums and galleries". These respondents were also removed from the sample, as their stated willingness to pay did not relate specifically to Art UK;

4. For those users who said they were or maybe willing to pay a monthly subscription for Art UK's services, activities and programmes to continue to be offered, one of the main reasons to pay listed was "I use and value the services, activities and programmes Art UK provides". We required that all users selected this option and excluded those who did not. (In Annex C we explore how sensitive are our results to this exclusion);

5. Of those users who said they were not willing to pay a monthly subscription, we excluded those who gave "I don't use Art UK's website" as a reason;

6. Of the non-users who said they were or maybe willing to pay an increase in their council tax to support the continued existence of Art UK, if they selected amongst their main reasons for doing so the (use-value-related) reason "I use and value the services, activities and programmes Art UK provides" they were removed from the sample;[10]

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[9] Specifically, they were asked the following question: "*What are the main reasons why you would be prepared to pay to support Art UK's offer? Please select all that apply".* The fourteen response options were:
-I use and value the services, activities and programmes Art UK provides
-I want to support Art UK even though I don't use the website much
-Art UK's community impact is important to me
-Art UK's national or global impact is important to me
-My willingness to pay is not just for Art UK, but also an expression of my support for museums and galleries
-Art UK's research, learning and educational services are important to me
-I agreed to pay because it seems like the right thing to do
-I don't believe I would really have to pay
-Accessing Art UK's offer is one of the most convenient or enjoyable ways to engage with all the public art collections across the UK
-Accessing Art UK's offer improves my wellbeing/mental health
-Accessing Art UK's offer inspires me to be more creative
-Access to Art UK's offer is important for children and young people
-Other (please specify)
-Don't know

[10] The following reasons were classified as use-value-related and non-use-value-related:
- Use value reasons:
  ● *I use and value the services, activities and programmes Art UK provides*
  ● *Accessing Art UK's offer improves my wellbeing / mental health*
  ● *Accessing Art UK's offer inspires me to be more creative*
  ● *Accessing Art UK's offer is one of the most convenient or enjoyable ways to engage with all the public art collections across the UK*

7. If a non-user said they were or maybe willing to pay an increase in council tax, we required that they must have selected at least one "non-use value related" main reason for doing so, otherwise they were excluded;
8. There were three respondents with an outlier willingness to pay a monthly subscription of £250 which we did not think plausible and which we did not want to inflate the mean average estimate. We excluded these individuals from the sample;
9. Finally, those respondents who said they were or maybe willing to pay but answered 'Don't know' or 'Prefer not so say' when asked how much, were removed from the final sample.
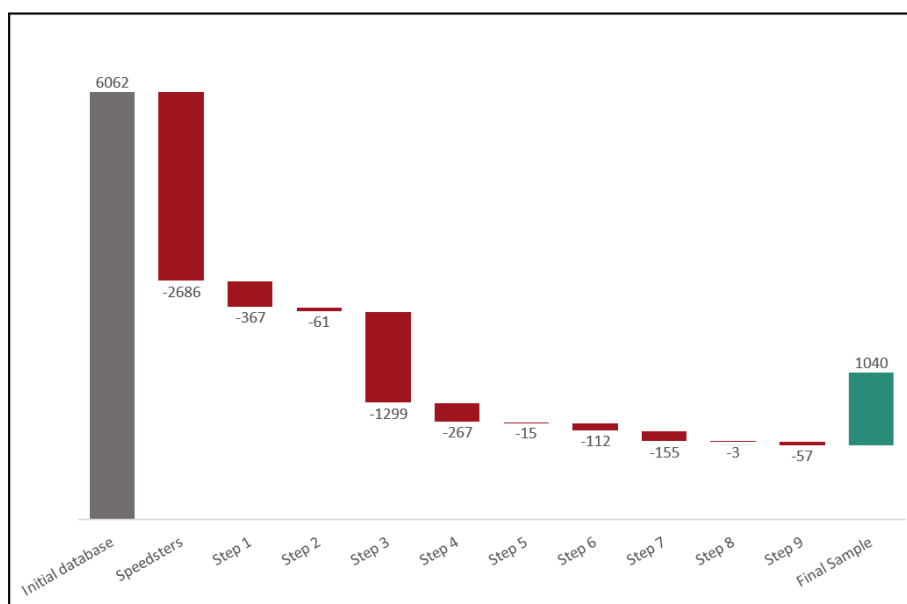


Figure 2– data cleaning process and final sample

After implementing all our data cleaning steps (summarised in Figure 2), we ended up with a baseline sample comprising of 1,040 respondents, of which 572 were users and 468 non-users. Although this is very considerably smaller than our initial 6,062 responses, we believe it is a price worth paying for the resulting increase in the quality of the resulting database and therefore our estimates of the economic value of Art UK to the public.

It should be acknowledged, however, that the exclusion of so many respondents might introduce some bias if it results in the systematic exclusion of certain types of respondents from the sample. To investigate this possibility, ex post analysis (logistic regression) was performed. We found that speedsters were significantly more likely to be male, younger,

- Non-use value reasons:
  ● *I want to support Art UK even though I don't use the website much*
  ● *Art UK's community impact is important to me*
  ● *Art UK's national or global impact is important to me*
  ● *Access to Art UK's offer is important for children and young people*

16

without a university degree, employed, white, and to have visited museums less frequently. This suggests we face a trade-off in excluding these speedsters from our baseline sample: insofar as there are speedsters in the wider population, excluding these individuals from our sample will result in mean average willingness to pay estimates that are not an unbiased estimate of the population mean; however, retaining these individuals may result in unreliable estimates. In contrast, the logistic regression results suggest that selection biases arising as a result of implementing the nine data cleaning steps above were much weaker (Annex B).[11]

# 4. Results

## 4.1    Descriptive analysis

### 4.1.1    Socio-demographic characteristics

Table 1 presents the distribution of respondents by NUTS1 region for users and non-users separately. Mirroring the wider UK population statistics, the two biggest regions in our sample were the South East and London (with London particularly well represented in the user group) and the smallest were Wales, the North East and Northern Ireland.

Table 1 – Respondents by UK region, Users and Non-Users

|  | Users | Non-users | Census population, % share |
|---|---|---|---|
| N | 572 | 468 |  |
| East Midlands | 6.3% | 6.4% | 7.2% |
| East of England | 7.3% | 10.0% | 9.4% |
| London*** | 19.4% | 9.4% | 13.2% |
| North East** | 2.4% | 5.3% | 3.8% |
| North West | 8.0% | 9.4% | 11.2% |
| Northern Ireland | 1.4% | 1.7% | 2.9% |
| Scotland | 9.44% | 9.6% | 8.1% |
| South East | 18.0% | 17.5% | 14.0% |
| South West | 9.4% | 6.8% | 8.6% |
| Wales | 5.4% | 4.5% | 4.6% |
| West Midlands+ | 7.5% | 10.9% | 8.8% |
| Yorkshire and the Humber | 6.1% | 7.9% | 8.3% |

n=1,040
    * Difference statistically significant, according to Z test
    (***) at 1%, (**) at 5% (+) at 10%

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[11] As with any voluntary survey, we cannot rule out the possibility of selection biases arising if those who opted to complete the questionnaire derive a systematically higher or lower value from Art UK. As this possible disposition is unobservable, we are unable to make allowance for it in this paper.

Table 2 provides statistics on demographic details of the two groups and information related to their cultural habits. It also shows that users on average spent a considerably longer amount of time than non-users completing the questionnaire, as noted earlier. Both groups had a broadly equal gender distribution, with a little over half the samples being females, but users were significantly older than non-users. While household income (as measured by the % of respondents with combined household income of over £40,000) was broadly the same in the two groups, the users were on average much more likely to be educated to at least degree level and were less likely to be employed (presumably because they were more likely to be retired). They were also much more likely to be frequent visitors to museums.

Table 2 – Selected characteristics and cultural habits of respondents, Users and Non-users

| | Users | Non-users |
|---|---|---|
| N | 572 | 468 |
| % Female | 53.3% | 55.8% |
| Age +40*** | 79.2% | 67.9% |
| Combined Income (+£40,000) | 50.7% | 53.2% |
| % White | 85.3% | 89.7% |
| Married | 48.1% | 49.7% |
| University*** | 79.9% | 40.4% |
| In Employment** | 50.% | 60.5% |
| Museum at least once a month* | 30.2% | 3% |
| Art UK use at least once a month | 40.6% | -- |
| Extremely/Very/Slightly/Fairly Familiar with Art UK | -- | 18% |
| Average time responding the questionnaire (in minutes)* | 19.2 | 12.10 |

\* Difference statistically significant, according to Z test
(\*\*\*) at 1%, (\*\*) at 5% (+) at 10%

Over 40% of surveyed users claimed to be frequent visitors to the Art UK platform, engaging with it at least once a month, which suggests they were on average an engaged user base. 18% of surveyed non-users claimed to have had some familiarity with Art UK before the study, which is perhaps surprisingly high in relation to Art UK's 2.3 million UK annual visitors: it begs the question whether this reflects some response bias (though only 1% non-users reported as being extremely or very familiar with Art UK).

**4.1.2 Cultural habits and experiences**

This section presents more detailed differences in the cultural habits and experiences of the two groups surveyed. Table 3 highlights that Art UK users were systematically more likely to have visited cultural and heritage sites of different descriptions in the preceding five years, with the only exception being sports heritage sites. These findings highlight the fact that the

Art UK users are culturally engaged and are likely to have accumulated high levels of cultural capital.

Table 3 – Visits to cultural places in the last five years, Users and Non-users

| Place | Users | Non-users |
|---|---|---|
| N | 572 | 468 |
| Historic building open to the public (non-religious)*** | 75.9% | 37.0% |
| A park or garden open to the public with historic or artistic features (e.g. sculptures)*** | 79.5% | 53.2% |
| A place connected with industrial history (e.g. an old factory, dockyard or mine) or historic transport system (e.g. old ship or railway)*** | 52.6% | 27.1% |
| Historic place of worship attended as a visitor (not to worship)*** | 68.4% | 28.2% |
| An ancient monument or archaeological site (e.g. a castle, fort or ancient burial site)*** | 66.4% | 35.7% |
| A historic landscape or habitat (e.g. coastline, countryside with unique features)*** | 71.0% | 43.4% |
| A museum or gallery*** | 87.1% | 49.6% |
| A performing arts venue (e.g. theatre, cinema, live music)*** | 77.6% | 52.6% |
| Site connected with sports heritage not visited for the purpose of watching sport (e.g. Wimbledon, football stadia) | 12.2% | 10.3% |
| A public library*** | 67.8% | 42.1% |
| Some other heritage or cultural site or historic place not listed above*** | 0% | 0% |
| None of the above*** | 4.6% | 12.4% |

\* Difference statistically significant, according to Z test
(***) at 1%, (**) at 5% (+) at 10%

Table 4 shows that this pattern carries across to engagement with digital cultural too, with Art UK users showing significantly higher levels of engagement across all surveyed activities. Among users, as many as 45.1% had taken a virtual tour of a museum or gallery, compared with just 8.1% of non-users. 22.6% of users had taken virtual walking tours of historic towns, cities, heritage sites, castles, or monuments, compared with 7.9% of non-users. Users were also much more likely to engage in online research, 68.5% researching items from museum or gallery collections and 47.2% researching local history, compared with 11.5% and 22.9% of non-users, respectively.

Additionally, 52.8% of Art UK users had viewed documents from an archive online, compared with 15.4% of non-users, and over half, at 55.3%, had engaged with digital content from heritage sites, including text, images, audio, video, animations, games, or podcasts, compared with only 14.1% of non-users who had participated in similar activities. Of most direct relevance to this study, 61.0% of Art UK users had engaged with digital content from museums, compared with 12.4% of non-users. Notably, just over one-half of

non-users reported as not having engaged in any of these digital cultural activities, compared with 6.6% of users.

Table 4 – Digital culture activities in the past 5 years, Users and Non-users

| Activity | Users | Non-users |
|---|---|---|
| N | 572 | 468 |
| Taken a virtual tour of a museum or gallery*** | 45.1% | 8.1% |
| Taken a virtual walking tour of a historic town or city, heritage site, castle or monument (not including drone flights)*** | 22.6% | 7.9% |
| Researched your local history online*** | 47.2% | 22.9% |
| Researched items from a museum or gallery collection online* | 68.5% | 11.5% |
| Viewed documents from an archive*** | 52.8% | 15.4% |
| Engaged with text, image, audio, video, or animation, game, or podcast content from heritage sites*** | 55.3% | 14.1% |
| Engaged with text, image, audio, video, or animation, games, or podcast content from museums*** | 61.0% | 12.4% |
| None of these*** | 6.6% | 50.9% |

* Difference statistically significant, according to Z test
(***) at 1%, (**) at 5% (+) at 10%

Table 5 shows the extent to which respondents agreed or disagreed with various statements regarding arts and culture. Predictably, amongst users a strong inclination towards the arts and culture was evident. A majority (66.0%) of users either "Somewhat agreed" or "Strongly agreed" that they often participated in the arts as children, while a smaller proportion (37.0%) of non-users stated the same. Similarly, 76.6% of users agreed that their family and friends often participated in the arts, compared with just 33.3% of non-users. General interest in the arts and culture was overwhelmingly high among users, with 94.4% expressing some level of agreement, including 79.2% who "Strongly agreed," whereas non-users showed lower overall interest, with 55.6% expressing some agreement of which only 15.2% "Strongly agreeing."

It is not surprising therefore that the importance of preserving arts and culture for current and future generations was a sentiment strongly held by users, with 92.5% agreeing (including 77.3% who "Strongly agreed"). In contrast, non-users were less committed to this view, with 66.2% expressing some agreement, of which 22.2% "Strongly agreed."

Table 5 – Attitudes towards arts and culture, Users and Non-users

| | Statement | Strongly disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Strongly agree | Don't Know |
|---|---|---|---|---|---|---|---|
| (N=572) Users | I often participated in the arts as a child | 7.7*** | 10.7*** | 15.2 | 33.7*** | 32.3*** | 0.3*** |
| | My family and friends often participate in the arts | 3.5*** | 7.0*** | 12.1*** | 35.7*** | 40.9*** | 0.9*** |
| | I am interested in the arts and culture generally | 2.1*** | 1.0*** | 2.3*** | 15.2*** | 79.2*** | 0.2*** |
| | Preserving the arts and culture for current and future generations is important to me | 2.6 | 1.4*** | 3.3*** | 15.2*** | 77.3*** | 0.2 |
| | | Strongly disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Strongly agree | Don't Know |
| Non-users (N=468) | I often participated in the arts as a child | 14.6 | 27.8 | 18.6 | 25.8 | 11.2 | 2 |
| | My family and friends often participate in the arts | 16.2 | 26.7 | 21.6 | 26.7 | 6.6 | 2.1 |
| | I am interested in the arts and culture generally | 5.3 | 13.2 | 25 | 40.4 | 15.2 | 0.9 |
| | Preserving the arts and culture for current and future generations is important to me | 2.8 | 8.3 | 21.2 | 44 | 22.2 | 0.2 |

* Difference statistically significant, according to Z test
(***) at 1%, (**) at 5% (+) at 10%

## 4.2 Econometric analysis

### 4.2.1 Contingent Valuation

As noted earlier, there is now an established tradition of using contingent valuation techniques to estimate the shadow price of cultural goods and services to infer their welfare value. They involve collecting primary data from individuals presented with hypothetical scenarios typically involving changes in provision of some good or service and querying how much they would be willing to pay to maintain their consumption at its current level (Noonan, 2003).

Besides presenting statistics for the willingness-to-pay (WTP), contingent valuation studies use multivariate regression analysis to understand the determinants of WTP. Typically, a model like equation 1 is estimated:

$$WTP_i = \alpha + \beta X_i + \varepsilon_i,$$  (1)

Where $WTP_i$ is the respondent's stated willingness to pay, α is the intercept value, $X_i$ represents the determinants of WTP value, such as socio-demographic characteristics and proxies for cultural capital, $\varepsilon_i$ is an error term representing unobserved factors that influence the WTP (this is typically large as in most contingent valuation studies observed factors account for only a small amount of variation in WTP) and β represents the regression coefficients.

Commonly, it is reported that the estimated WTP increases with individuals' income levels, education levels and the extent of their past cultural engagement (Fujiwara, Lawton & Mourato, 2019; Arber et al, 2021; Bakhshi et al, 2015).

In this paper, we also undertook multivariate regression analysis to understand the determinants of the value, but we first estimated a logistic model with the following categorical WTP variable to understand what determines an individual's propensity to say they are willing to pay:

- WTP = 0 if respondent said NO to WTP
- WTP = 1 if respondent said YES or MAYBE to WTP

So, the model took the form in equation (2):

$$logit\left(\Pr Pr\left(X\right)\right) = \ \alpha\ +\ \beta X_i +\ \varepsilon_i \qquad\qquad (2)$$

Where $\Pr Pr\left(X\right)$ is the probability of willingness to pay, given the predictors X, α is the intercept value and β represents the regression coefficients.

The payment mechanisms were different for users and non-users. For **users**, we made use of a **monthly subscription** to estimate use value on the grounds that this was most plausible for the types of services available on the Art UK platform. For **non-users**, we opted for an **annual increase in council tax,** as the public is already familiar with the idea of paying for services with public goods through their taxes. For the user group, who we had already asked to consider a hypothetical monthly subscription to capture the (use) value to them, non-use value was estimated using an annual donation on top of their monthly subscription, again as this would seem to be the most intuitive way that users would express their support for Art UK's educational, research, community and cultural tourism services in practice.

Following good practice, respondents were presented with a stepwise payment ladder of monetary values: compared with open-ended questions, the payment ladder helps reduce bias by providing a clearer decision framework. For the statistical analysis, respondents' WTP

were taken to be the midpoints between the selected values and the next one up the ladder (Lawton et. al., 2022).

Additionally, when presenting the WTP statistics and undertaking the econometric analysis, we used a raking procedure to weight the responses by population weights to ensure that the sample statistics reported were more representative of the relevant populations. Specifically, for the user group, we used gender and age information from Google Analytics figures supplied by Art UK, and for non-users we used gender, location and age information from the most recent available UK Population Census.

**4.2.1.1 WTP for Art UK users (use value and non-use value)**

The first question (which we call WTP1 as shorthand) attempted to estimate use value for the users. In particular, all users were asked:

> *"Please consider how much Art UK's offer is worth to you, if anything. Would you be prepared to pay a* **_monthly subscription fee_**_, even if only a very small amount, in order to support the_ **continued existence of Art UK**_, to ensure you could continue to use the website, and the_ **full range of services, activities and programmes currently offered**_? The offer would be updated with new content on a regular basis, and you would be_ **_free to cancel the subscription at any time_**_."_

Table 6 shows that 51.3% of users said Yes or Maybe when asked whether they would be willing to pay the monthly subscription. Table 7 shows that the mean average value of the WTP was £3.69 and the median £0.22 (Table 7). These average values may strike readers as low when compared with, say, the typical subscription fees charged by commercial providers of cultural services. However, it is important to note that the average figures quoted in Table 7 are calculated on the basis that the 48.7% of Art UK users – who currently enjoy a free service – who said they were not willing to pay had a WTP of £0. In fact, the 51.3% of users who said they *were* willing to pay had a mean average WTP of £7.19.

Table 6 – Willingness to Pay, Users, monthly subscription

| WTP1 | Count | % |
|---|---|---|
| Yes | 123 | 21.9% |
| No | 281 | 48.7% |
| Maybe | 168 | 29.4% |

Table 7 – Willingness to Pay Value, Users, monthly subscription

| | WTP1 |
|---|---|
| **Median** | £0.22 |

| | |
|---|---|
| **Mean** | £3.69 |
| **Lower 95% CI** | £2.63 |
| **Upper 95% CI** | £4.75 |

All WTP values are calculated as the midpoint interval between the selected payment amount in the payment card and the next highest response on the payment card. CI denotes confidence interval. The summary statistics are based on a distribution of WTPs where the 48.7% of users who said they were not willing to pay are treated as having a WTP of zero.

The second WTP question (which we call WTP2) was designed to identify the non-use value of Art UK to the users: that is, directed to those who answered Yes or Maybe to the monthly subscription question. The respondents were invited to reflect on the benefit of Art UK for wider society (below). 24.9% of the respondents said they would be willing to make an annual donation, giving a mean average value of £8.92 and a median of £0. These average values, which given the large number of Don't knows should be seen as at most indicative as they are based on a smaller sample size, are again computed on the basis that the 39.1% of users who were willing to pay a monthly subscription but not an additional annual donation had a WTP a donation value of £0. In fact, the 24.9% who said they were willing to make an annual donation had a mean average value of £22.95.

> *"Alongside the subscription fee, would you be willing to pay an additional <u>annual donation</u>, to **support Art UK's educational, research, community and cultural tourism services**, to ensure that <u>wider society could continue to benefit from these services</u>, now and in the future?"*

Table 8 – Willingness to Pay, Users, annual donation

| WTP2 | Count | % |
|---|---|---|
| Yes | 73 | 24.9% |
| No | 113 | 39.1% |
| Don't know | 105 | 36.0% |

Table 9 – Willingness to Pay Value, Users, annual donation

| | WTP2 |
|---|---|
| **Median** | £0 |
| **Mean** | £8.92 |
| **Lower 95% CI** | £5.60 |
| **Upper 95% CI** | £12.24 |

All WTP values are calculated as the midpoint interval between the selected payment amount in the payment card and the next highest response on the payment card. CI denotes confidence interval. The summary statistics are based on a distribution of WTPs where the 39.1% of users who said they were not willing to pay an annual donation are treated as having a WTP of zero. The 36% of respondents who said they did not know were excluded from the calculation.

### 4.2.1.2 WTP for Art UK non-users (non-use value)

Those in the sample identified as Art UK non-users were asked (WTP3):

*"**Would you be prepared to pay an increase in your annual Council Tax, <u>just for</u> <u>yourself</u>**, even if only a very small amount, in order to support the **continued existence of Art UK** to ensure they could continue to provide **the full range of services, activities and programmes currently offered?** The offer would be updated with new content on a regular basis."*

Table 10 shows that 54.9% of the non-users said they were or maybe willing to pay an increase in their council tax to support the continued existence of Art UK, with a mean average value £5.67 and a median of £0.63. Again, these average values mask the fact that the 54.9% of non-users who said they were willing to pay had a mean average WTP an increase in council tax of £10.33.

Table 10 – Willingness to Pay, Non-users, annual increase in council tax

| WTP3 | Count | % |
|---|---|---|
| Yes | 66 | 15.1% |
| No | 217 | 45.1% |
| Maybe | 185 | 39.8% |

Table 11 – Willingness to Pay Value, Non-users, annual increase in council tax

| WTP2 | Non-user |
|---|---|
| **Median** | £0.63 |
| **Mean** | £5.67 |
| **Lower 95% CI** | £4.43 |
| **Upper 95% CI** | £6.90 |

All WTP values are calculated as the midpoint interval between the selected payment amount in the payment card and the next highest response on the payment card. CI denotes confidence interval. The summary statistics are based on a distribution of WTPs where the 45.1% of non-users who said they were not willing to pay are treated as having a WTP of zero.

### 4.2.2 Certainty

As we have discussed, answering willingness to pay questions places a considerable cognitive burden on respondents, so it is important to gauge how confident they felt in their assessments. To probe this, respondents who had indicated that they were or maybe willing to pay were further asked how certain they were in their judgement. Figure 4 presents a density plot of these responses for both users and non-users. The distribution reassuringly skews right for both groups, suggesting reasonably high levels of certainty and, consequently, gives us more confidence in the WTP estimates.
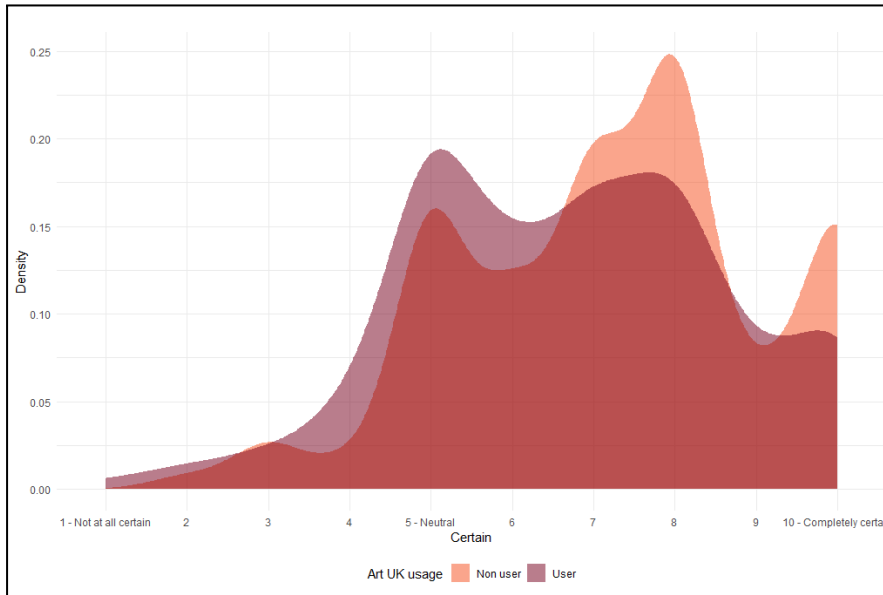
Figure 4 – Certainty about WTP responses, Users and Non-users

### 4.2.3 Reasons for willingness to pay

When the different respondents stating they were willing to pay a monthly subscription, annual donation and increase in council tax were asked what their main reasons were for doing so, a broad spread of use- and non-use-value-related reasons were selected (Table 12). (The first three rows re-emphasise that the responses to these questions have been used to remove inconsistent responses from our sample).[12]

Table 12 – Reasons to pay

|  | Users | Non-users |
| --- | --- | --- |
| N | 291 | 251 |
| I use and value the services, activities and programmes Art UK provides*** | 100%[13] | 0% |
| I don't believe I would really have to pay | 0% | 0% |
| My willingness to pay is not just for Art UK, but also an expression of my support for museums and galleries | 0% | 0% |
| I want to support Art UK even though I don't use the website much*** | 5.9% | 43.8% |
| Art UK's community impact is important to me | 16.9% | 14.2% |
| Art UK's national or global impact is important to me | 14.7% | 11.1% |

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[12] 19.9% of users and 28.3% of non-users selected amongst their main reasons for paying "I agreed to pay because it seems like the right thing to do". Lawton et. al., (2022) dropped such respondents from their sample on the grounds that their WTP values were necessarily biased. Our view in contrast is that taking a moral stance is a valid reason for being willing to pay a subscription, donation or council tax increment so we do not exclude such respondents. We note further that no respondents in our baseline sample *only* gave the moral reason as their only main reason for being willing to pay.

[13] Requiring all users in the baseline sample to have selected this amongst their main reasons to pay might arguably be seen as too restrictive if they selected other use-value-related reasons. To investigate the sensitivity of the WTP estimates we relaxed this restriction and recalculated the average WTPs. See Annex C.

| | | |
|---|---|---|
| Art UK's research, learning and educational services are important to me*** | 49.1% | 35.8% |
| I agreed to pay because it seems like the right thing to do** | 19.4% | 28.6% |
| Accessing Art UK's offer is one of the most convenient or enjoyable ways to engage with all the public art collections across the UK*** | 45.6% | 21.5% |
| Accessing Art UK's offer improves my wellbeing / mental health*** | 23.9% | 14.8% |
| Accessing Art UK's offer inspires me to be more creative*** | 21.8% | 9.2% |
| Access to Art UK's offer is important for children and young people*** | 30.0% | 64.1% |
| Other | 3.4% | 1.5% |
| Don't know/Prefer not to say | 0% | 0.1% |

\* Difference statistically significant, according to Z test
(\*\*\*) at 1%, (\*\*) at 5% (+) at 10%

Table 13 presents the main reasons why some users and non-users were not prepared to pay for Art UK's services. Among users, the most common reason for not paying was that they could not afford to pay (47.6%). Additionally, 42.2% of users believed that others, such as the government or corporate sponsors, should bear the cost of maintaining Art UK's website. 38.1% of users not prepared to pay counted amongst their main reasons that they only used Art UK's services because they were free.

Table 13 – Reasons not to pay

| | Users | Non-users |
|---|---|---|
| N | 281 | 217 |
| I cannot afford to pay | 47.6% | 43.7% |
| I don't use Art UK's website*** | 0 | 47.3% |
| I can go elsewhere for the services, activities and programmes*** | 18.5% | 8.3% |
| I have more important things to spend my money on*** | 21.9% | 41.3% |
| I only use Art UK's services because they are free*** | 38.1% | 5.6% |
| I think Art UK should cut its costs rather than seek to raising funds | 5.1% | 4.3% |
| Others such as Central Government and/or corporate sponsors should pay to maintain Art UK's website*** | 42.2% | 19.1% |
| Users should pay for these services, activities and programmes*** | 3.5% | 27.4% |
| I think the services, activities and programmes provided by Art UK are wasteful or don't meet local needs*** | 0.5% | 3.0% |
| Don't know / Prefer not to say | 3.0% | 2.6% |

\* Difference statistically significant, according to Z test
(\*\*\*) at 1%, (\*\*) at 5% (+) at 10%

Unsurprisingly, the main reason most frequently given by non-users for not being prepared to pay was that they do not use Art UK's website (47.3%). Like users, financial constraints were also commonly cited by non-users (43.7%), and as many as 41.3% expressed that they had more important things to spend their money on. Additionally, 27.4% of non-users believed that users should bear the cost of Art UK's services.

## 4.3. WTP Determinants

The analysis presented in Table 14 identifies several significant determinants of users' willingness to pay (WTP) for Art UK's services, as analysed through both a logistic model and an ordinary least squares (OLS) multivariate regression. In the OLS models, the sample sizes are smaller as we only consider respondents who were or maybe willing to pay. This is because the large number of £0 WTP observations when we include respondents who were not willing to pay can cause biases in OLS estimates when the 'zero inflation' violates the assumptions of OLS (Ateca-Amestoy, 2008).

In the logistic model – that models the propensity to be willing to pay or not – females are significantly less likely to be willing to pay. Intuitively, higher income individuals are more likely to be willing to pay. As are those who visit the Art UK platform more frequently and who had an early exposure to the arts. In the OLS model – which models how much the respondent is willing to pay – the only statistically significant predictors are age (with older people willing to pay less) and how certain the respondent is about their response.

Table 14 – WTP Determinants for Users' WTP

|  | Logistic (WTP decision) | OLS (WTP value) |
|---|---|---|
| (Intercept) | -4.663** | 2.845 |
|  | (1.646) | (16.132) |
| Female | -0.430* | -0.081 |
|  | (0.183) | (1.750) |
| Log Age | 0.329 | -4.735+ |
|  | (0.277) | (2.663) |
| University Degree | -0.342 | 1.869 |
|  | (0.231) | (2.201) |
| In Employment | 0.158 | 0.892 |
|  | (0.200) | (2.008) |
| Log Income | 0.306** | 1.276 |
|  | (0.112) | (1.211) |
| Married | 0.186 | 1.839 |
|  | (0.192) | (1.798) |
| Member cultural/conservation/environmental organisation | 0.186 | -1.101 |
|  | (0.192) | (1.801) |
| Visit Art UK at least once a month | 0.328+ | 0.968 |
|  | (0.186) | (1.743) |
| Visit museums at least once a month | -0.056 | -1.008 |
|  | (0.205) | (1.958) |
| Participated in arts as a child | 0.536** | -2.674 |
|  | (0.197) | (1.928) |

| | | | |
|---|---|---|---|
| Agree preserving arts and culture is important for current and future generations | -0.211 | | -1.083 |
| | (0.340) | | (3.243) |
| Agree Arts/Culture/Heritage are Top 5 gov priorities | 0.250 | | 2.000 |
| | (0.186) | | (1.773) |
| Certain about WTP values | | | 1.197** |
| | | | (0.390) |
| Num. Obs. | 572 | | 291 |
| AIC | 792.6 | R2 | 0.088 |
| BIC | 839.3 | R2 Adj. | 0.046 |

Statistical Significance: (***) at 1%, (**) at 5% (+) at 10%

Table 15 presents the equivalent results for non-users. This time, in the logistic regression three variables are significantly associated with individuals' willingness to pay a council tax increase: whether they participated in the arts as a child, whether they agree that art should be preserved for current and future generations and whether they believe that arts and culture or heritage should be one of the Top 5 priorities for government spending. In the OLS model, the only significant predictor at the 5% significance level is gender, with females willing to pay a significantly lower amount, and at the 10% level whether the respondent participated in the arts as a child and has a university degree.

These findings underscore the influence of cultural participation and values on willingness to pay among non-users, suggesting that even those who do not use Art UK may still be motivated to support it financially due to broader cultural and societal considerations.

Table 15 – WTP Determinants for Non-users' WTP

| | Logit (WTP decision) | OLS (WTP value) |
|---|---|---|
| (Intercept) | -4.343+ | 19.489 |
| | (2.335) | (21.381) |
| Female | -0.235 | -4.712** |
| | (0.208) | (1.789) |
| Log Age | 0.406 | 1.709 |
| | (0.374) | (3.510) |
| University Degree | 0.111 | 3.208+ |
| | (0.218) | (1.883) |
| In Employment | -0.146 | 1.032 |
| | (0.228) | (2.206) |
| Log Income | 0.185 | -2.120 |
| | (0.153) | (1.380) |
| Married | 0.164 | 1.790 |
| | (0.225) | (1.906) |

| | | | |
|---|---|---|---|
| Member cultural/conservation/environmental organisation | 0.237 | | 0.637 |
| | (0.322) | | (2.473) |
| Extremely or very familiar with Art UK | 0.275 | | -12.717 |
| | (1.857) | | (15.414) |
| Visit museums at least once a month | 0.426 | | -2.845 |
| | (0.697) | | (4.461) |
| Participated in arts as a child | 0.327+ | | 3.313+ |
| | (0.229) | | (1.895) |
| Agree preserving arts and culture is important for current and future generations | 1.089*** | | 0.248 |
| | (0.226) | | (2.276) |
| Agree Arts/Culture/Heritage are Top 5 gov priorities | 0.714** | | 2.591 |
| | (0.225) | | (1.794) |
| Certain about WTP values | | | 0.292 |
| | | | (0.501) |
| Num.Obs. | 468 | Num.Obs | 251 |
| AIC | 584.1 | R2 | 0.077 |
| BIC | 637.9 | R2 Adj. | 0.026 |

Statistical Significance: (***) at 1%, (**) at 5% (+) at 10%

# 5. Discussion and conclusions

Economic valuation techniques such as contingent valuation are gaining increasing currency in the UK's cultural and heritage sector. Under the umbrella of the Department for Culture, Media and Sport's Culture and Heritage Capital Framework, policymakers and funders are stressing to cultural and heritage institutions in investment appraisal the need to express the value of their work in monetary terms, even in cases where the value of the cultural and heritage services they provide cannot be observed in market prices.

While the application of such techniques has resulted in a marked increase in reports and academic papers presenting willingness-to-pay (WTP) estimates for a broad range of cultural and heritage assets, applications to digital culture remain few and far between.

In this paper, we present the findings of a contingent valuation study of Art UK, which brings together for free on one platform digitised artworks from every public art collection in the UK. We find that just over one-half of Art UK users said they were either willing or maybe

willing to pay a monthly subscription fee to ensure Art UK could continue to operate and offer its services in the face of hypothetical funding cuts, with a mean average WTP of £3.69 per month. This average value may strike readers as low when compared with, say, the typical subscription fees charged by commercial providers of cultural services. However, the average is calculated on the basis that the 48.7% of Art UK users - who currently enjoy a free service - who said they were not willing to pay have a WTP of £0. In fact, the 51.3% of users who said they *were* willing to pay had a mean average WTP of £7.19.

Of those individuals willing to pay a monthly subscription, around one-quarter said they would be willing to pay in addition an annual donation of mean average value of £8.92. This average value, which should be seen as indicative as it is based on a smaller sample size, is again computed on the basis that the 39.1% of users who were willing to pay a monthly subscription but not an additional annual donation have a WTP donation of £0. In fact, the 24.9% who said they were willing to make an annual donation had a mean average value of £22.95.

Lastly, we found that as many as 53.6% of the wider public that does not use the Art UK platform said they were willing to pay an increase in their annual council tax of £5.67 on average – the average being higher at £10.33 when considering only those willing to pay which suggests by any measure that a significant part of the tax-paying public appreciates the wider social value of a digital cultural resource like Art UK.

As important as the economic value estimates of Art UK's services themselves, our study surfaces some methodological lessons which researchers must pay heed to when applying contingent valuation and other survey-based economic valuation techniques to digital culture.

First, and foremost, researchers face a trade-off between sample size and the quality of the survey datasets used for analysis. Understanding hypothetical valuation scenarios and formulating estimates of their willingness to pay a subscription, donation or tax increment places considerable cognitive demands upon respondents. Respondents may even conceivably understand and answer some questions in a survey accurately while at the same time misunderstand or inaccurately answer others (which cannot of course be easily identified). Such challenges in principle afflict all contingent valuation studies, but the high % of inconsistent responses in our study indicates they may be particularly common when valuing digital culture.

All researchers can do in these circumstances is to develop protocols to remove from the sample respondents that are likely to have given answers that do not in fact reflect their actual willingness to pay. The consequent reduction in sample is costly in terms of statistical efficiency, but it can also induce selection biases in the average WTP estimates if the

individuals thereby excluded share characteristics that correlate systematically with their willingness to pay. In our study, we developed and applied a nine-step procedure to remove inconsistent respondents, including those whose stated reasons for being willing to pay did not align with the use or non-use values being elicited through the valuation scenario. Applying these consistency checks resulted in a large sample reduction from 6,062 to 1,040, and some evidence of selection bias, but we believe that this is a price worth paying to ensure we have a high-quality sample.

A second lesson is that survey designers need to make extra efforts to ensure that respondents are valuing the benefits of the digital cultural assets, not the benefits of the physical assets that may be underlying them. In the present case, the Art UK platform is built on, but separate to, the physical assets (paintings, sculptures) of the participating museums and collections. The survey valuation scenario presented to participants in which hypothetically as a result of financial constraints Art UK would be at risk of closure explained that this would not impact the physical galleries and museums which would remain open as normal. Even so, as many as 40% of those surveyed said their willingness to pay to support the continued existence of Art UK was not in fact just for Art UK but also an expression of their support for museums and galleries in general. We had to remove all these individuals from the sample (one of our nine steps above).

All in all, our results add to the small but growing evidence base that through careful sampling strategy and questionnaire design, contingent valuation techniques can be used to estimate the economic value of digital cultural services, and that - in the case of Art UK - these estimates, both use and non-use value, are evidently significant in magnitude.

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# Annex A – Time thresholds for identifying speedsters

Table A1 shows how the dimensions of the dataset and key summary statistics differ depending on the choice of threshold for identifying speedsters.

Table A1 - Effect of different speedster thresholds

|  | 7 minutes | 8 minutes | 9 minutes | 10 minutes |
| --- | --- | --- | --- | --- |
| Total sample | 1040 | 894 | 773 | 655 |
| Users sample | 572 | 525 | 482 | 426 |
| Non-users sample | 468 | 369 | 291 | 229 |
| Percentage of users saying Yes or Maybe to monthly subscription | 51.3% | 51.5% | 51.5% | 52.5% |
| Monthly subscription mean average | £3.69 | £3.68 | £3.75 | £3.86 |
| Percentage of users saying Yes or Maybe to annual donation subscription | 24.9% | 24.1% | 24.6% | 23.3% |
| Annual donation mean average | £8.92 | £9.29 | £9.51 | £9.71 |
| Percentage of non-users saying Yes or Maybe to council tax increase | 54.9% | 56.4% | 56.2% | 58.9% |
| Council tax increase mean average | £5.67 | £5.97 | £5.79 | £6.09 |

# Annex B – Checking for selection biases as a result of data cleaning

To investigate whether our consistency checks and data cleaning had introduced selection biases in our contingent valuation analysis, we estimated two logistic models. The first model tested for whether the exclusion of speedsters (those completing the questionnaire in less than seven minutes) had introduced systematic changes to the socio-demographic make-up of the sample. The second model tested whether such changes had resulted from the nine-step procedure to remove inconsistent respondents discussed in Section 3.1.

Specifically, Model 1 was estimated on the full sample (6,062 respondents), with the dependent variable assuming a value of 1 if the respondent was a speedster, and 0 otherwise.

Table B1 – Testing for selection biases

| | MODEL 1 (speedsters) | MODEL 2 (nine-step procedure) |
|---|---|---|
| | (1) | (1) |
| (Intercept) | 1.278** | -0.663 |
| | (0.432) | (0.531) |
| Female | -0.138+ | -0.085 |
| | (0.058) | (0.074) |
| Log Age | -0.038*** | 0.011*** |
| | (0.002) | (0.003) |
| University | -0.405*** | -0.009 |
| | (0.061) | (0.082) |
| In Employment | 0.508*** | 0.065 |
| | (0.070) | (0.087) |
| Log Income | -0.024 | 0.103+ |
| | (0.042) | (0.050) |
| Married | -0.090 | -0.053 |
| | (0.063) | (0.080) |
| Museum Frequency | -1.143*** | -0.094 |
| | (0.113) | (0.100) |
| White | 0.507*** | 0.017 |
| | (0.093) | (0.116) |
| Num.Obs. | 6062 | 3736 |
| AIC | 7062.4 | 4410.8 |
| BIC | 7122.8 | 4466.9 |

Statistical Significance:  (***) at 1%, (**) at 5% (+) at 10%

Model 2 was estimated on the sample having dropped the speedsters (3,736 respondents), with the dependent variable assuming a value of 1 if the respondent was deemed inconsistent after implementing the nine-step procedure and removed from the sample, and 0 if they had been retained.

The results for Model 1 show that speedsters were significantly more likely to be male, younger, without a university degree, employed, white, and have visited museums less frequently. This suggests we face a trade-off in having excluding these speedsters from our baseline sample: insofar as there are speedsters in the wider population, excluding these individuals from our sample will result in mean average willingness to pay estimates that are not an unbiased estimate of the population mean; however, retaining these individuals may result in unreliable estimates.

The results for model 2 suggest, in contrast, that at the 1% significance level, the only difference between those removed as a result of the consistency checks and the baseline sample was the fact that those excluded were older (income was significant too but only at the 10% level).

# Annex C - Sensitivity of WTP estimates to less restrictive cleaning of users

The table below presents the WTP estimates for users (use value and non-use value) where we do not require all users to have selected "I use and value the services, activities and programmes Art UK provides" as one of their reasons for willing to pay (i.e., step four in the nine-point cleaning procedure presented in Section 3.1).

Table C1 – Willingness to Pay Value, Users, monthly subscription

|  | WTP1 |
| --- | --- |
| **Median** | £1.25 |
| **Mean** | £4.07 |
| **Lower 95% CI** | £2.99 |
| **Upper 95% CI** | £5.15 |

All WTP values are calculated as the midpoint interval between the selected payment amount in the payment card and the next highest response on the payment card. CI denotes confidence interval. The summary statistics are based on a distribution of WTPs where users who said they were not willing to pay are treated as having a WTP of zero.

Table C2 – Willingness to Pay Value, Users, annual donation

|  | WTP1 |
| --- | --- |
| **Median** | £0 |
| **Mean** | £10.49 |
| **Lower 95% CI** | £6.89 |
| **Upper 95% CI** | £14.09 |

All WTP values are calculated as the midpoint interval between the selected payment amount in the payment card and the next highest response on the payment card. CI denotes confidence interval. The summary statistics are based on a distribution of WTPs where users who said they were not willing to pay an annual donation are treated as having a WTP of zero. Respondents who said they did not know were excluded from the calculation.

Comparing these findings with those in Tables 7 and 9 respectively in Section 4.2.1.1 shows that the WTP estimates for the monthly subscription and those for the annual donation are higher when we relax the restriction in step four of our cleaning procedure. We prefer to be conservative and include the restriction in light of the well-known positive biases that we discuss in this paper can afflict WTP value estimates.

# Annex D – Aggregating the WTP estimates

In principle, the WTP estimates based on the contingent valuation surveys can be scaled up to give aggregate values. However, the resulting figures should be treated with caution for several reasons.

First, as we have discussed, contingent valuation surveys are subject to several well-known sources of bias. In this study, while through careful questionnaire design we have tried to minimise these biases, we cannot be certain we have eliminated them.

Second, because extrapolating WTP estimates from sample surveys to the wider population introduces measurement bias when the sample is not fully representative. This is especially likely when sample sizes are not large. While we have used population weights where possible to adjust our sample WTP estimates for observed differences (gender, age and, in the case of non-users, region) between our sample and the wider population, the findings reported in Annex B suggest that our consistency checks and data cleaning introduced some selection bias in our estimates.

Third, because it is not always clear what population to use when aggregating the sample WTP estimates. This is especially the case for non-use value estimates.

Fourth, the WTP estimates are not comprehensive: they capture only those elements of value that are considered in the contingent valuation.

With all these caveats, we present an indicative calculation for the use value:

First, we calculate the average WTP a monthly subscription for all 572 users, i.e., assuming the 48.7% of users who weren't willing to pay a subscription in Table 6 have a WTP of zero:

Table D1 – Willingness to Pay Value, Users, monthly subscription

|               | WTP1    |
|---------------|---------|
| **Median**    | £ 0.22  |
| **Mean**      | £ 3.69  |
| **Lower 95% CI** | £ 2.63 |
| **Upper 95% CI** | £ 4.75 |

All WTP values are calculated as the midpoint interval between the selected payment amount in the payment card and the next highest response on the payment card. The 48.7% of users who said they were not willing to pay the subscription are treated as having a WTP of zero. CI denotes confidence interval.

Second, we assume a mean WTP estimate of £2.63 – the lower bound of the 95% confidence interval presented in Table D1. Use of the lower bound of the 95% confidence interval is recommended wherever contingent valuation values are applied in business case aggregation to account for the potential biases (HM Treasury Green Book).

If we make the further assumption that respondents were implicitly considering they would hold the monthly subscription for 12 months (in fact, no such direction was given in the valuation scenario), we can annualise the WTP a monthly subscription by multiplying by 12

to get an implied annual use value of £31.56. Multiplying this by the unique annual 2.26 million UK-based visitors gives an estimate of £ 71.4 million use value per year.[14]

Note that these use value estimates do not consider the use value for any of Art UK's non-UK users, nor the non-use value for Art UK users and Art UK non-users.

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[14] Note that in this indicative calculation we do not apply distributional weights to the WTP estimates to allow for our finding that higher income users appear to have a higher WTP. The DCMS is currently investigating how best to apply distributional weights in CHC valuation studies.