

# **Guidelines on the use of smells in GLAMs**

## **Deliverable D6.1**

Version FINAL



# Odeuropa

NEGOTIATING OLFACTORY AND SENSORY EXPERIENCES IN CULTURAL HERITAGE PRACTICE AND RESEARCH



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<b>Project Coordinator</b>	Prof. Dr. Inger Leemans KNAW Humanities Cluster Email: inger.leemans@huc.knaw.nl
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<b>EC Project Officer</b>	Hinano Spreafico
<b>Authors:</b>	Cecilia Bembibre <sup>1</sup> , Matija Strlic <sup>1</sup>
<b>Internal reviewers:</b>	William Tullett, <sup>2</sup> Inger Leemans <sup>3</sup>
<b>Affiliations</b>	(1) UCL, (2) ARU, (3) KNAW
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## Table of Revisions

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## Executive Summary

This deliverable identifies the barriers for the use of smells in galleries, libraries, archives and museums (GLAMs) and lays the groundwork for the development of best practices in olfactory heritage science. The study presents and discusses findings from online questionnaires and semi-structured interviews with heritage professionals regarding the use of smells in heritage spaces for interpretation, education and engagement purposes. This study identifies and classifies barriers in four large groups, loosely corresponding to museum areas of expertise and practice: visitor experience, olfactory design, curation/interpretation and conservation. The findings also reveal a number of sub-themes in these categories, which need to be further explored. Working with the stated four categories, this report presents existing evidence to address concerns and outlines opportunities for future research, working towards the development of best practices in olfactory heritage science.

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# 1 Introduction

There is a growing interest in using scent as part of multisensory engagement in galleries, libraries, archives and museums (GLAMs), which are still largely vision-centric spaces, referred to as ‘anosmic cubes’ ((Drobnick, 2021; Spence, 2020)). However, there are also certain barriers and challenges that hinder the advancement of multi-sensory approaches in the curation and presentation of cultural heritage collections.

In general, museum professionals are not trained to work with smell. There are no standardised practices to meaningfully do so, nor dedicated evidence of the impact that the introduction of smells can have on buildings, collections and visitors. Therefore, and in spite of valuable instances of olfactory engagement in heritage cf. (Spence, 2020), GLAMs have been reluctant to make use of the possibilities brought by olfactory storytelling due to these barriers related to risk, inexperience, and/or lack of access to reliable resources.

Consequently, the field of heritage science (the interdisciplinary domain of scientific studies of heritage which aims to enhance the understanding, care and sustainable use of cultural heritage) has, to date, developed few coherent research initiatives in this area, even while individual studies already show that at low but perceivable concentrations, the volatile organic compounds responsible for smells do not pose a conservation risk ((Strlič et al., 2009)). Furthermore, other studies outlined that visitors find value in sensory experiences in the museum (Aggleton and Waskett, 1999; Vega-Gómez et al., 2020).

To address this gap in evidence, one of Odeuropa’s objectives is to define and promote measurable standards and best practices for olfactory heritage science. This report is the first step toward that aim, providing (a) an overview of the barriers and concerns expressed by GLAMs professionals around working with smells, and (b) a pathway to addressing those barriers and developing evidence-based guidelines and recommendations for the safe use of odours in heritage spaces.

## 2 Methodology

### 2.1 Online Questionnaires

In May 2021, Odeuropa held an online workshop to explore the challenges of working with smells in GLAMs. Prior to the event, participants completed an online questionnaire reporting on their interest in working with scent and their experience in this field to date. The questionnaire (Appendix I) was distributed via Jisc,<sup>1</sup> a digital service in the UK specialised in education and research. Data from 30 respondents was anonymously collected, following UCL Research Ethics Guidelines as detailed in Odeuropa deliverable D8.1 H - Requirement No. 1, and analysed using Excel v.16.44. The questionnaires included multiple choice questions and a 7-point Likert scale matrix containing statements of value related to smells in museums (strongly agree, agree, moderately agree, not agree nor disagree, moderately disagree, disagree and strongly disagree). For the purposes of this report, these categories were condensed into positive, neutral and negative during data analysis. The results of this survey should be considered to have a positive bias, since most respondents were attendees or speakers in an online event dedicated to working with smell in GLAMs.

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<sup>1</sup><https://www.jisc.ac.uk/>

## 2.2 Research Interviews

After the collection of the questionnaires, a series of semi-structured interviews with heritage professionals was conducted using a digital video platform in July and August 2021, with the objective of exploring the different aspects of working with smells in GLAMs and identifying overarching themes related to barriers and opportunities of doing so. The interviewees comprised two visitor experience managers, one working in a large museum and another one in a 'huge' museum (please see below how museum size was established); a representative of a small perfume conservatory; an intangible cultural heritage expert working on scent; a cultural mediator working at a small museum; a curator specialised in smells who has worked with small, medium and large museums; an olfactory artist and an education and accessibility expert working at a huge museum. For a sample list of interview questions, please see Appendix A.1. Museum size was defined according to the categories set in the Mapping Museums project, which classified museums according to the annual visitor number in small (0-10,000), medium (10,001-50,000), large (50,001-1 million) and huge (1 million+) ((MappingMuseums, 2021)). At the time of the interviews, participants were working in GLAMs or other heritage institutions and/or academia in North America, The United Kingdom, France and the Netherlands. The criteria for interviewee selection was that they were (a) heritage professionals who had worked with smells in GLAMs in the last 5 years, (b) they had explored some of the challenges of their work with scent in published interviews in media, blog posts or in the preceding Odeuropa workshop; (c) they represented different disciplines in heritage organisation; and (d) there was language and geographical diversity, with a focus on Europe and North America, as well as a balance of gender. Interviews were conducted in English and French, and lasted one hour on average. Video files were automatically transcribed using NVivo version 1.5 transcription<sup>2</sup> and manually edited for legibility whenever needed (e.g. the software was not accurate whenever interviewees spoke English as a second language or quoted words in a different language). The interviews were anonymised at the transcript stage as detailed in Odeuropa deliverable D8.1 H - Requirement No. 1, and coded and analysed with NVivo to identify data themes and trends. The findings from the interviews and the survey were combined in the Working with smell in GLAMs: barriers to solutions matrix presented in Figure 3 on page 14. Before we present the matrix, we explain the different topics discussed in the interviews.

## 3 Results and discussion: Barriers and concerns

Heritage professionals see the value of using smells in GLAMs for engagement, education, accessibility, and storytelling purposes. They considered their collections to be suitable to be connected to scent (94%), as reported during the survey (Figure 2). Discussions on approaches and experiences related to this work were coded into four main themes, roughly corresponding to four museum departments (Figure 1):

- **Theme 1: Visitor experience.** With sub-themes Wellbeing and safety, Education and Accessibility;<sup>3</sup>
- **Theme 2: Olfactory design.** With sub-theme Maintenance;
- **Theme 3: Interpretation.** With sub-themes Smell of place, Methodology and Authenticity;
- **Theme 4: Conservation.**

<sup>2</sup><https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>

<sup>3</sup>In this work, accessibility in a museum context is understood as 1) the accessibility of the whole collection to a larger public and worldwide experts, (2) accessibility to racial minorities and economically underprivileged groups and (3) accessibility to disabled visitors ((Brulé, 2021)).

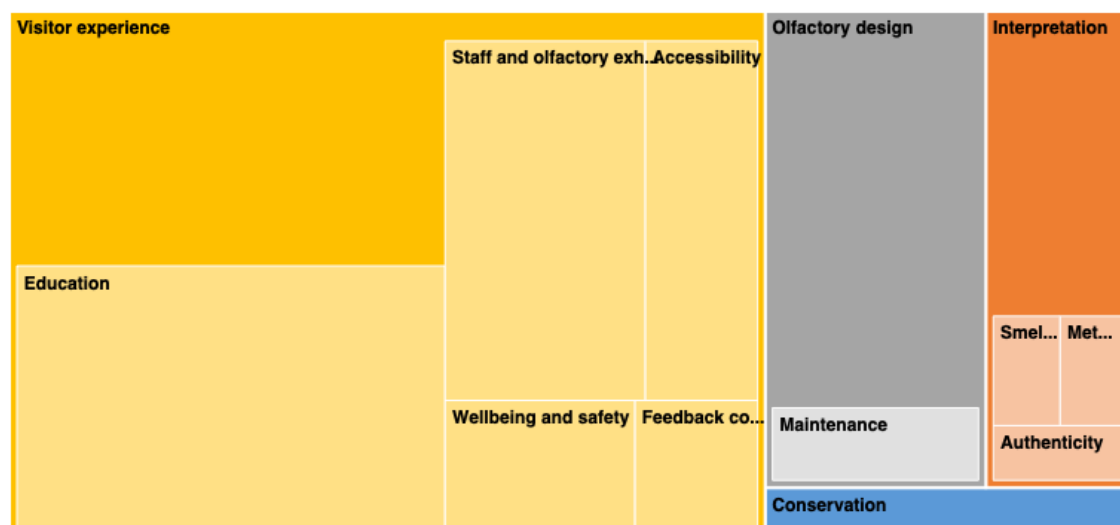


Figure 1: Themes around working with smell in GLAMs. This tree map represents the hierarchy of themes identified in semi-structured interviews with heritage professionals about smell in museums. Larger area sizes correspond to more frequent items coded to that theme; colours are arbitrary. Themes are: (1) Visitor experience, with sub-themes Wellbeing and safety, Education, Staff and olfactory exhibitions, Accessibility, and Feedback collection; (2) Olfactory design with sub-theme Maintenance, (3) Interpretation with sub-themes Smell of place, Methodology and Authenticity, and (4) Conservation

### 3.1 Theme 1: Visitor experience

Among teams with experience in working with scented installations, the nature of the olfactory experience in GLAMs is not usually discussed. 'The assumption is everybody's experience is pretty similar', noted an interviewee working in the visitor experience department of a huge GLAM. Guidelines would be welcome, they remarked, on 'help[ing] us to understand how visitors might experience things differently'. This is especially relevant considering a cultural mediator's experience in presenting smells to the curious public usually results in visitors 'completely overwhelmed by the intensity of their feelings. It's very often a complete discovery of a world they had no idea existed'. The core aspects of the visitor experience are discussed below, as is the role of the museum team and their own concerns and experiences when working with smells.

#### Wellbeing and safety

Interviewees noted concern for the wellbeing of visitors, coupled with a lack of knowledge of the safety details of the scented products they were faced with, which sometimes led to avoidance of working with scent on the grounds of preventing risk: 'So I guess it's knowing what is what is proportionate. I guess from a professional point of view, how how do we make those judgments on risks? Because, you know, I'm not a chemist. I don't readily deal with hazardous hazardous chemicals. And as soon as I'm presented with something that is at least has the potential to be hazardous or any of that is poisonous, then I would tend to say I'd rather not have any dealings with it whatsoever, particularly if it's in a learning setting and particularly if it is in a way in which it passes out of our control'.

#### Education

Frequently, the presence of smells in a museum involves an educational component. Inviting visitors to smell a series of fragrances, providing basic training to guide the experience, describe notes and appreciate the historic relevance of the scent can result, an interviewee explained, in a captive audience: 'From my experience, people don't stop listening. They are completely fasci-

nated by what they discover'. In this case, the educational session this GLAM offers are unusual because the session presents around 30+ different smells, whereas olfactory curators such as Caro Verbeek usually recommend limiting smell presentations to just half a dozen per olfactory tour. This will be further investigated and a recommendation provided in Odeuropa D7.4 Olfactory Storytelling Toolkit (due in M32, August 2023). It is worth noting that a consideration, when selecting the number of scents, might be, therefore, the aim of the olfactory engagement, since what is found fascinating by a small number of avid learners might be overwhelming to visitors exposed to multisensory elements during a different tour.

**Staff and olfactory exhibitions** During the interviews, museum professionals' lack of familiarity with smells was identified as a barrier against the use of olfactory component in GLAMs. One consultant with extensive experience in curating and supporting the development of olfactory events in museums summarised the attitude she often encountered in museum teams: 'they didn't trust their sense of smell. In the planning meetings [for one exhibition which included several perfumes] we were smelling lots of perfumes and deciding which were going to be included, it was partly about [the staff] not trusting their own sense of smell to have a view on those, as specialists working in culture and heritage. And then there was the feeling they didn't have the language to talk about it and less so about notes and ingredients and more so about, you know, we were dealing with the fragrance brands and then the fragrance houses like Givaudan. And they weren't sure what are we dealing with - what is the substance and what are the formats and the technical terminology'. Additionally, another barrier mentioned was the impact working in a scented environment could have on the health and wellbeing of staff. The health and safety aspect of working with smells was a concern for 50% of the professionals surveyed (Figure 2).

### Accessibility

Most interviewees pointed out positive aspects of working with smells to increase accessibility in museum setting. GLAMs with experience in olfactory engagement had usually considered using smell as an access point for to different audiences: 'we place, or pre-COVID certainly we placed, a heavy emphasis on object handling. So the emphasis is always on sensory input, not just the visual', expressed one interviewee, explaining that the visitor experience team at their GLAM had also taken measures to reduce the potential impact of multisensory stimuli. 'Autistic visitors might experience sensory overload or become overwhelmed. Now, of course, we know having the visual story available in advance of a visit can help an autistic visitor understand in advance what they're like to be presented with, so they're less likely to be taken off guard and overwhelmed'. So while the scents are still presented, they are mediated by advanced information to mitigate negative visitor experiences. On the same sub-theme, another interviewee commented that 'a lot of presentations in museums rely on reading sites. So there's an access value [of presenting olfactory information] as a different way to understand the exhibition'.

### Feedback Collection

The nature and frequency of feedback related to the smells included in exhibitions was also noted, with one interviewee from a large museum indicating that about 10% of exit surveys at this GLAM mentioned smells, with the nature of those mentions being 'either positive or negative, but it doesn't seem to stop people from visiting. So people will say oh, stinky! or I hated the smell. But they don't often say, I dislike the smell so much I'll never set foot here again. Or the smell made me ill'. The same interviewee discussed the hedonic register of most of the comments related to the olfactory component, stating that 'I think if it was felt that people were strongly revolted by the smells and it was preventing them from visiting, then that would be a reason to not have the smells or to make them smell nicer. But I guess the other thing is there's an extent to which we enjoy being disgusted and we enjoy being revolted or horrified. So the idea of smell is horrible and part of you wants to smell it, even though or maybe because you know how appalling it will be, there is a draw there, maybe because it's unique' and reflected that in their museum 'we can be exposed to unpleasant smells in a relatively safe and controlled way. So we don't need to be fearful of them; we can enjoy being disgusted'.



One interviewee noted that olfactory engagement is often led by younger visitors: 'Different generations [have different ideas] about what a visit to a museum is, for example, and how you should behave. So I think it's quite interesting that quite often the main impact on our visitor behaviours are the visitors. So although we talk a lot about how galleries and staff set the rules, quite often it can be another visitor [who] tells the visitor off for the way they behaved. [Sensory elements, for example] sound, can be quite divisive. Older generations, I've seen situations where there's been kind of music or whatever pumped into an area that wouldn't normally be, and they find it quite intrusive, etc. I wonder whether that is just the thing about, you know, perhaps not having such good hearing and not being able to therefore talk to the group you're with because [visiting a museum] is a social experience. And when you go to a pub and the music's too loud, as you get older, you start to want to have a chat. In one of the museums I worked in, children loved [the scents] because they were an activity they could scratch and sniff and scratching and sniffing is something that is quite familiar, but actually when they came in multigenerational groups, they gave permission for the adults to get involved as well, and once they were involved, they loved it. So I think sometimes it's about almost like a permission thing'.

Smell as a conversation starter was also highlighted as a positive aspect of working with scents in GLAMs by an interviewee working in the education department of a huge museum in North America: 'Using scent, both working in a school setting and in the museum, has the added value of fostering more conversation. People get so chatty and that's what we want to see. It's people really participating, not just by giving a response, but by chatting amongst themselves, because that's where learning can happen. That's where social socialization happens. And that's where people make of a museum visit a good, memorable experience'.

### 3.2 Theme 2: Olfactory design

Working with the exhibition design team of a large GLAM in the UK, one interviewee noted the staff 'were nervous about the protocols around mounting smell, because, you know, I remember there was a lot about room layout and the design agency who did the 3D design were all really clear on lighting rigs and enough space for wheelchairs between exhibits and visitor flow and signage, but they were nervous when I was trying to talk to them about ventilation, how the airflow works around the rooms and technical specifications of the infrastructure of the place and how it was going to support the use of smell. We went down a very low-tech route of having objects that were scented [instead of a diffusion system] partly because of this'. This unfamiliarity with the considerations of using smells in GLAMs, many of which are historic buildings with additional limitations, leads, in this interviewee's experience, to a lack of ambition in exhibition design: 'people aren't demanding enough. Again, maybe because they aren't confident. I almost want more resistance and pushback from clients'.

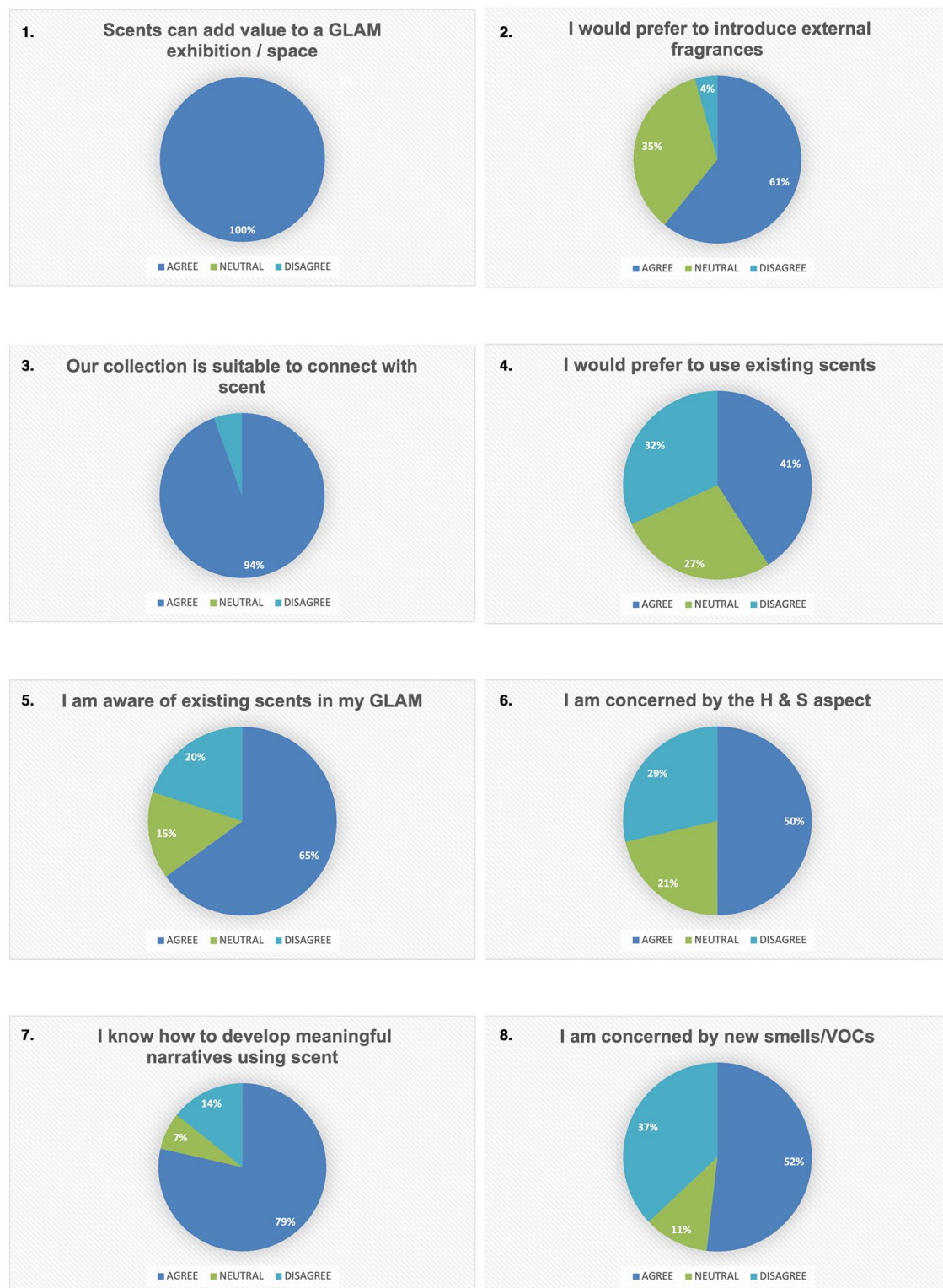


Figure 2: Barriers and opportunities around working with smell in GLAMs. These pie charts represent answers to a selection of statements from a survey among heritage professionals, smell experts and creative practitioners with an interest in working with smell in GLAMs. N=30. For the full survey please see Appendix A.1

<https://odeuropa.eu>

### Maintenance

The resources required to present and maintain the smells were a consideration, and a potential barrier, related to the use of smell in museums. Depending on the presentation technique (an overview of some of them is discussed below), these resources can have a significant impact on staff workload. One interviewee, working at a large UK museum where smells are diffused from a central location to different places in the galleries, explained the resistance of the museum technical team to an idea to use point-of scent cubes (see Figure 4, photo 4 on page 17) for certain smells: '[they said] they wouldn't last for very long so it's not a very cost effective solution for us'. They also mentioned the maintenance aspect: 'inside [the cubes] you have some of that material that's used in flower arranging that you then impregnate with the fragrance, then refresh with a few drops every time you need to'. When an institution working with a specific type of smell presentation considers switching to a different one (sometimes to better suit the nature of the exhibition or space), concerns about cost, time and safety seem to appear. 'When we presented a series of historic scents to young audiences, we used scratch'n'sniff', explains a visitor experience professional working in a historic house. 'So from a health and safety point of view, it was fine because it was quite localized. But now we are working in a different GLAM, with a focus on movement, aerosol, all that kind of thing. So I suppose the thing there is about the health and safety and understand understanding as well how risks move'. A different institution, focused on historic perfume and materials, relies on paper strips to present smells: 'we try to have a kind of neutral approach, and all the perfumes must be smelled the same way, also for safety reasons, we don't want anybody to be able to touch it too much, putting it down on the skin. When we are part of exhibitions we have other devices such as diffusers or ceramic plates'.

## 3.3 Theme 3: Interpretation

The curators and heritage interpretation professionals interviewed shared their experience developing the potential of 'nose-first' access to museum collections, working with olfactory installations and collaborating with perfumers, fragrance houses and scientists to design smells. 'We do work on heritage objects as modes of supplementation and I think smell is an interesting one because it allows us to add or subtract from heritage, one of the very important qualities of that object, and one which really is at the core of our attachment to objects.', observed an interviewee who has explored odours in heritage from a research and an artistic viewpoint. 'One of the defining characteristics of heritage is that we, as societies, invest ourselves in it, because we are attached to it and we take care of that heritage so that it may in turn sustain us, sustain our common memories, sustain our common experiences, our sense of collective identity. And the mode through which we attach to heritage is an experiential aesthetic mode and, in that realm, smell is an enormous component, and it normally goes by underutilized'. In this sense, another interviewee remarked that the act of presenting smells is especially important: 'the exact nature of the smells that are brought in are irrelevant in a way, and that it's more about bringing in a palette that visitors, people who come to museums and galleries and so on, can play with. And whether or not that smell has any relation to a painting or an object, it often really doesn't matter because it's about, you know, how your emotional state, while you're exploring or gazing or whatever it can change and how you can affect that change for another visitor if you want to'. Barriers that emerge from these comments are, for example, the risk of missed opportunities to engage embodied experiences and focusing on 'literal' olfactory translations of the visual; although from the survey, the potential to develop meaningful narratives using scent in the museum strongly emerged (94%, Figure 2).

### Smell of place

In some interviews, approaching engagement and storytelling with smells in the museum in a similar way as we approach the visual was a concern. One interviewee, for example, invited to rethink how knowledge is generated by smelling, and the role verbal input play in this process: 'I don't think it's either you can put it into words or it's not knowledge. It's both ends. Sure. You can

put [the smell experience] into words and that gives you certain ways of playing with smells. You might want to call that playful interaction with smells through logo-centric structures, you might want to call that knowledge. But there is also other ways in which smell can be interacted with. So smell can be. Repulsive. Smell can be attractive. Smell can be. Displacing. And replacing. Of heritage, you can be in heritage and be displaced somewhere else through its smell, transported somewhere else, you can be you can you can replace the heritage with an image of, you know, another place that you that it evokes in your mind'. The challenges of museums to interpret and present scent in relation to intangible cultural heritage (ICH) was also highlighted by a heritage professional: 'I think smells really plays a role in nearly every intangible cultural heritage experience. For sure. In crafts, people use their capacity of smelling to know if something is ready, [for example] if you have a process of making product or if you know, if you can use something which is made hot. Museums are interested in this topic and try to find ways how to integrate intangible cultural heritage, but there's still a lot of questions and challenges, how to integrate it in their work, how to do it in a participatory way so that authorities are shared. And also we have seen that it's all about projects, but there's nothing sustainable. There's no sustainability in this in dealing with intangible cultural heritage. So it's a project but it's not integrated in the general museum policies and in the general collection policies'.

### Methodology

The presentation of historical scents in the museums came up as a topic of interest in this study. Interviewees with experience working with the olfactory had different modes of approaching the process of sourcing the smells themselves. Specialised suppliers were mentioned along with the benefits of access to pre-interpreted and safe fragrances aligned with historic narratives; in some cases, collaborations with olfactory artists or perfumers were preferred., depending on the nature and aim of the smell event (engagement, education, artistic).

'The methodology is for me, very important', explained a heritage professional working in a smell archive and museum. 'We try to work with original formulas to recreate perfume; someone at the company or the author of the perfume has given us the right to do it. I think the vocabulary must be very strict as well and has to show the difference in the [creation] methodology. When we've used another method we want the public to be aware'.

### Authenticity

These considerations lead to interviewees reflecting about authenticity, in relation to the scent itself and the experience it invites: '[With visual artworks] there's less concern about the medium, you think you can see that oil painting and say, you know, there's that whole thing about seeing is believing, isn't it? But I don't think people think smelling is necessarily believing. I used to work in supermarkets, everyone told me that we used to pump the smell of bakeries around the building, but I never worked anywhere where we did that. We couldn't have afforded the technology to do it. But it's a it's received wisdom that's what happens'.

## 3.4 Theme 4: Conservation

When planning to work with smells in museums, most people surveyed preferred to introduce new fragrances (61%, Figure 2) to working with already existing scents in the collection or building (41%), while most of them (65%) were aware of smells in the buildings or related to the collections they worked with. Around 30% of respondents had a neutral position on this, while the idea of using of pre-existing scents generated the most disagreement (32%).

While these studies reveal a marked interest for working with new smells (as in external to GLAMs and purposely introduced for education, engagement or interpretation) among heritage professionals, there is a growing body of evidence on the value visitors place on the incidental smells of historic places, often considered contributing to the 'sense of place' and connected to the identity

of heritage spaces (Bembibre and Strlič, 2017). The study of smells resulting from the building fabric and the collections in GLAMs, and the development of best practices for their characterisation, documentation and preservation, are beyond the scope of this study but within the research tasks conducted by the Odeuropa project in future deliverables (most notably Deliverable D6.3). The impact introducing new volatile organic compounds (VOCs) can have in a heritage space was also one of the barriers to working with smells in museums. One interviewee, currently working at a huge museum in the UK, noted that ‘one of the issues for museums and galleries is the internal ventilation system. And so I think perhaps we haven’t thought as much about the impact that could have if [VOCs] get transferred to other galleries. [Working in] historic buildings previously, we certainly didn’t give it much thought beyond whether it would stain the fabric of the building. That’s something we need guidance for’. One consultant working with museums to develop olfactory events also mentioned that in a historic building-based project ‘we had a lot of fresh air coming in because often the windows were open. But no, we didn’t consider [VOC impact] in that space so much. And it’s not the kind of environment where you’ve got the ability to really marshal and contain because we have windows open, like people would just open the windows and shut them. And it just seemed to us that for this venue to try and do the ambient or diffused route would not work. It just wouldn’t have worked. And I think also it it would have caused more anxiety from a conservation point of view and a safety point of view, I would have had to do a lot of handholding’. These quotes support the survey results, with over half heritage professionals reporting concerns around the potential VOC impact on buildings and museums (Figure 2).

## 4 Towards best practices: From barriers to best practices matrix

To address the concerns identified and discussed in the previous sections, we developed a Barriers to best practices matrix (Figure 3). The matrix provides a pathway for heritage professionals with an interest of working with smells in GLAMs, addressing different perspectives related to the internal organisation of heritage institutions (conservation, curatorial, visitor experience and exhibition design departments) and providing available evidence to support discussions and decisions around working with scent.

The barrier considers four possible scenarios as a start:

- (a) We have smell-related pieces in our collection. An example of this starting point is the enlightening discussion a group of conservators and curators had at the Imperial War Museum in London, upon coming across a strong-smelling leather collar which had belonged to a decorated dog, to decide how to use the scent as part of storytelling (Hetherington, 2020);
- (b) We are planning an olfactory installation. This might be a familiar scene many curatorial departments in GLAMs find themselves in, where the usual processes of collaboration with artists and technical team might need specialised considerations. Examples of these can be the galleries working with famous olfactory artists such as Peter de Cupere, Sissel Tolaas, Maki Ueda or Anicka Yi;
- (c) We would like to develop a multisensory approach to our collection. A nose-first access to collections can be built in many ways: this document will show a selection of them. Fleeting scents in colour (Van Suchtelen, 2021) or Tate’s Sensorium (Pursey and Lomas, 2018) are examples of this approach;
- (d) Our space has an interesting scent. Working with existing smells to explore heritage building identity and value is another approach to working with scent. Examples of spaces which have followed this course are St Paul’s Cathedral Library (Bembibre, 2021b), Widnes (McClean, 2019) and Philip Glass House (Otero-Pailos, 2008).



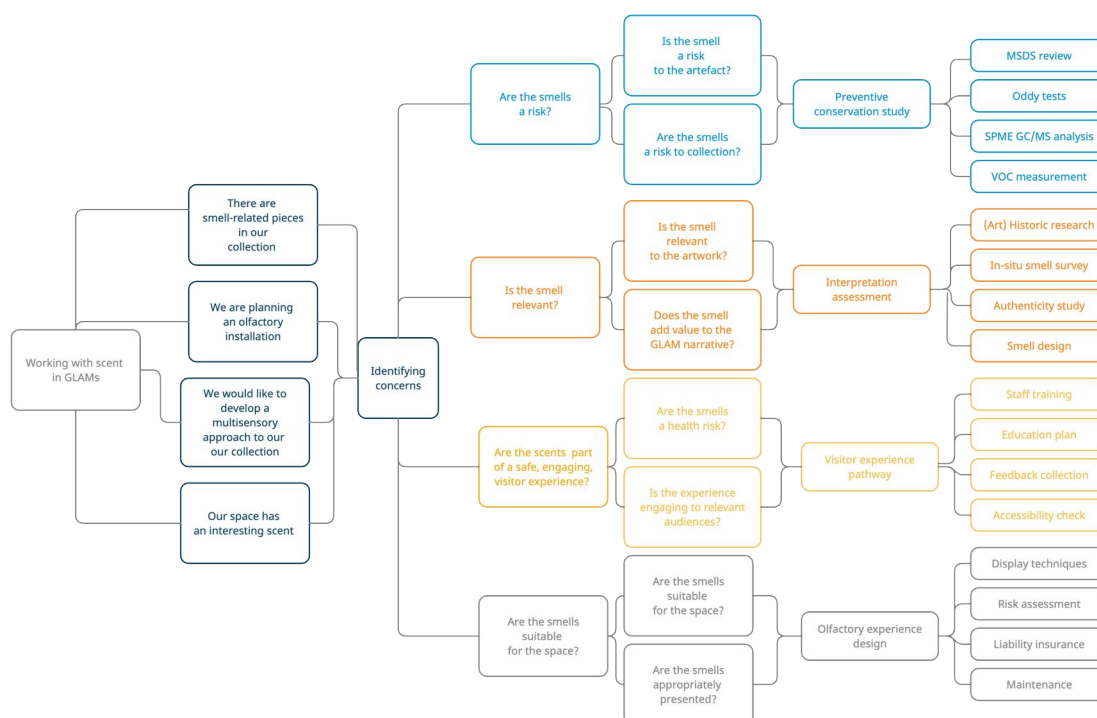


Figure 3: Working with smell in GLAMs: barriers to best practices matrix. From left to right, approaches to working with smell in GLAMs Conservation barriers to decision pathway (blue), curation/interpretation barriers to decision pathway (orange), visitor experience barriers to decision pathway (yellow) and exhibition design barriers to decision pathway.

Once the aims of working with smells is identified, we present a series of considerations, summarising the findings of the interviews and surveys conducted, in four categories: Conservation (Are the smells a risk to the collection?), Interpretation (Is the smell relevant to the object's/space's history/meaning?), Visitor experience (Are the scents part of a safe, engaging visitor experience?) and Exhibition design (Are the smells suitable for the space?). Below, describe each of these categories in more detail.

## 4.1 Conservation

The conservation department in GLAMs is focused on the care and protection of buildings and collections. In the studies, one of the main questions of interests to conservators regarding working with smells is whether the smells pose a risk to collections. This is both valid, for example, when faced with an artefact with a notorious scent and in the case of an olfactory installation co-existing in the same gallery as other collection items.

Conservation guidelines provide safe concentration limits for pollutants in museums. In the case of VOCs, responsible for most smells, evidence shows most of the compounds do not represent a risk in low concentrations (Strlič et al., 2009; Tétreault, 2021), while they can still be perceived by the human nose. Further research is, however, needed, to develop methodologies to test the impact of olfactory exhibitions. As of 2021, Odeuropa is, in collaboration with GLAMs, making progress in this field. Best practices support a preventive conservation assessment, including steps such as:

- **Material safety data sheet (MSDS) review.** When GLAMs source smells from a fragrance manufacturer or a chemical supplier, MSDS are provided, detailing information relating to

occupational safety and health. Screening these documents for known hazardous substances can provide valuable data for a risk assessment;

- **Oddy testing.** Sometimes MSDS are not available, or not complete enough to identify potential hazards. In these cases, Oddy testing can provide further evidence of risk. This is a method originally developed for evaluating the suitability of construction materials to be used in an enclosed space with heritage artefacts or artworks (Oddy, 1973). It tests the presence of potentially damaging gases by exposing three metal coupons (lead, copper, silver) to the test material for 28 days, after which coupons are assessed for changes: the silver can detect reduced sulfur compounds, the lead can detect organic acids, aldehydes, and acidic gases, and the copper can detect chlorides, oxides, and sulfur compounds;
- **SPME GC/MS analysis.** Whenever the composition of a smell is unknown, VOC sampling coupled with an analytical separation technique can offer insights into the qualitative nature of the smell (certain VOCs, particularly low molecular weight carboxylic acids such as formic and acetic acid, are known to pose a risk to museum objects (Tétreault, 2021). The technique of solid-phase micro-extraction followed by gas chromatography-mass spectrometry analysis has been proved helpful to characterise VOCs in historical objects (Lattuati-Derieux et al., 2006; Strlič et al., 2009; Sawoszczuk et al., 2015);
- **VOC measurement.** A measure of the total VOCs in a space can provide a baseline to establish changes brought by ventilation, perfume-wearing visitors or the introduction of a new olfactory piece. The Canadian Conservation Institute advises that, since 'No generic VOCs have, however, been linked to specific types of damage in conservation'. To better preserve collections, the focus should be on the concentration of specific pollutants in the room or inside a display case rather than on the total amount of VOCs' (Tétreault, 2021). It has to be noted that VOC sensors are not sensitive to inorganic odorants, such as sulfur-related compounds.

## 4.2 Interpretation

In vision-centric environments such as GLAMs, multisensory approaches to interpreting collections can be unfamiliar territory for curators. Barriers identified by these professionals are related to identifying and developing suitable narratives that incorporate or centre around smells. They are identified in the matrix by questions such as the relevance of the smell to the artwork or artefact's history and the value scents can add to a narrative: a suggested assessment of relevant curatorial aspects follows.

- **(Art)Historical research.** There are a number of valuable resources that explore the history of the senses, the heritage of regional smells, historical smellscape and cultural perspectives on the olfactory. To build best practices protocols, it can be helpful to draw from the valuable historic work conducted by sensory and art historians, anthropologists and other researchers. For a selection of literature, see Appendix A.2.
- **In-situ smell survey.** The smellscape of GLAMs and surrounding areas are part of the smells visitors experience, and can be interpreted as part of the identity of the space. Drawing on sensory mapping techniques, a walk around the space can help visitors develop meaningful connections with the site and their own experience. For smell walks background and methodology please see (McLean, 2019) and (Balez et al., 2021) in the bibliography.
- **Authenticity study.** Authenticity is one of the central concerns of the study of cultural heritage (Lemaire and Stovel, 1994). When working with olfactory heritage, understanding how a historic scent can be perceived as authentic in spite of the situational context no longer being there, is of central interest to curators and interpreters. Some relevant considerations are communicating smell provenance and authorship with transparency and reflecting on the aim of presenting historic smells (Verbeek, 2016; Bembibre, 2021b).

- **Smell design.** Depending on the aim of the project, budget, timing and other factors, smells can be sourced from dedicated suppliers to museums, fragrance manufacturers or they can be jointly designed with perfumers, scientists or artists. These scents can be accurate reconstructions (Odotheka, 2021) or interpretations (for a discussion of the different approaches, please see (Bembibre, 2021a)). Odeuropa project is developing practical resources to make informed choices in this respect, such as Odeuropa D7.4 Olfactory Storytelling Toolkit (due in M32, August 2023).

### 4.3 Visitor experience.

While the engagement potential of smells in GLAMs was highlighted by interviewees and survey respondents, they also revealed the need for best practices to making a visitor experience meaningful, memorable and safe. Firstly, providing evidence to appease concerns regarding staff and visitors wellbeing while being exposed to smells. And secondly, developing resources to support engaging, accessible olfactory exhibitions, capable of educating audiences and fostering conversation. A pathway to addressing these concerns is suggested below.

- **Staff training.** Familiarising museum teams with olfactory heritage and its potential for engagement was highlighted in the findings as an area where further work is needed. Between 2021 and 2023, Odeuropa will closely work with GLAMs professionals to develop case studies of staff training. These experiences, and supporting documents for future work, will be reported in the Odeuropa D7.4 Olfactory Storytelling Toolkit;
- **Education plan.** Identifying the educational potential of working with scents in GLAMs was of interest to most heritage professionals in this study. While the development of resources to this end is beyond the scope of the Odeuropa project, the Olfactory Storytelling Toolkit will present case studies where smells were used by the educational department in museums, providing supporting resources to explore this topic;
- **Accessibility check.** Olfactory input can provide valuable opportunities to increase access to heritage (Clapot, 2019). While the development of resources to this end is beyond the scope of the Odeuropa project, the Olfactory Storytelling Toolkit will present case studies where smells were used by the accessibility department in museums, providing supporting resources to explore this topic;
- **Feedback collection.** Familiarising museum teams with olfactory heritage and its potential for engagement was highlighted in the findings as an area where further work is needed. Between 2021 and 2023, Odeuropa will closely work with GLAMs professionals to develop case studies of staff training. These experiences and supporting documents such as questionnaires and interview questions for future work, will be reported in the Storytelling toolkit.

### 4.4 Olfactory exhibit design

Designing an olfactory exhibition presents new challenges to traditional GLAMs. From working with smell consultants to developing bespoke scents and presentation techniques, the practical aspects were identified as some of the most challenging barriers. While the scope of this work does not extend to an exhaustive review of resources and methods of presenting smells in GLAMs, we provide below some considerations, including an overview of the available techniques and considerations when designing with smell (Figure 4).



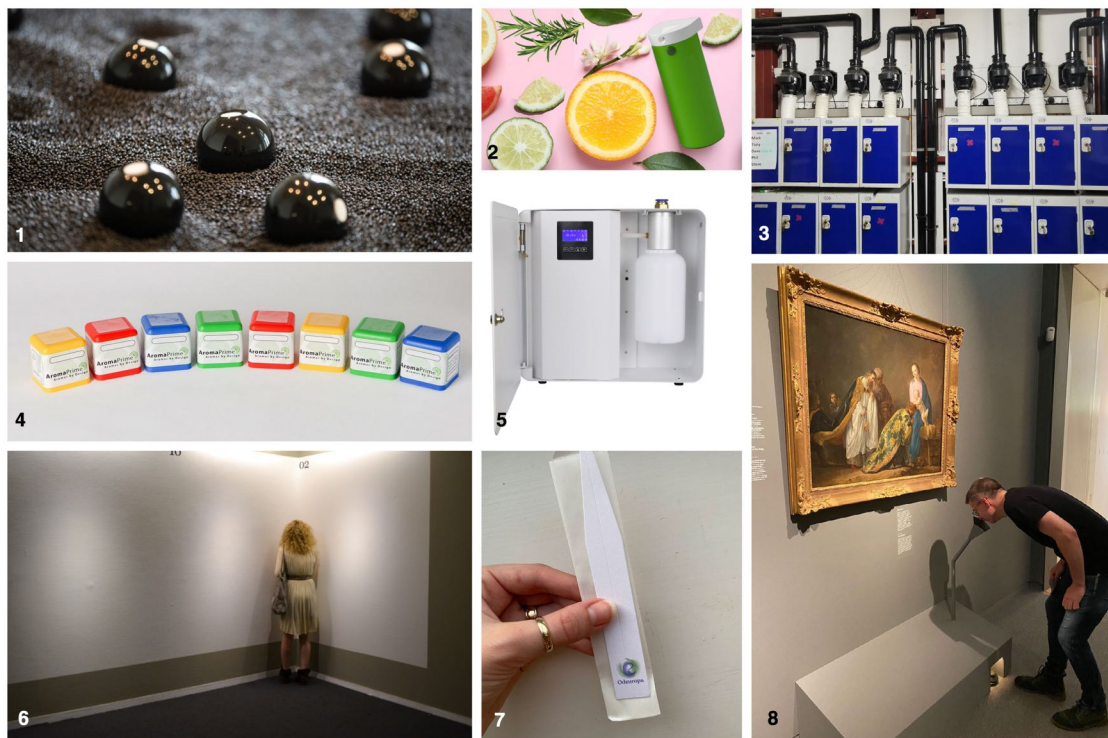


Figure 4: Smell presentation techniques. 1. Olfactory objects containing the scent of Mark Buxton's *Comme des Garçons*, a perfume presented the Perfume exhibition in Somerset House, 2016 ©Somerset House. 2. Whispi device, which pumps a puff of scented air. The liquid fragrance is held in a foam layer inside the device © Scentovation. 3. Scent distribution at Jorvik Viking Centre. The system pumps 12 smells through the Vikings experience visit in the archaeological site. ©ChrisTuckley/Jorvik Viking. 4. Aromacubes containing one fragrance for sampling in museums and educational environments. ©AromaPrime. 5. Oilworks & Co cold-air nebulizing diffusing technology used (with bespoke adaptations) at Tate Modern for Anicka Yi's olfactory installation (2021). ©Oilworks & Co. 6. Scratch'n'sniff wall by artist Sissel Tolaas' work *The smell of fear*. The fear of smell (2006). Smells were micro-encapsulated and painted on the wall. ©Marina Uhrig/Mediamatic. 7. Scented strips and glassine bags, widely used to present perfume and other smells. Ehrlich. 8. Pedal-operated odour pumps presented under artworks at *Fleeting Scents in Colour* exhibition at The Hague museum Mauritshuis (2021).

- **Display techniques.** There are two main approaches to presenting scents in the museum: diffusion-based, where molecules travel freely through the air, effectively scenting the space, and point-of-scent, where the smell is presented in a contained manner, usually allowing the visitor to control the encounter, exposure distance and duration. Figure 4 presents some examples of smell presentation techniques used in museums, both of point-of-scent (1, 2, 4, 6, 7, 8) and diffusion-based (3, 5). A detailed discussion of advantages and hindrances of each technique will follow in our Olfactory Storytelling Toolkit;
- **Risk assessment.** To assess risks to visitors and staff due to exposure and interaction with scents in the museums, it can be helpful to draw on industry experience. Recent reviews of air care (home smell diffusers, plug-in deodorizers and other domestic scenting techniques) show that there are potential risks related to exposure to specific compounds (Cohen et al., 2007) and that cognitive factors influence risk perception of odours (Dalton, 1996). This study identifies the importance of developing dedicated risk assessment templates for GLAMs to record and consider risk factors, as well as information packs on

potential allergens to made available to members of the public upon request.

- **Liability insurance.** The lack of evidence on potential risks posed by smells in the museum leads to high insurance policies being advised by insurers to GLAMs working with scents, as it was found in the interviews. A natural progression of this work would be to work with insurance companies and develop guidelines for dedicated policies;
- **Maintenance.** Considering the resources required to maintain the scented presentation or artwork was identified in this study as an important aspect of the planning work. Some suggestions to estimate maintenance and resources will be presented in D7.4 Olfactory Storytelling Toolkit (due in M32, August 2023).

## 5 Conclusions

The aim of the present research was to identify, classify and address barriers and concerns from museum professionals about working with smells in GLAMs for interpretation, educational or engagement purposes. The study also had the objective of presenting existing evidence to address those concerns, and outlining opportunities to conduct future research, working towards the development of best practices in olfactory heritage science.

This study has shown that barriers could be classified in four large groups, loosely corresponding to museum areas of expertise and practice: visitor experience, olfactory design, curation/interpretation and conservation. The findings also reveal a number of sub-themes in these categories, which require further exploration.

Visitor experience barriers include the health and safety of smells, inexperience in developing accessible sensory experiences, the challenges of setting audiences' expectations when the staff is not purposely trained and lack of access to dedicated feedback collection which captures the value of smell in GLAMs.

Olfactory design concerns emerged in relation to safely using scent in historic buildings, inexperience in the selection of scent presentation techniques that best suit the space and narrative, impact of required maintenance on staff and budget.

Interpreting the olfactory dimension and storylines of historic buildings and collections was a challenge even for curators with experience in sensory work. Resources supporting the development of olfactory narratives and modes of engagement were identified as essential needs for this group of experts, many of which expressed their interest in having access to forums and groups where conceptual discussions around smell and history, identity, intangible heritage and authenticity could take place.

Conservators were mostly concerned with the introduction of new VOCs into the controlled environment of GLAMs and the potential impact they could have on buildings and collections. The development of methodology to assess risks and make informed choices was identified as an area for future work.

The findings of this study suggest that there is a body of existing scientific evidence which partially address the barriers identified, although GLAM professionals are not necessarily familiar nor have access to it, since often the expertise has been developed in other knowledge domains or is industry-specific. To develop best practices, a natural progression of this work would be to source and organise the information for multidisciplinary access and complement it with conceptual and methodological frameworks anchored in the field of olfactory heritage. This is partly within the scope of a future Odeuropa deliverable (D7.4).

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## A.1 Appendix I

### Interview questions

1. How has smell added value to your heritage organisation?
2. What would you say the main aim of the inclusion of scents has been? (educational, experiential, accessibility)
3. What are, in your experience, the biggest concerns of heritage professionals around working with scent?
4. How can we establish/reveal links between scents and the space?
5. Most of the examples of smells in heritage sites are centred around the introduction of 'new' scents to the space – What is the value, if any, of the existing scents of a place?
6. Are the decisions regarding smell presentation, nature and number of smells, order, distribution in the space, etc, taken in-house or externally? What kind of scent external consultants have you worked with, or would you like to work with?
7. Could you give an example of your experience of working with smell, a conceptual or practical barrier and how you overcame it?
8. Is a risk assessment and mitigation strategy usually developed? If so, could you elaborate on how you thought about it?
9. What opportunity for engagement and inclusivity in heritage can be explored using smells?
10. How does an olfactory-led exhibition differ from more traditional visits, in terms of visitor experience? What can visitors gain, and what is expected from them?
11. Do you usually collect visitors feedback? If so, how?
12. What would be helpful to visitor experience professionals to be reassured about working with smell?

## USING SCENT IN GLAMs QUESTIONNAIRE (BEFORE)

The questionnaire will take approximately 7 min to complete

### 1. What kind of organisation do you represent?

- a) Academia
- b) GLAM
- c) Industry
- d) Other (please specify)

### 1. Which size is the GLAM you represent?

- a) Small (0–10,000 visitors per year)
- b) Medium (10,001–50,000 visitors per year)
- c) Large (50,001–1 million visitors per year)
- d) Huge (1 million+ visitors per year)
- e) I don't represent a GLAM

### 2. Have you ever worked with scent?

- a) Yes (please give an overview of the work)
- b) No

### 3. If you have, which departments were involved in this work?

- a) Education
- b) Curation
- c) Conservation
- d) Visitor Experience
- e) Library
- f) Other, namely (please specify)



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**4. Please rank the following statements on to the scale provided.**

	N/A	Strongly agree	Agree	Modestly agree	Not agree nor disagree	Modestly disagree	Disagree	Strongly disagree
1. Scents can add value to a GLAM exhibition / space	1	2	3	4	5	5	6	7
2. Our collection is suitable to connect with scent	1	2	3	4	5	5	6	7
3. I am aware of existing scents in my GLAM that could be related to an exhibition / used for public engagement / of value to visitors	1	2	3	4	5	5	6	7
4. I would prefer to use existing scents (library space scent, smell of historic artefacts in our collection)	1	2	3	4	5	5	6	7
5. I would prefer to introduce external fragrances purposely designed for GLAM spaces	1	2	3	4	5	5	6	7
6. I would find it easy to design an olfactory exhibit / include scent as part of a display / deal with the technical aspects	1	2	3	4	5	5	6	7
7. I am concerned by the health & safety aspect of working with smell with regards to visitors	1	2	3	4	5	5	6	7
8. I am concerned by the potential effect of introducing new smells/VOCs on existing collections	1	2	3	4	5	5	6	7
9. I know where to find expert consultants/suppliers to work with smell	1	2	3	4	5	5	6	7
10. I know how to develop meaningful narratives using scent	1	2	3	4	5	5	6	7
11. I have a good understanding of considerations around using smell in GLAMs from the organisation, supplier and consultant point of view	1	2	3	4	5	5	6	7
12. Scent kits in the post are an effective way of remotely communicating an exhibition / engaging with the public	1	2	3	4	5	5	6	7
13. My organisation would support the use of scent in an exhibition / for education purposes / for public engagement	1	2	3	4	5	5	6	7





## A.2 Appendix II

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