

SensMat Deliverable D2.4

Questionnaire

WP	2	Large-scale survey of evolving needs, barriers, standards, etc.
Task	2.3	Questionnaire and survey
Task	2.3.1	Construction, test and validation of the questionnaire

Dissemination level¹	PU	Due delivery date	30/06/2019
Nature²	R	Actual delivery date	17/09/2019

Lead beneficiary	CNRS
Contributing beneficiaries	All the partnership, Advisory Board, a representative panel of surveyed museum

Document Version	Date	Author	Comments³
1	14/06/2019	Diane BAUSTERT (CNRS)	Creation & Corrected by Juliette REMY
2	30/08/2019	Diane BAUSTERT (CNR-C2RMF)	Corrected by Juliette REMY
3	31/08/2019	Marie-Dominique Bruni (CEA)	Revision
4	4/09/2019	Karine FROMENT (CEA)	Revision
5	4/09/2019	Gilles CHAUMAT (CEA)	Revision
6	13/09/2019	François MIRAMBET (CNRS)	Revision
7	16/09/2019	Marie-Dominique Bruni (CEA)	Review and validation
8	17/09/2019	Laurence LAPOTRE (Wavestone)	Finalisation

¹ Dissemination level: **PU** = Public, **CO** = Confidential, only for members of the consortium (including the Commission Services), **EU-RES** = Classified Information: RESTREINT UE, **EU-CON** = Classified Information: CONFIDENTIEL UE, **EU-SEC** = Classified Information: SECRET UE

² Type of the deliverable: **R** = Report, **ORDP** = Open Research Data Pilot, **ETHICS** = Ethics requirement, **DEM** = Demonstrator, pilot, prototype, **DEC** = Websites, patent filings, videos, etc, **O** = Other

³ Creation, modification, final version for evaluation, revised version following evaluation, final

Deliverable abstract

Intending to provide an overview of conservation practices and afferent needs, we produced a survey to collect information from European museums. The analysis of these needs will be turned into requirements to which other WPs will propose a solution. This deliverable is the pivoting element of this survey: it consists in a table containing the full questionnaire, from the guidelines to answer to the criteria matrix sampling (D2.1) and the satisfactory survey. Any museum willing to participate is welcomed to, since the questionnaire will be :

- Sent directly to a list of 570 European museums
- Sent to national and international professional networks, such as ICOM or IIC, that will disseminate it to their members.

Anxious to explain our methodology, this deliverable presents the obstacles we encountered and their solutions.

Deliverable Review

Reviewer #1: François MIRAMBET, CNRS			Reviewer #2: Marie-Dominique Bruni, CEA		
Answer	Comments	Type*	Answer	Comments	Type*
1. Is the deliverable in accordance with					
(i) the Description of the Action?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a
(ii) the international State of the Art?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a
2. Is the quality of the deliverable in a status					
(i) that allows it to be sent to European Commission?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a
(ii) that needs improvement of the writing by the originator of the deliverable?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a
(iii) that needs further work by the Partners responsible for the deliverable?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a

* Type of comments: M = Major comment; m = minor comment; a = advice

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1. Introduction

Work Package 2 intends to provide an overview of conservation practices by collecting information from European museums and by identifying their needs through a survey. Its results will help us define and prioritize requirements and technical specifications to which other WPs will propose a solution.

To insure a satisfying market penetration, **both technical performances of the devices and their social acceptability** – as a guarantee of their use within the museums, must be assessed. To that end, CNRS holds a translator posture between the patrimonial stakeholders, from whom it relays the needs, and the technical partners of the consortium whom it evaluates the solutions. Our role is to transform environmental data into behavioral recommendations. Therefore, a survey has been designed to identify the needs for sensors and software, as well as their functionalities. It is a question of carrying out a **qualitative and quantitative survey**, making it possible to make objective a situation of use, but also the behaviours of the stakeholders involved. This also has the documentary advantage of globalizing the current state of preventive practices in Europe. Indeed, task 2.3 aims to base the elaboration of the questionnaire on international PC guidelines and standards, as well as on regional policies. Given the variety of these industrial proposals, the questionnaire therefore has the role of a customer satisfaction survey, to determine the market on which the engineers in charge of developing technologies related to sensors and their software will evolve. On the other hand, users' behaviors and attitudes towards measuring instruments may result from unconscious influences, which the questionnaire evaluates as part of the satisfaction survey. Both the answers filled in by the surveyed museums or the absence of such, will be analyzed in the formulation of their needs.

Consequently, this survey also aims to investigate, in a low-key way, practices and behaviors in preventive conservation. The interest is to target the knowledge contributions to the program: it is an opening on user behaviors **that can be rationalized and become communication tools**. Indeed, a large number of pre-existing solutions are already in the early stages of SensMat and CNRS role **is to identify and prioritize the related needs, in order to adapt the products to the daily practice of collection management**. It therefore has the dual ambition of providing a market survey to engineers through the assessment of customer satisfaction, but also to collect "behavior" data on the working environment of museums, which can rely more on the division of tasks within their teams than on a high level of expertise or a specialized service. The first point of attention is the recipient of the survey and the effort required to solicit it: to meet the internationalization of the procurement, it is essential that it is carried out digitally. The creation of a matrix of criteria defining small and medium-sized museums, made it possible to evacuate profiles outside the target (D2.1). It avoided a coverage error, due to a wide distribution of the questionnaire.

2. Expectations and barriers: methodology of the questionnaire's conception

First of all, the conception of the questionnaire had to match the expectations previously cited with the three components of it in order to identify possible obstacles. These elements had to be analyzed through the three components of a survey:

- The objectives: they constitute the grid of analysis of the survey' s results;
- The situation that catalyzes them: the relevant elements to be taken into account for further analysis;
- The population: definition of the sample characteristics (D2.1) and how to communicate with this population.

The project is characterized by its transdisciplinarity. This implies, as explained above, **interprofessional communication efforts between museums and technical partners**, but also between the various actors of the project. All technical partners are stakeholders of the questionnaire's results, from manufacturers of sensor technologies to designers of degradation models, as well as developers of the software platform. Thus, their priorities may differ more or less widely from the development stage of the technologies proposed by the partners.

The questionnaire has another functionality: **the ability to rank the answers according to their levels of respect, of minimal preventive conservation principles and conservation tools integration**. Hence the need to assess the behaviors behind the expressed needs, in order to understand the mechanism of daily practices. The idea was being able to define and measure a conservation performance, strategy we had already within the first deliverable, D2.1. It can be somehow tricky when it comes to the questionnaire since it has to transform the social acceptability of technology in a quantitative assessment methodology:

The measurement of conservation performance implies that a quantitative methodology is necessary, yet collecting and understanding the types of values that are being measured requires a qualitative methodology; in other words, it is not possible to directly measure values⁴.

Considering the variety of technical solutions that the consortium members can offer, the juridical wavering surrounding the patrimonial duties of the museums we previously mentioned (D2.2, D2.3) and the gap between these recommendations and their daily stakes, it was vital to identify a common operating procedure and rank its steps. Each step becomes a characteristic, structuring the level of expertise of the institution when it comes to preventive conservation.

⁴ Jeremy Wells, « Using sequential mixed social science methods to define and measure heritage conservation performance », in *School of Architecture, Art and Historic Preservation Faculty Papers*, Roger Williams University, 2011, p.7

Expectations	Barriers
1/ Be able to transcript answers in requirement-specification compliant to both museums and manufacturers	Transdisciplinary vocabulary + qualitative and quantitative assessment
2/ Wide communication to insure at least 100 relevant answers to be analyzed	What diffusion process?
3/ Quantification/qualification back-and-forth	
Solutions	
1/ Utilization of standard vocabulary (European Committee for Standardization, Conservation of Cultural Property, <i>Main general terms and definition</i> , Standard EN 15898, CEN, Brussels, 2011)	
2/Integrated web-platform to insure an accessible online survey, which diffusion process will be insured thanks to the Advisory Board and C2RMF network, to reach the cultural stakeholders.	
3/ Mixed-method approach to quantify the needs and qualify them: <ul style="list-style-type: none"> - Jeremy WELLS, « Using sequential mixed social science methods to define and measure heritage conservation performance », in <i>School of Architecture, Art and Historic Preservation Faculty Papers</i>, Roger Williams University, 2011, p.7 - Mylène LEMOINE, Une approche renouvelée des études de satisfaction, Guide pratique pour réaliser son étude de satisfaction pas à pas, outil mis à disposition par le Secrétariat Général pour la Modernisation de l'Action Publique, 2016 	

These various issues have given rise to two imponderable modalities that circumscribe the investigation. First, the clarity of the vocabulary used allows for an international transfer to museums but also between professionals from various disciplinary fields. The formalization of the survey should provide a basis for common reflection. Idiomatic translation also requires the use of a vocabulary shared by the heritage world. Secondly, the survey must be able to adapt to triple objectives in terms of the expected results for the drafting of the various specifications. Following the identification of these modalities, it became possible to define the limits of the survey in relation to the objectives. A “SWOT” analysis was used to frame the elaboration of the questionnaire as a performance indicator:



3. Results and Analysis

We shaped the questions to allow the results to provide a coherent answer: the different points of attention were thematized in four parts, in order to evaluate all the components that will then make it possible to produce relevant specifications. The first tab (see Annex 1, Questionnaire) is used to create the panel of museums, as exposed in D2.1. The second tab aims to determine the level of expertise of the teams in place. The third one investigates the collection management methods. It includes a general assessment of the collection, its conservation conditions and the risks it faces in order to contextualize their behaviors and needs and to weight, where appropriate, the statistical results obtained after the survey process.

On the other hand, it is a question of finding the **junction between collections, sensors and management protocols**. These are three elements, the software must be able to handle in order to provide adaptable and relevant decision-making tools that can encompass as many incidental parameters as possible on the conservation of collections. The fourth part of the questionnaire is the core of the survey as it examines the level of instrumentalization and satisfaction with the devices. It can also be reused in the test phase (WP7) to provide results that are sufficiently usable to provide a fruitful feedback on the experience. A question then arose: should the survey be carried out systematically by evaluating the instruments already used by museums? If so, it excludes museums that are not equipped, although they represent an interesting target for the project. The criteria therefore focus on the degree of satisfaction when they are present in the institution and on the elements that could encourage the other institutions to review their choice. The evaluation is based on the functionalities that can be offered by the product. In order to formulate the two orientations of the satisfaction questionnaire, it is thus planned that the first question in this part will be a question of restriction: depending on the answer, two orientations will be proposed. The first, in the case of instrumentalization, compares the various elements that characterize the use of sensors and, among these elements, which correspond to the user's expectations on a score of 1 to 10 and which are drivers of satisfaction or dissatisfaction. The two aspects of the survey are posed simultaneously in order to ensure the instantaneous evaluation of each parameter. If the institution is not provided with measuring instruments, the questions propose the same elements and drivers of satisfaction, but they are not examined with the steps of using the sensors. Rather, the objective is to identify what obstructs instrumentalization in the institution and to prioritize what could unlock these obstacles. To do this, we used the methodology set up by Mylène Lemoine⁵ to identify the structure of users in 3 distinct groups: the satisfied, the soft belly ("rather satisfied" or "no opinion"), the dissatisfied. In order to neutralize this "soft belly", whose level of information it provides is sterile, it proposes 3 moments of questioning according to an evaluation of the elements of satisfaction - which allows them to be prioritized later -, an inventory of the current user attitude, then a "scoring" of the solutions.

First of all, satisfaction drivers make it possible to define the technical characteristics of the instruments:

- **the driving elements:** these elements have a strong influence on satisfaction if they are present, a strong influence if they are absent,

⁵ Mylène LEMOINE, *Une approche renouvelée des études de satisfaction, Guide pratique pour réaliser son étude de satisfaction pas à pas*, outil mis à disposition par le Secrétariat Général pour la Modernisation de l'Action Publique, 2016

- **the basic elements:** these elements do not increase satisfaction if they are present but they increase dissatisfaction if they are absent. They represent the minimum required,
- **elements of excellence:** these elements do not provide dissatisfaction if they are absent but generate satisfaction if they are present,
- **the secondary elements** have a neutral impact.

This rapid evaluation makes it possible to prioritize, in the specifications, the points of attention for manufacturers. The second step of this satisfaction survey measures user involvement, which corresponds to attitude data, as explained above. To do this, Mylène Lemoine recommends using scoring questions. The respondent must therefore, for each parameter that can be the subject of a singular technical solution, express on a scale from 1 to 10, the adequacy of the item to his expectations.

The last step of this satisfaction survey is the use of four open-ended questions. The first investigates the reasons for their satisfaction and dissatisfaction. Addressing this question requires analyzing the vocabulary provided by the respondent and drawing new points of attention from it that may not have been targeted in the questionnaire. Then, the elements contributing to their satisfaction or dissatisfaction are asked in an open manner: the redundancy of this question compared to the previous phase makes it possible to add a coefficient to certain elements or to identify new ones. Finally, the last two open-ended questions invite the respondent to get involved in thinking about solutions by asking them what their expectations are for improvement in the short and long term. This involvement makes it possible to maintain a lively dialectic despite a less dynamic support than an interview survey. While open-ended questions may be difficult to use statistically, a study of the vocabulary used, its level of specificity and the recurrence of terms may give rise to new elements. On the other hand, it is a question of calling on the respondent's creativity, involving him/her in the rest of the events, and putting his/her opinion to good use. This is part of the reciprocal relationship that ensures the respondent's goodwill towards the questionnaire and therefore the quality of the responses.

The second phase of the survey is a pretest on a 3-week time to make the questionnaire operational. It is pretested in 30 museums, which gave six answers that is 20% response rate. We may expect, for the final diffusion of the questionnaire, an approximate 10% to 20% response rate on a 570-museum contact list.

The Advisory Board's notice on the questionnaire has been requested. It will be integrated into the analysis of the results in order to weight the statistical importance of the elements pointed in the remarks.

Topic	Objectives	Needs	Formulation	Results exploitation
Museum data	Institutions identification	Selection criteria to define the target: the level of coercion of preventive conservation operations	Questionnaire	Ranking of profiles according to orders of magnitude (average of variables) then counting the relevant responses in relation to the target
Staff data	Identification of employee training and degree of specialization (related to sampling criteria)	Identification of the interlocutors and their context of exercise (budget, daily planning, training)	Multiple-choice closed-ended questions	Identification of professional profiles => will make it possible to adapt the transformation of sensor data into behavioural recommendations
Collection management data	Contextualization of the environment of the collections and the actions carried out	Collection Evaluation Assessment of conservation conditions Risk assessment	Closed multiple choice Risk assessment methodology ABCD	Target and quantify needs: prioritization of solutions (+ statistical evaluation) and self-diagnosis tool
Environmental management data: instrumentalization and satisfaction	Resources mobilized for the management of this environment + identification of satisfactory points and obstacles to this instrumentalisation	To mark out the stages of instrumentalization in institutions: implementation of tools, daily use, maintenance, software + identification of the drivers of satisfaction/dissatisfaction allowing recommendations to be made to technical partners	Closed multiple-choice questions Open-ended questions	Inventory of the existing system to ensure "user-friendly" technical specifications: prioritisation and enhancement of satisfactory elements 1st iteration of the satisfaction survey process for resumption in WP7

4. Conclusion

The design of the questionnaire began with the formulation of the preventive conservation chain of action and required the ability to anticipate the results, while remaining consistent with the actual situation in the institution. The questionnaire surveys, through its four thematic parts on the conditions of practice of the profession. It is both a quantitative and qualitative survey, including an assessment of the professionals' satisfaction, aiming to fill the gap between their needs and the technologies available. Given the objectives of SensMat, the survey had to include practices and behaviors towards environment management, particularly in the understanding of technology in a profession based largely on accumulated experience and know-how. It is the crossed analysis of these two types of data that will make it possible to draw up a coherent set of specifications. The aim is to prioritize them and draw a strategic orientation when it comes to the implementation of the tools in the daily activities of the museum.

To that day, the questionnaire is operational for the survey, though we will have to wait for D2.5 Report to explain all major results in terms of detailed panel of answerers and statistical treatment of their answers.

5. Annex

Annex 1: Guidelines to answer and Questionnaire

Identification data			Selective scale for small and medium-sized museums		
Question	Answer	Commentaries (facultative)	Small	Medium	Large
The institution			No incidence ; No exploitation of their personal data, these fields are filled only to insure the aftercare of the survey		
1/ Name of the institution					
2/ Adress and country			No incidence		
3/ Name of the answerer					
4/ Function	Curator Conservator Director Registrar Restorer Other (please be specific)		No incidence ; No exploitation of their personal data, these fields are filled only to insure the aftercare of the survey		
5/ Juridical status of the institution	Private Public National Territorial Regional Municipal				
6/ Name of director or administrative executive			100m ² < museum <1500 m ² 1500m ² < museum <4000 m ² >5000 m ²		
7/ Total surface					
8/ Number of permanent agents (intern and extern)					

The collections		
9/Nature of collections (%)	Paintings Sculptures Stone Graphic arts Photography, audiovisual Technology/industrial Archeology Objects of art Natural sciences Militaria Textile Numismatic Contemporary art (other techniques) Other	
10/Number of items inventoried		
11/Displayed collections (%)		
12/Collections in storage (%)		
13/Amount of loans/year to other museums		
13bis/ Do you provide specific guidelines to the conservation of your objects in the Facility Report ?	Yes/No	
14/ Amount of loans/year from other museums		
15/Amount of deposits from other museums		
15bis/ Are exterior loans treated in an quarantaine area ?	Yes/No	

No incidence

Moderation element

Collection management		Coef.2						
16/ Nature of recommendation sources known	Regional legislation International legislation Standards Professional deontology Scientific and specialized literature		Maximum 1		At least 2		5	
Budget								
17/Does preventive conservation have its own budget ?	Yes/No		No / Yes but see elements of moderation		Yes (but see elements of moderation)		Yes (but see elements of moderation)	
17bis/ *If yes, how much ?	0-5000€ 5000-20 000€ >20 000€		0-5000€		5000-20 000€		>20 000€	
17ter / **If yes, what share does it have within the total budget of the institution ?	<5% Between 5 and 10% Between 10 and 15% Between 15 and 20% Between 20 and 25% >30%		<5%	5 to 10%	10 to 15%	15 to 20%	20 to 25%	>30%
18/ What is included in this budget ?	Museographic equipment Storage furniture Transport case Packaging materials Instruments and sensors Computing support (software, etc.) Mitigation resources (humidifiers, etc.) Human resources (formations and/or service providers)		1 or 2 elements		Maximum 3 elements		More than 3 elements	

Supervising preventive conservation					
19/ Does preventive conservation have a clearly identified supervisor ?	Yes/No ; Yes + external service provider No BUT tasks done by service provider No, tasks performed collectively		No ; No supervisor in particular but collective tasks	Yes / No BUT recourse of external service provider	Yes ; Yes + external service provider
19bis/ * If yes, specify his/her missions duly noted in his/her contract	Monitoring of degradation factors; Active/passive mitigation measures of degradation factors; Implementation of preventive conservation procedures (emergency protocols, PC protocols); Organisation of maintenance operations and/or restoration campaigns; Packaging and storage operations; Transport; Museographic display; Collection management (inventory, stocktaking, marking); Others.		2 of these missions max.	At least 2 missions	More than 4 missions (and additional tasks)
	Other (be specific) :				

19ter/** If yes, do preventive conservation department have dedicated work areas ?	Yes/No/In progress		No	In progress	Yes
20/ Has official procedures been established (Preventive conservation plans, emergency protocols, etc.) ?	Yes/No/In progress		No	In progress	Yes
20bis/* If yes, on which subject ?	Pest management Environmental monitoring Disaster prevention General surveillance Others (please be specific)		One element maximum	Maximum 3 elements	At least 3 elements
20ter/** If yes, has these procedures been tested...	At least 1/year At least 1/5 years Occasionally Never		Occasionally // Never	Occasionally // At least 1x/years	At least 1x/year
Equipment dedicated to PC					
22/Informatic equipment availability	Computer		At least 1 for the entire institution	At least 1 per departement	Several tools / agent
	Laptop(s)				
	Tablets				
	Other - please be specific				
23/Do you use a software for the management of the collections ?	Yes/No		No	Yes OR No (+moderation thanks to functionalities)	Yes + at least 3 functionalities
23bis/* If yes, what are its fonctionnalities ?	Inventory Stocktaking State report Risk assessment monitoring Management of sensors data Other			If max. 3 fonctionnalities	
24/ Do you possess specified tools related to preventive conservation's actions ?	Yes/No *Is yes : Sensors Humidifier/deshumidifier Air conditioning system Packaging materials Buffer materials Specialized furniture Light filters Pollutants/dust filters Safety monitoring equipment		No // Maximum 2 elements	Maximum 6 elements	At least 6 elements

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24bis/*If you use sensors, what degradation factors are monitored ?			No incidence		
Cultural dynamism					
25/ Annual frequentation	visitors < 5000 5000 < visitors < 50 000 >50 000 visitors		visitors < 5000	5000 < visitors < 50 000	>50 000 visitors
26/ Opening time	Annually Seasonnaly		Moderation element		
27/ Does the institution have specific public studies ?	Yes/No Yes : children, schools, students, adults, seniors		Moderation element		