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Augmented Representation of Cultural Objects

D16: Assessment and Evaluation report on the ARCO system and its components

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Glossary

Terms	ARCO Glossary File
For a complete glossary of ARCO terms see	ARCO-Glossary-R-1.0-280402.doc

Summary

This document describes the evaluation process and evaluation results collected during the ARCO project. The system components of the ARCO Prototypes and Final System have been assessed by museums experts, partners of the project (VAM and SussexPast), during the three organized Museum User Trials and the final stage of the project. Three different evaluations are considered in the report: the performance evaluation of the Obejct Modeller, the AMS (ARCO Metadata Schema) evaluation and the usability evaluation of all the ARCO system components.

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1. Museum User Trials

All the ARCO prototypes (first, second and third) have been subjected to the Museum User Trials with the aim to assess and evaluate the released system components. During the Museum User Trials, the museum pilot sites, e.g. VAM and SussexPast, provided personnel, technical and curatorial expertise for assessing and evaluating the technology with respect to the User Requirements Specification.

The Museum User Trials were designed to ensure that the prototypes were indeed fit for purpose within the museum environment, and both public access where appropriate and curatorial access.

1.1 Methodolody adopted

The main aim of the evaluation process led during the MUT was to estimate usability of the system components of the ARCO system components.

The assessment categories for usability included:

- Technical usability, that is the perceptual and physical aspects of the human computer interface such as display formatting as well as anthropometrical characteristics of the object being worked with.
- Domain suitability, that refers to the appropriateness of the content of information and display representations. It examines whether the design meets the cognitive requirements of the domain. For example, it is possible for a system to be usable but not suitable for domain tasks. The domain suitability poses problems with respect to the "cognitive adaptations" of the human activity after the introduction of a particular technology. Therefore the choice of the correct methodology for facing this aspect is crucial.
- User acceptability, that is the case of the use and suitability of the system for supporting cognitive task requirements. It depends also upon job satisfaction.

These categories were evaluated applying user-centred methodologies, including the cognitive walkthrough evaluation.

The Cognitive Walkthrough is a task-based inspection method widely adopted in evaluating user interfaces. It is applied to interactive prototype like ARCO system that allow system response to any user action. This method allow to estimate the cognitive effort related to the use of the system.

Cognitive walkthrough covers issues related to the effectiveness of the system, highlighting problems of actions executions and feedback interpretations with respect to a specific goal. It involves one or a group of evaluators inspecting the system by going through a set of tasks and evaluate its *understandability* and ease of learning.

The user interface is often presented in the form of a working prototype but it can also be a fully developed interface like ARCO. The input to the walkthrough also include the user profile, especially the users' knowledge of the task domain and of the interface and the task cases.

The method consist of the following steps:

- **Goal setting** – The user starts with a rough plan of what they want to accomplish (the tasks provided by the tutorials)
- **Exploration** – The user explores the system's interface to discover actions useful in accomplishing her/his current task.

- **Selection** – User selects actions that he/she thinks will accomplish his/her current task
- **Assessment** – User interprets the system's responses and assesses whether progress has been made toward completing the task; then the user answers to questions associated with the task

During the MUT it was suggested to adopt as theoretical background for the cognitive walkthrough a different model, the Normal's model of actions ([Hutchins et al]).

This method was defined and successfully tried out application domains than the ARCO case study [Rizzo et al]. In the following, the Norman's model is briefly described.

Norman's model

The Norman's model of human action provides a sound yet simplified theoretical framework of design and evaluation. It allows the definition of some basic cognitive steps in the analysis of human interaction with components.

The model describes five states (goal, intention, action, perception, evaluation) and three distances (semantic, referential and inter-referential, the first two are present on both sides of the model.

According to [Hutchins et al], cognitive distances indicate the amount and quality of information processing needed to fill the gap between two states. The notion of cognitive distance can be applied both for action execution and outcome evaluation. In the former case, it refers to the amount of information processing needed to bridge he gulf between an intention and the physical actions by which the intention is communicated to the system. In other words, it refers to the act of translating the thoughts and goals of the user into the system's language.

In the latter case, cognitive distance refers to the amount of mental effort needed to translate the information displayed by the system in the terms of the conceptual model adopted by the user.

In both cases, cognitive distance can take two forms: semantic and referential.

Referential distance, as for output evaluation, refers to the amount of mental effort needed to translate the form of the information displayed by the system into a form which allows the user to grasp its meaning (e.g. what does a given icon or layout mean? What's the meaning of a given modification produced by the user action?).

Whereas, in terms of action execution, it refers to the extent to which the user's understanding of the meaning of a physical action is similar to the user's understanding of the form of the action (i.e. can the user grasp the meaning of his/her physical action on the interface? What is the effect, if any, of the clicking longer on a given surface?)

Semantic distance, as for the output evaluation, refers to the amount of human information processing needed to translate the meaning of the output of an action in the terms of the intention it serves (e.g. after obtaining a given result how close the user is to the fulfilment o his/her intentions?).

In terms of action execution, it concerns the relationship between the user's intentions and the meaning of the actions that are possible in the interface language (e.g. is there any immediate way to map user intention in action that the system allows?).

Finally, there is the inter-referential distance, that is the cognitive processing needed to put in relationship the information processed in action execution and the information available as result of the action (e.g. Where does the output of the user action come out? Which are the modalities of the feedback to his/her action?).

These forms of distance allows to describe cognitively the relationship between the task the user has in mind and the way the task can be performed via the interface.

However, in Norman's model all forms of cognitive distance involve a stable relationship between the goal the user has in mind and the way it can be accomplished, or at least, the model does not suggest any explicit way by which a goal can be modified during the activity. But there can often be a goal shift since either the user might not have the significant knowledge to fulfil the goal or, in the given conditions, the goal might even be not feasible. Thus, human activity can fail, and it can require a modification in goal settings.

Two modalities by which a goal shift might be produced are suggested: i) the goal cannot be accomplished (lack of competence, or physical constraints) ii) different states of the world are suggested on the basis of the performed activity (incoming information activate alternative patterns of knowledge).

In order to avoid any misunderstanding with the scenarios used to perform the Cognitive Walkthrough, we use the term "issue distance".

For both execution and evaluation purposes, issue distance refers to the amount of processing needed to understand that the goal cannot be achieved or that a different goal, more suitable to the activity in which the user is involved, could be achieved. This last distance is particularly important not only to the aim of supporting the proper user mental model but also to identify how a certain sequence of interactions could be eliminated or replaced by higher-level modification in designing the interaction.

Results from the applying the above described technique during the Museum User Trials are reported in the following sessions.

1.2 Evaluation of the First Prototype

The ARCO first prototype has been demonstrated and evaluated at the first Museum User Trials held in Sussex on 8th April 2002. Users evaluated the system components of the first prototype by answering the following questions related to a list of tasks. Museum pilot sites and technical partners provided answers to these questions during the trials, however as one of the goals was to give museum users the confidence to experiment outside of the trials with similar equipment the museum users provided continuous feedback and new inputs to improve the first prototype.

Selection of Objects

1. What are the criteria for selecting the objects?

[VAM] Capturing images currently requires rotating objects on a turntable. This imposes restrictions on the size, weight and stability of selected objects. Also consideration needs to be given to the objects condition and whether the rotation process will cause damage. Object reflectivity also needs be quantified to see whether it falls within the 3D modelling perimeters. The physical weight we can manage on our turntable is 20kg.

[SussexPast] Depends on end product: virtual exhibition, cataloguing, collections management, interpretation, etc.

2. Based on your experience gained in digitisation and modelling with first prototype technology can you estimate the percentage of objects in your archives that would be suitable for digitisation? *(Museum)*

[VAM] Based on the first prototype with its limitations on size , weight and reflectivity I estimate around 15% to 20% of the VAM collection could be modelled. Even this figure will run into thousands of objects. More than enough for the project.

[SussexPast] Most objects could be captured, but would depend on selection criteria

3. Would you enter metadata on the selected objects into the database at this stage?

[VAM] Technical metadata from the camera would be captured at the time of image creation. Technical metadata regarding the creator and the method of creation would be prepared before capture. Descriptive metadata describing the object represented in the image would be collated after capture. Would be very useful to convert MODES database metadata to ARCO schema metadata

[SussexPast] Definitely a user requirement. Would be very useful to convert MODES database metadata to ARCO schema metadata. May require a conversion utility.

4. Have you other comments about the selection of objects?

[VAM] The packages will need to be as flexible as possible to allow the widest range of museum objects to be captured. Reflective objects may cause many problems regarding lighting in such a way to create virtual models.

Digital Capture

5. Was the object safe during the acquisition process?

[Technical]

- *First prototype digitisation process relies on standard digital photography environments, so the process should follow for example, VAM best practice*
- *No time was given to explain to other users present the very simple photographic studio set-up that we were using at these trials*
- *Practices relating to object handling, safe working distances were similarly not explained*
- *I saw evidence of incorrect handling of objects e.g. lifting a ceramic flagon by the handle; working too close to the object, incorrect focal length lens selected*

6. Did you have to move the object (simple, medium, complex) during the acquisition to facilitate the process?

[Technical]

- *Yes, during packaging, transporting, digitisation and returning to the museum*
- *In fact, this type of digitisation may involve more photography than is normally done*

- *During the digital capture experiments we decided that it would be better to take photographs as if we were doing a object movie. Two different types, one for the OM and one for the IMRR*

7. Do you regard the digital acquisition equipment as simple or complex to set up?

   [VAM] Simple

8. Was the provided tutorial sufficient to understand how to take the pictures and in which minimum number?

   [SussexPast] Yes

9. In your opinion is it feasible for you to set up a similar digital capture environments in your museum?

   [VAM] Yes
   [SussexPast] Yes

Object Modelling

10. Is the ImageModeler interface user friendly?

    [VAM] No

11. Is the PhotoModeler interface user friendly?

    [VAM] No
    [SussexPast] Yes, and the tutorials were easy to use

12. Does Image Modeler and Photo Modeler give the possibility of customising the interface to be simplified or adapted to the ARCO needs?

    [Technical] No

13. Did you find the option (provision of Photo Modeler, but could be adapted for Image Modeler) of projecting a grid of dots onto the object very helpful?

    [Technical] No, this would be difficult with transparent or white objects.

14. During the camera calibration, do Image Modeler and Photo Modeler require information on the camera used to take the photos?

    [VAM] Yes, the camera has to be re-calibrated for each change of focal length of lens.
    [Technical] Both require information, but relatively simple to set up. An off-line process is required to calibrate the camera with PhotoModeler and images with different focal lenses cannot be processed in a same stage. With ImageModeler, camera calibration is integrated in the modelling process. Internal parameters are computed concurrently to

the views registration. ImageModeler allows to process images acquired with different camera parameters (different focal lens or different cameras).

15. Do ImageModeler and PhotoModeler offer the colour balance among several images, useful before performing the texture extraction?

    [Technical] The raw files should be saved then image processing to perform simple tasks using Photoshop; colour correction, unsharp mask. Colour correction to Macbeth colour chart - Black, White & Grey points

16. Which manual operation among the listed below would you like to be automatic?

    - Colour balance
      [VAM] Yes
    - Camera calibration
      [VAM]Yes

      [SussexPast] Yes
    - Views registration
      [VAM]Yes
      [SussexPast] Yes, but not absolutely essential. Speeding up might be a better requirement
      [Technical] With ImageModeler, Camera Calibration + Views Registration is performed by selecting ten points in each image. Using fiducials that are easy to select accurately and having a small experience with the software (which is well designed for this task), less than 15 minutes is enough to complete these 2 steps for 10 images. It will be difficult to speed it up in a manual process
    - Mesh generation
      [VAM]Yes
      [SussexPast] It depends on object complexity and level of details wished by user.
    - Texture extraction
      [VAM]Yes

      [SussexPast] Again, this was straight forward but speeding up might be useful

17. In your opinion is it feasible for you to set up a similar object modelling system in your museum?

    [VAM] Yes
    [SussexPast]Yes

18. Have you other comments/suggestions about the Object Modelling?

    [VAM] They are dependant on creating shapes within the software rather than by the characteristics of the image.

Model refinement and rendering

19. Does 3ds max offer all the tools you would need to refine the geometry of the acquired object?

    [Technical] Yes, but we did identify that simple objects are better done in 3ds max as the start point in modelling. This required a more orthogonal set of photographs and the use of Photoshop to extract efficient textures. Whereas, both ImageModeler and PhotoModeler extract textures very well

    [VAM] Don't know.

20. Does 3ds max give the possibility of customising the interface to be simplified or adapted to the ARCO needs?

    [VAM] Probably
    [Technical] Yes

21. Could 3ds max be customised to:

    - Be connected to a relational or XML-native database directly?

      [Technical] Yes

    - Embed an XML editor?

      [Technical] Yes

22. Which manual operation among the listed below would you like to be automatic?

    - Files import from the OM module
      [VAM] Yes
      [SussexPast] Yes
    - Some kind of geometry corrections
      [VAM]Yes
      [SussexPast] Yes
    - Files export to the database
      [VAM] Yes
      [SussexPast] Yes

23. In your opinion is it feasible for you to set up a similar model refinement and rendering system in your museum?

    [VAM] Yes
    [SussexPast] Yes

Database Management

24. Are there functionality not covered in ACMA that you would like to be present in the tool?

    [Technical] Difficult without further evaluation after first prototype

25. Which functionality, among those provided by ACMA, would you embed in another module (OM, IMRR)?

    [Technical] Difficult without further evaluation after first prototype

XML development

26. Is XML Spy 4 Suite suitable for developing the ARCO XML Schema?

    [Technical] NK

27. Is XML Spy 4 Suite suitable for developing the XSLT Transforming Modelling?

    [Technical] NK

28. Could XML Spy 4 Suite be integrated in the OM module?

    [Technical] NK

29. Could XML Spy 4 Suite be integrated in the IMRR module?

    [Technical] NK

30. Could XML Spy 4 Suite be used to map all the elements of the ARCO XML Schema to a relational or XML-based database?

    [Technical] NK

31. Which metadata of the schema proposed by VAM for the ARCO project would you add, cut or modify?

    [VAM] Not applicable

3D browsers

32. Which VRML player, among Cosmo, Cortona and Blaxxun, Xj3D would you like to be integrated in the ARCO system? Why?

    [VAM] The one with the best functionality which creates the most accurate model in the easiest way.
    [SussexPast] The one with the simpler interface

1.3 Evaluation of the Second prototype

The ARCO second prototype has been demonstrated at the second Museum User Trials in Saclay (France) and Fishbourne (England) at the end of 2002 and beginning of 2003 respectively. Feedback was gathered from the two museum pilot sites which serves two main purposes.

1. Allows ARCO partners to update the User Requirements Specification, System Requirement Specification, System Design Specification and Component Design Specifications, etc. and hence this document.
2. Contributes to the ongoing development of a detailed questionnaire document that will be used in the final year to gather more comprehensive feedback from a wider group of museums at events such as the Museum Association Conference, October 2003.

The museum feedbacks (sometimes in the form of questions) are reported below.

Any new user requirements or issues arose from the user's feedbacks and appropriate technical responses provided by the technical partners have been mapped into the third user requirements and System Requirements documents.

SussexPast feedbacks:

- *Can a facility be created for giving labels to the objects in the exhibitions? This is not strictly metadata as is it not about the physical description of the object, it is about tying the object into the particular story/theme of the exhibition. The text is therefore contextual and temporary as it will vary from exhibition to exhibition.*

- *A text rather than a picture toolbar will be easier for new users to get to grips with when using 3ds max.*

- *As the object modeller is likely to be too expensive an option for most small museums what is the plan for involving them? Will one museum in an area act as an ARCO service provider for other local museums?*

- *As the modelling can be done using images captured from standard digital photography will it be an option for smaller museums to 'but into' ARCO using all the relevant technology but just with their own cameras rather than an object modeller.*

- *On line help for IMMR is great and very comprehensive but I know most people prefer to have help guidance at their sides and the screen clear for their work. Obviously they could just print out the help sheets but I wondered whether it might be worth producing some sort of help pamphlet?*

- *The image accuracy issue is a very difficult one to pin down but I feel any representation should be as accurate as possible as museums are not factories, they are repositories for unique objects which act as testimonies to history and culture.*

- *I know that the more accurate the model the higher the money and time input but I think it does the public a better favour to have a couple of models really well done than to give them such poor ones as to be misleading.*

- *Museums have numerous different users and so it is good that the project is taking into account different user scenarios. However, whilst differentiating between different user actions and needs helps to guide the project I do have reservations about being discriminatory in terms of image quality and accuracy.*

- *For example, it has been said that schoolchildren will not need such an accurate image as an academic researcher but what if the child then gets completely the wrong idea at the embarkation of its studies?*

- *And what if the very history it is seeking, e.g., a dent in a metal breastplate that shows how armour was tested in the 17th century, is lost through inaccuracy.*

- *Also it has been suggested that images to be viewed from outside the museum need not be as good as those in the museum used by staff and researchers.*

- *However, at the end of the day those in the museums can go and fetch the real thing if necessary but those who are unable to visit the museum, e.g., because of a disability or residence in a foreign country, will need a better image as they will not have the opportunity to view the real thing.*

As a consequence of the Second Prototype evaluation, SussexPast decided to propose a couple of new scenarios. They are reported below.

New User Scenarios from SussexPast

1. Serving the disabled

In 2004 the third stage of the Disability Discrimination Act will come into effect and services, including museums have been urged that:

"You must take reasonable steps to provide a reasonable alternative method for making your services available for disabled people, where a physical feature makes it impossible or unreasonably difficult to use these services."

This puts Barbican House museum and Anne of Cleves House in a difficult position as they both have upstairs galleries, and therefore physical features that impede disabled access, yet they are limited in the physical adjustments they can make to the premises as both are listed buildings. However, to comply with the law SussexPast realises it must plan ahead and be pro-active in meeting the needs of disable visitors and so, working with local disability organisations, it turns to ARCO to produce virtual representations of the displays in the upper galleries. It has, therefore, proven its commitment to its disabled visitors and utilised the ARCO technology to bring the collections to new users.

2. A winter, object based temporary exhibition:

Barbican House Museum has a small temporary gallery in which it stages 4-5 different exhibitions a year. Although much of what is displayed is usually flatworks on the walls it does contain a case for displaying relevant objects, for example, from the archaeological collections. However, at present the winter exhibition has to be solely flatworks as the case has to be moved to make room for school parties whilst the Education Resource Centre is in use for Christmas card sales. Yet the curator feels that the archaeological drawings on display are meaningless without objects and so she turns to the ARCO technology to create a virtual exhibition of the archaeological material she would otherwise place in the case. This helps attracts more people to the exhibition by bringing it to live and giving visitors more of an interactive role whilst overcoming the impediments of the winter season.

Also these two new scenarios contributed to the generation of new user requirements and provided interesting ideas about new business cases for ARCO.

VAM feedbacks:

- The general consensus from VAM following the Museum User Trials is positive with enthusiasm about the way the system is evolving. The development, which has taken

place in the ARCO processes and components shown in the presentations, were very impressive and gave the first real insight into the possibilities for the completed system.

- Model accuracy is something we have raised before and is an issue also concerning SussexPast. From our perspective accuracy can vary within an acceptable range dependent on the clients requirements. To make this judgement it is important to have some measure of the model's accuracy so an informed decision can be made about the capture process most suitable. When we use the term accuracy, we are not only speaking about the models shape but also its colour, contrast, texture and density. We are aware all these factors can be affected by the end users display set-up but assuming they are using a standard we would expect to achieve a good level of accuracy. An acceptable accuracy level is one that does not mislead anyone viewing the 3D model about the objects true shape. For example, when using a less detailed model we would want to restrict the view window so only general views are available which give a good representation of the object at that size. Our expectations on accuracy are high but we do appreciate the likely costs involved in precise image modelling, set against affordable 3D modelling of multiple objects.

- The cost of using each 3D modelling solution is important to evaluate so that projects (virtual exhibitions) can be properly budgeted. I believe an assessment of man-hours per modelling option is something ARCO intend developing.

- On site testing and ARCO showcases: a good way of testing the system, providing content for museums and showcases for the ARCO system is to use it on real projects. This will allow us to address problems as they become apparent and add additional options and templates in facilitating the creation of virtual exhibitions.

- Object Size: is object size determined by the point at which the stereo images cross? If this is the case could the stereo rig be calibrated so the images cross at different distances so larger object could be accommodated. Is the alternative different size stereo rigs for different sizes of object. Will there be different cameras for different size objects? Will 3D models of larger objects be made with a large number of different views and these stitched together in IMRR or some other tool?

1.4 Evaluation of the Third prototype

The ARCO third prototype has been demonstrated at the third Museum User Trial held at Michelham Priory on 27th – 28th November 2003 (see next figures)

Figure 1: ARCO people at work during the MUT #3

Feedbacks gathered from the two museum pilot sites, VAM and SussexPast. served two evaluate the different components of the prototype, namely:

- Object Modeller (OM);
- Interactive Model Refinement and Rendering (IMRR);
- ARCO Content Management Application (ACMA) and Augmented Representation InterFace (ARIF).

According to the methodology defined in 1.1, the museums expert were requested to answer to some questionnaire specifically prepared for the Museum User Trial.

The result of the exhaustive evaluation is reported in the Appendex B – MUT #3: Evaluation results.

Some statistics from analysis of the evaluation results are reported in the following charts.

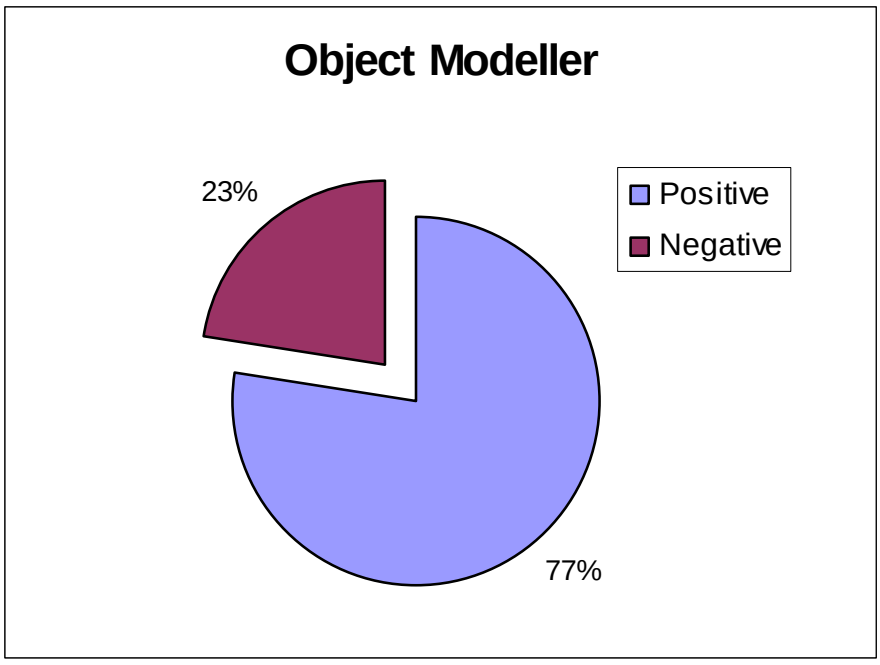


Figure 2: Positive and negative answers about the Obejct Modeller

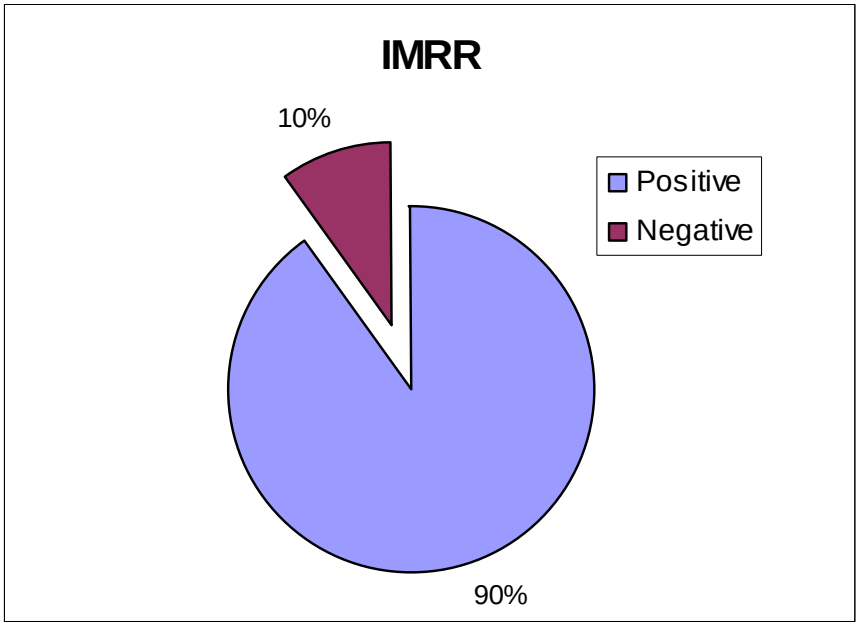


Figure 3: Positive and negative answers about IMRR

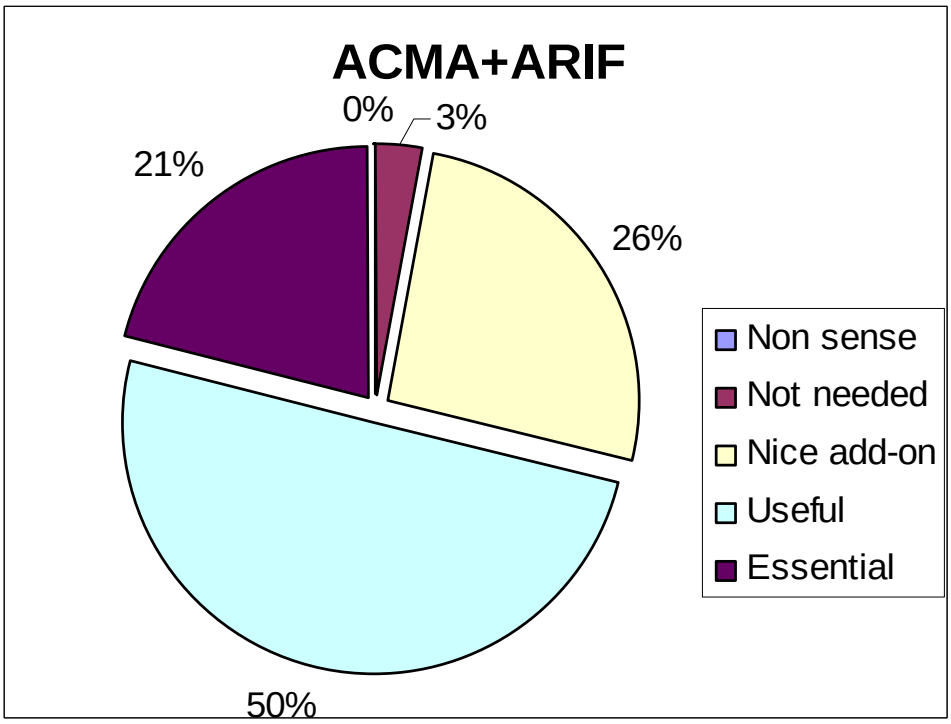


Figure 4: Utility of the functionality of the ACMA+ARIF

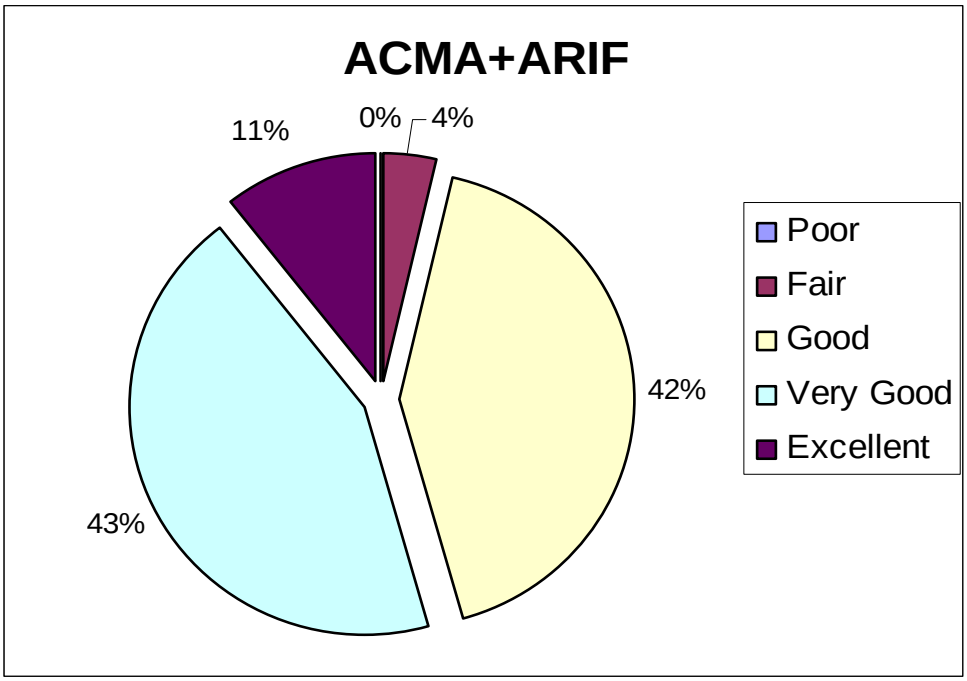


Figure 5: How implemented functionalities of the ACMA+ARIF have been evaluated

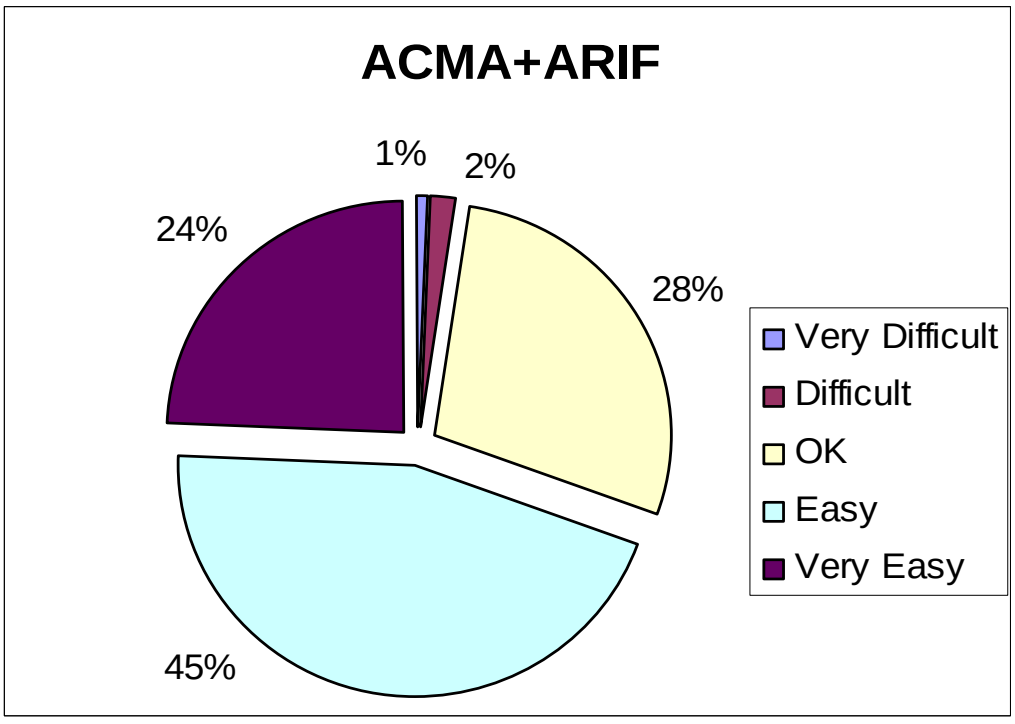


Figure 6: How usability of the ACMA+ARIF functionalities have been evaluated

2. Evaluation of the Final System

2.1 Performance Evaluation

This session aims to present the performance evaluation of the final system component Object Modeller (OM). This tool enables to build 3D textured models of artefacts. The output consists in a 3D mesh (set of 3D points and 3D faces) and in texture images (mapped on the 3D faces).

System performances are analysed from a metrological point of view. This technical analysis has to show the capabilities and the limits of the system. This analysis is independent of the field of application and gives the intrinsic potential of the system.

The final OM prototype enables the reconstruction of 3D models by non-expert staff. But, the prototype is still far of a commercial product. So the OM evaluation will be useful for specifying the improvement to carry into the industrial version of the OM.

2.1.1 Technical analysis

The objective of the technical analysis is to get some objective information on the capabilities of the OM system. This evaluation, tackled from a metrological point of view, is not exhaustive. However, it highlights the strengths and the weaknesses of the system and prepares the specification of the developments required to reach a competitive product.

The OM performances are compared to a commercial system using a similar technology: the Breuckmann TriTOS (http://www.breuckmann.com/HTML/engl/tritos.html). This system is composed of a single camera and a light projector. The presented performances are given by the commercial datasheet.

This technical evaluation studies the performance of the shape reconstruction and not of the texture extraction process. The quality of the model texture depends on the camera and on the photograph skill of the user. No objective evaluation of this part is done in this document.

2.1.2 Technical Evaluation

2.1.2.1 Planar reconstruction

In order to measure the OM characteristics, a fronto-parallel planar surface was reconstructed with the OM. The X resolution represents the distance between two successive points built along an image row (in fact it corresponds to the minimal distance between 2 stripes at the higher resolution). The Y resolution represents the distance between two successive points built along an image column. The X, Y resolutions are important parameters because it gives the level of detail that can be built on the object surface.

For the OM, the feature accuracy corresponds to the standard deviation of the distance between the reconstructed 3D points and the estimated plane. There is no information available on the way that Breuckmann results are obtained.

These performances may change with the observation distance between the plane and the system. We have set the system as the image diagonal represents 60 cm to be coherent with Breuckmann data.

	ARCO OM System	Breuckmann TriTOS
X resolution Y resolution	≈ 950 µm ≈ 400 µm	360 µm 360 µm
Feature accuracy	≈ 60 µm	60 µm
Speed	20 s	1s

Table 1: ARCO OM and Breuckmann performances

From this table, some comments can be derived:

- OM X, Y resolution is convenient with respect of the ARCO specification (under 1mm) but these parameters must be increased to get a competitive system.
- OM accuracy is in the same range than the Breuckmann system (see next section for further information).
- Acquisition speed (corresponding to the acquisition with structured light projection) is not decisive in ARCO application. Positioning the artefact and the acquisition system is longer than the acquisition. For example, considering a simple object built with 10 acquisitions, the full acquisition process is about 30 minutes long. The acquisition with structured light represents less that 10% of the total time. However, this feature must be improved to make the OM equivalent to the competitors and enable tackling others applications where time is a critical criterion.

2.1.2.2 Other considerations

The material of the object is a decisive parameter in a reconstruction process using optical system. Transparent surface are impossible to build. Specular surface (polished steel, varnish wood, glaze pottery...) can be build except around specular light spots. A Breuckmann reseller made a demonstration of this system to CEA people. The object proposed by CEA for this demonstration was an African statue (see Figure 7). During the demonstration, the reseller of the Breuckmann system had to cover the surface with chalk to suppress specular light spot. Of course, this technique cannot be applied with real museums' artefacts.

Figure 7: African statue considered for the Breuckmann demonstration

For estimating the influence of the surface nature, four different planes (white paper, black carton, raw steel, magnetic white board) were built with the OM and the results of the reconstructions are presented in

and Table 3. The accuracy is still given by the standard deviation of the distance of the 3D points to the estimated plane. The point ratio gives the percentage of built points: the resolution of the system depends on this ratio. Two configurations are available for the matching process: small or large correlation window. With small correlation window (7x7 pixel), the reconstruction is faster and less selective (higher point ratio). Using a larger window (21x21), the process is more selective and slower but may give more accurate result. These two configurations was tested with different material and the results are presented in Table 2 for small correlation and in Table 3 for large correlation window.

	White paper	Black cardboard	Raw steel	Painted steel (magnetic white board)
Accuracy	51 µm	23 µm	133 µm	61µm
Point ratio	45%	25%	37%	38 %

Table 2: Planar reconstruction with different material (small correlation window)

	White paper	Black cardboard	Raw steel	Painted steel (magnetic white board)
Accuracy	49 µm	24 µm	70 µm	50 µm
Point ratio (%)	25%	23%	25%	20 %

Table 3: Planar reconstruction with different material (large correlation window)

First, these results show mainly that this kind of system is very sensitive to the surface material. The better accuracy for reconstruction is obtained with dark object (Black cardboard) but the better point ratio (better resolution) is obtained with a light object (white paper). The results with the painted steel and the raw steel object are very good considering that the surface is very specular. This results shows that using large correlation window improve strongly the accuracy. (except for raw steel) but damage the point ratio.

For museums' staff, an important parameter is the time for modelling a complete artefact. In experiments done by CEA people, an average of 3 hours of an intensive work was necessary to build a complete 3D model. 1 hour is required for acquisition (15 views) and 2 hours for modelling (reconstruction, filtering, merging).

2.1.3 System enhancement

The analysis of the OM performances and the comparison with a commercial product show the parameters to improve in order to reach a very competitive system. This section presents some way of research to increase the performance level of the OM.

1°) Increasing the system resolution

In previous section, the X, Y resolution was the major weakness of the OM, even though it is respecting the ARCO specification Hereafter, some improvements are proposed to increase the resolution.

Some hardware modifications may increase the reconstruction resolution:

- **Increasing the projector performance.** The OM uses a basic video-projector. Recent products (DLP, LCD, LCOS) have to be analysed carefully in term of performances (resolution, contrast, brightness, volume, weight) but also of price, which are decreasing with the expansion of the video projector market (see a market overview at http://www.projectorcentral.com).
- **Increasing the camera performance.** Increase the resolution of the cameras, the lenses quality, or consider black and white cameras (cheaper and more convenient for detecting black/white strip interface) would increase the performance of the OM. Note that change for black & white camera would involve that texture acquisition will be done with an independent colour camera. This improvement of cameras would also have a positive effect on the accuracy of the system.

Some software modifications may increase the reconstruction resolution:

- The resolution can be increased by introducing high-level **image processing techniques** as phase shifting method. This interpolation technique enables to build 3D points between the strip interfaces. But, these techniques require more acquisition time and are sensitive to noise (risk of decreasing the accuracy).

Remark: increasing the system resolution will increase the size of the output mesh. Manipulating huge 3D model involve the use of dedicated software and very powerful computers.

2°) Increase the system accuracy

In spite of a basic hardware system, the original OM 3D reconstruction algorithm gives accuracy of the same range than the Breuckmann System one. An improvement of the system accuracy will give an added value to our system. Some solution to increase this accuracy is proposed hereafter.

Some hardware modifications may increase the reconstruction accuracy:

- **Design the stereo rig** with convenient material to have a more rigid system to keep the calibration parameters as accurate as possible.
- **Build a rigid link between the stereo rig and the projector**. The calibration of the relative position would give an interesting redundancy with the cameras epipolar geometry. This redundancy will increase the accuracy of the system.
- **Make a variable stereo rig.** The measurement volume and the accuracy are directly linked to the stereoscopic width and the view angle between the cameras. These parameters could be made adjustable with a variable stereo rig. The user might choose the configuration in function of the object size. A calibration process is required after each rig modification. An automatic calibration tool is required.

Some software modifications may increase the reconstruction accuracy:

- the calibration process and the matching process are the key points of the reconstruction accuracy. Make the present methods more precise, more robust would give better reconstruction result.

3°) Reduce the acquisition time

The time for shape acquisition (with structured light projection) is not optimised: a fine synchronization acquisition/projection coupled with a faster projector would decrease this time. Now, this process is around 20s and it could be reduced to 1s.

With the final prototype of the OM, a texture must be acquired for each shape acquisition. The acquisition would be speed up if the texture extraction was done in a separate process. It would avoid the change of lighting settings during acquisition. In this case, texture acquisition might be done with an independent camera from any points of view and the texture would be mapped on the mesh after the registration step. This new workflow would enable to use a very high-resolution colour camera for texture and use black and white cameras on the stereo rig for shape extraction (see sections on increasing resolution and accuracy). This separation would speed up the acquisition process and also optimise the texture extraction.

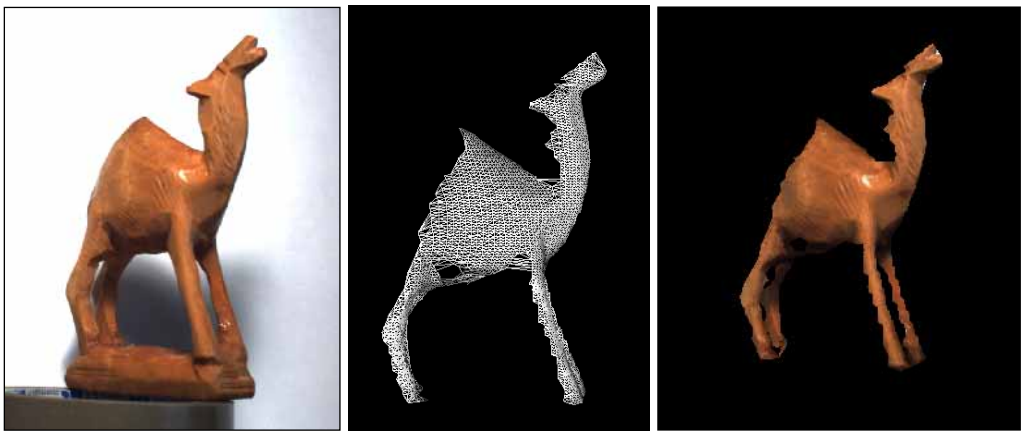
4°) Reduce the system sensitivity with respect to the object surface

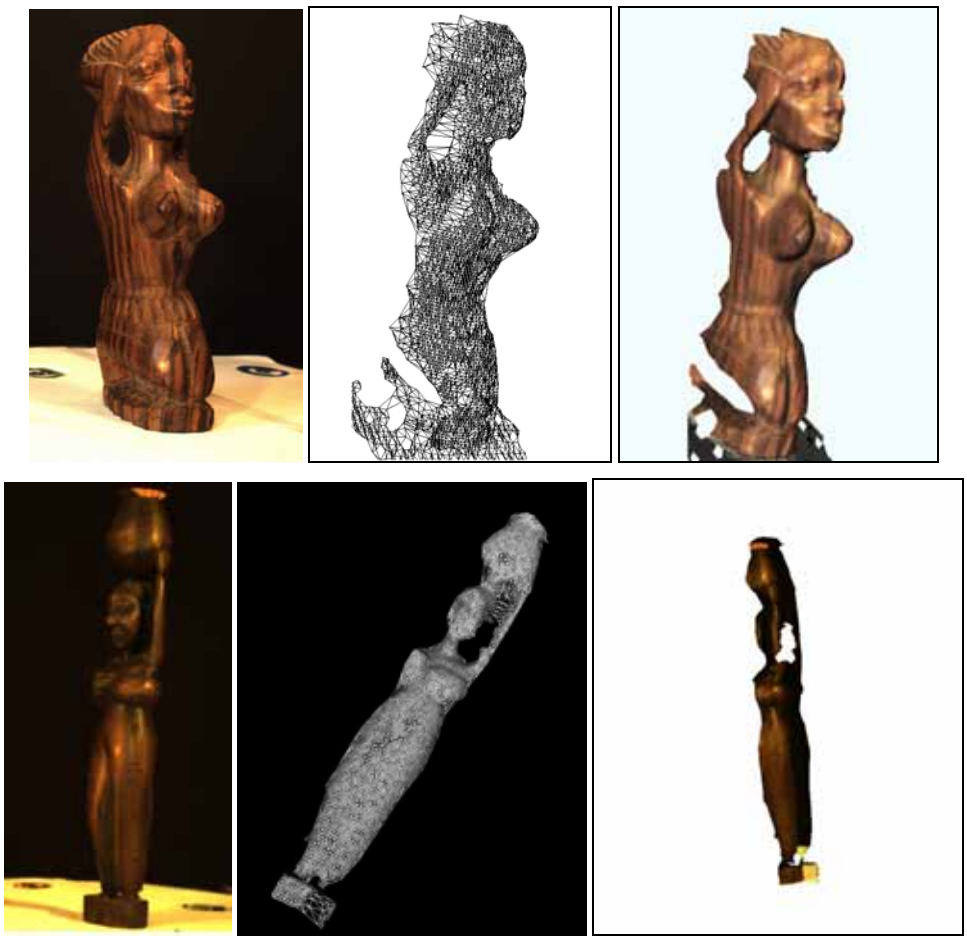
As all optical solution, the OM performance depends on the material of the surface (see section 2.1). With difficult surface, the projector light intensity must be adjusted (contrast, brightness). Manual settings may be delicate for the user. An automatic settings process could be made with projector driven by the computer.

The African statue demonstration has shown the sensitivity of the Breuckmann system with respect to the surface material. It seems that OM system is more robust that the Breuckmann system; this robustness is probably given by the use of a stereo camera system (only one camera with the Breuckmann system). The calibration of the projector position with respect to the cameras would increase this robustness.

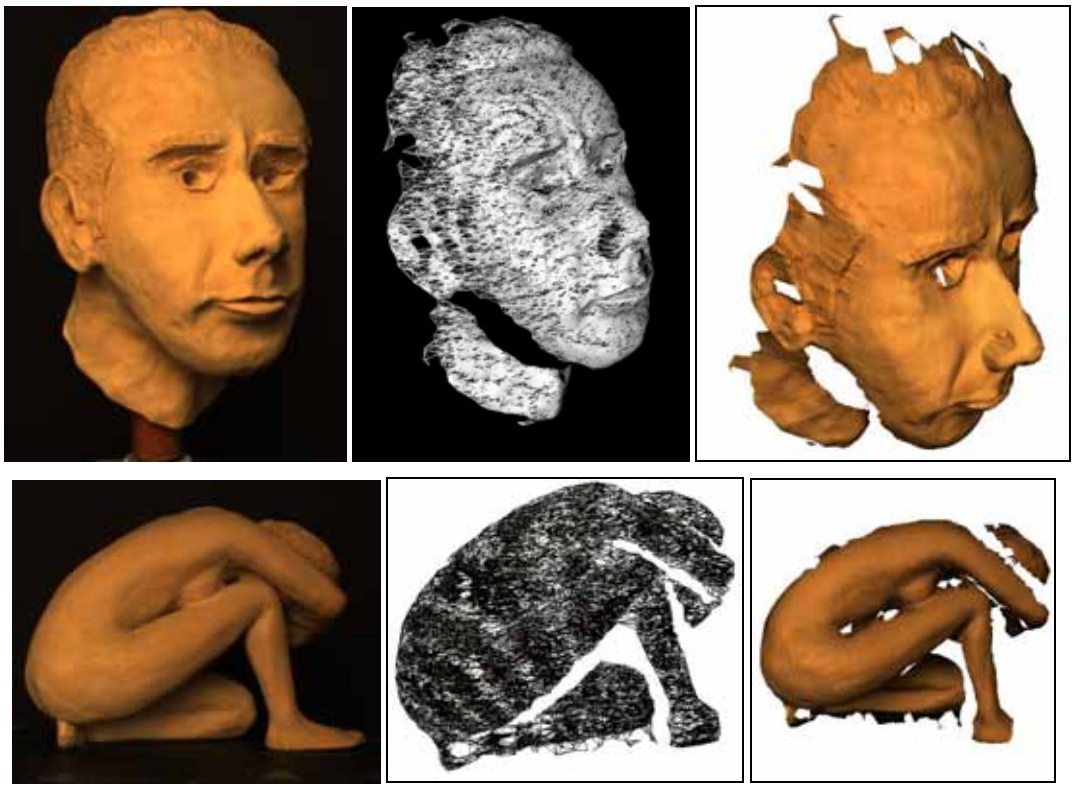
Hereafter, examples of reconstructions performed with the OM on different type of surface are presented.

Varnish wood

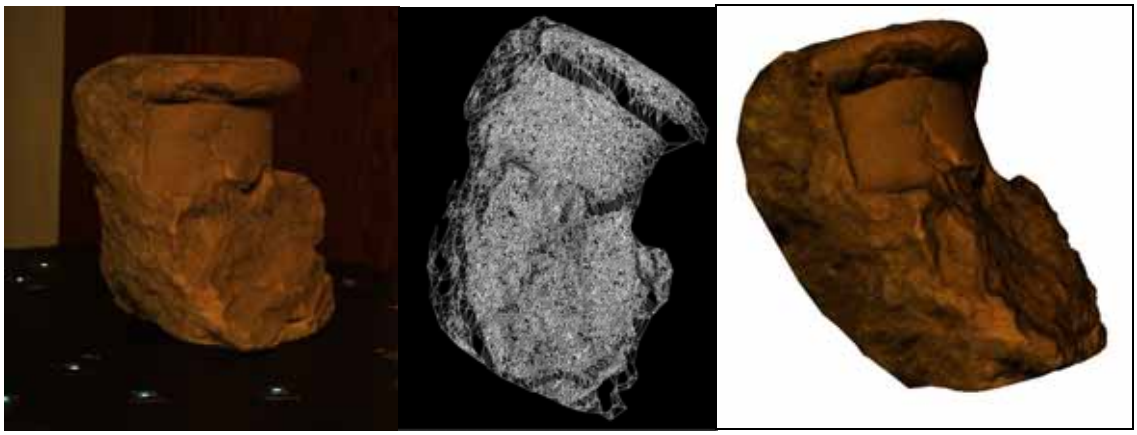




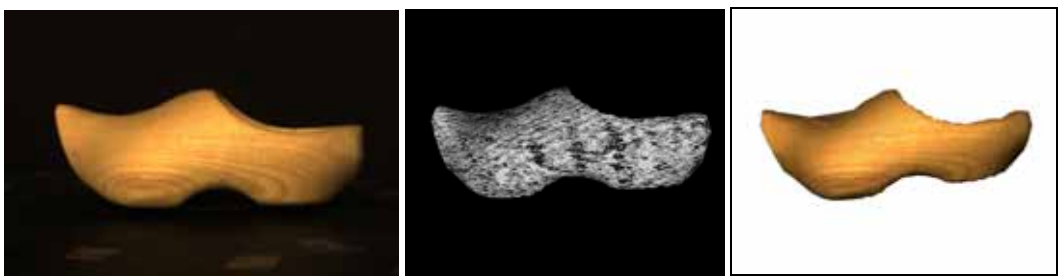
clay figurine



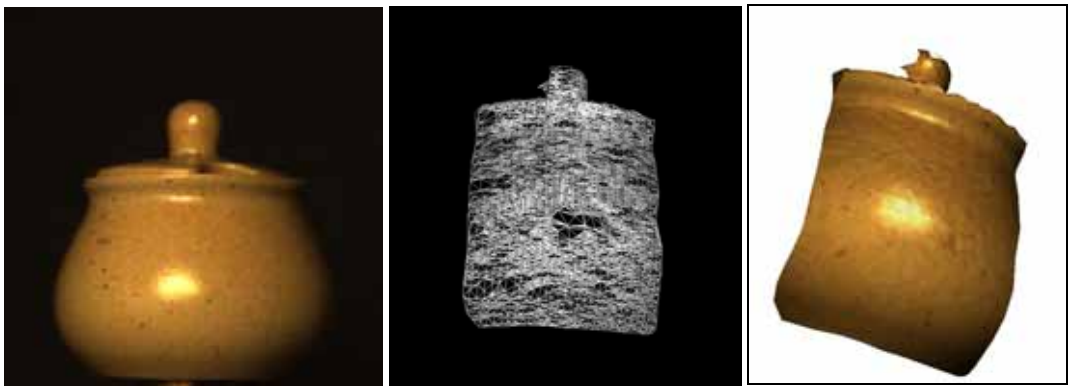
stone



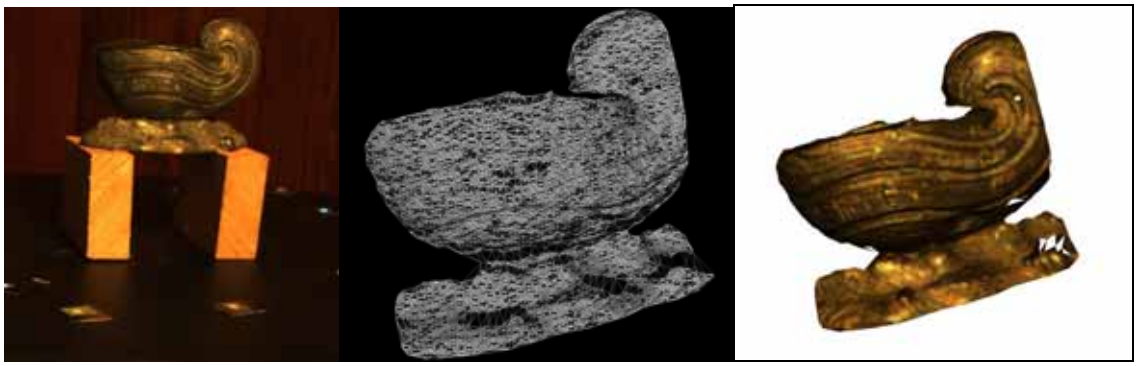
rough wood



Glaze pottery



Metal



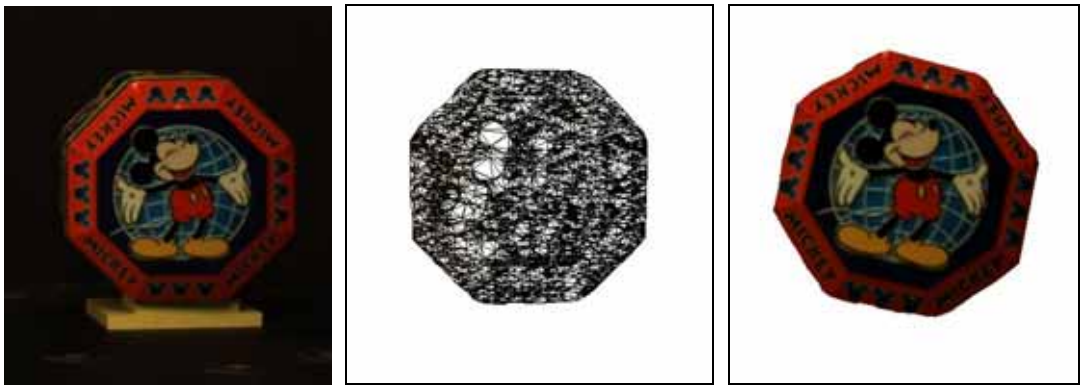


Figure 8: Image (left), 3D mesh (centre), textured model (right) of different models build with the ARCO Object Modeller

5°) Increase the quality of the extracted texture

Make an independent process for texture extraction could carry an improvement of texture extraction (see section 3). Algorithm for texture equalisation would also improve the reconstruction result. This tool could be integrated in the IMRR tool.

2.1.4 Conclusions

One of the objectives of the ARCO project was to develop a system, the Object Modeller, for 3D modelling of artefacts. In the project, specifications give the following constraints:

- the measurement volume was specified as a 30cmx30cmx30cm cube,
- the level of details of the model must be around 1mm,
- the system must be able to reconstruct the wider range of surface type,
- the system must be easy to use,
- the modelling process must be as fast as possible.

The technical OM evaluation results presented in this document show that the volume of measurement, the resolution, and the accuracy are in the bound defined by the ARCO project specifications.

2.2 AMS Evaluation

This session presents the result of the assessment and evaluation of the AMS. Museums experts answered to a set of questions prepared to collect museum feedbacks on the metadata used in the final system.

2.2.1 Types of Metadata

The AMS comprises several different types of metadata which are used for differing purposes throughout the ARCO system.

- Curatorial Metadata
- Resource Discovery Metadata
- Technical Metadata
- Administrative metadata
- Intelligent grouping
- Presentation

The AMS aims to fulfill several goals including that of providing curatorial support in the management of digital surrogates of museum artefacts. One of the major goals of the information recorded is to support the whole process from digital capture to presentation of artefacts in a virtual environment. However, to manage a repository of digital assets requires that adequate administrative, descriptive, resource discovery, presentation and technical metadata be recorded. In developing the AMS we have also tried to take account of issues relating to museum best practice, interoperability and appropriate standards.

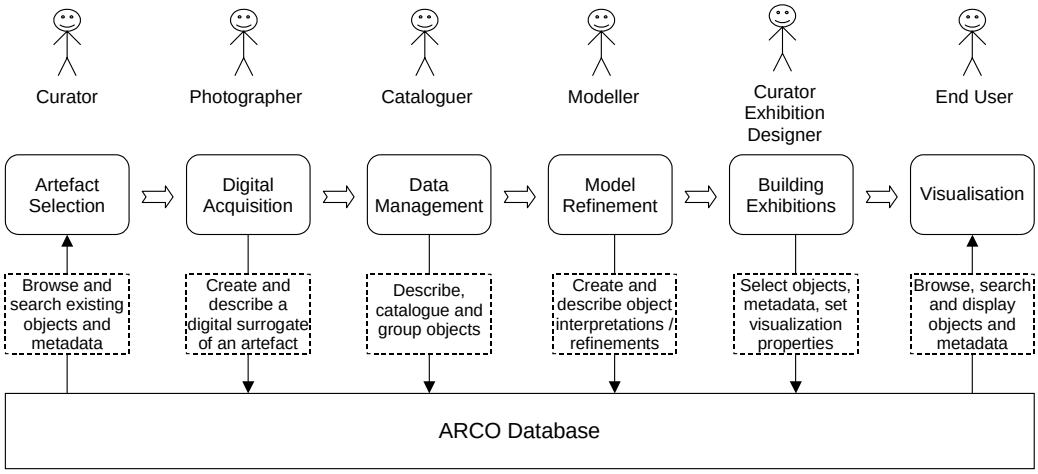


Figure 9: ARCO users, processes and metadata relation operations

Figure 9 shows the pipeline of processes involved in the digital capture of museum artefacts and their visualisation in a virtual environment. It also provides an indication of the related metadata operations in the system.

2.2.2 The ARCO Data Model

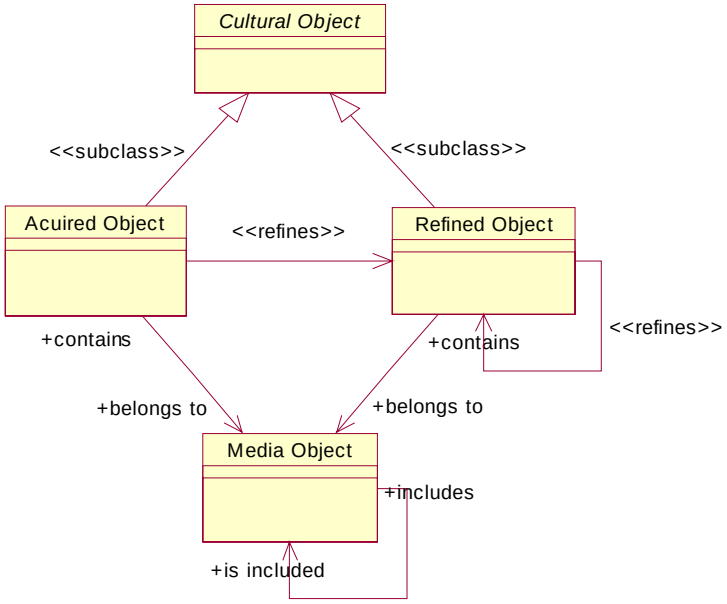


Figure 10: The ARCO Data Model

In order to meet the functional requirements of the ARCO system the data model depicted in Figure 10 was developed. The model describes the entities, as well as their relationships, which are involved in transforming a physical artefact into its digital form. We define a class, Cultural Object (CO), as an abstract representation of a physical artefact. This surrogate object is represented in terms of descriptive metadata, which provides a reference back to actual museum holdings. There are also two non-abstract entities, which are subclasses of the CO: the Acquired Object (AO) and the Refined Object (RO).

An AO is a digitisation of the physical artefact used in the ARCO system, whilst the RO is a refinement of an AO or another RO. There may be more than one RO created from a single AO or RO.

Digital representation of a CO (i.e. AO or RO) may be composed of one or more Media Objects (MO). The MOs are representations of the CO in a particular medium represented by some MIME type. Examples of MOs are *3D Model*, *Simple Image*, *Panoramic Image*, and *Description* – each with differing MIME types. An RO may inherit MOs from the CO it refines, and may add new ones.

2.2.3 User Groups

The following list illustrates the user groups that use AMS at different stages of the pipeline and in various use cases:

- Museum User
  - Curatorial
  - Cataloguer
  - Digital Photographer
  - Object Modeller

- Object Refiner
- ARIF Content Designer

- End User
  - Local AR interface User
  - Local Web Interface User
  - Remote Web Interface User

2.2.3.1 User Requirements for AMS

The following list of user requirements (based on prototype 3) target the AMS as an entity and **not** the ARCO interfaces that are used in order to manipulate AMS content.

Ref No.	Requirement
UR7.1	The AMS should include administrative, curatorial, and technical metadata
UR7.2	Administrative metadata should record when metadata changes are made and by whom
UR7.3	Curatorial metadata should conform to standards where appropriate and current museum best practice
UR7.4	Technical metadata should conform to standards where appropriate and current museum best practice
UR7.5	Resource discovery metadata should conform to standards where appropriate and current museum best practice
UR7.6	All metadata should conform to content guidelines
UR7.7	ARCO should adopt existing metadata systems or standards, e.g. DC, CIMI, where appropriate
UR7.8	Virtual exhibition metadata should allow grouping of cultural objects into virtual exhibitions; giving the impression of objects having intelligence

2.2.4 Assessment and Evaluation of the AMS

Section A. Personal information

1. Which broad category of user do you consider yourself to belong to **(Please tick only one)?**

Cataloguer	☐
Museum or Curator	
Digital Photographer	✓
Object Modeller	☐

Object Refiner	□
ARIF Content Designer	□
End User	□

Section B. Administrative metadata

2. Does the AMS record an adequate amount of administrative data?

Yes

Section C. Curatorial metadata

3. Does the AMS record an adequate amount of curatorial information? If not, please indicate the information that in your opinion is missing

No. Would need to match exactly the data held in legacy databases held in the museums. More recent mapping exercises that using the CIDOC CRM may be useful in making these maps. For the V&A in the recent life of the ARCO project we have developed what we refer to as 'public access' information. This is particularly useful within an ARCO system. The development of the metadata schema should naturally be an area of open development where eventually a user would be able to change a schema to suit their own needs.

Section D. Technical metadata

4. Does the AMS adequately describe an acquired object? *No*

5. Does the AMS adequately describe a refined object?

   No would need to record who refined the object and the date of their action.

6. Does the AMS adequately describe a media object? *Yes*

7. Does the AMS record sufficient information to describe a Simple image Type? *Yes*

8. Does the AMS record sufficient information associated with a media object type of 3D studio Max Project?

   No. This should also include, dimensions, views, animation actions, source, eg CAD etc.

9. Does the AMS record sufficient information associated with a media object type of VRML?

   No. It would be useful to include the number of triangles.

Section E. Resource Discovery metadata

10. Please indicate how each of the following elements could be used. (An element may have zero or multiple functions)

Element	**Search**	**Browse**	**Display**

Source	✓	☐	☐
Name	✓	✓	✓
Name Alternative	✓	✓	✓
Creator	✓	☐	☐
Contributor	✓	☐	☐
Date Created	✓	☐	☐
Type	✓	☐	☐
Description	✓	✓	✓
Completeness	☐	☐	✓
Condition	☐	☐	✓
Production Period	✓	✓	✓
Production Method	✓	✓	✓
Format Medium	✓	☐	☐
Dimensions	✓	☐	☐
Coverage Spatial	☐	☐	✓
Components	✓	☐	✓
Rights	☐	☐	✓
Owner	✓	☐	✓

11. Please indicate how each metadata element of an Acquired Object could be used. (Each element may have zero or multiple functions**)**

Element	**Search**	**Browse**	**Display**
Identifier	✓	☐	☐
Name	✓	☐	✓
Publisher	✓	☐	✓
Creator	✓	☐	✓
Contributor	✓	☐	☐
Date Created	✓	☐	☐

Description	✓	□	✓
Rights	✓	□	✓
Format	✓	□	□
Format Extend	✓	□	□

12. Please indicate how each metadata element of a Refined Object could be used. (Each element may have zero or multiple functions)

Element	**Search**	**Browse**	**Display**
Identifier	✓	□	□
Name	✓	□	✓
Publisher	✓	□	✓
Creator	✓	□	✓
Contributor	✓	□	□
Date Created	✓	□	□
Description	✓	□	✓
Rights	✓	□	✓
Format	✓	□	□
Format Extend	✓	□	□
Refines	✓	□	□

13. Please indicate how each metadata element of a Media Object could be used. (Each element may have zero or multiple functions)

Element	**Search**	**Browse**	**Display**
Name	✓	✓	□
Type	□	□	✓
Subject	✓	✓	□
Description	✓	✓	✓
Date Created	✓	□	✓
Creator	✓	□	□

Format Extend	✓	☐	☐
Rights	✓	☐	☐

14. Please indicate how each metadata element of the media object of Simple Image Type could be used. (Each element may have zero or multiple functions)

Element	**Search**	**Browse**	**Display**
Technique	✓	☐	☐
Image Size	✓	☐	✓
Resolution	✓	☐	✓
Compression method	✓	☐	✓
Compression factor	✓	☐	✓
Colour depth	✓	☐	✓

15. Please indicate how each metadata element of the Media Object Type Panorama Image could be used. (Each element may have zero or multiple functions)

Element	**Search**	**Browse**	**Display**
Technique	☐	☐	☐
Number Of Images	☐	☐	✓
Step Angle	☐	☐	☐

Section F. Intelligent Grouping

16. Please which metadata elements you believe to be useful for grouping objects that make archaeological sense to curators. (You must tick only one answer for each element)

Element	**Yes**	**No**	**I don't know**
Source	✓	☐	☐
Name	✓	☐	☐
Name Alternative	✓	☐	☐
Creator	☐	✓	☐
Contributor	☐	✓	☐

Date Created	✓	□	□
Type	✓	□	□
Description	✓	□	□
Completeness	✓	□	□
Condition	✓	□	□
Production Period	✓	□	□
Production Method	□	□	□
Format Medium	✓	✓	□
Dimensions	✓	□	□
Coverage Spatial	✓	□	□
Components	□	□	□
Rights	□	✓	□
Owner	□	✓	□

Section G. Miscellaneous Questions

17. In your opinion is the AMS compatible with existing metadata standards?

    Generally it is, more fields will be needed as legacy systems expand.

18. In your opinion are the elements of the AMS compatible with the current museum practice? *yes*

19. Are the content guidelines for the AMS elements adequate?

    No. There needs to be more worked examples, particularly ones which use content which has been developed and entered directly in to the ARCO system.

Section H. AMS Schema Manager

The AMS Schema Manager is probably very easy to use after sufficient training by a metadata specialist.

ACMA Functionality	ACMA A&E Question	Who should answer

The AMS Schema Manager is used to manage XML Schemas in the ARCO database. **UR5.16**: It must be possible to edit cultural object metadata structured according to the AMS schema **UR5.17**: It should be possible manage AMS XML schemas stored in the ARCO database **UR5.18**: Possibility of defining different versions of AMS schema for different media object types is desirable	How do you assess the user interface? (very good/ good/sufficient/ poor) ***Answer:*** *Good* Use of rollover guides would help	Museum User
	What do you think about multiple versions of AMS schema? (good solution/ should be just one/only current version would be enough) ***Answer:*** *My feeling is that only current system is sufficient.*	Museum User

2.3 Usability Evaluation

The purpose of this session is to report the assessment and evaluation results on the usability of the final prototype of the ARCO ACMA and ARIF components from a user's perspective. The assessment and evaluation (A&E) has been carried out using a number of different questionnaires tailored for each component. Two different user groups took part in the evaluation process: curatorial users and end users. The former are employees from different disciplines within a museum (referred to as curators) whereas the latter are potential virtual museum visitors. In this case, 10 curators from Victoria and Albert Museum (VAM) were invited to test the system along with 29 end users who were mostly students.

The A&E was focused on the following ARCO components:

- ARCO Content Management Application (ACMA)
    - Completed by the VAM curators
- Augmented Representation InterFace (ARIF)
    - Completed by the VAM curators
    - Completed by the end users
- Virtual Museum Exhibition
    - Completed by the end users

The chapter is organised as follows: next session provides a short description of the two main components of the ARCO Final system (ACMS and ARIF), session 2.3.2 describes the methodology adpted for the evaluation. Session refers to the questionnaires used in the A&E process 2.3.3. Session 2.3.4 summarizes the results of the interesting evaluation.

2.3.1 Components description

2.3.1.1 ACMS component

The ARCO Content Management System (ACMS) is the central component of the ARCO architecture. It consists of two subcomponents: ARCO database and ACMA – ARCO Content Management Application.

The ARCO database is the central repository used to store all persistent data produced and processed by ARCO tools. The data comprise digital representations of cultural artefacts including all multimedia objects, virtual exhibitions, 2D and 3D visualization templates, etc. All objects stored in the database are described by XML-based metadata records.

Data may be imported and exported from the ARCO database in various formats including XML for maximum interoperability.

The ARCO database is based on Oracle 9i ORDBMS. Application of an advanced database management system to store all the data needed in the ARCO system provides the ARCO system with features which otherwise would be either impossible to implement or prohibitively difficult and expensive. These features include:

- remote and local access to data repository,
- concurrent access of multiple users,
- data consistency enforced by database structure,
- access privileges for different users and groups,
- fine-grained object access rights for users and groups,

- backup and recovery of data, and
- advanced indexing and search capabilities including full text search on XML metadata records.

These features greatly improve the overall quality of the ARCO system and positively influence its competitiveness on the market.

The ACMA tool enables efficient and user-friendly management of all data stored in the ARCO database. ACMA is composed of several data managers specialized in managing different types of data.

Example managers are Cultural Object Manager for managing virtual representations of cultural artefacts, Presentation Manager for managing virtual exhibitions, Template Manager for managing visualization templates, and Template Object Manager for managing multimedia data. ACMA is implemented in Java.

An important feature of the ARCO database and the ACMA tool is their extensibility that allows users to extend the set of data types supported by the system and the structure of their metadata descriptions without modifying the database schema or the application code. This feature allows museums to customise the system for their specific needs both at the current time and in the future.

Data stored in the ARCO database may be automatically published on the Web via ARIF X-VRML Server in the form of 2D and 3D virtual galleries using the ACMA Presentation Manager.

The ARIF component is a presentation or visualisation framework that consists of several subcomponents.

1. ARIF Exhibition Server
    - Data stored in the ARCO Database are published on the visualisation interfaces via the ARIF Exhibition Server.
    - Future lightweight products will also serve data stored in an XML repository (a well defined network file system) to the visualisation interfaces via an ARIF Exhibition Server.
2. ARIF Presentation Domains—Web browser functionality
    - For web based presentations using VRML and HTML. The ARIF component is currently composed of presentation domains that are extendable, currently three domains are implemented and referred to as the Web ARIF end-user interfaces: WEB LOCAL, WEB REMOTE and 3D Gallery. The WEB LOCAL domain is appropriate for ARIF contents displayed on touch-screen displays installed inside museums, for example in museum kiosk displays. Here, the museum can dedicate high quality resources such as better processing PCs and graphics card as well as touch screen displays and other interaction devices. The WEB REMOTE domain is appropriate for ARIF contents accessed remotely over the Internet by the use of a web browser. Here, the quality of the graphics may be lower because the museum cannot determine the quality of the end user hardware. The 3D gallery domain allows the museum to build a virtual environment to display virtual objects, examples are: ‘Victoria and Albert’ gallery, ‘Anne of Cleves’ gallery and ‘Fishbourne Roman Palace’ gallery.
3. ARIF AR—Augmented reality functionality

Provides an AR based virtual museum exhibition experience on a touch screen in the museum using table-top AR based learning experiences, e.g. AR quizzes, or games, etc. Currently, the

AR functionality is provided as an extension to the Web Local and Web Remote presentation domains.

2.3.1.2 ARIF Component

The ARIF component is a presentation or visualisation framework that consists of several subcomponents.

4. ARIF Exhibition Server
    - Data stored in the ARCO Database are published on the visualisation interfaces via the ARIF Exhibition Server.
    - Future lightweight products will also serve data stored in an XML repository (a well defined network file system) to the visualisation interfaces via an ARIF Exhibition Server.
5. ARIF Presentation Domains—Web browser functionality
    - For web based presentations using VRML and HTML. The ARIF component is currently composed of presentation domains that are extendable, currently three domains are implemented and referred to as the Web ARIF end-user interfaces: WEB LOCAL, WEB REMOTE and 3D Gallery. The WEB LOCAL domain is appropriate for ARIF contents displayed on touch-screen displays installed inside museums, for example in museum kiosk displays. Here, the museum can dedicate high quality resources such as better processing PCs and graphics card as well as touch screen displays and other interaction devices. The WEB REMOTE domain is appropriate for ARIF contents accessed remotely over the Internet by the use of a web browser. Here, the quality of the graphics may be lower because the museum cannot determine the quality of the end user hardware. The 3D gallery domain allows the museum to build a virtual environment to display virtual objects, examples are: 'Victoria and Albert' gallery, 'Anne of Cleves' gallery and 'Fishbourne Roman Palace' gallery.
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2.3.2 The Methodology Adopted

The questionnaires used to evaluate the above components were designed to address specific user requirements and determine whether these requirements are being met. Questionnaires include:

- Augmented Reality (AR) Questionnaire
- ARCO Virtual Museum Presence Questionnaire
- Questionnaire for User Interaction Satisfaction (QUIS)
- ACMA & ARIF Tutorial Questionnaire

In general, these questionnaires addressed issues such as:

- Navigation, both in the ACMA interface and an ARIF implemented virtual museum exhibition. It is concerned with the ability to move through the contents of an interactive program in an intentional manner.
- Interaction within a virtual museum exhibition

- Affordance, how interface attributes allow users to know how to use it, or at a simple level 'give a clue' how to use an element of the interface such as 'enter a value'
- Usability, a users perception of the interface
- Error handling

The document will provide a basic analysis of the results gathered and present them as Excel spreadsheets. In addition, future improvements to the system will be discussed. These are drawn from specific users' remarks.

2.3.3 The HCI measurement devices

The HCI measurement devices refer to the questionnaires used in the A&E process. These questionnaires are used to get some feedback from the different users that might interact with the system.

The feedback can then be interpreted as future improvements to the current system as will be explained in section 4.

The AR Questionnaire (adopted from Regenbrecht & Schubert) [Regenbrecht] measures the degree to which individuals experience the presence of virtual objects in a real environment. It has been developed to assess six different aspects:

1. The presence experience of the virtual objects in the real environment i.e. space.
2. The experience of having the virtual objects and the body in the same space
3. The experience of the realness of the virtual objects
4. The synaesthetic experiences and behavioural confusion
5. The control experience over the interaction
6. The experienced effort for mental interpretation

This questionnaire is completed by the end users, and a qualitative and quantitative statistical analysis will be performed using SPSS.

The ARCO Virtual Presence Questionnaire measures the degree to which individuals experience presence in a virtual museum exhibition. This was heavily modified from an existing presence questionnaire, which originally focused on immersive environments (hence the modifications). This is completed by the end users.

The QUIS questionnaire (adopted from Shneiderman) [Shneiderman] evaluates the different aspects of the ACMA and ARIF interface design. This includes the readability of characters, the meaningfulness of command names, the helpfulness of error messages and the layout of displays. This was slightly modified to fit the context.

This has been done by discarding some aspects of the questionnaire which did not relate to either ACMA or ARIF. This is completed by the VAM curators.

The ACMA & ARIF set of Tutorial Questionnaires map the original museum user requirements into appropriate A&E questions. These questions are designed to assess the success of each of the ARCO components at both the system level and the sub-component level.

This is completed by both the VAM curators and the end users (end users evaluate this because the AR is part of the virtual museum exhibition). The end user is only required to complete the augmented reality part of the questionnaire because they interact with ARIF and not ACMA.

The questionnaires can be found in Appendix A.

2.3.4 Evaluation Results

The responses gathered from each of the questionnaires were collated into Excel spreadsheets. In general, the analysis revealed that the system is usable, helpful and enjoyable.

Regarding the presence questionnaire, most of the participants enjoyed navigating through the virtual museum website which includes the manipulation of the cultural objects. The results can be found in the Table below.

ARCO Virtual Museum Presence Questionnaire

Question No.	Questions	Answers							Total
		1	2	3	4	5	6	7	
1	To what extent do you use a computer in your daily activities? (not at all/very much)	0	0	0	2	0	6	21	29
2	Have you ever experienced virtual reality, augmented reality, 3D applications or games? (never/a great deal)	1	0	2	5	4	8	9	29
3	Please rate your sense of being in the virtual museum, on the following scale from 1 to 7, where 7 represents your normal experience of being in a museum. (not at all/very much)	0	1	5	5	11	6	1	29
4	When you think back about your experience of touring the virtual galleries, do you think of them more as images that you've seen, or more as somewhere that you visited? (images I've seen/a place that I visited)	4	2	5	8	4	5	1	29
5	While browsing through the virtual museum galleries, which were the strongest on the whole your sense of being in the virtual gallery or of being elsewhere? (being elsewere/being there)	1	1	3	1	11	10	2	29
6	During the time of the experience, did you often think to yourself that you were actually in the virtual museum? (not very often/very often)	3	2	8	3	6	5	2	29
7	Did the various multimedia contents, such as videos, sounds, texts and images help you with a better understanding of the virtual museum? (not at all/very much)	0	0	0	3	6	10	10	29
8	When you think back about your experience of manipulating the 3D virtual artefacts, how close to the real artefact do you think it was? (not very close/very close)	2	1	1	7	7	8	3	29
9	How intuitive was it to navigate through the virtual museum website?	0	0	4	4	4	12	5	29

	(not at all/very much)								
10	Were you involved in the virtual museum experimental task to the extent that you lost track of time? (not at all/very much)	2	4	3	12	5	2	1	29
11	Overall, how well do you think that you achieved the virtual museum experimental task? (not very well at all/very well)	0	0	3	4	5	9	8	29

The AR questionnaire showed moderately different results.

Here, the responses were varied through the Likert scale regarding previous experience with AR, with the larger group having little experience, but with a surprising few suggesting they had some experience?

Where did they get this AR experience?

Are they confusing AR with gaming experiences?

Participants perceived the interaction with the SpaceMouse – an input device for manipulating cultural objects in the AR environment – to be very good.

Participants also felt that their hands feel like their own rather than something strange or foreign and most of them were able to naturally interact with their hands in the AR environment.

In addition, around twenty one participants showed their enthusiasm for trying similar technologies in the future.

The results can be found in the Table below.

Augmented Reality Questionnaire

Question No.	Questions	Answers							Total
		1	2	3	4	5	6	7	
	Questions about your previous experience								
1	Have you had any previous experience with Virtual Reality? (none/many)	2	3	5	0	9	8	2	29
2	Have you had any previous experience with Augmented Reality? (none/many)	12	5	4	3	1	3	1	29
3	Have you had any previous experience with Computer Games? (none/many)	0	2	0	1	7	6	13	29
	Questions about how you experienced the demonstration								
4	When using the SpaceMouse as an interaction device, how did you perceive the interaction to be? (bad/very good) *	0	4	1	4	7	6	6	28
5	When you were in the augmented environment, did your hands feel like your own or did they feel strange/foreign? (foreign/my own hands)	0	1	2	2	4	9	11	29
6	Were you able to naturally interact with your hands in the augmented environment? (no, it felt strange/yes, just as in the real world)	0	0	2	5	8	10	4	29

7	Were you able to move your hands intuitively or did you have to consciously control your motions? (intuitively/consciously)	3	4	6	2	7	3	4	29
8	Did you have the impression that the virtual artefacts belong to the real environment or did they seem separate from it? (belong to the real world/separate from the real world)	0	2	11	6	3	5	2	29
9	Was watching the virtual artefacts just as natural as watching the real world? (completely unnatural/completely natural)	1	1	6	5	8	7	1	29
10	Did you have the impression that you could have touched and grasped the virtual artefacts? (not at all/absolutely)	1	2	1	6	5	8	6	29
11	In case you attempted to grasp the virtual artefacts, were you surprised that they were not “real”? (not surprised/very surprised)	7	10	2	2	5	2	1	29
12	Did the virtual artefacts appear to be (visualized) on a screen or did you have the impression that they were located in space? (on a screen/in space)	4	3	2	5	4	8	3	29
13	Do you have the impression that the virtual artefacts were part of the real world? (not at all/yes, very much so) *	1	3	4	4	7	7	2	28
14	Did you have the impression of seeing the virtual artefacts as merely flat images or as three-dimensional objects? (only as images/as 3-dimensional objects)	0	0	0	0	2	14	13	29

15	Did you have the impression that the virtual artefacts were (located) in the same space as you? (not at all/yes, very much so)	2	1	2	2	4	13	5	29
16	Did you pay attention at all to the difference between real and virtual artefacts? (not at all/yes, very much so)	0	3	3	6	5	5	7	29
17	Did the virtual artefacts appear “real” to you? (not real/absolutely real)	2	3	3	1	15	3	2	29
18	Did you have the impression that the virtual artefacts were really there? (not at all/yes, very much so)	3	1	3	5	9	4	4	29
19	The virtual artefacts seemed almost to be real. (not at all/yes, very much so)	3	2	4	4	6	8	2	29
20	Did you have to make an effort to imagine the virtual artefacts as being three-dimensional? (not at all/yes, very much so)	12	5	5	0	2	3	2	29
21	Did you have the impression that the virtual artefacts had a weight, that they weighed something? (Remember: it is not about what was objectively true but how it felt to you during the interaction) (not at all/yes, very much so)	6	6	2	2	10	2	1	29
22	When you moved the virtual artefacts, did you have the impression of directly manipulating them or did it feel like you were controlling them indirectly through the computer? (directly/through the computer)	5	2	8	4	3	4	3	29
23	Did the virtual artefacts look realistic? (not at all/yes, very much so)	1	1	2	4	10	8	3	29

24	I was able to interact well with the virtual artefacts and I was able to move them the way I wanted. (not at all/yes, very much so)	1	0	2	2	7	8	9	29
25	I enjoyed manipulating and playing with the virtual artefacts. (not at all/yes, very much so)	0	0	0	0	3	11	15	29
26	I would try out the same or a similar technology again. (not at all/yes, very much o)	0	0	0	0	0	8	21	29

* missing information

The ACMA & ARIF tutorial questionnaire which end users were required to complete revealed some positive results.

Most of the comments were about the text accompanying the VRML model in the AR environment.

They regarded the text to be not very clear.

Participants also mentioned that the quality of both the 2D image and the 3D model should be improved. An example is illustrated in figure 1 below.

Figure 11: The VRML model, the 2D image and the text accompanying the cultural object in the AR environment

Participants were provided with a tutorial to guide them through the navigation of ARIF.

They found it easier when instructions are provided because both the concepts and terms are not self explanatory.

While observing the participants and recording their comments, most of them found it slightly difficult in the beginning but once they were familiar with the system, they were more at ease with using it.

The results can be found in the Table below.

ACMA & ARIF Tutorial Questionnaire (Augmented Reality Exhibitions)

Question No.	Questions	Answers 1	2	3	4	5	Total
1	**Visualisation of VRML Media Objects**						
1.1	Navigation through the hierarchy of Exhibition Spaces in the Web Browser is (very difficult/very easy) **Comments:** The navigation was not very clear. It would be preferrable to provide images representing the different links. You need someone to guide you through the navigation. It is not very clear the meaning of boxes. It should mention the type of boxes they are referring to. It is easier when explanation is provided.	0	2	7	11	9	29
1.2	Presentation of Media Objects associated with selected Cultural Object in the Web Browser is (poor/excellent) **Comments:** The collections of 2D images i.e. first photographic session should be displayed in a logical order according to angles and not randomly. It is very difficult to understand what the different icons represent. They do not match their purpose.	1	1	10	14	3	29
1.3	Selection of Media Objects for visualisation in the AR environment is (very difficult/very easy) **Comments:** It is easier when instructions are provided 2 Familiarity with the system eases using it. Will be lost without the tutorial provided. For example, navigation alone. This is specific for assigning objects to markers.	0	4	6	10	9	29
1.4	Assignment of Media Objects to markers using the toolbar is (very difficult/very easy) **Comments:**	0	4	6	11	8	29

	It would be helpful if some instructions were added to the website. Familiarity with the system eases using it. 2						
1.5	Navigation between the Web and AR browsers is (very difficult/very easy) **Comments:** It is easy if someone guides you for the first time. The use of normal browser icons to accomplish new tasks is not intuitive	0	2	8	9	10	29
1.6	Manipulation of objects in the AR environment using markers is (very difficult/very easy) **Comments:** A person should be very careful when holding the marker. A cadboard paper might be more appropriate.	0	1	3	18	7	29
1.7	Manipulation of objects in the AR environment using SpaceMouse is (very difficult/very easy) * **Comments:** It is a little bit tricky Someone should guide you for using the SoaceMouse. There was a problem with the SpaceMouse 2 The rotation mode in the SpaceMouse was difficult to control. Adjustment issues. It was very fast	1	5	8	9	5	28
1.8	Manipulation of objects in the AR environment using additional input devices (such as SpaceMouse) is (nonsense/essential) * **Comments:** It is useful but the SpaceMouse could not be used properly. The design of the SpaceMouse should be changed. It is not obvious for a novice user.	1	4	7	9	7	28
1.9	The process of removing objects from the AR environment is (very difficult/very easy)	0	2	4	11	12	29
2	**Visualisation of Cultural Objects**						
2.1	Presentation of Cultural Objects in the Web Browser is (poor/excellent)	0	0	8	14	7	29
2.2	Selection of Cultural Objects for visualization in the AR environment is (very difficult/very easy)	0	2	4	11	12	29

Comments:
Familiarity with system eases using it. 2
It is a little bit ambiguous

2.3	Assignment of Cultural Objects to markers using the toolbar is (very difficult/very easy)	0	3	5	7	14	29
	Comments Familiarity with system ease using it. 2						
2.4	Manipulation of Cultural Objects in the AR environment using markers is (very difficult/very easy)	0	2	2	16	9	29
2.5	Visualization of Cultural Objects in the AR environment is (poor/excellent)	0	1	10	12	6	29
	Comments: The quality of the 2D image is poor The font accompanying the cultural object in the AR environment is not clear enough. The contrast between the background and the text is poor. 2 The 2D image is not needed.						
2.6	Sound descriptions accompanying Cultural Objects in the AR environment are (nonsense/essential) *	0	2	10	13	1	26
	Comments: Sound descriptions are not needed provided there is enough information. It would be a good idea to add some cultural music There was no sound descriptions.						
2.7	What improvements would you suggest in the visualization of Cultural Objects in the AR environment?						
	When using the SpaceMouse, sometimes a particular mode is consistent. The VRML objects were very synthetic. The graphics could be improved and the scale control was a bit tricky. However, it is a good idea. It is not intuitive to assign objects to markers. The fonts representing the metadata in the AR environment should be clearer. The 2D photograph is not needed. The information accompanying the cultural object could have been presented in a better way.						

	The cultural objects should be less shaky and more professional. Some improvements on the object's texture in order to make it look more realistic. A different layout should be introduced because the existing one is not very intuitive. Sometimes, the existing outline is not clear. It seems that all items seem to move with different speeds when you navigate. The 2D image accompanying the cultural object should be improved. 2 Better display of the description of the cultural object. Cultural objects need to be more defined. Contrast between the background and the font. The use of a harder material for making the marker. Text issues. Enlarge font size.						
3	**Visualisation of collections of Cultural Objects**						
3.1	Selection of collections of Cultural Objects for visualization in the AR environment is (very difficult/very easy) **Comments:** The use of "List All" instead of "List" This feature is very useful Someone should guide you for the first time. A tutorial is needed to discover all these different functions. However, we do not follow a tutorial when we use to the internet. Familiarity with the system eases using it.	0	3	3	10	13	29
3.2	Assignment of entire collections to markers using the toolbar is (very difficult/very easy) *	0	3	1	13	11	28
3.3	Visualization of collections of Cultural Objects in the AR environment is (poor/excellent) **Comments:** There are too many objects to be viewed.	0	1	10	11	7	29
3.4	The process of browsing collections using the book is (very difficult/very easy) **Comments:**	0	1	2	2	24	29

	There was a bug when browsing the magic book.						
3.5	Sound descriptions accompanying the AR book scenario are (nonsense/essential) *	0	3	5	17	2	27
	Comments: Sound descriptions should be loaded once only. Not heard any sound descriptions						
3.6	The use of AR visualization in museum exhibitions is (nonsense/essential)	0	1	7	18	3	29
	Comments: Useful if the real exhibition was not in the available museum						
3.7	What improvements would you suggest in the visualization of collections of Cultural Objects in the AR environment?						
	The font is hard to read. The more objects there are, the harder it gets to view them. Suggestion: a grouping solution. The models should be more professional. Fixing the bug when browsing the magic book. Space issues. Objects should not overlap.2 Better spacing between the cultural objects make less intersections. Need a guide to use the system. Contrast between the background and the font. It is better to view the cultural objects using the magic book than having to view them as a collection. Allow rotation of the cultural objects in the AR environment using the SpaceMouse. Rotation is only allowed for the visualization of VRML media objects.						
4	**Learning Scenario**						
4.1	Educational usefulness of the learning scenario within a museum/class room is (poor/excellent)	0	0	5	13	11	29
	Comments: It brings students closer to the real objects.						
4.2	Presentation of questions in the AR environment is (poor/excellent)	0	0	7	17	5	29

	Comments: It would be better to have more contrast between the questions and the background. The colour of the questions need changing. The text is not very clear.						
4.3	Answering questions using double-sided markers is (very difficult/very easy)	0	2	3	15	9	29
	Comments: it would be a good idea to answer the questions by blocking the correct answer rather than turning over the markers. The smiley face did not work						
4.4	Integration of the Web and AR presentation is (poor/excellent)	0	0	8	10	11	29
4.5	The scoring mechanism is (nonsense/essential)	1	3	9	11	5	29
	Comments: Provide more explanation about to the scoring mechanism. For example, the number of correct and wrong answers. 2						
4.6	Sounds accompanying the learning scenario are (nonsense/essential) *	0	2	9	13	4	28
4.7	What improvements would you suggest in the interactive experience? It would be easier for the user if they did not have to turn over the markers in order to proceed to the next object. Just graphics. Provide a brief introduction to the quiz. For example, a clip or a movie. Give some hints for answering the quiz questions. Use a clapping hand instead of a smiley face to indicate a correct answer. Use different emotion icons. Make the quiz more mechanical. Improvements on markers sensitivity. When turning over the marker twice, you lose two points in the stroke. (Is this a bug in the system?). More details about the cultural object in the Web browser should be provided. The quality of the VRML model should be improved						

The font should be clearer. Suggestion: changing the font colour.
The font is not clear enough.
Should have more questions. It would be a good idea if users are first introduced to a gallery with different cultural objects
and then the questions asked in the quiz relate to the cultural objects introduced earlier.
Beneath the VRML model in the Web browser, some navigation buttons should be added. For example, zoom in, zoom out,
rotate, pan. The idea is taken from the Dell website (www.dell.co.uk).
Add a quit option to the quiz. Depending on the score, the final construction should be built. The higher the score is, the
bigger the construction.
Text issues. The interface needs more interesting colours.

* missing information

The responses obtained from the QUIS questionnaire were very promising. Most of them ranged between 5 and 8 in the Likert scale.

Most of the participants regarded the system to be wonderful, satisfying, stimulating, easy, have adequate power and flexible. Similarly, participants were happy about the windows in the ACMA tool.

This includes the display of the characters and the layout and the sequence of the windows. Participants regarded both the terminology and information used in ACMA to be context-specific.

Participants also thought that ACMA is quite a complex tool and it takes a while to absorb all the functions and to learn how to use it intuitively.

Two of the ACMA capabilities scored 10 out of 10. Theses are: “the ACMA tool is reliable” and “ease of operation depends on your level of experience”. The final aspect of the questionnaire deals with the multimedia presentation in ARIF. Participants were impressed with the AR exhibitions and the visualization of cultural objects.

However, some of them suggested some improvements to the design of the interface i.e. website. The results can be found in the Table below.

Questionnaire for User Interaction Satisfaction (QUIS)

	Questions	Total		Total		Total
Part 1:	**Past Experience ***					
	computer terminal	9	personal computer	9	laptop computer	9
	colour monitor	9	touch screen	9	floppy drive	9
	CD-ROM drive	9	keyboard	9	joy stick	9
	track ball	6	pen based computing	6	mouse	9
	graphics tablet	3	head mounted display	0	modems	8
	scanners	9	word processor	9	graphics software	7
	spreadsheet software	8	database software	9	computer games	6
	voice recognition	3	video editing systems	2	internet	9
	CAD (Computer Aided Design)	2	rapid prototyping software	1	e-mail	9

		Answers									Total
		1	2	3	4	5	6	7	8	9	
Part 2:	**Overall User Reactions**										
2.1	(terrible/wonderful)	0	0	0	0	1	2	5	1	1	10
2.2	(frustrating/satisfying)	0	1	0	1	1	2	4	1	0	10
2.3	(dull/stimulating)	1	0	1	0	1	3	2	1	1	10
2.4	(difficult/easy)	0	0	1	2	0	3	2	0	2	10
2.5	(inadequate power/adequate power)	0	0	0	0	2	0	6	2	0	10
2.6	(rigid/flexible)	0	0	0	0	0	2	6	2	0	10

Part 3:	**Windows in the ACMA Tool**										
3.1	Characters on the ACMA Windows (hard to read/easy to read)	0	0	0	0	3	0	4	2	1	10
3.1.1	Image of characters (fuzzy/sharp)	0	0	0	0	1	2	4	3	0	10
3.1.2	Character shapes (fonts) (barely legible/very legible)	0	0	0	1	1	1	3	3	1	10
3.2	ACMA window's layout were helpful (never/always)	0	0	0	0	1	4	4	1	0	10
3.2.1	Amount of information that can be displayed on ACMA windows (inadequate/adequate)	0	0	0	0	2	4	3	1	0	10
3.2.2	Arrangement of information can be displayed on ACMA windows (illogical/logical)	0	0	0	0	3	0	6	0	1	10
3.3	Sequence of ACMA windows (confusing/clear)	0	0	0	1	1	1	5	2	0	10
3.3.1	Next ACMA window in sequence (confusing/clear)	0	0	0	1	0	2	6	1	0	10
3.3.2	Going back to the previous ACMA window (impossible/easy)	0	0	0	0	3	3	2	2	0	10
3.3.3	Progression of work related tasks (confusing/clearly marked)	0	0	1	1	0	4	2	2	0	10
	Comments Sometimes it is hard to read especially when rotated and floating beside a 3D Model. Good when flat and facing reader. The system is configured for an experienced user. These will less experience will quite likely need more assistance than is given										
Part 4:	**Terminology and ACMA Information**										
4.1	Use of terminology throughout system (inconsistent/consistent)	0	0	1	0	1	3	3	2	0	10
	Comments: Abort vs. Cancel										
4.1.1	Work related terminology (inconsistent/consistent)	0	0	0	0	1	2	5	2	0	10
4.1.2	ACMA terminology (inconsistent/consistent)	0	0	0	0	0	3	4	3	0	10
4.2	Terminology relates well to the work you are doing (never/always)	0	0	0	5	3	1	0	1	0	10

4.2.1	ACMA terminology is used (too frequently/appropriately)	0	0	1	2	2	4	0	0	1	10
4.2.2	Terminology on ACMA windows (ambiguous/precise)	0	0	2	1	1	1	4	1	0	10
4.3	Messages which appear on ACMA windows (inconsistent/consistent)	0	0	0	0	1	2	4	3	0	10
4.3.1	Position of instructions on the ACMA windows (inconsistent/consistent)	0	0	0	0	0	2	6	2	0	10
4.4	Messages which appear on ACMA windows (confusing/clear)	0	1	0	1	1	4	2	1	0	10
4.4.1	Instructions for commands or functions (confusing/clear)	0	0	2	1	2	2	1	2	0	10
4.4.2	Instructions for correcting errors (confusing/clear)	0	0	0	1	5	2	2	0	0	10
4.5	Computer keeps you informed about what it is doing (never/always)	0	0	2	0	1	5	2	0	0	10
	Comments: Would be useful to have measure of work in progress (clock,etc.) to show work is progressing										
4.5.1	Animated cursors keep you informed (never/always)	0	0	0	2	3	3	2	0	0	10
4.5.2	Performing an operation leads to a predictable result (never/always)	0	0	0	1	1	3	4	1	0	10
4.5.3	Controlling amount of feedback (impossible/easy) *	0	1	0	0	4	3	1	0	0	9
4.5.4	Length of delay between operations (unacceptable/acceptable)	0	0	0	3	1	0	2	4	0	10
4.6	Error messages (unhelpful/helpful) *	0	1	0	0	2	4	2	0	0	9
4.6.1	Error messages clarify the problem (never/always) *	0	1	0	2	2	4	0	0	0	9
4.6.2	Phrasing of error messages (unpleasant/pleasant) *	0	0	1	0	3	1	3	1	0	9
	Comments It seems very abstract to beging with. For example, 'Media Object'. However, when you have a concept to link it to, it becomes easier. There is too much jargon/technical terminology throughout the										

system. It is very
unintuitive

Part 5:	**Learning the ACMA Tool**										
5.1	Learning to operate the ACMA Tools (difficult/easy)	0	0	1	2	0	3	3	1	0	10
5.1.1	Getting started (difficult/easy)	0	1	2	0	1	3	2	1	0	10
5.1.2	Learning advanced features (difficult/easy)	0	0	1	2	1	3	1	2	0	10
5.1.3	Time to learn to use the ACMA Tool (difficult/easy) *	0	0	0	3	0	3	2	0	1	9
5.2	Exploration of features by trial and error (discouraging/encouraging)	0	0	1	0	2	2	3	2	0	10
5.2.1	Exploration of features (risky/safe)	0	0	0	2	0	2	4	2	0	10
5.2.2	Discovering new features (difficult/easy)	0	0	1	1	1	4	0	3	0	10
5.3	Remembering names and use of commands (difficult/easy)	0	1	1	1	1	4	0	2	0	10
5.3.1	Remembering specific rules about entering commands (difficult/easy)	0	1	1	0	2	1	4	1	0	10
5.4	Tasks can be performed in a straight-forward manner (never/always)	0	0	1	1	0	3	3	1	1	10
5.4.1	Number of steps per task (too many/just right)	0	1	0	0	2	0	5	2	0	10
5.4.2	Steps to complete a task follow a logical sequence (never/always)	0	0	0	0	2	1	6	1	0	10
5.4.3	Feedback on the completion of sequence of steps (unclear/clear)	0	0	1	0	1	5	2	1	0	10

Comments

It's a complex tool but with training and practice, people would start to use it intuitively.

It would take quite a while to absorb it all.

The tool is quite complex. It needs more time and explanation than allowed in this
testing scenarion. Also a problem that language of tests did not always conform to that

used in the assessment questions. This made it difficult to know whether what you had
done or experienced was what was being queried

Part 6:	**ACMA Capabilities**										
6.1	System speed (too slow/fast enough)	0	0	0	0	2	1	4	2	1	10
6.1.1	Response time for most operations (too slow/fast enough)	0	0	0	1	1	0	6	1	1	10
6.1.2	Rate information is displayed (too slow/fast enough)	0	0	0	0	2	0	5	2	1	10
6.2	The ACMA tool is reliable (never/always)	0	0	0	0	0	3	5	2	0	10
6.2.1	Operations (undependable/dependable)	0	0	0	0	2	0	7	1	0	10
6.2.2	System failures occur (frequently/seldom)	0	0	0	0	2	1	3	3	1	10
6.2.3	ACMA warns you about potential problems (never/always)	1	0	0	2	3	2	2	0	0	10
6.3	Correcting your mistakes (difficult/easy)	0	0	0	1	2	6	0	1	0	10
6.3.1	Correcting typos (complex/simple)	0	0	0	1	0	3	2	2	2	10
6.3.2	Ability to undo operations (inadequate/adequate)	0	0	1	3	1	1	3	0	1	10
6.4	Ease of operation depends on your level of experience (never/always)	0	0	0	0	0	0	5	4	1	10
6.4.1	You can accomplish tasks knowing only a few	1	0	1	0	3	0	3	1	0	9
6.4.2	commands (with difficulty/easily) *										
6.4.3	You can use features/shortcuts (with difficulty/easily)	0	0	1	1	4	2	2	0	0	10

Comments
I feel operating this program would be almost full-time operation, otherwise too burden-
some

Part 7:	**Multimedia Presentation in ARIF**										
7.1	Quality of still pictures/photographs (bad/good)	0	0	1	0	2	2	2	1	2	10
7.1.1	Pictures/Photos (fuzzy/clear)	0	0	0	0	2	2	3	2	1	10
7.1.2	Pictures/Photos brightness (dim/bright)	0	0	0	0	2	2	4	0	2	10

7.2	Sound output (inaudible/audible) *	0	0	0	2	0	2	1	1	2	8
7.2.1	Sound output (choppy/smooth) *	0	0	0	2	1	1	0	2	2	8
7.2.2	Sound output (garbled/clear) *	0	0	0	0	2	2	0	2	1	7
	Comments:										
	No sound heard										
7.3	Colours used (unnatural/natural)	0	0	0	2	0	4	4	0	0	10
7.3.1	Amount of colours available (inadequate/adequate) *	0	0	0	2	0	2	3	2	0	9

Comments
Very impressive capabilities.
Still images were rather fuzzy here

* Missing information

The ACMA & ARIF tutorial questionnaire received various comments.

This is due to the fact that the curators are from different backgrounds and work within different departments.

The latter includes: records and collections services, word & image, learning and interpretation, furniture, textile and fashion, collection services and information systems services.

The comments offered by each participant reflected the nature of their profession.

Some of them did not have a high level of competence with using computers.

Curators found the Ctrl/Enter function for saving the data is not intuitive and does not follow a convention.

This function violates the affordance design principle mentioned in section 1. Another issue relates to the access rights window.

When granting the user the read and write access right, the user is supposed to close the window by clicking on the "x" button and the data will be automatically saved.

Users thought that this function does not comply with conventions where there is usually an "OK" or a "SAVE" button.

2.3.5 Conclusions

It can be concluded that the assessment and evaluation (A&E) of both ACMA and ARIF revealed positive results. As with every system, there are always positive and negative remarks. However, the system is proved to be usable if the positive remarks weigh more than the negative. Here, participants' remarks were mainly suggested improvements to the system rather than faults in the system itself. These remarks can be taken into account when reviewing the system and improving its functionality.

Some suggested improvements to the system include:

- Adding an "OK" or a "Save" button at the bottom of the access rights window so that users ensure that their selections are saved. This is illustrated in figure 2 below.

Figure 2: The access rights window

- Adding a "Save" button at the bottom of the internal metadata editor window rather than having to press Ctrl/Enter to save the data. This is illustrated in figure 3 below.

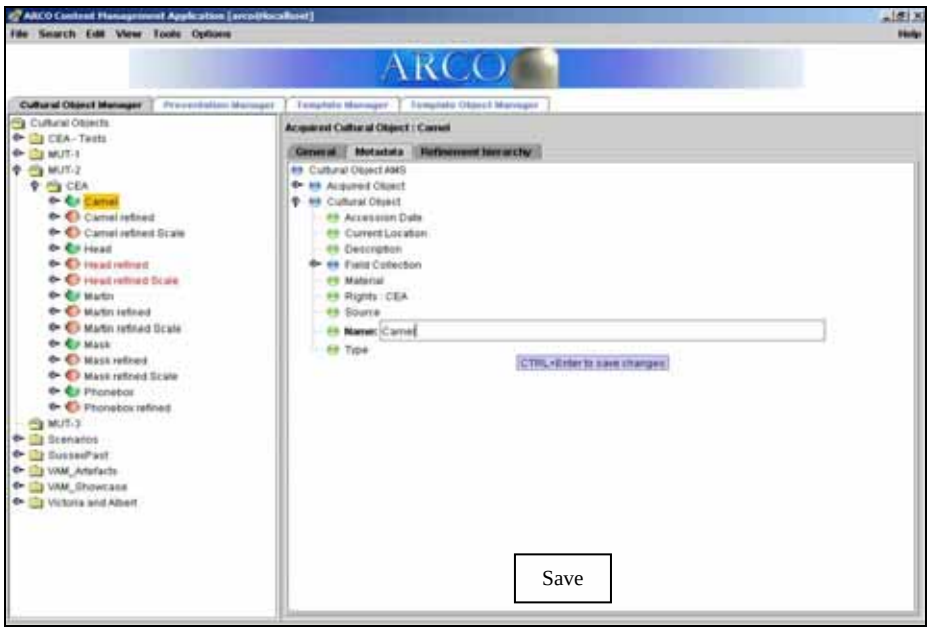

Figure 3: The internal metadata editor

- Adding a "Privilege Description" field on the other side of the window which provides few lines description of each of the ARCO privileges. For example, the *Access to ARIF* privilege enables to browse Augmented Reality Interface Folders. This privilege is mostly meant for providing secure access to ARCO data for public audience. This illustrated in figure 4 below.

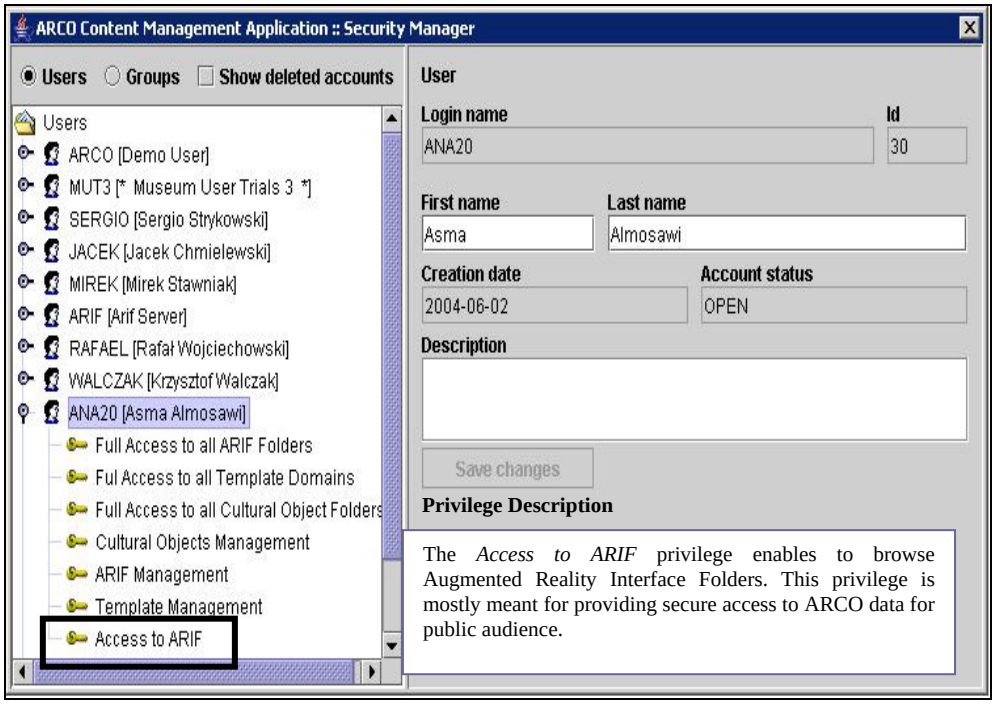

Figure 4: Description of the ARCO privileges in the Security Manager window

- Add some instructions at the bottom of the page informing the users that they can manipulate the VRML object. This feature is not obvious to novice users. This is illustrated in figure 5 below.

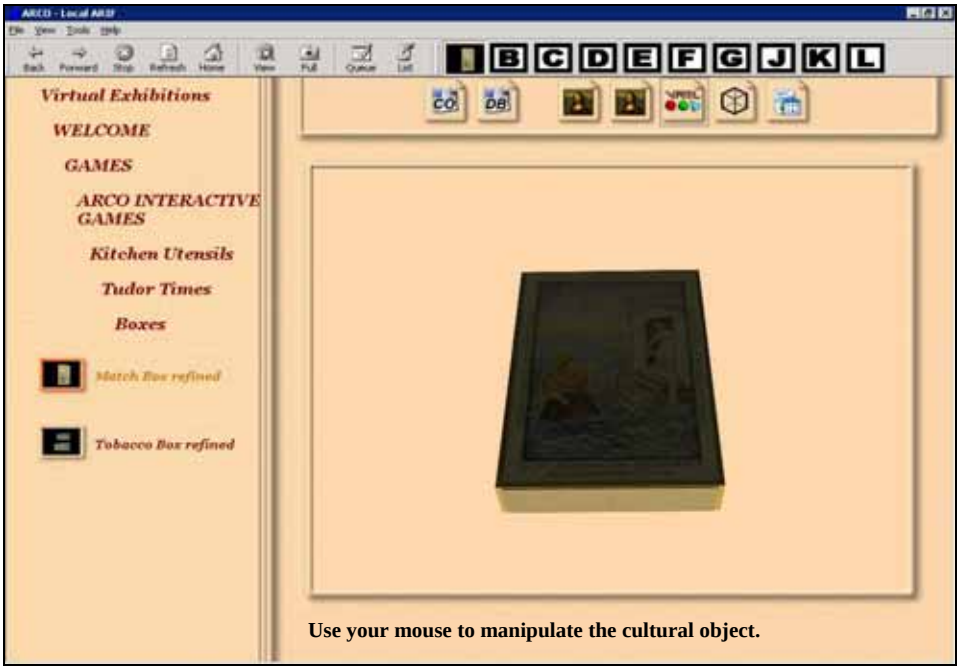

Figure 5: Adding some instructions to the ARIF interface

3. References

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4. Appendix

4.1 Appendix A: Questionnaires

4.1.1 ARCO Virtual Museum Presence Questionnaire

ARCO VIRTUAL MUSEUM PRESENCE QUESTIONNAIRE

INSTRUCTIONS

Thank you for taking a few minutes of your time to participate in our questionnaire. Filling out this questionnaire should take **5 to 10 minutes**. Please answer all the questions. You will answer the questions anonymously.

The following questions relate to your experience in the virtual museum exhibition.

Note: an ARCO virtual museum involves interacting with a Web3D environment, i.e. a set of web pages that contains several multimedia elements including virtual reality (i.e. virtual artefacts and tours through virtual galleries) and interaction with virtual artefacts in an augmented reality environment.

Please, circle the appropriate step on the scale from 1 to 7, for each question. In this questionnaire, the questions are of the following form:

Please rate how thirsty you are feeling at this moment

Not at all 1 2 3 4 5 6 7 very much

The mark close to ‘very much’ indicates that you are quite thirsty indeed.

QUESTIONS

To what extent do you use a computer in your daily activities?

Not at all 1 2 3 4 5 6 7 Very much

Have you ever experienced virtual reality, augmented reality, 3D applications or games?

Never 1 2 3 4 5 6 7 A great deal

Please rate your sense of being in the virtual museum, on the following scale from 1 to 7, where 7 represents your normal experience of being in a museum.

Not at all 1 2 3 4 5 6 7 Very much

When you think back about your experience of touring the virtual galleries, do you think of them more as images that you've seen, or more as somewhere that you visited?

Images I've seen 1 2 3 4 5 6 7 A place that I visited

While browsing through the virtual museum galleries, which were the strongest on the whole, your sense of being in the virtual gallery or of being elsewhere?

Being elsewhere 1 2 3 4 5 6 7 Being there

During the time of the experience, did you often think to yourself that you were actually in the virtual museum?

Not very often 1 2 3 4 5 6 7 Very often

Did the various multimedia contents, such as videos, sounds, texts and images, help you with a better understanding of the virtual museum?

Not at all 1 2 3 4 5 6 7 Very much

When you think back about your experience of manipulating the 3D virtual artefacts, how close to the real artefact do you think it was?

Not very close 1 2 3 4 5 6 7 Very close

How intuitive was it to navigate through the virtual museum website?

Not at all 1 2 3 4 5 6 7 Very much so

Were you involved in the virtual museum experimental task to the extent that you lost track of time?

Not at all 1 2 3 4 5 6 7 Very much so

Overall, how well do you think that you achieved the virtual museum experimental task?

Not very well at all 1 2 3 4 5 6 7 Very well

Thanks again for your participation!

4.1.2 Augmented Reality Questionnaire

AUGMENTED REALITY QUESTIONNAIRE

INSTRUCTIONS

Thank you for taking a few minutes of your time to participate in our questionnaire. Filling out this questionnaire should take **5 to 10 minutes**. Please answer all the questions. You will answer the questions anonymously.

The following questions relate to your experience in the augmented reality world. Please, circle the appropriate step on the scale from 1 to 7, for each question. In this questionnaire, the questions are of the following form:

Please rate how thirsty you are feeling at this moment

Not at all 1 2 3 4 5 6 7 very much

The mark close to 'very much' indicates that you are quite thirsty indeed.

Questions about your previous experience

Have you had any previous experience with Virtual Reality?

None 1 2 3 4 5 6 7 many

Have you had any previous experience with Augmented Reality?

None 1 2 3 4 5 6 7 many

Have you had any previous experience with Computer Games?

None 1 2 3 4 5 6 7 many

Questions about how you experienced the demonstration

The following questions ask you about how you experienced the augmented reality quizzes and magic book. They are not about objective technical facts but about YOUR experience and YOUR impression. Some terms first: when we talk about virtual artefacts, we always refer to the 3D objects generated by the computer. When we talk about the real environment, we refer to the real world around you. And when we talk about the augmented environment, then we refer to the entire environment consisting of both virtual artefacts and the real environment.

When using the SpaceMouse as an interaction device, how did you perceive the interaction to be?

Bad 1 2 3 4 5 6 7 very good

When you were in the augmented environment, did your hands feel like your own or did they feel strange/foreign?

Foreign 1 2 3 4 5 6 7 my own hands

Were you able to naturally interact with your hands in the augmented environment?

No, it felt strange 1 2 3 4 5 6 7 Yes, just as in the real world

Were you able to move your hands intuitively or did you have to consciously control your motions?

Intuitively 1 2 3 4 5 6 7 Consciously

Did you have the impression that the virtual artefacts belong to the real environment or did they seem separate from it?

Belong to the real world 1 2 3 4 5 6 7 separate from the real world

Was watching the virtual artefacts just as natural as watching the real world?

Completely 1 2 3 4 5 6 7 completely
unnatural natural

Did you have the impression that you could have touched and grasped the virtual artefacts?

Not at all 1 2 3 4 5 6 7 Absolutely

In case you attempted to grasp the virtual artefacts, were you surprised that they were not "real"?

Not 1 2 3 4 5 6 7 Very
surprised surprised

Did the virtual artefacts appear to be (visualized) on a screen or did you have the impression that they were located in space?

On a screen 1 2 3 4 5 6 7 In space

Do you have the impression that the virtual artefacts were part of the real world?

Not at all 1 2 3 4 5 6 7 Yes, very much so

Did you have the impression of seeing the virtual artefacts as merely flat images or as three-dimensional objects?

Only as 1 2 3 4 5 6 7 As 3-dimensional
images objects

Did you have the impression that the virtual artefacts were (located) in the same space as you?

Not at all 1 2 3 4 5 6 7 Yes, very much so

Did you pay attention at all to the difference between real and virtual artefacts?

Not at all 1 2 3 4 5 6 7 Yes, very much so

Did the virtual artefacts appear "real" to you?

Not real 1 2 3 4 5 6 7 Absolutely real

Did you have the impression that the virtual artefacts were really there?

Not at all 1 2 3 4 5 6 7 Yes, very much so

The virtual artefacts seemed almost to be real.

Not at all 1 2 3 4 5 6 7 Yes, very much so

Did you have to make an effort to imagine the virtual artefacts as being three-dimensional?

Not at all 1 2 3 4 5 6 7 Yes, very much so

Did you have the impression that the virtual artefacts had a weight, that they weighed something? (Remember: it is not about what was objectively true but how it felt to you during the interaction)

Not at all 1 2 3 4 5 6 7 Yes, very much so

When you moved the virtual artefacts, did you have the impression of directly manipulating them or did it feel like you were controlling them indirectly through the computer?

Directly 1 2 3 4 5 6 7 through the computer

Did the virtual artefacts look realistic?

Not at all 1 2 3 4 5 6 7 Yes, very much so

I was able to interact well with the virtual artefacts and I was able to move them the way I wanted.

Not at all 1 2 3 4 5 6 7 Yes, very much so

I enjoyed manipulating and playing with the virtual artefacts.

Not at all 1 2 3 4 5 6 7 Yes, very much so

I would try out the same or a similar technology again.

Not at all 1 2 3 4 5 6 7 Yes, very much so

Thanks again for your participation !

4.1.3 Questionnaire for User Interaction Satisfaction (QUIS)

QUESTIONNAIRE FOR USER INTERACTION SATISFACTION (QUIS)

INSTRUCTIONS

Thank you for taking a few minutes of your time to participate in our questionnaire. Filling out this questionnaire should take **10 to 20 minutes**. Please answer all the questions. Should you have any comments to any of the questions, please simply write them in the space provided at the end of each question. We are interested in your opinion.

The following questions relate to your experience using the ARCO ACMA-ARIF system to design, build and visualise a virtual museum based on Web3D, virtual reality, augmented reality and other multimedia components. You will follow a tutorial through several steps to build and visualise a simple virtual museum. The term system in the questionnaire refers to the use of both ACMA and ARIF.

Please, circle the appropriate step on the scale from 1 to 9, for each question. In this questionnaire, the questions are of the following form:

Please rate how thirsty you are feeling at this moment

Not at all 1 2 3 4 5 6 7 8 9 very much

The mark close to 'very much' indicates that you are quite thirsty indeed.

PART 1: Past Experience

Of the following devices, software and systems check those that you personally used and are familiar with:

computer terminal	personal computer	laptop computer
colour monitor	touch screen	floppy drive
CD-ROM drive	keyboard	joy stick
track ball	pen based computing	mouse
graphics tablet	head mounted display	modems
scanners	word processor	graphics software
spreadsheet software	database software	computer games
voice recognition	video editing systems	internet
CAD computer aided design	rapid prototyping systems	e-mail

PART 2: Overall User Reactions

Overall reactions to the ACMA Tool

terrible	1 2 3 4 5 6 7 8 9	wonderful
frustrating	1 2 3 4 5 6 7 8 9	satisfying
dull	1 2 3 4 5 6 7 8 9	stimulating
difficult	1 2 3 4 5 6 7 8 9	easy
inadequate power	1 2 3 4 5 6 7 8 9	adequate power
rigid	1 2 3 4 5 6 7 8 9	flexible

PART 3: Windows in the ACMA Tool

Characters on the ACMA windows

hard to read	1 2 3 4 5 6 7 8 9	easy to read

- Image of characters

fuzzy	1 2 3 4 5 6 7 8 9	sharp

- Character shapes (fonts)

barely legible	1 2 3 4 5 6 7 8 9	very legible

ACMA window layouts were helpful

never	1 2 3 4 5 6 7 8 9	always

- Amount of information that can be displayed on ACMA windows

inadequate	1 2 3 4 5 6 7 8 9	adequate

- Arrangement of information can be displayed on ACMA windows

illogical	1 2 3 4 5 6 7 8 9	logical

Sequence of ACMA windows

confusing 1 2 3 4 5 6 7 8 9 clear

- Next ACMA window in a sequence

  unpredictable 1 2 3 4 5 6 7 8 9 predictable

- Going back to the previous ACMA window

  impossible 1 2 3 4 5 6 7 8 9 easy

- Progression of work related tasks

  confusing 1 2 3 4 5 6 7 8 9 clearly marked

Please write your comments about the windows in the ACMA tool here

---

PART 4: Terminology and ACMA Information

Use of terminology throughout ACMA tool

inconsistent 1 2 3 4 5 6 7 8 9 consistent

- Work related terminology

  inconsistent 1 2 3 4 5 6 7 8 9 consistent

- ACMA terminology

  inconsistent 1 2 3 4 5 6 7 8 9 consistent

Terminology relates well to the work you are doing

never 1 2 3 4 5 6 7 8 9 always

- ACMA terminology is used

  too frequently 1 2 3 4 5 6 7 8 9 appropriately

- Terminology on ACMA windows

  ambiguous 1 2 3 4 5 6 7 8 9 precise

Messages which appear on ACMA windows

inconsistent 1 2 3 4 5 6 7 8 9 consistent

- Position of instructions on the ACMA Windows

inconsistent 1 2 3 4 5 6 7 8 9 consistent

Messages which appear on ACMA Windows

confusing 1 2 3 4 5 6 7 8 9 clear

- Instructions for commands or functions

confusing 1 2 3 4 5 6 7 8 9 clear

- Instructions for correcting errors

confusing 1 2 3 4 5 6 7 8 9 clear

Computer keeps you informed about what it is doing

never 1 2 3 4 5 6 7 8 9 always

- Animated cursors keep you informed

never 1 2 3 4 5 6 7 8 9 always

- Performing an operation leads to a predictable result

never 1 2 3 4 5 6 7 8 9 always

- Controlling amount of feedback

impossible 1 2 3 4 5 6 7 8 9 easy

- Length of delay between operations

unacceptable 1 2 3 4 5 6 7 8 9 acceptable

Error messages

unhelpful 1 2 3 4 5 6 7 8 9 helpful

- Error messages clarify the problem

never 1 2 3 4 5 6 7 8 9 always

- Phrasing of error messages

unpleasant 1 2 3 4 5 6 7 8 9 pleasant

Please write your comments about the terminology and ACMA information here

PART 5: Learning the ACMA Tool

Learning to operate the ACMA Tool

difficult 1 2 3 4 5 6 7 8 9 easy

- Getting started

  difficult 1 2 3 4 5 6 7 8 9 easy

- Learning advanced features

  difficult 1 2 3 4 5 6 7 8 9 easy

- Time to learn to use the ACMA Tool

  difficult 1 2 3 4 5 6 7 8 9 easy

Exploration of features by trial and error

discouraging 1 2 3 4 5 6 7 8 9 encouraging

- Exploration of features

  risky 1 2 3 4 5 6 7 8 9 safe

- Discovering new features

  difficult 1 2 3 4 5 6 7 8 9 easy

Remembering names and use of commands

difficult 1 2 3 4 5 6 7 8 9 easy

- Remembering specific rules about entering commands

  difficult 1 2 3 4 5 6 7 8 9 easy

Tasks can be performed in a straight forward manner

never 1 2 3 4 5 6 7 8 9 always

- Number of steps per task

  too many 1 2 3 4 5 6 7 8 9 just right

- Steps to complete a task follow a logical sequence

  never 1 2 3 4 5 6 7 8 9 always

- Feedback on the completion of sequence of steps

  unclear 1 2 3 4 5 6 7 8 9 clear

Please write your comments about learning the ACMA tool here

PART 6: ACMA Capabilities

System speed

too slow 1 2 3 4 5 6 7 8 9 fast enough

- Response time for most operations

  too slow 1 2 3 4 5 6 7 8 9 fast enough

- Rate information is displayed

  too slow 1 2 3 4 5 6 7 8 9 fast enough

The ACMA Tool is reliable

never 1 2 3 4 5 6 7 8 9 always

- Operations

  undependable 1 2 3 4 5 6 7 8 9 dependable

- System failures occur

  frequently 1 2 3 4 5 6 7 8 9 seldom

- ACMA warns you about potential problems

  never 1 2 3 4 5 6 7 8 9 always

Correcting your mistakes

difficult 1 2 3 4 5 6 7 8 9 easy

- Correcting typos

  complex 1 2 3 4 5 6 7 8 9 simple

- Ability to undo operations

  inadequate 1 2 3 4 5 6 7 8 9 adequate

Ease of operation depends on your level of experience

never 1 2 3 4 5 6 7 8 9 always

- You can accomplish tasks knowing only a few commands

with difficulty 1 2 3 4 5 6 7 8 9 easily

- You can use features/shortcuts

with difficulty 1 2 3 4 5 6 7 8 9 easily

Please write your comments about the ACMA capabilities here

PART 7: Multimedia presentation in ARIF

Quality of still pictures/photographs

bad 1 2 3 4 5 6 7 8 9 good

- Pictures/Photos

fuzzy 1 2 3 4 5 6 7 8 9 clear

- Picture/Photo brightness

dim 1 2 3 4 5 6 7 8 9 bright

Sound output

inaudible 1 2 3 4 5 6 7 8 9 audible

- Sound output

choppy 1 2 3 4 5 6 7 8 9 smooth

- Sound output

garbled 1 2 3 4 5 6 7 8 9 clear

Colours used are

unnatural 1 2 3 4 5 6 7 8 9 natural

- Amount of colours available

inadequate 1 2 3 4 5 6 7 8 9 adequate

Please write your comments about the multimedia presentation in ARIF here

Thanks again for your participation!

4.2 Appendex B – MUT #3: Evaluation results

4.2.1 Object Modeller

4.2.1.1 Acquisition

Q1: Is the image acquisition process within the OM tool an easy task?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**Yes**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Yes**
Patrizia Rimaboschi	**Museo degli Argenti**	**Yes**

Q2: Is the OM interface for image acquisition intuitive to use?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**Yes, with practice + understanding problems presented by complicated shapes e.g. curves**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Yes**
Patrizia Rimaboschi	**Museo degli Argenti**	**Yes**

Q3: Is the image resolution appropriate for the texture extraction? Can you suggest any improvements?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**Worked well with metal object**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Yes**
Patrizia Rimaboschi	**Museo degli Argenti**	**Yes, with the object acquired**

4.2.1.2 3D Reconstruction

Q1: Is the OM interface for building 3D model intuitive to use?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**Yes**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Yes**
Patrizia Rimaboschi	**Museo degli Argenti**	**Yes, after a short training session**

Q2: Is the model, given by the automatic process (without user interaction) enough accurate?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**Almost**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**No**
Patrizia Rimaboschi	**Museo degli Argenti**	**No**

4.2.1.3 Visualisation and 3D model enhancement

Q1: Is the interface for 3D visualisation/animation of the model intuitive to use?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**Not straight away – computer used was slow – with practice + speed it would be good**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Yes**
Patrizia Rimaboschi	**Museo degli Argenti**	**Not immediately, especially for the 3D model enhancement**

Q2: Are the automatic enhacement functions efficient (smoothing, decimation, erase longface)?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**On the one demonstration it seemed very good**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Yes**
Patrizia Rimaboschi	**Museo degli Argenti**	**Yes**

Q3: Is the manual insertion of some extra points into the 3D model intuitive to use?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**No answer**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Don't know did not try**
Patrizia Rimaboschi	**Museo degli Argenti**	**Yes**

4.2.1.4 Image registration and mesh merging

Q1: Is the interface for image registration/mesh merging intuitive to use?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**Yes**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Yes**
Patrizia Rimaboschi	**Museo degli Argenti**	**It needs some steps to remember**

Q2: Is the user interaction for image registration light enough?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**No answer**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Yes**
Patrizia Rimaboschi	**Museo degli Argenti**	**It needs some steps to remember**

4.2.1.5 Export

Q1: Is the interface for export intuitive to use?

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**Yes**

Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Yes**
Patrizia Rimaboschi	**Museo degli Argenti**	**Yes**

4.2.1.6 Tutorial

Q1: *Is the provided OM tutorial useful to learn functionalities and use of the OM component?*

Person Name	Organisation	Comment
Barbara Alcock, Museum Assistant	**SussexPast, Lewes**	**No answer**
Helen Poole, Senior Museum Curator	**SussexPast, Michelham**	**Yes**
Patrizia Rimaboschi	**Museo degli Argenti**	**Did not read it during the trials**

4.2.1.7 Other

Barbara Alcock, Museum Assistant (SussexPast, Lewes): compared to the very stages of object modelling, it is now quite impressive, fast and with practice, easy to use.

4.2.2 IMRR

4.2.2.1 UR4—Interactive Model Refinement and Rendering

Who should answer: The Curatorial-User as an Object Refiner

Ref No.	Evaluation Questions and Answers
UR4.1	Is it possible to refine the 3D mesh model? Does this provide an accurate visual representation of the object?

	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes. Done in practice.
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

UR4.2	Is it possible to view the texture-mapped model from different angles?
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes. Use rotage tool
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

UR4.3	Is it possible to create and save RO's together with their associated metadata within the system?
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

UR4.4	Is it possible to launch a separate window in the 'browser' that allows for detailed examination of surface texture independent of the geometry?
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

UR4.5	Is the resolution of the texture appropriate for the type of object?

	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	No. Image creation needs to be at higher quality
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	No

UR4.6	Is it possible to apply various textures and shading/rendering techniques to a 3D model of the object?
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes. Tutorial did not cover this
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

UR4.7	Is it possible to reconstruct an object's missing parts?
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes, manually.
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

UR4.8	Is it possible to enter metadata at this stage, e.g. software used, file formats, description of original object and related cultural metadata?
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

UR4.9	Is interactive online help for technicalities relating to modelling process as well as help with the software provided?

	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes
Chris Milburn, Library Cataloguer	SussexPast, Lewes	No answer
Patrizia Rimaboschi	Museo degli Argenti	Yes

4.2.2.2 UR3—Object Modeller

Who should answer: The Curatorial-User as an Object Modeller

Ref No.	Evaluation Questions and Answers
UR3.2	Is it possible to model "multi-part" objects?
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes, manually
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

UR3.3	Is it possible to model the "inside" of an object?
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

UR3.4	See UR4.7
UR3.5	Is it possible to model a facsimile?
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Facsimile, no Virtual representation, Yes
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	No

4.2.2.3 Sub-Component A&E questions

4.2.2.3.1 Functional Component 1—Model Refinement

A customised user interface for the refinement of models originally created using the OM tool

Who should answer: The Curatorial-User as an Object Refiner

<table>
<tr><th>IMRR Functionality</th><th>IMRR A&E Questions and Answers</th></tr>
<tr><td rowspan="4">Model Refinement</td><td>Is the refinement interface functionality intuitive to use?
Can you suggest any improvements?</td></tr>
<tr><td>Answer:
<table>
<tr><th>Person Name</th><th>Organisation</th><th>Comment</th></tr>
<tr><td>Ken Jackson</td><td>VAM</td><td>No answer</td></tr>
<tr><td>Chris Milburn, Library Cataloguer</td><td>SussexPast, Lewes</td><td>Yes</td></tr>
<tr><td>Patrizia Rimaboschi</td><td>Museo degli Argenti</td><td>No</td></tr>
</table></td></tr>
<tr><td>Are the icons and menus used in the refinement interface intuitive? Can you suggest any improvements?</td></tr>
<tr><td>Answer:
<table>
<tr><th>Person Name</th><th>Organisation</th><th>Comment</th></tr>
<tr><td>Ken Jackson</td><td>VAM</td><td>No answer</td></tr>
<tr><td>Chris Milburn, Library Cataloguer</td><td>SussexPast, Lewes</td><td>Yes</td></tr>
<tr><td>Patrizia Rimaboschi</td><td>Museo degli Argenti</td><td>Yes</td></tr>
</table></td></tr>
<tr><td></td><td>Does the interface give easy access to the functionality required for the model refinement task?
Can you suggest any improvements?</td></tr>
</table>

	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	No answer
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	No answer

4.2.2.3.2 Functional Component 2—Model Creation

A customised user interface for the creation of models directly in the IMRR tool

Who should answer: The Curatorial-User as an Object Modeller

IMRR Functionality	**IMRR A&E Questions and Answers**
Model Creation	Is the creation interface functionality intuitive to use? Can you suggest any improvements? Save Icon (Ken Jackson).
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Not for me

Are the icons and menus used in the creation interface intuitive? Can you suggest any improvements?
Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Not for me

Does the interface give easy access to the functionality required for the model creation task? Can you suggest any improvements? Move – Show map button (Ken Jackson)

	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	It's OK

4.2.2.3.3 Functional Component 3—Basic Input and Output

Who should answer: The Curatorial-User as an Object Modeller and Object Refiner

IMRR Functionality	IMRR A&E Questions and Answers
Basic Input and Output	Are the basic input/output functions intuitive to use? Can you suggest any improvements?
	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Mainly but move save button
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

Are the icons and menus used for I/O functions intuitive? Can you suggest any improvements? Move button (Ken Jackson)
Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	Yes
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

Do the creation and refinement interfaces give easy access to the functionality required for basic I/O tasks? Can you suggest any improvements?

	Answer: **Person Name** / **Organisation** / **Comment** Ken Jackson / VAM / See above Chris Milburn, Library Cataloguer / SussexPast, Lewes / Yes Patrizia Rimaboschi / Museo degli Argenti / Yes

4.2.2.3.4 Functional Component 4—Database access

Who should answer: The Curatorial-User as an Object Modeller and Object Refiner

IMRR Functionality	**IMRR A&E Questions and Answers**
Database access	Are the database plug-in functions intuitive to use? Can you suggest any improvements?
	Answer: **Person Name** / **Organisation** / **Comment** Ken Jackson / VAM / No answer *(did not try?)* Chris Milburn, Library Cataloguer / SussexPast, Lewes / Yes Patrizia Rimaboschi / Museo degli Argenti / No answer *(did not try?)*
	Does the plug-in provide the required functionality? Can you suggest any improvements?
	Answer: **Person Name** / **Organisation** / **Comment** Ken Jackson / VAM / No answer *(did not try?)* Chris Milburn, Library Cataloguer / SussexPast, Lewes / Yes Patrizia Rimaboschi / Museo degli Argenti / No answer *(did not try?)*
	Are the buttons, text boxes and layout panels intuitive?

	Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	No answer *(did not try?)*
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	No answer *(did not try?)*

Is the plug-in useful in model creation and refinement operations?

Can you suggest any improvements?

Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	No answer *(did not try?)*
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	No answer *(did not try?)*

4.2.2.3.5 Functional Component 5—XDE Import

Who should answer: The Curatorial-User as an Object Modeller and Object Refiner

IMRR Functionality	IMRR A&E Questions and Answers
XDE Import	Are the XDE Import functions intuitive to use? Can you suggest any improvements?

Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	No answer *(did not try?)*
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

Does the XDE Import mechanism provide the required functionality?

Can you suggest any improvements?

Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	No answer *(did not try?)*
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

Is the XDE Import mechanism useful in model creation and refinement operations?

Can you suggest any improvements?

Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	No answer *(did not try?)*
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Not for me

Is the XDE Import mechanism useful in terms of interoperability between ARCO system components?

Can you suggest any improvements?

Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	No answer *(did not try?)*
Chris Milburn, Library Cataloguer	SussexPast, Lewes	Yes
Patrizia Rimaboschi	Museo degli Argenti	Yes

4.2.2.3.6 Functional Component 6—XDE Export

Who should answer: The Curatorial-User as an Object Modeller and Object Refiner

<table>
<tr><th>IMRR Functionality</th><th>IMRR A&E Questions and Answers</th></tr>
<tr><td rowspan="4">XDE Export</td><td>Are the XDE Export functions intuitive to use?
Can you suggest any improvements?</td></tr>
<tr><td>Answer:
<table>
<tr><th>Person Name</th><th>Organisation</th><th>Comment</th></tr>
<tr><td>Ken Jackson</td><td>VAM</td><td>No answer (did not try?)</td></tr>
<tr><td>Chris Milburn, Library Cataloguer</td><td>SussexPast, Lewes</td><td>Yes</td></tr>
<tr><td>Patrizia Rimaboschi</td><td>Museo degli Argenti</td><td>Not for me</td></tr>
</table></td></tr>
<tr><td>Does the XDE Export mechanism provide the required functionality?
Can you suggest any improvements?</td></tr>
<tr><td>Answer:
<table>
<tr><th>Person Name</th><th>Organisation</th><th>Comment</th></tr>
<tr><td>Ken Jackson</td><td>VAM</td><td>No answer (did not try?)</td></tr>
<tr><td>Chris Milburn, Library Cataloguer</td><td>SussexPast, Lewes</td><td>Yes</td></tr>
<tr><td>Patrizia Rimaboschi</td><td>Museo degli Argenti</td><td>Yes</td></tr>
</table></td></tr>
<tr><td rowspan="2"></td><td>Is the XDE Export mechanism useful in terms of interoperability between ARCO system components?
Can you suggest any improvements?</td></tr>
<tr><td>Answer:
<table>
<tr><th>Person Name</th><th>Organisation</th><th>Comment</th></tr>
<tr><td>Ken Jackson</td><td>VAM</td><td>No answer (did not try?)</td></tr>
<tr><td>Chris Milburn, Library Cataloguer</td><td>SussexPast, Lewes</td><td>Yes</td></tr>
<tr><td>Patrizia Rimaboschi</td><td>Museo degli Argenti</td><td>Yes</td></tr>
</table></td></tr>
</table>

4.2.2.3.7 Functional Component 7—IMRR Online Help

Who should answer: The Curatorial-User as an Object Refiner

<table>
<tr><th>IMRR Functionality</th><th>IMRR A&E Questions and Answers</th></tr>
<tr><td rowspan="6">IMRR Online Help</td><td>Is the help system for the model refinement interface adequate?
Can you suggest any improvements?</td></tr>
<tr><td>Answer:
<table>
<tr><th>Person Name</th><th>Organisation</th><th>Comment</th></tr>
<tr><td>Ken Jackson</td><td>VAM</td><td>No answer</td></tr>
<tr><td>Chris Milburn, Library Cataloguer</td><td>SussexPast, Lewes</td><td>Yes</td></tr>
<tr><td>Patrizia Rimaboschi</td><td>Museo degli Argenti</td><td>No answer</td></tr>
</table></td></tr>
<tr><td>Is the help system for the model creation interface adequate?
Can you suggest any improvements?</td></tr>
<tr><td>Answer:
<table>
<tr><th>Person Name</th><th>Organisation</th><th>Comment</th></tr>
<tr><td>Ken Jackson</td><td>VAM</td><td>Yes</td></tr>
<tr><td>Chris Milburn, Library Cataloguer</td><td>SussexPast, Lewes</td><td>Yes</td></tr>
<tr><td>Patrizia Rimaboschi</td><td>Museo degli Argenti</td><td>Yes</td></tr>
</table></td></tr>
<tr><td>Is the help system for the database access plug-in interface adequate?
Can you suggest any improvements?</td></tr>
<tr><td>Answer:
<table>
<tr><th>Person Name</th><th>Organisation</th><th>Comment</th></tr>
<tr><td>Ken Jackson</td><td>VAM</td><td>No answer</td></tr>
<tr><td>Chris Milburn, Library Cataloguer</td><td>SussexPast, Lewes</td><td>No answer</td></tr>
<tr><td>Patrizia Rimaboschi</td><td>Museo degli Argenti</td><td>Yes</td></tr>
</table></td></tr>
<tr><td>Is the help system for xde import adequate?
Can you suggest any improvements?</td></tr>
</table>

Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	No answer
Chris Milburn, Library Cataloguer	SussexPast, Lewes	No answer
Patrizia Rimaboschi	Museo degli Argenti	Yes

Is the help system for xde export adequate?
Can you suggest any improvements?

Answer:

Person Name	Organisation	Comment
Ken Jackson	VAM	No answer
Chris Milburn, Library Cataloguer	SussexPast, Lewes	No answer
Patrizia Rimaboschi	Museo degli Argenti	Yes

4.2.3 ACMA

4.2.3.1 Exercise 1.1 – Creating New User Account

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.1.1. Maintaining user accounts with different privileges is …?				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.1.1. Maintaining user accounts with different privileges is …?				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

1.1.1. Maintaining user accounts with different privileges is …?				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

1.1.1. Maintaining user accounts with different privileges is …?				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.1.2. The types of privileges available in ARCO are …?				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.1.2. The types of privileges available in ARCO are …?				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				
Don't know till details of what will allow who to what or not do?				

James Stevenson, Victoria and Albert Museum

1.1.2. The types of privileges available in ARCO are …?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

1.1.2. The types of privileges available in ARCO are …?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				
But it is not clear the meaning of each type of privilege				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.1.3. How do you assess the functionality of the Security Manager?				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.1.3. How do you assess the functionality of the Security Manager?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				
But obviously need to use tutorial guide to use at all				

James Stevenson, Victoria and Albert Museum

1.1.3. How do you assess the functionality of the Security Manager?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				
Easy to use				

Patrizia Rimaboschi, Museo degli Argenti

1.1.3. How do you assess the functionality of the Security Manager?				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.1.4. Completeness of information about ARCO users stored in the database is ...				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments (what is missing?):				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.1.4. Completeness of information about ARCO users stored in the database is ...				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments (what is missing?):				
Have no experience of this as yet				

James Stevenson, Victoria and Albert Museum

1.1.4. Completeness of information about ARCO users stored in the database is ...				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments (what is missing?):				

Patrizia Rimaboschi, Museo degli Argenti

1.1.4. Completeness of information about ARCO users stored in the database is ...				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments (what is missing?):				
Contact details (email, telephone number, …)				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.1.5. Managing user accounts in ARCO is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.1.5. Managing user accounts in ARCO is ...

❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				
Probably easy if follow tutorials and one understands what the individual privileges mean				

James Stevenson, Victoria and Albert Museum

1.1.5. Managing user accounts in ARCO is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

1.1.5. Managing user accounts in ARCO is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.1.6. How do you assess the functionality of the Connection Manager?				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.1.6. How do you assess the functionality of the Connection Manager?				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				
What is the connection manager?				

James Stevenson, Victoria and Albert Museum

1.1.6. How do you assess the functionality of the Connection Manager?

❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

1.1.6. How do you assess the functionality of the Connection Manager?				
❑ Poor	❑ Fair	❑ Good	❑ Very good	☑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.1.7. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.1.7. Problems encountered during this exercise

James Stevenson, Victoria and Albert Museum

1.1.7. Problems encountered during this exercise

Patrizia Rimaboschi, Museo degli Argenti

1.1.7. Problems encountered during this exercise

4.2.3.2 Exercise 1.2 – Creating Working Space

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.2.1. Grouping Cultural Objects in folders is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.2.1. Grouping Cultural Objects in folders is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

1.2.1. Grouping Cultural Objects in folders is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

1.2.1. Grouping Cultural Objects in folders is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.2.2. Creating and managing Cultural Object folders in ACMA is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.2.2. Creating and managing Cultural Object folders in ACMA is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				
Once again with practice; tutorial guide useful				

James Stevenson, Victoria and Albert Museum

1.2.2. Creating and managing Cultural Object folders in ACMA is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

1.2.2. Creating and managing Cultural Object folders in ACMA is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.2.3. Managing access rights to folders is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.2.3. Managing access rights to folders is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				
As long as one is clear what these allow user to do / not to do				

James Stevenson, Victoria and Albert Museum

1.2.3. Managing access rights to folders is …				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

1.2.3. Managing access rights to folders is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.2.4. The usefulness of access rights on a folder level (not on object level) is …				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.2.4. The usefulness of access rights on a folder level (not on object level) is …				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

1.2.4. The usefulness of access rights on a folder level (not on object level) is …				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

1.2.4. The usefulness of access rights on a folder level (not on object level) is …				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.2.5. Defining access rights on an object level (not implemented) would be …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.2.5. Defining access rights on an object level (not implemented) would be …				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

1.2.5. Defining access rights on an object level (not implemented) would be …				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

1.2.5. Defining access rights on an object level (not implemented) would be …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

1.2.6. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

1.2.6. Problems encountered during this exercise

James Stevenson, Victoria and Albert Museum

1.2.6. Problems encountered during this exercise

Patrizia Rimaboschi, Museo degli Argenti

1.2.6. Problems encountered during this exercise

4.2.3.3 Exercise 2.1 – Creating Cultural Objects

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.1.1. Creating and managing Cultural Objects is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.1.1. Creating and managing Cultural Objects is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

2.1.1. Creating and managing Cultural Objects is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.1.1. Creating and managing Cultural Objects is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.1.2. The difference between Acquired and Refined Objects is … to understand.				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.1.2. The difference between Acquired and Refined Objects is … to understand.				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				
Acquired = object and metadata etc from our database Refined = object in 3D and refinement?				

James Stevenson, Victoria and Albert Museum

2.1.2. The difference between Acquired and Refined Objects is … to understand.				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.1.2. The difference between Acquired and Refined Objects is … to understand.				
☑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.1.3. How do you assess the way the metadata is visualized and edited?				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.1.3. How do you assess the way the metadata is visualized and edited?				
❑ Poor	☑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

2.1.3. How do you assess the way the metadata is visualized and edited?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.1.3. How do you assess the way the metadata is visualized and edited?				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.1.4. The internal ACMA metadata editor is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.1.4. The internal ACMA metadata editor is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

2.1.4. The internal ACMA metadata editor is …				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.1.4. The internal ACMA metadata editor is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.1.5. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.1.5. Problems encountered during this exercise
Evident lack of knowledge on my part with regard to programme terminology

James Stevenson, Victoria and Albert Museum

2.1.5. Problems encountered during this exercise

Patrizia Rimaboschi, Museo degli Argenti

2.1.5. Problems encountered during this exercise
The metadata “inventory number” is missing and should be considered essential. The tool tip appears for a too short time to be read

4.2.3.4 Exercise 2.2 – Adding new data / files

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.2.1. Loading new data / files is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O’Connor, Museum Curator (SussexPast, Lewes)

2.2.1. Loading new data / files is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				
Requires practice				

James Stevenson, Victoria and Albert Museum

2.2.1. Loading new data / files is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.2.1. Loading new data / files is ...				
❑ Very difficult	☑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.2.2. How do you assess the functionality of the Media Object loading wizard?				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.2.2. How do you assess the functionality of the Media Object loading wizard?				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

2.2.2. How do you assess the functionality of the Media Object loading wizard?				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				
Quite complicated. It needs more information on basic steps in manual				

Patrizia Rimaboschi, Museo degli Argenti

2.2.2. How do you assess the functionality of the Media Object loading wizard?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.2.3. The predefined Media Object types are …				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.2.3. The predefined Media Object types are …				
❑ Poor	☑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

2.2.3. The predefined Media Object types are …				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.2.3. The predefined Media Object types are …				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.2.4. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.2.4. Problems encountered during this exercise
Nothing that plenty of repeats and practice won't resolve - familiarity

James Stevenson, Victoria and Albert Museum

2.2.4. Problems encountered during this exercise
Need to do so many steps

Patrizia Rimaboschi, Museo degli Argenti

2.2.4. Problems encountered during this exercise
What's the difference between Multi-resolution Image and Simple Image?

4.2.3.5 Exercise 2.3 – Refining Cultural Objects

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.3.1. Refining Cultural Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.3.1. Refining Cultural Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential

Comments:

James Stevenson, Victoria and Albert Museum

2.3.1. Refining Cultural Objects is …				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.3.1. Refining Cultural Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.3.2. The “hierarchy view” (Refined Objects) under Acquired Object is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Emma O’Connor, Museum Curator (SussexPast, Lewes)

2.3.2. The “hierarchy view” (Refined Objects) under Acquired Object is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

2.3.2. The “hierarchy view” (Refined Objects) under Acquired Object is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential

Comments:

Patrizia Rimaboschi, Museo degli Argenti

2.3.2. The “hierarchy view” (Refined Objects) under Acquired Object is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.3.3. The internal ACMA editor for some types of Media Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Emma O’Connor, Museum Curator (SussexPast, Lewes)

2.3.3. The internal ACMA editor for some types of Media Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

2.3.3. The internal ACMA editor for some types of Media Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.3.3. The internal ACMA editor for some types of Media Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.3.4. The internal ACMA preview for Media Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.3.4. The internal ACMA preview for Media Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

2.3.4. The internal ACMA preview for Media Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.3.4. The internal ACMA preview for Media Objects is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.3.5. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.3.5. Problems encountered during this exercise
Lack of familiarity with terminology

James Stevenson, Victoria and Albert Museum

2.3.5. Problems encountered during this exercise
The hierarchy of access is quite complicated at first, but presumably gets easier with practice

Patrizia Rimaboschi, Museo degli Argenti

2.3.5. Problems encountered during this exercise

4.2.3.6 Exercise 2.4 – Preparing objects for presentation

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.4.1. How do you assess the functionality of the Cultural Object Manager?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.4.1. How do you assess the functionality of the Cultural Object Manager?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

2.4.1. How do you assess the functionality of the Cultural Object Manager?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.4.1. How do you assess the functionality of the Cultural Object Manager?				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.4.2. The difference between 'copy' and 'assign' actions is … to understand.				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.4.2. The difference between 'copy' and 'assign' actions is … to understand.				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				
What is the difference?				

James Stevenson, Victoria and Albert Museum

2.4.2. The difference between ‘copy’ and ‘assign’ actions is … to understand.				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.4.2. The difference between ‘copy’ and ‘assign’ actions is … to understand.				
❑ Very difficult	☑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.4.3. The inheritance of Media Objects (from parent Cultural Object) is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Emma O’Connor, Museum Curator (SussexPast, Lewes)

2.4.3. The inheritance of Media Objects (from parent Cultural Object) is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

2.4.3. The inheritance of Media Objects (from parent Cultural Object) is …				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.4.3. The inheritance of Media Objects (from parent Cultural Object) is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.4.4. The inheritance removal functionality is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.4.4. The inheritance removal functionality is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

2.4.4. The inheritance removal functionality is …				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.4.4. The inheritance removal functionality is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.4.5. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.4.5. Problems encountered during this exercise
As before

James Stevenson, Victoria and Albert Museum

2.4.5. Problems encountered during this exercise

Patrizia Rimaboschi, Museo degli Argenti

2.4.5. Problems encountered during this exercise

4.2.3.7 Exercise 2.5 – Searching for Objects

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.5.1. The search tool in ACMA is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.5.1. The search tool in ACMA is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				
Although a little cumbersome - compare MODES 'simple text search' and 'curator of objects' etc				

James Stevenson, Victoria and Albert Museum

2.5.1. The search tool in ACMA is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.5.1. The search tool in ACMA is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.5.2. How do you assess the functionality of the search tool?				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.5.2. How do you assess the functionality of the search tool?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				
As above				

James Stevenson, Victoria and Albert Museum

2.5.2. How do you assess the functionality of the search tool?				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.5.2. How do you assess the functionality of the search tool?				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.5.3. The search tool is … to use.				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.5.3. The search tool is … to use.				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				
As above				

James Stevenson, Victoria and Albert Museum

2.5.3. The search tool is … to use.				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

2.5.3. The search tool is … to use.				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

2.5.4. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

2.5.4. Problems encountered during this exercise
Lack of standard searches ready to use – also object number not automatically displayed – unique qualifier in every museums should always be displayed

James Stevenson, Victoria and Albert Museum

2.5.4. Problems encountered during this exercise

Patrizia Rimaboschi, Museo degli Argenti

2.5.4. Problems encountered during this exercise
The search window is displayed after a significative delay. The search button is not really visible.

4.2.3.8 Exercise 3.1 – Creating Internet Exhibition Spaces

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.1.1. The process of creating Exhibition Spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.1.1. The process of creating Exhibition Spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

3.1.1. The process of creating Exhibition Spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.1.1. The process of creating Exhibition Spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.1.2. The process of creating instances of templates is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.1.2. The process of creating instances of templates is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

3.1.2. The process of creating instances of templates is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.1.2. The process of creating instances of templates is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.1.3. Assignment of Cultural Objects to exhibition spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.1.3. Assignment of Cultural Objects to exhibition spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

3.1.3. Assignment of Cultural Objects to exhibition spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.1.3. Assignment of Cultural Objects to exhibition spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.1.4. The intuitiveness of the ARCO Presentation Manager is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments (what is missing?):				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.1.4. The intuitiveness of the ARCO Presentation Manager is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments (what is missing?):				

James Stevenson, Victoria and Albert Museum

3.1.4. The intuitiveness of the ARCO Presentation Manager is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments (what is missing?):				

Patrizia Rimaboschi, Museo degli Argenti

3.1.4. The intuitiveness of the ARCO Presentation Manager is ...				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments (what is missing?):				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.1.5. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.1.5. Problems encountered during this exercise
As before; practice and language/terminology usage and familiarity

James Stevenson, Victoria and Albert Museum

3.1.5. Problems encountered during this exercise

Patrizia Rimaboschi, Museo degli Argenti

3.1.5. Problems encountered during this exercise
The "save changes" of the presentation manager is different from the Cultural Object Manager (CTRL+Enter)

4.2.3.9 Exercise 3.2 – Creating Local Exhibition Space

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.2.1. The concept of different Presentation Domains is …				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.2.1. The concept of different Presentation Domains is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

3.2.1. The concept of different Presentation Domains is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.2.1. The concept of different Presentation Domains is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.2.2. Configuring ARCO templates in presentations is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.2.2. Configuring ARCO templates in presentations is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

3.2.2. Configuring ARCO templates in presentations is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.2.2. Configuring ARCO templates in presentations is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.2.3. The search functionality in local web template is ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.2.3. The search functionality in local web template is ...				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

3.2.3. The search functionality in local web template is ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.2.3. The search functionality in local web template is ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.2.4. The search system in local web template is ... to use.				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.2.4. The search system in local web template is ... to use.				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

3.2.4. The search system in local web template is ... to use.				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.2.4. The search system in local web template is ... to use.				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.2.5. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.2.5. Problems encountered during this exercise
As before

James Stevenson, Victoria and Albert Museum

3.2.5. Problems encountered during this exercise

Patrizia Rimaboschi, Museo degli Argenti

3.2.5. Problems encountered during this exercise

4.2.3.10 Exercise 3.3 – Creating 3D Exhibition Spaces

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.3.1. How do you assess the tree representation of exhibition spaces?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.3.1. How do you assess the tree representation of exhibition spaces?				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

3.3.1. How do you assess the tree representation of exhibition spaces?				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.3.1. How do you assess the tree representation of exhibition spaces?				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.3.2. Is the inheritance of template instances in descendant exhibition spaces understandable?				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.3.2. Is the inheritance of template instances in descendant exhibition spaces understandable?				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				
More time and use and familiarity would make easier and relevant				

James Stevenson, Victoria and Albert Museum

3.3.2. Is the inheritance of template instances in descendant exhibition spaces understandable?				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.3.2. Is the inheritance of template instances in descendant exhibition spaces understandable?				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.3.3. Creating and customizing 3D galleries is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.3.3. Creating and customizing 3D galleries is …				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

3.3.3. Creating and customizing 3D galleries is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.3.3. Creating and customizing 3D galleries is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.3.4. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.3.4. Problems encountered during this exercise
As before

James Stevenson, Victoria and Albert Museum

3.3.4. Problems encountered during this exercise

Patrizia Rimaboschi, Museo degli Argenti

3.3.4. Problems encountered during this exercise

4.2.3.11 Exercise 3.4 – Customising Exhibition Spaces

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.4.1. Changing order of Cultural Objects within exhibition space is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.4.1. Changing order of Cultural Objects within exhibition space is …				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

3.4.1. Changing order of Cultural Objects within exhibition space is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.4.1. Changing order of Cultural Objects within exhibition space is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.4.2. Limiting visibility of Media Objects is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.4.2. Limiting visibility of Media Objects is …				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

3.4.2. Limiting visibility of Media Objects is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

3.4.2. Limiting visibility of Media Objects is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

3.4.3. Problems encountered during this exercise

Emma O'Connor, Museum Curator (SussexPast, Lewes)

3.4.3. Problems encountered during this exercise

James Stevenson, Victoria and Albert Museum

3.4.3. Problems encountered during this exercise

Patrizia Rimaboschi, Museo degli Argenti

3.4.3. Problems encountered during this exercise

4.2.3.12 Exercise 4.1 – Visualization of VRML Media Objects

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.1.1. Navigation through the hierarchy of Exhibition Spaces in the Web Browser is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.1.1. Navigation through the hierarchy of Exhibition Spaces in the Web Browser is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.1.1. Navigation through the hierarchy of Exhibition Spaces in the Web Browser is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.1.1. Navigation through the hierarchy of Exhibition Spaces in the Web Browser is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.1.2. Presentation of Media Objects associated with the selected Cultural Object in the Web Browser is ...				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.1.2. Presentation of Media Objects associated with the selected Cultural Object in the Web Browser is ...				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

4.1.2. Presentation of Media Objects associated with the selected Cultural Object in the Web Browser is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.1.2. Presentation of Media Objects associated with the selected Cultural Object in the Web Browser is ...				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.1.3. Selection of Media Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.1.3. Selection of Media Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.1.3. Selection of Media Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.1.3. Selection of Media Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.1.4. Assignment of Media Objects to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.1.4. Assignment of Media Objects to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.1.4. Assignment of Media Objects to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.1.4. Assignment of Media Objects to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.1.5. Navigation between the Web and AR browsers is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.1.5. Navigation between the Web and AR browsers is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.1.5. Navigation between the Web and AR browsers is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.1.5. Navigation between the Web and AR browsers is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.1.6. Manipulation of objects in the AR environment using markers is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.1.6. Manipulation of objects in the AR environment using markers is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.1.6. Manipulation of objects in the AR environment using markers is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.1.6. Manipulation of objects in the AR environment using markers is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.1.7. Manipulation of objects in the AR environment using SpaceMouse is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.1.7. Manipulation of objects in the AR environment using SpaceMouse is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.1.7. Manipulation of objects in the AR environment using SpaceMouse is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.1.7. Manipulation of objects in the AR environment using SpaceMouse is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.1.8. Manipulation of objects in the AR environment using additional input devices (such as SpaceMouse) is ...				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.1.8. Manipulation of objects in the AR environment using additional input devices (such as SpaceMouse) is ...				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

4.1.8. Manipulation of objects in the AR environment using additional input devices (such as SpaceMouse) is ...				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.1.8. Manipulation of objects in the AR environment using additional input devices (such as SpaceMouse) is ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.1.9. The process of removing objects from the AR environment is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.1.9. The process of removing objects from the AR environment is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.1.9. The process of removing objects from the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.1.9. The process of removing objects from the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

4.2.3.13 Exercise 4.2 – Visualization of Cultural Objects

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.2.1. Presentation of Cultural Objects in the Web Browser is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.2.1. Presentation of Cultural Objects in the Web Browser is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

4.2.1. Presentation of Cultural Objects in the Web Browser is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.2.1. Presentation of Cultural Objects in the Web Browser is ...				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.2.2. Selection of Cultural Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.2.2. Selection of Cultural Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.2.2. Selection of Cultural Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.2.2. Selection of Cultural Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.2.3. Assignment of Cultural Objects to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.2.3. Assignment of Cultural Objects to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.2.3. Assignment of Cultural Objects to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.2.3. Assignment of Cultural Objects to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.2.4. Manipulation of Cultural Objects in the AR environment using markers is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.2.4. Manipulation of Cultural Objects in the AR environment using markers is ...				
❑ Very difficult	❑ Difficult	☑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.2.4. Manipulation of Cultural Objects in the AR environment using markers is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.2.4. Manipulation of Cultural Objects in the AR environment using markers is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.2.5. Visualization of Cultural Objects in the AR environment is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.2.5. Visualization of Cultural Objects in the AR environment is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

4.2.5. Visualization of Cultural Objects in the AR environment is ...				
❑ Poor	❑ Fair	❑ Good	❑ Very good	☑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.2.5. Visualization of Cultural Objects in the AR environment is ...				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.2.6. Sound descriptions accompanying Cultural Objects in the AR environment are ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				
Can be distracting but would be good for the blind or partially sighted				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.2.6. Sound descriptions accompanying Cultural Objects in the AR environment are ...				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

4.2.6. Sound descriptions accompanying Cultural Objects in the AR environment are ...				
❑ Nonsense	☑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				
Difficult to incorporate in a public gallery				

Patrizia Rimaboschi, Museo degli Argenti

4.2.6. Sound descriptions accompanying Cultural Objects in the AR environment are ...				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.2.7. What improvements would you suggest in the visualization of Cultural Objects in the AR environment?

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.2.7. What improvements would you suggest in the visualization of Cultural Objects in the AR environment?

James Stevenson, Victoria and Albert Museum

4.2.7. What improvements would you suggest in the visualization of Cultural Objects in the AR environment?
Not spinning!

Patrizia Rimaboschi, Museo degli Argenti

4.2.7. What improvements would you suggest in the visualization of Cultural Objects in the AR environment?

4.2.3.14 Exercise 4.3 – Visualization of collections of Cultural Objects

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.3.1. Selection of collections of Cultural Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.3.1. Selection of collections of Cultural Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.3.1. Selection of collections of Cultural Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.3.1. Selection of collections of Cultural Objects for visualization in the AR environment is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.3.2. Assignment of entire collections to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.3.2. Assignment of entire collections to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.3.2. Assignment of entire collections to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.3.2. Assignment of entire collections to markers using the toolbar is ...				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.3.3. Visualization of collections of Cultural Objects in the AR environment is ...				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.3.3. Visualization of collections of Cultural Objects in the AR environment is ...				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

4.3.3. Visualization of collections of Cultural Objects in the AR environment is ...				
❑ Poor	❑ Fair	❑ Good	❑ Very good	☑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.3.3. Visualization of collections of Cultural Objects in the AR environment is ...				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.3.4. The process of browsing collections using the book is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.3.4. The process of browsing collections using the book is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.3.4. The process of browsing collections using the book is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.3.4. The process of browsing collections using the book is ...				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.3.5. Sound descriptions accompanying the AR book scenario are ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				
As before				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.3.5. Sound descriptions accompanying the AR book scenario are ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

4.3.5. Sound descriptions accompanying the AR book scenario are ...				
❑ Nonsense	☑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.3.5. Sound descriptions accompanying the AR book scenario are ...				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.3.6. The use of AR visualization in museum exhibitions is …				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				
Particularly appealing to children				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.3.6. The use of AR visualization in museum exhibitions is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

4.3.6. The use of AR visualization in museum exhibitions is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.3.6. The use of AR visualization in museum exhibitions is …				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.3.7. What improvements would you suggest in the visualization of collections of Cultural Objects in the AR environment?
Information panels e.g. going history of objects, that can be shown with visualizations

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.3.7. What improvements would you suggest in the visualization of collections of Cultural Objects in the AR environment?

James Stevenson, Victoria and Albert Museum

4.3.7. What improvements would you suggest in the visualization of collections of Cultural Objects in the AR environment?
If the letter squares were lower on the page, the objects would fit better. Is it possible to stop them rotating unless the viewer wants them to rotate?

Patrizia Rimaboschi, Museo degli Argenti

4.3.7. What improvements would you suggest in the visualization of collections of Cultural Objects in the AR environment?

4.2.3.15 Exercise 4.4 – Learning Scenario

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.4.1. Educational usefulness of the learning scenario within a museum/class room is …				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.4.1. Educational usefulness of the learning scenario within a museum/class room is …				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

4.4.1. Educational usefulness of the learning scenario within a museum/class room is …				
❑ Poor	❑ Fair	❑ Good	❑ Very good	☑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.4.1. Educational usefulness of the learning scenario within a museum/class room is …				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.4.2. Presentation of questions in the AR environment is …				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.4.2. Presentation of questions in the AR environment is …				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

4.4.2. Presentation of questions in the AR environment is …				
❑ Poor	❑ Fair	❑ Good	❑ Very good	☑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.4.2. Presentation of questions in the AR environment is …				
❑ Poor	❑ Fair	☑ Good	❑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.4.3. Answering questions using double-sided markers is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.4.3. Answering questions using double-sided markers is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.4.3. Answering questions using double-sided markers is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.4.3. Answering questions using double-sided markers is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.4.4. Integration of the Web and AR presentation is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.4.4. Integration of the Web and AR presentation is ...				
❑ Poor	❑ Fair	❑ Good	❑ Very good	❑ Excellent
Comments:				

James Stevenson, Victoria and Albert Museum

4.4.4. Integration of the Web and AR presentation is ...				
❑ Poor	❑ Fair	❑ Good	❑ Very good	☑ Excellent
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.4.4. Integration of the Web and AR presentation is ...				
❑ Poor	❑ Fair	❑ Good	☑ Very good	❑ Excellent
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.4.5. The scoring mechanism is ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				
Encouraging for children				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.4.5. The scoring mechanism is ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

4.4.5. The scoring mechanism is ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.4.5. The scoring mechanism is ...				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.4.6. Sounds accompanying the learning scenario are ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	☑ Useful	❑ Essential
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.4.6. Sounds accompanying the learning scenario are ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	❑ Essential
Comments:				

James Stevenson, Victoria and Albert Museum

4.4.6. Sounds accompanying the learning scenario are ...				
❑ Nonsense	❑ Not needed	☑ Nice add-on	❑ Useful	❑ Essential
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.4.6. Sounds accompanying the learning scenario are ...				
❑ Nonsense	❑ Not needed	❑ Nice add-on	❑ Useful	☑ Essential
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.4.7. What improvements would you suggest in the learning scenario?
More questions + relate directly to National Curriculum (consult with Educational Stuff)

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.4.7. What improvements would you suggest in the learning scenario?

James Stevenson, Victoria and Albert Museum

4.4.7. What improvements would you suggest in the learning scenario?

Patrizia Rimaboschi, Museo degli Argenti

4.4.7. What improvements would you suggest in the learning scenario?

4.2.3.16 Exercise 4.5 – Modifying Learning Scenario

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.5.1. Assignment of Cultural Objects to exhibition spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.5.1. Assignment of Cultural Objects to exhibition spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.5.1. Assignment of Cultural Objects to exhibition spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.5.1. Assignment of Cultural Objects to exhibition spaces is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.5.2. The process of defining learning scenarios for Cultural Objects is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.5.2. The process of defining learning scenarios for Cultural Objects is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	❑ Very easy
Comments:				

James Stevenson, Victoria and Albert Museum

4.5.2. The process of defining learning scenarios for Cultural Objects is …				
❑ Very difficult	❑ Difficult	❑ OK	❑ Easy	☑ Very easy
Comments:				

Patrizia Rimaboschi, Museo degli Argenti

4.5.2. The process of defining learning scenarios for Cultural Objects is …				
❑ Very difficult	❑ Difficult	❑ OK	☑ Easy	❑ Very easy
Comments:				

Hannah Crowdy, Assistant Museum Curator (SussexPast, Lewes)

4.5.3. What improvements would you suggest in the process of defining learning scenarios?

Emma O'Connor, Museum Curator (SussexPast, Lewes)

4.5.3. What improvements would you suggest in the process of defining learning scenarios?

James Stevenson, Victoria and Albert Museum

4.5.3. What improvements would you suggest in the process of defining learning scenarios?
How do you secure the cards if they are in a public gallery? The noise may be a bit loud in that context, but there is a real feel-good factor when the answers are correct – good learning technique. Scale with object on thumbnail. No noise when you pick up object on card, as it is distracting + children would enjoy doing it on purpose!

Patrizia Rimaboschi, Museo degli Argenti

4.5.3. What improvements would you suggest in the process of defining learning scenarios?