# Project

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# Deliverable

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# 1 EXECUTIVE SUMMARY

This document reports on the piloting activities carried out within the framework of the AthenaPlus project for the MOVIO Digital Exhibitions, CityQuest and SchoolTrip creative tools.

The pilot actions were guided by a three-phase methodology, inspired by the Living Lab philosophy of involving users in open innovation. The focus of these co-creative actions was to provide a continuous stream of user feedback to the software developer teams, in the shape of comments to fix software issues, recommendations for enhancing the user experience, and suggestions for additional features and functionalities. Phase I was centred on the teams from the partner cultural heritage institutions in AthenaPlus, providing internal issue reports and initial recommendations to fix bugs and improve usability. Phase II involved small groups of end users and professionals in giving feedback, with a series of co-creation actions centred on the AthenaPlus tools. And Phase III implemented a feedback procedure that allows the open source community around the tools to continue to receive inputs from users beyond the end of the AthenaPlus project.

After 17 months of piloting trajectory with the three creative tools, more than 300 users were reached with several types of feedback-generating activities. These actions involved a range of socioeconomic profiles, including both end users and cultural heritage, education and tourism professionals. The user feedback obtained was instrumental in improving iteratively the tools, integrating user-contributed inputs into the work of the technical professionals in work package 5, and thus bringing the creative tools closer to the needs and requirements of the communities of users.

The final results of these actions showed a high level of interest and user satisfaction with the piloted creative tools, with acceptable to excellent results in all relevant user experience metrics and indicators that were generated with data from the 16 models of unique questionnaires that were used in the pilots. Likewise, qualitative data coming from piloting event reports, evaluation workshops, outdoors user tests and other co-creative activities also confirmed these results.

# 2    INTRODUCTION

## 2.1    Background

From the onset, the creation of ICT solutions for the reuse of cultural heritage elements has been one of the main pillars of the AthenaPlus project. These envisioned software tools should offer a range of users the possibility to reprocess the wealth of cultural heritage contents available in Europeana for communication, education and tourism purposes.

In the world of software development, it is increasingly recognised that software products and services must be developed in creative partnership with the communities of users. This statement was acknowledged from the beginning and built into the fabric of the project, with the inclusion of a work package devoted to the testing and piloting of the creative tools. Operating in an open innovation paradigm, in which the several categories of stakeholders are involved in a trajectory of iterative testing in parallel with the development of the creative tools, can bring several benefits to an ICT innovation project[1]. Chief among these is an increased user satisfaction with the developed tools, and the implementation of additional user-centred functionalities. The following report is an exposition of how these benefits have been obtained and realised within the AthenaPlus project.

## 2.2    Role of this Deliverable in the Project

This deliverable, coordinated by I2CAT, offers a global evaluation of the pilot actions and results, in order to validate the solutions designed and developed by WP5, and to provide technical feedback for tool developers. The creative tools that are the object of this report are MOVIO Digital Exhibitions, CityQuest, and SchoolTrip. A description of the UrbanExplore creative tool, as well as a report on the piloting activities executed in the course of its development, can be found in deliverable D6.2.

The document is structured in three main sections, plus annexes. The core of the document begins in section three, with a detailed description of the pilot methodology that has been followed to generate the information reported in the deliverable. Section four follows, in which all the pilot activities carried out within the framework of the AthenaPlus project are described. This section is the lengthiest, as it comprises the analysis of the data collected from the communities of users throughout the piloting trajectory with MOVIO Digital Exhibitions, CityQuest, and SchoolTrip. At the end of each subsection, a summary of the main lessons learned is offered. Finally, section five contains a global assessment of the creative tools based on the sum of the feedback collected from the users, and provides some concluding remarks on the issues of sustainability and future perspectives. The last pages of this deliverable are covered by a series of annexes which compile, for documentation purposes, the contents used for the writing of this report. These files can be accessed from the digital Word version of the deliverable.

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[1] See for instance Chesbrough, H.W. (2003). Open Innovation: The new imperative for creating and profiting from technology. Boston: Harvard Business School Press., or Bilgram, V.; Brem, A.; Voigt, K.-I. (2008). User-Centric Innovations in New Product Development, in: International Journal of Innovation Management, Vol. 12, No. 3, pp. 419-458.

# 3   PILOT METHODOLOGY

## 3.1   The AthenaPlus pilots

A pilot is not only a particular instance of work produced with the creative tools, but also a period of time when data on the stakeholders' involvement in using the AthenaPlus tools is systematically generated, so that these tools can be iteratively improved.
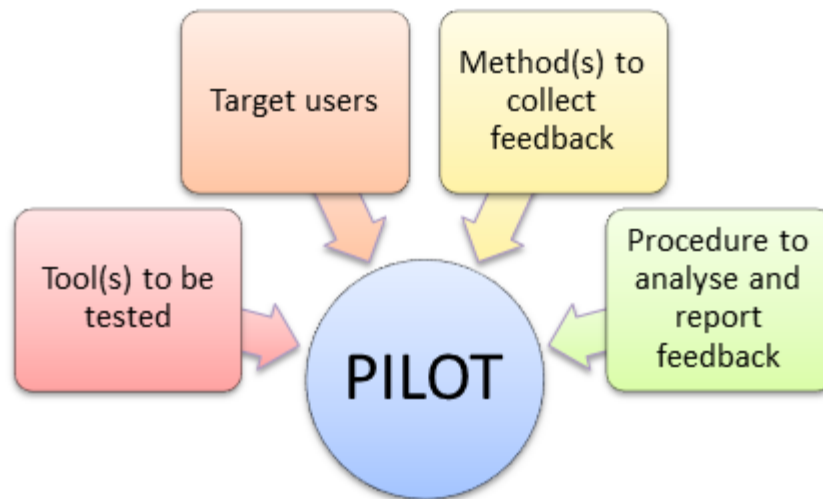


**Figure 1. The basic elements of a pilot**

Involving users in testing and giving feedback on the tools has as a result the creation of a community of users. For the purposes of the AthenaPlus project, we define a community of users as a group of people with different socioeconomic profiles, professional backgrounds and requirements who nevertheless share a point in common:

To operationalize this definition in a way in which social research is made possible, these different groups of stakeholders that make up the communities of users have been clustered in three sets:

-   Pilot-running professionals: This set includes all professionals associated with the AthenaPlus partner organisations. The profile of these individuals is that of highly trained culture heritage professionals, who will dedicate a significant amount of time and effort testing and working with the creative tools as part of their commitment to the project.

-   External professionals: This set includes all professionals not formally involved with organisations that take part in the AthenaPlus project. The profile of these individuals is that of an experienced professional in the fields of cultural heritage, the application of cultural heritage to the purposes of tourism, and education.

-   End users: This set includes all individuals that experience the tool from an 'end result' perspective, without any awareness of the backend, and regardless of profile. This is the most diverse group of stakeholders, as it involves all sorts of visitors to museums and other GLAM institutions. It includes families with children, amateur art lovers, young students, etc.
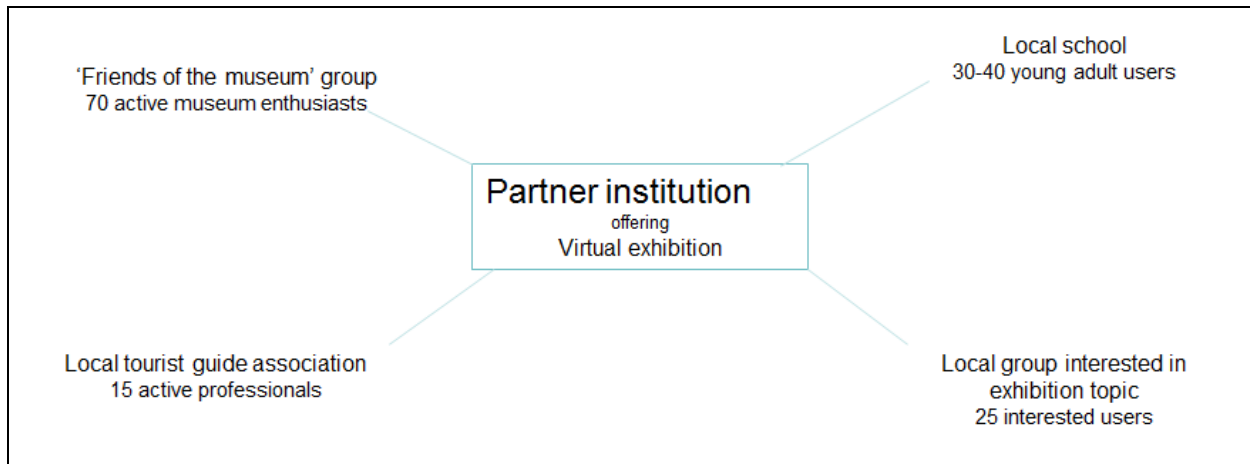
**Figure 2. Example of an imagined community of users created around an AthenaPlus pilot**

## 3.2 Description of pilot phases

In D6.1, a shared framework in which all AthenaPlus pilots operate was laid down. This framework detailed a three –phased process of user-centred design of the software tools. These three phases correspond to and are geared towards the three major sets of stakeholders that constitute the communities of users of the creative tools. The phases are designed to transition gradually from in-lab, closed-group evaluation to Living Lab, open-group evaluation. As the evaluation trajectory opens up in scope and involves larger and farther groups of users, the focus of evaluation transitions from usability and technical bug-fixing concerns, to broader user experience, relevance and attractiveness metrics.

| Pilot phase | Phase 1 | Phase 2 | Phase 3 |
|---|---|---|---|
| Scope | Internal | Small-scale | Large-scale |
| User profiles | Pilot-running professionals | Cultural heritage professionals and end users | End users |
| Evaluation focus | Usability and technical evaluation | Usability, and user experience | User experience |
| Indicative number of users | 4-5 users | 20-30 users | 1000+ users |

**Figure 3. Diagram of the three pilot phases for MOVIO digital exhibitions**

This model of the three-phase process was followed in detail for MOVIO, as was the creative tool that was ready at the beginning of work with the pilots. However, as first stable releases of CityQuest and SchoolTrip applications were made available at a later stage of the project (February 2015), the need to plan for a more compact and less-time consuming piloting trajectory for these tools also became clear. To address this project need, a compact evaluation model was devised, incorporating the same three-phase approach in a shorter time frame.
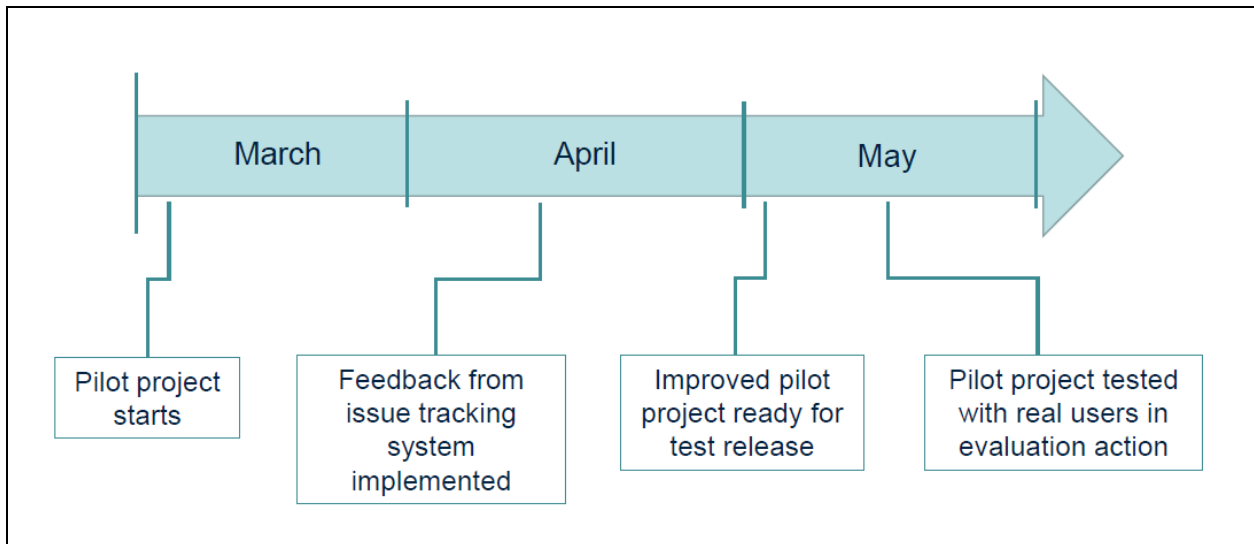
**Figure 4. Diagram of the compact pilot trajectory for CityQuest & SchoolTrip**

## 3.3    Calendar of execution of the pilots

The following chart provides the details of the timeline and calendar of the execution of the phases of evaluation for each of the tools:

| GANTT CHART | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ATHENAPLUS PILOTS** | **2014** | | | | | | | | | | **2015** | | | | | | | | | |
| | mar | apr | may | jun | jul | aug | sep | oct | nov | dec | jan | feb | mar | apr | may | jun | jul | aug | set | oct |
| **PROJECT MONTHS** | M13 | | | M16 | | | M19 | | | M22 | | | M25 | | | M28 | | M30 | | M32 |
| **MOVIO Digital Exhibitions** | | | | | | | | | | | | | | | | | | | | |
| Phase I – internal usability evaluation | ▓ | ▓ | ▓ | ▓ | ▓ | ▓ | ▓ | ▓ | | | | | | | | | | | | |
| Phase II – small-scale actions with stakeholders | | | | | | | | | ▓ | ▓ | ▓ | ▓ | ▓ | ▓ | | | | | | |
| Phase III – large-scale continued evaluation | | | | | | | | | | | | | | | | | ▓ | ▓ | ▓ | ▓ |
| **CityQuest** | | | | | | | | | | | | | | | | | | | | |
| Phase I – internal usability evaluation | | | | | | | | | | | | | ▓ | ▓ | ▓ | | | | | |
| Phase II – small-scale actions with stakeholders | | | | | | | | | | | | | | ▓ | ▓ | ▓ | ▓ | | | |
| Phase III – large-scale continued evaluation | | | | | | | | | | | | | | | | | ▓ | ▓ | ▓ | ▓ |
| **SchoolTrip** | | | | | | | | | | | | | | | | | | | | |
| Phase I – internal usability evaluation | | | | | | | | | | | | | ▓ | ▓ | ▓ | | | | | |
| Phase II – small-scale actions with stakeholders | | | | | | | | | | | | | | ▓ | ▓ | ▓ | ▓ | | | |
| Phase III – large-scale continued evaluation | | | | | | | | | | | | | | | | | ▓ | ▓ | ▓ | ▓ |

**Figure 5. Gantt chart of all pilot phases for all AthenaPlus tools**

## 3.4  Living Lab user research

A Living Lab is a user-centred open innovation ecosystem, based on a systematic user co-creation approach integrating research and innovation processes[2]. The Living Lab philosophy of software evaluation has a close correspondence with other user-centred and co-creation design methodologies, with an added emphasis on bringing emerging technologies still under development in real-life contexts where real-life users can provide useful feedback to the technical team. A Living Lab approach is fully compliant with the standard ISO 9241-11 defines usability as "the degree to which a product can be used by specified users to achieve goals with effectiveness, efficiency and satisfaction in a particular context of use"[3].

Living Lab processes of evaluation rely on a broad range of social research techniques to elicit and obtain feedback from users. Both quantitative (numeric) and qualitative (textual) methods are used, depending on the focus of the evaluation, the timing of the software development effort, and the nature of the data sought. Very often, the optimal approach consists in a mixed-method , in which both types of methods are deployed alongside each other, so that quantitative methods can provide breadth of research (reaching larger numbers of users) and qualitative methods can deliver depth of analysis (more fleshed out insights that complement the broad picture painted by the numeric data).

For the AthenaPlus project, an initial selection of research methods was provided in D6.1. These were refined several times throughout the piloting trajectory, to adjust to specific requests for particular answers (i.e. which suggested improvements to the creative tools were to be given priority). The final set of methods used is described in the following table:

**Table 1. Description of evaluation methods used for the AthenaPlus pilots**

| Evaluation phase | Research method | Objective |
|---|---|---|
| Phase I – internal usability evaluation | Software issue reports | Provide an efficient means to furnish relevant data for the improvement of the creative tools to the technical teams in WP5 |
| | Usability questionnaire | Obtain a global usability assessment of the first release of the creative tools, based on the input of the piloting partners |
| | Usability interview | Refine the insights generated by the analysis of the usability questionnaire to determine priorities for further development |
| Phase II – small-scale actions with stakeholders | Professional evaluation workshops | Obtain feedback from the envisioned community of professional users, on usability, user experience and attractiveness |
| | User evaluation events | Obtain feedback from the envisioned community of end users, on usability, user experience and attractiveness |

[2] https://en.wikipedia.org/wiki/Living_lab, accessed 29/06/2015
[3] ISO 9241-11:1998, "Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 11: Guidance on usability", available at http://www.iso.org/iso/catalogue_detail.htm?csnumber=16883, accessed 26/06/2015

| Phase III – large-scale continued evaluation | Online user feedback form | Obtain data for the continuing improvement of the creative tools after the publication of the finished pilots |
|---|---|---|

A key concern in the choice of the data-generating instruments was that of striking a balance between ease of use and comparability. It must be borne in mind that, to stay close to the communities of users at each pilot country, many of the evaluation activities with users in pilot phase II were planned to be carried out by the museum professionals at each CH institution. This meant that these data-generating instruments had to be simple enough to be used by professionals with little or no background in usability testing, user-centred design or user experience analysis. On the other hand, it was important for these methods to still be powerful and reliable enough for the project to be able to extract a valuable analysis out of the piloting trajectory.

For this reason, a modular approach to evaluation was chosen, based on methods with gentle learning curves, such as questionnaire forms to be filled in by users, and workshops followed by an evaluation of the tools. This conscious choice can be seen, for instance, in the design of the evaluation questionnaires, which were created in a way to achieve two goals. First, simplicity and flexibility sought to reduce the labour burden in preparing evaluation activities and to ensure that the methods would fit most situations in which users would be confronted with the creative tools (workshops, trainings, demo sessions, etc…). And second, the principle of sharing common items to ensure comparability of results across tools, so that results in levels of satisfaction, attractiveness and perceived interest could be compared across the creative tools to prioritise effort into the most useful tools and features.
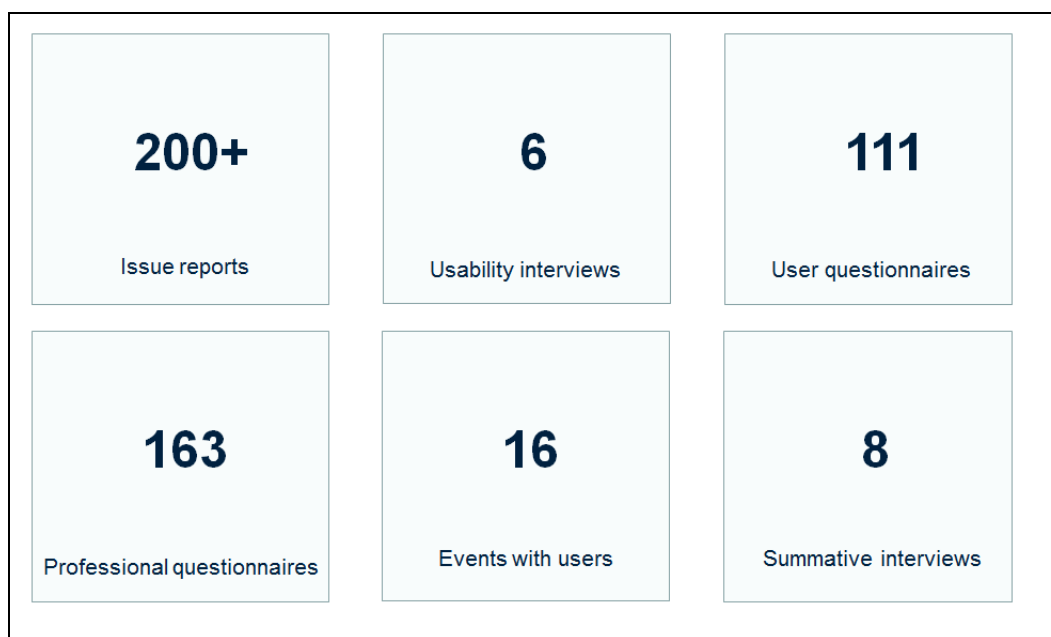


**Figure 6. Quantitative summary of evaluation activities**

As a result of the piloting trajectories of the creative tools, a large number of feedback-generating events have been carried out, as can be seen in Figure 6 above. Over the course of 17 months of piloting the AthenaPlus creative tools, more than 300 users have been reached to obtain feedback on several aspects of the creative tools, yielding a rich database of user-contributed suggestions, recommendations and insights. The results of the activities are detailed in section 4.

## 3.5 Project coordination and operational procedures

At the onset of work in Work Package 6, a series of protocols to manage the sharing of information of the evaluation of the creative tools was agreed with Work Package 5. These protocols provided the procedures to direct the feedback from the three sets of users: from moment of obtaining it from these users, to the processing of the data by piloting partners, the analysis by the evaluation experts in WP6, and finally to the technical teams in WP5, as can be seen in Figure 7:



Part A. Evaluation data flow from creative pilots partners of the AthenaPlus project



Part B. Evaluation data flow from the involved end users of the creative tools

Part C. Evaluation data flow from the involved professional users of the creative tools
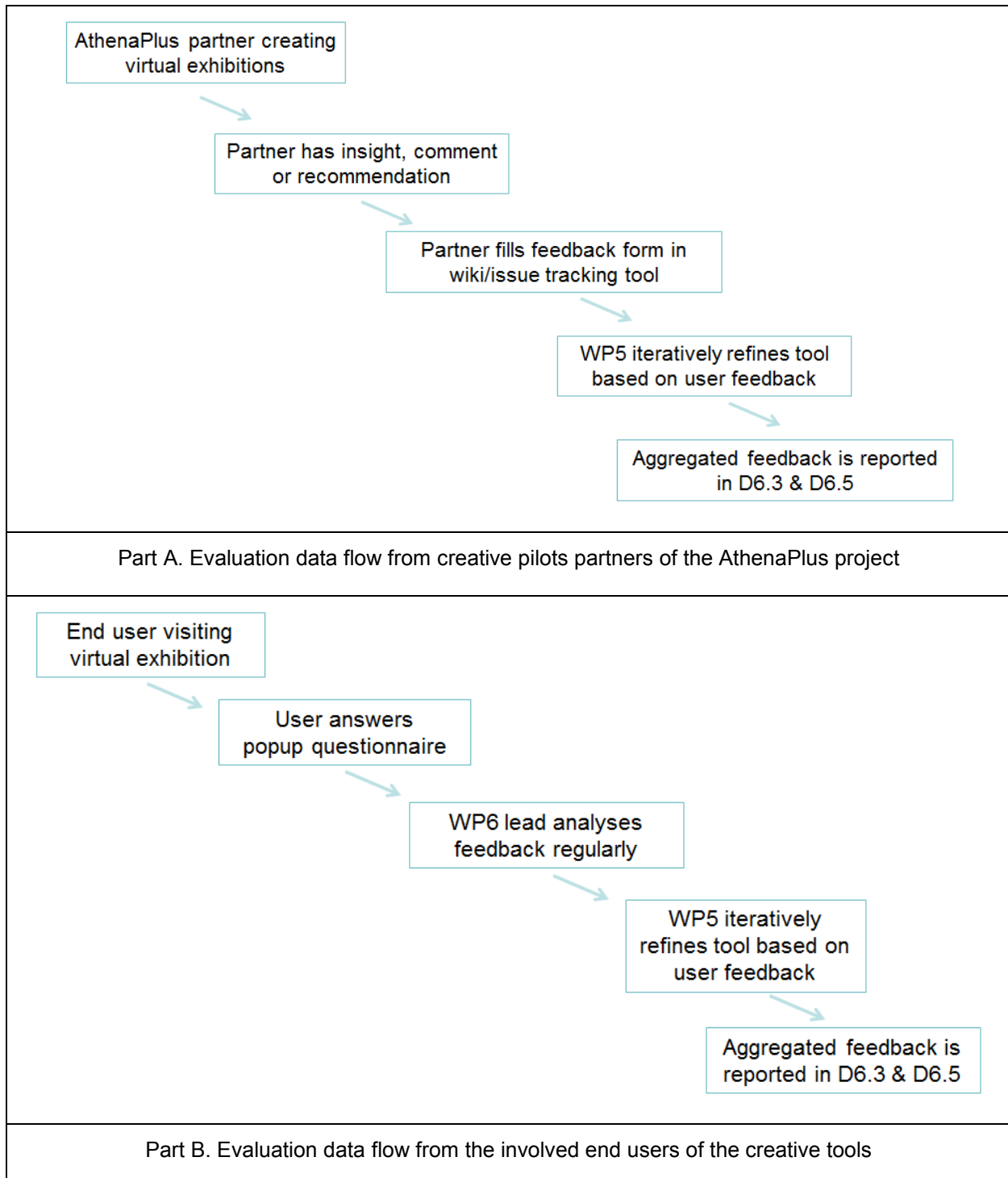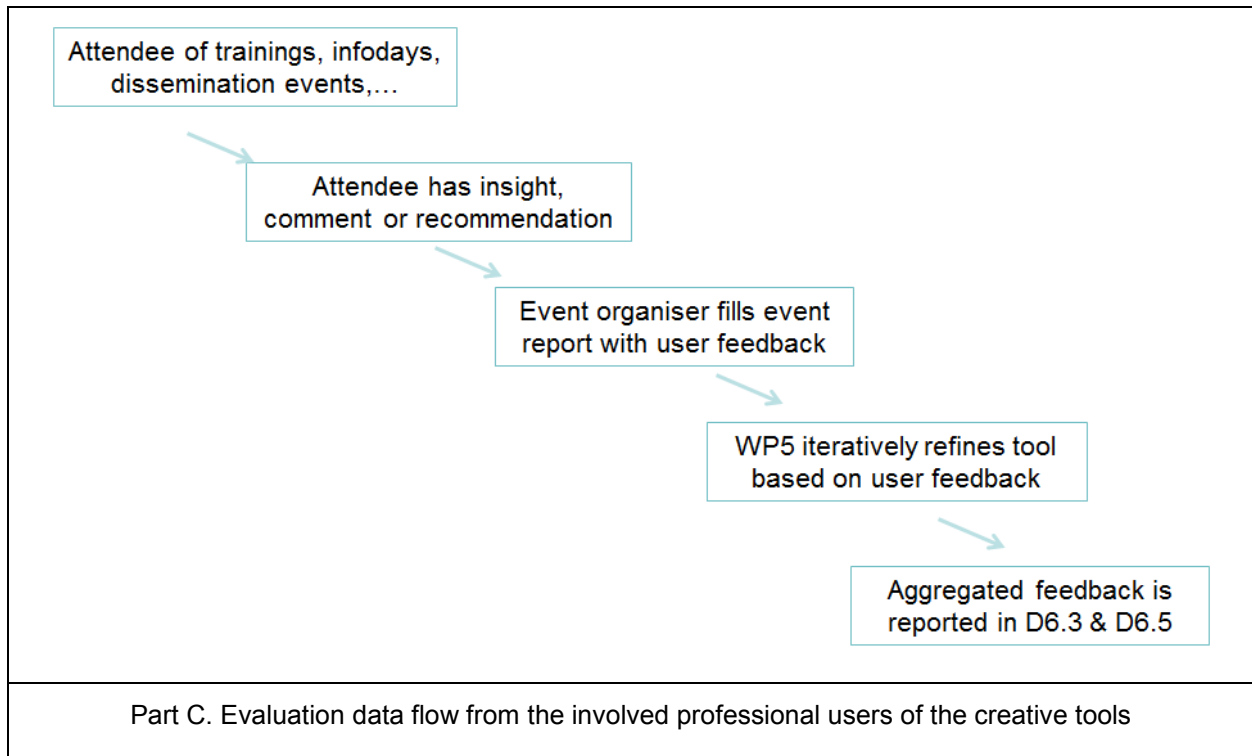
**Figure 7. Diagram of the evaluation data flow within the project**

Before the start of the piloting activities, the methodology for the processing of the reported issues was also agreed with Work Package 5 representatives. Each issue report or e-mail communication was to segmented, recorded (also taking into account duplicated issues) and assigned to a developer. The developer has the responsibility to classify the issue as a bug (a high-priority problem with the software) or as a suggestion (a lower-priority statement of a recommendation for an improvement or an advanced functionality). All these bugs were kept updated in a shared issue tracking system, which also served the purpose of issue archive for documentation.

# 4 DESCRIPTION OF PILOT ACTIONS

This section describes the pilot actions that were undertaken for each tool at each stage, and reports on its outcomes and the insights gained.

## 4.1 MOVIO Digital Exhibitions

MOVIO is a multifunction platform for the creation of multimedia exhibitions and storytelling as well as exhibition guides and mobile applications. It is based on open source technology, can be easily integrated with existing platforms and complies with access standards. MOVIO-HUB is the catalogue, which harvests all MOVIO exhibitions (real or virtual) and it is not limited only to MOVIO installations.

This tool empowers museum curators to create virtual exhibitions and digital extensions of real exhibitions. It guides the visitor by means of theme pages, and enables the publication of multimedia galleries, timelines, thesauri, ontologies creation, slide-shows and interactive geographical maps, personalized content fruition; it is Europeana-plugged, it enables the building of customized modules (importing local DBs).

MOVIO enables the use and reuse of cultural resources, using the storytelling paradigm natively designed for mobile communications. MOVIO's vision is to allow all Europeana content providers, to publish exhibitions using their ready published resources through Europeana in a narrative paradigm.

### 4.1.1 Phase I. Internal usability evaluation

The issue tracking system for the MOVIO Digital Exhibitions tools was active from May 2014 to June 2015, and reported a total of 165 items:
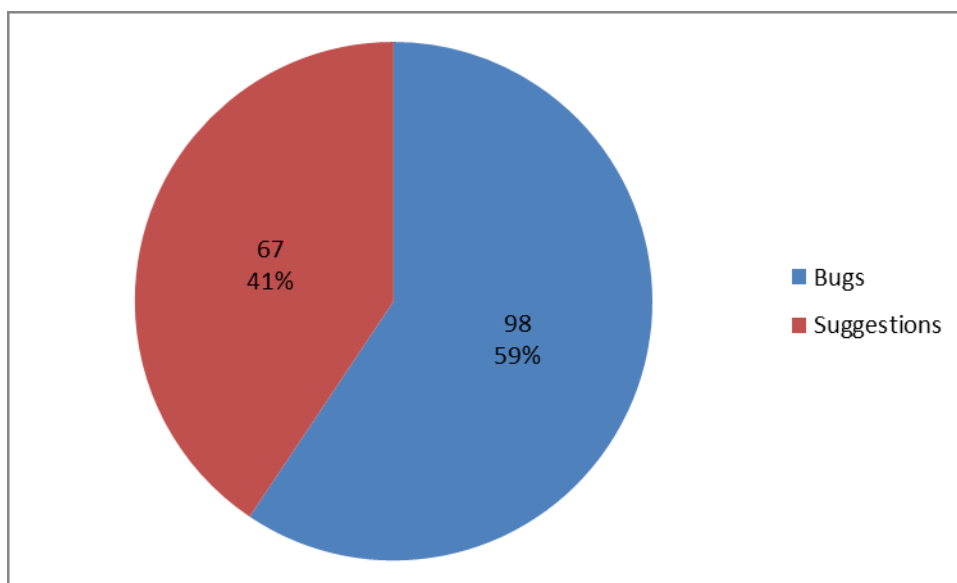


**Figure 8. Statistics for MOVIO Digital Exhibitions issue tracking system**

Of these, 59% were reports of problems that prevented the successful operation of the creative tool, and 41% were recommendations for further improvements. As of July 2015, no high-priority issues remain to be solved.

### 4.1.1.1 Usability evaluation findings

SUS Score results

The System Usability Scale is a standardised 10-item questionnaire, which yields a value between 0 and 100. This figure encapsulates the ease of use and learnability of a given system[4].

The SUS questionnaire was given to the pilot project partners at the end of pilot phase I (September 2014). The score below is based on the responses of 10 team members, which were the most involved in the production of the first release of the MOVIO digital exhibitions pilots.

At the end of this first pilot phase, the System Usability Score of MOVIO Digital Exhibitions was 76.75. As can be seen in Figure 9 below, adapted from Bangor et al[5], this was an unusually high score for a first release. This fact can be explained by the influence of learning effects: since the respondents were questioned four months after starting to use MOVIO, their initial difficulties were less apparent to them than their current skill with the creative tool; hence, they reported a quite high level of usability of the tool.
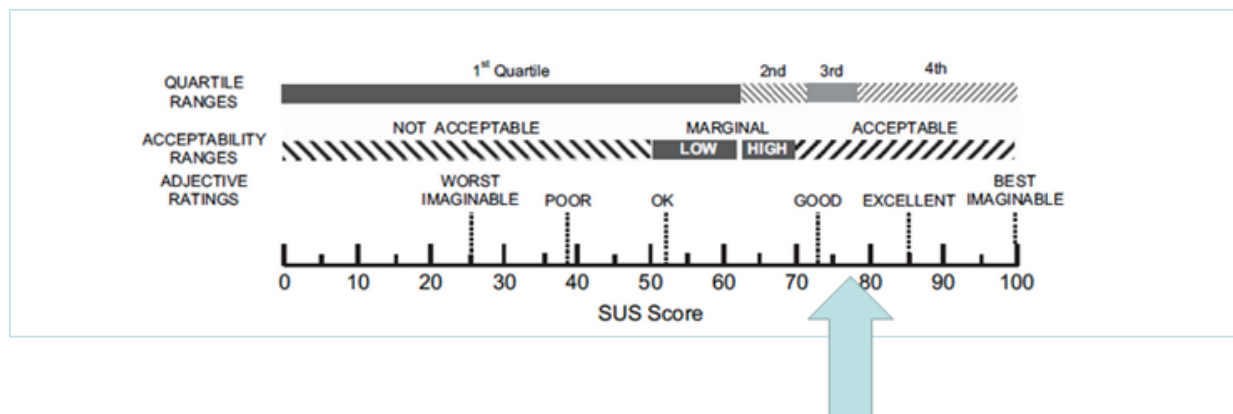


**Figure 9. System Usability Scale scores for MOVIO, pilot phase I**

Detailed usability evaluation results

The following Table 2 contains the details of the outcomes of the usability research. The raw data from questionnaires and in-depth interviews was analysed, classified and rendered in a form in which it could be used by the MOVIO development team to inform their resource allocation decisions.

**Table 2. Detailed analysis and recommended improvements for MOVIO from internal evaluation**

| Analysis | Recommendation |
|---|---|
| *Visualisation of contents is good in laptop but can improve in smartphone* | - Image size in handheld devices should scale with screen size |

[4] Brooke, J. (1996). "SUS: a "quick and dirty" usability scale". In P. W. Jordan, B. Thomas, B. A. Weerdmeester, & A. L. McClelland. *Usability Evaluation in Industry*. London: Taylor and Francis.
[5] Aaron Bangor , Philip T. Kortum & James T. Miller (2008) An Empirical Evaluation of the System Usability Scale, International Journal of Human-Computer Interaction, 24:6, 574-594, DOI: 10.1080/10447310802205776

| | |
|---|---|
| *The templates are generally liked* | - Create more templates for different kinds of virtual exhibitions |
| *Users would like more customisation* | - Issues with display of non-Western European characters<br><br>- Selective social media functions (adding tweet or like button only to some pages)<br><br>- Possibility to hide buttons (i.e. Print button)<br><br>- Choose font type and size (i.e Gothic)<br><br>- An integrated PDF reader would be a nice extra |
| *Content management, resource integration and navigation are good* | - No specific recommendations |
| *Great possibilities in streamlining content import* | - Direct metadata import from collection management system<br><br>- Provide support for LIDO input<br><br>- Implement app export function |
| *There are some small issues with image display* | - Some images are not displayed with the correct size in all pages<br><br>- Ideally, creators should be able to choose the display size of the image<br><br>- Allow users to enlarge thumbnails in the timeline |
| *Zooming and searching need some fixes* | - Search functionality does not work properly sometimes<br><br>- Google indexing of MOVIO pages is important to improve visibility |
| *Improving visualisation and display of ontology builder* | - Zooming is not possible, so when ontologies grow large it is difficult to read text in the display<br><br>- Users agree it is a powerful tool with a steeper learning curve than other MOVIO modules<br><br>- Some degree of integration with site map could be explored |
| *Map functionality could benefit from enhanced POIs* | - Allow curators to add pictures, short edited texts and links to POIs<br><br>- Allow curators to connect POIs thematically or chronologically to tell a story |
| *Timeline is liked but would benefit from better display* | - Allow users to enlarge thumbnails in the timeline |

*4.1.1.2    Conclusions from evaluation with project partners*

The following conclusions were reached at the end of the phase I of evaluation with MOVIO:

-    Some technical issues are pressing: special character display, image adaptation to page, screen display in handheld devices

-    Make ontology easier to start working with and with improved visualisation

-    In general, more customisation of pages is wanted: social media, text fonts

-    More templates would deliver huge value

-    Explore possibilities for data import

-    Google maps: add extra info to POIs is highly desired

### 4.1.2    Phase II. Small-scale evaluation with end users and professionals

In phase II, a total of 8 evaluation actions were carried out by pilot partners. These actions had the goal to involve external end users and professionals in testing MOVIO and providing feedback on how the tool could be improved to better suit their needs and requirements.

*4.1.2.1    Evaluation workshop with cultural heritage professionals (Stockholm, November 2014)*



| Description of action | Training and evaluation workshop for cultural heritage professionals |
|---|---|
| Number and type of users involved | 27 cultural heritage professionals |
| Feedback collection method | Professional feedback questionnaire, Event report form |
| Main outcomes/insights/feedback generated | The following points are extracted from the insights generated by the attending cultural heritage professionals:<br><br>-    Hotspots should be able to be formed in different more versatile shapes. |

| | - The tool should duplicate the exhibition with a different language, without having to redo the whole site. |
| --- | --- |
| | - The current version cannot harvest Europeana to make use of content in local museum/archive databases and does not support common standards like LIDO and EAD to be able to interact with local databases |
| | - Using maps other than in the map page, such as own maps |
| | - More flexibility in graphics, including additional customization possibilities such as more templates. |
| | - Additional data import and export possibilities were suggested. In particular, XML import and export of data, load balancing and caching of images, and improved search and retrieval of data from Europeana were mentioned. |

### 4.1.2.2    Night of Museums event with visitors (Zagreb, January 2015)



| Description of action | MOVIO Corner at Night of Museums event |
| --- | --- |
| Number and type of users involved | 64 visitors |

| Feedback collection method | End user feedback questionnaire, Event report form |
|---|---|
| Main outcomes/insights/feedback generated | The following points were suggested by the museum visitors who took part in the experiment: <br><br> - Adding sound - audio commentary, and unobtrusive music and soundtrack (for example, ticking clocks). <br><br> - An interactive application for smartphones that would greatly assist in touring exhibitions in the museum <br><br> - The aesthetic aspect of the user interface could be worked on a little bit more, to improve the general user experience with the digital exhibition. |

### 4.1.2.3 Evaluation workshop with cultural heritage professionals (Torun, March 2015)

| Description of action | Training and evaluation workshop for cultural heritage professionals |
|---|---|
| Number and type of users involved | 6 cultural heritage professionals |
| Feedback collection method | Professional feedback questionnaire |
| Main outcomes/insights/feedback generated | The following points are refined from the suggestions made by the attending cultural heritage professionals: <br><br> - The map function could be more scenic and visually appealing. <br><br> - The graphical interface for some of the core functions could be improved to achieve a better user experience. <br><br> - Automatic resizing of the pictures to fit the page, instead of setting the size in pixels. <br><br> - More image editing tools <br><br> - More flexibility in page design, chance to modify what we see under the pictures <br><br> - Above all, more templates were requested |

### 4.1.2.4 Evaluation workshop with cultural heritage professionals (Split, March 2015)

| Description of action | Training workshop and dissemination event for cultural heritage professionals |
|---|---|
| Number and type of users involved | 40 museum educators and curators |
| Feedback collection method | Event report form |
| Main outcomes/insights/feedback generated | Verbal feedback was gathered from several attendees of this workshop. MOVIO was generally well received, although attendees also recognised the need for some improvements in certain areas for the tool to be as useful as it can be for education purposes. The areas pinpointed as requiring some revamping were the ontology, which was deemed too difficult to master for non-specialist users, and the end user interface, which could benefit from improved aesthetics (i.e. via some additional more visually appealing templates).<br><br>Nevertheless, in its current form, attendees expressed their view that it can be very well used to present well structured and not too complex information. |

*4.1.2.5   Evaluation workshop with social science and humanities students (Split, March 2015)*



| Description of action | Training session for social science and humanities students |
|---|---|
| Number and type of users involved | 28 students |
| Feedback collection method | Event report form |
| Main outcomes/insights/feedback generated | This session served to raise awareness in the higher education sphere, and to collect direct feedback on MOVIO's attractiveness among education professionals and students.<br><br>Through short informal post-event interviews, it was possible to ascertain that MOVIO was perceived by the attending students as a very interesting creative tool, with huge potential for education and communication in the social sciences and humanities field. |

*4.1.2.6 Evaluation workshop with cultural heritage professionals (Budapest, April 2015)*
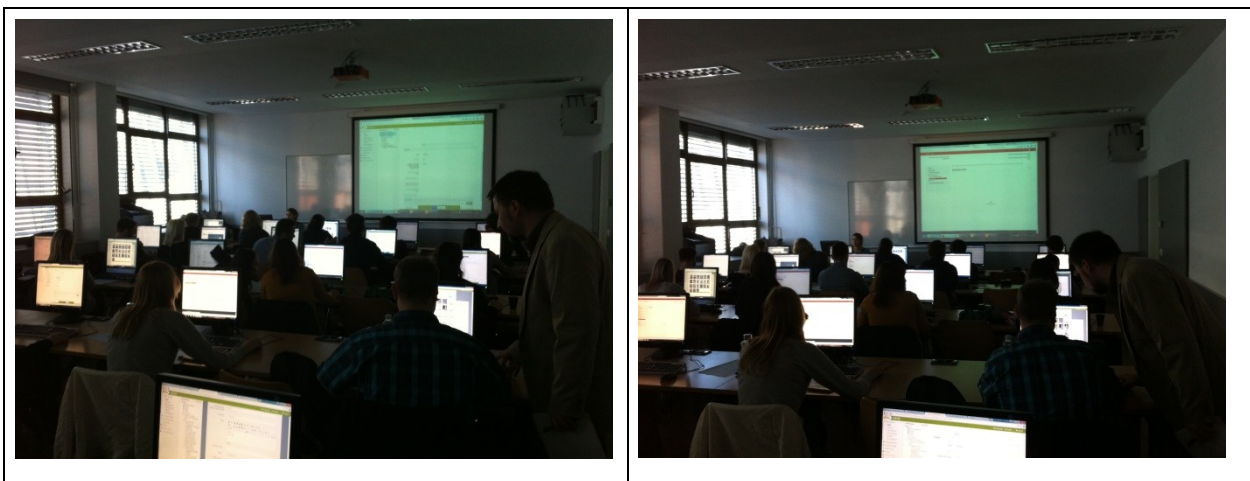
| Description of action | Training and evaluation workshop for cultural heritage professionals |
|---|---|
| Number and type of users involved | 10 cultural heritage professionals |
| Feedback collection method | Professional feedback questionnaire, Event report form |
| Main outcomes/insights/feedback generated | The following points synthesize the suggestions made by the cultural heritage professionals who took part in the workshop:<br><br>- Improvement of ontology map and ontology manager<br><br>- Non linear story telling, as in Homm-sw<br><br>- Better organization of the images in folders in the media archive<br><br>- The possibility to show videos and photoes in the same page<br><br>- The possibility to put some specific and different media in the italian/english version<br><br>- Enhance the interaction with social media<br><br>- On line tutorial and interactive help would be essential for expanding the adoption of Movio.<br><br>- Further maintenance for minor bugs would be consistent with the larghe scale diffusion of Movio"<br><br>- The need to add templates and improve the storyteller |

*4.1.2.7 Evaluation workshop with cultural heritage professionals (Vilnius, April 2015)*

| Description of action | Training and evaluation workshop for cultural heritage professionals |
|---|---|
| Number and type of users involved | 6 cultural heritage professionals |
| Feedback collection method | Professional feedback questionnaire, Event report form |
| Main outcomes/insights/feedback generated | Trainees unanimously agreed that the tools are relevant to the professionals of cultural institutions in order to disseminate and reuse digital cultural heritage. They were impressed by the user experience and ease of use of the tools. However, general consensus was that final and more stable versions of the tools are needed before trainees would be willing to incorporate the tools into their everyday activities.<br><br>A few direct recommendations were discussed:<br><br>- Encryption of passwords was named as a critical error and serious security risk. Function "Remind a password" was, which would change the password to the temporary one instead of simply showing it was suggested as solution;<br><br>- Incorrect display of Lithuanian diacritics was also mentioned. Possibility to insert custom CSS code in the template of exhibition makes it possible to "get around" the problem, but it also can have a negative effect of loading time of the exhibition. |

| | Thus, national diacritics should be stored in the database of the MOVIO software; |
| --- | --- |
| | - Possibility to import/export content to/from other content management systems was requested; |
| | - "Edit" function in the front-end of the tool which would directly lead to the content editing of particular page / element of exhibition was suggested. |

### 4.1.2.8   User test with museum visitors (Vilnius, June 2015)

| Description of action | Randomised user evaluation |
| --- | --- |
| Number and type of users involved | 53 users |
| Feedback collection method | Event report form, Direct feedback report |
| Main outcomes/insights/feedback generated | The following points synthesize the suggestions made by the participating visitors:<br><br>- At the digital exhibition level, some users requested more photographies. Also, some would like more historical information about all objects that are presented in the exhibition.<br><br>- A few remaining problems with some Lithuanian alphabet characters were pinpointed by several users.<br><br>- In general, users regarded MOVIO as a very nice idea, and recommended to disseminate it as widely as it is possible. As one user put it, "It is great that you can learn so much about the city and the history of architecture even if you did not come to the museum." |

### 4.1.2.9   Conclusions from evaluation with stakeholders

Analysis of SUS scores

The System Usability Score for MOVIO was calculated on the basis of the responses of 37 professionals attending 4 workshops and events with an updated interim version of MOVIO digital exhibitions, on which the several displayed pilots were based:
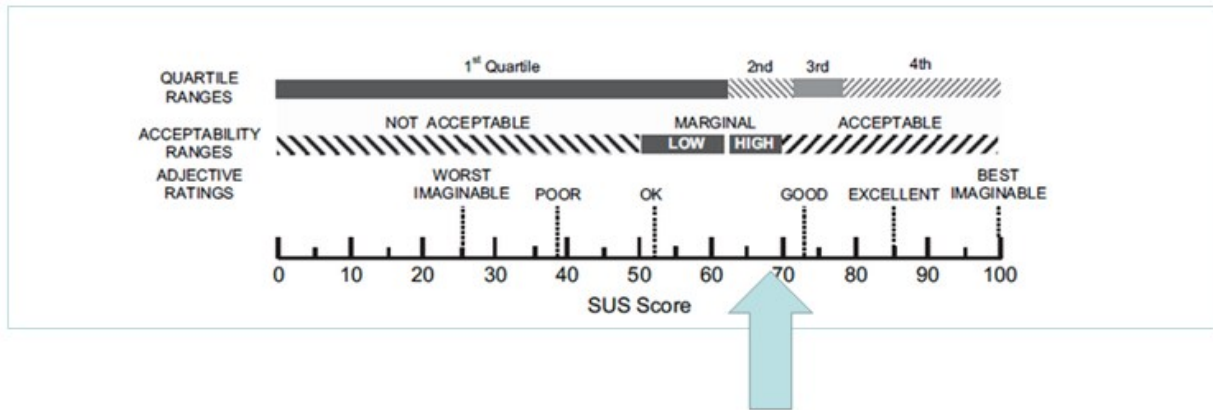
**Figure 10. System Usability Score result for MOVIO digital exhibitions**

MOVIO Digital Exhibitions' SUS score is 68.52%, a reasonably good score. This score reflects phase II of the piloting trajectory as a whole, an eight-month period in which many improvements were implemented into the creative tool.

For this reason, if we go in depth into the change of these scores throughout the evaluation trajectory, we get a clearer picture of the improvement in usability that MOVIO has experienced as a result of the piloting trajectory. In the graph below, we can see the disaggregated SUS scores, plotted against time in a graph that details the evolution of the scores in each event involving cultural heritage professionals.



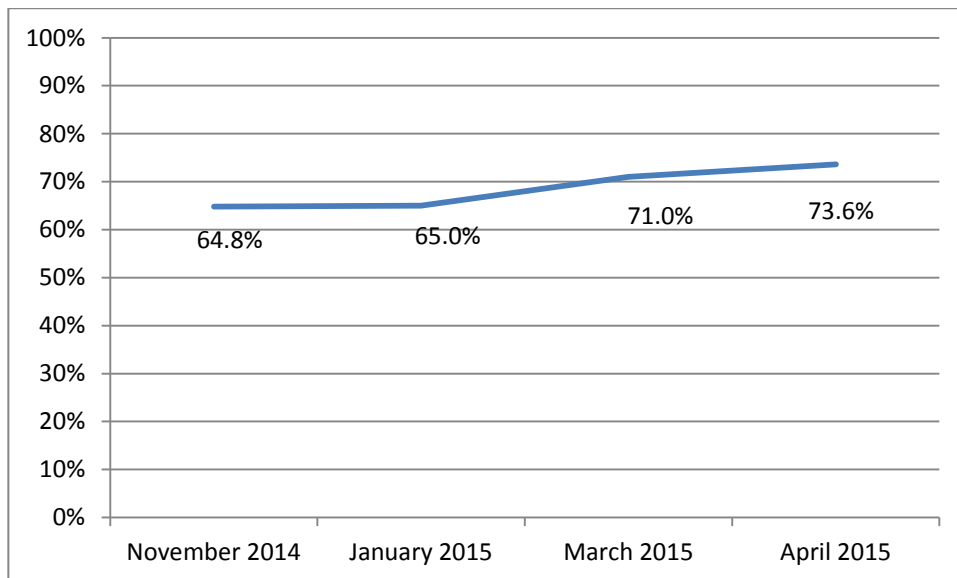**Figure 11. Evolution of System Usability Scores during pilot trajectory, November 2014 - April 2015**

As we can see, there is a clear upwards tendency in the SUS results, which reflects a steady and constant improvement as a result of continuous bug spotting and fixing, as well as the implementation of additional functionalities requested by users.

Analysis of relevance indicators and user experience metrics for end users
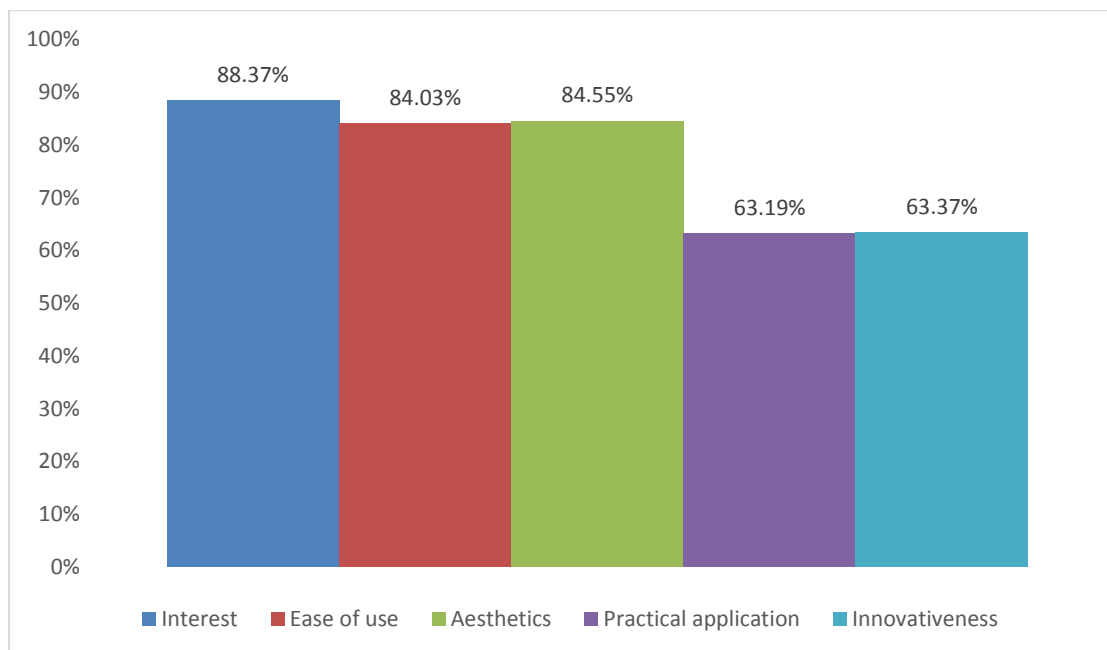
**Figure 12. User ratings in selected dimensions of user experience with MOVIO**

As can be seen in Figure 12 above, MOVIO scores highly in the dimensions of interest, ease of use (here understood as end-user usability), and aesthetics. This data can be complemented with the satisfaction and recommender scores of the application, which stand at 84.4% and 84.9% respectively.

On a less positive note, though, are the lower scores in perceived practical application and innovativeness, both hovering just over the 63% mark. This might reflect the fact that MOVIO's usefulness is oriented mostly towards professionals and not visitors, and that its innovativeness can only be fully perceived from a backend perspective.

Analysis of relevance indicators and user experience metrics for professionals

As regards the evaluation with cultural heritage professionals, the series of four graphs below contain the statistics on the collected data for MOVIO Digital Exhibitions.
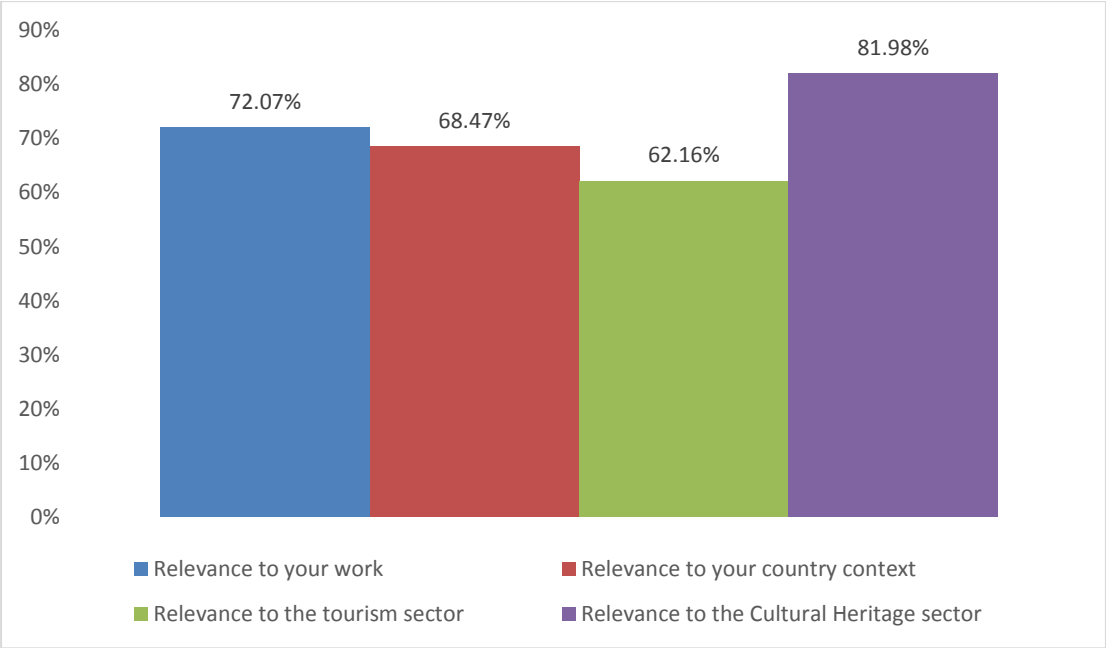
**Figure 13. Perceived relevance of MOVIO tool – basic indicators**
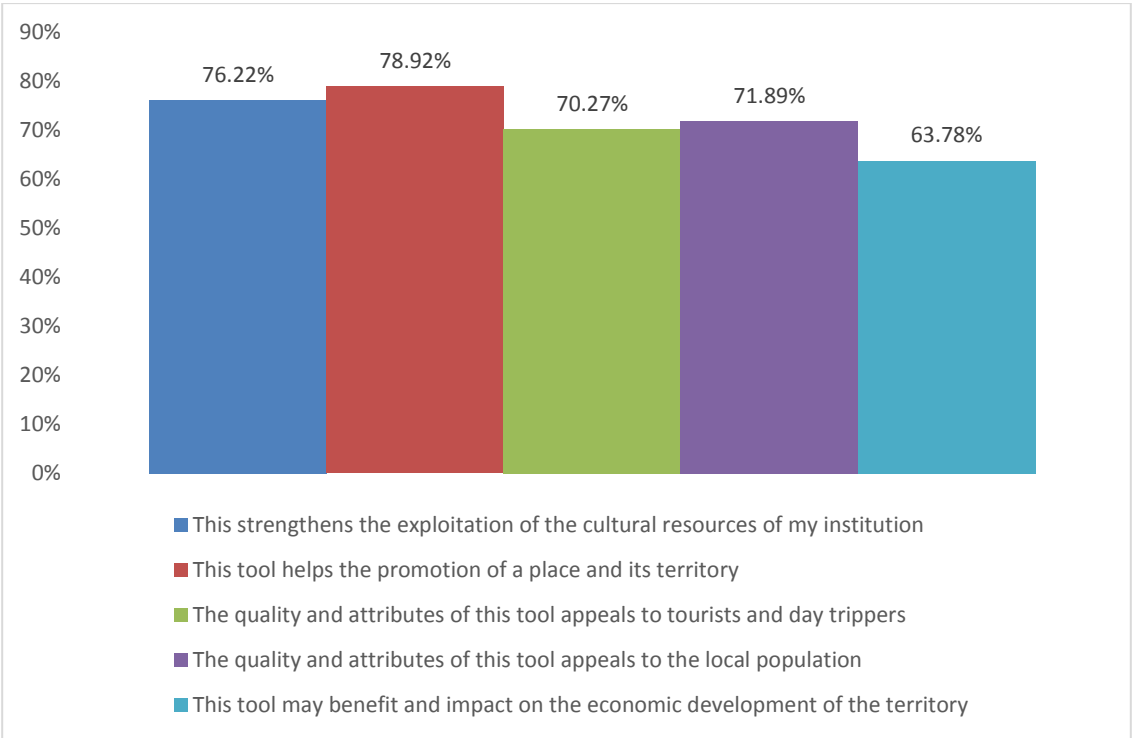


**Figure 14. Perceived relevance of MOVIO tool – extended indicators**
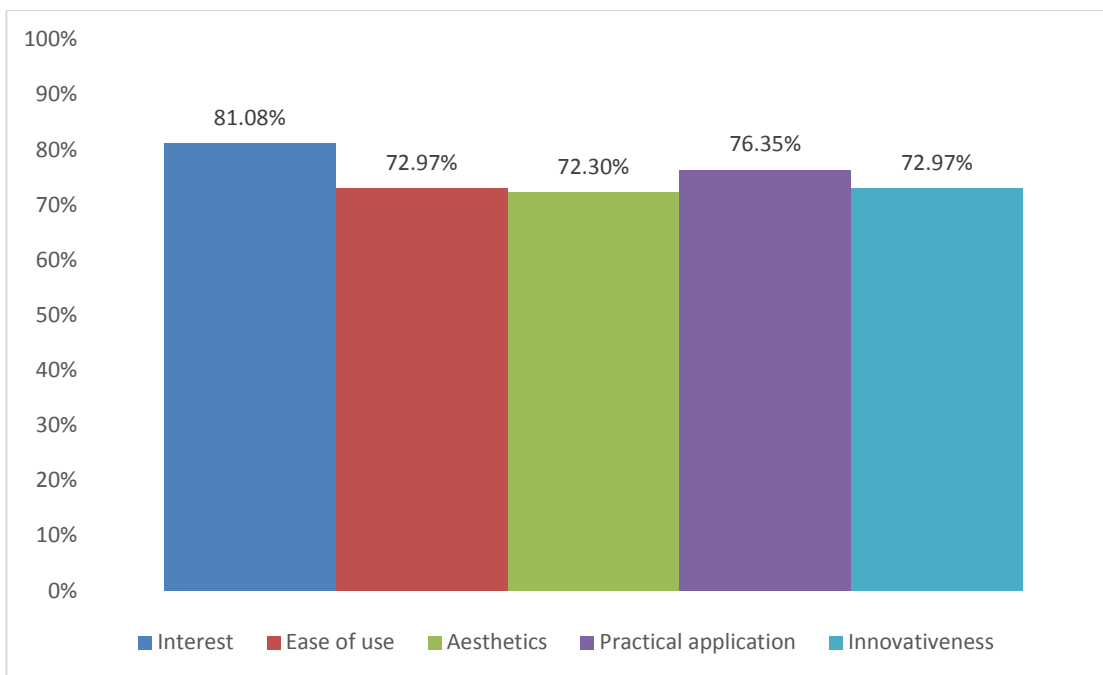
**Figure 15. Professional ratings in selected dimensions of user experience with MOVIO**
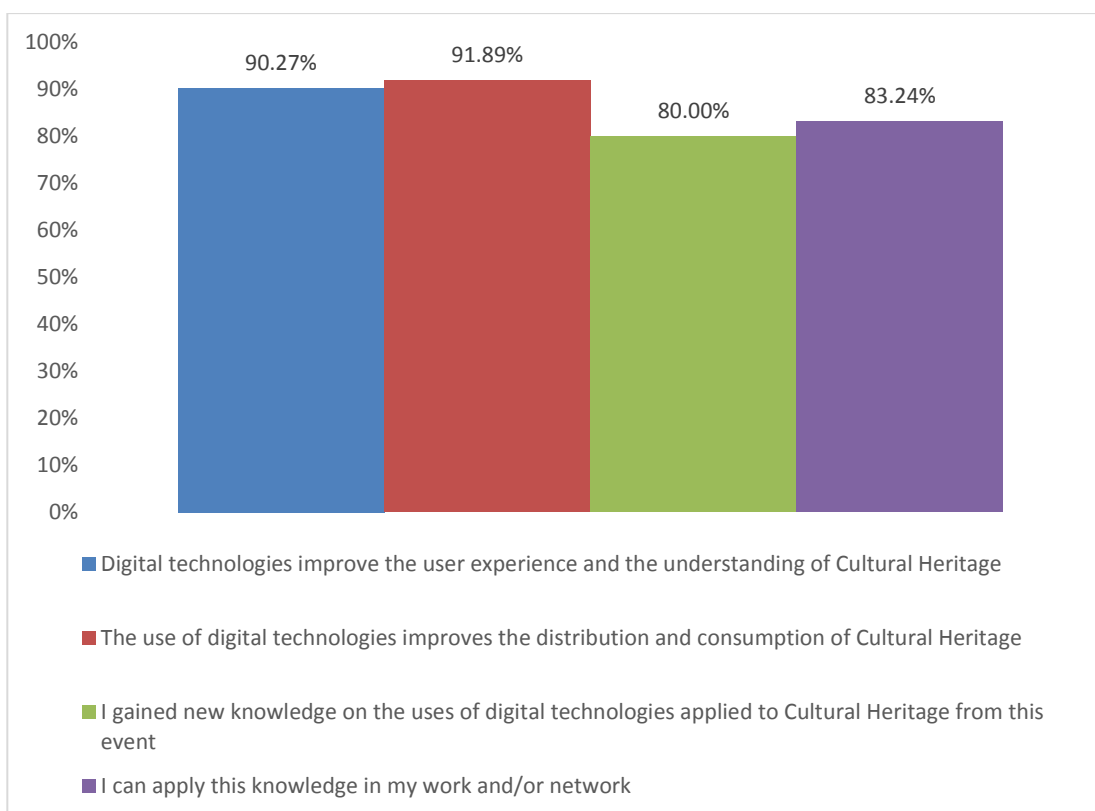


**Figure 16. Overall opinion of digital technologies for cultural heritage after exposure to MOVIO tool**

Taken as a whole, the aforementioned graphs reveal that MOVIO has achieved a good level of user experience. Of particular note is the very positive score in the interest metric, with an 81% average rating. Moreover, if we take a glance at Figure 13, it is apparent that MOVIO is perceived as being very

relevant for the cultural heritage sector; not so much for the tourism sector though. This is compounded by the data in Figures 14 and 15, where tourism-related indicators ("..appeals to tourists and day trippers…", "…impacts on the economic development of a territory….") have slightly lower scores than cultural heritage-related indicators ("…strengthens the exploitation of cultural resources of my institution…", "…helps the promotion of a place and territory…", "…improves the understanding of cultural heritage…"),

The conclusion of a positive outcome in the evaluation of this creative tool is reinforced with data from items 13 and 14 of the professional questionnaire, where MOVIO obtains a satisfaction score of 82.3% and a recommender score of 87.7%.

Summary of evaluation results

The following conclusions were reached at the end of the phase II of evaluation with MOVIO:

- MOVIO Digital Exhibitions has been met with a positive response at workshops with professionals – many instances were asked.

- Professionals have praised MOVIO virtual exhibitions for the simplicity and ease of use of the backend, and the relevance and interest of certain functionalities (map, timeline).

- The possibility of using user-generated maps and improvements in data import and image display has been suggested.

- A critical improvement, which has been suggested throughout the piloting trajectory, is the addition of more templates for MOVIO, to enhance its visual appeal and increase its flexibility and usefulness for the creation of a wide array of digital exhibition types. This requirement has been implemented.

- Visitors seem to get a very positive impression out of virtual exhibitions created with MOVIO.

- From the point of view of users, the success of a virtual exhibition lies in the creative interplay of several functionalities to arrange digital contents along a narrative.

- Particularly liked features are maps, timelines, story-driven content combinations (i.e. storytelling), and smartphone deployment (for a low-cost, high-quality visit guide).

- User suggestions to consider are the addition of audio (descriptions, documents, soundtrack), the integration of interactive applications (minigames).

### 4.1.3 Phase III. Large scale evaluation

As a result of the improvements made during the piloting activities, a set of fully finished MOVIO instances are available at the end of pilot phase II. This complete set of AthenaPlus pilot exhibitions created with MOVIO will be described in detail in the upcoming D6.5 document. Once these exhibitions are finalised at the end of pilot phase II, phase III can begin. In this third and last phase of the piloting trajectory, the published Digital Exhibitions created with MOVIO are publicly released online and promoted through a variety of communication channels and dissemination activities.

Although the main purpose of the public release of the pilots is to serve as public showcases of the functionalities offered by the MOVIO tool, making the pilot instances available to a large offers enormous possibilities for evaluation. To take advantage of these opportunities, an online feedback form has been created for MOVIO Digital Exhibitions. This feedback form will be included in each of the published instances, to award visitors the possibility of suggesting improvements and providing suggestions to both the curatorial team who created the exhibition and the technical team who developed the tool. The insights collected through this phase III evaluation instrument are expected to

give grounds for any additional improvements of MOVIO, and bolster the marketability and sustainability profile of the tool.

## 4.2   City Quest

CityQuest allows cultural organisations to easily create a quest online, and publish it to a mobile app. Send your visitors around the city to discover items from your collection and the locations they are connected to.

Based on hints and media you track down an item, scan the QR code on its location and learn the (hi)story behind it.

The mobile app is free to download. The online interface is free to use upon registering. CityQuest is an open source application.
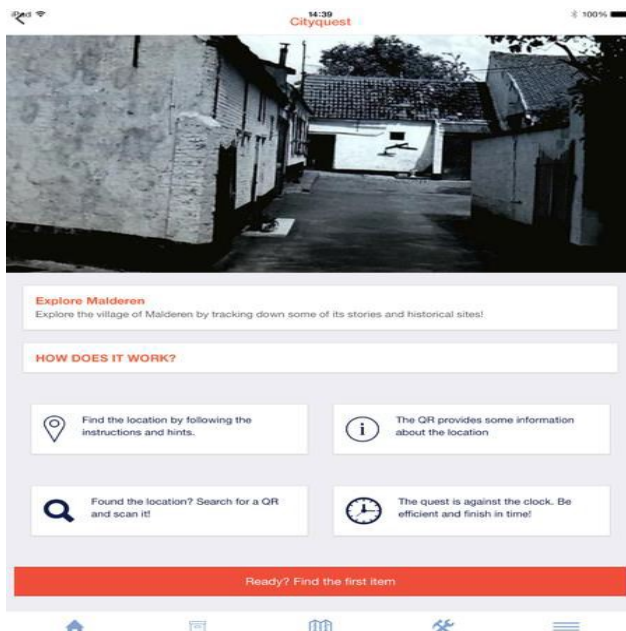


### 4.2.1   Phase I. Internal usability evaluation

The issue tracking system for the MOVIO Digital Exhibitions tools was active from February 2015 to June 2015, and reported a total of 41 items:
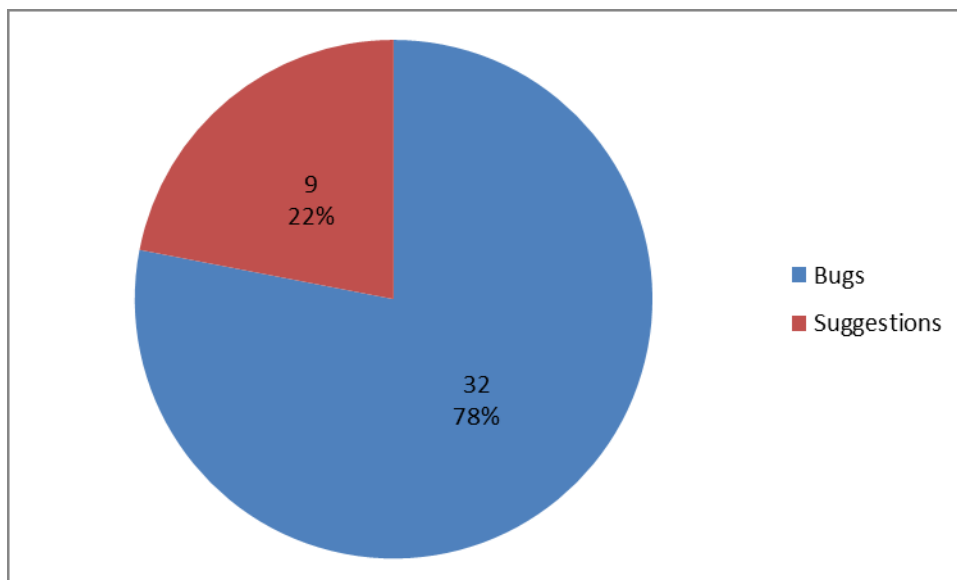


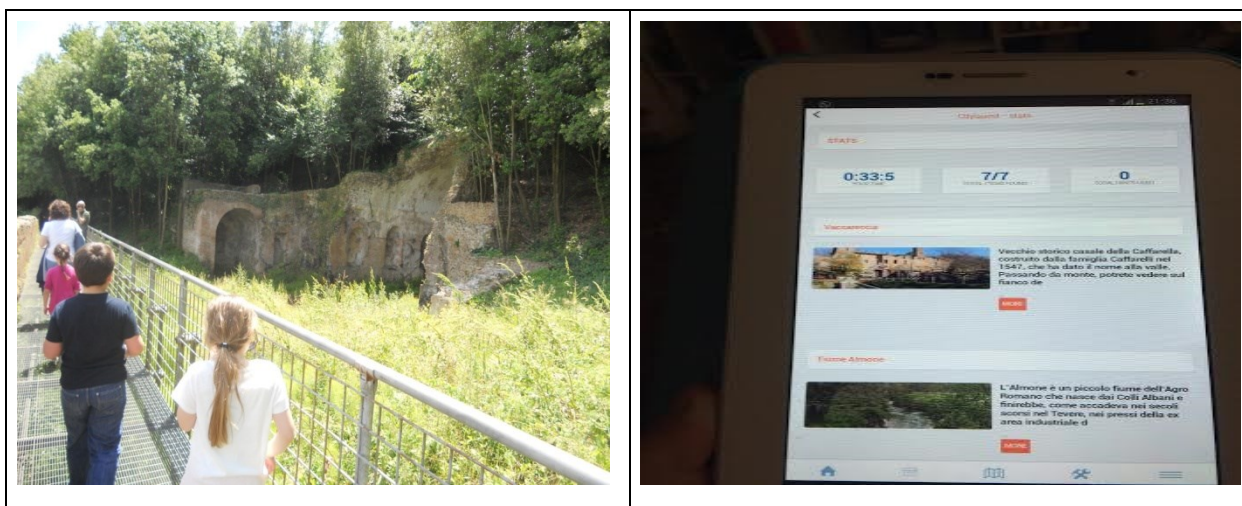**Figure 17. Statistics for CityQuest issue tracking system**

Of these, 78% were reports of problems that prevented the successful operation of the creative tool, and 22% were recommendations for further improvements. As of July 2015, only one high-priority issues remains to be solved.

### 4.2.2 Phase II. Small-scale evaluation with end users and professionals

*4.2.2.1 Evaluation workshop with cultural heritage professionals (Vilnius, April 2015)*

| Description of action | Training and evaluation workshop for cultural heritage professionals |
|---|---|
| Number and type of users involved | 6 cultural heritage professionals |
| Feedback collection method | Professional feedback questionnaire, Event report form |
| Main outcomes/insights/feedback generated | The following points synthesize the suggestions made by the users:<br><br>- Possibility to use image recognition instead of scanning QR codes was suggested;<br><br>- For item description presented after particular item is found, not only text but also possibility to display image of the item should be present;<br><br>- Time count should be stopped (temporary) after one object is found and restarted then the search for another item is launched. It would give user a chance to take his time while exploring and learning new information about the object he found;<br><br>- Use of interactive maps with GPS was proposed. Some trainees suggested that maps could work in two modes: one mode for those without internet connection and other mode for those with it. |

*4.2.2.2 Outdoors user test with families (Rome, May 2015)*

| Description of action | User test of a full quest in a public park setting |
|---|---|
| Number and type of users involved | 12 users (4 children aged 8-12 and their parents) |
| Feedback collection method | Event report form, User interviews |
| Main outcomes/insights/feedback generated | At the end of the quest, a show interview was made to the children, who were enthusiastic to have participated in this quest, |
| | They were very happy to have used the Tablet, they found the application usable (even if the interface was in English) and the quest well structured |
| | The parents were happy to have done this experience with the children in open air and some told that they did not know this park before, even if they live not far from it, and that they will bring the children back to this park. |
| | In short, the tool was regarded as an alternative and innovative tool for a Quest. It was easy and funny to create the quest on the online interface, and to use the application to play. |

### 4.2.2.3 Indoors user test with museum visitors (Vilnius, June 2015)

| Description of action | Randomised user evaluation |
|---|---|
| Number and type of users involved | 18 users |
| Feedback collection method | Event report form, Direct feedback report |
| Main outcomes/insights/feedback generated | The following points synthesize the suggestions made by the users: |
| | - Lithuanian language file needs some adjustments, so that the translations reflect more accurate meanings. |
| | - In the Settings menu of the app, part of the program script is visible ("The QR provides some information about the location./p>", see the screenshot no_2 attached). It is visible both in English and Lithuanian versions. |

- Buttons "Less" and "More" near the found items in the Inventory menu need to be translated. Also, several issues with overlapping text of the descriptions after pressing "More" button were encountered (see the screenshot no_3 attached). Besides, images were not displayed near the descriptions anymore. Not sure if it is an issue, but before images made the Inventory menu more attractive.

- Issues with unsuitable layout of the text, especially on mobile phones, were encountered (see the screenshot no_4 attached). I guess it is down to the unsuitable resolution and is not the real errors, but still, maybe something can be done.

- When the item is found and QR code is scanned, app does not automatically return to the top of the screen, to the description of the item. Instead it only hides hints. So, especially if several hints were used, after finding the item user is being left with empty grey screen (see screenshot no_5 attached) and need to perform one additional scroll to the top. I did not thought of it as a big issue, but it really caused unnecessary confusion for the end-user when our pilot was tested.

- When skipping the item, additional popup window asking "Do you really want to skip the item? Yes / No" is needed. Because it is very easy to accidentally skip the item. And once you skipped, you cannot return.

- At the moment quest's status bar on top of the screen only shows one symbol – check ("v") both for found and skipped items. Maybe it is possible to display skipped items with symbol "x", as not found?

### 4.2.2.4 Evaluation session with cultural heritage professionals (Vienna, June 2015)

| Description of action | Small-scale workshop with key professional profiles and in-depth qualitative evaluation |
|---|---|
| Number and type of users involved | 3 senior cultural heritage professionals |
| Feedback collection method | In-depth interviews, Event report form |
| Main outcomes/insights/feedback generated | - Tools are relevant to professionals of educational institution in order to disseminate and reuse digital cultural heritage. Tools are easy to use but versions and installation possibilities need to be finalised before every day use is possible.<br><br>- Creating the quest was in fact not too difficult except when it came to installation of the app. The app is definitely needed in the app store as well in order to guarantee the feasibility on iPhones too. The usage of tablets is not common in schools so additional usage of mobiles with large screens is more likely.<br><br>- More interactivity and more ease of use were pinpointed as the only areas requiring slight improvements. Also, in small villages QR-codes are ok, but in large cities picture recognition would be better. |

| | - The most popular demands from users concerned the "rewards" you get after successfully completed tasks. First, then the item is successfully found, additional image (e.g. image of the item in full) as a reward would greatly improve the sense of satisfaction. Second, users did not feel right that one, who skipped the item, received exactly the same "reward" as the one who found the item and scanned QR code. Thirdly, "reward" after completing entire quest must be greater than simple statistics. Suggestion was offered of implementing some scale evaluation, corresponding to the number of items one has found. E.g. topic of our pilot is "Crime Stories of Vilnius Picture Gallery". So, for the user who have found all or most of the items in the quest congratulation message could be: "Congratulations! You have found 8/8 items. You are the new Sherlock Holmes / true detective / etc.". Ones who have found less could be compared with other persons/characters, which could also match the topic of the quest. |
|---|---|

### 4.2.2.5  Conclusions from evaluation with stakeholders

Analysis of SUS scores

The following SUS score for CityQuest has been computed on the basis of the responses of 6 cultural heritage professionals attending a total of two events (a workshop and an evaluation event) with an updated interim version of CityQuest, on which the several displayed pilots were created.
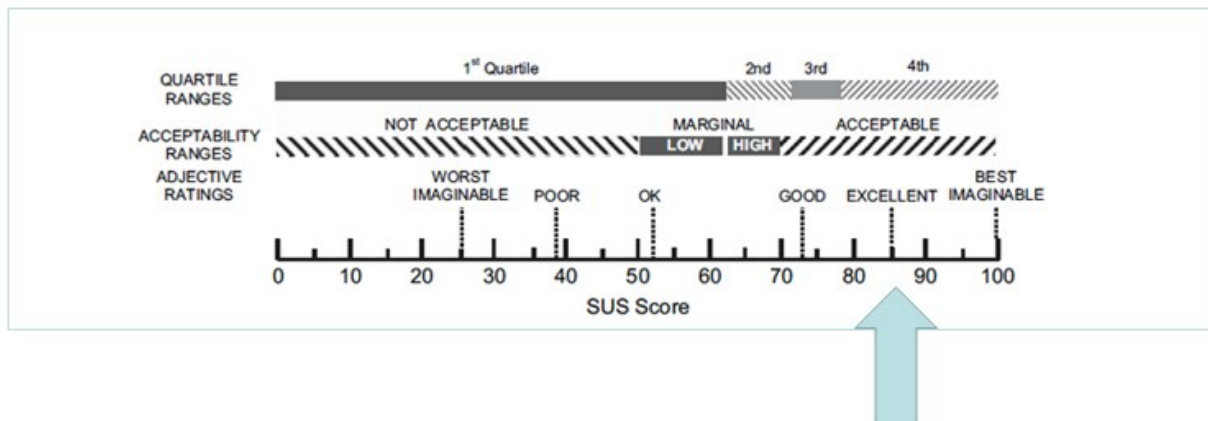


**Figure 18. System Usability Score results for CityQuest**

The SUS score of the final release of the CityQuest creative tool is 85%, an outcome widely regarded by the literature on the System Usability Scale as an excellent result (see footnote nº3 for further reference).

Analysis of relevance indicators and user experience metrics for end users

CityQuest has been received very positively by the sample of test users, reaping excellent marks on all five of the dimensions of the user experience that were assessed (see Figure 19 below), plus excellent satisfaction and recommender scores standing at 90% and 91.6%.
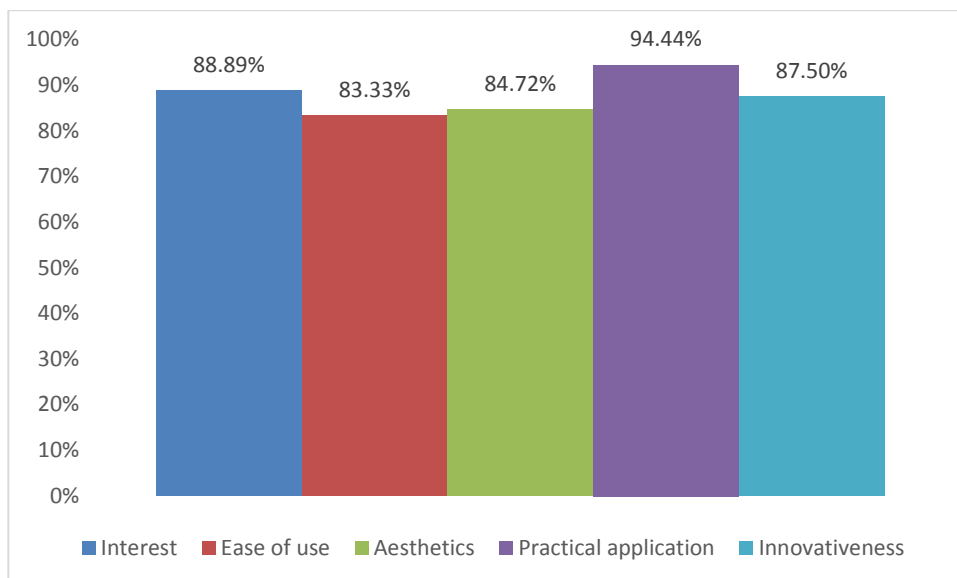
**Figure 19. User ratings in selected dimensions of user experience with CityQuest**

Analysis of relevance indicators and user experience metrics for professionals

The series of four graphs below contain an analysis of the responses to the professional questionnaire form, which was given to the professionals who attended the evaluation workshops of CityQuest's phase II piloting trajectory.



**Figure 20. Perceived relevance of CityQuest tool – basic indicators**

**Figure 21. Perceived relevance of CityQuest tool – extended indicators**



**Figure 22. Professional ratings in selected dimensions of user experience with CityQuest**
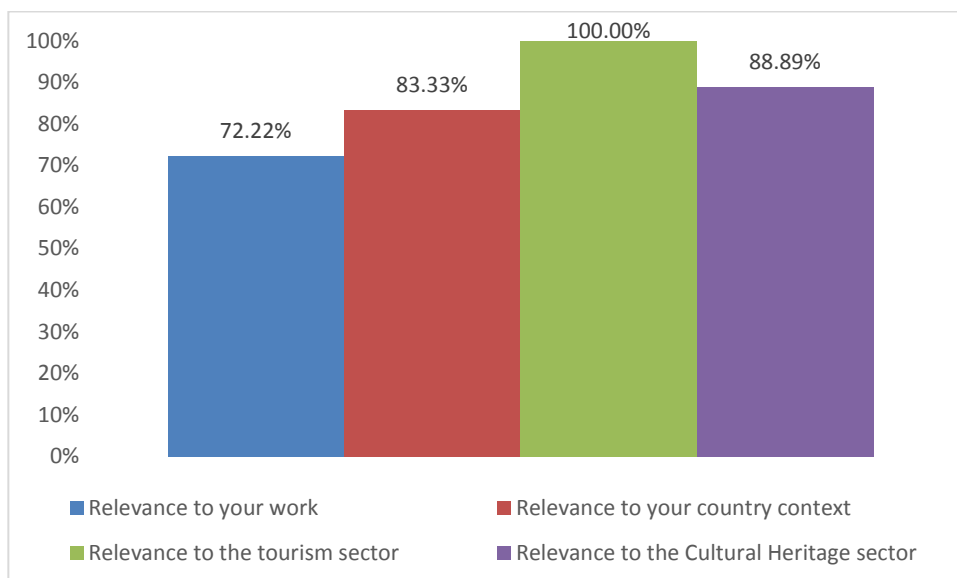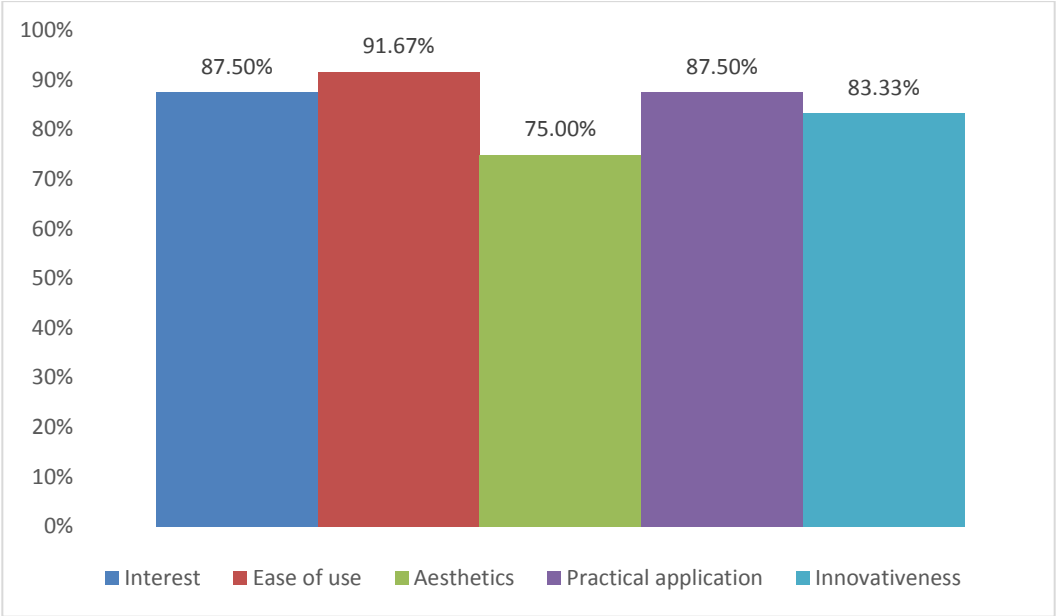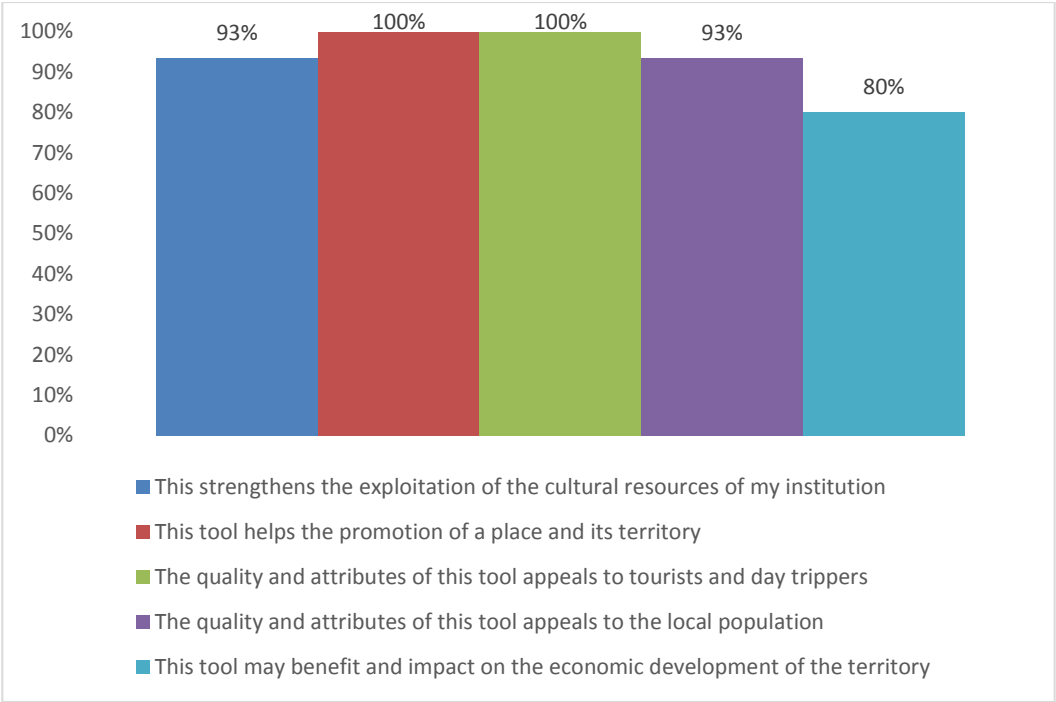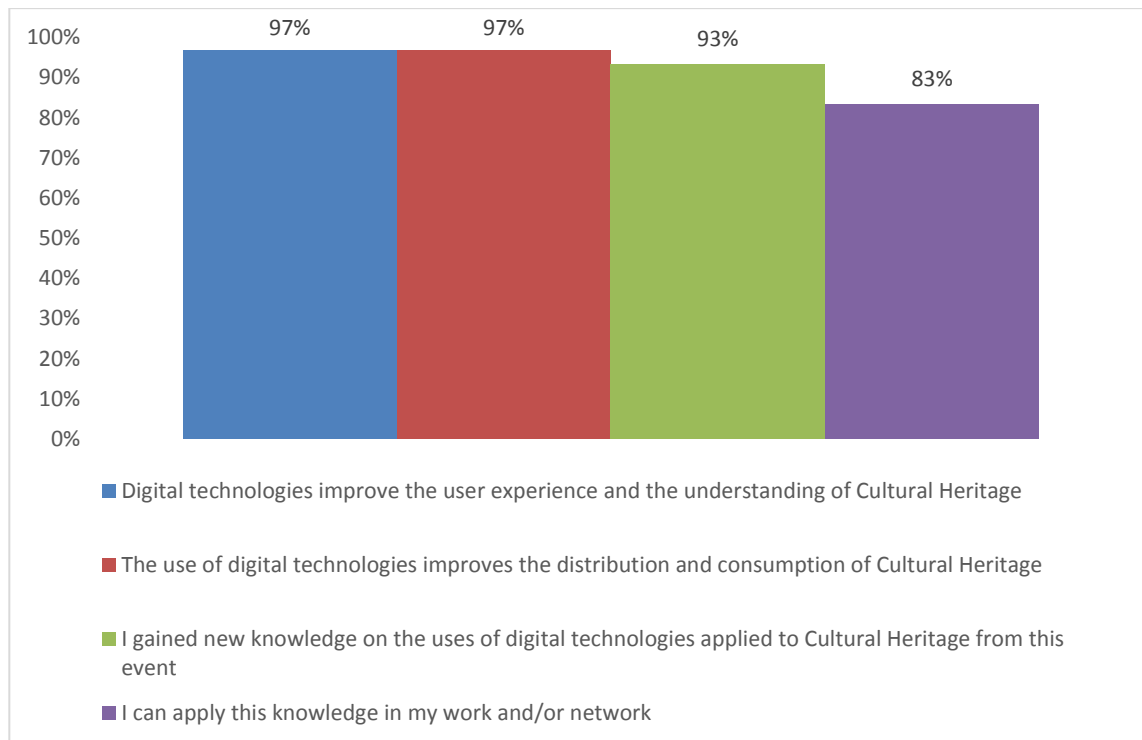
**Figure 23. Overall opinion of digital technologies for cultural heritage after exposure to CityQuest tool**

In general, the metrics extracted from the CityQuest professional questionnaire data is very positive, with some remarkably excellent results in tourism indicators such as the perceived relevance to the tourism sector (Figure 20), its appeal to tourists and day trippers (Figure 22), and its improving the distribution and consumption of cultural heritage (Figure 23). The satisfaction and recommender scores also point to the same direction, with respective scores of 92.2% and 95.5%. The interpretation of these results warrants some caution, though, as the small sample that had been possible to assemble makes it difficult to infer results to a larger population.

Summary of evaluation results

The following conclusions were reached at the end of the phase II of evaluation with CityQuest:

- CityQuest has reaped outstanding scores in the evaluation with professionals and end users, which attest to its usefulness and interest for the community of users.

- Excellent to discover for open air museums, archaeological sites and outdoors cultural heritage locations.

- Professional user suggestions as regards possibilities for future improvements lay in expanding possibilities for markers, not just using QR codes, but incorporating technologies such as pattern recognition or GPS tracking. This would make it easier to create quests around protected areas, where the addition of alien elements such as QR-code panels is regulated and may be difficult to secure.

- Also, from an end user perspective, it might be interesting to enhance the gamification aspect of the creative tool, adding a structure of rewards and badges to be awarded to the users upon completion of sections of the quest. This would increase the appeal of CityQuest for young users.

**4.2.3 Phase III. Large scale evaluation**

As described in Section 4.1.3, phase III constitutes the final phase of evaluation in the AthenaPlus piloting framework. In this phase, the published instances of work with the creative tools are released and promoted widely among the target user groups in a non-controlled way, so that further feedback can be collected.

As regards the CityQuest tool, an online feedback form will be attached to each of the published Quests created by the pilot institutions. In this way, interested users can provide additional recommendations to improve both creative tool and the particular Quest that they have undertaken.

## 4.3   School Trip

Schooltrip is a tool that allows students to create their own school journey. Through an online interface the teacher can set a couple of parameters defining the skeleton of the trip.

Students fill the template with information on practicalities, cultural heritage sites to visit, historical information, and so on. They learn to plan a travel from a to z, while incorporating our cultural heritage. At the end, a journal-like document is generated which can be used as itinerary guidebook.

The SchoolTrip programme is free to download and install. SchoolTrip is an open source application.
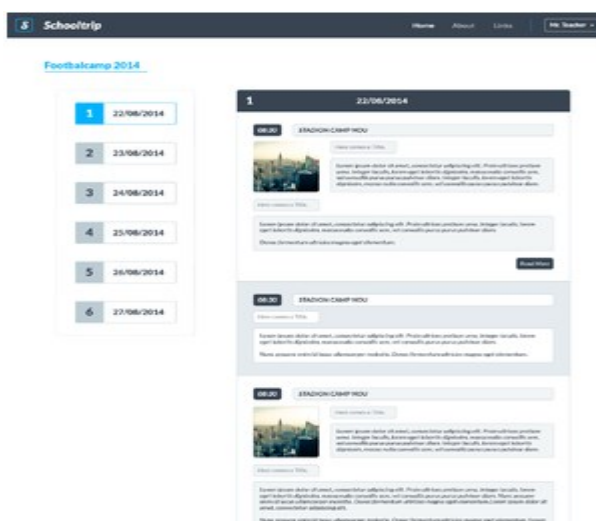
### 4.3.1   Phase I. Internal usability evaluation

The issue tracking system for the MOVIO Digital Exhibitions tools was active from April 2015 to June 2015, and reported a total of 6 items:
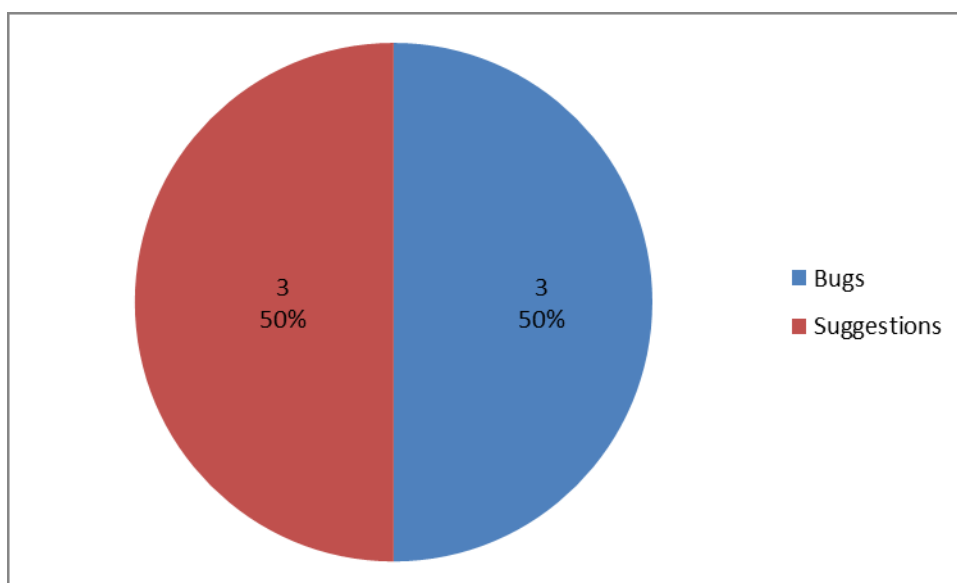


**Figure 24. Statistics for SchoolTrip issue tracking system**

Of these, half were reports of problems that prevented the successful operation of the creative tool, and half were recommendations for further improvements. The low number of bugs reported can be attributed to the remarkable stability and completeness of the first release of the tool, but also to the significantly shorter piloting period as compared to the other AthenaPlus creative tools. As of July 2015, no high-priority issues remains to be solved.

### 4.3.2 Phase II. Small-scale evaluation with end users and professionals

#### 4.3.2.1 Evaluation workshop with education professionals (Siauliai, May 2015)



| Description of action | Training and evaluation workshop for higher education professionals |
|---|---|
| Number and type of users involved | 17 higher education professionals |
| Feedback collection method | Professional feedback questionnaire, Event report form |
| Main outcomes/insights/feedback generated | The tool was very much appreciated, and a few teachers expressed interest in using the tool with their groups.<br><br>In particular, SchoolTrip was perceived as a tool that could introduce a playful and "fun" way of learning into the classroom, involving students in a more interactive manner.<br><br>In terms of improvements, multilingualism (i.e. a Lithuanian version of the tool) was universally requested.<br><br>Also, time permitting, enhancing the visual elements of the user interface to make it more attractive for younger users could be desirable. |

#### 4.3.2.2 Evaluation session with cultural heritage professionals (Vienna, June 2015)

| Description of action | Small-scale workshop with key professional profiles and in-depth qualitative evaluation |
|---|---|
| Number and type of users involved | 3 senior cultural heritage professionals |
| Feedback collection method | In-depth interviews, Event report form |

| Main outcomes/insights/feedback generated | The idea of involving the students in the organisation of planning a trip via this tool was highly appreciated. |
|---|---|
| | It was regarded as an attractive way of combining different aspects of cultural knowledge transfer into a user-friendly educational tool. |
| | Even if tools are prototypes and were not finalised by that time this workshop was convincing enough to get invited to an important national e-learning-conference. |

### 4.3.2.3 User test with student group (Vienna, July 2015)

| Description of action | User test with class group of schoolchildren |
|---|---|
| Number and type of users involved | 25 students aged 12-13, 2 teachers |
| Feedback collection method | Event report form, End user feedback form (for teachers) |
| Main outcomes/insights/feedback generated | The students were generally quite positive about the creative tool. The most praised features were its innovativeness and potential for learning about places in a fun way. |
| | The tool was regarded as useful not only in the event of an actual school trip involving transportation in the physical sense, but also to undergo "virtual" trips to locations of cultural interest, just as a classroom exercise to learn in a more fun and engaging way. |
| | There were some non-impeding issues with certain models of Android devices, which caused the user experience to be of lesser quality than expected in 6 out of 16 test devices. |

### 4.3.2.4 Conclusions from evaluation with stakeholders

Analysis of SUS scores

The SUS score below has been calculated from the responses of 17 professionals attending a workshop with an updated interim version of SchoolTrip, on which the several displayed pilots were based.
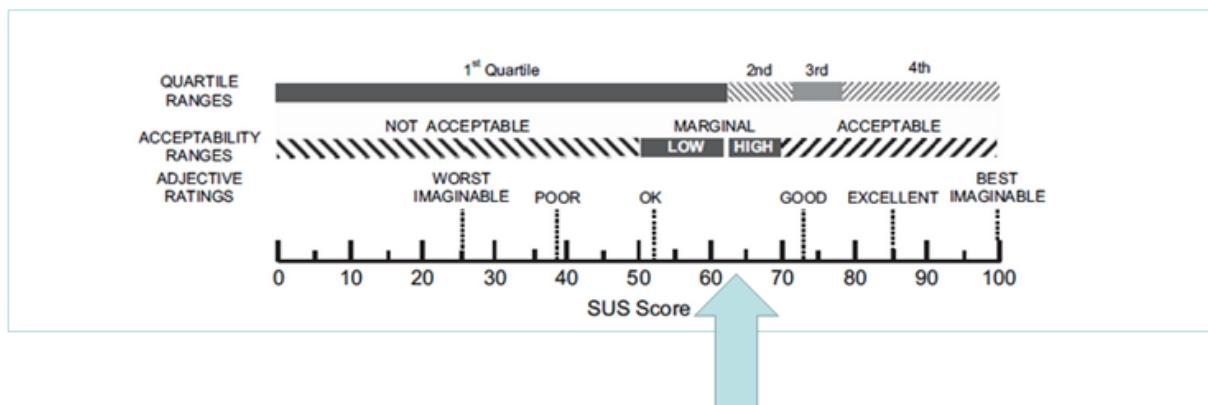
SUS = 62.08%



**Figure 25. System Usability Score results for SchoolTrip**

The SUS score of the SchoolTrip application stands at 62%, a marginal high score. These results, however, should be taken with a pinch of salt, as two factors may have had a negative influence of the final score. First, the size of the sample from whom it was possible to extract item responses towards calculation of SUS scores was rather small: a group of 17 professionals, gathered at a single event. This factor alone makes generalisation of results a risky affair. And second, and most importantly, further analysis of the open-ended questionnaire responses revealed that the single most relevant issue that pushed down the user's evaluation of the SchoolTrip application was the lack of local language version (in that particular case, Lithuanian). This key update was communicated to the developers' team, which then proceeded to take the necessary steps to include this enhancement in subsequent releases. If the questionnaire administration was to be repeated with this crucial element fixed, it is highly likely that SUS scores would rise sharply.

Analysis of relevance indicators and user experience metrics for professionals

The figures below synthesize in a graphical presentation the results of the questionnaire evaluation performed with professionals at the evaluation workshop carried out with the SchoolTrip application within pilot phase II.


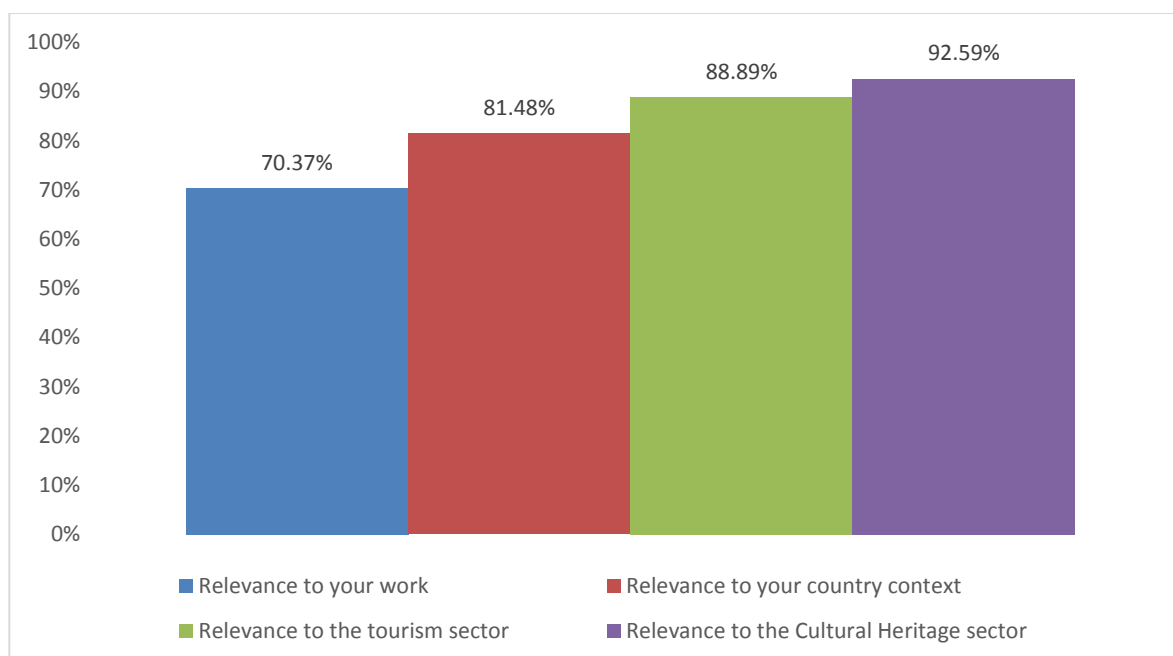
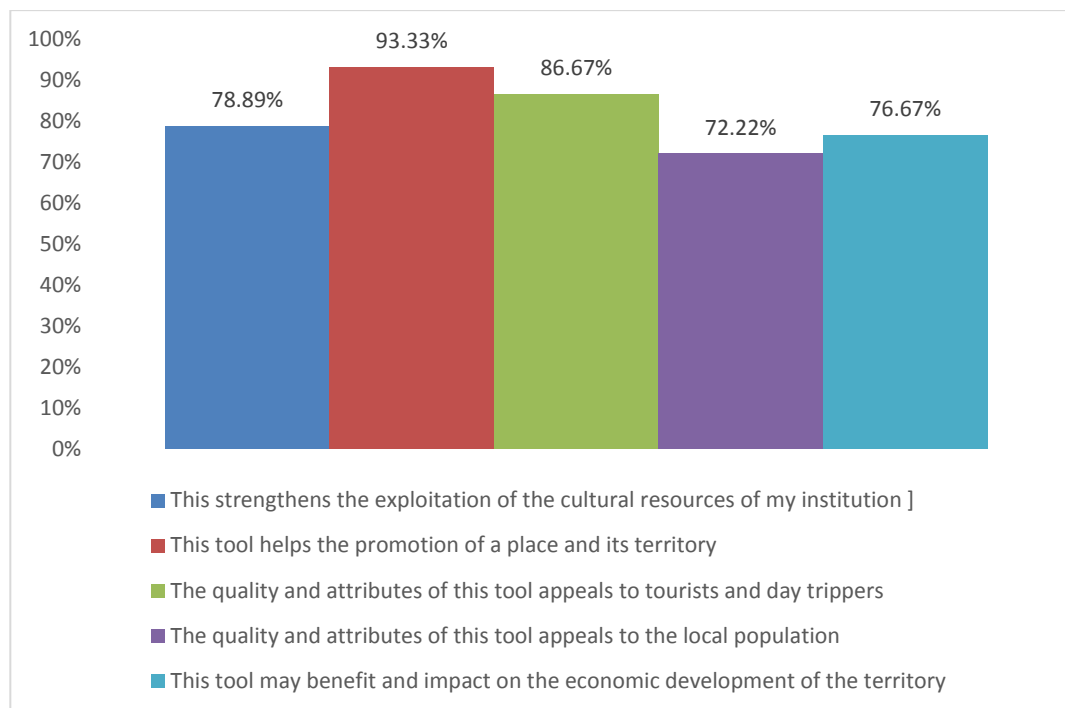**Figure 26. Perceived relevance of SchoolTrip tool – basic indicators**

**Figure 27. Perceived relevance of SchoolTrip tool – extended indicators**
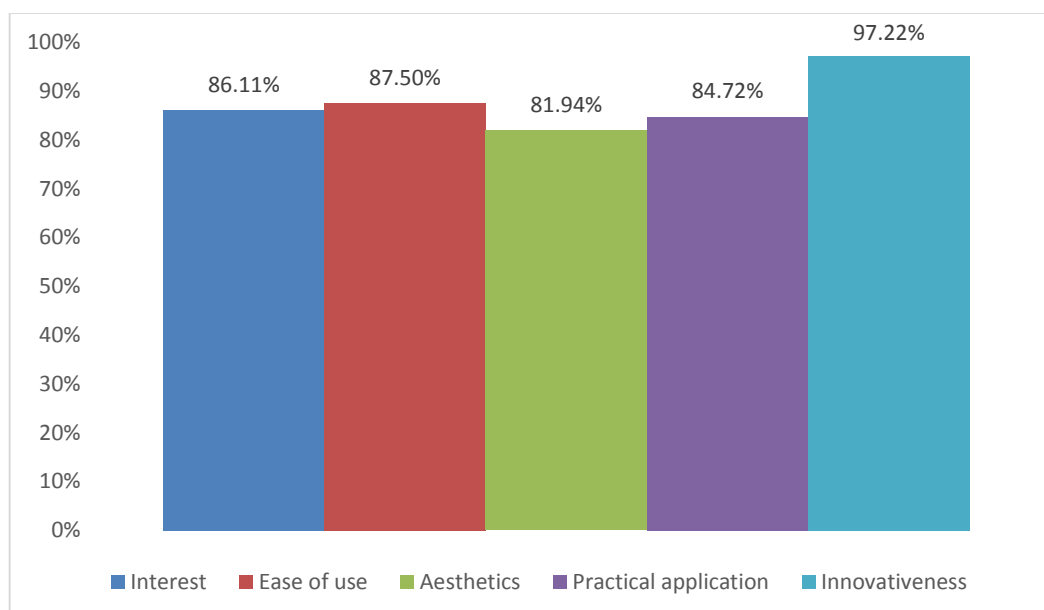


**Figure 28. Professional ratings in selected dimensions of user experience with SchoolTrip**
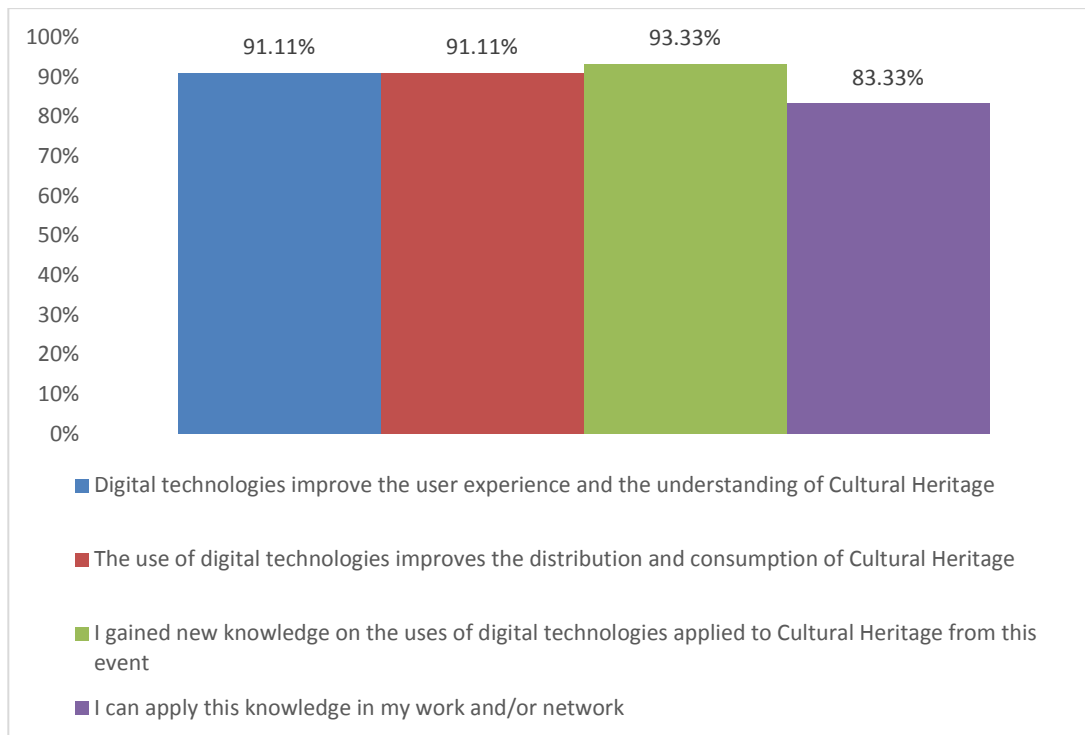
**Figure 29. Overall opinion of digital technologies for cultural heritage after exposure to SchoolTrip tool**

As can be ascertained in the figures above, the results from evaluation with professional educators have been quite positive. Most scores reflect that the contacted stakeholders hold the creative tool in high regard. In particular, SchoolTrip is perceived as a highly innovative ICT offering for education professionals seeking to introduce their students to the local cultural heritage. All dimensions of the user experience are well rated by the user sample, with no dimension standing below 80% (see Figure 28). The satisfaction and recommender scores are very positive as well, with a 91.1% rating in the former metric and a 83.8% grade in the latter.

An aspect worth mentioning is that there seems to be the perception among the education professionals that the tool has a lower relevance to their work than with other indicators. This fact can be probably explained because there were many tertiary education professionals in the sample (42%), whereas the tool is in fact geared towards pupils with a maximum age of about 14-16 years old, which has the effect of making it less suitable and hence less relevant for university students.

Summary of evaluation results

The following conclusions were reached at the end of the phase II of evaluation with SchoolTrip:

- Good evaluation results, with high levels of interest and reported usefulness of the SchoolTrip tool.

- Education professionals value above all the innovativeness of the creative tool, and its possibilities in the teaching of a place's cultural heritage in a way in which students gain not only academic knowledge but also independent learning skills.

- Students see in SchoolTrip a tool with the promise to deliver a more fun and engaging classroom experience, and are quite satisfied with the user experience.

- A user-contributed use case that can expand the appeal of SchoolTrip is the usage of this tool for "virtual" school trips, in which students learn about a place by organising a virtual expedition from the classroom itself.

### 4.3.3 Phase III. Large scale evaluation

Consistent with the activities planned for phase III with the other tested creative tools, MOVIO Digital Exhibitions and CityQuest, an online feedback form has been crafted for SchoolTrip as well. This tool will direct any further suggestions and recommendations from the community of users (mostly education professionals and students) to the teams of developers working of additional improvements to the software tool.

# 5 CONCLUSIONS FROM GLOBAL EVALUATION OF PILOT ACTIONS

As has been cogently demonstrated throughout the present report, the pilot activities organised within the framework of the AthenaPlus project have demonstrated the current quality and future potential of the AthenaPlus creative tools. Thanks to direct API integration with all three of the creative tools' backends, professionally curated content from GLAM institutions' own CMS and/or user-contributed content can be utilised alongside reused Europeana content in the same set of user-friendly tools. Hence, the AthenaPlus creative tools provide an easy-to-use and highly customisable pathway for non-technical users to access and reuse Europeana's cultural heritage contents, unlocking the potential of the Europeana portal.

The three-phase user-centred design process crafted and deployed for the project has provided a continuous stream of issue reports, recommendations for improvements and suggestions for advanced functionalities. This source of contextualised and up-to-date information on the users' opinion of the creative tools has been instrumental in bringing the tools closer to the user needs and expectations, and has resulted in excellent ratings of usability and user experience at the closure of the piloting process.

The modular approach to evaluation adopted at the onset of the pilots allows us to compare results not only within the pilots, but also across the three creative tools that have been subject to a piloting trajectory with users. If we carry out this exercise, we can find out that all three tools obtain similarly good results, in a range that goes from acceptable to excellent.

Besides the specific recommendations and user experience metrics extracted from the pilot actions, some high-level conclusions emerge from the sum of the research that has been carried out. These point out to future directions for development, innovative use cases stemming from the user's point of view, and suggestions for the successful dissemination of the outcomes created with the software tools. The careful consideration of these recommendations shall inform the sustainability and exploitation strategy for the AthenaPlus suite of creative tools, with the final goal to ensure that these tools continue to create value for the communities of users beyond the successful closure of the AthenaPlus project.

Specific recommendations for the creative tools

During the course of the piloting trajectories, proposals for additional use cases have emerged, that can contribute to expand the current user base and deliver new value to further communities of users. For instance, MOVIO has shown the potential to disrupt existing GLAM sector practices, by allowing cultural heritage institutions to replace expensive audio-guide hardware and with a low-cost, do-it-yourself ICT solution that can be used on any standard tablet or smartphone. Applications created with MOVIO's App Builder module could be downloaded to a tablet and deployed as a companion museum guide, to provide audio information throughout the visit, and deliver additional multimedia contents at selected points of interest.

CityQuest has proven to be a highly interesting creative tool for discovering cultural heritage in a fun way, thus providing an excellent tool for humanities education and family tourism. An enhanced gamified experience (i.e. with a structure of rewards) and more technological flexibility in POI marking could increase even more its appeal for both visitors and professionals. And finally, current versions of SchoolTrip could see their envisioned usage expanded, to serve as well as a framework for collaborative learning on cultural heritage topics.

Concluding remarks on sustainability

The piloting trajectories for each of the AthenaPlus tools have provided evidence to conclude that the final release of said tools is ready for use. To boost the tools' public profile, it is recommended that the AthenaPlus creative tools are disseminated as a single open source suite of digital creative tools for

cultural heritage, with high relevance and value-creation possibilities for the reuse of Europeana contents for education, tourism and cultural heritage sectors.

To this end, the existence of tool translations in several languages is key, to broaden the reach and allow users to interact with cultural heritage in their own native languages. This critical recommendation has already been implemented to a great extent, as each creative tool has versions in several European languages.

The continued sustainability of the tools is also linked to the ability of the creative tools to sustain a community of open source developers around the software. The existence of the online feedback form created in pilot phase III gives this community the possibility to gather user feedback and suggestions and, in this way, respond to the demands of the communities of users of the AthenaPlus tools. This stream of user feedback can thus lead to the implementation of new functionalities, which can contribute to ensure that the AthenaPlus creative tools stay updated and relevant for the communities of users.

# 6   APPENDIX 1: EVALUATION TOOLS AND DOCUMENTS

## 6.1   Internal usability evaluations (Phase I)

### 6.1.1   Issue report template

software_issue_repo
rt_template.docx
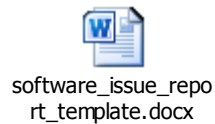
### 6.1.2   MOVIO digital exhibitions

*6.1.2.1   Online usability questionnaire*

MOVIO virtual exhibitions - feedback questionnaire for partners.pdf

*6.1.2.2   Usability interview guide*

Questions for phase
I MOVIO usability inte

## 6.2   Printed questionnaires (Phase II)

### 6.2.1   MOVIO digital exhibitions

MOVIO professional
questionnaire - for wo

MOVIO end user
questionnaire - for us

### 6.2.2   CityQuest

CityQuest
professional question

CityQuest end user
questionnaire - for us
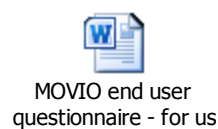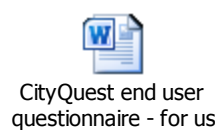
### 6.2.3   SchoolTrip



Plan your School Trip
professional question



Plan your School Trip
end user questionnair

## 6.3   Online questionnaires (Phase II)

### 6.3.1   MOVIO digital exhibitions



AthenaPlus professional feedback questionnaire - MOVIO virtual exhibitions.pdf



AthenaPlus user feedback questionnaire - MOVIO virtual exhibitions.pdf

### 6.3.2   CityQuest



AthenaPlus professional feedback questionnaire - CityQuest.pdf



AthenaPlus user feedback questionnaire - CityQuest.pdf

### 6.3.3   SchoolTrip



AthenaPlus professional feedback questionnaire - SchoolTrip.pdf



AthenaPlus user feedback questionnaire - SchoolTrip.pdf

## 6.4   Public feedback forms (Phase III)

### 6.4.1   MOVIO digital exhibitions

MOVIO public release form.pdf

### 6.4.2 CityQuest



CityQuest public release form.pdf

### 6.4.3 SchoolTrip



SchoolTrip public release form.pdf

## 6.5 Stakeholder events

### 6.5.1 Pilot event report template



Athena_plus_event_
report-template.doc

## 6.6 Online feedback form

### 6.6.1 MOVIO digital exhibitions



MOVIO digital exhibition feedback form.pdf

# 7 APPENDIX 2: EVALUATION DATA

## 7.1 Bug tracking system statistics

Bug tracking system statistics.xlsx

## 7.2 Questionnaire results and data

### 7.2.1 MOVIO digital exhibitions

#### 7.2.1.1 Internal usability data

MOVIO virtual exhibitions - feedback questionnaire Phase I (for project partners).pdf

SUS MOVIO virtual exhibitions phase I.xl

#### 7.2.1.2 Feedback data from end users and professionals

GRAFICS_MOVIO visitor feedback ques

GRAFICS_MOVIO professional feedback

SUS_MOVIO digital exhibitions.xlsx

### 7.2.2 CityQuest

#### 7.2.2.1 Feedback data from end users and professionals

GRAFICS_CityQuest user feedback questio

GRAFICS_CityQuest professional feedback

SUS_CityQuest.xlsx

### 7.2.3 SchoolTrip

#### 7.2.3.1 Feedback data from end users and professionals

GRAFICS_SchoolTrip
professional feedback

SUS_SchoolTrip.xlsx

# 8 APPENDIX 3: PILOT COORDINATION DOCUMENTS

## 8.1 Pilot preparation form

WP 6 - Pilot
preparation form.doc

## 8.2 Pilot workplan slide

Pilot workplan -
[software tool - count

## 8.3 Coordination meeting minutes

Athena Plus WP6 pilot meetings minutes.pdf