

D3.2 – User Requirements and Scenarios - Beta

Sara Perry¹, Akrivi Katifori², Maria Economou³, Hilary Young³

Reviewed by:

Hara Stefanou (EXUS), Maria Roussou (ATHENA)

Abstract

This deliverable reports on the evolving user needs and requirements for EMOTIVE experiences, focusing on the two main user groups targeted by the project: authors and visitors. It builds on the results published in D3.1 (wherein we present EMOTIVE's alpha version user requirements and scenarios), showcasing our most recent work in three parts. Firstly, we outline our elicitation methodology for constructing EMOTIVE experiences for users; secondly, we assess the needs of particular visitors and EMOTIVE authors; and thirdly, we present selected interpretation material and scenarios for two specific EMOTIVE use cases: a chatbot of 'conviction' for the site of Çatalhöyük in Turkey, and an on-site experience for the Hunterian Museum in Scotland.

Official Submission Date: 28/02/2018

Actual Submission Date: 30/03/2018

Dissemination Level: PU

Partner	Estimated Effort (in PMs)
¹ YORK	1
² ATHENA	1.5
³ UGLA	0.4



TABLE OF CONTENTS

1	EXECUTIVE SUMMARY.....	4
2	INTRODUCTION	5
3	REQUIREMENTS ELICITATION METHODOLOGY.....	6
3.1	Authoring requirements elicitation.....	6
3.2	Visitor requirements elicitation.....	7
3.2.1	<i>Verecunda Experience</i>	7
3.2.2	<i>Chatbot of Conviction</i>	8
4	NEEDS ANALYSIS AND USER REQUIREMENTS	10
4.1	Visitor experience.....	10
4.1.1	<i>Approaching informational content</i>	10
4.2	Authoring.....	11
4.2.1	<i>Authoring storytelling experience scenarios workflow</i>	11
4.2.2	<i>Story drafting authoring needs</i>	11
4.2.3	<i>Needs for activity templates</i>	15
5	SCENARIOS.....	16
5.1	Verecunda Experience, Hunterian Museum	16
5.1.1	<i>Background</i>	16
5.1.2	<i>Character and story development</i>	16
5.2	Chatbot of Conviction, Çatalhöyük.....	17
5.2.1	<i>Background</i>	17
5.2.2	<i>Pattern development</i>	18
6	CONCLUSIONS AND NEXT STEPS	20
7	BIBLIOGRAPHY	21
	ANNEX 1: AUTHORING WORKFLOWS – USER NEEDS QUESTIONNAIRE.....	23
	ANNEX 2: PERSONALISATION IDEAS FOR HUNTERIAN ANTONINE WALL ON-SITE EXPERIENCE	25
	ANNEX 3: ÇATALHÖYÜK EXPERIENCE – VISITOR QUERIES FOR INFORMATIONAL CONTENT	26

TABLE OF FIGURES

Figure 1: School group of 11-year-olds working on the character and story of Verecunda	8
Figure 2: Early development process of Catalhoyuk's bot	9
Figure 3: Using a graph structure created in Microsoft Word to present the structure for the Athens Agora Storytelling experience (in Greek)	13
Figure 4: Graph structure created in Microsoft Word to present the story concept structure for the Athens University Museum of Minerology and Petrology (in Greek)	13
Figure 5: On the left, the Hunterian Antonine Wall Exhibition Hall. On the right, one of the halls of the Museum of Minerology and Petrology of the University of Athens	14
Figure 6: Verecunda's gravestone from the Antonine Wall on display at The Hunterian Museum	16
Figure 7: Bot of Conviction 'Figure 8' pattern	18
Figure 8: An example of the 'Figure 8' pattern completed with a full conversational sequence (or 'chat')	19

LIST OF ABBREVIATIONS

AW: Antonine Wall
ATHENA: Athena Research and Innovation Center in Information Communication and Knowledge Technologies
EB: Executive Board
PB: Plenary Board
SBE: Storyboard Editor
UI: User Interface
UGLA: University of Glasgow
UX: User Experience
VR: Virtual Reality
WP: Work Package
WHS: World Heritage Site
York: University of York

1 Executive Summary

This deliverable records the most recent user-related activities of the EMOTIVE project, following on from those outlined in D3.1: User Requirements and Scenarios – Alpha. This comprises work conducted from approximately May 2017 to March 2018 with specialist and non-specialist users involved in authoring EMOTIVE experiences and in participating in some such experiences. An iterative design, development and evaluation process allows us to progressively refine our tools and techniques, paving the way for the creation and release of a full EMOTIVE storytelling ecosystem to be implemented in the final year of the project.

SUMMARY OF CONTENTS

A brief introduction, offered in **Section 2**, explains the background to our user requirements and scenarios work. **Section 3** details our requirements elicitation methodology, elaborating on the evolving emotive conceptual framework which underpins the project, and outlining our recent work in defining the emotive needs and requirements of authors and users/participants. **Section 4** summarizes the key findings of our needs analysis with visitors and authors. **Section 5** presents two of our most recently developed scenarios (EMOTIVE experiences) which grow out of lessons learned from previous requirements and scenarios refinement: the Verecunda Experience for the Antonine Wall Exhibition at the Hunterian Museum, and the Bot of Conviction for Çatalhöyük. **Section 6** concludes the report, commenting on next steps for the final iteration of our user-related work over the course of the next year. In the subsequent **Annexes**, we reproduce (1) the questionnaire employed for surveying users about their authoring experiences using EMOTIVE's authoring tools; (2) the outcomes of some of our elicitation efforts with Hunterian Museum stakeholders; and (3) the informational content needs and expectations of users as they have emerged through evaluation of the Çatalhöyük on-site experience.

METHODS OF RESEARCH AND ANALYSIS

EMOTIVE continues to adhere to a user-centred design philosophy, drawing specialist and non-specialist participants into all phases of the articulation, development and evaluation of our tools and experiences. We work, in particular, with rich qualitative methods, including focus groups, interviews, and observations, complemented by quantitative survey techniques, to elicit and explore user needs. This builds upon an ongoing scan of the emerging scholarship on emotional design and emotive engagement at cultural sites, as well as integration of institution-specific data gathered from visitors and other key stakeholders.

KEY FINDINGS SUMMARISED

The emerging literature on emotion-driven cultural heritage interpretation suggests that (1) traditional, education-driven models of information presentation at heritage sites are narrowly conceived, lacking inclusivity and privileging a very specific demographic of often highly-literate users; and (2) the impacts of emotionally-resonant interpretative practice are broad, potentially transformative, appealing to a diversity of audiences, and deeply linked to learning outcomes themselves. Our needs analysis indicates that visitors are apt to naturally explore traditional didactic content once engaged via emotive interpretation, seeking out information of their own volition (rather than having it foisted upon them by the institution) and thus potentially transforming their knowledge base in a far more intuitive, self-reflective and empowering manner. Studies with authors of EMOTIVE experiences demonstrate a common approach to story design and story drafting, enabling the articulation of a standard workflow and refinement of EMOTIVE's authoring tools to address relatively ubiquitous user needs.

2 Introduction

This report presents the beta version of EMOTIVE’s user needs and requirements and experience (or ‘scenario’) prototyping work. It is the result of close collaboration between the consortium partners, external affiliates and representative users or visitors to cultural heritage sites who have combined their knowledge and expertise with cultural heritage to record their insights as to the directions that should be explored within the project. Our concern is both for developing emotionally-resonant experiences for cultural heritage audiences at our partner sites, as well as for enabling other experts (with varying degrees of technical expertise) to develop such experiences for their own audiences. In other words, our ‘users’ include both visitors (online, on-site or simultaneously online and on-site) and authors (cultural and creative partners in charge of creating cultural interactive experiences and making them available to the visitors).

This deliverable grows directly out of our alpha version report on the same topic, D3.1, prepared in the first quarter of the project, at a time when EMOTIVE was still in its infancy. We refer to that report for baseline information on our cultural partner sites, and their typical visitor profiles and personas, as well as for EMOTIVE’s early vision of needs and possibilities for constructing meaningful visitor and authoring experiences. These include general guidelines for experience design, a broad authoring framework for EMOTIVE storytelling, and a set of proposed templates to record content and streamline the story creation process.

Here we focus on specific user-related developments since the publication of D3.1. We report elsewhere on the nature of several alpha-version EMOTIVE experiences (D3.7: Pilot Experience Prototypes), on the overall EMOTIVE conceptual framework (D5.1: Conceptual Framework and Guide), and on results of formative evaluations of a series of our prototype authoring tools and experiences. This deliverable, therefore, attends expressly to our recent work on articulating user needs and honing specifications for effective EMOTIVE experiences.

The report has three parts, beginning with review of our requirements elicitation methodology, including our evolving scan of the current scholarship on emotions research in and beyond the heritage sector, and our data collection activities with users (visitors and authors). The second part discusses new developments within the project in terms of attending to the needs of both our visitors and our authors. The third and final part offers detail on the articulation of the user experience for two specific EMOTIVE use cases, the Hunterian Museum’s Verecunda Experience and Çatalhöyük’s Chatbot of Conviction, both of which build upon existing use cases developed in Year 1 of the project.

We conclude with reflection on next steps for further development of EMOTIVE’s user experience, anticipating the submission of the final user requirements and scenarios document later this year.

3 Requirements Elicitation Methodology

EMOTIVE experiences are grounded in a conceptual model (see D5.1) which privileges personalised, sociable and emotion-driven engagements with the heritage record. Our philosophy is more fully articulated in Perry et al. (2017), which we summarise in brief here in order to frame our approach to addressing user needs.

Typical museums and cultural institutions rely on a model of visitor engagement that is education driven. However, empirical studies of audience outcomes in these environments increasingly testify to the flaws and prejudices in such learning-centric approaches. Franklin & Papastegiadis (2017), drawing on the work of Hanquinet & Savage (2012), accuse them of embracing an “older, culturally paternalistic form [of] ‘educative leisure’ that appeals only to a very narrow band of the educated middle classes.” Watson (2013, 286), summarizing the work of Pekarik (2002), expresses the problem succinctly: “more attention needs to be paid to what visitors feel...it is this that they remember after their visit, rather than any ‘learning’ they have undertaken.”

In reality, learning and feelings are entangled, as emotions trigger attention and memory, which are critical to learning itself (Staus & Falk 2017). The research suggests that the challenge is thus in managing the balance—providing emotive experiences that enable learning rather than eclipsing or privileging it, therein ensuring impact. However, in the cultural heritage context, especially as it relates to the prehistoric or premodern past, little guidance is available for achieving such impact. Multiple frameworks exist, but of varying quality for, and applicability to, the vast majority of temporally-distant heritage collections and sites. These include very loosely conceived approaches focused primarily on design, such as Witcomb’s (2013) “pedagogy of feeling”, which advocates for the deployment of certain aesthetic and narrative interventions in museums (e.g., the juxtaposition of contrasting displays, experimentation with visitor flow and architecture, use of first-hand accounts, etc.) to stimulate visitors’ senses and to prompt introspection. Others, like Smith’s (2016) “registers of engagement”, focus primarily on audience evaluation (although its specific components are not reported in any of the published literature to date), using the resulting data to help determine the source of visitors’ emotional or transformational experiences. Still others, such as de Bruijn’s (2014; also see Savenije & de Bruijn 2017) analytical framework for fostering historical empathy, and Nilsen and Bader’s (2016) seven actions for promoting empathy in the museum, narrow in on the design of one specific emotional outcome - in this case empathy. Here interpretative tactics such as role play, reenactment, perspective-taking, experiments with narrative mode and structure, among others, are highlighted as efficacious empathetic devices.

The EMOTIVE project has sought to develop and test a series of use cases specifically grounded in such tactics, with a focus on **reenactment, play, critical conversation** and **personal decision making**. These foci derive from close engagement with both those who might be enrolled to author EMOTIVE experiences, and those who will participate in such experiences on-site or online (or in hybrid, simultaneously online and on-site, environments). Some of our most recent work eliciting the needs and requirements of authors and users/participants is outlined below.

3.1 Authoring requirements elicitation

In the context of supporting authoring needs for those developing interactive storytelling experiences, the EMOTIVE team held interviews with teams (from within and outside the project consortium) that have created experiences using the alpha version of the EMOTIVE storytelling drafting tools, namely the SBE.

The interviews involved members of the EMOTIVE user requirements and evaluation teams and the authors in focus-group sessions, either held face-to-face or on-line. The question list in ANNEX 1 was used to structure our conversations.

THE TEAM PROFILES

In all cases the authoring teams were comprised of members with mixed expertise and diverse backgrounds. Museologists and domain experts collaborated with experts in story authoring and with those who are specialists in technology-oriented design and development. Our research with these teams spanned November 2017 to February 2018, and included studying the authoring experiences of our EMOTIVE partners who have created stories used within the context of this project, as well as the experiences of six teams that created mobile storytelling experiences in the context of the “Museums and New Technologies” course of the postgraduate “Museum Studies” program at the University of Athens.

Specific elicitation sessions included:

- Athens Ancient Agora authoring team, focus group / semi-structured interview, February 2018: 1 storyteller - archaeologist, 1 experience designer, working on an on-going project for an interactive storytelling experience
- 6 Museum Studies authoring teams, focus group discussion following presentation of work by teams, on February 27th, 2018. 6 projects for 6 of the University of Athens Museum (Archaeology Museum, Palaeontology Museum, Zoology Museum, Anthropology Museum, Criminology Museum, Museum of Minerology and Petrology)
- UGLA – NOHO authoring team, semi-structured interviews, February 2018: mixed group of EMOTIVE consortium members working on the “Ebutius” experience
- Catalhoyuk, interviews with the designer of the on-site Catalhoyuk experience, September 2017.

3.2 Visitor requirements elicitation

In the context of developing our Verecunda Experience and Chatbot of Conviction EMOTIVE stories for visitors to the Hunterian Museum and Çatalhöyük respectively, we have tailored our elicitation methodologies to our target audiences and sites. These are the most current EMOTIVE use cases under development, hence our focus on them here. We detail each in turn below.

3.2.1 Verecunda Experience

In order to elicit user requirements, two user requirement sessions were held at the Hunterian Museum. The first session was held with a group of c.29 Primary 7 school children (aged 11). This session involved the children using creative writing to develop stories and narrative for a virtual character, Verecunda. Working in small groups the children developed an aspect of Verecunda’s story from one of the four following themes: daily routine, fun time and friends, her stuff, and clues about Verecunda’s life today (Figure 1).



Figure 1: School group of 11-year-olds working on the character and story of Verecunda

Clear themes and points of interest for the school children became apparent during their discussions, including tasks Verecunda might do such as cleaning, washing, and caring for farm animals. Questions the children had regarding the life of Verecunda included: How and with what did she clean? Did she have to take care of pigs? What was the Roman general like? What did their money look like?

As the children developed their stories their questions and areas of interest began to probe more complex topics for example: Why is there slavery? Other questions focused on identity and the difference between Roman and Caledonian identity.

A second user session was conducted with MSc Museum Studies students of the University of Glasgow. This focused on the development of personalisation of the experiences for the five Hunterian personas (See D3.1: User Requirements & Scenarios - Alpha). These user needs included how the different personas might wish to consume information and navigate the experience differently, as well as how their rationale for using the experience might differ and how the “end point” might vary for each persona. For more detail see ANNEX 2.

3.2.2 Chatbot of Conviction

EMOTIVE’s Facebook Messenger-based chatbot has been designed for the typical heritage setting where site managers and curators may have little-to-no technical expertise, operating on a shoestring budget with few resources to expend on anything beyond essential services. Most sites have dedicated Facebook pages, often run by volunteers, with minimal capacity to do more than advertise upcoming events, and no or vague social media policies to guide action or respond proactively to problems. In these circumstances, a simple content-retrieval model, deploying Natural Language Understanding with a Conversation Manager, offers the control and safety that such sites demand. Use of artificial intelligence or more sophisticated machine learning technologies within the bot is inappropriate, as staff and volunteers may be ill-equipped to deal with the consequences and the potential for the technology to cause unforeseen challenges within these already-challenging environments is high.

The earliest versions of the EMOTIVE bot were developed through a six-part approach, leading to the development of a useable prototype. That 6-part approach is outlined in Tzouganatou (2017) and started with (1) researching the Facebook page of the Çatalhöyük Research Project, (2) creating the chatbot's content and a preliminary design, (3) refinement with EMOTIVE consortium members, (4) hosting live chat sessions (on the themes of burials, wall paintings, coprolites and latrines, the archaeological process & wall reliefs and plastering) with Çatalhöyük Research Project's experts and dozens of members of the Çatalhöyük Facebook community, in order to further develop the bot's content, (5) integrating the content from the live chat sessions into the bot, and (6) embellishing the bot with richer interactions such as images, emojis, etc (Figure 2).

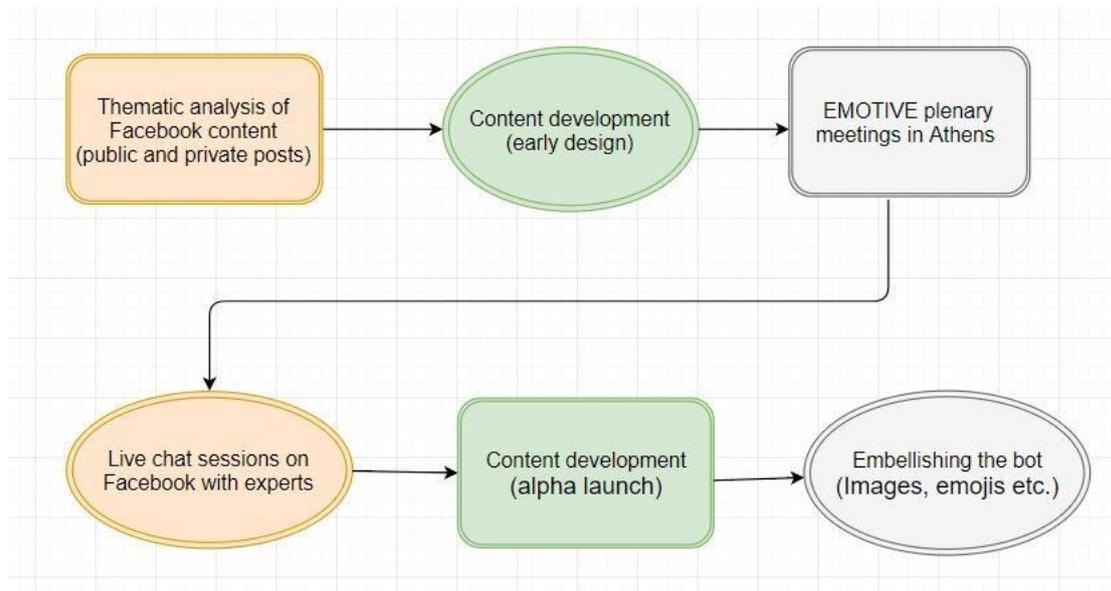


Figure 2: Early development process of Catalhoyuk's bot

From there, a series of evaluation sessions with three types of audience (followers of the Çatalhöyük Research Project Facebook page; people who were not aware of the site and hence would be interacting with it for the first time; and experts from the Çatalhöyük Research Project team) and additional development work (see Tzouganatou 2017 and D9.2) have positioned us to push the bot into more innovative territory, for which no extant models of practice exist to guide our efforts (although we are informed by the experiences of pioneering institutions like Anne Frank House, whose Facebook bot is the first of its kind in the world). As described below (see section 5.2), we are articulating now the earliest prototype of the Chatbot of Conviction, to be tested with a substantial (100+) user base over the course of the year.

4 Needs Analysis and User Requirements

4.1 Visitor experience

This section presents an overview of the main needs of visitors for an EMOTIVE experience. We discuss these needs with specific reference to the Çatalhöyük on-site experience, amongst the first EMOTIVE use cases to be constructed (see Mirashrafi 2017) and the most studied in the sense of having been adapted and evaluated by diverse users in both on-site and virtual environments. Whilst Çatalhöyük is the focus, we argue that the lessons learned here are applicable more broadly – to EMOTIVE experiences in general across cultural heritage sites.

4.1.1 Approaching informational content

The Çatalhöyük on-site experience attempts to present to visitors the concept of an egalitarian society mimicking the non-hierarchical lifestyle of the earliest inhabitants of the site. The experience is grounded in an object exchange activity, wherein visitors are asked to re-enact egalitarian behaviours. It guides visitors through four reconstructed houses where they are asked to exchange between them, pick up or leave behind different objects. (More information about the experience can be found in D3.7: Pilot Experience Prototypes.) The activity is *not* information based but rather attempts, through re-enactment, to provide visitors a direct experience and understanding of the main concept of egalitarianism and its contrast to common ways of life today. Almost exclusively based on the need to promote engagement and direct and deep understanding of the main concept, the activity does not offer information in the traditional sense. That ‘traditional’ informational content is delivered in abundance elsewhere on site and online, leaving a major gap in terms of more emotive, concept-driven interpretation for visitors.

An interesting outcome of the experience testing (see ANNEX 3) is that users, while getting involved and connected with the activity, regularly express questions about different, very specific aspects of the site, including (a) the objects used in the experience, (b) the features of the site itself and (c) the way of life of Çatalhöyük’s inhabitants. Similarly, formative evaluation (D9.2) of the Hunterian Museum Antonine Wall prototype of Ebutius’s Dilemma indicates that some users are asking for factual information related to the story (e.g. Who was Antoninus Pius? How long did he reign?) or express the wish to be able to differentiate between fact and fiction (e.g. Did Ebutius really exist and if so, when did he live?). Addressing these issues effectively without compromising engagement with the story is a priority for EMOTIVE, and we aim to tackle the predicament in different ways via the refinement of existing experiences and the design of new ones.

The traditional assumption that seems to guide the design of informational content for museums and cultural sites in general is that all visitors come with an a-priori “appetite” for generic information—thus the need for exhibit labels or audio guides which focus on presenting the facts about the object and its historical context. However, not all visitors experience the same a-priori engagement with the site and its theme. In fact, it is not uncommon for visitors to be overwhelmed, not knowing what there is to care about, and moving from exhibit to exhibit without any actual engagement nor with any genuine curiosity that could lead to meaning making.

The EMOTIVE approach focuses, firstly, on realizing the engagement, bringing the visitor closer to topics and themes that she can potentially care about. When engagement is established, the visitor naturally becomes more curious and, of her own volition, will then ask and look for additional information.

EMOTIVE should be ready to cater to the informational needs of the visitors, as they are generated during the experience, via the visitors’ emotional engagement. This informational content should be presented from the perspective of the visitor, and her possible questions should guide the design and delivery of the material to the visitor. Through actively seeking the answer to relevant questions, the visitor will enter a “web of knowledge” in which she will be able to navigate and find the answers to her questions.



4.2 Authoring

This section presents an overview of the main needs of authors for an EMOTIVE experience. It has been developed via observation and interviews with storyauthors (see above, section 3.1).

4.2.1 Authoring storytelling experience scenarios workflow

Interestingly, the authoring process as it has been recorded with users roughly follows the same approach every time. Note that, in all cases, the definition of personas to serve as the target audience of the storytelling experiences precedes the authoring of the story. From there, the typical workflow goes as follows:

Understanding the museum context. This involves research and review of any possible relevant material available to the authors. Starting from the available information within the museum exhibits, the authors also familiarize themselves with the historical context through books, documentaries, interviews with museum curators and other experts, etc.

Defining the story's main concept and experience type. An important step to story authoring is to decide on the main concept of the story and the specific experience type, which in the case of the specific experiences developed here has been deemed "interactive storytelling".

Selection of exhibits. The selection of exhibits is made based on a combination of what is perceived as generally "interesting" for the visitors, including possibly museum "highlight" exhibits and, at the same time, materials that can support the story concept.

Drafting the story concept and script. Invariably all the teams did not opt for starting to work directly with the ATHENA SBE tool (see deliverable D4.1 EMOTIVE Authoring Tool Alpha Release), which was made available to them early on. They generally started to work on a text document, which described the initial story concept and then moved on to a more detailed script of the story. In some cases this script included a screen-by-screen design with text and proposed multimedia assets (images, videos). Choices on the story plot were presented in different ways, including: (a) different section headings in the structured text document, (b) different columns on a table, (c) through a graph or tree representation. In some cases, to support the need for collaboration, Google Drive or One Drive documents were used in the drafting process.

Situating the story in space. In many cases a floorplan in an image format was used. The authors used the image to annotate points of interest where a particular part of the experience should be presented.

Using the SBE. Interestingly enough, although the SBE had been designed and developed with the objective to support the initial, drafting stages of authoring, all teams introduced its use once the story concept and initial script were complete. In other words, the tool was adopted as a production tool for the prototype experience. Text was copy-pasted from the initial text document, and images and other multimedia material were added accordingly. This use of the tool, although it led to full production of the experience in draft form without any of the teams facing major issues and setbacks, brought forth important points on the improvement of this initial story drafting workflow.

4.2.2 Story drafting authoring needs

The process of recording the authoring workflow presented in the previous section led to the identification of several authoring needs for story drafting which are presented below.

N1 - DRAFTING THE STORY IN TEXT FORM

The general use of a text editor for the initial stages of story drafting seemed to be a well established need for all the authoring teams. Familiarity with the use of a text editor like Microsoft Word for other tasks is seemingly a factor in this need. Authors writing stories for different media, including books, films, etc. are used to coherent texts where they can have an immediate overview of greater parts of the story concept, as well read the script details.

The SBE through its zoomable structure and interface arranging the story in Chapters, Scenes and Pages led to the obligatory fragmentation of the story text in smaller parts, making it impossible to read it in a seamless, coherent way. As one of the authors commented: *"I do not like to work in little chunks of text. I work in Word."*

Furthermore, this aforementioned structure, along with the Branching Points concept and the way they were implemented in the interface, were not intuitive for most of the authors.

There seems to be a need for a drafting tool that will work as an augmented text editor, allowing authors to draft the story in a textual format, much in the way they would do this with a general use text editor like Microsoft Word.

N2 - INTEGRATION BETWEEN DRAFTING TOOLS

Another important point mentioned was the need to seamlessly move from the story concept in text format and the initial script to the draft production phase of the experience, without painstaking copy pasting from the text editor to the SBE tool. As one author mentioned: *"The process of taking the text and "shifting" it felt arbitrary. I was making a leap from the text document to the end result in the tool."*

Seamless integration between story concept drafting and draft production is needed to simplify not only the production phase, as the story structure will be automatically available to the story production phase, but also support direct implementation of changes on the structure or concept that come up during the story production phase.

Maintaining an updated version of the text document and the structure of the experience it is an important need, as this document may also be used for publication and dissemination purposes.

N3 - VISUALIZING THE STORY STRUCTURE

Although directly editing the story structure and concept on a graph has not been considered as a practical feature, most authors felt that viewing the story structure is useful and, in the case of more complex branching narratives, even necessary: *"I would like a simple and unobtrusive way to turn the document into a graph, a visualization of the structure."*

Authors resorted to the use of different graph formats to present this structure, as shown in Figures 2 and 3.



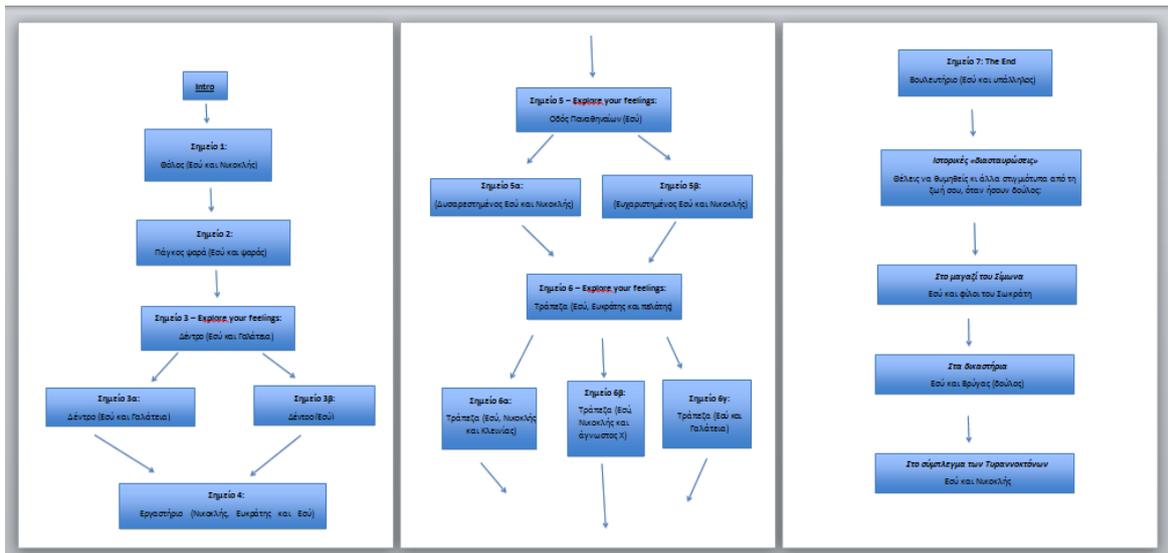


Figure 3: Using a graph structure created in Microsoft Word to present the structure for the Athens Agora Storytelling experience (in Greek)

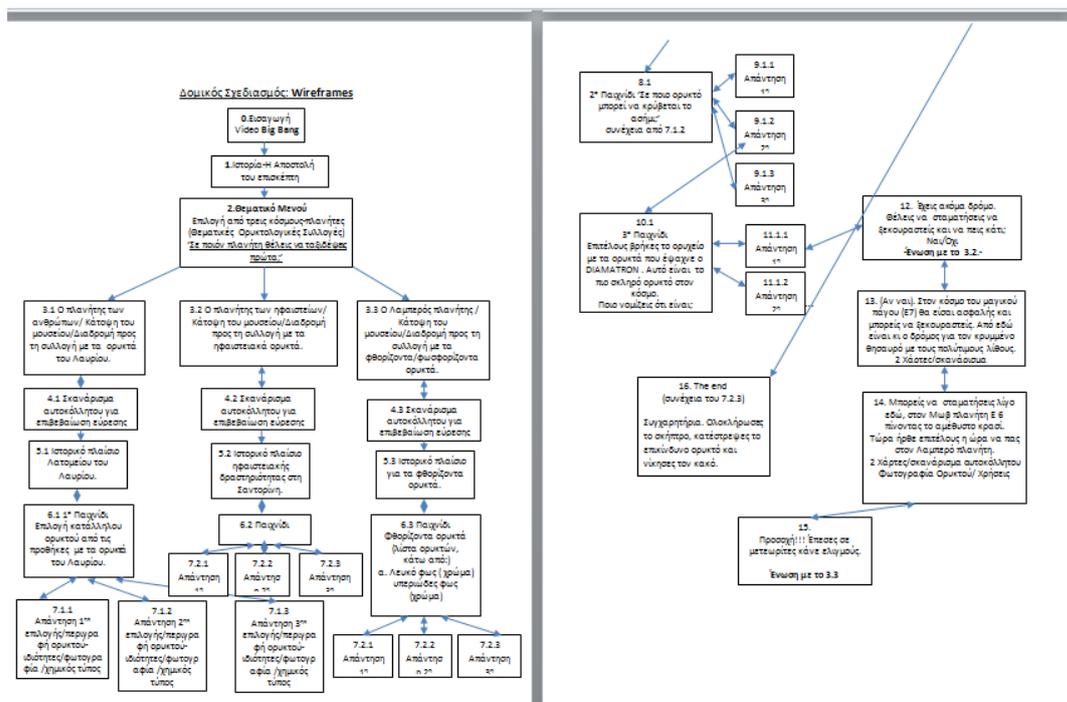


Figure 4: Graph structure created in Microsoft Word to present the story concept structure for the Athens University Museum of Mineralogy and Petrology (in Greek)

Especially in the case of experiences where the main concept is based on an interactive branching narrative approach, the need to be able to visualize the graph while authoring is quite strong.

N4 - CONDITIONS WITHIN THE BRANCHING NARRATIVE

Conditions within the branching narrative are an additional, more complex step in interactive storytelling than creating branches alone. An example, as one author explained, is the following: *“I would have liked to have the main character decide whether to wear a medallion or not, which will impact how the story unfolds in different ways throughout the duration of the story. It is very difficult to implement that through branching only. I would like to set this as a variable.”*



In other words, to be an effective authoring tool, conditions within branches need to be supported for interactive storytelling.

N5 - DRAFTING THE SITE SPACE

The cultural site space layout was considered very important when drafting experiences. The authoring teams took the space into account using exhibition space plan views annotated with the position of the exhibits and the experience parts that took place at each point.

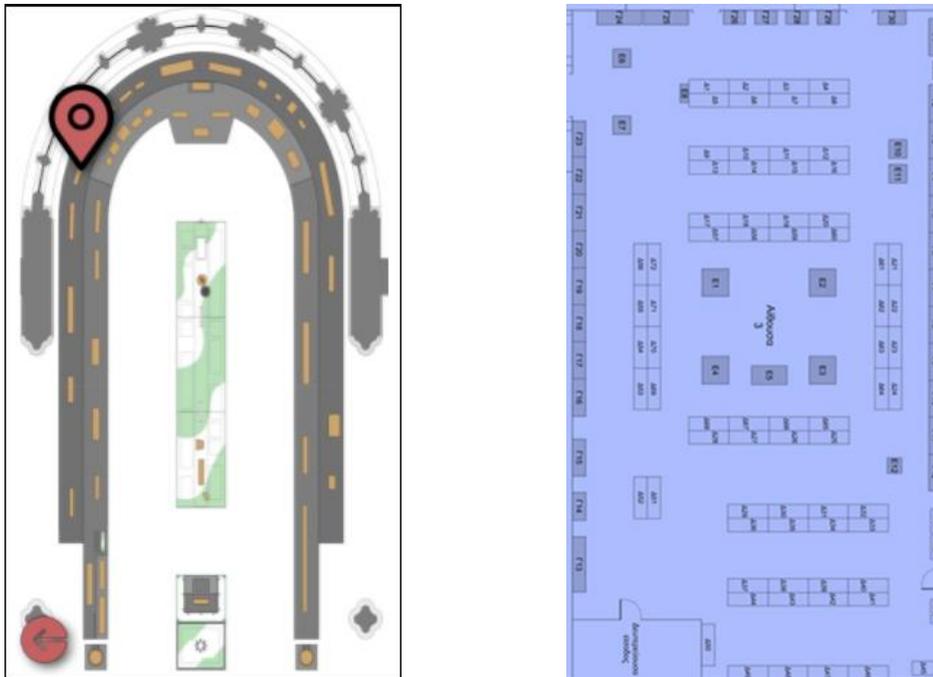


Figure 5: On the left, the Hunterian Antonine Wall Exhibition Hall. On the right, one of the halls of the Museum of Mineralogy and Petrology of the University of Athens

Additional to defining points of interest on the floor plans of sites, authors sometimes used photos of the cultural site showing whole rooms, close-ups of exhibition cases or the exhibits themselves to be able to design the specific story flow.

Interestingly, it has been mentioned that a tool to support the presentation of the story flow in the site could also be applicable to the visitor as a means of experiencing the story virtually, as a low-cost solution for presenting the story experience online.

N6 - COLLABORATIVE EDITING AND VERSIONING

Authoring teams expressed the need for version control for their stories, including the need for commenting and even the definition of authoring roles.

N7- GUIDANCE THROUGH EXPERIENCE TYPES, TEMPLATES AND EXAMPLES

All authoring teams felt that, although they initially drafted their experience in a text editor, using the SBE to implement the draft version *“affected and in a sense defined the work”*. As an example, *“the initial idea for the Hunterian Ebutius story was to have people move around and stumble across stories of objects. It was implemented through the SBE the other way around: Visitors being guided to objects.”*

It was also noted that the tool was simultaneously both limiting as well as offering guidance: *“It did not restrict but rather guided. You need some guidance if you are not an expert writer. You have a start, middle, end.”*

Some teams mentioned that it would be very useful for the authoring toolsets to be combined with guidelines on possible experience types, as well as examples for each type, possibly also templates of experiences to adapt to their concept and re-use, thus applying best practices.

4.2.3 Needs for activity templates

The experiences that the authoring teams designed led to the identification of specific activity templates that were considered useful to the process:

- **Item inventory.** During their design stage, some experiences introduced the concept of an “item inventory” where the user collects clues or objects (including exhibits).
- **Text input field.** The need for text input for personalization, opinion recording, etc. has been identified in various experiences.
- **Experience evaluation when the story ends.** Some teams expressed the need to include at the end of the experience a brief evaluation section where the user is able to leave feedback to be used for the improvement of the story.
- **Take a photo.** In some cases the authors would have liked to include the possibility for users to take a photo during their experiences.

5 Scenarios

5.1 Verecunda Experience, Hunterian Museum

5.1.1 Background

The Hunterian Museum onsite experiences are based on the artefacts from the Antonine Wall collection. The first stage in developing the experiences involved writing the Information Cards (see D3.1 ANNEX for the Hunterian Information Cards). The team then developed a set of themes, characters and initial scenarios (See Table 1 in D3.7: Pilot Experience(s) Prototypes). All of the potential characters for the EMOTIVE Hunterian onsite experiences have a connection to the objects on display in the Hunterian Museum (i.e., the names for the characters appear on the historical artefacts and these have inspired the character development and scenarios).

5.1.2 Character and story development

The Verecunda character is based on the Roman gravestone dedicated to a female named solely as Verecunda (See Figures 5.1 and 5.2). The inscription reads: D M VERECVNDAE "To the spirits of the departed [and] of Verecunda". Traditionally Roman women were given both a personal name and a family name (Keppie, 2004). As Verecunda only had one name it is believed she was a slave. We do not have any more information from the archaeological or historical records about Verecunda's origins. It is possible she was enslaved during foreign conquest or was born into slavery. Female slaves were usually employed for domestic tasks such as cooking and cleaning. Others worked as midwives or nurses. The construction and erection of a costly stone gravestone, as opposed to a wooden one, suggests that Verecunda was respected by her household. Many slaves were not as fortunate as Verecunda. It was common for slaves of the poor to be buried in unmarked graves or to have their ashes placed in an urn (Bateson & Cooper, 2011). Based on this research and developmental work the team chose to develop a story for Verecunda as it was agreed there was potential to create an emotional story around the physical object, the gravestone, and the name of Verecunda, using a female character that would appeal to several of the Hunterian personas.



Figure 6: Verecunda's gravestone from the Antonine Wall on display at The Hunterian Museum

The overarching theme or concept of ‘The Things We Leave Behind’ was developed as an umbrella concept for the Hunterian Onsite experiences (See D3.7: Pilot Experiences Prototypes). Verecunda’s story also fits under this concept.

The prototype experience was written collaboratively in MS Word. A character backstory, with motivation and crisis points were drafted for the character of Verecunda. The story for Verecunda was developed collaboratively during writing and plot meetings between the authoring team (UGLA and NOHO). The domain expert was consulted on the content to ensure the story adhered to the known facts of the objects and historical period. After developing several initial plot outlines the team created a backstory for Verecunda including a list of key events and memories in her life.

For example, in Plot Outline 1 Verecunda is a young female slave who is well looked after by her Roman Commander’s family. She overhears a rumour that the Antonine Wall is going to be abandoned. Her motivation in the story is that she wants to feel settled but is unsure if she should follow her Commander’s family or flee the army and stay at the wall. She comes across a young Caledonian boy and discusses with him her options. A crisis within the plot happens when Verecunda is discovered talking with the Caledonian and is threatened with being handed to the Roman army for collusion with the Caledonians.

5.2 Chatbot of Conviction, Çatalhöyük

5.2.1 Background

Çatalhöyük’s EMOTIVE experiences have been designed with 10 years of visitor profiling and five distinct visitor personas in mind. That research, conducted through the work of the site’s Visualisation Team (i.e., the leaders of EMOTIVE’s WP3), is outlined briefly in D3.1: User Requirements and Scenarios – Alpha, as well as being presented in detail in publically-accessible reports on Çatalhöyük’s webpages (http://www.catalhoyuk.com/research/archive_reports). Çatalhöyük is remote, difficult to visit and not particularly well resourced even when visitors do manage to get there. Its Facebook site, on the other hand, has a thriving user base of almost 10,000 people, growing by approximately 1000 new users per year. It is in the context of innovating with this active social media forum that we have experimented with the development of a chatbot for Çatalhöyük.

The first prototype of Çatalhöyük’s chatbot, ChatÇat, is reported in short in D3.7: Pilot Experience Prototypes; its formative evaluation is reported in D9.2: Formative Evaluation Results; and its full rationale and detailed methodology and analysis are published in the MSc Dissertation of University of York graduate Angeliki Tzouganatou (Tzouganatou, 2017). This first prototype follows the typical ‘info-bot’ model, prevalent amongst bots in the museums and cultural heritage sector, wherein chatting is used to guide visitors around a site or to help the user to organise their visit and reply to simple, common questions about the visiting experience or the site itself. Herein, the experience is one-way, information-delivery driven, with the bot engaged primarily to answer the users’ questions. Most such bots are unevaluated and, ultimately, lack meaningful forms of engagement – e.g., creative expression, critical dialogue, genuine debate – that could induce an emotional response.

Inspired, then, by Shawn Graham’s (2017) call for digital media that are able “to move us, to inspire us, to challenge us,” we have turned to Mark Sample’s (2014) concept of ‘bots of conviction’ - also known as ‘protest bots’ - to explore the potential for more open conversational agents that are focused on asking (not answering) questions, and provoking critical thought (see Tzouganatou et al., 2018 for a more detailed discussion of the bot of conviction concept and its early implementation by the EMOTIVE team). While EMOTIVE’s bot of conviction has important differences from Sample’s (2014) and others’ conceptualisations of protest bots (which, in effect, are still info-delivery focused conversational agents;

see Tzouganatou et al., 2018), its focus on social change and challenging users aligns with the larger, impact-oriented goals of such bots.

5.2.2 Pattern development

To create EMOTIVE’s bot of conviction we are in the process of developing a series of what we call ‘conversational patterns’. These patterns, or templates, inserted into our standard Conversational Manager, enable the bot to ask questions of the users, while still maintaining control over the structure and direction of the conversation. Working with a team of technicians, content experts, students and interpretation specialists beginning in late Autumn 2017, a pilot pattern – the ‘Figure 8’ – was conceived, and then appropriate content written to facilitate several different ‘chats’ which follow this Figure 8 format. Herein, the bot begins by either asking a question or making a bold statement. That pronouncement then prompts the user to respond, either positively or negatively, and continue further into the conversation. After a few exchanges, the user is questioned about their response to the topic, the centre of the formation, in order to assess their level of ‘conviction’ before entering the second section, which concludes with a summarizing statement – i.e., a statement of conviction. This structure aims to engage the user by reversing the roles of the traditional info-bot, with the bot asking questions first, thus provoking users to generate the answers, all while maintaining a guided and controlled exchange (Figure 7).

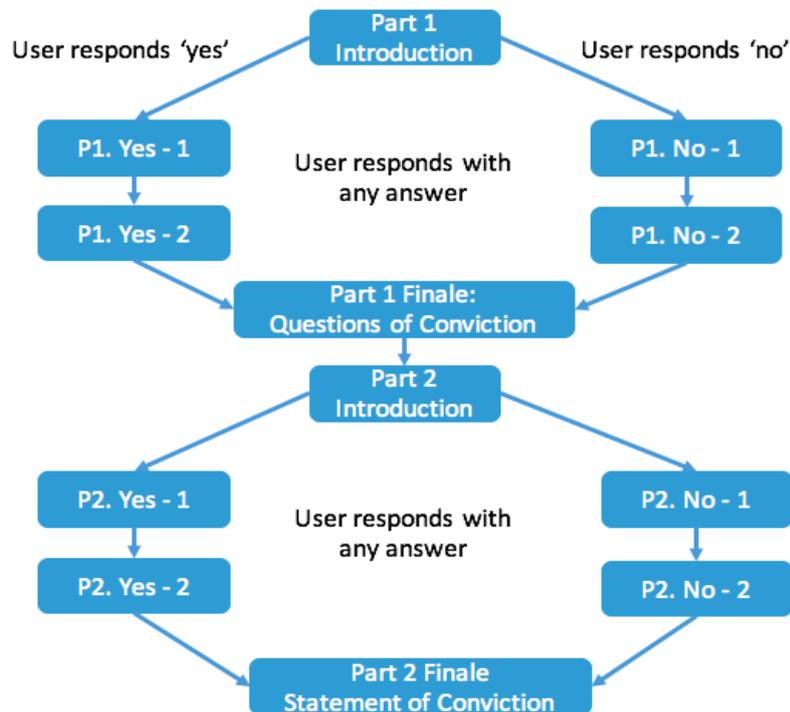


Figure 7: Bot of Conviction 'Figure 8' pattern

Figure 8 presents a partial example of the ‘Figure 8’ pattern implemented as a chat experience, including branching based on user responses.

Burial2.P1.Node-Intro Would you bury someone you care about under your bed?

If “yes” or similar then jump to Node-Yes-1.

If “no” or similar then jump to Node-No-1.

Otherwise jump to Node-No-1

Burial2.P1.Node-Yes-1 You’re just like a real Çatalhöyükian 🤔 Would you ever open the grave again after you’ve buried them under your bed?

Proceed to Node-Yes-2 with any answer.

Burial2.P1.Node-Yes-2 Well, at Çatalhöyük the bones of the dead were sometimes dug up and moved between houses, maybe even put on display in homes, connecting everyone together.

Proceed to Node-Finale without waiting for an answer.

Burial2.P1.Node-No-1 Why not? Are you afraid?

Proceed to Node-Yes-2 with any answer.

Burial2.P1.Node-No-2 Well, here the dead are part of people’s daily life--they are kept close. Sometimes the bones are even dug up and moved between houses, maybe even put on display in homes, connecting everyone together.

Proceed to Burial2.P1.Node-Finale without waiting for an answer.

Burial2.P1.Node-Finale What do you think about this?

Proceed to Burial2.P2.Node-Intro with any answer.

Figure 8: An example of the 'Figure 8' pattern completed with a full conversational sequence (or 'chat')

It begins with a bold question “Would you bury someone under your bed?”. The user’s answer then places them on distinct paths depending on whether they reply ‘yes’, ‘no’ or anything else. The bot’s responses are designed to be sensible for a variety of user responses, and consistently incorporate questions to provoke a user response. The tone of this pattern has been written to be conversational and approachable. Further it allows us to incorporate a bit of the ChatÇat personality, developed in the info-bot, in the form of emojis and attitude.

Four chats for the ‘Figure 8’ pattern have been developed, and we are embarking now on evaluation and authoring of several additional patterns and associated themed chats. Our intent is for the themes of these chats to become progressively more current, intimate and emotion-driven in nature, focused on challenging users’ deeply-held values and beliefs.

6 Conclusions and Next Steps

This document represents the beta version of our work on eliciting user requirements and drafting scenarios for the EMOTIVE project. Our understanding and insight into our user experiences (both authors and visitors) has been significantly refined since the release of D3.1 - the alpha version of EMOTIVE's user framework – based on extensive review of the scholarship on emotional engagement in and beyond the cultural heritage sector, as well as testing in a variety of forums with different types of user. We have deployed site-specific personas to initially shape our storytelling and storyauthoring experiences, and from there honed them in direct collaboration with key stakeholders, including domain experts, school groups, university students, site visitors, and other specialist and non-specialist users.

Over the upcoming months, in advance of the release of D3.3: User Requirements and Scenarios – Final, our authoring methodology and our visitor experience methodology will undergo further assessment in relation to those scenarios presented here and those still in the early stages of development. Our aim is ultimately to be able to compile our findings in such a way as to facilitate the authoring and experiencing of EMOTIVE stories at cultural heritage sites around the world, with useable, validated tools and interpretative tactics that genuinely connect with visitors on a personal, emotional level.

7 Bibliography

- Bateson, D., & Coupar, S-A. (2011). *Hunterian Treasures: The Antonine Wall: An Illustrated Guide*. Glasgow: The Hunterian Museum: University of Glasgow.
- Bedford, L. (2001). Storytelling: The Real Work of Museums. *Curator: The Museum Journal*, 44(1), 27–34.
- de Bruijn, P.A.C. (2014). *Bridges to the Past: Historical Distance and Multiperspectivity in English and Dutch Heritage Education Resources*. PhD Dissertation, Erasmus Universiteit.
- Franklin, A. & Papastergiadis, N. (2017). Engaging with the anti-museum? Visitors to the Museum of Old and New Art. *Journal of Sociology*, 53(3), 670–686.
- Hanquinet, L. & Savage, M. (2012). “Educative leisure” and the art museum. *Museum and society*, 10(1), 42–59.
- Graham, S. (2017). An Introduction to Twitterbots with Tracery. Online article: <http://programminghistorian.github.io/ph-submissions/lessons/intro-to-twitterbots> (accessed 15 March, 2018).
- Keppie, L. (2004). *The Legacy of Rome: Scotland’s Roman Remains*. Edinburgh: John Donald Publishers.
- Mirashrafi, S. (2017). *A Collaborative Experience in Çatalhöyük: Conception, Construction, and Evaluation*. MSc in Digital Heritage dissertation, University of York, submitted August 2017.
- Nilsen, A. P., & Bader, M. (2016). The Psychology of Empathy: Compelling Possibilities for Museums. In E. M. Gokcigdem, ed., *Fostering Empathy through Museums*, Rowman & Littlefield Publishers, 115-130.
- Pekarik, A.J. (2002). Feeling or learning? *Curator: The Museum Journal*, 45(4), 262–264
- Perry, S., Roussou, M., Economou, M., Young, H., & Pujol, L. (2017). Moving Beyond the Virtual Museum: Engaging Visitors Emotionally. In *Proceedings of 23rd Int’l Conference on Virtual Systems and Multimedia -VSMM 2017* (forthcoming). Dublin, Ireland: IEEE.
- Sample, M. (2014). A Protest Bot is a Bot so Specific You Can’t Mistake it for Bullshit: A Call for Bots of Conviction. Online article: <https://medium.com/@samplereality/a-protest-bot-is-a-bot-so-specific-you-cant-mistake-it-for-bullshit-90fe10b7fbaa> (accessed 15 March, 2018).
- Savenije, G.M. & de Bruijn, P. (2017). Historical empathy in a museum: uniting contextualisation and emotional engagement. *International Journal of Heritage Studies*, 23(9), 832–845.
- Smith, L. (2016). Changing views? Emotional intelligence, registers of engagement and the museum visit. In Gosselin, V., & Livingstone, P. eds., *Museums as Sites of Historical Consciousness: Perspectives on Museum Theory and Practice in Canada*, 101–121.
- Staus, N.L. & Falk, J.H. (2017). The Role of Emotion in Informal Science Learning: Testing an Exploratory Model. *Mind, Brain and Education*, 11(2), 45–53.
- Tzouganatou, A. (2017). *A Chatbot Experience for Çatalhöyük*. MSc in Digital Heritage dissertation, University of York, submitted August 2017.

Tzouganatou, A., McKinney, S., & Perry, S. (2018). Chatbots for Museums and Heritage Sites: ChatÇat, a Bot of Conviction for Çatalhöyük. Paper presented at the 46th Computer Applications and Quantitative Methods in Archaeology Conference (CAA 2018), Tübingen, Germany, March 19-23, 2018.

Watson, S. (2013). Emotions in the History Museum. In Macdonald, S. & Rees Leahy, H. eds., *The International Handbooks of Museum Studies*. Oxford, UK: John Wiley & Sons, Ltd, 283–301.

Witcomb, A. (2013). Toward a Pedagogy of Feeling: Understanding How Museums Create a Space for Cross-Cultural Encounters. In Macdonald, S. & Rees Leahy, H. eds., *The International Handbooks of Museum Studies*. Oxford, UK: John Wiley & Sons, Ltd, 321–344.

ANNEX 1: AUTHORIZING WORKFLOWS – USER NEEDS QUESTIONNAIRE

The objective of this activity and resulting report will be to record user needs and possible requirements for the EMOTIVE storytelling authoring process. A set of interviews will be conducted with authoring teams currently working on the development of storytelling experiences.

The experience

- E1. Can you briefly describe the experience you created?
- E2. Is the experience you created ready to be viewed by real visitors?
- E3. If not, what is the current status?
- E4. What do you envision as future steps?

The team

- T1. What is the composition of your authoring team? Think of everyone that contributed considerably in the process, even if they are not members of the core authoring team.
- T2. Did the members have experience in the creation of similar experiences? If so, briefly describe.
- T3. Can you identify specific roles for each member of the authoring team?

The authoring process

- A1. Were there specific stages in the authoring process? You are encouraged to start from the very beginning, before you had any conception of the experience you were going to create.
- A2. Were all/any members of the core authoring team familiar with the relevant historical period / theme and exhibits? If not, how did you exchange/find the necessary information?
- A3. How detailed was the first conception of the experience? Did you have specific ideas about how the visitors would experience parts of the story or was it something more abstract?
- A4. Did you have one specific experience idea that you kept till the end or did you experiment with several? How did you decide on the one you finally developed? At which stage did you reject the other ideas and for what reasons?
- A5. When you had an accurate draft for your story, how did you go about fleshing it out? What was the process and which tools did you use, if any?
- A6. Was the authoring experience an iterative process? Did you have to go back to previous stages and refine your decisions? Did you have to start over completely? If so, what did you realize that made you reconsider?
- A7. How did you manage to balance the need to create a storytelling experience while also providing enough information for and putting some focus on the exhibits? Did you feel you had to compromise the storytelling aspects to achieve this? Would you say that you achieved a balance between the storytelling and informational aspects in the final experience?
- A8. Did any other considerations make you compromise the quality of the storytelling (e.g., the short duration of the experience, the need to move the visitor around the exhibit space, etc.)?
- A9. How did you describe in your experience the use of complex media productions? Did you already have an idea of what was technically possible (e.g., manipulation of 3d assets, augmented reality, interactive games, etc.) or did you have to find out? If so, how did you find out?
- A10. Was the authoring process clear and straightforward from the beginning or did you need to make it up as you went along?
- A11. Did you adjust the process during the development of the experience? If so, please explain.
- A12. What were the tools, if any, employed at each authoring stage? Were these tools sufficient?
- A13. At which stage in the authoring process did you start using the EMOTIVE tools?
- A14. Did you feel you have done considerable work outside of any EMOTIVE tool (e.g., on paper, using text editors, etc.) which you had to redo when you started working with the EMOTIVE tools?



- A15. Did you have to adjust your authoring process to accommodate the EMOTIVE tools? If so, at which stage?
- A16. Did you have specific restrictions in mind for what is possible with the EMOTIVE tools? Did this make you compromise the quality of your developed experience? Alternatively, did you develop a draft experience without any specific restrictions and you then had to change it considerably so it could be inserted in the EMOTIVE tools?
- A17. How would you envision the ideal tool or tools to support the authoring process at its various stages?

ANNEX 2: PERSONALISATION IDEAS FOR HUNTERIAN ANTONINE WALL ON-SITE EXPERIENCE

Organised per persona. For a description of the personas, see D3.1.

Mary

- Linear storytelling
- Less choice
- More hotspots or ability to zoom
- Include information about how the object is made, material, etc

Annie

- Ability to export object, e.g. vase to 3rd party digital app to draw on, customize
- Print PDF of object to be able to draw on, customise
- Include link to share via social media

Carlos

- Include more background info
- Include maps/plans of the fort, excavation reports in order to link to his interest in building and construction

Callum

- Game-like activity
- Adding/dragging distance slabs to map and once completed more info is revealed
- Potential for printing or linking to school blog?
- Maths/numbers - convert Roman numerals/metric unit of measurement

Suzie

- Wants to take notes and have the ability to export them
- Post notes/comments/questions to MUSE Facebook group about AW
- Wants to be able to restructure her tour for different groups
- Wants to see other MUSE guide's tours
- Wants to be able to differentiate between visitors/MUSES' profile info from session logs to customise her content for a physical onsite tour.

ANNEX 3: ÇATALHÖYÜK EXPERIENCE – VISITOR QUERIES FOR INFORMATIONAL CONTENT

An interesting outcome of the Çatalhöyük on-site experience as it has been tested amongst the ATHENA and York teams, is that in some cases the experience intrigued the users enough about the site to express different questions. The experience involves two or more visitors in an object exchange activity that attempts to re-enact the concept of egalitarianism in the Neolithic society of Çatalhöyük. (More information can be found in D3.7: Pilot Experience Prototypes.) The experience has been tested with users both on and off site with similar results. Off-site testing took place with the support of virtual representations of Çatalhöyük's replica houses, constructed via 360-degree panoramic images.

The questions expressed by the users were relevant to (a) the objects used in the experience, (b) the features of the site itself and (c) the way of life of the Çatalhöyük inhabitants.

CURIOSITY ABOUT THE OBJECTS

Part of the testing activities that took place in the ATHENA premises involved object cards which presented not only an object photo but also information about the object as a textual description on the card. In this case most of the users felt that the information helped them make an informed decision about which object to choose or leave behind: *"This way I know what the object is for, its use and function."*

It has also been noticed that the users made decisions on what to leave behind taking the function of the object into account. For example, in the second house: *"They seem to have stamps and figurines, let's leave the arrow head, as they are missing a weapon."* Or *"Let's arrange the objects here by function."*

So in this sense if the users have no information about the objects we expect relevant questions to formulate and be expressed during the experience. We also appreciate that without information, users are missing key opportunities to expand their knowledge and to make meaningful informed decisions.

CURIOSITY ABOUT THE HOUSES

As the virtual representations of Çatalhöyük's houses were completely empty from any informational content (owing to the fact that at the time of capturing of the 360-degree photos, the replica houses which form the basis of the experience had only just been installed), users had many questions about the space and its various elements:

- What is this ladder leading to the roof?
- What is this hole/feature on the floor?
- Where is this platform? What is it?
- Ah, I can see back there a small space! I suppose this is the toilet?

These questions at points distracted them from the task at hand, which was the object exchange activity. This was noted during both the on-site and virtual versions of the experience: visitors don't seem to understand what each house represents and why they are named in the way they are named. e.g. someone asked: *"Why each house has a title and this one is 'building 77'?"*

CURIOSITY ABOUT THE WAY OF LIFE

The users made several queries relevant to the way of life of the Neolithic inhabitants of the site:

- *How can I decide which objects to leave in the grave? How did people then decide this?*
- *Did they use these objects for decoration purposes in the houses?*



Especially in the case of the Vulture Shrine house, there was discussion about the iconography on the wall:

- *Are these birds vultures, like in the House name? And are these people missing limbs? Are the birds eating them? Vultures normally eat dead people and animals. So what does this mean here? Why would they have this wall painting in their house?*
- *Is this related to how people buried their dead? But they buried them in their houses... So what does this with the vultures mean? In India they used to leave people to leave their dead to be eaten by vultures. Could this be a similar custom?*
- *Was this thing on the wall with the vultures part of a ritual?*
- *Maybe it represents dead enemies that they saw outside their town being eaten? I wonder, did they have enemies? To be such a perfect society they must have had external enemies.*

