



Europeana Space – Spaces of possibility for the creative reuse of Europeana’s content
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Project Coordinator:

Coventry University

Prof. Sarah Whatley

Priority Street, Coventry CV1 5FB, UK

+44 (0) 797 4984304

E-mail: S.Whatley@coventry.ac.uk

Project WEB site address: <http://www.europeana-space.eu>

Context:

Partner responsible for deliverable	COVUNI
Deliverable author(s)	Hetty Blades, Tim Hammerton, Rosa Cisneros and Alex Woolner (COVUNI)
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1 EXECUTIVE SUMMARY

The aim of the Games Pilot has been to develop three game demonstrators, which draw upon content from Europeana, in order to meet two key aims:

- show game developers and businesses the potentials for using digital cultural heritage content, with a view to inspiring new products. This aim aligns with the central focus of Europeana Space, to generate opportunities for growth and employment within the cultural industries.
- demonstrate how the gamification of participation with cultural heritage can cultivate new forms of interaction for a wide range of audiences.

The Pilot met these two aims through the development of three prototypes; a casual, creative and educational game, designed for use by adults and young people in educational, social and casual contexts and therefore reach different demographic groups.

COVUNI's Serious Games International team carefully planned the design of each type of demonstrator, not only to create an enjoyable player experience, but to illustrate the potential for cultural heritage content to be re-used. Different approaches were experimented with, including initial consideration of HTML5 to have the demonstrators available on multiple platforms. In the end the Unity3d platform was chosen because of graphics performance and flexibility. The initial intention was to draw content directly down into the demonstrators, but instead it was decided that having fixed, but limited, content was better at this stage, given the problems with accessibility and the metadata not always available via the Europeana API.

The Pilots work moved through the development phases of research, documentation, alpha development and beta development, with quarterly meetings ensuring that work progressed effectively. There was however a delay in progress as, by coincidence, several members of the Pilot development team left the university, meaning that others (members of the COVUNI Dance Pilot) had to take over and understand prior activity. The demonstrators were available from November and user testing took place in January and February 2016, which helped the new Pilot team to understand the next steps forward.

- The casual demonstrator focusses on restoration of painting drawn from Europeana. Based upon the 1980s arcade game QIX, users have to 'clean' paintings quickly; if this generates a sufficient score, they progress to the next painting.
- The creative demonstrator allows users to create remixes of video content, based upon the simple drag and drop technique. With no experience, users can create their own video montages and soundtracks.
- The educational game presents users with a portrait from Europeana (with background information available) and challenges them to recreate it either by taking a selfie or taking photographs of friends. Filters can then be added (such as sepia) to change the visual image of the picture.

The objective of the Pilot has never been to create mass market computer games, but to develop demonstrators that can reach out to different user demographics (and designers) and to demonstrate the availability of digitised cultural heritage content for creative re-use within future games.

2 INTRODUCTION

Computer games are popular leisure and teaching tools. As generations become increasingly 'native' to digital technologies, games and interactive technology more generally plays an advancing role in everyday life. Games are now played on mobile phones, tablets and computers, as well as through consoles, meaning that the potential modes of production are vast and varied. The market is constantly changing and growing, and developers are often looking for new approaches.

The Europeana Space Games Pilot set out to engage with this growing field through the development of three game demonstrator prototypes, which were developed to appeal to a range of audiences, for use in a variety of contexts; a mini game (later referred to as the casual game), a social (later referred to as the creative) game, and an educational game. These games demonstrators draw on artistic Europeana Content to encourage use and experimentation with Europeana through interactive engagement. The Pilot focussed on dissemination and sharing the demonstrators, through a hackathon, in order to inspire new products, which may eventually lead to a commercial product developed in the future. Staff changes within the Games Pilot resulted in some small delays with the development of the games, and the related hackathon. However, work is now progressing positively.

2.1 BACKGROUND

D5.1 – *Market Analysis* - defines video game as an electronic game that involves human interaction with a user interface to generate visual feedback on a video device. The word video in video game traditionally referred to a raster display device, but it now implies any type of display device that can produce two- or three-dimensional images. Over recent years the entire gaming industry had been affected by the digital content revolution in uses and business models: disintermediation, deflated production costs, changes in the pricing models, etc.

The charts below demonstrate how the global video game revenues changed over the years between the digital and physical selling of video game (not including hardware), as well as the changes in the share of the main video games segments.

Global Games Market 2012 - 2016 by type (on total 100%)

	2012	2013	2014	2015	2016
Massive multi-player online (MMO)	19.8%	21.2%	21.9%	22.3%	22.7%
PC	9.8%	8.6%	7.5%	6.6%	5.8%
Tablet	3.2%	5.3%	7.5%	9.6%	11.6%
Smartphones	10.6%	12.1%	13.6%	15.0%	16.2%
Handled	9.8%	7.3%	6.1%	5.1%	3.9%

Console	36.7%	36.1%	34.8%	33.5%	32.4%
Social	10.2%	9.8%	8.6%	7.9%	7.3%

Table 1: Source: Newzoo, Global Games Market 2012-2016

Global changing of video game selling revenue (€Bn)

	2012	2013	2014	2015	2016
Digital	23.9	28.0	33.4	40.0	46.6
Physical	17.5	16.2	16.0	14.7	12.6

Table 2: Source: IDATE, World Video Game Market, edition January 2013

Definitions of Types of Games

Nowadays there are many types of video games: consideration must be made as to those that are most suitable for reusing Europeana’s content (casual game, social game and educational game). Massive Multi-player Online Games (MMO) are also increasing in popularity, although the Pilot has chosen not to focus on this area, in order to focus in more depth on the three approaches adopted.

A casual game is a video game used by a mass audience of casual gamers. Casual games can have any type of gameplay, and fit in any genre. They are typically distinguished by their simple rules and lack of commitment required in contrast to more complex hard-core games. They require no long-term time commitment or special skills to play, and there are comparatively low production and distribution costs for the producer. Casual games are typically played on a personal computer online in web browsers, although they now are starting to become popular on game consoles and mobile phones as well. Casual gamers are typically older than traditional computer gamers, and more often female, with over 74% of casual gamers being female.

Social gaming commonly refers to playing games as a way of social interaction. More specifically games with social network integration or elements: they are a type of online game that is played through social networks, and typically features multiplayer and asynchronous gameplay mechanics. Social network games are most often implemented as browser games, but can also be implemented on other platforms such as mobile devices.

Educational games are games explicitly designed with educational purposes, or which have incidental or secondary educational value. All types of games may be used in an educational environment (subject to content). Educational games are games that are designed to help people to learn about certain subjects, expand concepts, reinforce development, understand an historical event or culture, or assist them in learning a skill as they play.

Europeana

Europeana provides content in image, text, video, sounds and also 3D format, and all of them can be used by creative industries in creating games (i.e. for the storyboard, for the scenarios setting, for the game content itself, etc.). The ultimate purpose is to find and encourage those creative industries to use Europeana's content in creating games.

As the final aim is to define how the Europeana's content could be used by creative industries, or game developers, in creating games, the nature of the content available via Europeana, which is mostly cultural and historical, has to be considered.

That is why it is important to focus also on the educational games world in which cultural and historical content used for the game can be provided by the digital archives of Europeana. The educational games market, which includes 'Game-based Learning' and 'Simulation-based Learning' will more than double (according to Ambient Insight) between 2012 and 2017.

Age and gender of European gamers

GENDER	Total	16-24	25-34	35-44	45-54	55-64
Males	55%	80%	67%	55%	40%	28%
Females	45%	61%	49%	44%	34%	27%

Table 5: Ipsos MediaCT, Videogames in Europe: consumer study, November 2012

51% of European gamers are under 35.

Summary

This analysis demonstrates high levels of engagement in games in Europe, in particular online via computers. Another important consideration is the age of the potential users, with the most notable finding being that, 51% of European gamers are under 35.

2.2 ROLE OF THIS DELIVERABLE IN THE PROJECT

This document draws on the work of the Europeana Space Games Pilot and was created by those working on the project, drawing on documentation and data collected throughout the course of the Pilot. The deliverable provides an in-depth report on the activities and outcomes of the Pilot, focussing on the development of three prototypes; a casual, education and social game and their potential for development and reuse during the Games Hackathon, scheduled for April 2016. The document also considers the lessons learned through the Pilot and outlines plans for sustaining the knowledge developed through the development and dissemination of the three games.

2.3 APPROACH

This deliverable uses data analysis, and narrative to explain and articulate the activities and outcomes of the Games Pilot. It draws upon primary research, conducted through user-testing, and workshops, alongside web-based research to assess the market potential.

The pilot took the view that it should not try to create a state of the art game, within a market place that has many competing brands. Within the budget of the Pilot, there would be little scope to do this and it would also be inappropriate to use project funding in this way. In considering best use of the funding and generating a wider reach, it was decided to create three smaller Games demonstrators rather than a single one. The focus is therefore upon the potentials of the games to inform the development of new tools and ways of engaging with cultural heritage, through Europeana and beyond. With this in mind, the Pilot has taken an open approach to sharing the prototypes, disseminating them via various gaming networks, and sharing the source code with participants at the Games Hackathon.

As a brief introduction, the three Game demonstrators are:

- Casual: focussing on restoration of paintings drawn from European. Based upon the 1980s arcade game QIX, users have to 'clean' paintings quickly; if this generates a sufficient score, they progress to the next painting.
- Creative: allowing users to create remixes of video content, based upon the simple drag and drop technique. With no experience, users can create their own video montages and soundtracks.
- Educational: users are presented with a portrait from Europeana (with background information available); they are challenged to recreate it either by taking a selfie or taking photographs of friends.

2.4 STRUCTURE OF THE DOCUMENT

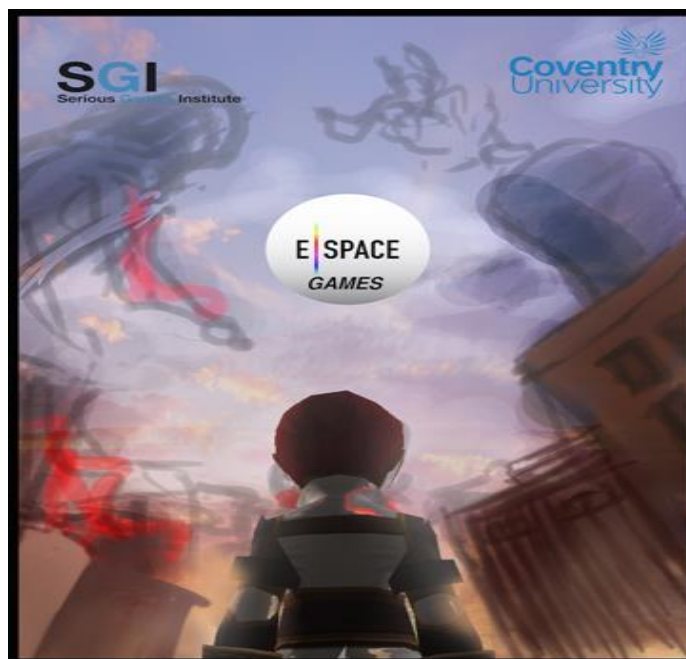
- Chapter three discusses the execution of the project, outlining the work undertaken by the Games Pilot team and technical details.
- Chapter four outlines the outcomes, discussing the ideas and usability of the three games demonstrators.
- Chapter five discusses the content sources for the demonstrators (and copyright status), all of which was sourced from Europeana.
- Chapter six outlines links with other activities within the Europeana Space project.
- Chapter seven discusses the evaluation procedures used to assess and develop the demonstrators, outlining user testing methodologies, results and recommendations.
- Chapter Eight articulates the lessons learned through the execution of the Pilot, in order to cultivate further interest between the games sector and cultural heritage.
- Chapter Nine considers the educational use of the games and discusses ways in which the demonstrators can be used by students to inspire further engagement with cultural heritage through game playing.
- Chapter Ten outlines the plans for impact and sustainability.
- Chapter Eleven outlines the plans for future work.
- Chapter Twelve offers conclusions, reflecting upon the main findings of the Pilot.

3 PILOT EXECUTION

3.1 TIMELINE

The Games Pilot began in February 2014 and is on-going at the time of writing. It is due to be completed in the summer of 2016. The Pilot took place over three phases in the development of its three demonstrator Games (casual, creative/social and educational),

1. Research and planning
2. Prototyping of game demonstrators
3. Testing and dissemination



Poster image for the Europeana Space Games Pilot

The work on each of the three demonstrators following a similar pattern, comprising:

- research
- documentation
- alpha development
- beta development
- testing
- final development.

In line with usual COVUNI development practices, software went through two stages of testing before it was considered finished. Alpha testing (using an early version of the software that does not contain all of the planned features) is generally performed only by internal users, followed by the second stage, beta testing that involves a limited number of external users, ahead of a wider set of user testing.

During February – May 2014 the team (from COVUNI's (SGI) Serious Games International) began work on the Pilot and established the methodology, with Alex Woolner acting as Pilot Coordinator, as the interface between the project and the university. The Pilot reviewed Europeana content with partners, and storyboarded themes for the games demonstrators. It was decided that the team would hold meetings every three months to discuss idea, progress and ensure that work is being conducted within the timescale set. During this period the team also started to source content from Europeana, through browsing the archive. The three games were initially scoped and the team started work on the technical and content design brief (completed in month 4), they also held the first of the three-monthly progress meetings.

June – August 2014 involved research for the casual game and social game. This involved investigating different technical and aesthetic approaches, and evaluating the current market for the two games. The research for the educational game began in August, and dealt with similar issues.

At an early stage of development, partner NISV was able to provide the Games Pilot with contact details of the creators of the Europeana Creative project's Natural History Educational Games <http://pro.europeana.eu/europeana-creative/pilots/memory-match-natural-history-edition> both to avoid duplication and maintain innovation and originality, whilst also seeking any synchronous benefits.

The development of the casual game design document began in June and was completed in December. The social games design document was completed in August and the 6 month progress meeting was held in July.

September – October 2014. The alpha version of the casual game was developed between September 2014 and January 2015 and the alpha version of the social game was developed between September 2014 and February 2015. The 9 month progress meeting was held in October, and the educational game design document was completed in September.

November 2014 – January 2015. The alpha version of the educational game began in November and was completed in March 2015. The 12month progress meeting was held in January 2015.

February 2015 – April 2015. The beta version of the casual game was developed between February and April. The development of the beta version of the social/creative game began in March and was completed in June. The beta version of the educational game began in April and was completed in August. The 15 month progress meeting was held in July.

The first stages of the Pilot were executed to schedule. By April 2015 the first game demonstrator (casual) was reaching completion (and partners were given a preview at the General Assembly meeting in Coventry in March), with the second (creative) moving into development and the third (educational) was in planning stages.

The initial concepts were altered slightly within the demonstrators in order to improve the underlying gameplay and design concepts task for each, and to operate within the constraints of the archive material available. There were some issues with reliable provision of content.

Therefore, the concept for the Casual Game demonstrator was altered in order to allow for a wider selection of available content to be used. During development some technical inconsistencies were encountered during the pulling of data from Europeana, resulting in the implementation of ‘workarounds’ in order to provide a consistent experience. For example, the team had set up the games to draw down Europeana content, but found that it had been removed. It was decided that the team would form a small repository of content for these demonstrators, to overcome this situation. This would allow for the concept of drawing on Europeana to be demonstrated, without relying on the stability of the collection.

Alex Woolner left COVUNI in August 2015, meaning that production of the games stalled while the team was reorganised. The Project Coordinator took the decision that at this late stage of the Pilot’s work, the COVUNI Dance Pilot team and Project Manager would take over the work, rather than wait for a new member of the SGI team to be recruited. This led to a delay, as the new team assessed the situation; this was hindered further, as the developer of the three Games had also left the university and therefore, none of the original team was in place.

Despite this minor delay, by December 2015 development stage two had been completed and beta versions all three game demonstrators had been developed. User testing took place in January 2016 (coordinated by the COVUNI Dance Pilot team), with feedback forwarded to SGI outlining potential developments. Source code was made available in March 2015, ahead of the hackathon, which is planned for April 2016.

Pilot Milestone number	Milestone Name	Delivery date	Comments
MS1	D4.1 Pilots methodology and content sourcing	March 2014	Completed
MS2	Prototypes ready to contribute to D4.3	January 2015 – Project Milestone 7	Completed
MS3	Design documents for all 3 demonstrators completed	February 2015	Completed
MS4	All 3 demonstrators completed	December 2015	Completed

3.2 TECHNICAL

At the beginning, on the basis of accessibility, the Pilot proposed to use standard HTML 5 / JavaScript to develop each of the games, therefore allowing players to access the games as ‘web apps’ either through a computer or mobile device. HTML 5 is emerging for accessible games development since it allows developers to develop once and deploy across multiple platforms. However, since HTML 5 is more limited than native development in some aspects, such as access to sensors and high performance graphics, there was always the possibility that a different approach might be needed if it was felt that these tools were hampering innovation and engagement within the development process.

Therefore, the decision was made to port development to the Unity 3D games platform www.unity3d.com and provide independent deployment for desktop, web and mobile devices. Access to the Unity platform for players would require the installation of a plugin for web-based play, or an App for mobile play. Desktop machines running recent versions of Windows and Mac OS can simply download and play standalone executables.

Unity 3D is freely available, with a 'pro' paid version. It is probably the most accessible and popular game engine of the modern generation, therefore it is highly accessible to participants in the Games Pilot hackathon.

Developing the game demonstrators has involved the creation and integration of various technical, gameplay and aesthetic features including:

- Gameplay design
- User Experience design (UX)
- API integration
- GUI and iconography
- In game scoring system

Whilst each of the games has been produced using the English language, this does not restrict them for using content sourced in other languages, and this could be particularly apparent when using film content. The demonstrators have been created using platforms that allow for the substitution of any text / spoken content into other languages, (although there can be a design tension when working with particularly verbose languages that require increased screen real estate.)

Ultimately, the Games were coded as follows:

Game	Platform	IDE	Language / frameworks
Casual Game	Windows	Visual Studio	Unity, C# Scripts
Educational Game	Mac OS X	Xcode	Objective-C
Social Game	iOS	Xcode	Objective-C

The API designed with the games is a REST based API with wrappers in Objective-C and Unity C# used by the applications listed above.

Originally, the backend server API was developed using NodeJS. It was designed to run as a service on a server, and be accessed through HTTP GET requests. The API would act as a service operating between an app that implements a client side API and the API provided by Europeana. It would take requests for records, through previously retrieved IDs, or search terms with various criteria and accesses the Europeana API to retrieve the requested data.

The most challenging part of creating this API was contending with inconsistent metadata structures returned by the Europeana API. For instance, provider names or item descriptions can be held in several different places within the data returned by that API, so it was necessary to set up several rules to check the location and existence of such data, in cases where it even exists at all.

For the specific cases of images, video and audio (media data that apps were built around) the usable URL of the assets may be conveniently part of the data package returned by the API, but it's also just as likely to be absent altogether. In all instances, the URL of a container page of the providing archive was present, and in the case of the asset URL being missing it was necessary to "scrape" this container page to find the asset being sought. However, in a number of cases the asset provided at the direct URL has been significantly lower fidelity than the corresponding asset in the container page, necessitating the scraping of these pages in all cases to find the best possible asset for the app's purposes.

While developing the API it was found necessary to build up a hard coded "blacklist" of providers, by domain name and provider name, that the API must ignore as many of them require authentication of some kind - which the Europeana API does not provide, nor does it communicate that any authentication is required for a given provider or item. Some providers protect their content, so the apps were unable to retrieve it, and some host their content, particularly video content, on external services such as YouTube, which the API couldn't reliably pull content from, so they, too, had to be blacklisted for this purposes. Other providers require registration, which there wasn't the development time to implement and interface with during this project, and others have domains that simply don't resolve or seemingly contain no content whatsoever.

Alex Woolner attended the internal technical workshop in Florence in May 2015. From the summer of 2015, the Technical Space WITH API also became available which with integration of its back-end would have the potential to provide a further dimension to the demonstrators. Via its federated search, multiple cultural heritage repositories are available including Europeana, The Digital Public Library of America, National Library of Australia, Digital New Zealand, Rijksmuseum, British Library collections on Flickr Commons, Europeana Fashion and YouTube. Although each source has different metadata configuration, this federated search has the possibility merge results and present them in a unified format, combining the potential of different APIs to provide heterogeneous information (images, videos and records of different metadata schemata etc.) and potentially, with further work needed, address the issues that were previously faced by the Games Pilot. However, due to Alex Woolner and the developer leaving COVUNI shortly after WITH became available this did not happen There is still the potential and the intention for the three game demonstrators to use the WITH platform to draw on content and therefore show the potential of the games to access and reuse content from multiple repositories.

4 OUTCOMES

As described previously, the Pilot had the objective to create three Game demonstrators. They were never intended to be state of the art games, but a clear demonstration of what is possible; introducing gamers and designers to the range of cultural heritage content available (including Europeana) and its potential for reuse.

The development of the Games considered the varying needs of its target audience and the fact that the demonstrators could be played on different types of mobile devices. Traditional games limited users to the privacy of their homes, but through the iPad, tablet and mobile phone design there is the greater possibility of engagement with CH content and sites. This has the potential to lead to economic growth, as well as to support the rapidly changing needs of the educational sector that is turning to digital platforms to challenge and engage young and adult learners.

4.1 CASUAL GAME

The casual game focuses on restoration. It presents the player with a painting (from Europeana), covered in dust. The aim is to restore the painting as quickly and effectively as possible, challenging the speed and accuracy of the player. The casual game is based on the arcade game QIX from 1981. The objective of QIX is to claim rectangular shaped areas of territory on the games screen, in order to acquire over 50% of the space available. This casual and compelling model of gameplay has been adapted to reveal image content from Europeana as the player claims territory. The casual game prototype has been completed and the source code will be released to participants of the hackathon in April 2016.



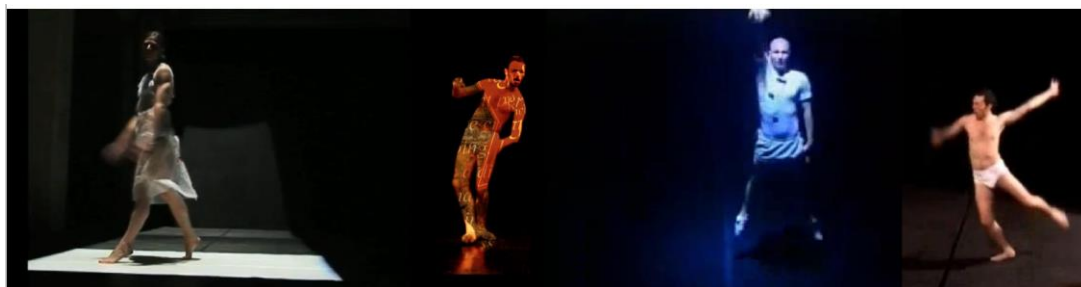
Playing the casual game involves using a virtual paintbrush to remove dust from a painting, as quickly and accurately as possible. The cleaner the painting becomes, the higher percentage score is awarded to the user; this enables players to move onto the next picture, with a higher score needed to progress in each round. It demands focus and speed, and encourages the viewer to engage with cultural heritage through a process of revelation. Information about the artist, title and location of each painting is available through the credits, and via the Information tab.



4.2 CREATIVE GAME

The creative game allows the player to create collages from filmed footage (from Europeana), encouraging people to draw connections between content and generate their own remixes. The social game is themed around dance and the playful experience of mixing and matching archived videos of contemporary dance in order to create new 'mashups'. Players are presented with a library of dance clips video content that has been curated by the members of the Games and Dance Pilots which they are then able to sequence together on a timeline. The creative game prototype has been completed and the source code will be released to participants of the hackathon in April 2016.

This game encourages users to respond creatively to moving images, developing editorial and artistic skills. It is a fun game to play, and allows users to look closely at short clips, encouraging analysis and observation of the content. Attributions are clear, meaning that the user is able to conduct further research of these clips via Europeana.



4.3 EDUCATIONAL GAME

The educational game is themed around the format of the self-portrait, using a series of images already drawn from Europeana. Using the styles and themes of these images as a starting point, players can map photographs of themselves or their friends into the image and blend these together using a range of touch screen based tools.

The original images link back to their archive sources and also to open content on the artist, arts techniques and historical context for the image. The aim is to match the images as closely as possible, encouraging creativity and learning through emphasising the form and composition of the painting. The educational game prototype has been completed and the source code will be released to participants of the hackathon in April 2016.



This is a fun game to play. Users must try to emulate the images presented, or match pictures of other people to the self-portraits. It encourages close engagement with the painting, and draws users in through its relationship to the popular 'selfie' craze, but can equally the picture can be taken of someone else, as a photograph taken on a phone. Once the picture has been taken, a series of colour and tone filters can be added to alter the picture; the objective is to get the photograph as close to the original picture as it possible.

As the new Games Pilot team came to the demonstrators afresh, they were able to undertake an initial user test. One of the areas left for development was that each game lacked a set of instructions of how to maximise playability; this was especially important for the Educational Game. This was urgently addressed with the SGI development team, but it was decided to wait until after the imminent user testing to gather further impressions, before providing final feedback. Ultimately, instructions will be added to each game during early April.

5 CONTENT SOURCES

5.1 CHALLENGES OF SOURCING CONTENT

The intention was that content for the Games Pilot was to be drawn primarily from Europeana resources with supplementary resources drawn from other archives. For the purpose of the Pilot, copyright and quality were considered to be the two defining factors in the selection of media. Firstly, the necessary usage permissions and restrictions had to be examined and understood. Secondly, the media had to be of suitable fidelity to promote the aesthetic appeal of the games and fit with the overall vision for the Pilot.

One of the main challenges facing the Pilot was always likely to be the tension between providing users with the ability to add content to games dynamically using the database interrogation facilities available in order to provide a more open experience, and curating the aesthetic presentation and suitability of content in order to provide an engaging user experience.

The casual game uses content from Europeana; originally it was to be based on specific images available through Europeana within the theme of 'games'. These were contributed by a particular provider, who in the last period, while the game was in the development phase, elected to remove them from the Europeana content: this meant that the only content left available for use in the game was the low res thumbnails. These were not suitable assets to progress the development of the game, thus it was necessary to change the concept of the game, whilst remaining in the casual arena.

Researchers from the Games and Dance Pilot collaborated to curate a library of dance content videos to form the creative game demonstrator. This became a 'static' library of videos drawn from different archive sources (including Europeana sources), that have been downloaded and inserted into the demonstrator, rather than using a dynamic system of loading videos into the software using search terms at run time. This approach has been selected in order to provide the user with a coherent experience as videos will be selected based on aesthetic content, quality of image and licensing being 'pre-loaded' there will be no download times for users and therefore no negative impact on their download service and any tariffs for data. Also the experience of using the demonstrator and having access to content will not be reliant on that content still being available directly from Europeana.

The Pilot has been acutely aware that the success of the games is reliant on content continuing to be available through Europeana and it was therefore decided that for the purpose of these demonstrators, the games should include fixed content from the archives that could be changed over time or used by future developers to utilise dynamic content from owner and providers.

5.2 CASUAL GAME

Name of the content provider	Name of the selected collection/s	Type of content	Approximate amount of the sourced content	Copyright status
Europeana Collections	Europeana Art History	Images	6	PDM –Share with attribution Rijksmuseum
Europeana	Europeana Music	Music	1	PDM –Share with attribution Netherlands institute for Sound and Vision

Images

- *View of the Garden of Villa d’Erste in Tivoli* by Moucheron Issac de, Rijksmuseum
- *The Drawing Lesson* by Moritz, Louis, Rijksmuseum
- *The Rape of Europa* by Verkolje Nicolaas, Rijksmuseum
- *Orpheus and the Animals* by Potter, Paulus Rijksmuseum
- *Cleopatra’s Banquet* by Lairesse, Gerard de, Rijksmuseum
- *The Good Samaritan* by Scorel, Jan van, Rijksmuseum

Music

- Dancing (WoO.17) 1-3, by Beethoven, Ludwig van. Performed by Vienna State Opera & Franz Lischauer. Netherlands institute for Sound and Vision

5.3 CREATIVE GAME

Name of the content provider	Name of the selected collection/s	Type of content	Approximate amount of the sourced content	Copyright status
Europeana Collections	Europeana Art History	Videos	3	PDM –Share with attribution Netherlands institute for Sound and Vision

Europeana	Europeana Music	Music	1	PDM –Share with attribution Sound Archive of ISPAN: Poland
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Videos

- *Tango Demonstration 1930*, Sound & Vision (Beeld en Geluid) The Netherlands.
- *Demonstration of the Foxtrot*, Sound & Vision (Beeld en Geluid) The Netherlands.
- *CC Cushion. Sibiu Dans 2007*, *Festival International de Dans Contemporain* Library of the “Lucian Blaga” University of Sibiu.

Music

- AZFM pomor by Szoc, Sound of Archive of ISPAN; Poland

5.4 EDUCATIONAL GAME

Name of the content provider	Name of the selected collection/s	Type of content	Approximate amount of the sourced content	Copyright status
Europeana Collections	Europeana Art History	Images	10	PDM –Share with attribution Rijksmuseum
Europeana Collections	Europeana Art History	Images	3	CC BY University of Edinburgh

Images

- *Self-Portrait by Dujardin, Karel, Rijksmuseum*
- *Self-portrait by Gogh, Vincent van, Rijksmuseum*
- *Self-Portrait by Steen, JanHavicksz, Rijksmuseum*
- *Self-Portrait by Tischbein, Johann Friedrich August, Rijksmuseum*
- *Self-Portrait by Rembrandt Harmensz, van Rijn, Rijksmuseum*
- *Self-Portrait [missing credit], Rijksmuseum*
- *Self-Portrait by Troost, Cornelis, Rijksmuseum*
- *Engraving by G.B. Shaw of a portrait G.B. Shaw by Sir Henry Raeburn. University of Edinburgh*
- *Self-Portrait as the Apostle by Paul Rembrandt Harmensz. Van Rijn, Rijksmuseum*
- *Self-Portrait with the portrait of his Wife Margaretha van Rees and their Daughter Maria by Werff, Adriaen van der, Rijksmuseum*

- *Self-Portrait of Sir William Allan steel engraved by W.H. Lizars by Sir William Allan, University of Edinburgh*
- *Portrait of Raden Syarif Bustaman Saleh by Schreuel, Friedrich Carl Albert, Rijksmuseum*
- *Engraved portrait of William Hogarth by J. Mollison, after William Hogarth, University of Edinburgh*

6 PROJECT INTEGRATION

The Games Pilot predicted links with Dance and TV, both of which share commonalities due to an interest in the use of moving image to engage audiences. The Game demonstrators use both TV and dance content from Europeana.

In particular, the Games and Dance Pilots worked closely together. During the development of the games, there were multiple discussions between the teams, which resulted in the content for the creative game being relevant to the Dance Pilot. Work was undertaken on the development of a demonstrator game to allow players to choreograph and remix archived video recordings of dance and dancers, using 'mashed up' videos based upon the original concept of movement of humans across the frame of the recorded image.

The Games Pilot team also played an active role in the Consortium, participating in regular WP4 Skype meetings. This was an opportunity to hear other Pilots describe their work and to identify synergies and learn from the approaches of others.

The Pilot Coordinator, Alex Woolner, attended the project's technical workshop in Florence in the summer of 2015 to explore how the Pilot could benefit from the developments of WP2, just ahead of the launch of the first iteration of the WITH platform at the end of July. Unfortunately, it was at this point that he was offered another job, leaving in mid-August (quickly followed by the developer) and therefore the discussions on integration were taken no further at that stage. This is, of course, the objective of the new Pilot team, based upon their experience of project integration, as part of the Dance Pilot.

Dissemination of the game demonstrators and the thinking that drove them happened in different forms. In particular, COVUNI's Digital Echoes Symposium in March 2016 focused on questions around participation with digital technology, providing a context for exchange between the games and dance communities. The games were presented in the Europeana Space Corner, alongside the prototypes from the Dance Pilot. Attendees were encouraged to explore both sets of prototypes and consider the relationship between the two in relation to the themes of the symposium.

It was also interesting to note that at the Europeana Space Digital Dance day, held in Coventry, one participant gave feedback to DanceSpaces that he would be interested to see a tool where videos could be mashed up. At the end of the session, the team were able to show him the Creative Game that did exactly what he was asking for.

As with all Pilots, the Games Pilot is working with the WP3 Content Space team to create an IP related case study based upon the decisions that were made and development process. This will feature as one of a series of important lessons available to other potential re-users that wish to learn from the project.

Although it is a clear objective of the Games Pilot to introduce the cultural heritage content that is available for creative reuse to gamers and designers, it also acknowledges the concerns that have been shared by the Photography Pilot. Following the Photographic Memories Workshop in Leuven in November 2015, the Photography Pilot Leader shared public feedback on ethical reuse of content at the Tallinn General Assembly meeting. Whereas members of the public were happy to share their family photographs from years gone by (following licensing advice from WP3), it became apparent that one of the bigger concerns was that images of their grandparents or other relatives would be taken out of context and could appear in a computer game. This had reputational concerns and caused reluctance for them to make content available. This is an important message for the Games Pilot to share with potential re-users of content, to be respectful of the images that are available to be used in games.

7 EVALUATION

7.1 EVALUATION PROCEDURE

The Games Pilot addresses two key markets:

1. the game player / consumer
2. games developers
3. educators

The purpose is to understand the value of digital archives such as Europeana as a source of valuable content for video games that engage audiences, and therefore offer a viable content source to developers interested in business models that can exploit this data further. By promoting content from Europeana in the games, awareness of the archive and its content should also be raised more generally.

Within the Pilot specific audiences of game players and are addressed:

1. The casual game: Casual game players – this is a broad audience, although typically described as older and predominantly female. The simplicity and content of the game may also appeal to younger players with less sophisticated gaming requirements.
2. The creative game: This will be aimed at more sophisticated users of games technology who are keen to play with and explore media and to share their ideas and creations. Typically teenagers and young adults. This game should also appeal to media enthusiasts interested in tools that redefine narrative within moving image.
3. The educational game: will target the pedagogic needs of teachers and students with a specific age group / key stage of student to be defined in part by the subject matter chosen. The development team will work with existing contacts in education in the UK to define this further.

The Games Pilot engaged most closely with education providers in the development of the educational game in order to select specific target audiences, themes and content and further to then test the emergent prototype game. Game development is typically iterative and responsive to user feedback.

The games demonstrators were evaluated through three user-testing sessions in January and February 2016. The first testing took place on 27th January. The second took place over the 5th and 6th February and the third was conducted on 27th February. The Pilot drew together participants from each of the target groups to experiment with the games and feedback via quantitative questionnaires and qualitative observational feedback. In an ideal world, there would have been more time for the new Games Pilot team to have prepared for this event, but due to the necessity of completing this deliverable, testing went ahead with recognition that not having demonstrator instructions available had the potential to portray them less favourably. Given the tight timescale, this could only be addressed at a later date.

The following criteria were outlined in March 2014 for the evaluation of the prototype and for the development/improvement of the final output:

1. Technically sound – no critical bugs
2. Clear purpose – users understand the purpose of each demonstrator
3. Usability – users are able to complete the tasks demanded
4. Links to content – users are aware of the archive content showcased in the demonstrators and are able to link back to the sources and conduct further research around them if wanted
5. Attribution is clear when necessary

Continual evaluation took place during iterative development process, with user evaluation taking place toward the end of the cycle.



User testing at Coventry University Photo Credit: Rosamaria Cisneros



User testing at Coventry, University Photo Credit: Rosamaria Cisneros

7.2 EVALUATION EVENTS

The first testing day was divided into two sessions. Session one was attended by three female participants, aged between 30 and 50. Each of the participants had some experience of playing computer games, with two out of three saying that they had only done this rarely and not for many years. Session two was attended by two male and one female participants, aged between 30 – 60. Each of the participants had minimal or no experience of playing computer games in the past. All of the participants in both groups work in Higher Education contexts.

During the testing each of the participants were given 15 minutes to play with each game. They completed an online questionnaire on Attrakdiff (<http://attrakdiff.de/>), which focuses on the attractiveness of the prototypes (see addenda). They also completed a quantitative questionnaire designed by Rosa Cisneros and Hetty Blades (that had carried out the Dance Pilot's user testing) to measure usability and potential for development (see addenda).

Alongside these questionnaires they conducted short focus groups, using open-ended questioning to further probe the participants' responses to the games (see addenda).

The second evaluation was conducted by Sarah Whatley, Project Coordinator, with one female and one male child aged between the age of 12 – 17. The results of this evaluation were recorded on Attrakdiff and through the quantitative questionnaire.

7.3 EVALUATION RESULTS

7.4.1 User Testing Questionnaire Results

Educational Game

	No	Partially	To a large extent	Yes
Did you enjoy using the game?	3	2	2	2
Was the interface easy to use?	1	2	1	5
Did you understand how to succeed at the game (win points etc.)?	3	3		3
Would you be likely to play this game in your own time?	7	1		1
Can you see any potential for development?		4		4

Summary:

- Most participants rated their enjoyment negatively
- Most participants found it easy to use
- Two thirds of participants did not fully understand how to succeed at using the game
- All participants saw at least partial potential for development

Creative Game

	No	Partially	To a large extent	Yes
Did you enjoy using the game?	4	2		4
Was the interface easy to use?	3	2	2	3

Did you understand how to succeed at the game (win points etc.)?	3		4	3
Would you be likely to play this game in your own time?	5	2		3
Can you see any potential for development?		3		6

Summary:

- Over half of the participants did not enjoy using the game
- The participants were evenly divided regarding the ease of use
- Most of the participants understood how to use the game.
- The majority of participants responded no or partially when asked if they would use the game in their own time
- Responses to the potential for development were fairly positive. All could see at least partial potential.

Casual Game

	No	Partially	To a large extent	Yes
Did you enjoy using the game?	3	3	1	
Was the interface easy to use?	2	4		1
Did you understand how to succeed at the game (win points etc.)?	6	1		
Would you be likely to play this game in your own time?	5	2		
Can you see any potential for development?	1	2	1	2

Summary

- The enjoyment of the game was divided fairly evenly between no, partially and to a large extent.
- Most participants found it at least partially difficult to use. One participant found it easy.
- None of the participants fully understood how to succeed at the game (although this does not correlate with the findings from the discussion, as two participants did seem to grasp the point scoring structure).

- Most participants responded negatively to the likelihood of playing the game in their own time,
- Opinions were fairly evenly divided regarding the potential for development.

7.4.2 Attrakdiff online questionnaire results

The online questionnaire evaluated the following areas:

-Pragmatic Quality (PQ):

Describes the usability of a product and indicates how successfully users are in achieving their goals using the product.

-Hedonic quality - Stimulation (HQ-S):

Mankind has an inherent need to develop and move forward. This dimension indicates to what extent the product can support those needs in terms of novel, interesting, and stimulating functions, contents, and interaction- and presentation-styles.

-Hedonic Quality - Identity (HQ-I):

Indicates to what extent the product allows the user to identify with it.

-Attractiveness (ATT):

Describes a global value of the product based on the quality perception.

Educational Game

The products user interface was rated as "neutral".

The value of pragmatic quality only reaches the average values. Therefore there is room for improvement in terms of usability.

In terms of hedonic quality the character classification applies positively. The user is stimulated by this product, however the hedonic value is only average. This means that in terms of hedonic quality there is clearly room for improvement.

The confidence intervals of both dimensions are large. This could be attributed to limited sampling or to greatly differing product ratings. The users are at one in their ratings of both dimensions.

Casual Game

In terms of pragmatic quality the product user interface was rated "superfluous". In terms of hedonic quality it was rated "neutral".

The product is rated very poorly in terms of pragmatic quality. The user is not able to achieve his/her goals. Therefore it is imperative that this product be revised.

The user is stimulated by this product, however the hedonic value is only average. This means that in terms of hedonic quality there is clearly room for improvement.

Creative Game

In terms of pragmatic quality the product user interface was rated "superfluous". In terms of hedonic quality it was rated "neutral".

The product is rated very poorly in terms of pragmatic quality. The user is not able to achieve his/her goals; therefore it is imperative that this product be revised.

The user is stimulated by this product, however the hedonic value is only average. This means that in terms of hedonic quality there is clearly room for improvement.

7.4.3 Responses to the five original criteria

Evaluation results of the findings in relation to the criteria proposed in March 2014 are addressed below, drawing on the results from all three data sets.

1. Technically sound – no critical bugs

All three games are technically sound. There are no major bugs to be fixed. Below is one observation.

Creative Game

The touch-screen mechanism is not very sensitive, meaning that users must hold down their finger for a few seconds before they are able to move the footage around on screen. This will be made clear in the instructions for the game.

2. Clear purpose – users understand the purpose of each demonstrator

Educational Game

According to the questionnaires, many of the participants did not understand how to succeed at using the game. During the focus group two participants agreed that they could not make sense of the game in terms of how to score points. However, all the participants did understand the basic premise of matching the photograph with the image from Europeana. The idea was generally received very positively, and the potential for use in educational contexts was broadly acknowledged.

Casual Game

According to the questionnaires none of the participants fully understood how to succeed at the game. However, this does not correlate with the findings from the focus group, as two participants did seem to grasp the point scoring structure.

There was some confusion over how to score points. The potential for this game as an educational tool was also acknowledged by many of the participants.

Creative Game

According to the questionnaires, understanding was fairly evenly divided, although no one seemed to fully understand the game. During the focus group there was a general consensus among the participants that it was not entirely logical how to use the game. This was partly a usability issue, due to the difficulties noted above about the drag and drop function. The lack of point-scoring was also confusing for some participants, who felt that this meant that it is not really a 'game'.

Summary

The concepts of all three games were generally considered strong, and the potential for their use in various contexts was acknowledged.

3. Usability – users are able to complete the tasks demanded

Educational Game

According to the questionnaires the group was evenly divided regarding the ease of use. During the focus group it was acknowledged that it was not always clear what constituted a match between the images. One participant mentioned that they expected information to appear on the screen.

Creative Game

Most participants did not enjoy using the game. Most found it at least partially difficult to use. Some of the participants were unable to work out how to use this game at all. Those who could use it noted that it was easy to use once they understood to keep their fingers pressing on the film for long enough to move it to the timeline.

Casual Game

According to the questionnaires most participants found it at least partially difficult to use. One participant found it easy. During the focus group it appeared that most of the participants found this game frustrating to use, as they could not work out how to restore the painting and use all of the functions properly. Two participants figured out the rules and methods, but both said that the time pressure means that it is not possible to see the image properly once it has been restored.

Summary

According to the Attrakdiff questionnaire all three games were rated very poorly in terms of usability. The three prototypes were tested without the use of instructions and most of the participants failed to comprehend the point-scoring logic, and some of them could not work out how to use the creative game at all, due to the difficulties with the drag and drop function.

4. Links to content – users are aware of the archive content showcased in the demonstrators and are able to link back to the sources and conduct further research around them if wanted

Educational Game

It was suggested that there could be greater links forged with online images, or for use in a gallery context where users can choose the images they use. The information about the images is clear.

Creative Game

The participants were frustrated by the limited content available. It was suggested that the potential to link to online content would improve the experience of the game. The potential to conduct further research is limited at this stage of the development.

Casual Game

As noted above the speed of the restoration action limited the ability of the users to engage in content.

One participant suggested that they could not see the art works and were unable to learn anything about cultural heritage through using the games. Two participants concurred that it would have been beneficial to include more depth about the painting. Information and the potential for further research is also limited at this stage. It was suggested that this could be further improved and developed by including explanations of how paintings are usually restored and what the buttons mean. For example, by being talked through it by a professional, generating a link to real-life practices, and linking to Europeana and other websites.

5. Attribution is clear when necessary

Attribution is generally clear, but the participants felt that in all of the games there was un-met potential regarding the depth of information given. For example, the dates of the paintings used on the educational and casual game are not provided. There is a credit missing in the educational game.

7.4 FURTHER EVALUATION AND ENGAGEMENT ACTIVITIES

The Europeana Space Corner at the 2016 Digital Echoes symposium provided an opportunity for further user engagement. Participants were introduced to the games, and asked for their feedback through qualitative methods, such as an open-space feedback sheet, where users could contribute ideas and observations, and discussion with members of the E-Space team. It was noted that whilst the usability of the demonstrators would need to be developed in order to become commercially accessible, as demonstrators they work well to highlight the potentials of games for creative reuse and engagement with cultural heritage content.



E-Space Corner during DES16 Photo Credit: KoZin Photography

The hackathon is planned for April 2016, and will be a major event in regards to engagement with the demonstrators. In order to meet the primary aim of the Pilot, to examine the potentials for using cultural heritage content in games contexts, the three prototypes will be shared with the participants, who will be encouraged to use the source code, and underpinning research to develop their own games in response to the theme.

Engagement with the demonstrators will also be promoted via COVUNI's 'Game Changers' project. Students will be encouraged to use these prototypes as a point of departure to develop their own games. The findings and lessons learned from the project will also be disseminated through relevant educational and research events in order to promote further engagement with Europeana, and highlight the potentials of using cultural heritage content in game playing contexts, and how the gamifying engagement with cultural heritage can inspire new modes of participation and interaction.

7.5 IMPROVEMENTS AFTER EVALUATION

After evaluating all of the data Rosa Cisneros and Hetty Blades made the following recommendations to be addressed by the developers.

Casual Game

Introduction and clear instructions are required

It should be slower to use so that the user can score the maximum points whilst still being able to see the content emerging.

Educational Game

Introduction and clear instructions are required

Creative Game

Introduction and clear instructions are required

The option to edit the length of the clips

The user testing team have written instructions for each Game, based upon their understanding and comments of testers. These are to be added into the Games in early April, ahead of the hackathon. This will alleviate some of the comments provided here and the difficulty that participants had in understanding Game requirements.

7.6 FURTHER COMMENT

The user feedback was valuable to the Games Pilot, but has to be considered within the context of its work. As mentioned, the Games were never intended to be state of the art, but demonstrators to peak interest.

One of their limiting factors is how little content is currently available through them. Having initially tried to create them with live feed via the Europeana API, only to be let down with the removal of designated content, a fixed library was installed for demonstration purposes. This is clearly frustrating to users, especially with the few options available for video mash-up with the Creative game. However, as described in section 3.2, the option of integration with the Technical Space's WITH back-end has the potential to solve this problem and allow access to a multitude of content.

8 LESSONS LEARNED

During the focus groups conducted as part of the user testing the potentials of the games and the use of games in cultural heritage contexts was discussed. The participants (aged 30 – 60) suggested that there is a lot of potential for use in educational contexts, however they were generally under-stimulated by the games. A key reason for this was that the engagement with the art works was limited and obscured by the format of the game. This demonstrates that for adult users, deeper engagement with cultural content, and the ability to conduct individual research would have greatly enhanced the games. Although the participants seemed confident about the potential for young people, the games were not rated highly by the younger users (aged between 12 – 17). The gamification of engagement with cultural heritage has a lot of potential, but deep, independent engagement with content is important.

The Pilot struggled to recruit a large number of young people for user testing. It would have been beneficial to test the game with a larger number of people from this target group, especially given the educational focus of one of the games. Due to the changes in Pilot personnel, the testing also happened quite late in the process, meaning that only limited improvements were undertaken, due to time constraints. There is enthusiasm for engaging in cultural heritage through games, however, it is recommended that future projects in this area engage actively with specific target groups from the start of the process.

The change of personnel also had a positive impact upon the Pilot, as the new team had experience of delivering a successful Dance Pilot that had experience of user testing and developing collections of content within the WITH Technical platform.

The initial aim of the Pilot was to develop three game demonstrators. These were intended to link to social media, and directly to Europeana and other online content. The development of the prototypes took longer than anticipated, and there were problems accessing the Europeana content, meaning that the team developed workarounds, and these social and research features were not developed. In hindsight it might have been beneficial to focus on the development of two games, and provide a wider range of functionality.

The thinking behind the development of the prototypes has demonstrated the great potential of games for accessing and engaging in cultural heritage. From discussions within the Pilot team, as well as within the focus group, games could be used to support economic growth within museums, to support the tourist trade/hospitality sector marketing or within the growing transmedia and storytelling arenas, reaching people from different socio-economic groups. These finding suggests that there is great scope for this field to be developed (that the thinking for game development should not be limited to niche audiences) and that there is genuine potential for creating jobs and inspiring new business opportunities.

The experiences of the team helped to highlight the skills needed by those undertaking games development. In order for the development of gaming products that utilize content for creative re-use (including from Europeana), based upon experience of the Pilot recommends that teams have specific skill sets that include:

- **Game producer**, having an overall vision and understanding for the game and the processes and steps required in order to achieve it. Able to manage the team and workflow, with an overall knowledge of the technical and aesthetic challenges in game development.
- **Code developer**, having specific understanding and experience of programming languages and APIs for game development, and able to work within cooperative and multi-skilled team. Different code developers should be required depending on the platform being addressed (ie web / app / console etc)
- **Game designer**, experienced in creating engaging user experiences using the vocabulary of games, and within the technical infrastructure of games. Experienced in creating designs that understood and can be realized by the development team.
- **Game artist**, capable of creating graphical artwork optimized for use within games, including specific game assets and UI requirements. Depending on the nature of the project (ie 2d, 3d, static, animated etc) different artists' skills would be required. Sound artists may also be required to create audio material for the game, and should be experienced in understanding the art of sound design for games and the associated best practice for the use of sound effects and music within interactive and platform dependent digital projects.
- **Researcher**, capable of sourcing and collating Archive content for use by the development team. This may correspond closely with the game design role with regard to creating a narrative structure for games produced. If the game is to target specific audiences (ie education) then a research role should be created to understand specific requirements and translate these effectively to the Designer and thus into the game.

It is possible that dual roles could be undertaken by team members.

9 EDUCATIONAL USE

One of the game demonstrators specifically targets secondary school education in art. It focuses on the art of the 'self-portrait' using imagery from the archives as its basis, and combines this with the multimedia capabilities of mobile devices to allow students to research and create their own self-portraits. It enables the 'Selfie' to be brought into the art classroom, or even a general setting, in a way that provides a great deal of fun.

During the user testing the potentials of the other two games for use in educational contexts also became apparent. The casual game, for example was considered to offer great potential in terms of teaching people about restoration, art practices and cultural heritage. Equally, the creative game has great potential to teach people about video editing and online content, and encourage the creative reuse of media sources. The games therefore reflect differing aspects of the content available to be used.

Each of the images used within the three games has an attribution and a degree of information. In addition to taking a selfie, by pressing the 'i' icon, further information about the painting is revealed.

Given that these are demonstrator games, one of the most important educational functions is the introduction of repositories such as Europeana and opening the door to a world cultural heritage creative re-use of content.

Once the improvements of the games have been completed the next stage is to establish links with educational communities, in order to disseminate the games and explore their educational potential in various contexts.

The Pilot team have forged links with colleagues in the Disruptive Media Learning Lab (DMLL) and in particular their Game Changers project at COVUNI. DMLL is an innovative centre, focussed on the development of new approaches to teaching and learning, through digital media. Many of the researchers and educators working in the centre are exploring the potentials of games for teaching and learning, making this a valuable connection for the Pilot. At the time of writing plans are under consideration for an educational event, which will involve partners from DMLL and a group of students, in order to explore the potentials of games for engaging with cultural heritage. It is intended that the game demonstrators will be used to inspire thinking and creativity in emerging game designers and programmers. Furthermore, Luca Morini from DMLL will be a jury member at the hackathon, hopefully paving the way for further collaboration between the Pilot and DMLL.

10 IMPACT AND SUSTAINABILITY

The casual game explores the potential for gaming to be used to distribute archived digital cultural content, and the Pilot will therefore be looking to demonstrate this model through distribution both of the game and the underlying game code in order to inspire further developments in this field. This will be kick started by the hackathon event in April 2016, at which the game and its code will be shared with a focus group of game developers, creatives and cultural thinkers in order to build upon the platform and produce a range of new ideas in this arena.

The social game has been developed for the iPad. This game targets users interested in the creative and playful 'mashing' up of media, it is likely to appeal to users interested in remixing various forms of cultural content. It will be shared with participants at the hackathon, and students via the DMLL 'Game Changers' project, in order to inspire further work on the theme.

The educational game is designed for teenagers interested in the visual arts, and plays with the concept of self-portraiture. The potential of this idea as a mechanism for engaging young people was highly rated during user-testing and the engagement activities at Digital Echoes 2016. This game will be shared at the hackathon and via the 'Game Changers' network, with the aim of inspiring further development of the concept.

The social and educational game demonstrators and their underlying code will be shared with attendees of the hackathon event. The developers will be encouraged to take the initial idea and develop for other platforms such as Android, Windows mobile and Desktop systems.

Each of the Game demonstrators will be showcased by COVUNI (including through SGI's portfolio of work) and will be disseminated at upcoming conferences and seminars both in Europe and Internationally.

One of the key areas of sustainability is the lessons that have been learned through the Games Pilot. The knowledge that has been gained regarding the potentials of gamification in cultural heritage contexts will be disseminated in relevant symposia and research contexts. The introduction of Europeana and other repositories (available through the WITH platform) to gamers and developers is important, as raising awareness of the range of content available can inspire further creative re-use.

The links with the Dance Pilot are important in encouraging a consideration of the way that various art forms are mediated, translated and engaged with via digital technology. These links have led to a shared platform at Digital Echoes Symposium 2016, and will continue to inform the research of the team members, meaning that this research will evolve in various ways beyond the context of Europeana Space.

11 FUTURE WORK

Following the recommendations made after the user testing, minor amendments are being made to the Game demonstrators such as the inclusion of instructions for each Game. However, as activity is taking place later than anticipated, there is only time for minimal work to enable the games to be ready for the hackathon.

Planning is underway for the Games hackathon, which will take place between 16th – 17th April. The venue (Games City, Nottingham). As with previous project hackathons, the work of the pilot, in this instance the three demonstrators, will be shared as a potential starting point. The source code will be released to participants, who will be encouraged to develop new games that enable engagement with cultural heritage, in particular content from Europeana. Other pilots have found this to be the ultimate user testing session; the Games Pilot will learn from any lessons that are learned.

Further links have been developed within COVUNI, in particular with the Disruptive Media Learning Lab (DMLL), and their 'Game Changers' project. There are early stage plans to make the demonstrators available to participants in that project; the aim being to share some of the lessons learned and the thinking that has driven the production of the demonstrators. It is hoped that this opportunity will inspire people to develop their own games and think about the potential of games to encourage engagement with cultural heritage, thus leaving a lasting impact.

Plans are being developed for educational activities at COVUNI. The team intend to forge links with local groups in order to disseminate the improved games, inspire further thinking in the area. A further option is to make the source code available to other Europeana Space partners to enable their re-use of the Games, potentially creating deeper cross project integration. As the project is developing a MOOC to provide instructive insight into its activity and lessons learned, the Games Pilot has the opportunity to provide educational activity related content.

Following on from other pilots, Games will also work closely with the WP3 Content Space team to develop an IP case study based upon the developments of the Pilot's activity, considering what worked well and what barriers existed that others could learn from.

Further important dialogue is planned with the WP2 Technical Space team, to consider the integration of the WITH back-end with each of the three games. As noted, this would have taken place at an earlier stage had the changes in Pilot Personnel not have taken place. By giving each demonstrator the potential to access wider content, some of the issues of the user testing will be addressed. It was initially the intention of the Pilot to create prototypes that accessed repositories directly, but the Europeana API was not able to facilitate this. Given that the WITH API is controlled from within the project, there is a greater possibility of successful alignment, (although it is recognised that this task might not be as straightforward as if it had been undertaken by the original code developer.)

12 CONCLUSION

Gaming is a growing market place, with the numbers of devices sold rising every year. As the Europeana Space project has the remit to raise awareness of digital cultural heritage content (including Europeana) and increase the number of people creatively re-using it, the inclusion of games was an obvious medium. Clearly, there is no single category of game players (and designers), they comprise multiple demographics that play casually, socially or for educational purposes and the Pilot took that into consideration when developing its work. When considering the multi-billion Euro industry, it was clear that the Pilot should not attempt to create a game that would try to compete in this market; instead it was important to consider the objective of introducing the wealth of cultural heritage content available to the broader demographic of players. It was on this basis that Pilot considered that the most effective method was to create three Game demonstrators to show what could be achieved with a view to inspiring others that may wish to do the same.

It is true that some of the user feedback could have been more positive, but this is not a great surprise. In fact, it was also acknowledged that once the testers stopped comparing the demonstrators to high end computer games, they actually achieved their goal of introducing the re-use of cultural heritage content. The Pilot team knew, ahead of the user testing, that there were issues still to be addressed, but getting the feedback was a valuable step within this development process. The change in personnel between month 18 and 22 of the Pilot timeline led to final touches such as instructions not being available, but this is being overcome. There is also clearly restricted content in each of the demonstrators, after the Europeana API caused the live draw down of content and metadata to be unreliable, but the WITH back-end has the potential to address this situation. Improvements continue to be made ahead of the hackathon, (with benefits drawn from the Dance Pilot's experience), which will provide the next form of user testing in April 2016.

In spite of delays caused by changes in personnel and problems with accessing Europeana content, the Pilot has identified key user groups and developed three demonstrator Games that are accessible via multiple devices to meet the varying needs of a range of different users. Each of them contains cultural heritage content and shows what can be done. The demonstrators were never considered to be the ultimate goal of the Pilot; they were the vehicles to show the potential of what others could create, in this regard, the Pilot has achieved its objectives.

APPENDIX

Games Testing Questionnaire - Sample

Date: 5/2/16

Age:

12 – 18 []

19 – 30 []

31 – 50 []

61 - 70 []

71+ []

Gender:

Do you have previous experience of playing computer games?

Please indicate answer by placing an X in the relevant box

Educational (Self-Portrait) Game

	No	Partially	To a large extent	Yes
Did you enjoy using the game?				
Was the interface easy to use?				
Did you understand how to succeed at the game (win points etc.)?				
Would you be likely to play this game in your own time?				
Can you see any potential for development?				

Creative (Collage) Game

	No	Partially	To a large extent	Yes
Did you enjoy using the game?				
Was the interface easy to use?				
Did you understand how to succeed at the game (win points etc.)?				
Would you be likely to play this game in your own time?				
Can you see any potential for development?				

Casual (Restoration) Game

	No	Partially	To a large extent	Yes
Did you enjoy using the game?				
Was the interface easy to use?				
Did you understand how to succeed at the game (win points etc.)?				
Would you be likely to play this game in your own time?				
Can you see any potential for development?				

Focus Group Notes

Interview conducted by Rosa Cisneros and Hetty Blades

Session One

What is your experience of using computer games in the past?

What kind of contexts have you used such systems within (education, training, social, leisure etc.)?

P1: As a teenager. Sopped around 13. Played with Wi at parties etc. Likes physical movement but wouldn't sit down and play a game. Doesn't get that much out of it.

P2: Socially, not very much. Don't really like games. Prefers person interaction. Eg. Used a Wee, physically active. Even if using with others, looking at the screen, not at each other.

P3: Socially. Xbox. Also increasingly using the in museums. Imperial War Museum in Salford has readers, but they didn't work very well. Could pull out drawers etc. Portland Historical Society, could huge screen to make timeline.

Are they useful in the CH sector?

P1: I would feel for young audiences. As a learning/participation aid. Not sure of benefit beyond Primary/Junior School.

P2: The games did spark thoughts about how things could be developed. EG. portraits, if you were with another person it might be different. Couldn't copy the images because of holding the screen. Lots of things could have been added.

P3: Switched camera so could match picture with composition around the room.

P2: Expected something to ping up, such as information about net level etc.

P3: What constitutes a match?

P2: That made no sense to me either, was trying to get as far away as possible for a match and the score increased. There is potential for interesting interactivity in museum contexts. Couldn't work out film one, but could be an interesting idea if you could go online.

P1: Thought the casual game was the most interesting.

P3: Figured out to hold down finger to drag to timeline.

P2: Could see what VT had done previously, which made it easier to see the potential.

Could be pushed forward.

How so?

P3: Depends on your own context.

Generally speaking, in what way(s) do you think the development of game culture might inform your life/work?

P1: Could they add to you work?

P2: Different time periods. Games could look at cultural context from different periods and guess the time frame.

P1: People take photos of pictures. Is there a way to incorporate this? The information on the app. Was hidden by the layering of the picture. Would make sense to see both together.

P2: Big space (floor) to move clips around with friends.

P3: Plays a role play game on the Xbox, has a personal investment and a storyline. The portrait one brings creativity into play. Having a personal engagement. If the task is to help people to go to cultural heritage they have to see themselves in that cultural heritage.

P2: Could make an avatar that could go through the gallery etc. Could be a way for people to engage who can't get to the gallery.

P1: Is that a valuable approach for the CH sector.

P3: In two minds. When you can't go it is an excellent interface, but it shouldn't take away from the activity of going to the museum.

P2: Working in a school and preparing students to go and see something. Using it to prep. students. Tool for looking and analysing.

Is there something specific about the game format?

P1: Restoration game. I was so absorbed in the speed and clicking that I wasn't absorbed in the content.

P2: Something about the rewards/interactive aspect. Couldn't figure that out which was frustrating.

P3: The film clip one wasn't really a game because there are no rewards.

P1: It's more like film software.

With the self-portrait game. Might it be useful for engaging people who might not interact with CH content?

P3: Yes

P1: I think if it was clear what the game was.

P2: The underlying idea is a good one (about selfies/portraits), just needs more development.

And how about in the tourism sector?

P3: What I found engaging/surprising was seeing the two images overlaid and being able to manipulate the light/darkness.

P2: It would be good to be able to save that image and connect it to FB etc.

Educational Game:

P2: Potential to superimpose both images and post of social media. Something needs to happen to make you progress and relate to the content. Something else sensory.

P3: Or a series of themed images.

P2: could pick favourite topic.

P1: could trace historical timeline

P3: The game could be showing how much you know.

P1: Maybe a demo to show how the games work, how you score points etc.

Creative Game

P2: If you could pick your clips. Arranged by themes/interests. If the game could do something to what you collect. Change colours etc.

P3: The length of the clip is always the same. It would be good to be able to change the length of the clip.

P1: Not logical how to use it. Drag and drop not clear.

P2: Needs a game function. What are you learning?

P1: Feels like DanceSpaces, assembling show reel etc. Couldn't see how it would develop into a game.

Casual Game

P3: [needs]clear instructions

P2: I had no idea what was going on. I couldn't understand.

P1: It was nice to see when it was very clean. Figured out the illuminated button. Had to work out the logic.

P2: Liked the way it looked, not too technical. Nice colours. Could see the art. Didn't understand or learn anything about CH.

P1: Once I realised the game, could not see the content. Focus on scoring. Need to find a balance. Not clear why one button would be used over any other.

P2: If there was something about actual restoration that has been done, and you were aiming to achieve something to match.

P1: More focussed and isolated.

Any other observations?

P2: There were some nice technical ideas. It would be aided by an artist/ creative/ideas generator, who might not be the technical person. Stopped at a certain point and could have gone further.

P1: A bit dull, lacking creative vision.

P3: The ideas were compelling in all three, but not enough support to facilitate the game playing.

P2: Needed prompts.

P3: Yes, when I couldn't figure out the thing used Info button but it just told me where the clips were from.

Session Two

What is your experience of using computer games in the past?

What kind of contexts have you used such systems within (education, training, social, leisure etc.)?

P4: Don't play computer games. If so likes the simulation games. Absorbed into Candy Crush Saga. Simplicity of task. Mindless. App on tablet. Arcade style game. Puzzle solving. Never been into games. Has played the Wi.

P5: Never played computer games. Nothing.

P6: Have done computer games when 7-9 with very first computers. Putting blocks in space. Smurf games.

What about in museums, have you ever played a game without knowing it?

P5: Have used interactive tools, but they are not games. Usually block digital requirements. Would actively reject.

P4: I would rather look at the art/cultural objects than any additions.

P6: Sometimes would have to search for related objects. More interaction than a game.

Is there potential for the CH sector to use these types of games? Are they useful?

P4: Really liked restoration as an idea. Broadening ideas about what CH means. Makes you think about roles. In terms of education this has potential because it highlights how it has been made. Gives an idea about art history, context and method. Has potential. It was frustrating to execute but there is lots of potential.

The collage one: interesting reuse of content. Frustrated by lack of content. The ability to choose, edit etc. was important. Not very satisfying. More educational, to show film editing.

Not sure about the portrait one. Found that the weakest of the three.

P5: If there is potential for the digital level. This is how interaction and communication happens. It is essential, and therefore important to use these means. Resists idea that things need to be made palatable for people to engage with them. Why must everything be cut and tailored to cater for everyone? As a means in education, then why not? It can kick off ideas around taking care of the art. You need to do something. Interesting level that appealed. Frustrated because couldn't understand how to restore the painting. Needed more knowledge and context.

Educational: Always had low rating. Tempted to match the picture with the contrasting images. This was not intended/wanted.

Creative: Ipad didn't respond to finger. If one can deal with the technicalities in might be interesting. If one can control content it would be interesting.

P6: Agree with all the above. A great way of engaging young public. But is it more about discovering skills and finding out where their interests lie than in preserving cultural heritage. Found collage one least interesting. Might discover interest in film. Liked restoring one most, but didn't work out how to use it properly (although actually did work out the buttons).

There is a time pressure. Could not see what had been restored. Wanted more depth about the painting. The programme moved on.

The self-portrait one, very good to relate to the selfie craze. Frustrating because of having to hold the iPad in a certain way. It was a nice way in for kids.

P4: But you don't need the app to do that.
Whole convention of the portrait.

P5: Yes, attributes of power.

P6: If you have kids in a museum

P4: with a dressing up box

P6: Yes, the way in might be through digital technology.

P4: Now there are 20 year olds who have always had a mobile.

P5: I resist the idea that everything has to be conserved in a digital way environment.

P4: But is that the proposition? Is it not just a way to engage with it?

P5: Is there no engagement otherwise?

P4: Very few people know about museums in Europe etc. Part of a broader agenda. It is just a tool.

P5: Dangerous de-corporalisation that is dangerous.

P4: Yes, it's the same with filming performance.

So if there is something that is lost when we bring in the digital, is there a way that games can support that and bring in the body? Or is it that something must be lost?

P5: I have a more positive reaction to games when I see people moving to games. Something is going through the body. There is an embodied experience happening. There is an experience going through the body. Physical interaction might evoke the necessity or desire to interact with something.

P4: Scale is an interesting thing to consider. My relationship to digital is to do with scale. Can it be on human sized screen? How would it be if it was on the human scale.

How might they be improved?

Educational Game

P4: Props and costumes available in the content that could be added. Eg. Draw a hat on.

P5: Change the scoring system. Only the possibility of doing exactly what the system does. Should be able to choose how you engage with the picture.

P6: Could you let go of the scoring all together?

P4: Or team up? I felt isolated using all three.

P6: Perhaps we can make a dialogue between characters within the one game. What's happening? Who's saying what? Interaction between other players. Creating narrative.

P5: Yes, it's much more interesting than scoring.

Casual Game

P5: That it's more clear. How to use it was not clear.

P4: A link to the artwork and the whole art history notion. What's the painting. The processes...why certain techniques are necessary and the art history, about the painting itself, could link to Wikipedia, or the content on Europeana.

P5: Invoking an emotional reaction to thing. Given the choice to voice your emotions that linked to the experience.

P6: To include explanation of how paintings are usually restored and what the buttons mean. Being talked through it by a professional. Link to real-life practices.

P4: Other objects beyond paintings.

Creative Game

P4: Assume that you would choose the clips that you would bring in.

P5: To be able to edit films that are significant.

P6: What's the message that you want to get across?

P4: It was interesting in creating something but could get quite easily bored quite quickly. Lots of iterations.

P6: I kept struggling with the point. It would be improved if there is a more diverse set of available clips. Different activities that portray the same thing (themed). Eg. YouTube (A – Z of dancing). A thread is helpful.

Anything else?

P4: Not clear about the demographic. The education one is obvious. Might the restoration game have potential for social contexts/travelling. Idle activities.

Need an introductory page.

Generally speaking, in what way(s) do you think the development of game culture might inform the lives of other groups of people?

Thinking specifically about these games, how might they be developed? (we can link back to the points articulated in response to the previous two questions) (Go through each one).

In what way(s) did playing these games inform your experience of the cultural content (might have to explain this!)?

Any other observations?