D7.4 Report on "App challenge"

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1 **R**=Document, report; **DEM**=Demonstrator, pilot, prototype; **DEC**=website, patent filings, videos, etc.; **OTHER**=other

2 **PU**=Public, **CO**=Confidential, only for members of the consortium (including the Commission Services), **CI**=Classified, as referred to in Commission Decision 2001/844/EC

Modifications index	
30/10/2019	Initial Release
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EXECUTIVE SUMMARY

In order to promote the use of PLUGGY and demonstrate its pluggable nature, the consortium organised an open competition (app challenge), where external organisations and individuals were invited to present ideas for the exploitation of the PLUGGY Social Platform and Curatorial Tool. The submitted applications were evaluated based on the following high-level criteria:

(a) idea with the best commercial potential. This category aimed at involving companies.

(b) idea with the best education potential. This category aimed at engaging educators and teachers in exploring how PLUGGY can be used as part of educational courses, workshops and modules.

(c) idea with the biggest social and cultural impact. This category aimed at demonstrating the societal potential of PLUGGY.

As also the following:

(d) user experience.

(e) creativity and innovation

Twelve applications were submitted in paper, out of those only six were selected by a committee. Five applications have been submitted and out of those four were positively evaluated.

The funded applications include:

- SharedHeritage, raising awareness of our European shared cultural heritage through the user's discovery and engagement with common memories and traditions, common history, etc.
- Top6, aggregating the top 6 interesting things to do in an area.
- Art Battle, an online real time quiz battle for the users of the PLUGGY platform.
- TimelineVR, a VR experience for the timeline stories in PLUGGY.

1 Introduction

D7.4 – Report on "App challenge" is a public report on the activities performed in the frame of WP7 "Communication and Dissemination" and specifically T7.4 "Organisation of an app challenge". The term "app challenge" refers to an invitation to external developers to develop an application for PLUGGY, whilst a price reward was appointed.

The app challenge was organised towards the end of the action to invite external developers to develop pluggable applications in three different categories: a) best commercial potential, b) best educational potential and c) biggest social and cultural impact, in order to demonstrate the pluggable nature of PLUGGY and its exploitation potential. An overall amount of 10,000 € was foreseen for this activity.

1.1 Purpose of the Document

This document describes:

a) The procedure followed to define the exact scheme of the app challenge, including specific criteria and prize money distribution
b) The actions taken towards the dissemination of the app challenge to the appropriate channels
c) The developer's tools provided to the contestants of the app challenge
d) The submitted applications
e) The procedure followed for selecting the finalists
f) The submitted applications from the finalists
g) The procedure followed for select the winner of the app challenge

1.2 Intended Readership

This document is of dissemination level "Public" in order to provide the necessary transparency to the procedures and decisions taken. Its intended readership includes anyone interested on running an app challenge, as also PLUGGY users interested in the submitted apps.

1.3 Relation with other PLUGGY deliverables

There is no direct relation with other PLUGGY deliverables.

2 The scheme of the app challenge

During the proposal preparation phase the app challenge was thought of enabling the interesting parties to submit their idea and technical description of the solution in one of the following categories:

- idea with the best commercial potential. This category will be aimed at involving companies
- idea with the best education potential. This category will be aimed at engaging educators and teachers in exploring how PLUGGY can be used as part of educational courses, workshops and modules
- idea with the biggest social and cultural impact.

The three best ideas would be funded with 3,000 € each and then through voting the best one would receive an extra 1,000 € as a prize. An overall amount of 10,000€ was foreseen for the app challenge.

After several discussions amongst the PLUGGY consortium members and especially the SMEs, it was pinpointed that the prize of 3,000 € would not be appealing to SMEs and therefore a different scheme was needed. The following ideas were proposed:

a) The original idea: 3,000€ to the three best ideas and 1,000 € to the overall winner
b) Give 500 € per submitted app and the rest of the prize money to the 3 best apps
c) 1,000 € to 6 finalists and then 4,000 € as prize money to the overall winner

Considering that students would be the best audience for this app challenge, the consortium has decided that option (c) was best suited allowing:

a) The availability of 6 apps instead of 3
b) A greater amount (4,000 €) as an overall prize money, to be seen as a motive for more professional applicants
c) Greater dissemination opportunities

The final guidelines and prizes for the PLUGGY App Challenge can therefore be summarized as follows:

1. Initial selection:
    a. 6 apps selected among the ones who submitted initial proposal; developers are invited to submit their app to the next stage.
    b. 1,000 € each, upon submission of the app to the next stage.
2. Final selection:
    a. 1 app selected among the ones who have been submitted
    b. 4,000 € prize

The decision was taken during plenary meeting 6 in Athens, 18-19/12/2018. At that point, through the development of the PLUGGY Social Platform, another option was available to the developers: a developer could develop a standalone app or a plugin directly interfacing with PLUGGY's web interface.

The following timeframe was originally set for the applications

I) 19/2/2019 11,00 CET webinar introducing the app challenge to all interested participants
II) 24/3/2019 Deadline for submitting the app description (1000 words + media)
III) 31/3/2019 6 applications chosen by the PLUGGY committee
IV) 30/6/2019 Deadline for uploading the final apps
V) 31/7/2019 PLUGGY committee to check the uploaded apps

A short extension was provided till 4/4/2019 and at that date 12 applications were received. The applications descriptions are included in Annex I.

During plenary meeting 7 in Malaga 9-10/4/2019 the PLUGGY committee reviewed all applications and selected the six finalists, who were directly notified by email. The selection criteria are described in Table 1 below[3].

Since 31/7/2019 was in the middle of the summer it was decided to give an extra two months of development time to the six finalists, till 30/9/2019.

By that deadline, a total of five applications were uploaded.

Within October 2019, ICCS checked the functionality of the submitted applications and then the PLUGGY committee met online at the 31st of October 2019 to decide on the final winner. The criteria what were used for selecting the six finalists, were used again, but this time the applications were marked based on the actual delivered software and not its description, as it was the case for selecting the finalists.

[3] Criterion #2 “User experience” was not evaluated during the selection phase of the finalists.

Category/Criterion	Weight	Description – Criteria	FAIL score = 0[4]	PASS score = 1	INTERMEDIATE score = 2	EXCELLENT score = 3
1. Integration with PLUGGY backend	25%	The application should be able to retrieve existing content (e.g. assets and exhibition) from the back-end, and create new content to be uploaded and used.	Does not read any content from back-end	Can read assets OR can read exhibitions	Can read assets and exhibitions OR Can read and write assets OR Can read and write exhibitions	Can read assets and exhibitions AND write assets and exhibitions
2. User Experience	20%	·Easy access to all functionalities in short time. ·App does not lead the novice users to make mistakes (catastrophic not catastrophic). ·Functions are easy to remember. App is fast to use. ·Mental model of user is reflected in UI.	·More than 6 criteria are not met at all. ·The app shows significant bugs which do	At least 3 criteria have been met, and the others have been at least identified and partially addressed.	At least 5 criteria have been met, and the others have been at least identified	At least 7 criteria have been met, and the others have been at least identified and partially addressed.

[4] Failing categories 1 or 2 results in the proposal being rejected

Category/Criterion	Weight	Description – Criteria	FAIL score = 0[4]	PASS score = 1	INTERMEDIATE score = 2	EXCELLENT score = 3
		·Simple & natural dialogues. ·User feels in control. System always gives feedback. · Sufficient, but not excessive, information. ·Consistency: same controls always do same thing across app. ·The app has no dead-ends.	not allow normal use		and partially addressed.	
3. Educational potential	10%	·The app clearly addresses an identified learning community. ·There is a specific methodology (e.g. gamification) employed to engage learners. ·The app is aimed at young students (children or teenagers).	No educational function	The app has an educational function, but it is unclear to which community this is addressed AND it is not possible to identify any methodology for engaging learners	The app is clearly addressed to a specific community OR the app shows a specific methodology to engage learners	All identified criteria are met.

Category/Criterion	Weight	Description – Criteria	FAIL score = 0[4]	PASS score = 1	INTERMEDIATE score = 2	EXCELLENT score = 3
4. Commercial potential	10%	·The application includes a business model, where specific revenue streams are described. ·The idea addresses a specific market, whose size is estimated in billions. ·The customer segments are described and linked with exploitation models, accordingly (i.e. buy / donate buttons for users). ·The application also includes a go-to-market / launch strategy to penetrate the appropriate market.	No revenue streams are described.	·Some revenue streams are described and executed through specific exploitation models clearly visible in the application. ·The market may be small and its customer segments not described in detail.	·The app clearly presents an exploitation model. ·It addresses a big (e.g. billion-euro) market.	The application includes a clear business model, with details on customer segments, go-to-market strategy and a target market of billions.
5. Social and cultural impact	15%	·The application aims to counter fight or address a societal challenge (behavioural awareness, tourism dispersal, illiteracy, pollution, etc.) preferably exploiting or re-using cultural content from PLUGGY.	·Not oriented towards specific social challenges.	·The application addresses a societal challenge. ·Cultural content from	Some KPIs are specified, but no application features that a user can interact	·KPIs are clearly specified for each challenge. ·There are application

Category/Criterion	Weight	Description – Criteria	FAIL score = 0[4]	PASS score = 1	INTERMEDIATE score = 2	EXCELLENT score = 3
		·Specific tangible or intangible KPIs are described (likes, shares, comments) and executed through application features.	·No cultural impact described.	PLUGGY is re-used, but no specific KPIs are described.	with are included in the execution.	features a user can interact with that directly affect measured KPIs.
6. Creativity and innovation	20%	·The application "invents" new ways of presenting PLUGGY cultural content or presents an out-of-the-box thinking. ·The app may include features that boost users' creativity while interacting with the app.	Nothing new	The application presents content in revolutionary ways and encourages users.	Content is unusually promoted or users are invited to interact with it in an entirely new way.	A jaw-dropping app

Table 1: Selection and evaluation criteria

3 Disseminating the app challenge

A special session for the app challenge was designed in the official web site of PLUGGY: https://www.pluggy-project.eu/app-challenge, serving as main source of information for the applicants.

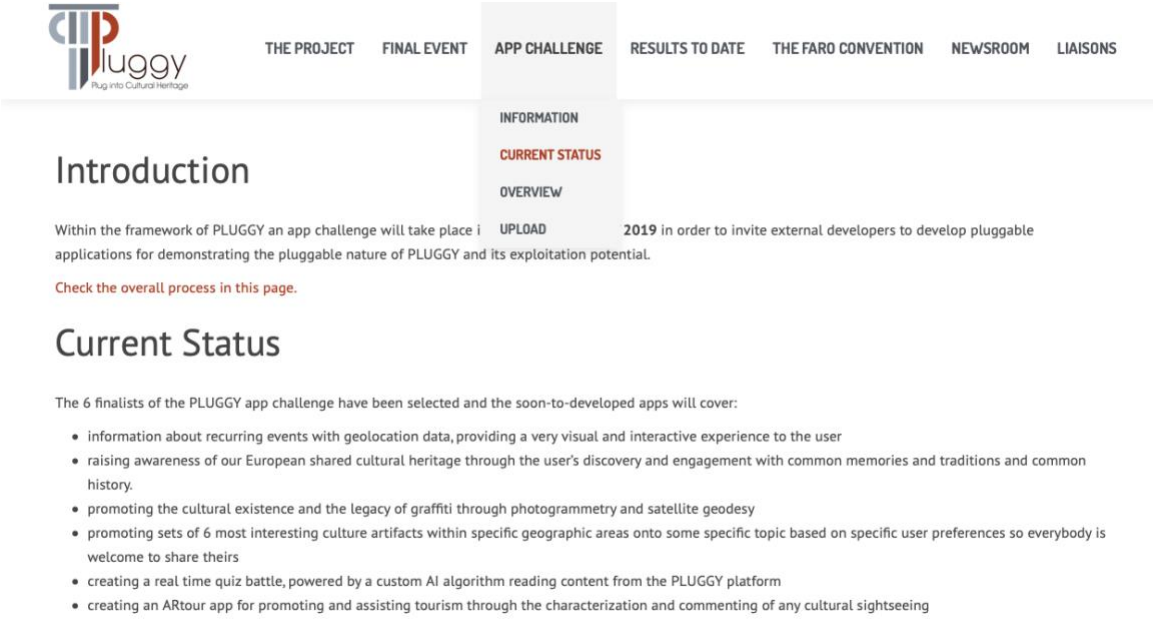


Figure 1: App challenge section in https://www.pluggy-project.eu

There the visitors would be informed of

a) The overall information of the app challenge
b) The current status
c) The overview of the procedure will all the necessary information needed for someone to participate
d) The upload procedure

An infographic picture was created for use in the website, social media and eblasts.

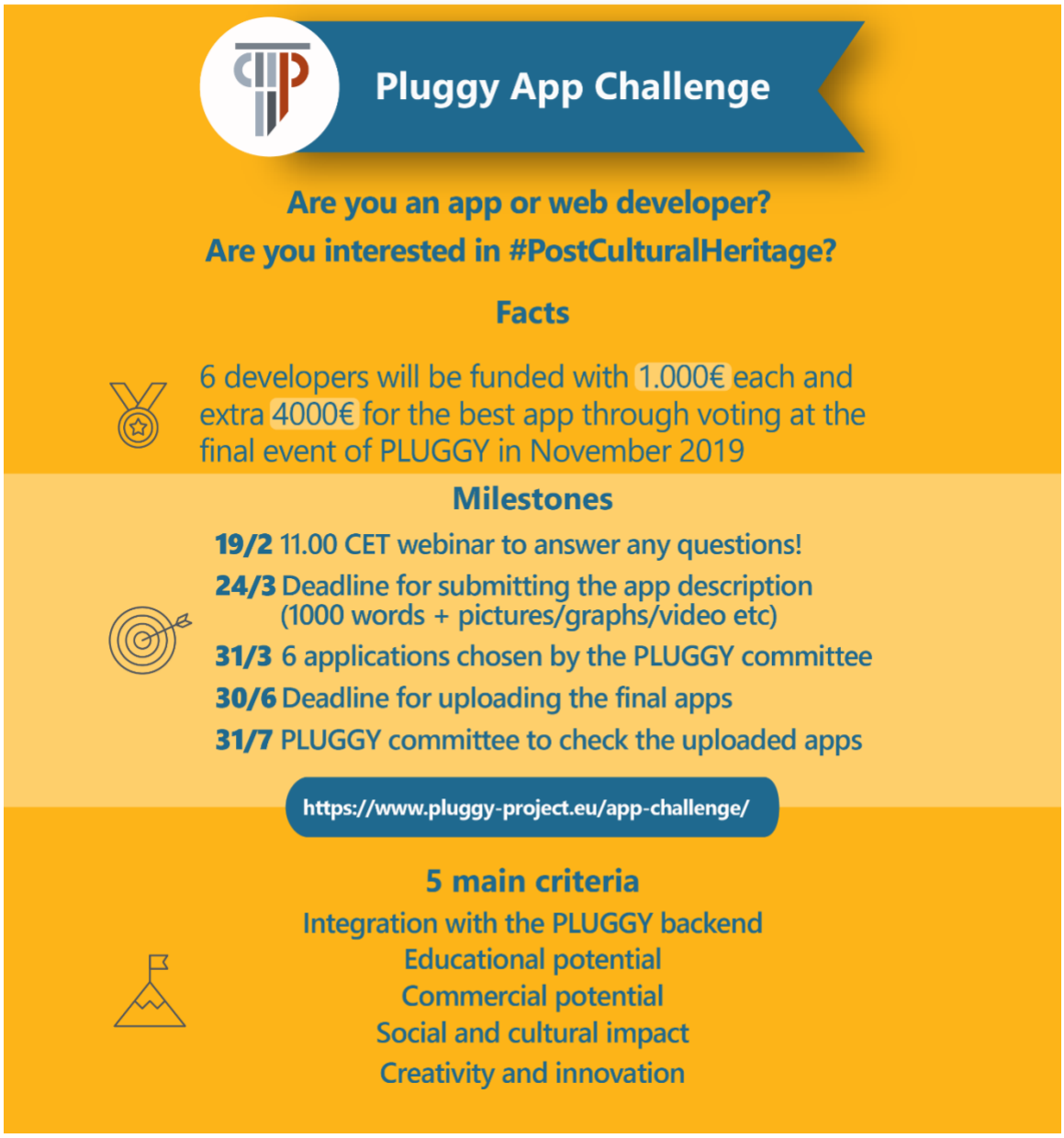


Figure 2: App challenge infographic

The app challenge was advertised through the following channels

a) Social media of PLUGGY: Facebook, Twitter, Instagram and LinkedIn
b) Liaisons of PLUGGY: EMOTIVE, VIMM, REACH, etc.
c) Liaisons of PLUGGY SMEs
d) Universities: NTUA, UMA, ICL, TUK, AUTH etc. and their career offices
e) EC through the project officer
f) App challenge sites: www.the-hackfest.com, www.hackathlon.io

After the first wave of dissemination was concluded towards mid of February 2019 the webinar took place with about 40 participants.

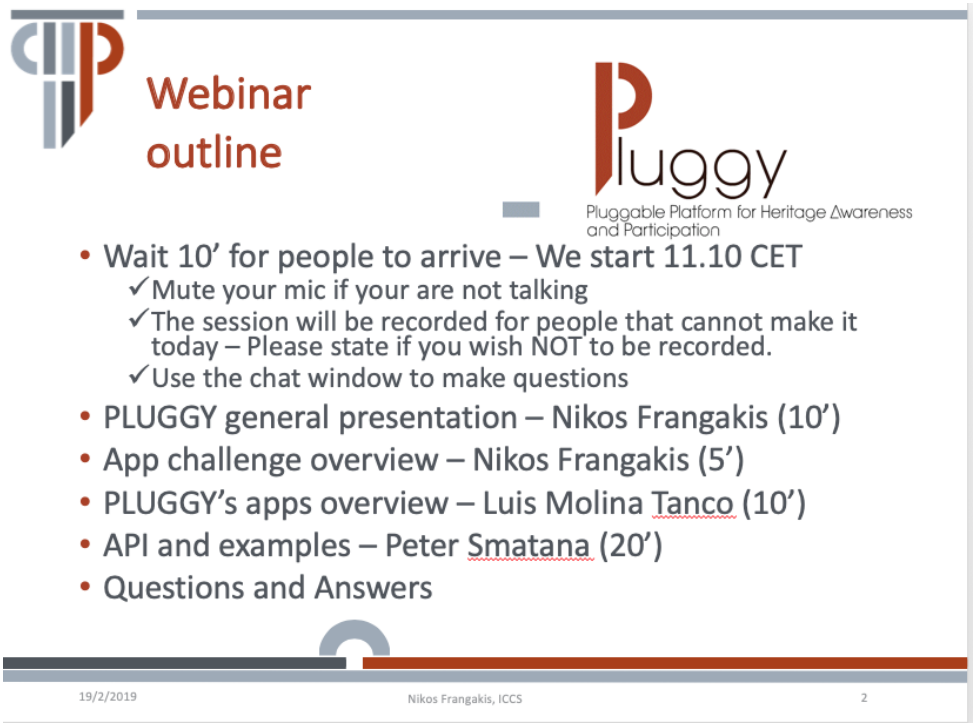


Figure 3: Webinar overview

The webinar was recorded, with the permissions of the participants, as to be used as instructions for any interested developer, who did not manage to participate. It was uploaded here: https://vimeo.com/318197916

Then another month of dissemination activity followed toward the deadline of the submission using the aforementioned channels.

4 Developer's tools

An extensive document was produced describing the architecture of PLUGGY, its data model, as also instructions of the procedure that needs to be followed by the potential developer. The document was uploaded here: https://www.pluggy-project.eu/wp-content/uploads/2019/01/Pluggy-Developers-Guidelines.pdf

Access to PLUGGY's API and its documentation was provided through the following links:

- https://beta.pluggy.eu/api
- https://beta.pluggy.eu/api/doc/

Finally, a set of examples on how to connect with PLUGGY and how to use its API were also included through a functional example, available here: https://isense-gitlab.iccs.gr/pluggy_public/pluggy-examples

A support email was also setup to provide instruction under the address app-challenge@pluggy-project.eu

User Guidelines for 3rd party Applications and Plugins development

Introduction

The aim of this document is to provide developers of applications through basic concepts of PLUGGY. More information about PLUGGY platform could be explored on official page: http://pluggy-project.eu/

PLUGGY as a place for sharing and bringing culture closer to everyone allows developers to create enhanced and non-traditional experience for all the users via exploring content with their applications. As 3rd party developer you can create two types of applications:

- Plugin integrated within PLUGGY social platform
- Standalone desktop or mobile or web application connected to PLUGGY back-end

These applications will be available to wide audience and promoted via PLUGGY. Every registered users on PLUGGY social platform (https://beta.pluggy.eu/) is able to apply for developers account that will bring more information and examples how to start development. For those that want to jump directly into development please visit this page for more information about API:

https://beta.pluggy.eu/api

Probably the most important document is API specification:

https://beta.pluggy.eu/api/doc/

Next few sections will try to explain you how to use PLUGGY back-end and how to create new experience for the users interested in culture or even better you can make culture interesting to people that are not into it and also you will find information how to make your application available via PLUGGY social platform to wide audience.

Figure 4: Support document for app developers

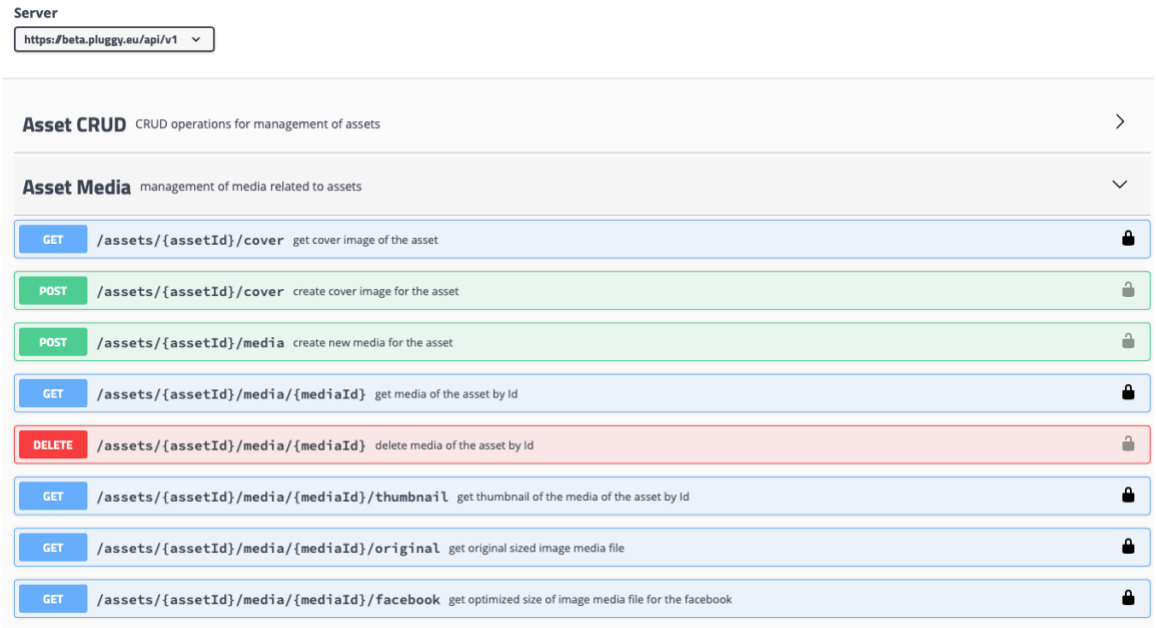


Figure 5: Example of the provided API documentation

5 Submitted applications

12 applications were submitted in total. The original submissions are included in Annex I.

5.1 PCULIAR

PCULIAR application proposed to integrate with PLUGGY and utilise its API to create and read Exhibitions, ExhibitionPoints, Assets and possibly Events to transfer content from pculiar into PLUGGY and vice versa.

5.2 Intelligent Interaction research group proposal

The mobile application proposed by Intelligent Interaction research group in the context of PLUGGY App Challenge aims to facilitate PLUGGY users in creating narratives in order to describe their cultural experience, by reusing content hosted on the platform.

5.3 MOBILE QUIZ GAME

They suggest a mobile quiz game about cultural heritage objects / connections and stories. It would be for mobile and web using Unity3D to display 3D object on the website.

5.4 SharedHeritage

The author envisioned an application for Smart Phones (Android Application) which will raise awareness of our European shared cultural heritage through the user's discovery and engagement with common memories and traditions, common history, etc. The proposed application will promote and facilitate in some way the collaborative curation of stories by people from different areas (preferably different countries) in order to come up with a single virtual exhibition which will uncover similarities in the cultural heritage of the various European countries. The goal of the app is to underline our common European history and values and thus develop mutual respect and understanding.

5.5 "Nearby" app

They suggested their app "nearby", which is set to be launched Q3/2019* for German speaking countries and Q4 for English and Spanish speaking users. It's a social app with several functionalities all focused on your location / neighborhood.

5.6 Graffiti Geolocation and Geometrical Validation

They suggested an app to project the cultural existence and legacy of graffiti. In order to achieve this, they would use the science of photogrammetry and satellite geodesy. Some of the theories that they would use are for the creation of the orthophotography photogrammetric conversion, for the geolocation precise point positioning and CAD with back projection algorithms for the final linear drawing.

5.7 Asinou Mobile Application

The author suggested an existing application.

The application developed by Cyprus University of Technology for the Panagia of **Asinou** church (UNESCO World Heritage List monument) in Cyprus demonstrates:

- a holistic approach to document various aspects of the site and liturgical explanations of paintings
- the means of bringing 1000 years of cultural history into schools
- a Virtual Reality (VR) application
- an e-Book as an immersive installation requiring extensive content creation, such as 3D modelling, video/image editing, visual design and software development
- digitisation of tangible and intangible content and metadata enrichment for Europeana.

5.8 TOP6 – DISCOVER AND SHARE HIGHLIGHT OF CULTURE AROUND YOU

The application will consist from the map with aggregated top 6 interesting things. The aim is to integrate the top6 web page with The PLUGGY platform as a plugin. User will be able to browse and select assets from the PLUGGY platform and add appropriate short asset descriptions. Based on this selection top6.eu platform will publish newly created video as a new asset to the PLUGGY platform.

5.9 THE ART BATTLE

They plan was to develop an online real time quiz battle for the users of the PLUGGY platform. The game is very simple, one user invites other one to have an art battle. They chose topic for their battle (i.e. Košice modernism, Renaissance in Italy, Architecture). Based on this topic users will receive the same set of questions that are generated from selected PLUGGY assets.

5.10 "AR-GALLERY" WEB & MOBILE APPLICATION

The objective was to create a web plugin for the PLUGGY platform through which PLUGGY user will be able to curate "AR-Gallery" stories. This tool will use the simplest form of means to create new shared stories. "AR-Galleries" will consist of images, coming from PLUGGY platform along with text provided by the user. The purpose of the text is to provide a brief narrative of the image that may present customs, practices, places, objects, and artistic aspects. The user will be able to create an AR-gallery of characteristic images in order to describe specific cultural events, eras, traditions, customs etc. Furthermore, the presentation of these stories will be available through an application implemented for Android mobile phones and tablets supporting AR-Core library.

5.11 TRIVIAR

TriviAR is in its core a competitive team-based question game combined with AR (Augmented Reality) elements. Within it, two teams compete to see who will achieve the most points by claiming a question first and then answering it correctly. If one team claims a question but provides the wrong answer, the other team gets a chance at answering it. During each turn, the item tied to the question appears above it and can be examined by

zooming in and out or by rotating it. If the environment around them allows it, this can also be done in AR mode. By doing that, we maximise the amount of information a player receives and help imprint that item in his/her memory so that it is not forgotten shortly after. After the turn ends both teams will also receive some extra information, relevant to the question they were asked. In the end, the team with the most points wins and can share their results or specific questions online.

5.12 ARTOUR

The objective is to use the PLUGGY framework to develop an application that can be used to promote and assist tourism, first in Greece and later worldwide. The app will have a twofold functionality. It can be used as a mobile app that uses Geolocation services to characterise and comment any cultural sightseeing points that people find intriguing and fascinating. Afterwards and when in the vicinity of this point of interest, other users can use the same app to read all the information and comments made by the original and subsequent posters. Moreover, this capability can be regarded from a more artistic viewpoint; for example, adding an image on a house exterior wall as a new form of street art (see Image 1) or projecting a video on a flat wall surface.

6 Selection of the six finalists

During plenary meeting 7 in Malaga 9-10/4/2019 the PLUGGY committee reviewed all applications and selected the six finalists, who were directly notified by email. Below one can see the score each application received.

Category/ Criterion	Weight	Description - Criteria	App 1	App 2	App 3	App 4	App 5	App 6	App 7	App 8	App 9	App 10	App 11	App 12
1. Integration with PLUGGY backend	25%	The application should be able to retrieve existing content (e.g. assets and exhibition) from the back-end, and create new content to be uploaded and used.	3	2	2	3	2	2	0	2	2		1	3
2. User Experience	20%	·Easy access to all functionalities in short time. ·App does not lead the novice users to make mistakes (catastrophic not catastrophic). ·Functions are easy to remember. App is fast to use. ·Mental model of user is reflected in UI. ·Simple & natural dialogs. ·User feels in control. System	This criterion was not evaluated at this stage. It was evaluated when the finalists' apps were received											

		always gives feedback. ·No excessive but sufficient information. ·Consistency: same controls always do same thing across app. ·The app has no dead-ends.												
3. Educational potential	10%	·The app clearly addresses an identified learning community. ·There is a specific methodology (e.g. gamification) employed to engage learners. ·The app is aimed at young students (children or teenagers).	2	1	1	0	1	2		0	2		1	2
4. Commercial potential	10%	·The application includes a business model, where specific revenue streams are described. ·The idea addresses a specific market, whose size is estimated in billions. ·The customer segments are described and linked with exploitation models, accordingly (i.e. buy / donate buttons for users). ·The application also includes a	1	0	0	0	0	2		2	1		0	3

		go-to-market / launch strategy to penetrate the appropriate market.												
5. Social and cultural impact	15%	·The application aims to counter fight or address a societal challenge (behavioural awareness, tourism dispersal, illiteracy, pollution, etc.) preferably exploiting or re-using cultural content from PLUGGY. ·Specific tangible or intangible KPIs are described (likes, shares, comments) and executed through application features.	3	1	2	2	2	1		1	1		1	1
6. Creativity and innovation	20%	·The application "invents" new ways of presenting PLUGGY cultural content or presents an out-of-the-box thinking. ·The app may include features that boost users' creativity while interacting with the app.	1	1	1	2	1	1		3	3		2	3
		TOTAL WEIGHTED SCORE	**1.7**	0.95	1.1	**1.45**	1.1	**1.25**	0	**1.45**	**1.55**	0	0.9	**2**

Table 2: Submitted applications scores

7 Applications from the finalists

Below one can find information about the six finalists.

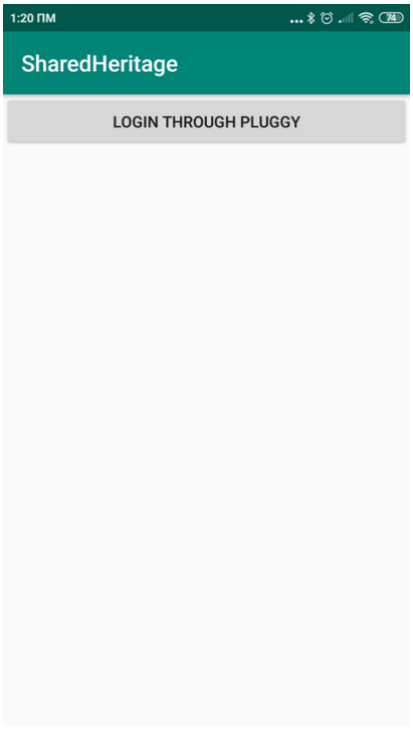
Detailed documentation is included in Annex II.

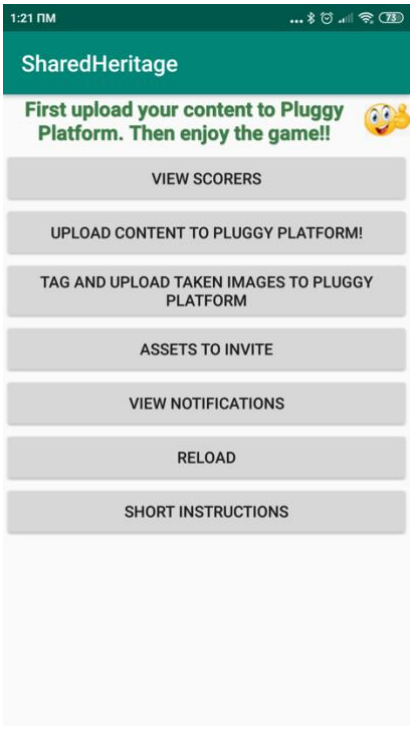
7.1 PCULIAR

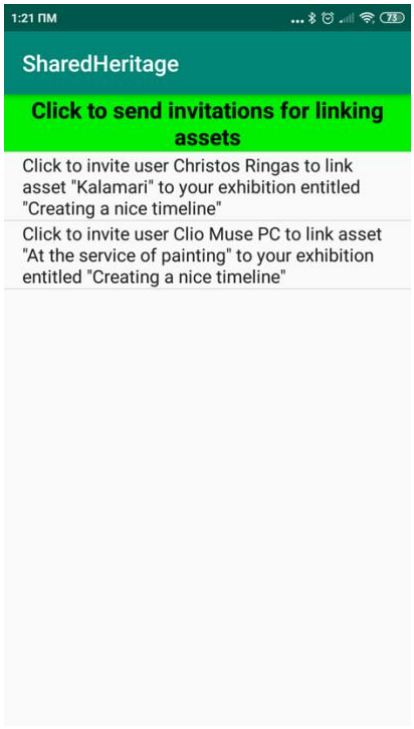
Pculiar did not upload any application on time.

7.2 SHAREDHERITAGE

The SharedHeritage application is an Android application available on Google Play https://play.google.com/store/apps/details?id=com.challenge.sharedheritage







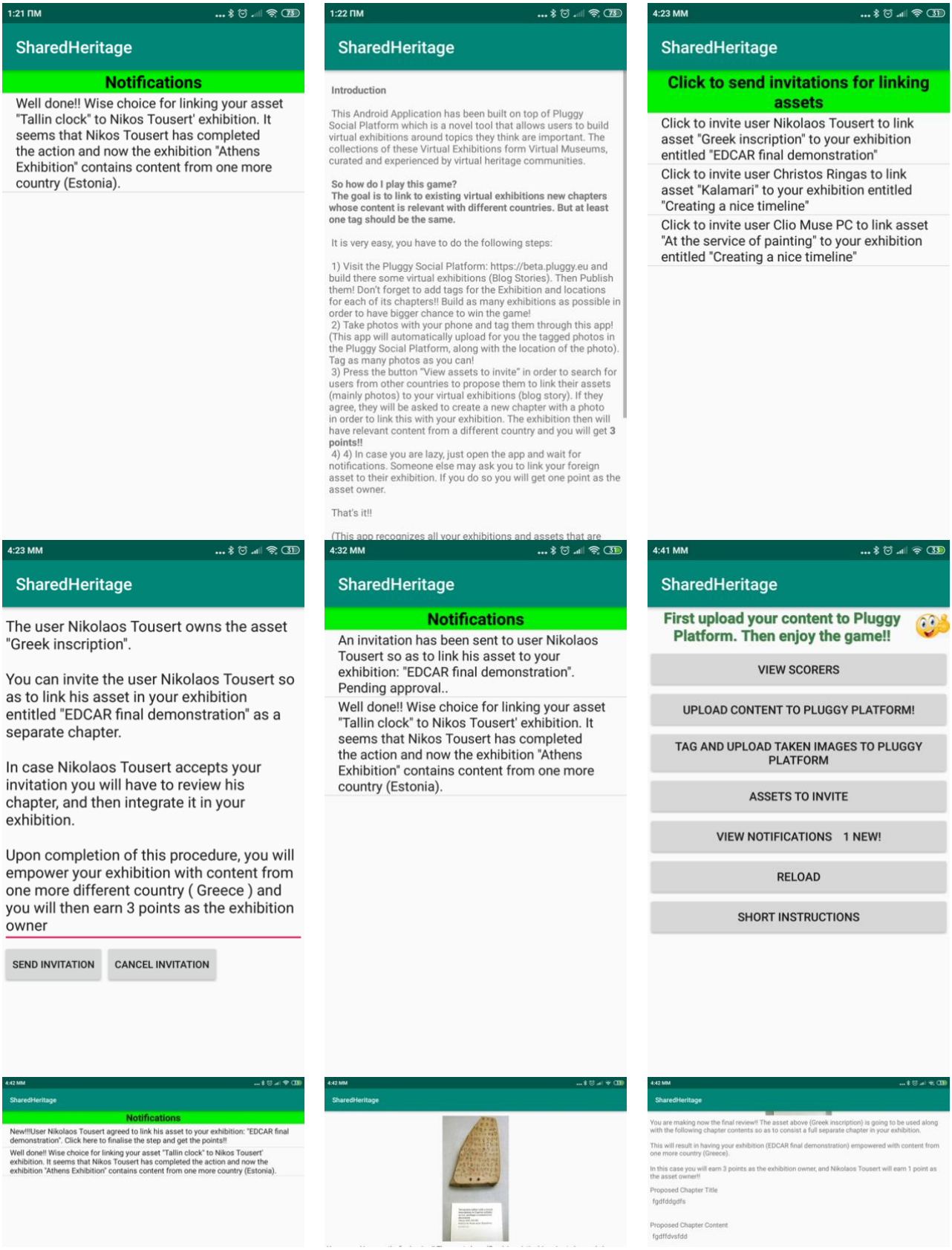
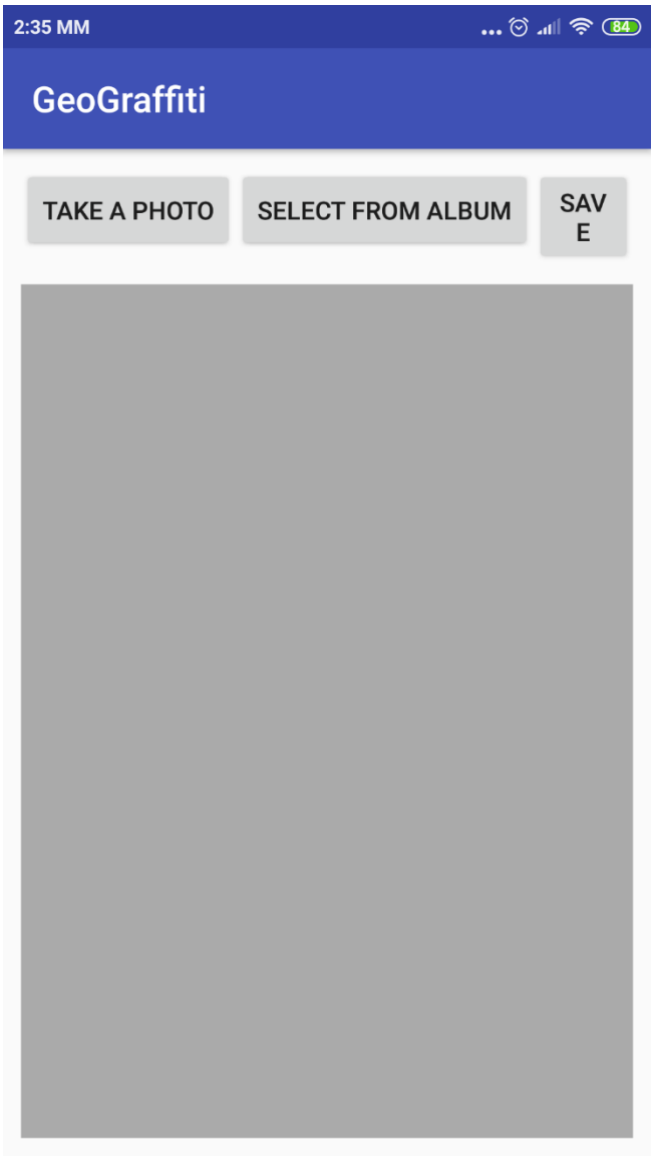


Figure 6: SharedHeritage screenshots

7.3 Graffiti Geolocation and Geometrical Validation

The Geograffiti application is an Android application available only as an apk file.



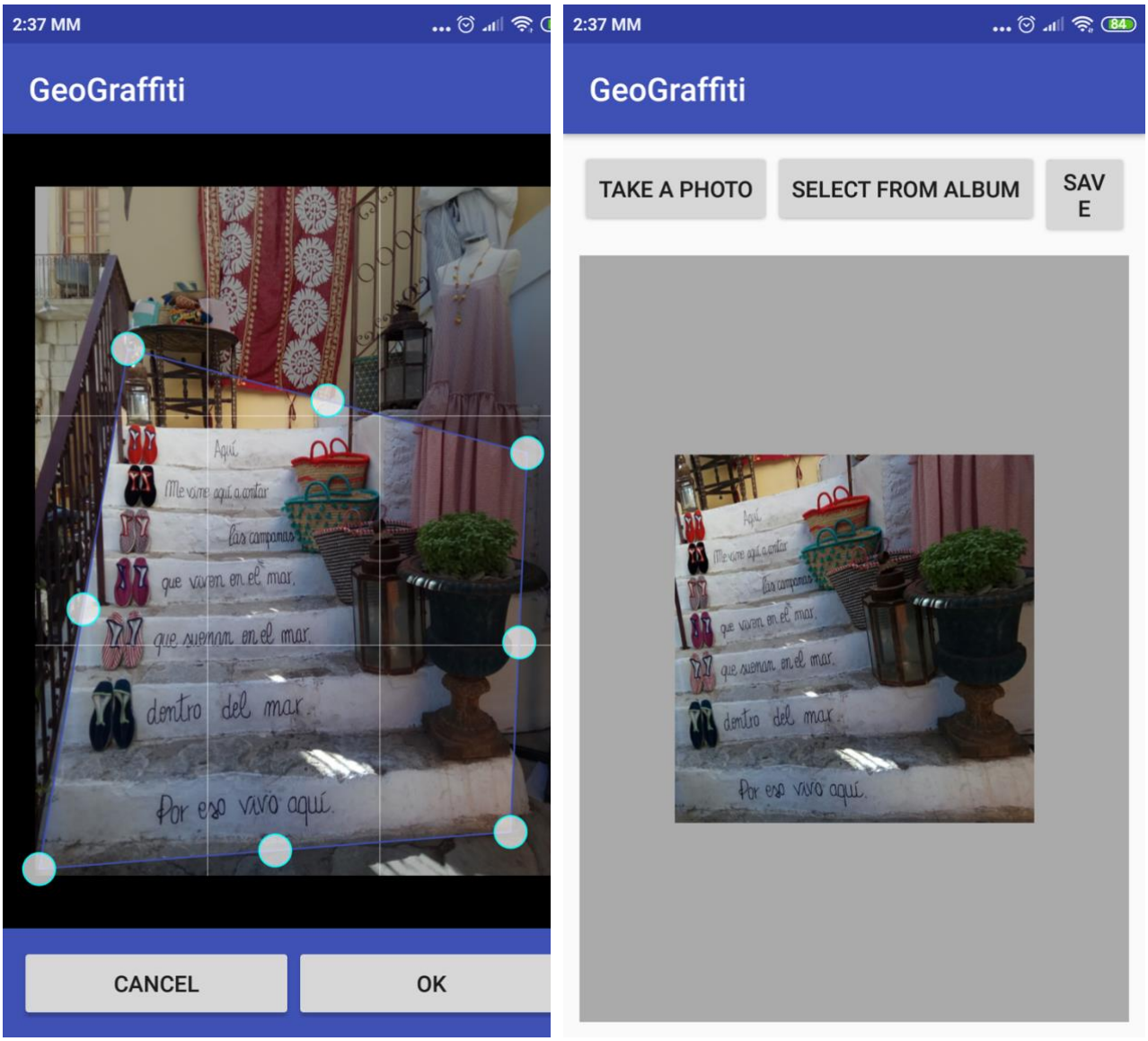


Figure 7: Geograffiti screenshots

7.4 TOP6

The Top6 application is implemented as a plugin on the Social Platform. A registered user has access to it when creating a new asset. The application is also linked with this site https://top6.eu/.

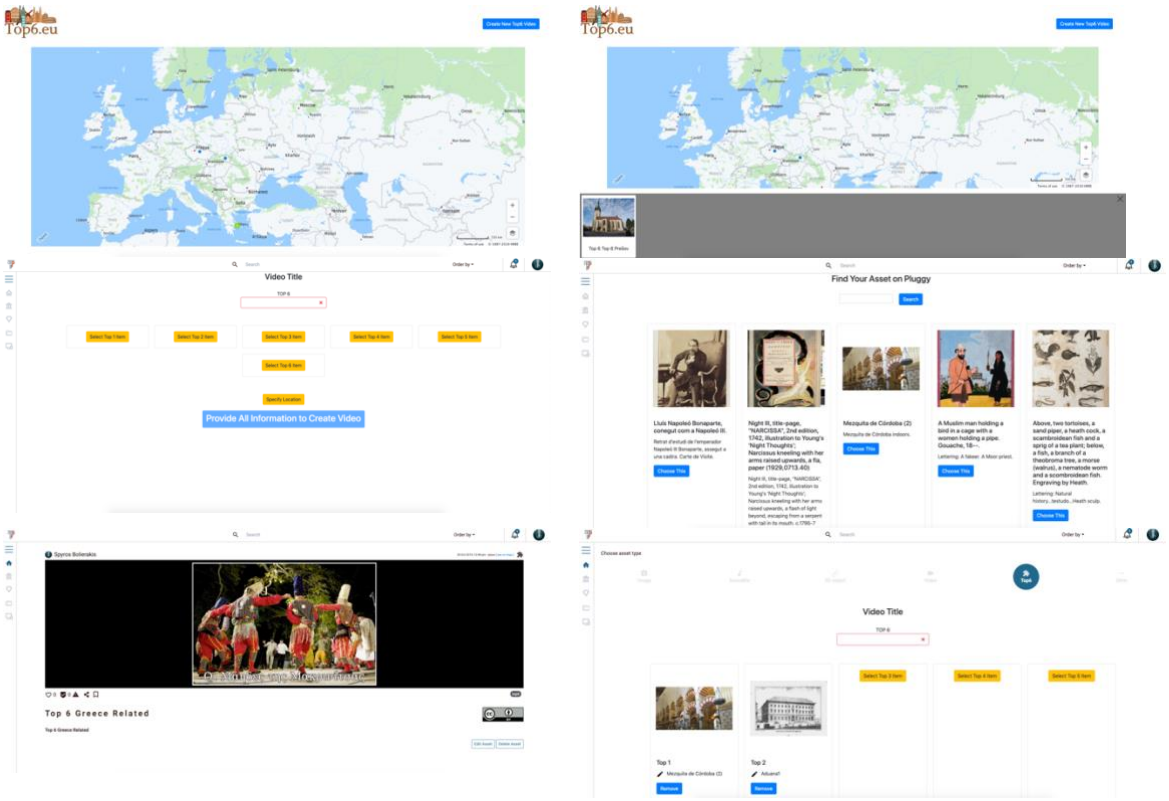
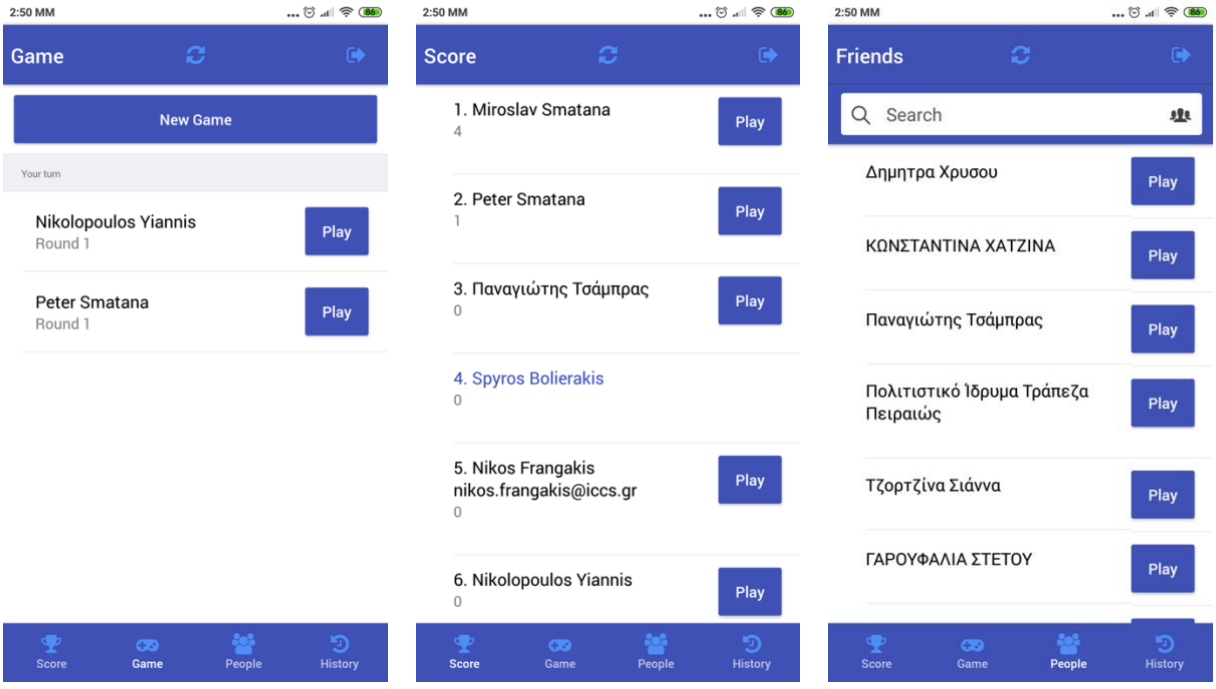


Figure 8: Top6 Screenshots

7.5 THE ART BATTLE

Art Battle is an android application available also on Google Play. http://smartvia.sk/smartvia/ArtBattle/



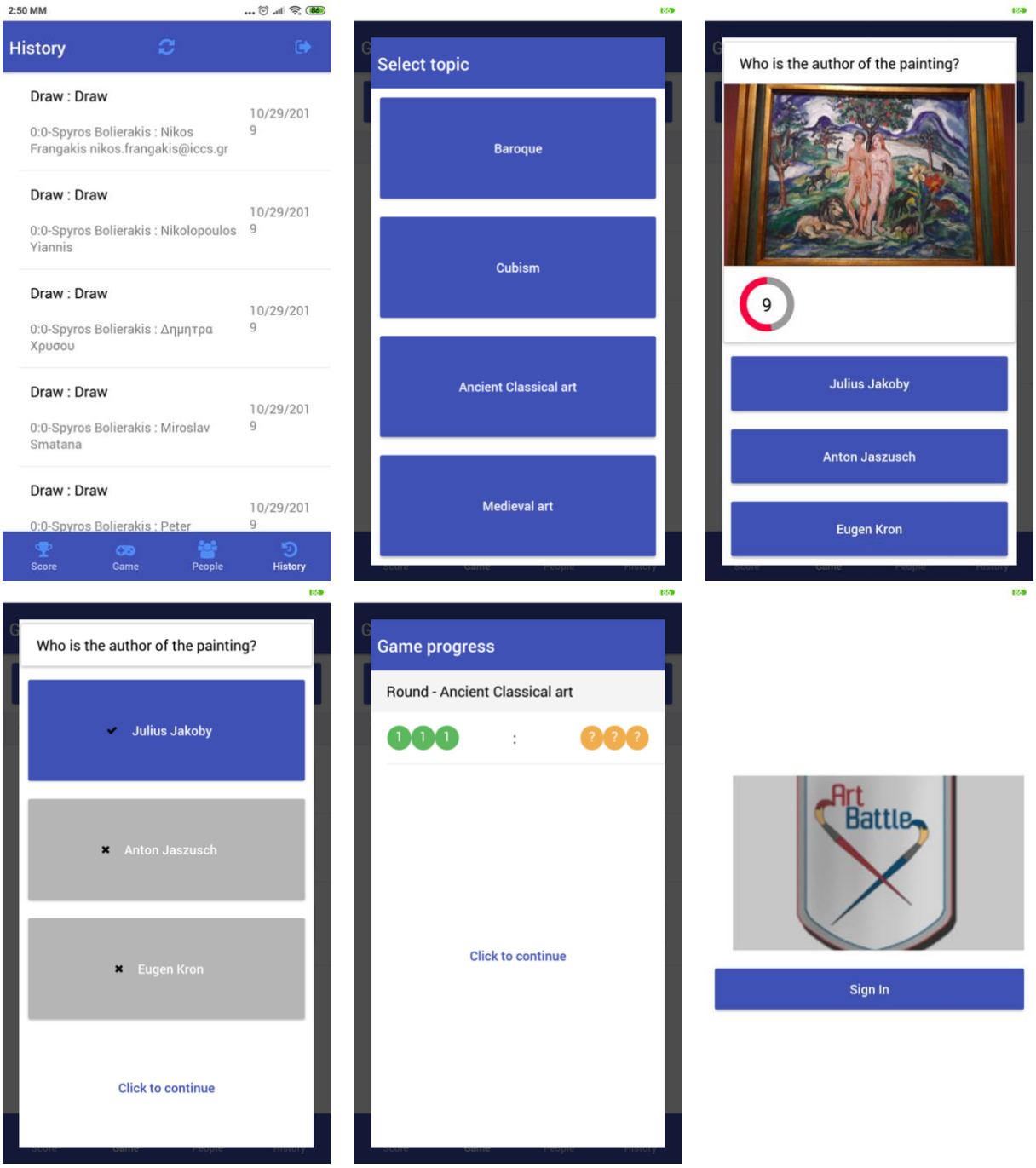


Figure 9: Art Battle Screenshots

7.6 ARTOUR - TIMELINEVR

The author of ARTour decided to change its application content and since the new idea was in line with PLUGGY and well received, no objections were raised. The application is called TimelineVR and is available as a plugin on the Social Platform enabling an alternate viewer for timeline stories.

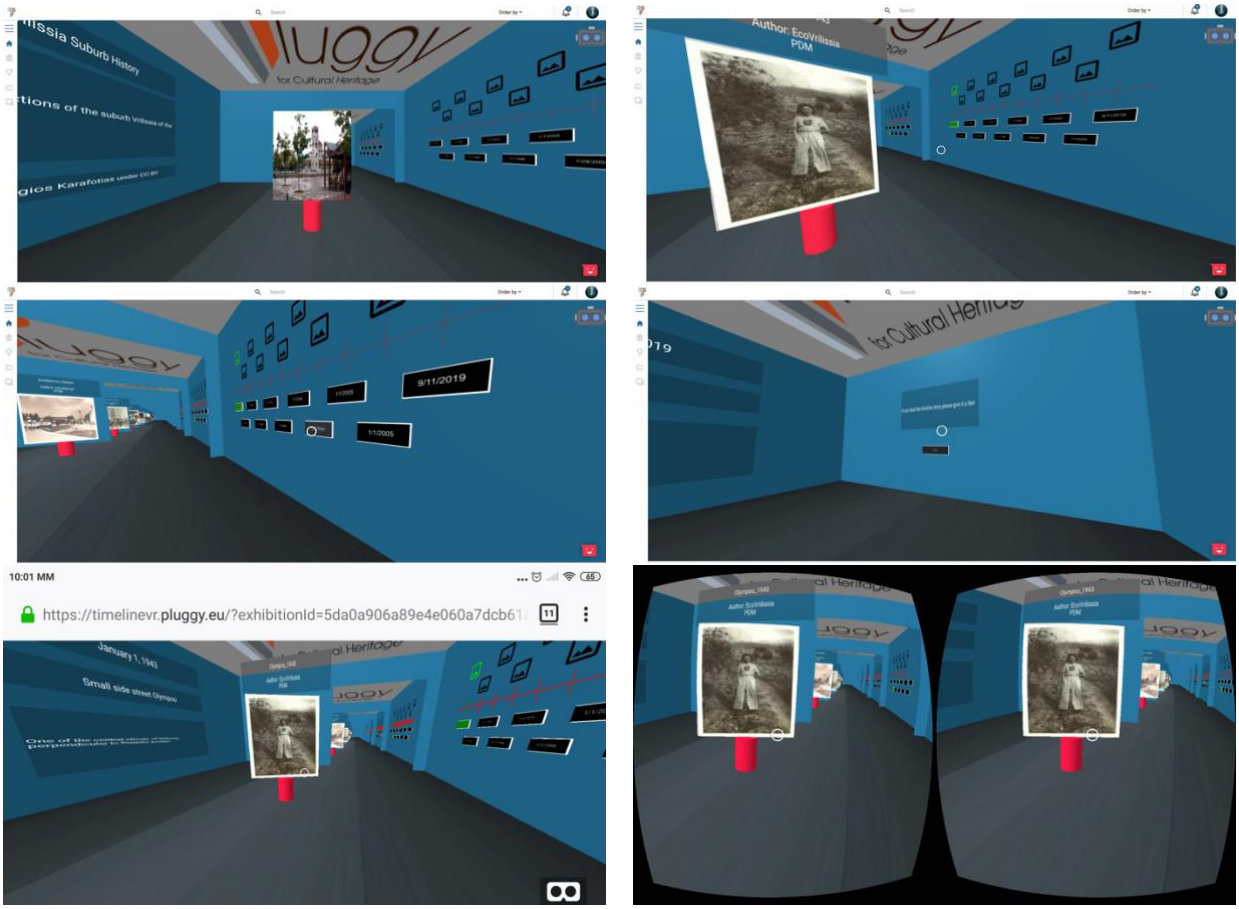


Figure 10: TimelineVR Screenshots

8 Selection of the winner of the app challenge

PLUGGY committee met online at the 31st of October 2019 to decide on the final winner. The criteria what were used for selecting the six finalists, were used again, but this time the applications were marked based on the actual delivered software and not its description, as it was the case for selecting the finalists.

A technical person from ICCS evaluated the criterion "**Integration with Back-end"**. The application GeoGraffiti scored 0 in the criterion "**Integration with Back-end"** and therefore failed the challenge.

The rest of the jury members each scored for each application all criterions, based on the criterion description (See Table 1)

Application\Criterion	**Integration with Back-end (weight: 25%)**	**Integration wb. * weight**
reviewer	Technical reviewer	
TimelineVR (plugin, which is used only for timelines)	2	0,5
Top6 (plugin)	2	0,5
ArtBattle (android app)	1	0,25
GeoGraffiti (android app)	0	0
SharedHeritage (android app)	3	0,75

Application\Criterion	**User Experience (weight: 20%)**					
reviewer	J1	J2	J3	J4	J5	average * weight
TimelineVR (plugin, which is used only for timelines)	2	3	2	2	2	0,44
Top6 (plugin)	3	3	2	2	2	0,48
ArtBattle (android app)	2	3	3	2	3	0,52

GeoGraffiti (android app)						
SharedHeritage (android app)	2	1	2	1	2	0,32

Application\Criterion	**Educational potential (weight:10%)**					
reviewer	J1	J2	J3	J4	J5	average * weight
TimelineVR (plugin, which is used only for timelines)	2	2	1	1	2	0,16
Top6 (plugin)	2	2	1	2	2	0,18
ArtBattle (android app)	3	3	2	3	3	0,28
GeoGraffiti (android app)						
SharedHeritage (android app)	2	2	1	3	2	0,2

Application\Criterion	**Commercial potential (weight: 10%)**					
reviewer	J1	J2	J3	J4	J5	average * weight
TimelineVR (plugin, which is used only for timelines)	0	0	1	0	1	0,04
Top6 (plugin)	0	0	2	2	1	0,1
ArtBattle (android app)	0	0	0	1	1	0,04
GeoGraffiti (android app)						
SharedHeritage (android app)	0	0	0	1	1	0,04

Application\Criterion	**Social and cultural impact (weight: 15%)**

reviewer	J1	J2	J3	J4	J5	average * weight
TimelineVR (plugin, which is used only for timelines)	1	1	1	1	1	0,15
Top6 (plugin)	1	1	1	2	1	0,18
ArtBattle (android app)	1	1	2	1	1	0,18
GeoGraffiti (android app)						
SharedHeritage (android app)	3	3	3	3	1	0,39

Application\Criterion	**Creativity and innovation (weight: 20%)**					
TimelineVR (plugin, which is used only for timelines)	J1	J2	J3	J4	J5	average * weight
Top6 (plugin)	3	2	2	1	2	0,4
ArtBattle (android app)	2	2	2	1	1	0,32
GeoGraffiti (android app)						
SharedHeritage (android app)	2	2	3	2	1	0.4

Table 3: Applications scores per criterion

8.1 OVERALL WINNER

The overall winner of the PLUGGY app challenge is the android app called "SharedHeritage".

Application Name	Total Score
TimelineVR (plugin, which is used only for timelines)	1.69
Top6 (plugin)	1.76

ArtBattle (android app)	1.63
GeoGraffiti (android app)	
SharedHeritage (android app)	2.1

Table 4: Overall winner

9 Conclusions

PLUGGY organised an “app challenge” in order to invite external developers to use the Social Platform architecture and API in order to develop additional apps, in three high level different categories:

(a) idea with the best commercial potential,

(b) idea with the best education potential and

(c) idea with the biggest social and cultural impact.

The call for applications was published on M24 inviting applicants to submit their idea to the PLUGGY consortium. Applications provided the description of the overall idea and a list of technical specifications. A formative evaluation of the submitted proposals was held by a committee appointed by the consortium in M29 and six finalists were announced. Each finalist was to receive 1.000E upon successful submission of a working application. Four finalists made it. The committee decided also for the overall app challenge winner, who would receive an extra 4.000E. This winner is the developer of the application “SharedHeritage”.

Overall, the procedure of the app challenge generated publicity for PLUGGY and provided also to the development team valuable feedback from developers external to the consortium.

Annex I – Initially Received Applications

1. pculiar
2. Intelligent Interaction research group proposal
3. mobile quiz game
4. SharedHeritage
5. “Nearby” app
6. Graffiti Geolocation and Geometrical Validation
7. Asinou Mobile Application
8. Top6 – Discover and Share Highlight of Culture Around You
9. The Art Battle
10. “AR-Gallery” web & mobile application
11. TriviAR
12. ARtour

pculiar

Discover traditional events and customs around the world

Pluggy
Plug into Cultural Heritage

Pluggy app challenge

About pculiar

pculiar.com is a web application that allows visitors to discover and take part in local traditional events and rare customs with a particular historical and cultural interest. Its main focus is in Europe and especially the Balkan countries, but it appeals to any traveller seeking for original and off-the-beaten-path inspiration for a new adventure.

The platform is free to use and the content we upload is on a strict approval process and only by pre-selected photographers, in order to maintain the highest quality standard.

The celebration of Saint Agathe at Aitolikon

Virgin Mary's snakes

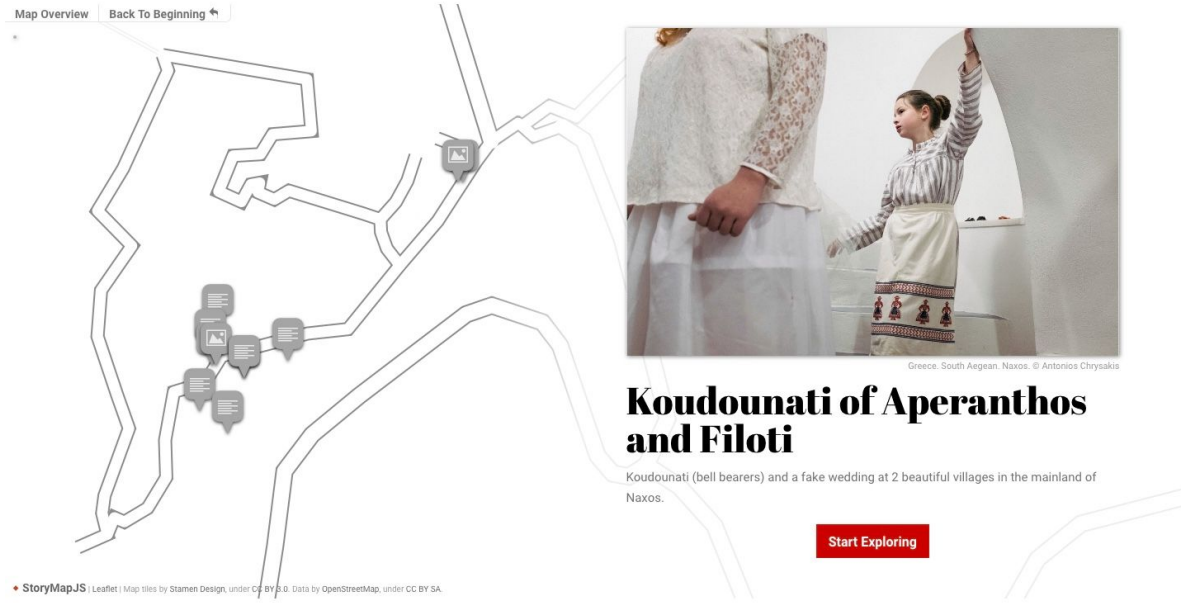
The images and the text of each event are based on the personal and unique experience of the creator, who is a traveller, with a real interest in traditional customs, thus making pculiar a very humanized and approachable source for information compared to what can be found in most travel recommendation sites.

Visitors of the platform receive an inside view of the events, presented with photos, text video and experiences that are not easily or discoverable by ordinary tourists.

Integration with PLUGGY backend and User Experience

We believe that pculiar will be a perfect partner to PLUGGY by contributing valuable and unique content to its distributed database of local knowledge.

Our application contains recurring events with geolocation data, both on the event and on the photograph level, which allows us to provide a very visual and interactive experience to the user.



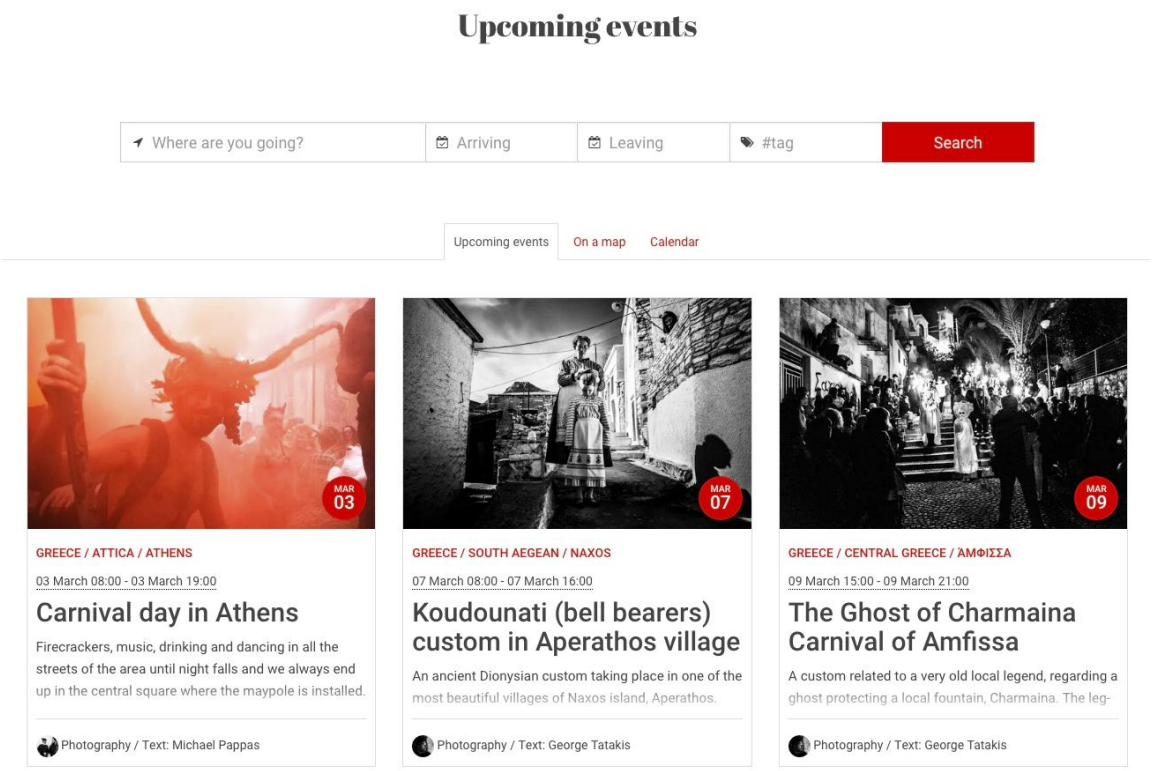
By knowing the geolocation of photos and events we can create interactive experiences.

An automated algorithm recalculates the dates and times based on attributes like Easter or Christmas and reschedules the event depending on its frequency. This way the visitor always receives fresh and valid data.

As part of the presentation, we provide google maps directions and smart search functionality for finding information related to the user's interests and time and place of travel in a way that pculiar can be used as a destination planning platform by both travellers and locals, interested in cultural tourism.

Our integration with PLUGGY will be utilizing its API to create and read Exhibitions, ExhibitionPoints, Assets and possibly Events to transfer content from pculiar into PLUGGY and vice versa. We will also be programmatically maintaining the accuracy of this data by updating the exhibitions when new information has been added or dates have been rescheduled.

Our search functionality will also be linked to PLUGGY which will allow us to retrieve information stored in its databases about a custom or a location and integrate it into our system as added-value information to our users.



Search functionality for finding information based on interests, time and place of travel

We are also working on a collaboration with the National and Kapodistrian University to integrate their digitized collection of cultural objects and traditional outfits into pculiar. When this feature is finalized we will be able to create 3D media type of Assets which can be added in the events stored in PLUGGY'S database.

Educational potential

The cultural events featured in our platform provide rich data that helps our visitors experience and learn about the traditions, the people that reincarnate them and the way of life in the areas where these are hosted.

By providing an approachable and personal experience of the custom we can offer a different perspective on the historical information, more human-centred and at the same time filled with visual interactions.

Our partnership with the National and Kapodistrian University will introduce relevant digital artefacts into the events creating a more holistic educational experience to our visitors.

We believe that our platform, as an educational tool, combines a very high quality of geographical, historical and cultural data, all of which are freely accessible to anyone in the world by their computer or mobile device.

Traditional Wedding in Olympos

Kotsamania in Tetralofos

Commercial potential

Our motto is to always keep our content free and accessible by anyone in the world. We believe that by spreading the experience of these customs, to as many people as possible, it can also benefit our monetization structure which is based on 3 elements:

1. Organizing cultural trips based on the events that we feature on pculiar. We offer very unique and very well prepared workshops for travel and photography enthusiasts helping them discover and experience these customs.
2. Selling museum quality prints of our photos through our platform.
3. Creating strong partnerships with businesses interested in investing in cultural tourism.

Travel photography workshop in Galaxidi

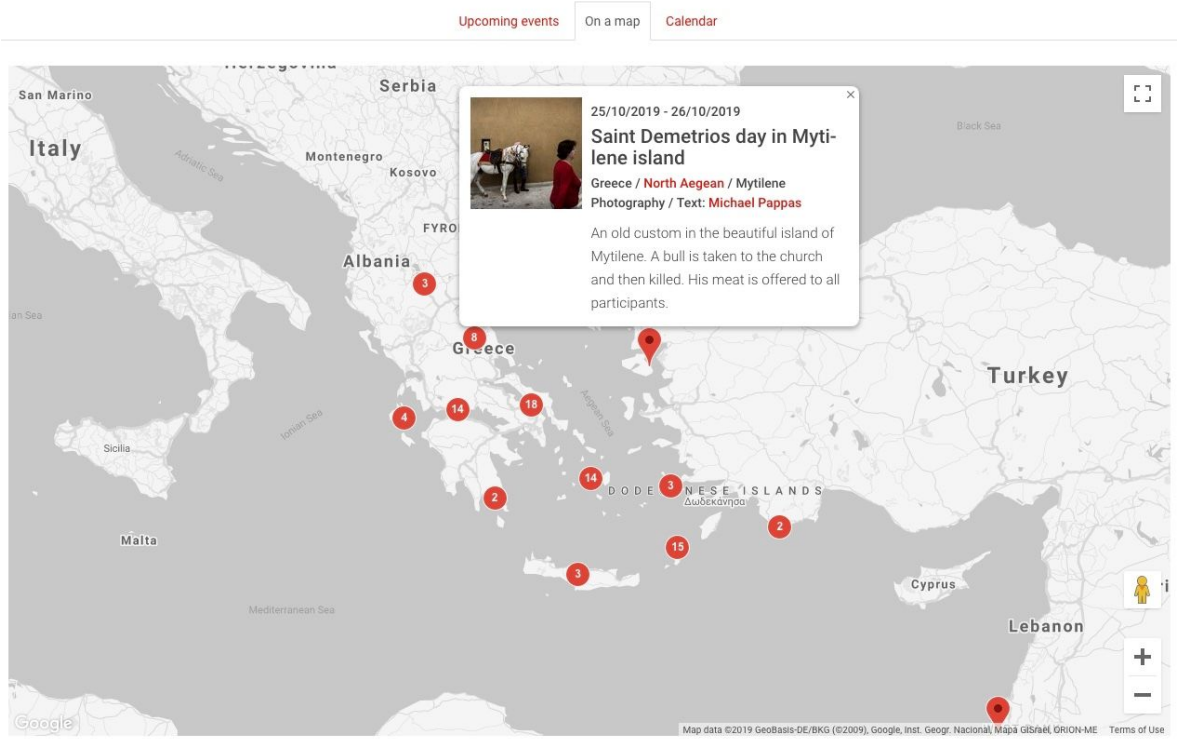
The social and cultural impact

What differentiates us from other travel/photography platforms is that we display very rare and unique events, that many times, even people from the same country, are not aware of their existence.

By doing so we are raising awareness of these traditions and at the same time, we are helping the local communities (most of the times small remote villages) to gain tourism and exposure.

We know that pculiar can help in the preservation and reintegration of these customs into our modern society by becoming a more approachable and interesting medium appealing to the younger generation who uses the web as a route to learning and deciding for future travel plans.

As a last measure, our database can also be used as historical evidence for customs that no longer exist.



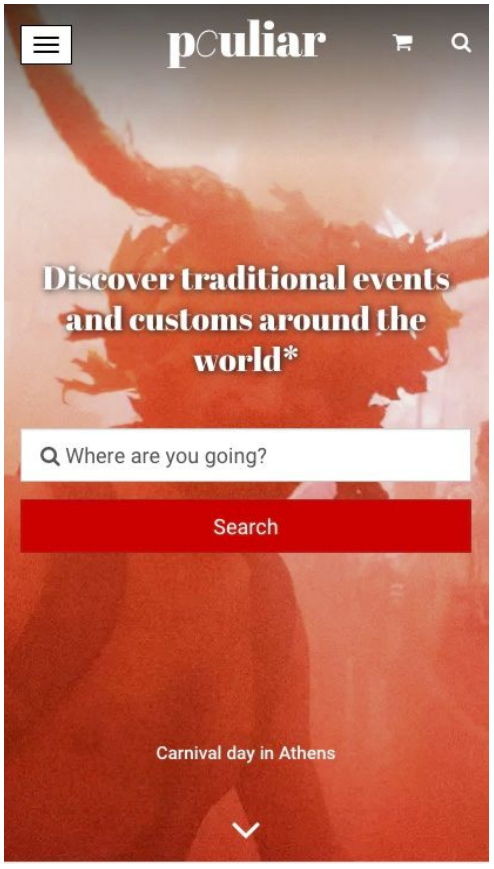
Customs and traditional events in Greece on a visual map

Creativity and innovation

On the technical side pculiar is a custom written Ruby on Rails application with some very clever algorithms that include:

1. Rescheduling of complicated events based on non-standard dates e.g. Easter, special geographic holidays.
2. A very large database with geolocation data on the events and photos, that can be used to map with accuracy locations and provide clever navigation to the user.
3. The large set of metatags that link the events together creating clever recommendations to the visitor based on their interests, location and availability.

Our innovation is based on the uniqueness of our content, the very high quality of the photography which provides a very immersive experience and finally the very friendly and usable UI that helps the visitor easily discover new experiences and gather information for their next adventure.



Mobile view

Mobile view

Thank you

Pluggy App Challenge – Intelligent Interaction research group proposal

The mobile application proposed by Intelligent Interaction research group in the context of Pluggy App Challenge aims to facilitate Pluggy users in creating narratives in order to describe their cultural experience, by reusing content hosted on the platform. In particular, the app will enable users to create *narrative routes*. These narrative routes may be composed of (a) stories already hosted on Pluggy, (b) external content, i.e. content hosted in external relevant repositories by utilizing Linked Open Data (LOD) technologies, or (c) a combination of (a) and (b). To assist users in creating their narrative routes, the app will make suitable recommendations from the available material (whether internal or external), based on various factors: the user's profile, context awareness parameters (e.g., user's geo-location), as well as relevance (e.g., thematic relevance). Additionally, users will be able to add their own stories to the narrative route they are creating, while at the same time those stories are added to Pluggy. Furthermore, the app will allow users to depart from an existing story (e.g., a place they are visiting for which a story has already been created in Pluggy by another user), and extend it by adding information according to own experience. The narrative routes can be either actual (based on geo-location) or more abstract (e.g., based on thematic relevance). By doing so, the proposed app aims to record and share cultural experiences of Pluggy users (in the form of narrative routes) while at the same time enrich the platform's content with novel content in the ways described above.

Intelligent Interaction research group is a recently established (2016) research lab active in the areas of Human Computer Interaction, Intelligent Systems and Cultural Heritage Management. Its research interests include Affective Computing, Natural Interaction, Artificial Intelligence and Machine Learning, Gaming, Digital Storytelling and Mixed Reality Interaction. II is active in research and development areas related to Human Computer Interaction focusing on the integration of intelligent systems and ubiquitous computing for the augmentation and enhancement of Cultural User eXperience. Furthermore, the lab's research is focused on studying and proposing user experience design principles that cover natural interaction methods, aiming at a more efficient and enjoyable human-computer interaction. II's academic activity includes participation in national and european conferences and publications in reputable scientific journals. Indicatively, team members participated at ACM Intelligent User Interfaces (IUI) 2017, Digital Cultural Heritage (DCH) ITN 2017, Semantic Media Adaptation and Personalization 2017.

very last minute, but for the app challenge I want to suggest a mobile quiz game about cultural heritage objects / connections and stories. Together with a friend we would build it for mobile and web. I saw that you are using Unity3D to display 3D object on the website (btw the 3D display doesn't work at all right now).
We also use Unity3D to build software and would like to make a quiz game using pluggy's api. Hopefully also using it's 3D content.

APPLICATION FOR THE PLUGGY APP CHALLENGE

Name of Applicant: Nikolaos Tousert
email: tousert.nick@gmail.com
Phone Number: +30 6978989527
Date: 24/03/2019
Type of App: Android Application

1. Introduction

Even if European's past is not completely common, and it is impossible to form a single, all-embracing conception of European culture, nonetheless, there are core elements which are generally agreed upon as forming the cultural foundation of modern Europe. One list of these elements in a high level includes:

1. Common cultural and spiritual heritage derived from Greco-Roman antiquity, Christianity, Judaism, the political thinking of enlightenment, the French Revolution, the developments of Modernity, etc.
2. A rich and dynamic material culture that has been extended to the other continents as the result of industrialization and Colonialism during the Great Divergence.
3. A specific conception of the individual expressed by the existence of, and respect for, a legality that guarantees human rights and the liberty of the individual.

In any case, the concept of European culture is generally linked to the classical definition of the Western World (i.e. a set of literary, scientific, political, artistic and philosophical principles which set it apart from other civilizations.).

To this end, the author envisions an application for Smart Phones (Android Application) which will raise awareness of our European shared cultural heritage through the user's discovery and engagement with common memories and traditions, common history, etc. The proposed application will promote and facilitate in some way the collaborative curation of stories by people from different areas (preferably different countries) in order to come up with a single virtual exhibition which will uncover similarities in the cultural heritage of the various European countries. The goal of the app is to underline our common European history and values and thus develop mutual respect and understanding.
In order to address the above objective, the App will trigger and facilitate the creation of exhibitions that will consist of exhibition points created in different cities (preferable different countries). All these exhibition points (belonging to the same exhibition) will describe same cultural stories (i.e. they mostly use same tags), but they will have totally different location attributes (this means derived from different countries). The result will be a virtual exhibition that will create links between seemingly unrelated facts. The exhibition narrative will reveal common historical processes (same exhibition, same tags and same topic) from different places (i.e. totally different exhibition point locations) which will strengthen our sense of belonging to a common European family. However this will not always be the case, because of the rich and diverse European culture.

2. Application Workflow

In order to address the above objective and reveal the commonalities in the European heritage, a representative workflow of the app would be the following:

1. The user (George) downloads the Android App from Google Play App store.

2. George creates through the app an account and the app uploads through the REST service the user's data into the Pluggy Social Network.
3. The app runs in the background and does not disturb George. But for each photo George stores in his phone, the app stores also the location coordinates of the position that the photo was taken
4 Every one week (or earlier according to the app settings), the app reminds George that there are many photos saved but without tags. Thereafter, the app asks George whether he would like to browse the various photos and tag them with the relevant cultural heritage information.
5. In the case George wants to tag some photo with heritage information (and also with description, legal info, type info, etc.), the photo is uploaded directly as an asset into the pluggy social network. In case George does not tag any photo, the app continues working in the background in the same way as before without disturbing.
6. After the tagging and uploading of the photo by George, another user, named Peter gets informed that the exhibition he owns in Pluggy social network, could be enriched with an asset derived from another country (an asset belonging to George with pretty identical tags). Peter reviews George's asset in his phone, and makes through the app a request to George to link his asset to Peter's exhibition but in a seperate exhibition point.
7.George views Peter's request through the app and agrees to link his asset to Peter's exhibition.
8. The Android app notifies every user who has liked Peter's exhibition, that the exhibition has been enriched with new content derived from another country, but dealing with the same european heritage topic

The above workflow has the following objectives:

1) to empower, as far as possible the virtual exhibitions with semantically identical but geographically diverse content (i.e. cultural heritage info concerning same topics but different locations)
2) to not engage the users with complex tasks/ workflows that will not work. For instance, both users, Peter and George, are engaged mainly through notifications, photo tags and links proposals.
3) To not work seperately from the Pluggy web app. The Android app will connect, notify and prompt the users through the utilization of Pluggy services. Thereafter the android app will not replace the main functionalities of Pluggy platform (stories curation, exhibitions storage, etc.).
4) to provide **motivations** to the users using the Android app through intelligent **scoring** system. (i.e. semantically coherent virtual exhibitions consisted of many geographically dispersed exhibition points and assets will provide points to the contributors and much more points to the exhibition owners, in accordance to the number of likes/views).

The following UML sequential diagram depicts the above workflow and the communication between the proposed Android App and the Pluggy web app.

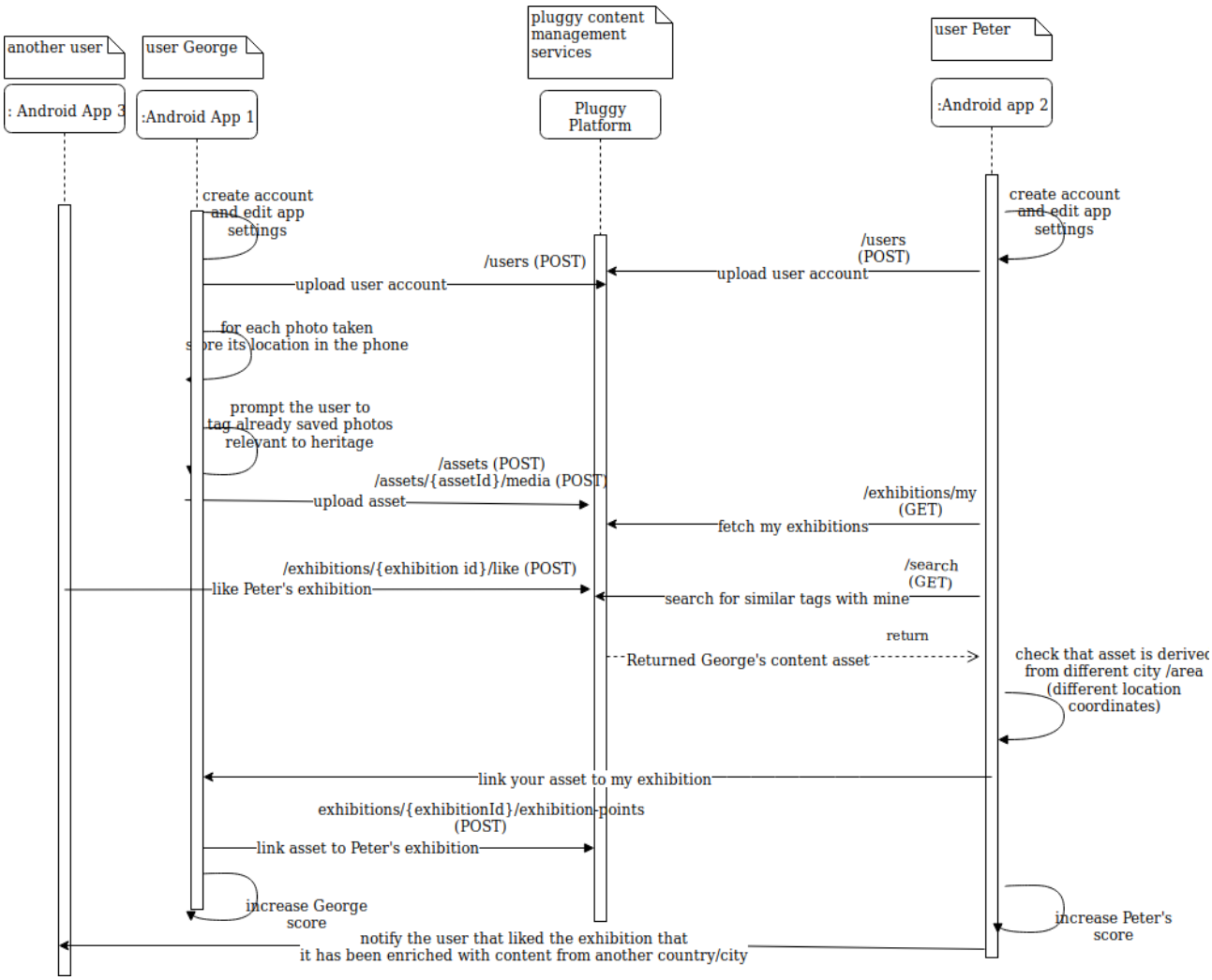


Illustration 1: Sequential Diagram depicting the workflow. Android Apps 1, 2 and 3 are different instances of the proposed app.

The following diagram depicts the proposed high level system architecture:

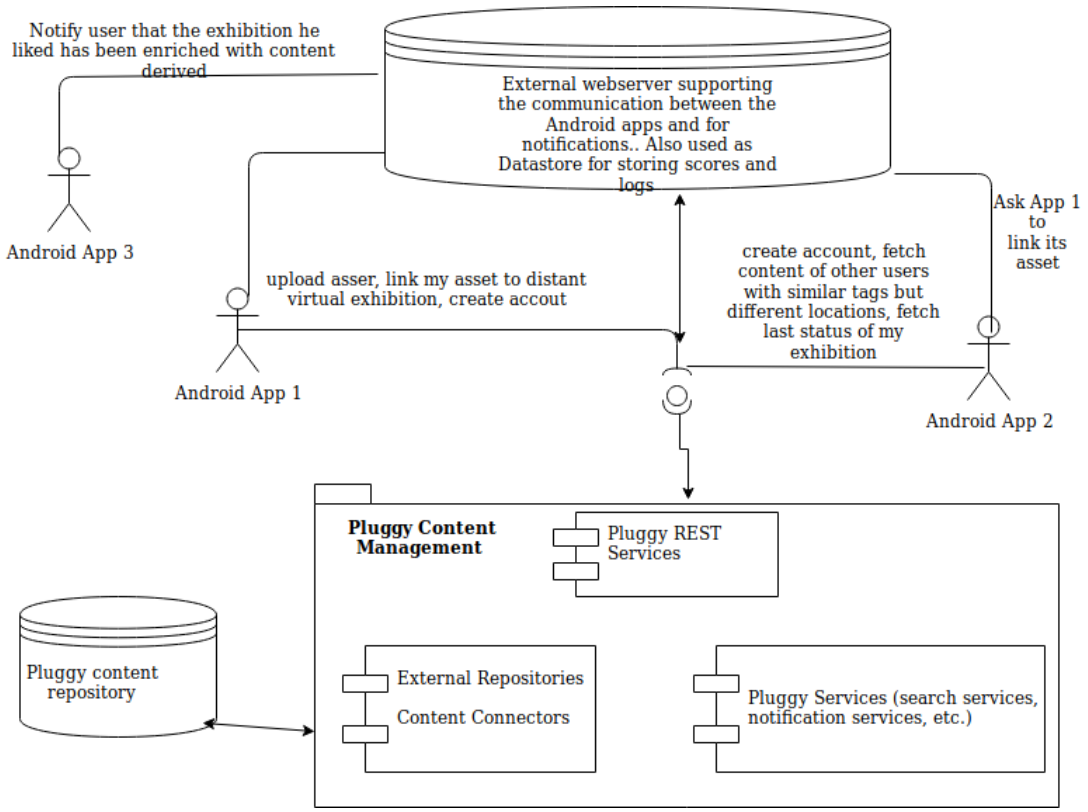


Illustration 2: High Level Architecture depicting the integration of the Android App with Pluggy Platform. Android Apps 1,2 and 3 are different instances of the same App.

for the Pluggy Challenge I want to suggest you our app "nearby“ which is set to be launched Q3/2019* for german speaking countries and Q4 for english and spanish speaking users.
It’s a social app with several functionalities all focused on your location / neighbourhood.

- Find (micro)jobs, local resources, shopping opportunities, local news etc. All in one place on your home screen.
- Share, buy and sell, help ... all local
- Communicate with your community (infos on local government / votes / discussions) and find new friends in the area you are located in (friends for hobbies, sport, meditation etc.)
- Location based game. Claim your area and learn more about it. Maybe not in the first version of "nearby"
- Get discounts at local stores. We help the stores to switch to the online world
- Augmented Reality view: See hotspots in the community through the lens of your smart phone. Find location messages and all location based infos by looking directly at your surrounding through your smart phone.

- For this challenge we would integrate: Possibility to get infos about interesting historical sites (map view and AR view, show info text, images and 3d models) and the possibility to add information to this view. This would be used probably mostly by older people in the community that want to share their knowledge (eg. what was here before, how was it done). For young people or people new to the area this info would be interesting to explore and learn from. They would also be able to ask questions like "what was here?“.
If time is left plans are to integrate a location based quiz with the infos provided from pluggy.

"nearby“ is a mobile app that also runs in the web browser.

Tech frontend:
React Native (Swift, Java) for mobile apps
React/Redux/RxJS for the website

Backend:
nodeJS,MongoDB,mySQL,AWS

Do you need more info?

Graffiti Geolocation and Geometrical Validation

Introduction

With this program we are trying to project the cultural existence and legacy of graffiti. In order to achieve this we are going to use the science of photogrammetry and satellite geodesy, some of the theories that we will use are for the creation of the orthopphotography photogrammetric conversion, for the geolocation precise point positioning and cad with back projection algorithms for the final linear drawing. In this document we are going to present you how our program will be able to cover all the requirements that the competition provides.

Integration with PLUGGY

The program we vision will have certain capabilities that are integrated with certain aspects of the pluggy platform the first one would be the photographic shooting of graffiti in different areas and the insertion of those in a map through the gps of each phone this would help with the media aspect of pluggy. The next step is getting accustomed with graffiti history by using some recordings that come from the people who know the history and the purpose of those. This could lead to tours with routes based on the graffiti connection and thematic points of view. The last is the use of AR/VR based technology to project the graffiti and a linear drawing of that, in a cad based environment, so that the user is able to see the differences between the timeline of each graffiti.

Educational Potential

As far as the educational potential of the program it can be used by many professions such as architects, graphic designers, artists, rural and surveying engineers, game developers, the students of the above professions and even simple users to learn and interact with the graffiti culture and history. Also specialized users can use this app for reconstructing graffiti in towns and teaching the meaning of reconstruction and cultural preservation to the future students of the professions that are described above. The users after what you have already read can learn through graffiti the history of the area, because graffiti are a mean of expression.

Commercial Potential

The graffiti culture has already expanded its wings throughout the world for many years and this program can contribute commercially to the scientist that want to reconstruct and see the changes in the expressions of those. Furthermore simple users can contribute a fee for having the additional recorded tours and graffiti routes. This would help in the further evolution of the PLUGGY platform.

Social and Cultural Impact

The graffiti ideology started by the impact of oppression in many societies that had strict rules or some kind of conservative system and ideology, it also was a form of expression for younger ages

about their concerns for the future and also for the groups of the society that they represented. That being said graffiti existence alone can be considered an impact in modern culture and social values. So the program that we vision is based on maintaining that social and cultural inheritance that the graffiti are nowadays.

Creativity and Innovation

The idea of this program came to us from the oppression and the crisis (economic and social) and that is what graffiti is all about. Moreover the areas that we grew up were areas with many graffiti art especially Exarchia where the graffiti is a form of expression for all the political, social, cultural discriminations between the masses and also a beautiful form of art and are considered part of the inheritance. So taking into consideration all the above we thought that by using the technological advancements of today we could recreate and keep those in databases for the future generations to see and feel their history.

The Asinou Church App. (UNESCO WHL monument)

Culture is increasingly a precondition of all kinds of economic and social value generation, a process driven by two concurrent streams of innovation: digital content production and digital connectivity. Society is increasingly dependent on and driven by digital technology. Cultural Heritage stakeholders must adapt and become engaged with this development. Therefore, clear and tangible policies are needed from governments and managements of CHI.

The current developments on Digital Cultural Heritage (DCH) has identified the need for a more holistic approach to the e-documentation of the past in order to increase the scientific, economic and social potential of advanced services to users, which capture, reconstruct, model, archive, and enable use/reuse and dissemination of CH content (Knowledge based documentation, instead of object oriented digitalisation → The story will be described by the Use of the Smart App).

A **holistic** approach reveals (tangible and intangible) how the reconstruction was conducted and why the part has its dimensions, materials, actual colour, artistic outlook, etc., especially when elements of intangible heritage are incorporated into virtual reconstructions, such as in Historic Buildings Information Modelling (HBIM) systems.

Relevant applications can have a high impact within in different areas such as education , creative industries, tourism and cultural heritage institutions. Augmented and Virtual Reality nowadays are used widely in the cultural heritage domain in order to present monuments and objects (reconstructed and otherwise) to the users, but it is still in many cases evident that users think the things that they are looking at are not real. Future applications will provide the best quality possible so that the users will not be able to tell the real objects from the augmented ones, or to delay that for as long as possible.

The application developed by Cyprus University of Technology for the Panagia of **Asinou** church (UNESCO World Heritage List monument) in Cyprus demonstrates:

- a holistic approach to document various aspects of the site and liturgical explanations of paintings
- the means of bringing 1000 Years of cultural history into schools
- a Virtual Reality (VR) application
- an e-Book as an immersive installation requiring extensive content creation, such as 3D modelling, video/image editing, visual design and software development
- digitisation of tangible and intangible content and metadata enrichment for Europeana.

State-of the-art technology is here combined with a novel experimental app involving:

- High quality dense matching photogrammetry
- Reverse engineering processes from created point clouds
- Morphological and holistic reconstruction of monuments
- Single Image 3D reconstructions (camera alignments)
- 3D Real-time Implementation to mobile devices using AR and IVR (immersive VR)
- VR implementation to mobile devices
- Hotspot techniques.

Top6 – Discover and Share Highlight of Culture Around You

We are developing web page http://top6.eu that promote sets of 6 most interesting culture artifacts within specific geographic areas onto some specific topic. For example: “Top 6 Castles of Slovakia”, “Top 6 Sundials of Slovakia”, “Top 6 Bells of Košice”, “Top 6 Authors of Košice Modernism”. This list of top 6 interesting things could be subjective based on specific user preferences so everybody is welcome to share their. The social videos and video stories are one of the top video trends in marketing[1] so we decided that all the created content will be presented as a video that contains images of these interesting things with some short description. Example of video created by our platform: https://youtu.be/GCNQNGo2aoo.

Figure 1: The First mockup of Map of Top 6 of the Slovakia

Our application will consist from the map with aggregated top 6 interesting things. For example Figure 1 shows first mockup of different highlights in Slovakia. Our aim is to integrate our web page with The PLUGGY platform as a plugin. User will be able to browse and select assets from the Pluggy platform and add appropriate short asset description. Based on this selection top6.eu platform will publish newly created video as a new asset to the Pluggy platform.

Video is very engaging media so we are expecting that users will create more content. With our application it will be quick and easy. Every video contains totally 6 assets and background music where we are strictly following license policy of individual assets.

We are thinking of creating event within the Pluggy platform that will be challenge for users to create Top 6 videos. For example you have one month to publish your “Top 6 of sundials in your city”, “Top 6 historical figures of your country”.

How we meet App Challenge criteria

- **Integration with PLUGGY backend:** we are creating application that will be plugin. It will be retrieving image assets from the Pluggy platform and based on the selection we will create a new video asset uploaded to the Pluggy.

1https://medium.com/slonmedia/top-7-video-marketing-trends-for-2018-e1ac24ea3d47

- **User Experience:** Top6 will have very straightforward usage: select image asset; modify asset description; select background audio; specify geolocation and title; then publish. Video creation is little bit time consuming for better user experience it will be background process and user will be notified about created content with Pluggy's notifications.
- **Educational potential:** This application motivate users to explore another cultural artifacts and interesting places while creating end exploring content of Top 6.
- **Commercial potential:** There are few commercial potentials:
  - every video could have payed advertisement as it is in other video sharing services
  - customized logo at the end of the video for institutions that pay some fee
- **Social and cultural impact:** Making users more interested in culture. Inform them about interesting things around them. It is very engaging for users to see the top things that probably they don't know they are exists. Content creation challenges will be motivation for creation of groups of interests in some topic and also opens discussions on these topics.
- **Creativity and innovation:** Nobody uses "top 6" phrase everybody uses "top 10" or "top 5". Easy way to create and share engaging content.

The Art Battle.

We are planing to develop online real time quiz battle for the users of the Pluggy platform. The game is very simple, one user invite other one to have art battle. They chose topic for their battle (i.e. Koisce modernism, Renaissance in Italy, Architecture). Based on this topic users will receive the same set of questions that are generated from selected Pluggy assets. Questions are automatically generated by custom AI algorithm based on the asset metadata, selected topic and users overall score. Assets could be found also from external libraries like europeana, wikipedia or british museum, which have rich amount of metadata for individual artifacts.
Every user have the limited time to answer the question. When the users answer set of questions they receive their score for the battle and general score. Scoring system of "The Art Battle" is motivated by the chess Elo rating system[1]. Scores of the users are displayed in total score board stored in the Pluggy platform.

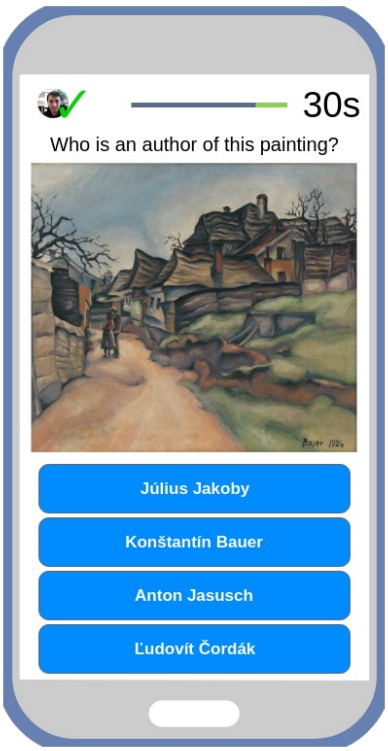


Figure 1: First mockup of the user interface.

Figure 1 shows first mockup of the user interface, where the user have to answer specific question. You can also see that opponent already answered this question and current user have only 30 seconds to provide the answer.

Few examples of the questions: "What technique did author use to paint this masterpiece?"; "Who is the author of this painting?"; "What material is the sculpture made of?"; "When was this building build?"; "In which city you can find this building?"

That's all, the main aim of this game is to have just fun with the friends.

How we meet App Challenge criteria

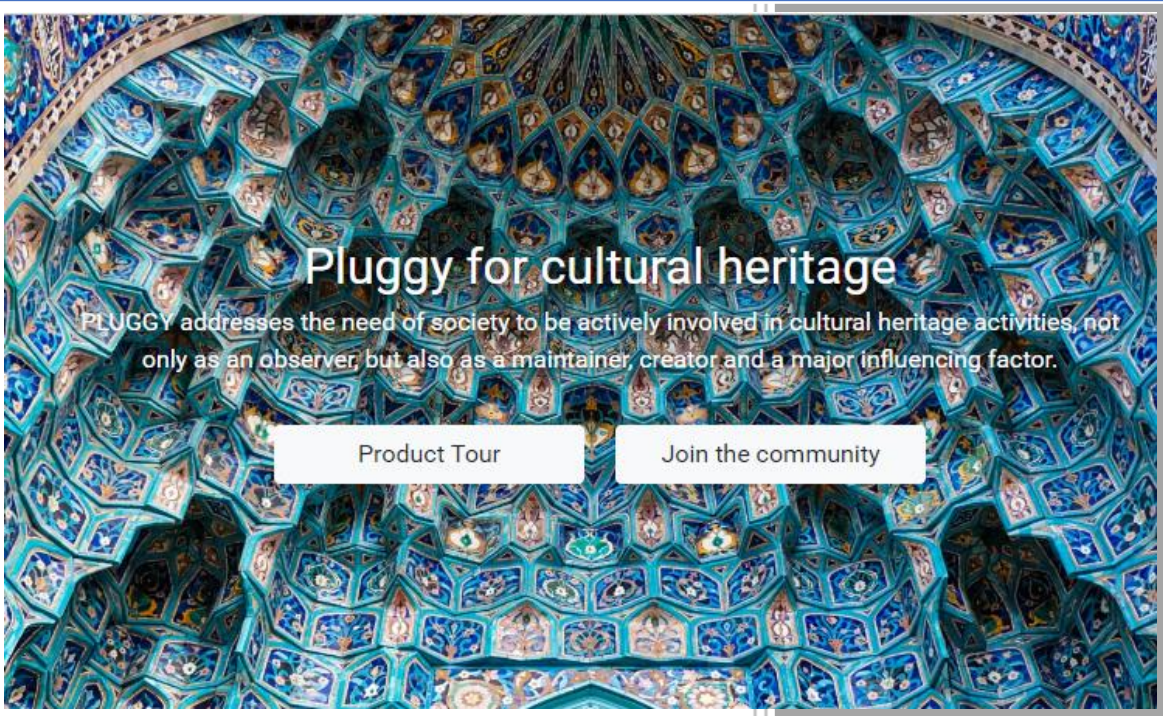
- **Integration with PLUGGY backend:** Browsing and downloading assets uploaded to the Pluggy platform and searching in external libraries for the content that match battle topic. Publishing score board to the Pluggy's backend.

1 https://en.wikipedia.org/wiki/Elo_rating_system

- **User Experience:** Very straightforward usage: invite user to art battle; answer set of questions; wait for the results of the match and your overall score. Application will be developed as a mobile application with real time notifications.
- **Educational potential:** User can find more interesting masterpieces related to the topics of his or her interests. Questions that can help user to discover very interesting connections between cultural heritage artifacts.
- **Commercial potential:** Expositions, that contain the asset displayed with the battle question, can be promoted. Some advertisement can be placed between individual questions, mainly related to culture.
- **Social and cultural impact:** Users are more aware about culture and can explore individual masterpieces from different points of view. Art battle can be very good for building social connections between the Pluggy users.
- **Creativity and innovation:** Automatic question generation based on AI algoritms. AI algorithm selects assets and questions based on the users overall scores and selected battle topic.

2019

“AR-Gallery” web & mobile application



Elena Nikolaou

Pluggy App Challenge Proposal Submission
22/3/2019

Pluggy App Challenge

"AR-Gallery" web & mobile application

Objective

The objective is to create a web plugin for the Pluggy platform through which Pluggy user will be able to curate "AR-Gallery" stories. This tool will use the simplest form of means to create new shared stories. "AR-Galleries" will consist of images, coming from Pluggy platform along with text provided by the user. The purpose of the text is to provide a brief narrative of the image that may present customs, practices, places, objects, artistic. The user will be able to create an AR-gallery, of characteristic images in order to describe specific cultural events, eras, traditions, customs etc. Furthermore, the presentation of these stories will be available through an application implemented for Android mobile phones and tablets supporting AR-Core library.

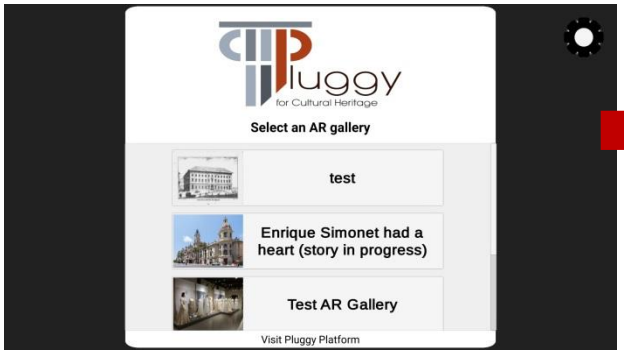
User Experience

As far the web tool for the story curation is concerned, interfaces will be as simple as possible allowing the user to select easily each an image from Pluggy platform to use and write the accompanying narrative. The Android application will be usable everywhere and users will be able to experience images as augmented reality objects, text in readable form but also as audio using text to speech engine.

Mobile Application Workflow

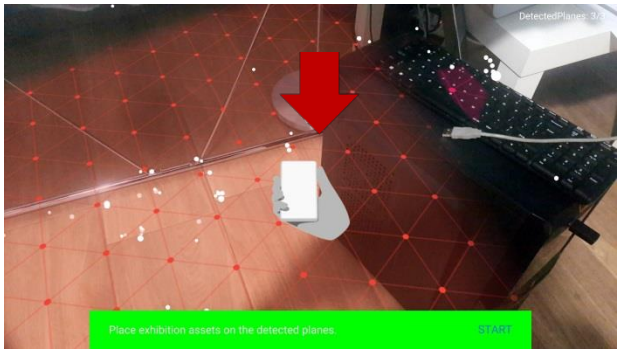
The mobile application will retrieve "AR-Gallery" stories from Pluggy platform, giving the option to the user to select which story to experience. The second step will provide all information, retrieved from Pluggy, related to the story such as title, short description, author and license. The third step will request user to scan the space around for the application to detect enough surfaces (planes). Following this, the application will fill automatically the detected planes with augmented images along with some information (image title and description). In order the user to proceed experiencing the "AR-Gallery" he/she must find and select each augmented image in space. The selection of each image will be achieved by focusing on the image and tapping it on the mobile screen. Each image selection will bring image information to screen, along with user generated text. If text to speech engine is supported by mobile/tablet user generated narrative will also be provided as audio.

Another workflow will be available through deep linking from Pluggy platform to a specific “AR-Gallery”. The user may start directly from third step described above through a link in the story page that is already in the Pluggy platform.



Step 1 Selection of desired “AR-gallery”

Step 2 "AR-gallery" information: Cover Image, Title, Description, Author and license



Step 3 Scan desired area to detect surfaces

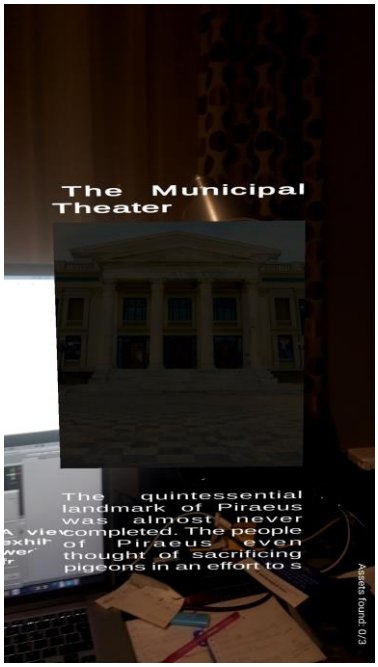


Image Step 3 Augmented images attached to detected surfaces

Image 1 Image in full focus

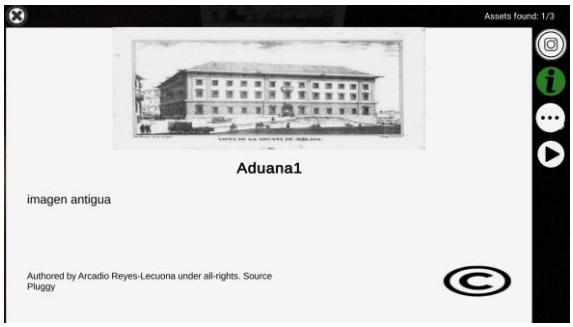


Image 2 Image details retrieved from Pluggy: Title, Description, Author, License

Image 3 Title and text of narrative

Integration with the Pluggy backend

Integration with the Pluggy backend will be accomplished with multiple ways. The curation tool will get images via Pluggy's backend and will be able to create new stories which will be uploaded using Pluggy's backend. Moreover, the mobile application will have to retrieve available "AR-Gallery" type of stories that already exist in Pluggy. "AR-Gallery" will also use the social notification system provided by Pluggy backend.

Educational potential

The mobile application provides an easy, playful way to experience through images and audio customs, practices, places, objects, artistic expressions as an expression of the ways of living developed by a community and passed on from generation to generation. An individual may use its mobile phone or tablet to illustrate literally anywhere a narrative via an "AR – gallery" and thus be a part of the cultural heritage. This may be used by schools in a classroom, by museums who wish to advertise their collections, local communities who wish to attract attention to their customs and preserve them.

Additionally, the provided narrative could be written and supported from text to speech engine in many languages combined with the fact that application could be used everywhere would make "AR-Gallery" app a fantastic tool to educate individuals of many different age ranges, descending from different countries from the comfort of their own space.

Commercial potential

“AR-Gallery” mobile application could allow in application sales of stories or packages of stories. Another alternative is to apply other commercial restrictions such to set a fee for a number of stories per user or number of images per “AR-Gallery”. Finally, application could allow in application advertisement for a fee.

Social and Cultural impact

“AR-Gallery” stories can be easily authored and can be experienced by anyone and everywhere which attracts interest in raising cultural awareness. The mobile application will provide the possibility smaller communities to share and preserve local traditions. Finally, the augmented reality part could give culture, traditions and customs the means to be hosted under a modern technological cloud, attracting even more people to absorb this shared knowledge.

Creativity and Innovation

The creativity of both “AR-Gallery” applications, web and mobile, lies to the fact that they provide to the users an easy way create content. This content will have a high-impact experience to their end users that will have the sense of having an actual gallery around them with full audio-visual narrative. The innovation of proposed application is supported by the use of latest augmented reality library (AR-Core) along with text to speech engine as means of creating audio effects.

Thank you for the consideration

Pluggy App Challenge

TriviAR

Introduction

From books and paintings to statues and buildings, cultural heritage has always been a window to each others way of living, because through customs and works of art we have been able to express ourselves and understand others. In our application we want to celebrate that, by combining information and play in a way that brings people together and motivates them to spread but also acquire new knowledge. In the lines that follow, we present you “TriviAR”, an already established trivia game, with a couple of twists.

User Experience

TriviAR is in its core a competitive team based question game combined with AR (Augmented Reality) elements. Within it, two teams compete to see who will achieve the most points by claiming a question first and then answering it correctly. If one team claims a question but provides the wrong answer, the other team gets a chance at answering it. During each turn, the item tied to the question appears above it and can be examined by zooming in and out or rotating it. If the environment around them allows it, this can also be done in AR mode. By doing that, we maximize the amount of information a player receives and help imprint that item in his/her memory so that it is not forgotten shortly after. After the turn ends both teams will also receive some extra information, relevant to the question they were asked. In the end, the team with the most points wins and can share their results or specific questions online.

To make it easier to understand here is how a single turn is played out :

1. The question together with its available answers appears.
2. The team that taps on the claim button first has 3 seconds to provide an answer.
    - If the answer they provided is correct then we move onto the next question
    - If the answer they provided is wrong then the other team is given 10 seconds to provide the correct answer or forfeit the question.
3. Points are awarded based on three factors.
    - If the answer was correct or not (wrong answers subtract points)
    - How fast it was answered
    - If the team that answered it correctly also had claimed the question first

This sequence is repeated for each question.

Now that we have the basic functionality down, let’s go into the details.

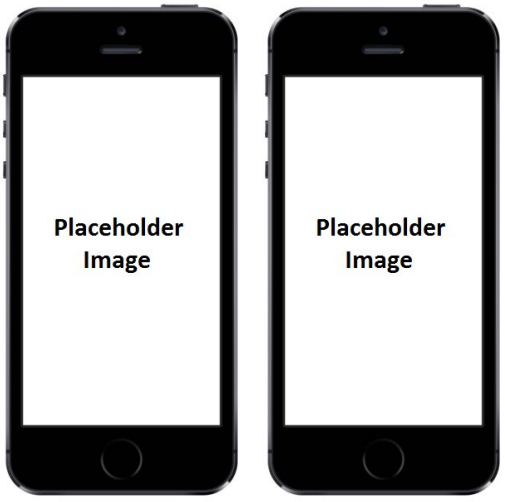
What is needed to play

This application prioritizes its educational value. Because of that, ease of access is a must. All that the players need to get a game started are :

- 2 smartphones
- A group of friends eager to play

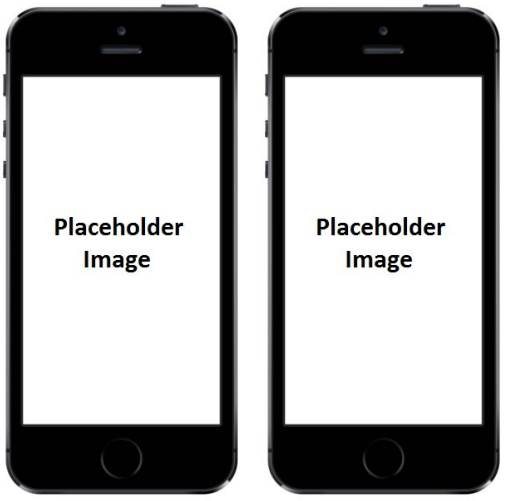
Connecting to a game

Once the user has opened the application, he is greeted by the game's menu screen, a background displaying the game's logo and one UI Button labeled "Play". After taping on it he is transferred to the lobby screen where he can see a list of all the available games or decide to start his own. In case he decides to host his own game he has also the option to add a password so that only his own friends can join.



Playing the game

The main game's UI can be split into two smaller ones. The object one and the question one. The first displays the object connected to the question as well as a button that allows the view to be switched between normal and AR mode. In normal we see our 3d model in predefined scene whereas in AR we see it displayed in the closest surface to the camera. The second displays all the question related elements. That is the question, its available answers as well as the question claim button.



Ending Screen

After the game reached its end the user is displayed with its final screen. There he can see if he won or lost the game as well as the exact number of points he scored.

Technical Description

In order to create the aforementioned application we would be using either Android Studio (technology for building simple or complex Android applications) or Unity 2d (game engine), both of these technologies combined with the Vuforia SDK (responsible for creating the AR part of the application) will yield the final result.

Android Studio in combination with Firebase a.k.a realtime database is able to achieve synchronization between devices as well as intercommunication, so that two users will be able to participate in such a game. Each user after Logging into our application, preferably using some third party authentication such as Google Sign in or Facebook Sign in, will be able to start a game or join any available games as described above; these games will be hosted in Firebase.

The questions that our application will be hosting, will be created using the content from the PLUGGY REST API, where we will access the multiple assets offered by the API, an example would be integrating painting assets, display them and then generate questions based on their description or their content (small details in the painting), these questions will also be hosted in Firebase so that when the PLUGGY content is been updated so are our repository of questions, without any further requirement such as also updating the application.

App Description for PLUGGY's App Challenge

ARtour

Introduction

Greece is one of the most visited countries in the world, having received a total of 27.2 million international tourists in 2017[1]. This fact is also noticeable from tourism's participation in the country's GDP which stands at 19.7% (35 billion Euros) for 2017[2], and from supporting the 12.2% of the total employment (459,000 jobs) in 2017[2]. Therefore, by trying to facilitate the growth of tourism, there is an opportunity to help:

- the Greek economy, which is still in recession, and
- the Greek society, in general, on account of lowering the unemployment rate.

Statement of Problem

The app challenge, that we wish to participate in, is a call to develop "pluggable" applications using the PLUGGY framework, in order to demonstrate the framework's features, capabilities and potential. PLUGGY was developed to become a tool that anyone can use to create standalone / mobile / web applications that share cultural content and experiences with other users, thus bringing these diverse users and their cultures closer. Pluggy supplies a content repository and specific content management services to provide functionalities for the undermentioned kind of applications:

- Social Platform
- Curatorial Tools
- Applications (AR, Geo, 3D)
- Games
- Other 3rd party applications

Objective

Our objective is to use the PLUGGY framework to develop an application that can be used to promote and assist tourism, first in Greece and later worldwide. Our app will have a twofold functionality. It can be used as a mobile app that uses Geolocation services to characterize and comment any cultural sightseeing points that people find intriguing and fascinating. Afterwards, other users, when in the vicinity of this point of interest, can use the same app to read all the information and comments made by the original and subsequent posters. Moreover, this capability can be regarded from a more artistic viewpoint; for example, adding an image on a house exterior wall as a new form of street art (see Image 1) or projecting a video on a flat wall surface.

A second adoption of the app is to design a gamified tour consisting of a series of waypoints, where the first user has augmented these points with riddles guiding the rest of the users to the next locations. In both cases, text or media (images, videos, 3d models) can be uploaded to the PLUGGY's repository and then can be viewed from other people, when they are in the correct position, using the AR technology.

Scope

The ARtour app will be able to retrieve existing content, assets and exhibitions as they are called in the PLUGGY framework, from the platform's backend. Similarly, the app will be capable of creating new content and uploading it to the PLUGGY's backend repository system. The latter happens when the user constructs the gamified tour of cultural landmarks, attractions or experiences.

The app will be designed in such a way, that it will offer an intuitive, minimalist and user-friendly interface. The UI will also be fast and consistent, that is: its controls and elements will look and behave the same way across the whole app (see Images 2 and 3).

The gamified cultural tour can be used as a methodology to teach tourists, of any age, about other cultures. Moreover, tourists will learn about the various cultural heritage sights from other regular people. This means that the information will be more personal and helpful than the one received from officials like tour guides.

ARtour is focused on the tourism industry which produces a revenue of over 7.6 trillion U.S. dollars[3] (2016) and thus is established as one of the world's largest industries. Greece can be considered as a very good starting and test point for our app, because of the high numbers of visiting tourists and cultural and heritage landmarks. Various tour companies and travel agencies will be interested in using ARtour to add new content in the PLUGGY system and create exciting tours for their customers. ARtour will be sold to these customers for a fee and a predefined percentage of this will be forwarded to the corresponding company. Hence, our app will also be a very convenient way for these companies to advertise more products and services. Finally, we can offer to customize (for example the UI) our app for specific needs of a particular company.

The social and cultural impact of the application is very important since it is a way to boost tourism and promote the exchange of different cultures. Tourists will learn many unfamiliar and unknown things from the locals and furthermore will be able to post their own positive experiences for the next tourists to read. Or they could also mention similarities found between a local cultural landmark and one in their birthplace, incentivizing others to visit both places.

Conclusion

The ARtour app is trying to take advantage of all the superb capabilities of the PLUGGY framework, aiming to boost the tourist industry by offering a new, creative and innovative way to exchange cultural content. The app can be used by both locals and companies to promote and advertise cultural experiences, as well as by tourists to visit, comment and add upon them.

Image 1. Example of AR technology showing an partial older view of the building.

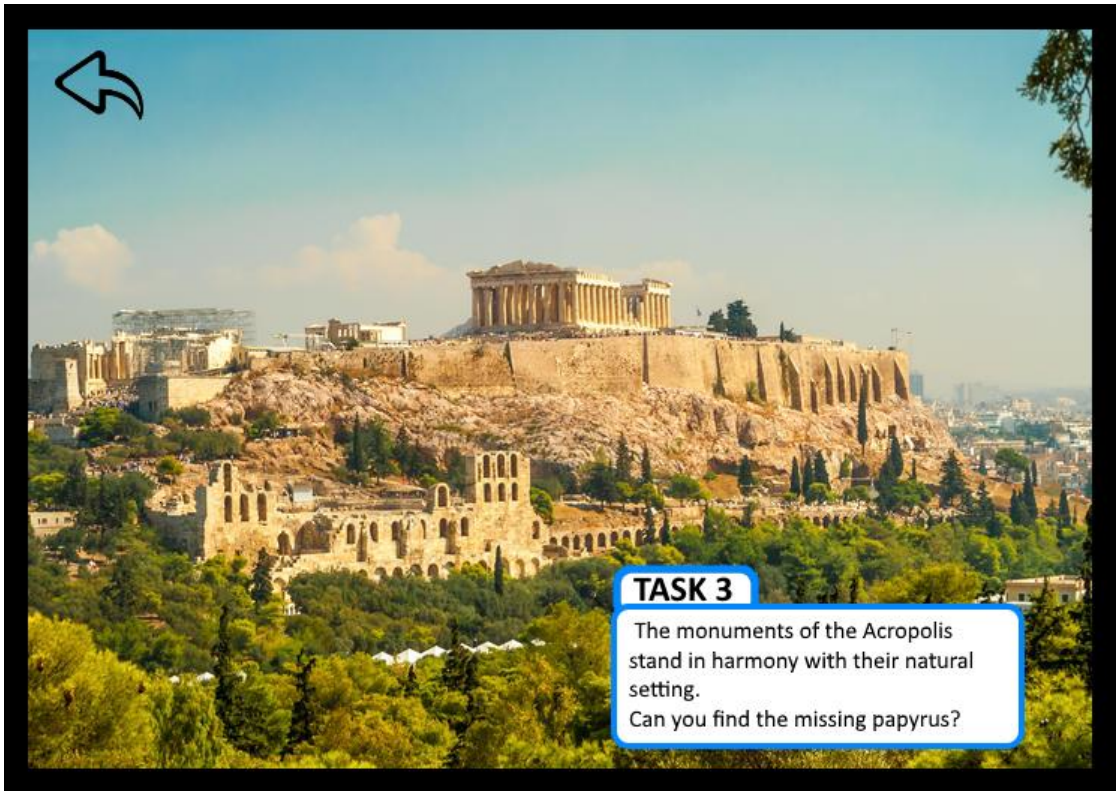


Image 2. Example of the gamified tour and the UI.

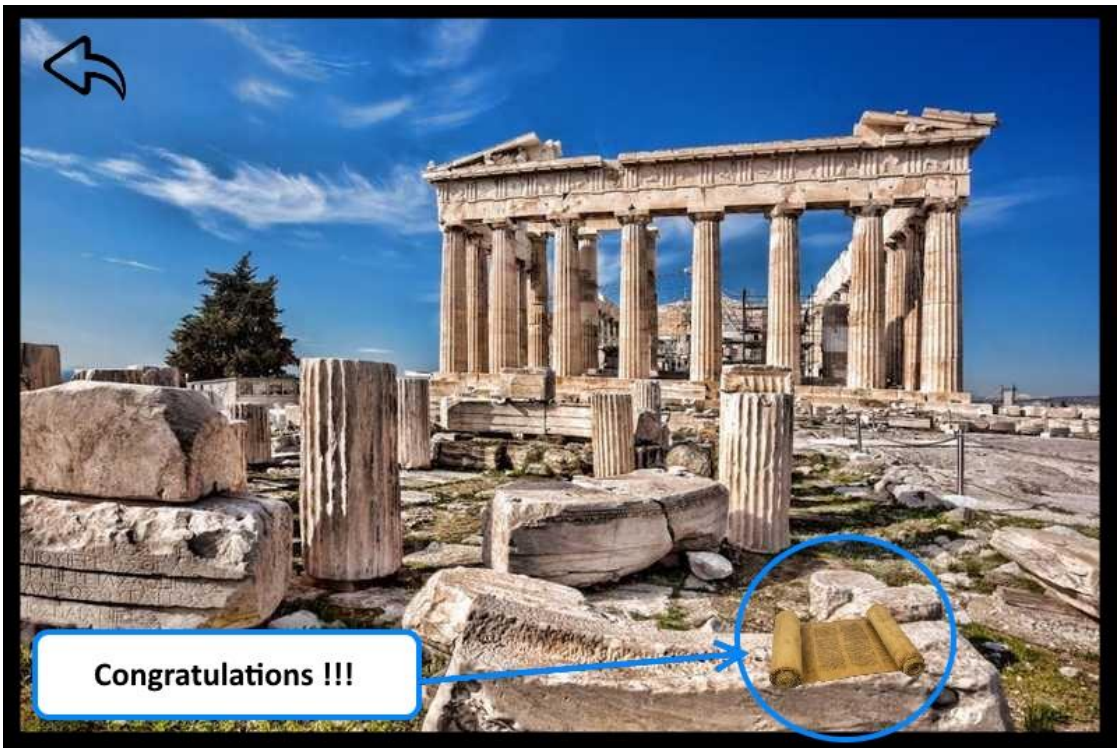


Image 3. Another example of the gamified tour and the UI.

References

1: https://www.amna.gr/en/tourism/article/233196/Over-27-million-tourists-visited-Greece-in-2017-

2: https://news.gtp.gr/2018/04/12/wttc-greek-tourism-key-economic-driver-2017-set-for-growth-2018/

3: https://www.statista.com/topics/962/global-tourism/

Annex II –Applications uploaded

1. SharedHeritage
2. Graffiti Geolocation and Geometrical Validation
3. Top6 – Discover and Share Highlight of Culture Around You
4. The Art Battle
5. ARtour-TimelineVR

APPLICATION FOR THE PLUGGY APP CHALLENGE (Description)

Name of Applicant: Nikolaos Tousert
email: tousert.nick@gmail.com
Phone Number: +30 6978989527
Type of App: Android Application
Name of the App: SharedHeritage

App link in Google Play:
https://play.google.com/store/apps/details?id=com.challenge.sharedheritage

Preconditions for running successfully this App:

1) Two Android devices (2 users) with camera and GPS.
2) The Android version for these 2 devices should be at least 5 or even bigger (Lollipop, API =21). Android 5 runs well.
3) The devices should include the Google Play Store (Google Play Service apk)
4) The user should provide some privileges to the app in order to have control (App should have access to device location, to access photos and media from the device, and the gps should be ON). The App most probably will navigate the user accordingly.

Purpose of the App:

The purpose is to reveal commonalities in the cultural heritage across European countries through gamification. The Pluggy Social Platform helps on this. By creating in the same virtual exhibition, chapters (the so called exhibition points) with different locations, but with the same tags, this means that an almost same European event can be described differently from these countries.

So the goal of this App is to help people from different European countries to collaborate and learn about cultural commonalities. If a person contributes to an exhibition (of another person) and he adds content (just an asset) from a different country, he gains 1 point as the asset owner. The exhibition owner who asked the aforementioned person to offer his asset, he gains 3 points as the exhibition owner.

The exhibition owner seeks for assets from different countries but with the same tags with his exhibition. If he finds someone, he sends the invitation and the workflow goes on. Finally upon completion of the workflow, the scores are being displayed on the App.

Some small notes before describing the workflow:

Click the reload button in order to synchronize the App with the servers and get the final notifications/data.

“Assets to invite” is used by exhibition owners to check if there are potential assets from other users to link and therefore send invitations.

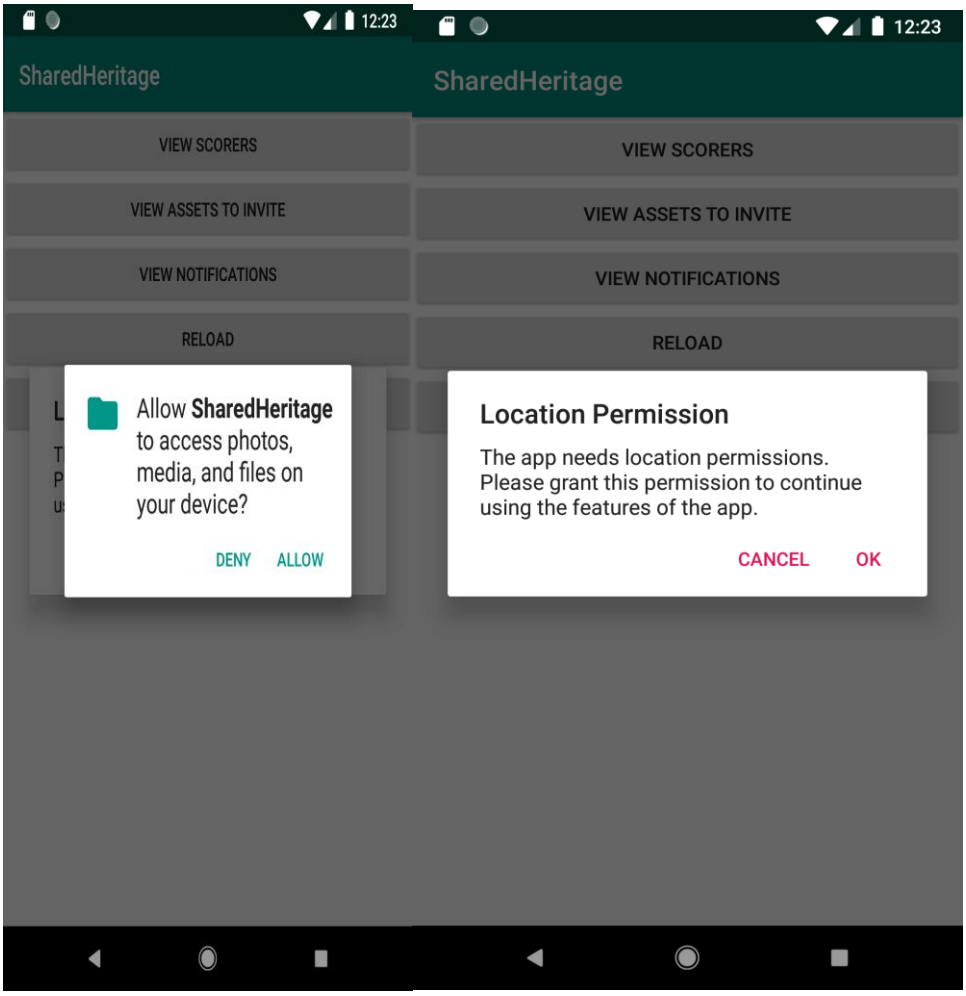
“Notifications button” is to check about actions from other users (invitations, acceptance, etc.).

In order to simulate the following workflow you need 2 Android devices (version >5) with two different Pluggy accounts.

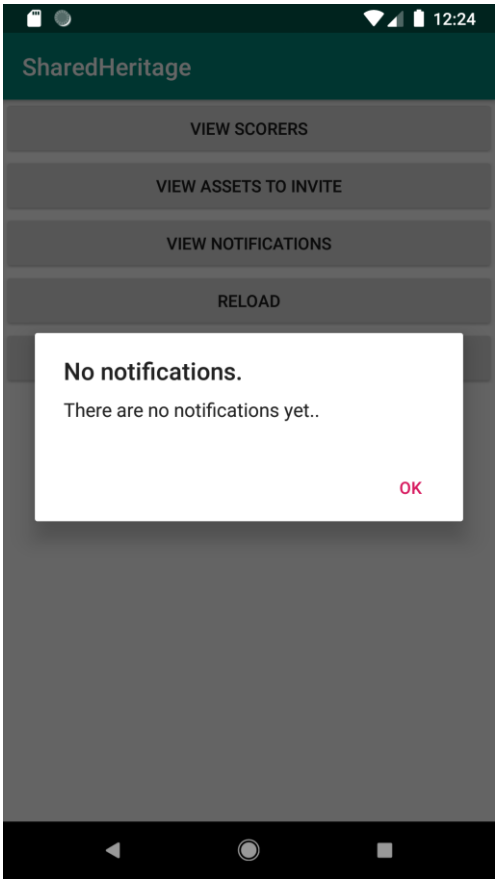
A simple workflow to test the App (two persons):

Nikos (Exhibition owner)

1) Nikos has created in the **Pluggy Social Platform** 2 exhibitions. The first exhibition contains 2 chapters (exhibition points) from Italy and Spain respectively with the tags: dog and cat. He created one more exhibition with one chapter that has location Greece and the tag: dog
2) Nikos now wants to get some points. He downloads the App SharedHeritage and he logins with the same account as before (same account for the App and the Social platform). He then provides to the App the needed privileges (location ,media).



3) Nikos presses the notifications button and he sees nothing (no invitation). He presses “Assets to invite” button but he sees no asset from a foreign country with just a same tag with his exhibitions.



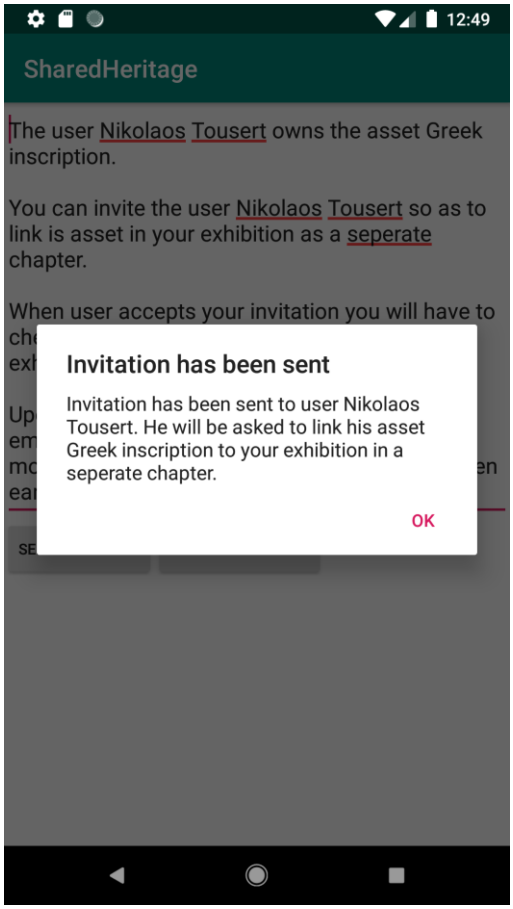
4) He then waits…

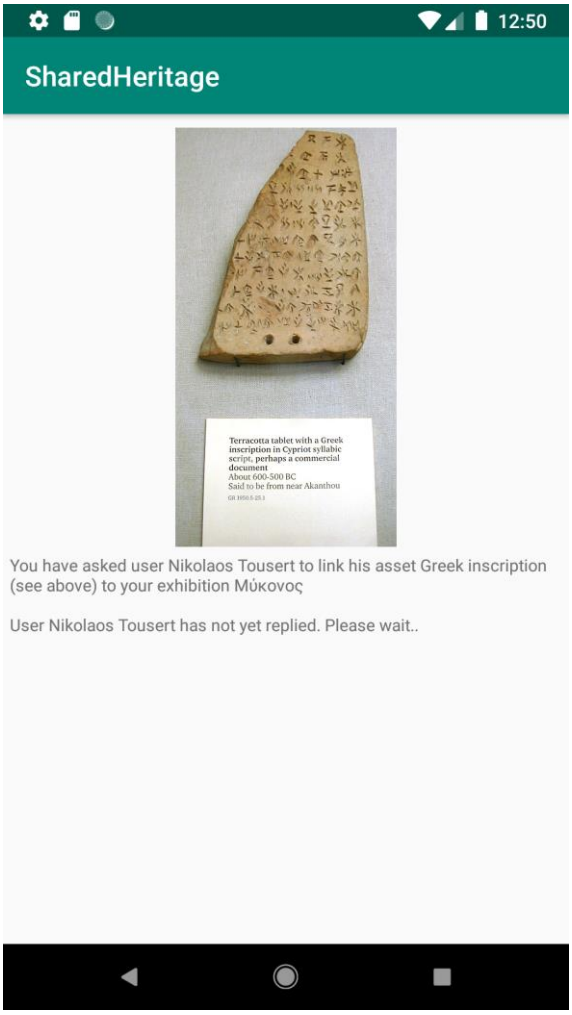
Nikolaos (Asset owner)

1) Nikolaos lives in Greece, he downloaded the App he run it in the background. He takes photos from Greece and the App automatically saves the location for each photo.
2) He decides to tag a photo through the App and upload it on pluggy. He can do it through a button. He decides to add the tag dog to the photo. The photo is uploaded on Pluggy along with the location (Greece), the tag: dog and the description of the image. (**Please note that this step does not need to be done for testing the App. You can simply upload a photo (on behalf of Nikolaos) manually through Pluggy Social Platform and set the aforementioned location and tag manually**)

Nikos (Exhibition owner)

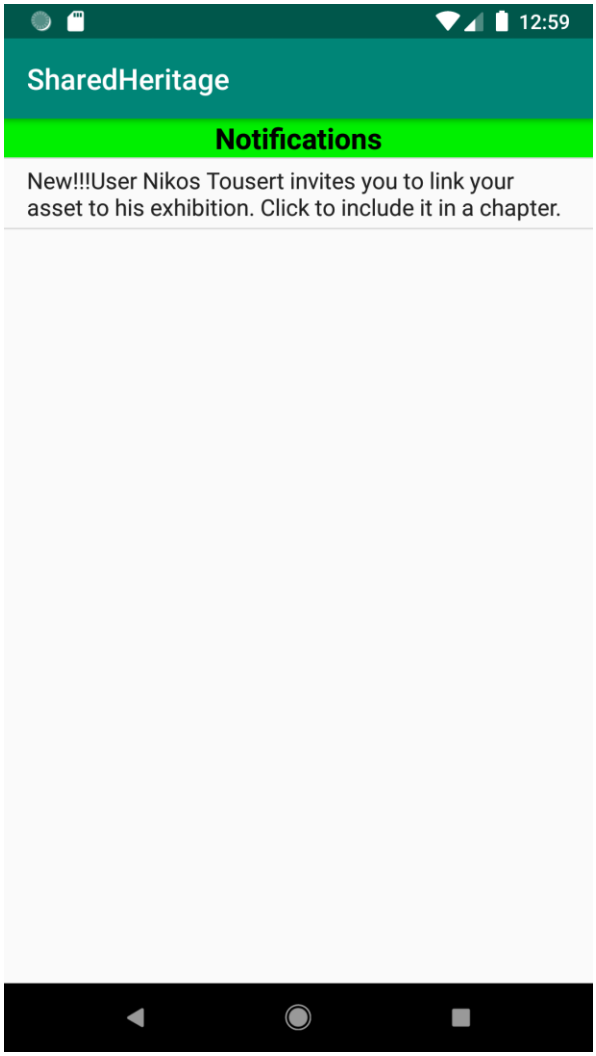
5) Nikos **reloads** the App and finally sees that someone has an image taken (uploaded on Pluggy) with location Greece and the same tag with his first exhibition (i.e. dog). Luckily enough, Greece is not contained in one of his exhibitions, and the tag is the same (i.e. dog).
6) Nikos sends invitation to Nikolaos and then waits…:


12:49
SharedHeritage
The user Nikolaos Tousert owns the asset Greek inscription.
You can invite the user Nikolaos Tousert so as to link is asset in your exhibition as a seperate chapter.
When user accepts your invitation you will have to
Invitation has been sent
Invitation has been sent to user Nikolaos Tousert. He will be asked to link his asset Greek inscription to your exhibition in a seperate chapter.
OK

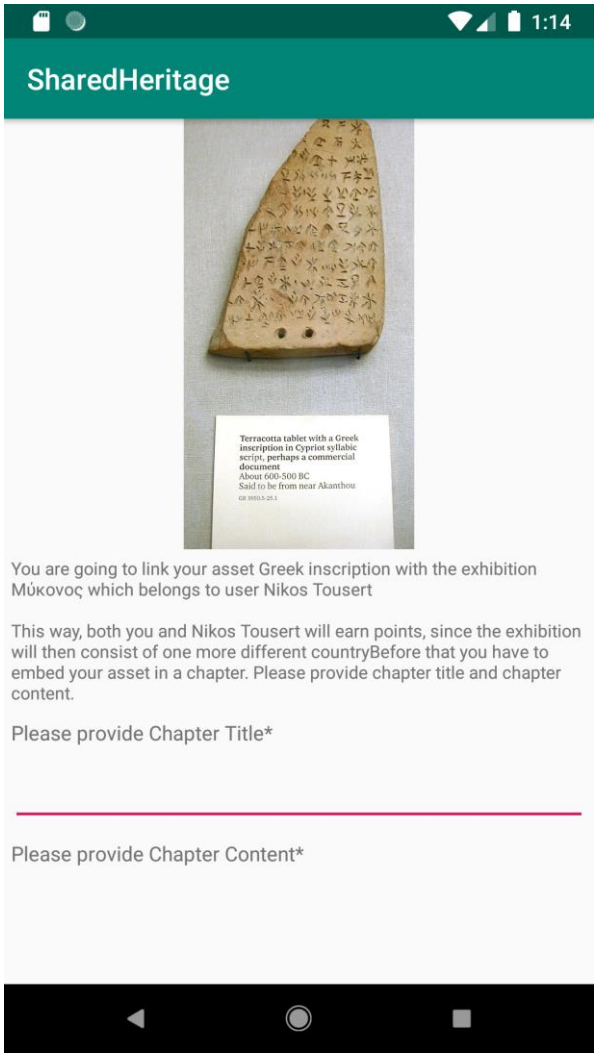


Nikolaos (Asset Owner):

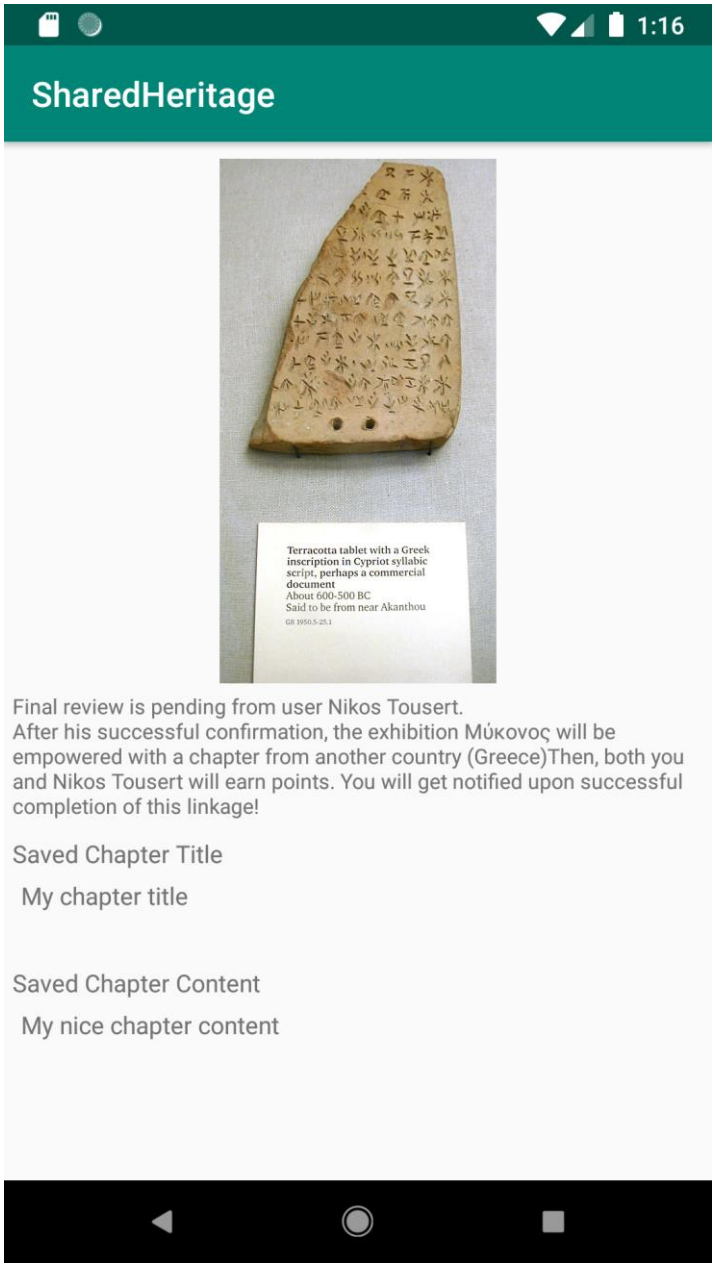
Nikolaos receives the Invitation:



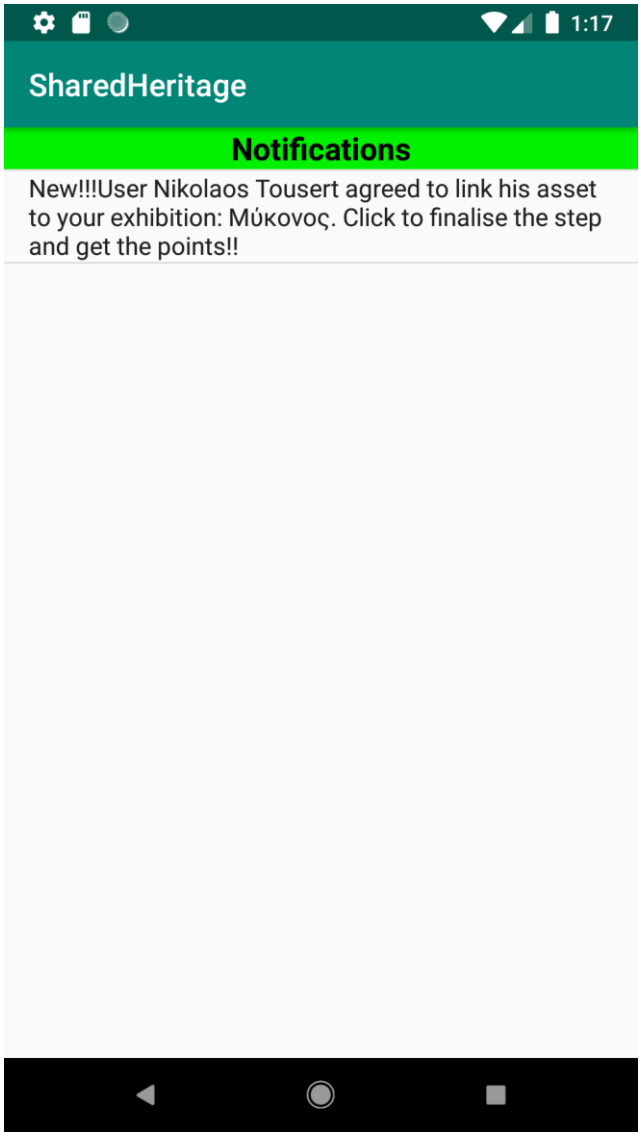
and agrees to include the asset to a separate chapter in Nikos' Exhibition:



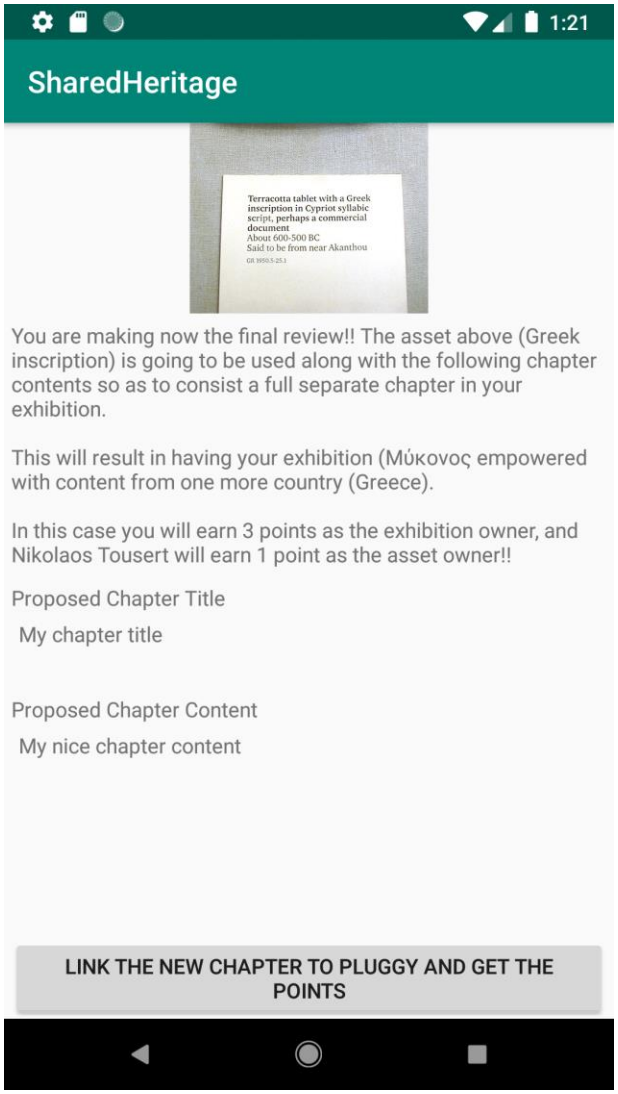
He sends the chapter and then waits Nikos confirmation for finally getting the points:



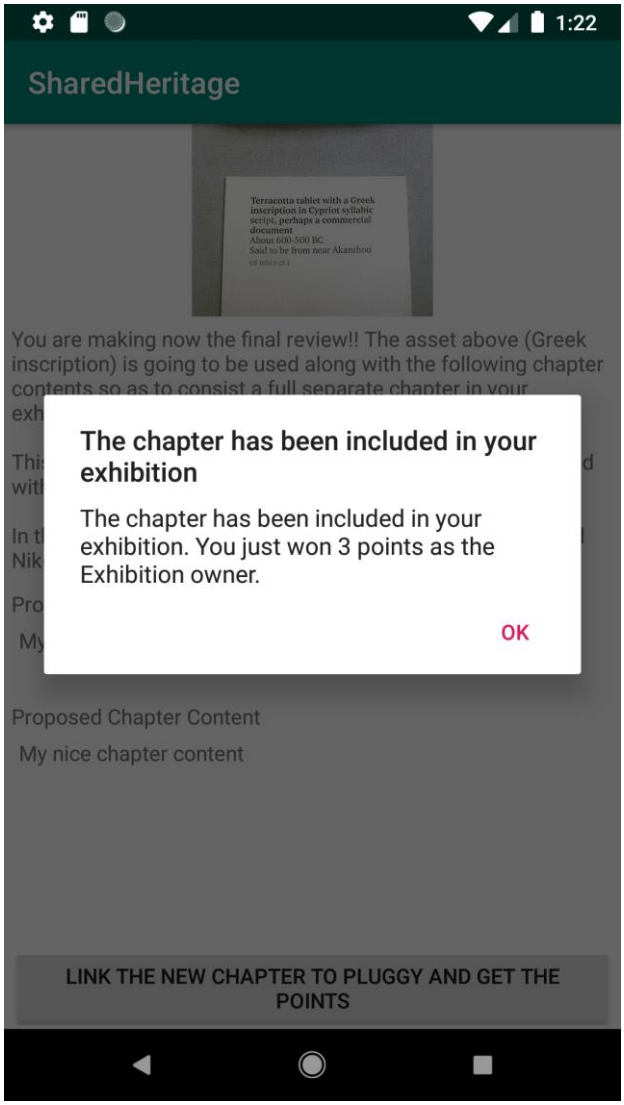
Nikos now just needs to finalize the workflow and make the final review:



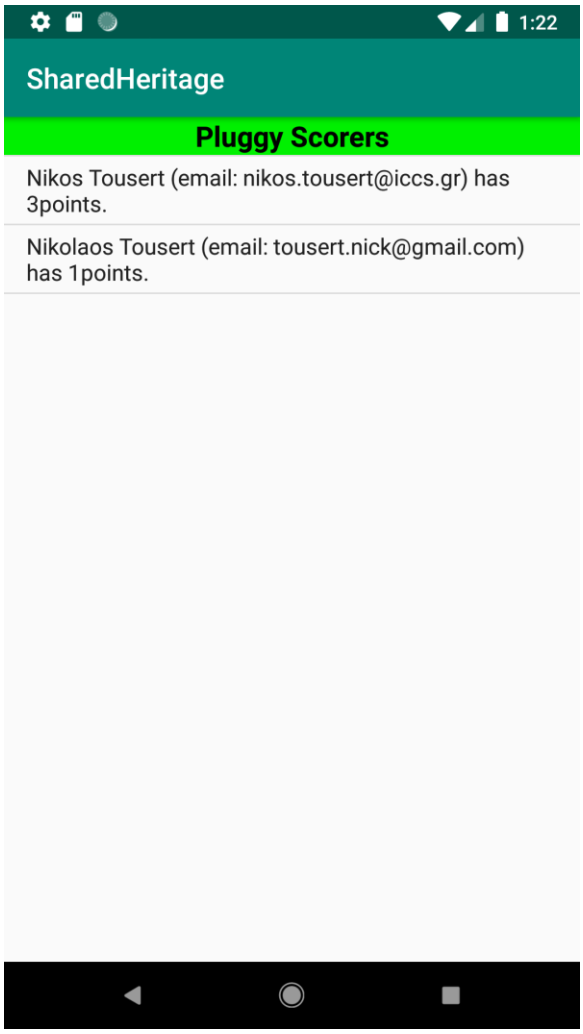
Nikos makes final review:



And then both receive the successful message:



All users have access to all scorers: (here Nikos gets his first 3 points as the exhibition owner)


1:22
SharedHeritage
Pluggy Scorers
Nikos Tousert (email: nikos.tousert@iccs.gr) has 3points.
Nikolaos Tousert (email: tousert.nick@gmail.com) has 1points.

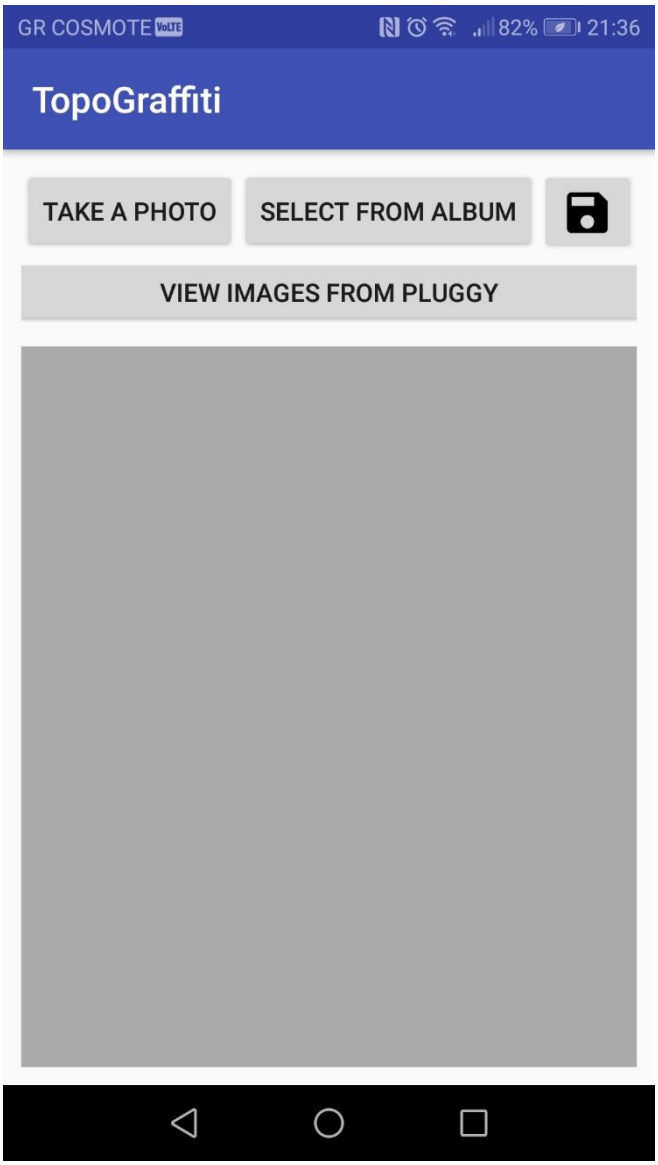
Topograffiti App Challenge Candidate

Installation

The Installation of the app is easy because you just have to copy the app-debug.apk and the output.json to your phone via usb cable and after that you just run the apk file and everything is ready.

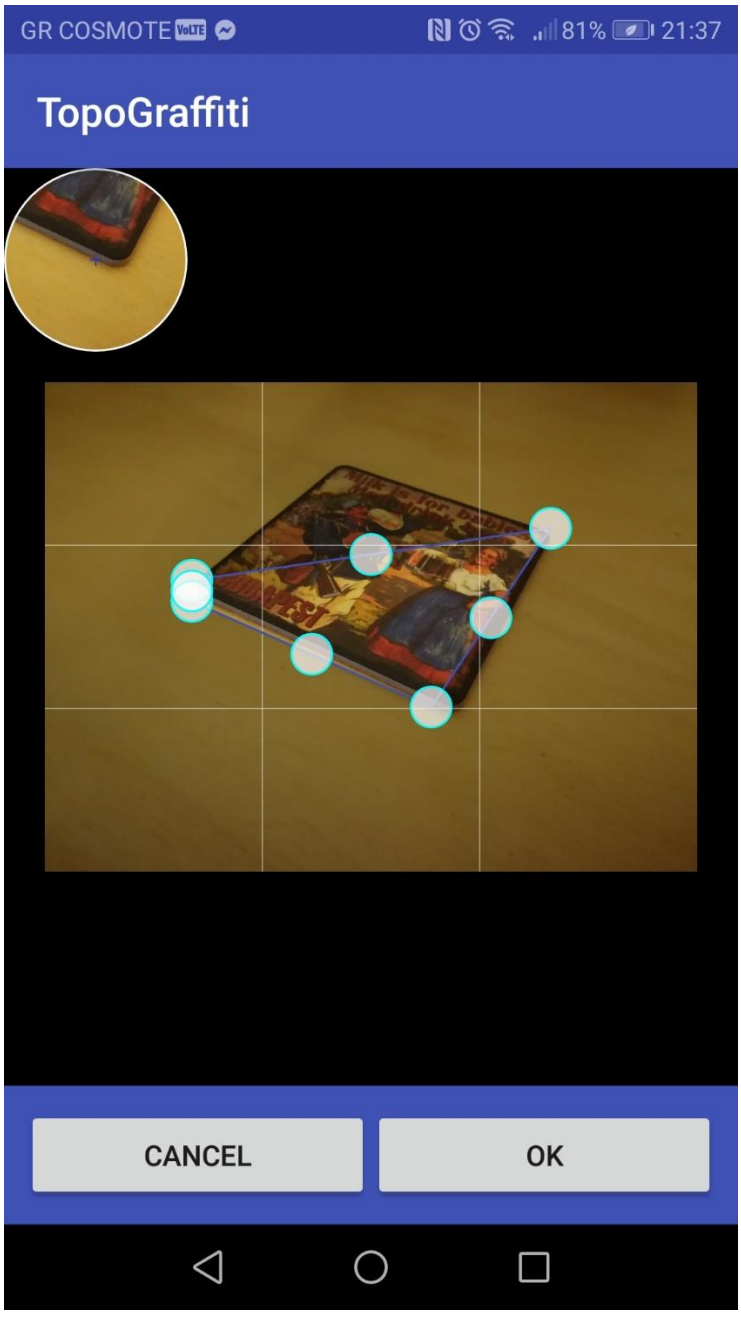
How to use the app

The app is easy to use because of the interface that gives you the feel of an app destined for everyone. You just start the app and you choose between the options of taking a photo or using a photo from those in your gallery. We still have a problem with the view from PLUGGY button but we hope to make it usefull until the end of the week.



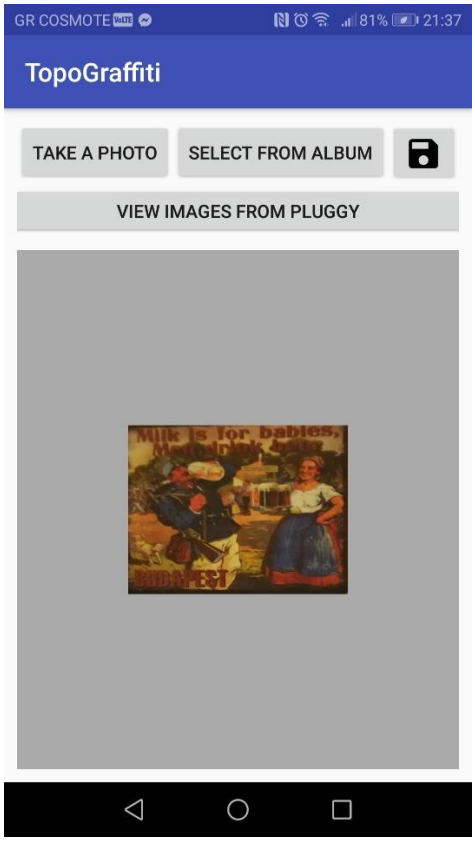
1. Starting interface

Then, after you have picked an image, a pop up window opens for showing you the rectangle which you will use in order to pick the right corners of the graffiti that you like and correct it from perspective distortions. This means that you will have to pick a rectangle in the real world and not in the image as shown in the next image.



2. Picking the right points

Finally after these steps you can get your final product an image corrected from distortions and also in good quality.



3. The final Product of the app

Problems

We had some problems with implementing the API for fetching some images in order for them to be used by our app, but we hope that we will fix this bug as soon as possible. We are sorry we could not implement it in the last month you gave us. We hope that our app will not disappoint you.

This app was created By Amarildo Haxhi and Tsironis Petros for PLUGGY's App Challenge

Thank you for your time

Top6

Top6 application for creation of videos is available online. Interactive map and all the content can be accessed via this link:

https://top6.eu/

Application is also available via PLUGGY platform as an option when user creates assets. The direct link of the plugin is here:

https://beta.pluggy.eu/assets/plugin/5d9261ded8f3cb5b63e6cec6/new

If needed we can share also source codes.

Jan Smatana
email: smatana.jan@gmail.com

Play interactive art and culture focused quiz with your friends. Just install Art Battle application and play it. For now click on the link and download apk to your mobile phone. Be sure that you have allowed installation of application from other sources than Play Store.

You can follow these steps:

- Load the .APK file into your device (you may need a File Manager Appl)
- Enter the "Settings" of your device
- Select the "Security" option
- Find the "Unknown sources" option
- Activate the "Allow installation of apps from sources other than the Play Store" option
- Locate the package again and tap on it, the device should ask if you want to install it

Download application and find this instructions also online:
http://smartvia.sk/ArtBattle

Application will be available soon also on Google Play Store

If needed, we can share also source codes.

Miroslav Smatana
email: miroslav.smatana1@gmail.com

Application for the PLUGGY App Challenge

Description

Name of Applicant: Georgios Karafotias
E-mail: gkarafotias@yahoo.com
Phone Number: +30 6939798555
Type of App: Plugin integrated within the PLUGGY social platform
Name of the App: TimelineVR

Preconditions for running successfully TimelineVR:

The TimelineVR app is a plugin than is integrated within the PLUGGY platform. Therefore, anyone who has access to PLUGGY, can use the app.

Instructions on its usage will be shown later in this document.

Purpose of TimelineVR:

The app's purpose is twofold; first to take advantage of the PLUGGY's large repository of cultural multimedia content and second to showcase this content in a more aesthetically pleasing and entertaining way than just viewing it in a 2-D environment.

The main concept is to utilize PLUGGY's "Timelines" feature and display the created exhibition in a VR setting, where the user will be able to walk as an avatar inside a 3-D art gallery and observe the various Timeline's stories and their multimedia in their own separate spaces.

TimelineVR was designed with the following three goals in mind:

- To integrate with the PLUGGY's backend to take advantage of all the stored multimedia cultural content.
- To present an intuitive, consistent and pleasant User Experience interface.
- To have a social and cultural impact by providing an easily accessible way for people to experience the Timelines (with their original and unique cultural contents) uploaded by anyone anywhere in the world.

Being an integrated plugin, TimelineVR uses PLUGGY's Web Application Platform which is a modular platform that allows usage of common functionality, like logging and security, for the Social Platform, Curatorial Tool and Application Developer Tool. At the same time, it utilizes PLUGGY's two main modules: the Content Management Services which provides communication through the REST API and the PLUGGY Content Repository which holds all the multimedia content.

That way, much of TimelineVR's functionality depends on the various PLUGGY's modules and takes advantage of the provided services.

Instructions on how to use TimelineVR:

Our app creates a three dimensional gallery room filled with the various stories and multimedia that comprise a PLUGGY Timeline.

The user can either create their own Timelines or experience some else's.

The following part A will describe how to make your own Timeline. If you want to learn how to experience an already created then proceed to part B.

- Part A – How to create a Timeline

After logging in the PLUGGY platform, go to My Exhibitions (step 1) and then select New Exhibition (step 2).

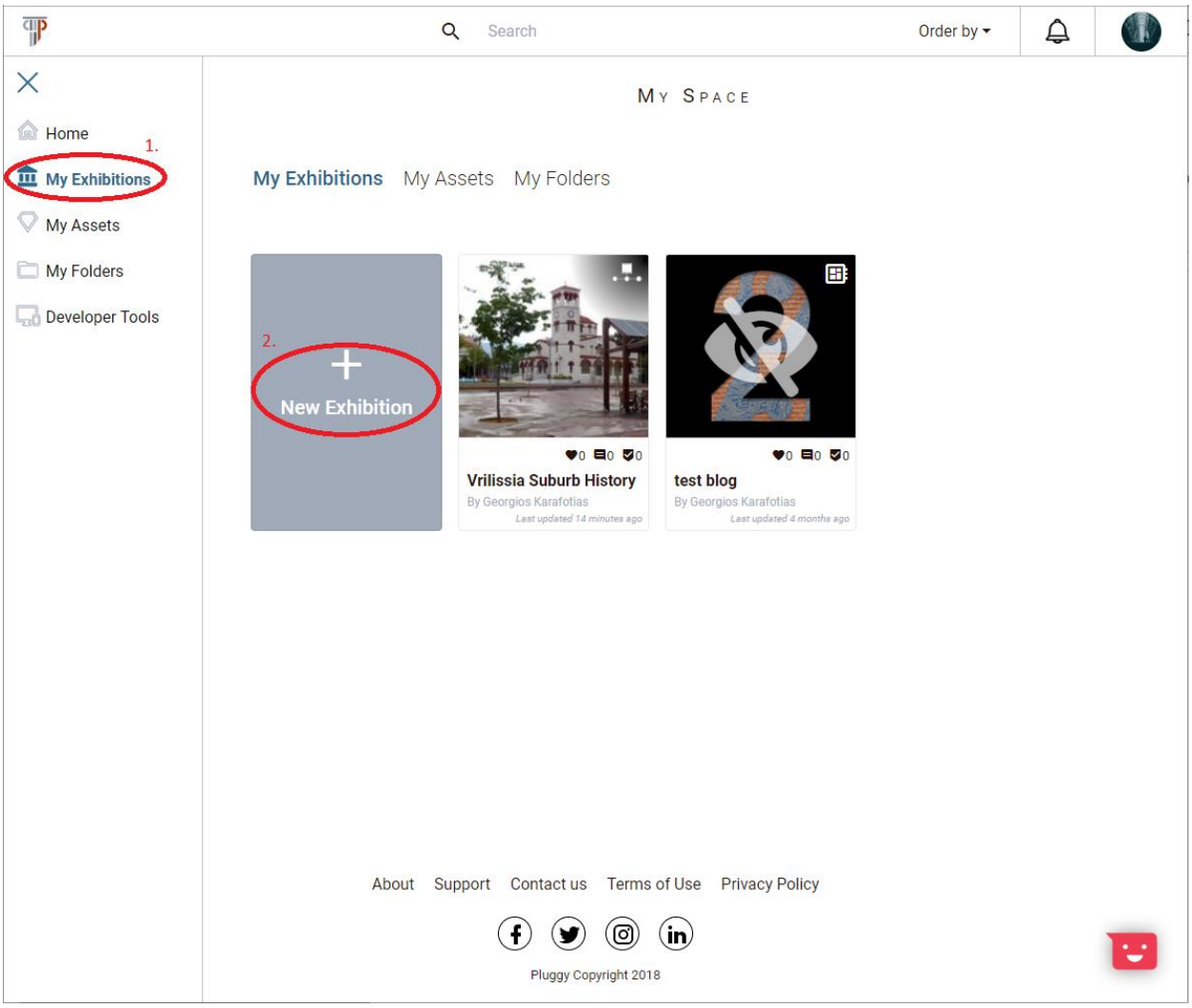


Figure 1: Create a new Exhibition

Select Timeline as the type of the new Exhibition (step 3). This Timeline will be possible to be viewed later in 3-D with the TimelineVR plugin.

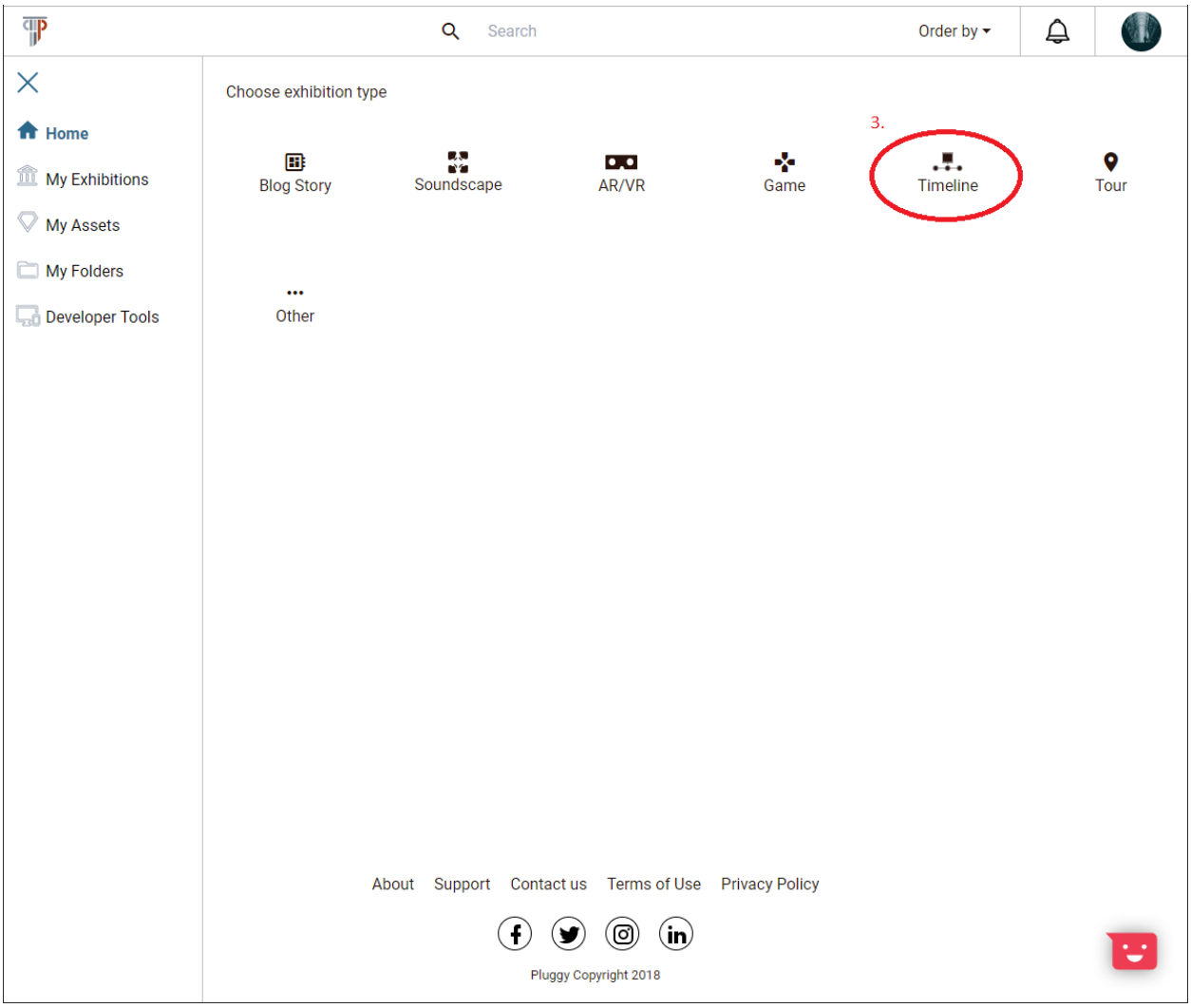


Figure 2: Create a new Exhibition of type Timeline

Enter a title and a short description (step 4) of the Timeline. Then, you may enter a cover image (step 5) and an optional location (step 6).

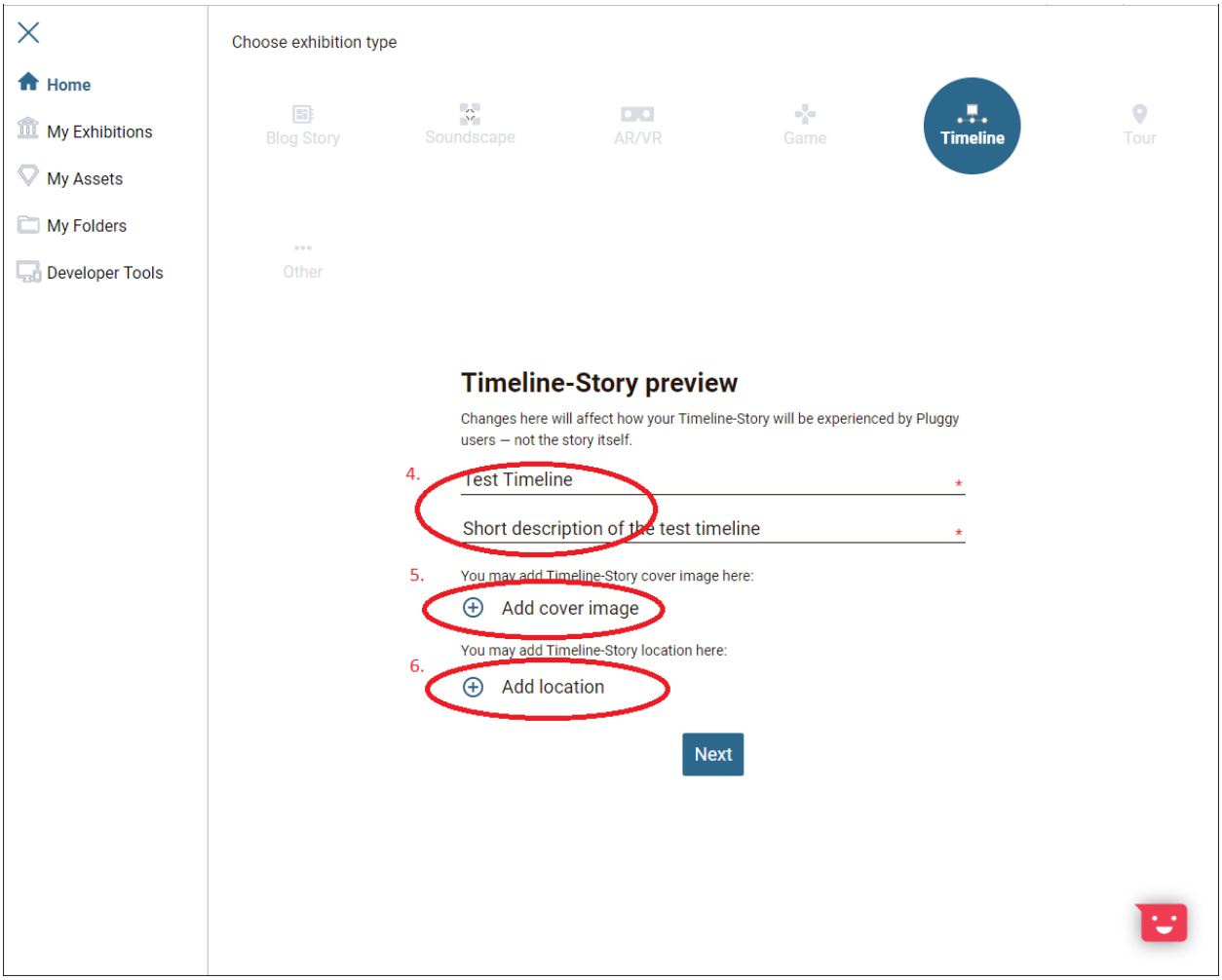


Figure 3: Providing basic information of the Timeline

The Timeline consists of a sequence of dated Stories. Figure 4 shows how to create a Story. A date (step 7) and a title with a description (step 8) must be entered. A location is optional (step 9). Multimedia (images, 3-D models, videos, audio) can be added (step 10). Step 11 publishes the Story and at step 12 you may preview your Story or start creating a new one.

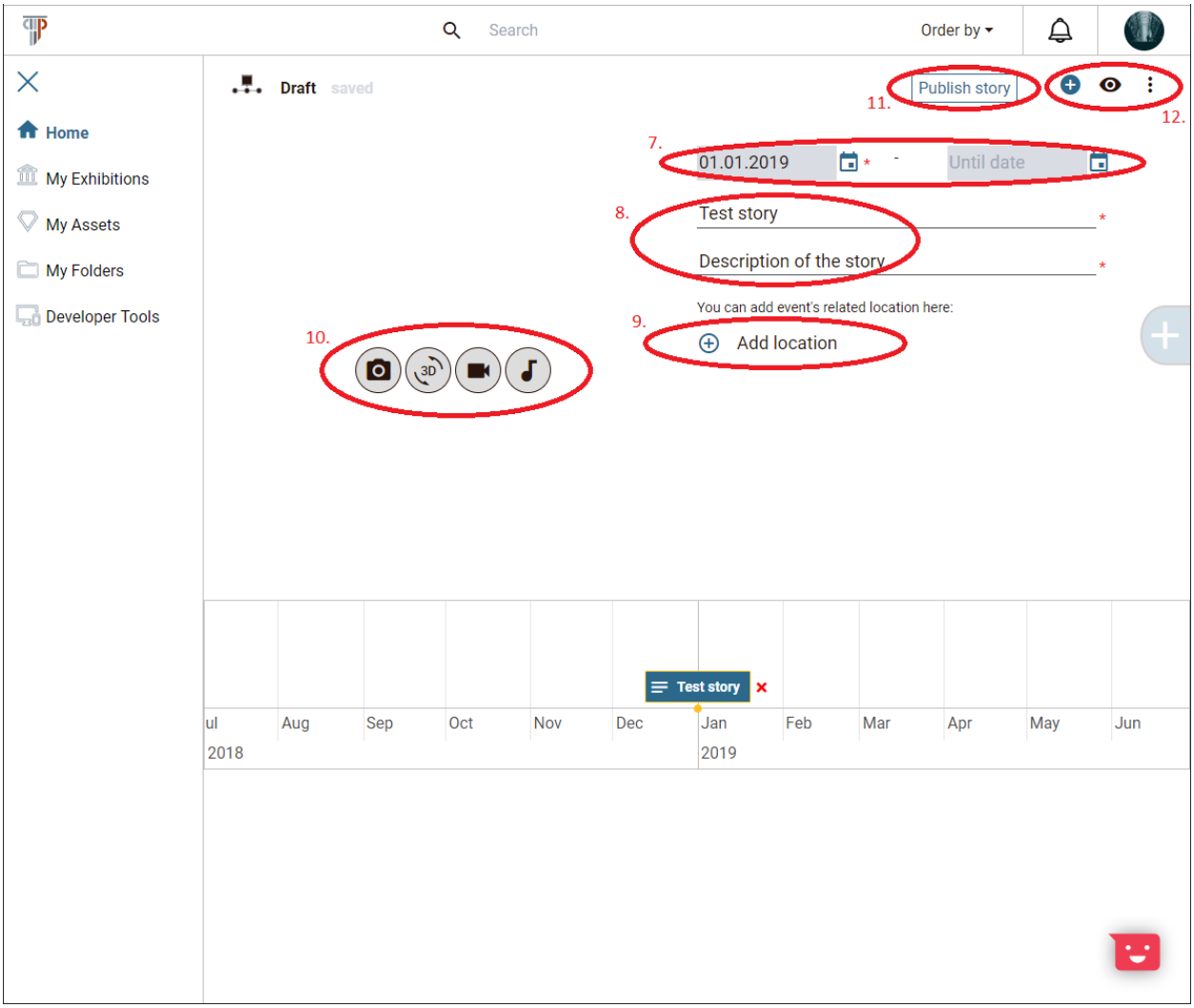


Figure 4: Creation of a Story

The previous step 11 (Publish Story button) leads to Figure 5, where extra metadata must be added to the Story, such as at least three tags (step 13). Publishing should happen after adding all desired Stories first (step 12).

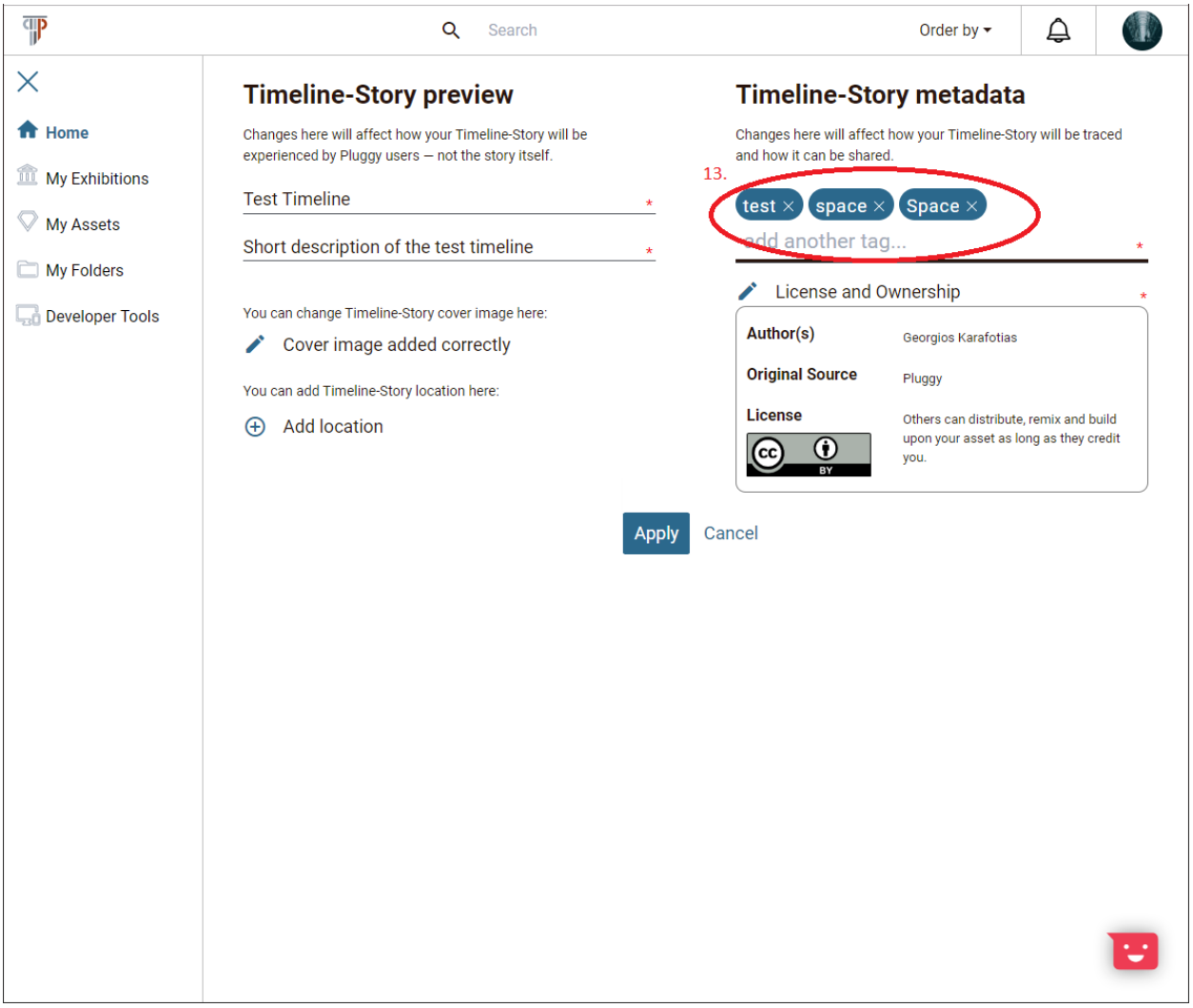


Figure 5: Adding metadata to the Story

- Part B – Use TimelineVR plugin

Visit Home (step 14) and select Timelines (step 15) to see the available ones. Click on the one you want to experience (step 16).

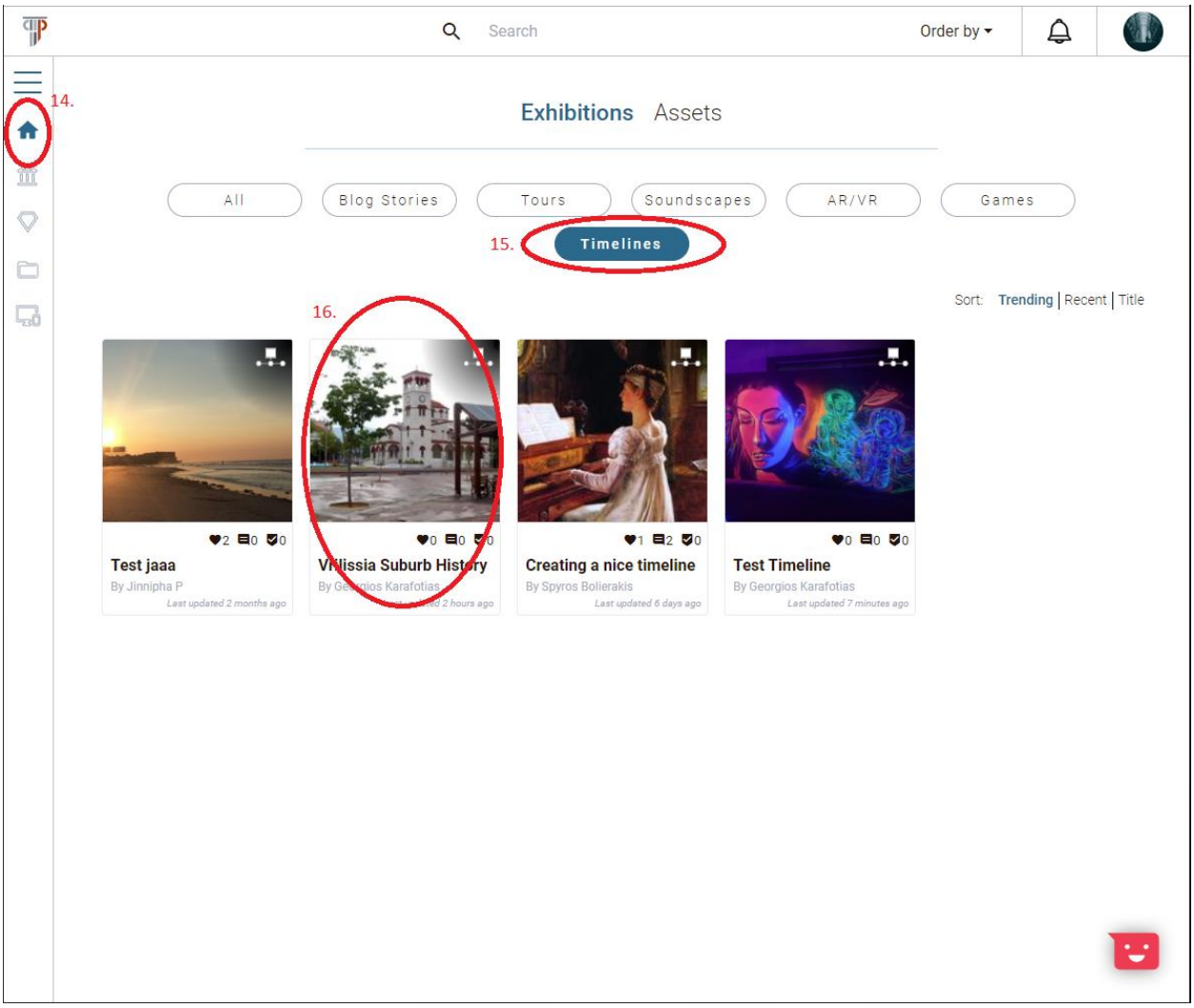


Figure 6: Selecting a Timeline

The puzzle icon button opens the available plugins (step 17). Select TimelineVR (step 18).

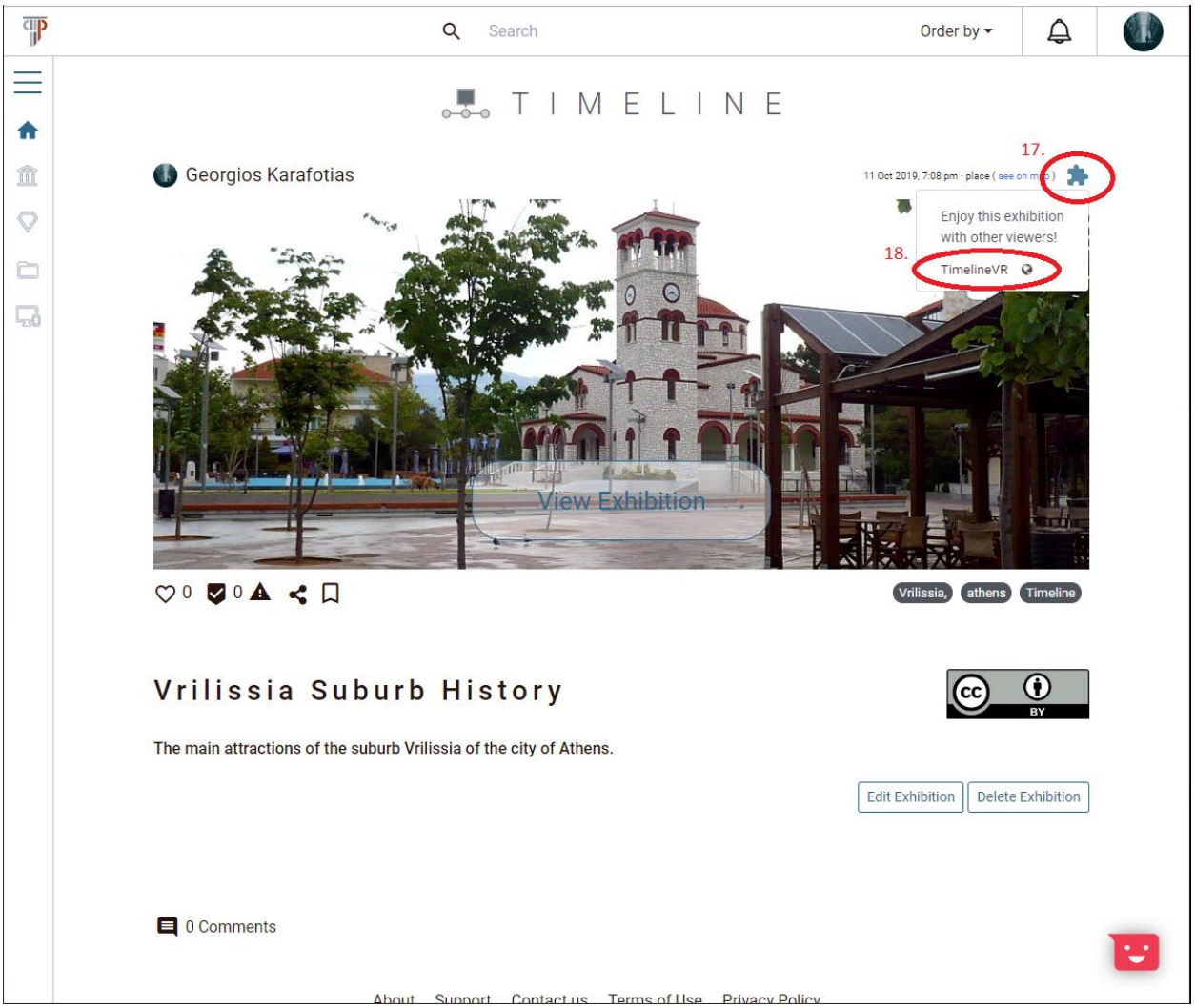


Figure 7: Using the TimelineVR plugin

Figure 8 shows the virtual environment of the Timeline and the various rooms that host the various stories and their multimedia content. You can navigate in the virtual gallery through a first-person perspective, read the information stored in each story and experience the stories' multimedia in a 3-D space.

Figure 8: TimelineVR plugin's Virtual Environment