D7.8

WRAP UP OF ALL SUPPORT ACTIVITIES TO THE PHASE 3 AND ALL USER EXPERIENCE EVALUATION RESULTS ACROSS ALL SITES (M31)

October 2015

ABSTRACT

This deliverable will summarize i) the actions undertaken by the experimentation sites to support the Phase 3 accelerators and sub-grantees and to promote FIC2Lab, and ii) the evaluation results of novel Future Internet user media experiences driven by heavy user involvement and carried by relevant contents from all experimentation sites

This document is a deliverable of the FI-CONTENT 2 integrated project supported by the European Commission under its FP7 research funding programme, and contributes to the FI-PPP (Future Internet Public Private Partnership) initiative.

DISCLAIMER

DELIVERABLE DETAILS

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EXECUTIVE SUMMARY

This deliverable summarizes i) the actions undertaken by the experimentation sites to support the Phase 3 accelerators and sub-grantees and to promote the FIC2Lab (branded FIWARE Media and Content Lab), and ii) the evaluation results of novel Future Internet user media experiences driven by heavy user involvement and carried by relevant contents from all experimentation sites.

This deliverable starts with a list of all actions done by the 6 experimentation sites to support the Phase 3 accelerators and SMEs and to promote the FIWARE Media and Content Lab and Enablers.

Then follows a general overview about the six experimentation sites, the performed experiments and the evaluation results.

Every experimentation site has obtained an ethical clearance through an audit from our external ethical advisor before starting the experiments, which is documented in the Annex A of this document.

Annex B presents a report on 'Additional Results on User Experience Evaluation of the Zurich Experimentation Site'. This experiment evaluated the Flexible and Adaptive Text To Speech (FA-TTS) SE of MIVOQ and was performed from October 9th to October 13th 2015 under the umbrella of the Zurich experimentation site. Annex C describes an experiment called Civic participation game – participatory game design by Takomat under the umbrella of the Zurich Experimentation Site, which ended also in October 2015. As the deliverable D7.6.2 of Zurich Experimentation Sites Phase 2 was already submitted to the Project Officer in Spring 2015, these two additional experiments were added as Annex B and C to this deliverable**.** All the other experiments are described in detail in the respective deliverables of each experimentation site (D7.2-7.1-2.).

LIST OF AUTHORS

Organisation	Author
GAR	Carmen Mac Williams
FhG/FOK	Robert Seeliger, Miggi Zwicklbauer
FhG / IAIS	Heike Horstmann
I2CAT	Marc Aguilar, Sergi Fernández, Pau Adelantado, Pau Pamplona
ETHZ	Marcel Lancelle
ILB	Pierre FRANCOIS
IRT	Ralf Neudel, Christoph Ziegler
ULANC	John Hutchinson
PIX	Dirk Krause
RBB	Martin Gordon
FINCONS	Paloma Basile, Matteo Villa
UPVLC	Benjamin Molina, Carlos E. Palau
BT	Jörn Berkefeld
MIVOQ	Fabio Tesser, Giacomo Sommavilla, Giulio Paci
MTSA	Pablo Martín Pacheco
BridgehouseLaw (Subcontractor)	Thorsten Jansen, Klaus Brisch

Table 1- List of Authors

TABLE OF CONTENTS

ABBREVIATIONS

ADSL	Asynchronous Digital Subscriber Line
AR	Augmented Reality
B2B	Business To Business
CDI	Connected Device Interface
CMS	Content Management System
DRM	Digital Rights Management
DVB	Digital Video Broadcasting
EPG	Electronic Program Guide
ETHZ	ETH Zurich
FTTH	Fibre To The Home
GUI	Graphic User Interface
HbbTV	Hybrid Broadcast Broadband TV
IM	Instant Messaging
IPTV	Internet protocol TV
LTE	Long Term Evolution
OTT	Over The Top
PEGI 7	Pan European Game Information
SCG	Smart City Guide
STB	Set Top Box
UGC	User Generated Content
UI	User Interface

1 - INTRODUCTION

This deliverable first presents the list of actions of the different sites and partners for Phase 3 Open Calls, and then describes the experiments and gives a summary of the validation results from the six different sites. The focus of our work in WP7 has been to provide six working experimentation sites in Brittany, Berlin, Cologne, Barcelona, Zurich and Lancaster for Social Connected TV, Smart City Guide and Gaming trials, to run experiments with test users to validate the specific enablers as well as to give support to the Phase 3 accelerators and sub-grantees. In the first experimentation cycle the partners focused on small scale trials and in the second experimentation cycle on large scale experiments such as Fall of the Wall in Berlin, Transmusicales in Brittany and Fallas in Valencia, involving thousands of users until Mach 2015. Some of the new partners of the open call joined the Zurich experimentation site later and used the extension of the project to perform experiments until October 2015 (see Annex B and C).
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1.1 - Overview: Support Actions for Phase 3

The partners have performed a number of promotional actions to promote the FI-C2 Enablers of the FIWARE Media and Content Lab (FI-C2 Lab), and the open calls of phase 3. Actions comprised workshops and hackathons to demonstrate and test the technologies and form collaboration with different accelerators to promote the open calls. Together all partners presented the FIWARE Media and Content Lab in Barcelona in March 2015 by inviting the Phase 3 accelerators and local SMEs and Developers and demonstrating them the specific enablers. As follow up action, the Barcelona Institute of Barcelona Culture's Directorate for Creativity and Innovation (ICUB) launched from June to October 2015 the Apps&Cultura competition of ideas for applications using FIWARE Media and Content Enablers, and all the other partners promoted the enablers at their experimentation sites and at events throughout Europe.

The following table shows the support actions for Phase 3 from all partners.

Time	Event	Partner	Place	Participants
21st November 2013	Open Call information breakfast for phase 2 and phase 3 in Zurich	DRZ, ETHZ	Zurich	6
July 2014	Startupfair Zurich	ETHZ, DRZ	Zurich	1700
2-5th March 2015	4yfn exhibition: FI-PPP Booth to promote the FIWARE Media and Content Lab to accelerators and third parties (http://www.4yfn.com/)	GAR	Barcelona Fair	+1000
5th March 2015	FI-C2 presentation of the FIWARE Media and Content Lab for the	WP7 Partners involved in FI-C2 Lab Task Force	Barcelona Design Hub	12

	accelerators focused on content and media			
6th March 2015	Joint workshop of FI-C2 partners with Creati-FI, European Pioneers and other accelerators focused on content and media to attract SMEs for the next open calls.	Common action of all WP7 partners	Barcelona Design Hub	150
16 – 18th March 2015	CeBit, FI-PPP Booth and joined Accelerator workshop	GAR	Hannover	+500
25th & 26th March 2015	Net Futures 2015 (http://netfutures2015.eu/)	WP7 Partners	Brussels	+1.000
April 10-11	FI-C2 presentation at "IMPACT FIWARE Hackathon in Florence"	MIVOQ	Florence	+100
15th May 2015	FI-C2 workshop to promote the 2.Open Call in the regional cluster	PIX, GAR	Cologne	11
16th April 2015	Valencia Intelligent City	UPVLC	Valencia	150
April-October 2015	Dissemination of FIC2Lab and Phase 3 opportunities through SCC Knowledge Business Centre regional network	ULANC	NW England	100+
18th May 2015	Workshop at Developer and Startup Hub in Cologne called Startplatz to promote FI-C2 Lab to SMEs and Web developers	GAR	Cologne	32
19th May.2015	Coordination of workshop at FOK, Berlin as part of Media Web Symposium: dissemination of Phase 3 and FIC2Lab	FOK/RBB/IRT	Berlin	20
20th May 2015	Fiware accelerator programme presentation and focus on FI-C2 Lab	ILB	Toulouse	30
26th May 2015	Second Pitch of FI-C2 Lab and Open Call to Startups	GAR	Cologne	46
27th May 2015	EuropeanPioneers Tech Camp presenting FIC2Lab and SCTV platform to SMEs and entrepreneurs	IAIS	Dublin	60

5th June 2015	Fiware accelerator programme presentation and focus on Specific Enablers of FI-C2/FIC2 LAB	ILB	Valenciennes	70
9th June 2015	EuropeanPioneers Tech Camp presenting FIC2Lab and SCTV platform to SMEs and entrepreneurs	IAIS	Warsaw	200
17th of June	Apps and Cultura Launch	I2CAT	Barcelona	~100
23rd July 2015	Smart City Workshop	UPVLC	Valencia	150
11th September 2015	#HaKaTaL FIC2Lab/Phase 3 dissemination and TAL training event (http://tal.lancs.ac.uk/)	ULANC	Lancaster	25
6th of October	Apps and Cultura final event	I2CAT	Barcelona	~30
23rd of October	Apps&Cultura Final winners announcement	I2CAT	Barcelona	N/A

Table 2- WP7 Support Actions for Phase 3

Most actions listed in the table have been performed by a team of partners at different locations throughout Europe and are not documented in detail, as it would go beyond the scope of this deliverable. As demonstration of the collaboration of all WP7 partners, the FIWARE Media&Content Days and the follow up Apps&Cultura competition in Barcelona have been chosen as an example in this deliverable, to show how the WP7 partners promoted together the FIWARE Content and Media Enablers to Phase 3.

1.1.1 - *FIWARE Media&Content Days (March 5th and 6th 2015)*

The FIWARE Media&Content Day was one relevant event targeting to promote FIWARE Open Calls, the adoption of FI-CONTENT 2 technologies, and to evaluate users' perception of SE. The event was two-folded: public and private FIWARE and FI-CONTENT 2 presentations, followed by practical technical sessions.

The 2-days event started with an internal meeting with FIWARE accelerators, which had a FI-CONTENT 2 Lab presentation. On the second day was a full-day public event to present funding opportunities to entrepreneurs, start-ups and developers. The event was hosted in the facilities of Disseny HUB in Barcelona.

Image 1 Disseny HUB building (Barcelona)

Attendees could register to different kinds of sessions and topics. The first type of sessions (main auditorium) provided training on FI-PPP technology and funding opportunities to a select group of local developers. The second one was training oriented to empower attendees to position them to take advantage of:

- More than 80M€ of financing offered by the open calls of FI-PPP Phase III accelerator projects for apps developed using FIWARE/FI-Content 2 technologies;
- The “Apps&Cultura” Hack@home competition, organized jointly with the Barcelona City Council (ICUB), which had the objective to reward the usage of technologies developed under the project FI-Content 2.

It was in the morning that funding opportunities (open calls) were presented, to help participants building their ideas and stimulate them to reach their market. The Open calls introduced were:

- Apps and Cultura 2015
- New open calls from the FIWARE Accelerator program, including: CreatiFI, FI-C3, EuropeanPioneers, IMpaCT and FABulous.

These presentations were followed in the afternoon by hands-on sessions and workshops, where FICONTENT 2 experts introduced FIWARE Media and Content Enablers. Three different rooms received almost 75 attendees that learnt about the different opportunities that have emerged around the FI-PPP ecosystem, and which obtained valuable technical knowledge on the usage of the three FI-Content 2 technology platforms:

- Social Connected TV,
- Smart City Services,
- Pervasive Games.

Image 2: Some of the sessions and demos that took place during the event at Disseny HUB (Barcelona)

This knowledge assisted them to better target their proposals, as well as submit more solid project ideas, at both the technical and conceptual levels, at the FI-PPP open calls and the "Apps&Cultura" competition.

The audios and videos of the sessions were recorded and made available in the project's website, as a source of additional knowledge for third parties on the usage of the FIWARE enablers.
It is important to highlight the importance of such event in order to stimulate and boost the adoption of FIC2 enablers by creatives and developers in Europe. The event was also advertised through the project website and other relevant networks and entities, not only from the creative sector, but also others like biomedicine or mobile technologies (http://mediafi.org/fiware-media-content-open-day-funding-opportunities-technical-training-creative-industries/, http://www.ticbiomed.org/2015/03/02/el-fiware-media-content-open-day-se-celebrar%C3%A1-el-pr%C3%B3ximo-6-de-marzo-en-barcelona/, http://idigital.cat/web/i-digital/coneixement/noticies/detall/-/asset_publisher/SyO6/content/noticia_disseny_hub_acull_media_content_open_day).

Finally it was also relevant that interaction between SE owners and attendees brought informal feedback about the enablers and how much interesting they are for users.

1.1.2 - *Apps&Cultura Hack-at-home FIWARE Competition (3 June – 23 October 2015)*

Apps&Cultura is an annual competition of ideas for applications that can be used on any device (computers, tablets or smartphones) to facilitate and/or promote public access to culture, helping those engaged in the cultural and creative industry to improve and develop their activities. The competition is hosted by the Barcelona Institute of Culture's Directorate for Creativity and Innovation (ICUB), which launches the Apps&Cultura competition.

For the 2015 edition of Apps&Cultura, the Directorate for Creativity and Innovation partnered with the FI-CONTENT 2 project to offer the Hack-at-home FIWARE Competition. The agreement stipulated that those entering the Apps&Cultura competition were also eligible to compete for prizes worth 13,500 euros if they used at least 2 FIWARE enablers by FI-CONTENT2. In parallel they could enter the final of Barcelona Smart City Apps Hack. Thus, this partnership promoted usage of FIWARE enablers, and the development of applications that made effective use of the FIWARE technologies. Moreover, FICONTENT 2 strengthened its links with the CreatiFI accelerator, stimulating applicants to use the outcomes of Apps&Cultura to apply in CreatiFI's 2nd Open Call (closing September the 30th).

Event	Date
Registration opens	3 June 2015
Registration closes	26 June 2015
Presentation	17 June 2015 19h at Disseny Hub Barcelona
Meeting for the formation of teams, idea forming and selection	4 July 2015. Fabra i Coats Carrer de Sant Adrià, 20 at 10:30h
Publication of those selected for the training phase	10 July 2015
Training begins	20 July 2015
Training ends	September 2015
Pre-selection of winners	September 2015
Final event	6 October 2015
Submission of final prototypes and technical doc	23 October 2015

Table 3. Calendar for Barcelona Apps&Cultura FIWARE competition

From July 2015 till October 2015, i2CAT members have been in constant contact with participants in order to provide them some guidance and advice on the usage of FICONTENT 2 SEs. This is thanks to how Apps and Cultura is structured.

First there is an ideation stage, where i2CAT provided initial advice on which technologies could feed and enrich the project. A set of enablers was recommended for each applicant, introducing the technology and what was the added value for their project.
After this stage, applicants sent and presented their proposals. Based on all these submissions, a jury made a pre-selection among all of them. Only 15 entities were chosen to keep participating in the incubation process (from July 4th till October 23rd). During this process there were two strands: one leaded by ICUB (supported by INCUBIO), to guide participants in the process to bring an idea to a project concept ready for acceleration. The second strand was conducted by i2CAT and guided participants to their introduction into the FIWARE ecosystem.

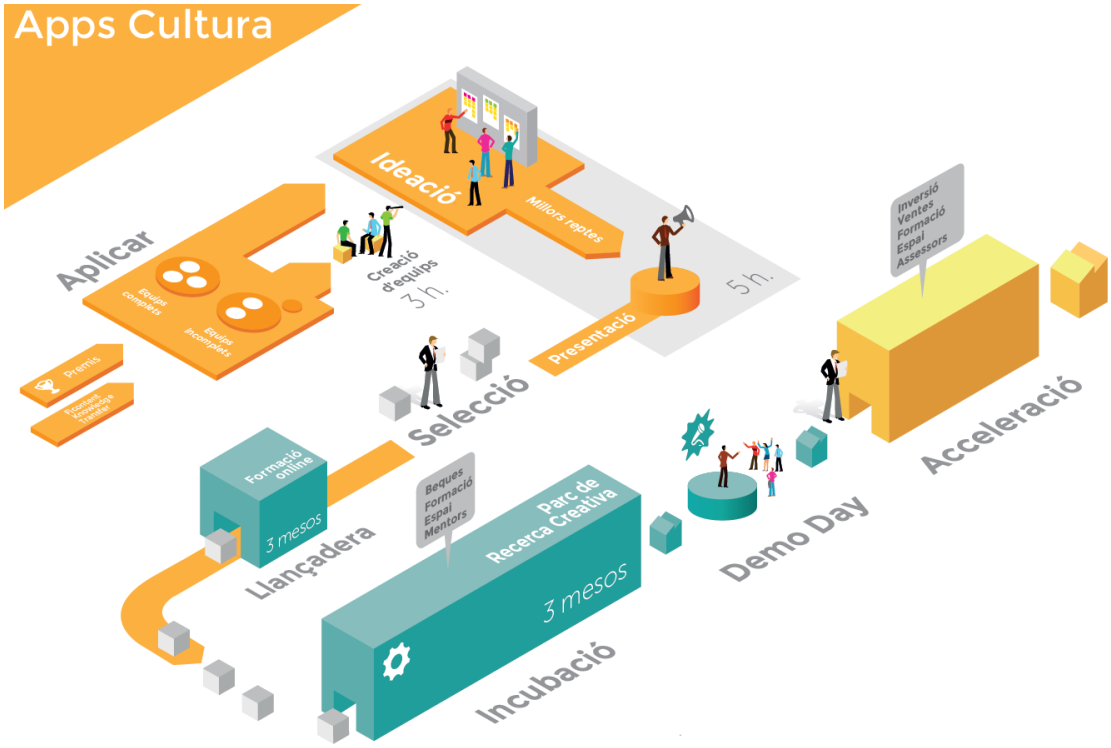


Image 3 INCUBIO's project process management: Application, Ideation, Selection, Launching, Incubation, Demo and Acceleration

FICONTENT 2 was involved in this process using Google Classroom. This tool enabled the creation of tasks (milestones) for those willing to take part in the FICONTENT 2 awards.

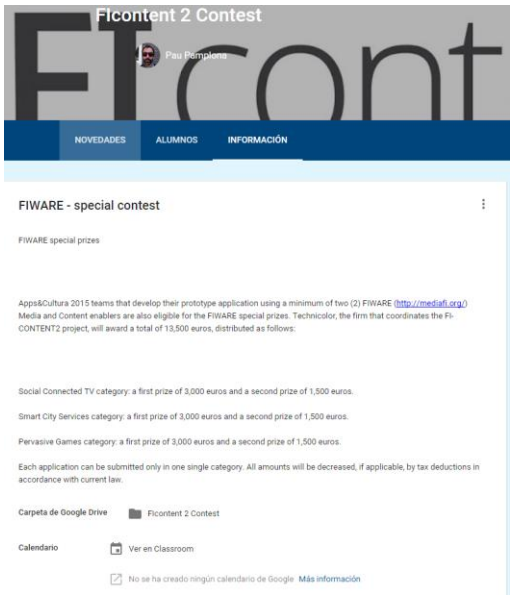


Image 4 Introduction to FICONTENT 2 special contest in Apps&Cultura

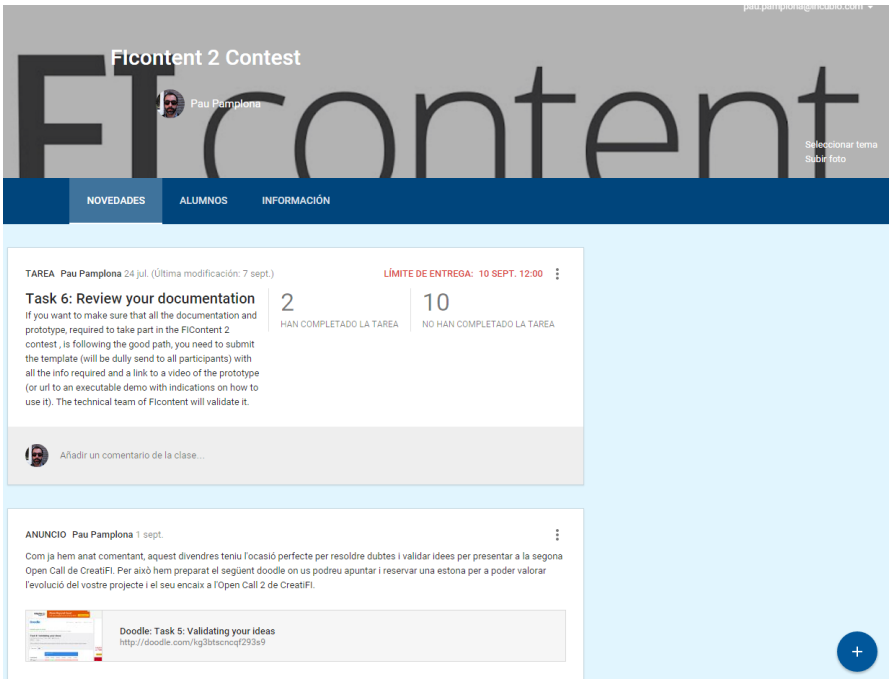


Image 5 Screenshot of the classroom used

In parallel, follow-up meetings were hold by FICONTENT 2 members (i2CAT technicians and project managers). The 7th and 21st of August, and the 4th and 18th of September, jury members have evaluated the progress of the developments by the teams.

Annex A

FINALLY, FOUR TEAMS REACHED THE FINAL STAGE, PRESENTING A WORKING (AND SUPPORTED BY TECHNICAL DOCUMENT AND A DEMO-VIDEO AND INTERVIEWS[1]. THE TEAMS ALSO WERE ADMINISTERED A FEEDBACK QUESTIONNAIRE ON THEIR USAGE EVALUATION OF THESE ENABLERS, AND SUGGESTIONS FOR IMPROVEMENT OF THE FIWARE INFRASTRUCTURE (SEE ANNEX CD: CIVIC PARTICIPATION GAME – PARTICIPATORY GAME DESIGN

Experiment by Takomat: Participatory game design with a game about civic participation

Zurich Experimentation Site

Description

TAKO's specific enablers Phenomobile Dialog Manager and the 2D-character functions of the Phenomobile Character Manager have been used in a game that has been published by takomat in May 2015. The game "Buebe-Bürgerbeteiligung" is an online game about civic participation and can be played online under the following link: http://game.buergerbeteiligungsspiel.de. The game has been produced for the Baden-Württemberg Foundation.

For evaluation purposes TAKO created a website: http://buergerbeteiligungsspiel.de

The website of the game had 1776 unique visitors until end of October 2015. TAKO implemented an online participatory design contest for players that was hosted on this website. In this competition players could comment on the game and make suggestions to improve it. The two winners of this participatory design contest have been announced on August 17th 2015.

The game has been tested so far by 120 web users who successfully played the online game until the end of the game. TAKO created a review and comment function for players for the participatory design competition. TAKO collected 26 online comments and 8 offline comments from players to improve the game and game technology.

Website of the game and the participatory design contest:

[1] https://www.youtube.com/channel/UCk6r7qGjvS4uQ_F_083F3dQ

Screenshots of the game:

Apps and Culture technical deliverables)

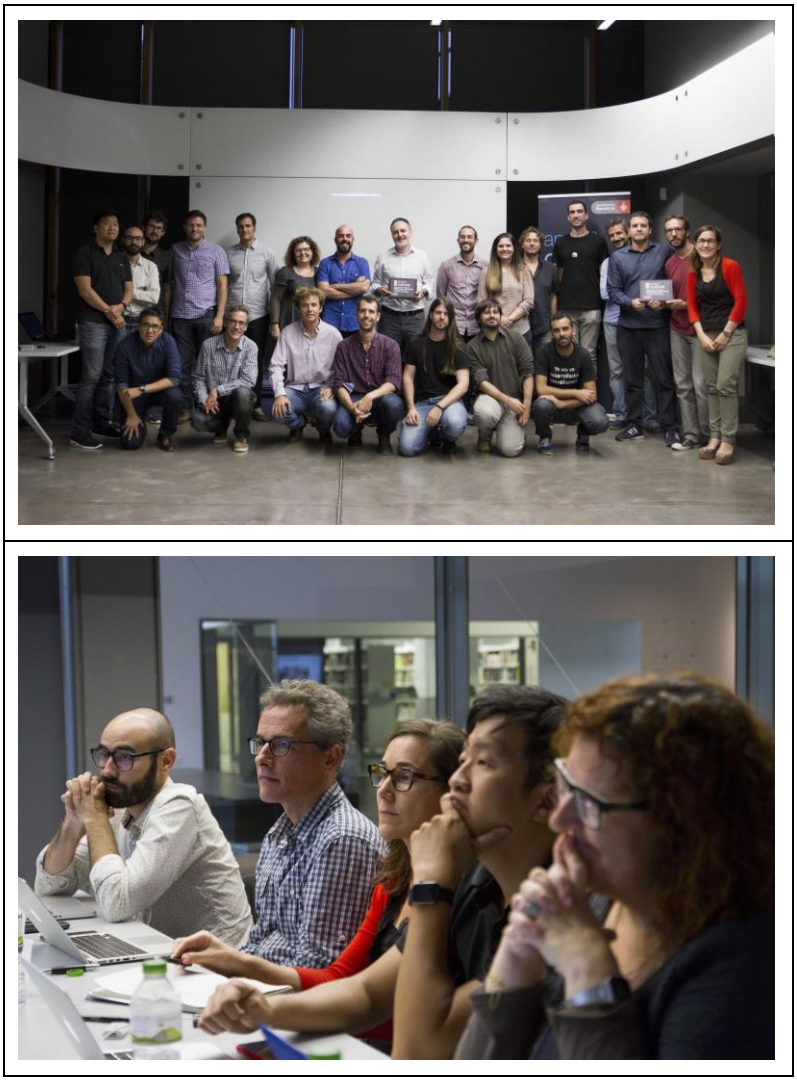


Image 6 Finalists of the competition and the members of the local jury

The first and second prizes for the Pervasive games category were CommonLocals and HeyMoth apps, respectively. As regards the Smart City services category, the winning submission was the Propozapp application. The project UpperSocial reached the final steps of the competition, but they did not present the final prototype which was requested to access the awards. In the Social Connected TV category, there was no winner of prizes, since all participant groups who expressed interest in taking part in the competition had difficulties in the prototype development phase, which made them drop out of the final submission phase.

Project Name	Category	Ranking
Hey Moth!	Pervasive Games	1
CommonLocals	Pervasive Games	2

Below is provided an abstract of each one of the projects taking part in the competition.

PERVASIVE GAMES

Hey Moth description:
Hey Moth! is a platform with the purpose of connecting people with events and venues with similar music tastes. Basically, it is the musical map of your city.

It creates a music profile for each point of interest (POI) based on the music usually played at this location. Also, the system creates a music profile for each user through a mobile application through small interactions with the App. Then, these profiles are matched in order to display in a map the venues of interest for the user.

With the purpose of making the application more enjoyable and addictive, it is intended to introduce some Gamification features. The aim is to allow the users to upload up to 10 seconds of audio associated to a specific place. Also, the users will be able to moderate these audios in order to earn some points that they can spend in some other features, enhancing this way the content of the application.

In order to make the experience closer to a wide-city game, there is idea to add a few new features, as for example:

- Allowing users to also upload pictures;
- Leave messages in some places that can only be read if users are near this point;
- Rating the material uploaded by other people, creating contests based on these rates.

All this information will be stored and shared in order to create not only data about what's going on right now, but also a timeline of the events which happened in our city.

In order to ease the addition of these Gamification features and increase the visual impact, the HeyMoth team decided to use Unity 3D as a mobile development engine.

The following link brings to a demo-app of Hey Moth.
https://play.google.com/store/apps/details?id=com.heymoth.heymoth

Please, bear in mind that this application is in development process, so some of the functionalities described in this document are not included. Also, the data displayed may not be real.

A demo-video can be seen through the following link:
https://www.youtube.com/watch?v=4CJMmjCPajc

Common Locals description:

Common Locals is a marketplace platform where travellers can contact local people. The objective is to connect them so that the local is able to:

(1) help the traveller in the trip planning task, and

(2) provide additional services and activities during the trip.

In such marketplace, the first action the traveller will take is to select the visiting destination (mockups in Figure 1 illustrate the initial user workflow). Afterwards, the traveller will be able to browse among different locals available in the visiting destination. Each local will have a detailed user profile including description, list of interests, favourite spot, recommended example route, services and additional activities, reviews from other travellers, etc. The platform includes a so detailed local profile because it is very important to help the traveller find the local that better fits him. In addition to this, we plan to implement a recommendation engine that optimizes the matching between the traveller and the locals with most similar profiles. Once the local is chosen, the trip planning co-creation phase occurs. In this step the traveller and local remotely interact to build a trip plan.

Figure 1. Initial user's workflow: Chose destination => Browse locals => Local profile

While the trip-planning co-creation is a task performed before the trip starts, Common Locals is also present during the trip itself. This is where the other services offered by locals come into action. Although some of them are not platform dependent because they are based on the personal interaction between the traveller and the local (e.g. *Airport Pickup* or *Welcome Meeting*), the ***Online Gamified Trip Support*** service is a real-time gaming and communication tool that indeed requires technological effort, and hence it will be part of the software platform as well (figure 2 shows a mockup of this feature).

This feature aims at introducing a gamified experience during the trip; it is considered that such features will help in making a better experience for the traveller. Thus, this gamified experience has been designed as a clue-based game where:

- Each clue is a different place to visit (it is seen as a gamified tourist route);
- The traveller only sees the picture of the next visit, and has to guess where it is located;
- When the traveller physically arrives to the place in the clue, the next one is unblocked.

The local is the person that manually selects the personalized clues for the traveller.

Figure 2. *Online Gamified Trip Support*

The described game is a multi-user gamified platform where players interact in order to boost their travelling experience. Note that this type of game requires no physical structure (just the city), and it brings the possibility to introduce different 'tasks' to facilitate relationship between the traveller and other locals (for instance one task could be to take a picture on the place to visit together with other locals). Note that, in the end, the objective is to enhance the traveller experience, by making contact to local people who can help to open new experiences. Also note that the game is not limited to two people (local and traveller): it is proposed to introduce group-tasks to be completed together with other travellers, or even more complex clues where several locals are involved.
It is exactly around this feature that FIWARE/FICONTENT 2 platform possibilities will be tested.

The demo app (only iOS version) can be downloaded and tested using the following link: https://rink.hockeyapp.net/apps/2156fbf77305700eded60f0c58d41200.
Click the link for a visual demo of both local and traveller functionalities:
https://www.youtube.com/watch?v=F2G2U6zM1RI

SMART CITY SERVICES

Propozapp description:

Propozapp - Unfolden is a two part solution, empowering artists for their promotion and providing new entertainment alternatives to event seekers.

Any artists can create their new event and start promoting themselves by going to our web, entering their personal space and creating events and places where they perform. The focus on simplicity and feedback allows the artist to see how the event will be displayed when they are gathered and distributed through the second part of the solution, our agenda.

The agenda is a mobile app where you can find those alternative events the artists just created, mixed with other events and data to ensure you find what you most like. The design is simple and focused on easiness: you are presented with just an event at a time, you can like it or dislike it by swiping right or left respectively, and the app will learn from that, making future suggestions so much better.

We focus on empowering the artists with a good and easy tool to promote themselves to new audiences, and for that, we aim at having a dynamic agenda very appealing to the public.

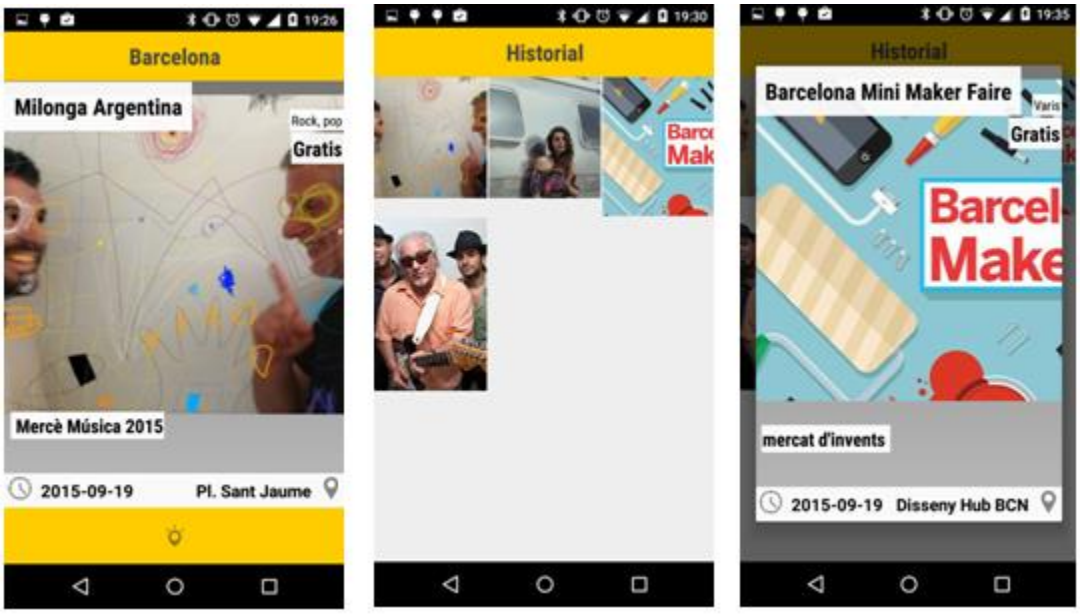


Image 7 Screenshots of the App

There is an instructional video at: https://youtu.be/6l2ASFxV0ek .

UpperSocial description:

Upper is an app which aims to give the user an experience in the whole process of leisure. The before, the during and the after.

- Before: the application displays leisure offers with user preferences and geographic location based on Big Data techniques. You will know where your friends go to events, at the same time which users go to the same event, while you can communicate with them.
- During: during the event, users can share posts with other people in the same event: pictures, videos, text, etc. And they can communicate with other users.
- After: users can see establishments near the event and know where other users go.

All this with a character of exclusivity and privacy.

Our main objective is to change the way that people are consuming entertainment:

- Filter the maximum cultural offer noise on the major cities;
- offer the user a unique experience in the way he has to enjoy his free time and how it reaches the cultural offer;
- Organize your time quickly and efficiently.

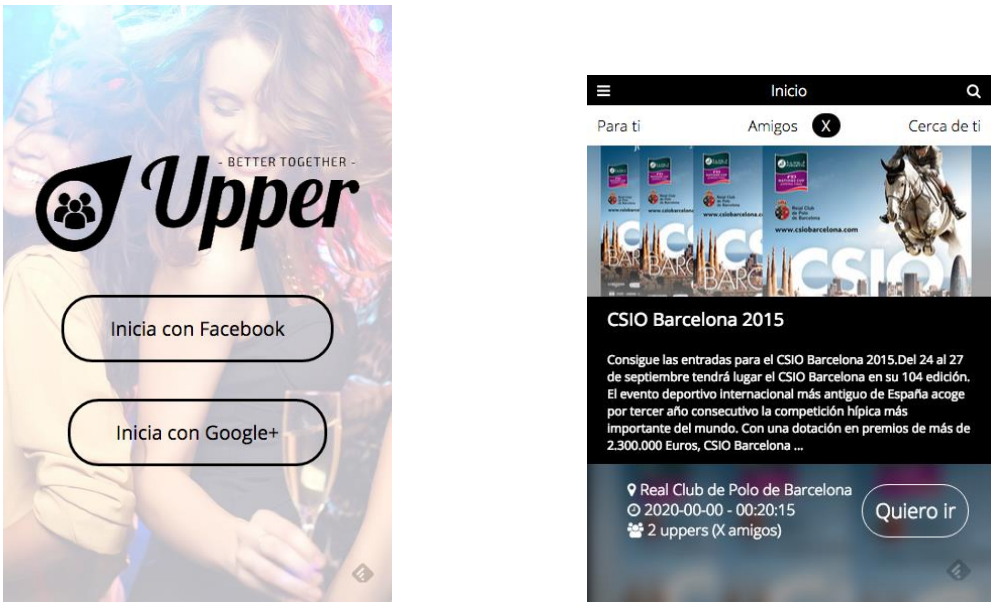


Image 8 Screenshots of the UpperSocial App interface

Download Demo App: https://play.google.com/store/apps/details?id=social.upper (Register with Facebook or Google +).

2 - EXPERIMENTATIONS OVERVIEW OF ALL PARTNERS

The following table lists all 46 experiments in WP7 in chronological order:

Number	Date	Site	Scenario
1	Apr 13	Zurich	Attractions Driving Content Sharing
2	June 2013	Berlin	Multi-screen experience
3	July 2013	Zurich	Augmented Reality in the Wild
4	Sep 13	Berlin	Multi-screen experience
5	Sep 13	Berlin	On Site Visit
6	Oct 13	Brittany	Smart City Guide (Orange)
7	Nov 13	Zurich	Seamless Augmented Reality on the Web
8	Nov 13	Zurich	Virtual Character Synchronization on the Web
9	December 13	Brittany	Smart City Guide (Orange)
10	December 2013	Zurich	Tabletop Augmented Reality Games
11	December 2013	Brittany	Search and discovery (Technicolor)
12	January 2014	Berlin	Multi-screen experience
13	February 2014	Cologne	Carnival Social Network
14	February 2014	Zurich	Immersive Control Systems
15	February 2014	Barcelona	Local Content and Recommendation functionalities
16	February 2014	Barcelona	Tabletop Augmented Reality Games
17	February 2014	Barcelona	Virtual Character Synchronization on the Web
18	March 2014	Berlin	On Site Visit
19	March 2014	Barcelona	On Site Visit
20	March 2014	Berlin	Multi-Sceen Experience
21	March 2014	Berlin	Rich Content
22	March 2014	Barcelona	Augmented Reality Games hackathon
23	May 2014	Barcelona	On Site Visit
24	July 2014	Zurich	Location-Based Virtual Reality
25	July 2014	Zurich	Tabletop Augmented Reality Games
26	Aug 14	Lancaster	Social Annotation
27	October 2014	Zurich	City-Wide Economic Game
28	October 2014	Zurich	City-Wide Scavenger Hunt Game
29	October 2014	Zurich	Tabletop Augmented Reality Games
30	Nov 14	Berlin	Fall of the Wall
31	December 2014	Brittany	"evenTribe" App for Transmusicales
32	December 2014	Zurich	Creating SLAM-based AR Game using Web Creator Tool
33	February 2015	Barcelona	City-Wide Economic Game
34	February 2015	Berlin	On Site Visit

35	February 2015	Barcelona	On Site Visit
36	February 2015	Berlin	Advertising Applications / Multi-Screen Experience
37	February 2015	Berlin	Indexing and Retrieval for Media Archives
38	March 2015	Cologne	Valencia Fallas Festival
39	May 2015	Lancaster	TAL Evaluation
40	May 2015	Cologne	Tenerife Transit Experience
41	May 2015	Lancaster	Content Optimisation
42	May 2015	Lancaster	Rich Content application Video Cloud
43	June 2015	Berlin	Rich Content application Video Cloud
44	June 2015	Berlin	Advertising Applications / Multi-Screen Experience
45	Aug 15	Zurich	Civic Participation Game
46	October 2015	Zurich	Intelligibility of Flexible and Adaptive Text To Speech

Table 4 - WP7 Experimentations

These are the scenarios which have been tested on FI-CONTENT's Experimentation Sites and will be shortly described by each experimentation site in the next chapters.

2.1 - BRITTANY Experimentation Site

2.1.1 - *Description of experiments*

Brittany site performed 4 experiments:

- 3 of them were Smart City Guide Experiments,
- And the 4th was a Social Connected TV Experiment.

Among them, 3 small scale experiments were performed during the 1st cycle of experimentation:

- In October 2013, a "Smart City Guide" mobile application developed by Orange was tested in Brest by a small group of 15 native students appointed and managed by ILB. This mobile application, built on 2 Specific Enablers developed by Orange (Local Content Management, Recommender) with open data provided by Brest Métropole, gave recommendations on events (concerts, exhibitions, etc…) and points of interests (museums, restaurants, attractions, etc.). These contents (events and points of interest) were aggregated to provide users a simplified experience and geolocation services, tourism and cultural offerings available in Brest.
- In December 2013, an enhanced release of this application, using the same enablers, was again tested in Brest by another group of students, mostly foreigners, to study their specific needs.
- From December 2013 to February 2014, a “Social Connected TV: search and discovery” application was tested in Rennes by 18 local people. Built on a specific enabler (Content similarity) developed by Technicolor and 2 FIWARE Generic Enablers, this application aimed at helping VOD users to discover new contents in innovative ways.

The last one was a large scale experiment which involved more than 200 people during the Transmusicales festival in Rennes (4-7 December 2014). The scenario was developed by eBusiness (eBiz) in partnership with the Transmusicales staff, and aimed to improve the user

experience of festival attendees by providing them useful and attractive new applications (evenTribe App). It involved many Specific enablers (PIO Proxy, Content Sharing, 3D Map Tiles, …) and Generic Enablers (3D UI, POI Data Provider).

2.1.2 - *Summary of evaluation results of experiments*

The “Smart City Guide” experiment gave the following results:

- Testers were well motivated: they all declared being still interested in the service at the end of the experimentation.
- The SUS (System Usability Scale) showed a good score of usability, attractiveness and appearance.
- In terms of usage, no main difference has been observed between both groups, native and foreign students, showing that it makes sense to propose a convergent offer to this both segments.
- They clearly positioned the application to be different from existing offer and found an added value.
- Dynamic data such as events were clearly the ones that were highlighted first. Transportation data associated was perceived as interesting completion. Position of bus and tramway or metros in real time appeared to be one of the most important functions according the Kano analysis.
- The richness of POI, which is a combination of various data integration such as Open Data, Professional Content and some UGC, has a clear added value.
- Contribution was clearly a missing point of the existing proposition as it has been tested.
- Filters, paths / itineraries were the most valued features by both groups.
- Users consider the app has to rest on a community, sharing content was well perceived by users. Two main categories of content can be shared according to them: POIs (which include events according to our definition) and Paths.
- However they qualified two levels of privacy in terms of sharing: publicly for POIs and restricted audience for paths. This point out a sensibility while treating with personal contents, contextualization …
- Considering content enrichment, three structural aspects have been identified to determine which type of enrichment: the content itself, the devices used, and the displaying.

The “Search and Discovery” experimentation was well received by panellists too:
Two methods were used for the evaluation: Usage logs & Evaluation kit

- Usage logs were generated by users at platform level. Each user action was stored and can be analyzed in differed time.
- In addition, a specific kit has been conceived to collect user feedbacks.

At the end, we obtained a very good involvement of panellists with relevant results on the use and attractiveness of applications - 87% of the panellists would recommend the service.
The usage of the application was increasing week after week. The application worked perfectly and almost no technical or functional support was necessary.

The large scale experiment carried out during the Transmusicales festival has shown how easy it was to develop applications very quickly in the area of festivals with FIWARE generic enablers and FIContent 2 Specific Enablers.

Tests conducted by users during this large scale experiment highlighted the strengths and weaknesses of the application both technically and in terms of usages.
To briefly summarize results of the experimentation:

- Users mostly perceived the functionalities as innovative (specially the 3D map) and very useful, but some of them had difficulty running these functionalities properly due to technical limitations of their smartphone.

For companies who would use these enablers, recommendations are:

- To associate representative users to the early phases of development, to be sure that the developed product meets expectations of users;
- If you are developing apps for smartphone, it is important to find the right compromise between new technologies and performance provided by an heterogeneous fleet of smartphones;
- To ensure compatibility of enablers with smartphones and to be precise on the minimum system requirements.

After taking into account corrections and changes proposed by the users during the experimentation, eBiz plans to make “evenTribe” App a marketable product dedicated to all festival organizers.

2.2 - BERLIN Experimentation Site

2.2.1 - *Description of experiments*

The Berlin Experimentation Site performed WP2 and WP3 experimentations.

- WP2 June 2013: the first Multi-Screen Experience was tested with an expert test. The IRT Second Screen Framework SE was developed in the *rbbtext* demo. *rbbtext* was part of the portfolio of on-air services broadcast by RBB. The tests were designed to be ‘friendly’ user tests to be conducted under realistic circumstances. The aims were to identify usability issues in advance of further testing, to identify areas for possible improvement and development of additional services, and to deliver methodological input into future testing and trials.

- WP2 September 2013: FOKUS tested the Rich Content scenario including Content Enrichment SE on HbbTV. Objects in the video were "enriched" with further information, which was displayed as an overlay on the TV screen. The objective of the test was to validate content enrichment on standard HbbTV devices. We needed to assess the technical performance of the app on a range of HbbTV-enabled devices from various manufacturers. A further objective was to gather feedback on the user experience in terms of interacting with objects on the TV screen using a remote control as interaction device.

- WP3 September 2013: the 1st version of the Smart City Guide Web App was developed and tested by FOKUS as part of the On Site Visit scenario. The content comes from the Open City Database (OCDB) SE, which contains a collection of cities and their Points of Interest (POIs). For the first experiment in Berlin, the IFA was established as a “city” and various booths could be created as POIs.

- WP2 November 2013: the second Multi-Screen Experience was tested in lab tests. Applications tested were *rbbtext* and the ARD Electronic Programme Guide (EPG). The purpose of the tests was to reveal basic usability problems in advance of upcoming field tests. Discovery of any such issues at an early stage minimises any possible problems during field tests.

- WP2 January - March 2013: during the field trial in of the Multi-Screen Experience, users tested the HbbTV version of *rbbtext* and ARD Electronic Program Guide (EPG). The objective of the field trial was to evaluate the second screen framework by running tests under realistic circumstances. The objective of the field trial was to evaluate the second screen framework by running tests under realistic circumstances. Real users were to test second screen applications at home under real conditions. During the trial, data about the frequency of use, changes in use of the applications (effect of habituation) and about problem-solving strategies was generated, giving rise to recommendations about optimization of applications from the perspective of end user needs and acceptance.

- WP3 March & May 2014, February 2015: the 'Smart City Guide', which was the second release of the On Site Visit application, was tested in lab tests. In this release it was also possible to add videos to an existing POI. To enable testing, Barcelona was created as a city in the Open City Database and filled with local information and enriched images with the Content Enrichment Common Enabler. This was done by integrating the Content Enrichment SE and the Object Storage GE for storing uploaded user generated videos.

- WP2 March 2014: the second Rich Content application was tested with content from RBB in the FOKUS Hybrid TV Lab. Also the Second Screen Framework was integrated to combine the two WP2 Scenarios Rich Content and Multi-Screen Experience. The objective of this round of tests was to validate the use of the second screen for content enrichment.

- WP2 November 2014: the HbbTV Application Toolkit (HAT) SE was used in the creation of a social-media HbbTV app, which accompanied a 25hour-long programme from German broadcaster RBB. On 9th of November 2014, the 25th anniversary of the Fall of Wall, the broadcast used HAT to integrate broadcast video and a 'Scribble Live' feed, which aggregated user posts and comments from various social media sources (Twitter, Facebook et al).

- WP2 February 2015: following the on-air trials of the Fall of the Wall application in November 2014, an additional usability trial of the application was conducted on 19/20 February 2015. After the on-air trials, a second navigation theme was developed for the Fall of the Wall application, which uses arrow keys for navigation. The objective of this test was to reveal usability problems and to comparatively test an updated version of the navigation theme against the one implemented in the on-air trials.

- WP2 February – March 2015: the first Interactive TV Events and Advertising Applications / Multi-Screen Experience, Rich Content scenario was tested at FINCONS lab. The applications, implemented by FINCONS and developed within the FI-CONTENT2 project, provide a multi-interactive experience to the end user based on Second Screen and Content Enrichment Frameworks.

- WP2 February – April 2015: Fraunhofer IAIS tested their Audio Mining SE in the Indexing and Retrieval for Media Archives / Rich Content Scenario. 'Indexing and Retrieval for Media Archives' was derived as a sub-scenario of the 'Fall of the Wall'. With a shift of user-focus from editors and journalists towards archivists, these experimentations evaluated the application of Audio Mining for indexing and retrieval of audio-visual data to improve access and re-use of archived media content for interactive social connected TV broadcasts such as the 'Fall of the Wall'.

- WP2 June 2015: BitTubes tested the Interactive Video and In-Video Commenting / Rich Content application VideoCloud at the FOKUS Hybrid TV Lab. This experiment evaluates the video synchronization and collaboration features. The idea of the module was to seamlessly integrate various JavaScript video players and sync their playback across devices while also allowing viewers to chat with each other. This experiment evaluated operation of the BitTubes features and collected feedback from users.

- WP2 June 2015: FINCONS application for the Interactive TV Events and Advertising / Multi-Screen Experience, Rich Content scenario was tested in a lab test at the FOKUS Hybrid TV Lab. Field trials involved a large number of users employing RBB's broadcast infrastructure and IRT's web servers in order to execute the tests on the seven proposed scenarios. The objective of the trial was to evaluate the integration with the frameworks (Second Screen and Content Enrichment) by running tests under realistic circumstances. Real users were able to test the two applications under conditions close to reality.

2.2.2 - *Summary of evaluation results of experiments*

Three scenarios were tested at the Berlin Experimentation Site: **Rich Content**, **Multi-Screen Experience** (WP2) and **On Site Visit** (WP3). **13 experiments** were conducted, ranging from lab tests to field trials with multiple users.

2.2.2.1 - rbbtext and ARD-EPG

- *rbbtext* test outcomes provided important feedback about presentation of content and connectivity issues;
- ARD-EPG tests outcomes provided further insight into connectivity, GUI design;
- Field tests of *rbbtext* and ARD-EPG confirmed usability of *rbbtext* and indicated necessary improvements in the ARD-EPG.

2.2.2.2 - Content Enrichment on HbbTV

- Content Enrichment tests produced insight into control, connectivity and display issues, and provided useful insights into users' perception of content types under various circumstances.

2.2.2.3 - Fall of the Wall

- Fall of the Wall tests gave feedback about general interest in/uptake of HbbTV apps, and led to further use of the HAT app in subsequent broadcasts. Feedback was also obtained about control surfaces and presentation of content.

2.2.2.4 - Indexing and Retrieval

- The Audio Mining for Indexing and Retrieval testing quantified the value of the SE for audio-visual archives, and indicated which functionalities were of interest for future development.

2.2.2.5 - VideoCloud

- Video Cloud tests provided valuable insight into user perceptions of video-tagging, chat functionalities, security, use of social networks, control and GUI issues.

2.2.2.6 - Interactive TV Events and Advertising

- Interactive TV Events and Advertising tests produced feedback about control and GUI aspects and indicated possible improvements to functionalities.

2.2.2.7 - Smart City Guide – cooperation with Barcelona

- Smart City Guide tests provided reactions to the underlying concept and insight into usability issues, leading to developments for the following round of testing, which confirm that the correct steps had been taken, and delivered further insight into preferred devices.

2.3 - COLOGNE Experimentation Site

2.3.1 - *Description of experiments*

Cologne Site performed 3 major Smart City Guide Experiments

- In February 2014, during Carnival in Cologne, GAR and PIX deployed a “Social Network Enabler” allowing real time sharing of media between participants, including dynamic Point of Interests with audio-visual map, timeline and mashup view. They conducted an experiment around Carnival called “Active experience of a live cultural event" with school students.

- In March 2015, the partners Prodevelop and UPVLC have conducted a large scale deployment in the Valencia Fallas Festival. Several enablers (SEs) developed within Phase 2 have been integrated and a free mobile app was developed (both for Android and

iOS phones) to engage citizens enjoying the Fallas Festival by accessing these SEs as supporting backend services (POIs of Interest, social network activity, etc.).

- In May 2015 MTSA started “Tenerife Transit Experience”. The basis of that experiment is a beacons network allowing geo-localized services. A mobile app collects data and sends them to the server. The server selects an “experience” to send back to the mobile according to the user profile and the beacon detected.

2.3.2 - *Summary of evaluation results of experiments*

2.3.2.1 - Carnival in Cologne Experiment

During the two years in FI-CONTENT 2 the project partners GAR, as Work package Leader of large scale user experimentation sites, and PIX have conducted many user studies of live smart city services. The companies’ user centric approach mixes co-design, user trials and validations right from the start. The key aspect here has been the highly interactive and cooperative model whereby end users have been involved already in the conception of the user media experiments – in essence a participatory approach. Grassroots has kicked off a user advisory board with domain experts such as academics, entrepreneurs, developers and public administrators as well as focus groups with various citizen groups to capture the user needs and requirements in an iterative process for the trials. Pixelpark provided the technical training and support for the test users, which were a group of 18 school students and Grassroots provided the trustful contact and relationship to the teacher and students, the co-creation of the experiment and the evaluation. Both were present on site during the experiment to accompany and support the students. The students were asked to create several teams to act like photo/video journalists and to document and share audio-visual material about their favourite themes like beautiful carnival costumes and girls, music bands as well as alternatives places to escape from carnival. The students had 3 hours to experience actively the live carnival event and create the audio-visual presentation. They moved around in their different teams and communicated through the social network enabler with the other teams. They created a non-linear story in real time using an audio-visual mash up, time line and map views to document in real time the carnival event.

The Carnival in Cologne experimentation has led to identify following user needs for novel smart city service experiences:

- the request of the user to be informed simply about what events are going on in his/her area and to receive relevant recommendations in tune with his/her preferences, mood and geographical position;
- the wish from individual users as well as groups to retrieve, watch, share and interact on live cultural content;
- the wish to overcome the difficulty to retrieve meaningful audio-visual content about events due to the excess of non-classified, user generated cultural content;
- and the request for (near) real-time discovery. Except for major main streams events such as big concerts, many persons decide at the very last moment about their entertainment.

The identified user needs can serve as inspiration for novel services based on the social network enabler and other FIWARE media and content enablers. They could be used as

recommendations for third parties to create mobile services around live cultural and sport events and exciting places.
A complete overview on the results and evaluation of this survey is found in Deliverable D7.4.1 and 3.3.1 (D3.3.1 SCG First experimentation cycle). As next step the new start up VIVITnet, which is partner in FI-CONTENT2, plans to develop a commercial mobile event discovery service based on the user validation results of this experiment.

2.3.2.2 - Valencia Fallas Festival

During the second year in FI-CONTENT 2, the project partners UPVLC and Prodevelop (entered in Period 2) have developed POI related technologies related to open data and social networks. As Valencian settled partners, they successfully contacted the City Council of Valencia to promote the Fallas Festival. This provided (i) initial feedback of requirements in the early phase, (ii) continuous promotion of the developed app at institutional level during the Festival, and (iii) final feedback and dissemination activities of the results. From the FI-Content 2 perspective, it was an excellent opportunity to integrate enablers related for Smart City Services (POIProxy, Fusion Engine, OCDB, Context-aware Recommendation). From the citizen's point of view, they were able to navigate through the city of Valencia with a mobile app able to provide geolocated POIs (Fallas), route them to the nearest or most rated Falla and even allow social network interaction.

The Fallas Festival experiment has extracted the general conclusions for smart city large events:

- Users want simple apps that provide direct (visual) geolocated information on maps. Basic routing and recommendation information is also welcome.
- Users do not want to remain passive actors but participate actively sharing content, primarily through social networks where they find familiar with.
- It is really important to provide the mobile app in time on the mobile marketplaces, and place significant effort on promotion. There is little time to react once the app is online and citizens are using it. Flash crowds should be prevented and real time open data updated.

The Valencia Fallas experiment has been very successful, with more than 8000 users (citizens) engaged, and has been presented in several local disseminative events as part of the Fiware and Fi-Content2 technologies related to smart cities.

2.3.2.3 - Tenerife Transit Experience

Technology underlying Tenerife Transit Experience was designed to allow Tenerife public transport users to receive experiences based on their city interests. Once a user subscribes to the info channel that he is interested in, the different servers collect from many data sources which experiences he should receive according to his subscriptions and his position into the city.

Our design objectives could be summarized into three main points:

- The experiences received by users combine geo-localized dynamic data (stops, tram line and direction) and transit service information (offers, incidences in the line, transfers between lines, POIs in the city, special events, etc.). This content are provided by POI Proxy and FE enablers.

- An important target group of this experiment is visually impaired people. The system will be able to send a message when it detects the arrival to a stop, reporting the stop name

and the next tram arrival time. Even the system can propose him/her to validate the trip if he/she is detected inside a tram. We have worked close to some local disabled associations, receiving their advice on mobile app usability and accessibility guidelines for public transportation.

- The system can provide useful information of fraud estimation and transport demand (by origin-destination) for internal management of the operator and the relevant public office.

The users' feedback has been a very important tool to tune the number and quality of experiences they are willing to receive. We have delivered our smartphone app to a beta tester user group and collected their opinion through emails forms and phone contacts, allowing our development team to adjust the client and server side before deploying the app to the whole public transport users (close to 30.000 current users) end 2015.

2.4 - BARCELONA Experimentation Site

2.4.1 - *Description of experiments*

In the Barcelona Experimentation Site, a trajectory of user-driven experimentation with the FI-CONTENT 2 enablers was planned in two cycles. In the first cycle, the experiments conducted were focused on evaluating three scenarios in the Smart City Services and Pervasive Gaming platforms: Local Content and Recommendation functionalities, Virtual Character Synchronization on the Web, and Tabletop Augmented Reality Games. For the first scenario, the bulk of the effort was placed on the field user trials of the Smart City Guide Android app developed by Orange. For the second and third scenarios, four combined demo workshops with developers were carried out.

In the second cycle, the experiments conducted were focused on evaluating three scenarios in the Smart City Services and Pervasive Gaming platforms: the 'On site visit' functionalities, the Tier 3 City-Wide Economic Game, and a special user-driven scenario consisting of Hackathons & Competitions with Smart City Services and Pervasive Gaming Platforms. For the first scenario, the bulk of the effort was placed on a trajectory of preparatory iterative testing of the Smart City Guide web app, focused on debugging the application and improving its usability. Two actions involving users were performed, in March and May 2014. This was followed by a final user trial to validate the technology's deployment and ability to meet diverse user needs, with a gamified user-driven experiment in the shape of a geocaching competition. To validate the second scenario, a similar user trials approach was taken, in which a set of advanced users tested the application on the field in a festive competition setting. The two user trials were conducted in tandem in February 2015. For the third scenario, a more hands-on approach towards the interaction of the users with the Fi-Content 2 technology was adopted, in an Augmented Reality Games hackathon held in March 2014 to give local hackers the change to test and build their applications with several specific enablers from the Pervasive Gaming platform.

The quantitative and qualitative data generated at these actions were carefully analysed and rendered into a set of recommendations for improvement of the technologies developed by the FI-CONTENT consortium, which were fed into the second release of the Smart City Services and Pervasive Gaming platforms. The several aspects of these experimentation actions, the users involved, and the evaluation results have been described in ample detail in deliverables D7.5.1

and D7.5.2. For more information on the testing activities in the aforementioned experimentation cycles, readers are kindly referred to these two documents.

In addition to these activities, in the final phase of the project two actions were planned, with the specific goal of promoting the FI-C2 Enablers of the FIWARE Media and Content Lab (FI-C2 Lab), and the open calls of phase 3 of the FI-PPP: the FIWARE Media&Content Day, and the Apps&Cultura Hack-at-home FIWARE Competition. See Annex D for a detailed description of the the Apps&Cultura Hack-at-home.

2.4.2 - *Summary of evaluation results of experiments*

A formal online questionnaire was administered to the members of the participant teams at the Apps&Culture FIWARE Competition. The purpose of this questionnaire was to collect the participating teams' feedback on their participation in the Apps&Cultura competition, and the understanding and usage of the FI-CONTENT enablers available at the FIWARE infrastructure.

The distribution of enablers finally adopted by participants is the following:

- Hey Moth: Geospatial – POI Interface, POIproxy;
- Propozapp: POIproxy, Social Network;
- Upper: POIProxy, FA-TTS;
- Common Locals: Leaderboard, POIProxy, Social Network.

After receiving the questionnaires with their answers, we can list below the main conclusions:

- The information on how to participate and use the enablers was clear for all the participants, although they attended some on-site events (e.g.: Competition seminars, request of technical advice and follow-up meetings) to get more information about the competition and the technologies;
- In general, all participants understood the functionalities of the enablers.

In what concerns the enablers, the most used ones were the POI proxy (4) and Social Network (2). Some users have been working and evaluating different enablers, to choose which ones better fit with their needs. Some of those enablers have been included in their answers in the questionnaire.

Participants evaluated positively the enablers used, although there are different impressions related to some issues detected.

In the case of Geospatial-POI interface, the rating is about 8 in a scale of 1 to 10. This enabler gave some issues to the developers that were directly handled with SE owners.

The POIProxy evaluation results show different impressions. The average rating is 6.5 in the same scale as the Geospatial-POI Interface. On one hand, the enabler showed some problems when being implemented and tested. It has been raised that documentation was not good enough (*It doesn't describe what each service provides or on what fields could be used).* Some other problems came when accessing the FIWARE instances, which can be probably related with FI-LAB. Finally, it was also described problems when interacting with external data sources. Despite these facts, the relevance of the enabler for the app made increased its rating and added-value for users.

In the case of the Social Network enabler, ratings differ depending on the project. There was a project which was mainly based on this enabler and its rating is high – 7 out of 10 -. Lower rating was received from the other project, as this enabler was more accessory. This demonstrates the direct linking between relevance of the technology and the impact of the issues. Main recommendations are to improve and facilitate its customization, to extend documentation, and evaluate its performance to improve it.

In general, and taken from the f2f meetings hold during the development months, this action has been relevant to approach the FIcontent and FIWARE world to a new segment of developers and make them understand its potential. One of the main positive statements is that, if the technology chosen meets your needs, then it really helps to reduce development time and effort dedication. On the other side, users recommend to work more on documentation to shorten the learning phase.

2.5 - ZURICH Experimentation Site

The Zurich experimentation site was used for all WP4 experiments.

2.5.1 - *Description of experiments*

WP4 ran several scenarios/experiments on games and organized or helped with hackathons.

- Scenario 1/Experiment 5: Attractions Driving Content Sharing (see D7.6.1)
  The Reality Mixer – Reflection Mapping SE and the Reality Mixer– Camera Artifact Rendering SE were used for the ARPix application that enables to take pictures with an AR movie character with realistic lighting. 2000 users tested this app in the NY Grand Central Station. A formal evaluation was done to study the impact on realism.
- Scenario 2/Experiment 7: Augmented Reality in the Wild (see D7.6.1, D7.6.2)
  The Fast Feature Tracking SE was tested with the Skye Wars app by about 1500 users at the SIGGRAPH 2013 conference. A bright robot balloon was used as a tracking reference.
- Scenario 3: Seamless Augmented Reality on the Web (see D7.6.1)
  The Reality Mixer– Reflection Mapping SE was demonstrated in the Star Tours app.
- Scenario 4: Virtual Character Synchronization on the Web (see D7.6.1)
  The Networked Virtual Character SE was showcased in an app with a physics simulation of a virtual spider running on a server. It can be influenced and rendered by multiple mobile devices.
- Scenario 5: Tabletop Augmented Reality Games (see D7.6.1)
  Augmented Resistance is an AR tower defense game that was shown on various occasions, in particular at the CeBIT 2014. It uses the Reality Mixer– Reflection Mapping SE and the Reality Mixer– Camera Artifact Rendering SE to improve realism of the rendered scene. The Leaderboard SE is used for displaying high scores. The tower defense game has been also adapted into Augmented Resistance RTS, a real time strategy game that uses the Game Synchronization SE and has been shown on various occasions.
- Scenario 6: Immersive Control Systems (see D7.6.1)
  The Dragon Flight game uses a depth sensor to control a virtual character.
- Experiment 1: Tabletop AR by running AR Travelers (see D7.6.2)
  A formal evaluation was done to evaluate the impact on realism and performance for the Reality Mixer– Camera Artifact Rendering SE. For this purpose, the AR Travelers game was developed, where users shoot invading aliens.

- Experiment 2: Tabletop AR by running AR Travelers (see D7.6.2)
  The same game was used to formally evaluate the influence of latency on the performance.
- Experiment 3: Tabletop AR Games by running Live Inspector (see D7.6.2)
  The Visual Agent Design SE was used for studies of educational programming for an autonomous mobile robot.
- Experiment 4: Creating SLAM-based AR Game using Web Creator Tool by running ARvatar (see D7.6.2)
  The ARvatar game demonstrates how the web tool ARTool can be used to create engaging AR applications, with the example of adjusting rendering according to networked sensors.
- Experiment 6: Location Based Virtual Reality by running Skye Wars VR (see D7.6.2)
  The Augmented Reality – Fast Feature Tracking SE was used with a camera mounted on a Head Mounted Display to stabilize the gyro based internal tracking of the device.
- Experiment8: City-Wide Economic Game by running Gnome Trader (see D7.6.2)
  The POI Data Provider GE was used in this city wide AR game about trading. Newspaper boxes were used as AR marker in conjunction with the GPS information. The Leaderboard SE and the Unusual Database-Event Detection SEs are used for displaying and monitoring the high scores. A quantitative evaluation was conducted in the Barcelona experimentation site.
- Experiment 9: City-Wide Scavenger Hunt Game by running Treasure Hunt (see D7.6.2)
  The Treasure Hunt App is a city wide scavenger hunt game. Users had to solve a puzzle to find the next building where the following puzzle was presented.
- Experiment 10: City Wide Augmented Reality Strategy Game by running Outdoor Tower Defense (see D7.6.2).
  This multi-player city wide AR game was an experiment on the tracking requirements for large scale AR in an urban environment. Only the GPS, gyroscopes and the magnetometer were used.
- Experiment11: Intelligibility of Flexible and Adaptive Text To Speech (see Annex B)
  Speech synthesis was added to the Treasure Hunt App via the Flexible and Adaptive Text to Speech SE.
- Experiment12: Civic Participation Game by Takomat (See Annex C)
- Hackathon NEM 2013 (see D7.6.1)
  Together with WP2 and WP3 we ran this hackathon.
- Hackathon Zurich 2014 (see D7.6.1)
  ETHZ and DRZ organized a hackathon where FI-Content2 enablers were used to create AR games within one day.
- Hackathon Ludicious 2014 (see D7.6.2)
  DRZ and ETHZ organized another hackathon in the context of the LudiciousZurich Game Festival.

Please refer to the WP4 architecture diagram and deliverables for the full usage of SEs.

2.5.2 - *Summary of evaluation results of experiments*

The evaluations of many WP4 enablers were done during the development, to better understand the user's needs and to improve the functionality.

The formal evaluations of the AR Travellers Game with the Reality Mixer – Camera Artifact Rendering SE was published in 'Influence of Animated Reality Mixing Techniques on User

Experience', Proceedings of the Seventh International Conference on Motion in Games (Los Angeles, USA, November 6-8, 2014).
The Reality Mixer was presented at the JSPS UK/Japan CGVR 2014 conference.
The Visual Agent Design SE was used in a paper 'Enhancing Robot Programming with Visual Feedback and Augmented Reality', which was presented at the 20th Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE 2015).

With presentations, demonstrations and publications, we raised awareness of the FI-PPP programme on various occasions such as at *NEM 2013*, *SIGGRAPH 2013*, *CeBIT 2014*, *Startup Fair 2014*, *Web3D 2014*, *ECFI 2014*, *CGVR 2014*, *Eurographics 2015* and *Zurich meets New York*.

During the second experimentation cycle, the Unity based WP4 enablers have been published on the Unity Asset Store. The Game Synchronization SE and the POI Interface SE have been welcomed by the Unity community with more than 350 total downloads since July 2015. This has led to even more feedback from the Unity community that helped WP4 into the evaluation of its enablers and provided some valuable information to improve the functionalities.

2.6 - LANCASTER Experimentation Site

2.6.1 - *Description of experiments*

The Lancaster Experimentation Site has carried a number of evaluation over the period of the project and has focused on technologies from WP2:

- Throughout the period June 2013-March 2014, a number of activities were undertaken to evaluate the efficacy of the Vision platform deployed across the University campus as a "living lab" and specifically to assess the ability to track activity data and the use of a cross device resume play feature developed in conjunction with the BBC (who left the project at the end of year 1). These included:
    - Focus groups prior to the development of the cross device resume play feature,
    - Multiple rounds of questionnaires to assess use,
    - Static analysis of automatically logged activity data,
    - Interviews and focus groups to follow up cross device resume play feature,
    - In-depth user study/cultural probe to investigate cross device resume play feature usage.

- Throughout 2014 we engaged in a number of additional studies evaluating the use of a version of the Vision system re-implemented on the TV Application Layer (TAL) SE framework. Rather than running as a web site, this version ran as a "connected TV" application – in this case, running on a Sony Playstation 3.

- During August-December 2014 we carried out a number of evaluations of the "social annotation" feature that was implemented on the TAL system – in part, this was in preparation for layer evaluations with other project partners.

- In May 2015, we carried out a user study to further evaluate the use of the TAL-based version of Vision. We also employed a questionnaire to gather feedback.

- In May 2015, we collaborated with IAIS to carry out an evaluation of their Content Optimisation SE. We had previously provided input for the SE by extracting subtitle data from our video streams and then integrated the results that were returned to us into the social annotation feature we had developed on the Vision system. Again, we used a questionnaire to gather feedback on the experiment.

- In May 2015, in conjunction with BitTubes, we carried out an evaluation of their Interactive Video and In-Video Commenting features which, for the purpose of the experiments, we had integrated into the Vision platform. We followed up these two experiments with a detailed questionnaire to collect feedback.

2.6.2 - *Summary of evaluation results of experiment*

Detailed reports of all of these evaluations can be found in the FIContent2 deliverables D7.7.1 and D7.7.2. Brief summary of the results is as follows:

- The Vision system and its deployment across the Lancaster University campus constitutes a viable and useful living lab environment. Recruitment is continuous and registrations number over 2000. Many more people actually use the system at any given time, but the activity data collected is vast and is often based on “domesticated” use of the technology rather than lab-based tests. Furthermore, the lab continues to be available for collaborations on future EU projects.

- The Cross Device Resume Play feature performed well and was used by Vision users. However, there were subtle differences between how the feature was conceived and how it was used. This feature was tested as a candidate feature for the BBC’s iPlayer and was duly added to the iPlayer in a major update earlier in 2015.

- The TAL-based version of Vision was well received in lab-based evaluations where participants interacted with the application and considered how they might use it. In this environment, users seemed to think that the more limited feature set was offset by the ability to watch on a larger screen. However, only a few people have actually taken up the opportunity to install the TAL-based version on campus. One explanation for this is that only a relatively small number of users have the necessary PS3. Another is that we know that most Vision use is an individual activity rather than a shared one.

- The Content Optimization SE provided links of potential interest while participants were watching TV programmes and users could imagine uses for the feature. However, there were oddities in the way the links referred to programme content – for example, in our trial, we used a programme called “Father Ted” – this often linked to “TED talks” on the Web. Although this might be considered a straightforward “error”, some users thought it was similar to the former “I’m feeling lucky” button in Google.

- Both the Interactive Video and In-Video Commenting features met with general approval from users – with some caveats. Specifically, two design decisions (pausing of the video during commenting and the default behavior of the “ENTER” key) were considered poor by users and both issues were remedied during the trial. The Interactive Video – essentially a mechanism for advertising within the video – generated stimulating discussions about where it could most usefully been used. (In the short period since these

experiments took place, there are been a number of developments in the “home delivery” market – such as “one-hour delivery” on items from Amazon in cities like London and Birmingham. These developments and future one will likely have a huge impact on the viability of this type of advertising.)

3 - CONCLUSION

The different experimentation sites worked together on the common goal to test and validate enablers and applications with test users to give feedback to the developers how to enhance the enablers for the FIWARE Media and Content Lab in order to be used by third parties in Phase 3. The experimentation sites decided together on the execution strategy to connect their large scale experimentations to public cultural events such Carnival, Fall of the Wall, Transmusicales and Fallas, to attract the collaboration of the cities, public awareness and a large community of thousands of users. The qualitative and quantitative feedbacks of the test users led to the refinement of the apps and enablers to be used by third parties to create their own FIWARE prototypes in phase 3. Most partners started in the extension period to promote the FIWARE Media and Content Lab to their local clusters and ecosystems and participated in consortium WP7 collaborative support actions such as the FIWARE Media&Content Days in Barcelona. The result of all these efforts is now the running FIWARE Media and Content Lab with a growing community of users resulting from the open calls of phase 3.

The partners summarized the validation results of their experiments in this document to give some useful recommendation from their lessons learned to the new users of the FIWARE Media and Content Lab. This deliverable and the preceding WP7 deliverables (D7.1-7.1-2 give detailed description of all the experiments and results listed in this document) can serve these 3rd parties to understand the use cases and user trials around the enablers. The new developers and companies can use the WP7 validation results as inspirations to create their own apps and services, user trials and business plans to become a commercial success story.

Annex B ETHICAL CLEARANCE OF EXPERIMENTATION SITES

Referring to our mandate within the FI-Content 2 Project to provide an external view on possible ethical issues arising from the interactions of the project partners with participants of the various experiments, BridgehouseLaw is pleased to present this statement as external ethical advisors for the final project report.

Overall, the ethical issues that were foreseeable at the beginning or arose during the course of the project, remained within a well manageable scope. There were no cases of ethically questionable behaviour by the project partners vis-à-vis the study participants reported or observed. On the contrary, the project partners demonstrated awareness of the ethical issues and implemented pragmatic solutions in order to comply with all relevant ethical standards, and sometimes even go beyond the requirements.

Especially due to the efforts at the beginning of the project to identify and classify in Deliverable D7.1.1 the foreseeable ethical issues rooted in the area of data protection, privacy, informed consent and in some cases dealing with minors, a standardized process could be used to assess the individual risk of each project partner, and either clear the project partner's experimentation plan or request further information and provide specific advice on how to resolve specific problems encountered by individual or multiple project partners. All ethical issues identified prior to the start of the project, and the ethical issues that arose in the course of the project, are detailed in the Deliverable D7.1.1 and in BridgehouseLaw's detailed statement for the M12 Management Report, which are hereby included by reference.

The process and findings of BridgehouseLaw's ethical clearance of the various experimentation sites, as detailed in the documents references above, may be summarized as follows: For an initial review of the various experimentation sites and project partners, a standardized questionnaire was used to gather information by the project partners on the goals and setup of the respective experiments. All information disclosed by each experimentation site and each project partner regarding will be kept on record for a mandatory filing period of five years.

From the information disclosed by the project partners, BridgehouseLaw determined the risk of possible conflict with ethical guidelines set by the European Commission for each experimentation site and project partner. Based on the information received by each project partner, BridgehouseLaw found the risk of conflict with ethical guidelines to be low or medium at most. Therefore, the measures that were necessary to ensure compliance with legal and ethical requirements could be limited to only a few suggestions that would cover most of the identified issues.

The involved ethical issues at hand were mostly privacy and data protection requirements. Thus, as for each experimentation site a data protection officer was either mandatory or could optionally be appointed with little effort, it was suggested to extend the scope of the data protection expert's supervisory work also to the project partners performing experiments at the respective sites. Templates for the "sharing" of the experimentation sites' data protection experts were provided, and used by some of the project partners.

The feedback BridgehouseLaw received from one of the data protection experts involved confirmed that most of the data that was collected from the participants was anonymous, and that in most cases, only personal data required for the administration of the study was collected and processed. Project partners were also advised on aspects of privacy that are not strictly required by European data protection law, as well as on some specific data protection issues in specific national jurisdictions. During the course of the project, BridgehouseLaw collected additional feedback from the project partners, both during face-to-face meetings and using e-mail questionnaires. In those, further ethical issues were identified by the project partners during the project, particularly on how to deal with the use of other people's ideas that are not legally protected. As a result of this feedback, BridgehouseLaw issued a further statement on this in its statement for the M12 management report.

Feedback was again requested from the project partners prior to this statement for the Deliverable D7.8. The feedback sent to BridgehouseLaw unanimously declared that the project partners had not encountered any new ethical issues that had not been discussed before, and that the project partners were able to resolve the issues that had been previously identified, and that the statements and guidelines already disseminated within the project were helpful for that purpose.

In the course of the project, new project partners were included. For these, the same approach was used as for the initial project partners, i.e. an initial assessment of the risk of ethically questionable practices war performed and further feedback was requested equal to that of the other project partners. Therefore, the new project partner underwent the same clearance process as all other partners.

In conclusion, BridgehouseLaw did not notice, and has currently no concern of any non-compliance of any project partners with applicable law or ethical standards set forth for this project. Based on the information available to BridgehouseLaw and the efforts prior to the beginning of the project identifying potential ethical issues, BridgehouseLaw sees no grounds as external ethical advisors to withhold ethical clearance for the project.

Annex C ADDITIONAL RESULTS ON USER EXPERIENCE EVALUATION

Experiment by MIVOQ: Intelligibility of Flexible and Adaptive Text To Speech

Zurich Experimentation Site

Description

This experiment was performed under the umbrella of the Zurich experimentation site. As the deliverable D7.2.6 of Zurich Experimentation Sites Phase 2 was already delivered in Spring 2015 we decided to add this experiment as Annex B to this deliverable**.**

In this experiment we evaluate the Flexible and Adaptive Text To Speech (FA-TTS) SE concerning one of the key parameters of a TTS system: the intelligibility. In speech communication, intelligibility is a measure of how comprehensible is speech under particular conditions.

In our case, we want to evaluate how the synthesis from text is understandable, because it gives a measure about the goodness of the synthesis models. In addition, the results can give indications on how to improve the quality of a TTS system.

Regarding the *conditions*, we are interested in ensuring that the sentences are understandable with every device (headphones, headsets, desktop speakers, hi-fi systems); for this reason we did not give any indications about them. In this way we can receive feedback from people who are running the test in front of a Desktop PC or using a smartphones and earphones.

In order to measure the intelligibility of speech, different methods can be used. Some methods use the injection of additional noise in the speech signal to measure the intelligibility depending on the level of added noise.

In our case we decided not to make use of additional noise. Also, in order to simulate real conditions, it was decided to leave the user the freedom to listen to the test where and how he/she preferred.

At this time we had evaluated only the Italian voices available on FA-TTS but the experiment is easily extendible to the other languages supported by FA-TTS.

When designing the test, in fact, it was considered a constraint the fact of being able to test and prepare the data for other languages with little effort.

Objectives and expected outcomes

The aim of the experiment is to estimate the intelligibility of the Flexible and Adaptive Text To Speech and try to answer to the following questions:

- How much intelligible is the system?
- What voice is more intelligible?
- Are there particular words or phonemes less intelligible than others?

Application of user centric methods and evaluation tools

Usually intelligibility tests ask the user to transcribe what he heard. This, however, requires a lot of effort from the user and makes it difficult to analyse the results (due to typos, different ways of writing the same words).

For the current experiment, we designed a novel type of intelligibility test, based on multiple-choice answers.

The test has been designed to be used through a web browser, in order to reach as many people as possible.

Figure 1 shows the instructions for the experiment available on the first page of the intelligibility web evaluation tool.

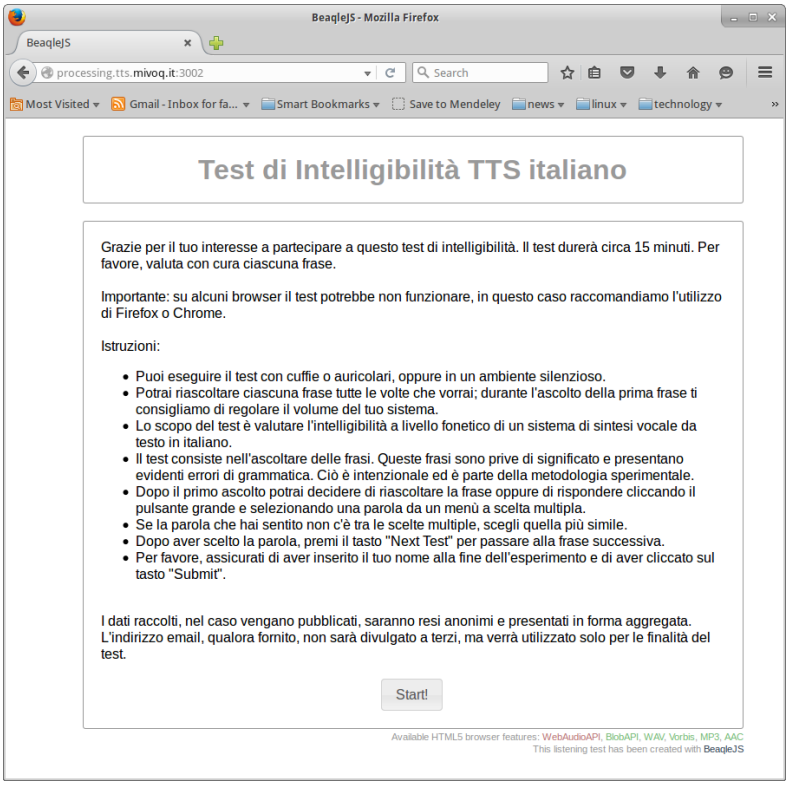


Figure 1 Intelligibility web evaluation tool, initial page (instructions)

The instructions for the user were:

- Firstly, to listen to the sentence generated by FA-TTS (has many times as the user wanted);
- when the user was ready, the text of the sentence was displayed on the screen with exception of one word the (*missing word*);
- referring to the *missing word*, the user was asked to select the one that she/he has understood by choosing from a list of five acoustically-similar words.

Figure 2 shows the tool when selecting the *missing word*.

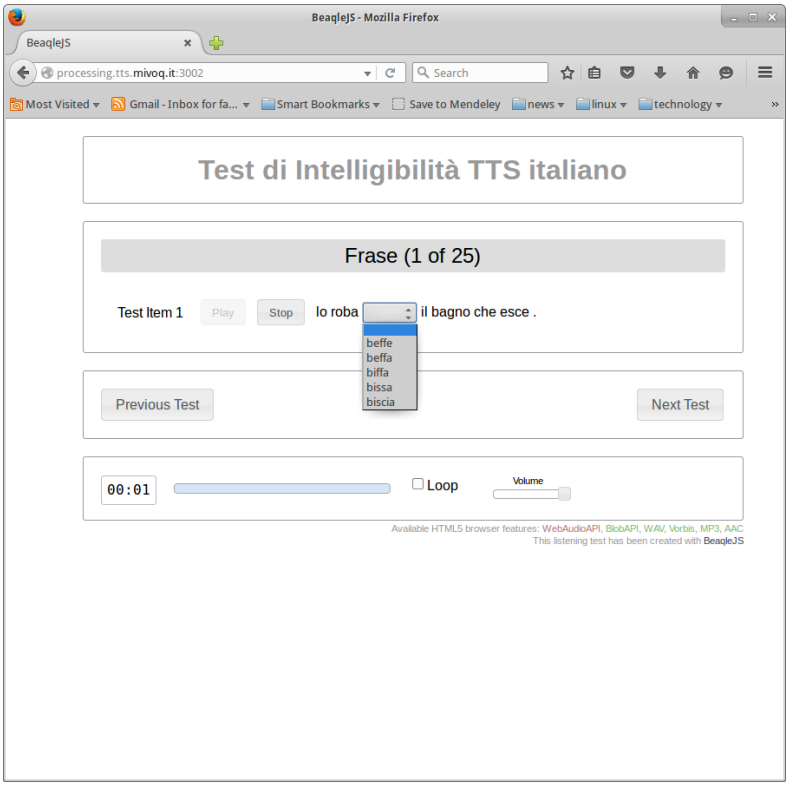


Figure 2 Intelligibility web evaluation tool, selection of the missing word.

To ensure that this test provides useful results, much attention has been dedicated to the design of the data set.

Firstly, the sentences shall be formed from words that are unpredictable from the previous ones, in order to avoid the prediction of the *missing word* from the context.

These kind of sentences, called SUS (Semantically Unpredictable Sentences), have been built from permissible grammatical structures. An example is shown below:

- Italian sentence*: Lo roba beffa il bagno che esce.*
- Literal English translation: *The stuff jokes the bathroom that exits.*

Also, since the words of the sentences are randomly picked, there is no agreement in gender and number between nouns, modifiers and verbs (from the example above: “Lo” is a masculine article, while “roba” is a feminine noun.

To automatize and randomize the process, an automatic SUS sentences generator has been developed. Moreover the process to build the dataset requires the list of the missing words (and the related acoustically similar words). This list was automatically generated in two steps:

1. a list of N words that cover all the phonetic inventory of the language is automatically extracted from a phonetic dictionary;
2. for each of these words the list of five similar words has been automatically computed looking into the dictionary and using an algorithm able to compute the phonetic distance between the pronunciation of two words (we implemented a custom version of the Needleman-Wunsch algorithm).

All these steps have been designed to use, as much as possible, automatic procedures in order to be easily reproducible for other languages. Most of the efforts in organizing the experiment have been spent on:

- the development of the web-based evaluation tool (we implemented additional features into an open source web application for listening tests called *BeaqleJS* - https://github.com/HSU-ANT/beaqlejs);
- the development of the dataset creation tools;
- the development of the result analysis tools.

Planning and running the trial

The web service for delivering this experiment and collecting the data has been running from October 9th and October 13th 2015.

For each user the test session consisted of a set of 25 randomly selected sentences among the 870 ones that have been automatically generated by the system described above.

The estimated time necessary to execute the experiment was 10-15 minutes.

Recruitment: number of experimenters, targeted end users, criteria

Since in this experiment we evaluated the Italian voices, we have sent requests to several Italian mailing lists.

The only required constraint for the target user was being Italian mother tongue.

We did not make difference between people expert on speech technology or phonetics/phonology, even though we sent the invitation email also to the Italian Association of Speech Sciences mailing list.

The targeted end users were Italian people familiar with email and internet.

A total number of 146 subjects participated to the experiment.

Devices and SIMs cards, network

Everything necessary to run the test was:

- a device with a browser and audio output;
- a working network connection.

Data collection and ethical issues

The users were informed that the data collected, if published, will be made anonymous and presented in aggregated form.

The email address, if provided, will not be disclosed to third parties but will be used only for the purposes of the test.

Empirical findings and evaluation

Quantitative evaluation

A typical measure for the intelligibility is the word correct rate (WCR), i.e. the ratio between the number of correct words and the total number of words.

The following table shows the WCR computed from the analysed data; The global WCR of the Italian voices is 87.7 %, and there is not a significant difference between the female voice and the male one.

	WCR %
FA-TTS Italian voices	87.7
Female voice	87.2
Male voice	88.1

Table 1: Word Correct Rate (WCR) of FA-TTS Italian voices

Figure 3 shows the WCR score by the number of subjects.

From this figure we can see that 12 subject out of 146 have done everything right (WCR = 100%).

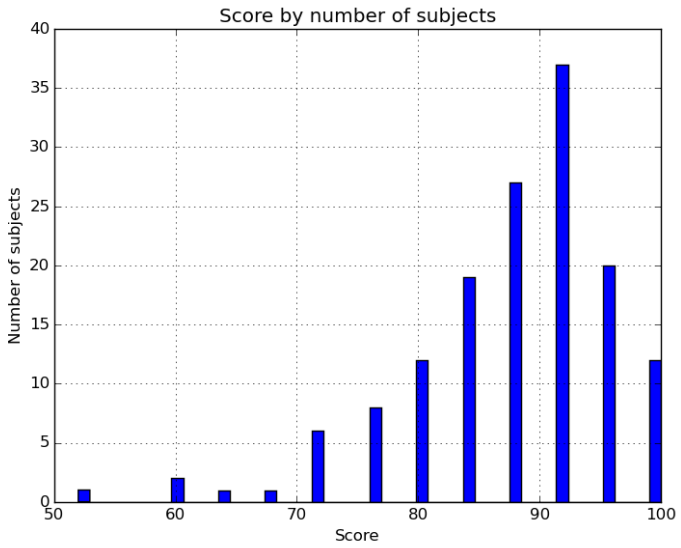


Figure 3: WCR score by the number of subjects.

Other interesting figures are shown on Table 2,

Average number of listenings for the correct words	1.89
Average number of listenings of wrong words	1.66
Average time spent on correct words	17.72 sec

Average time spent on wrong words	22.55 sec

Table 2: Average number of listenings and time spent on correct and wrong words

The average number of listenings (i.e., the number of clicks on the “play” button) when the user guessed right the *missing word* is not so different from the number of listenings when the the answer was wrong.

With the available phonetic transcriptions it has been possible to analyze which phonemes have caused more problems.

The most common mistake has been to misunderstand two very similar vowels: /i/ and /e/ or /e/ and /a/.

Another interesting and frequent error was confusing the geminates with its non-geminate counterpart.

Also liquid consonants /l/ and /r/ have been misunderstood quite frequently.

Qualitative evaluation

- After each session, the participants were asked:
  - to give her/his name (optional)
  - to give her/his email address (optional);
  - to fill comments (optional).
- Analysing the comments we noticed that many people have found the experiment entertaining (probably because of the strange phrases) and they were curious about their score. For this reason we have also decided to send the results to those who asked for them.

Summary of outcomes and feedback to WP 2-4

The test has been carried out in order to identify the intelligibility of the Italian voices available on the Flexible and Adaptive Text To Speech SE.

This enabler has been released on WP4 platform and it has been used in the city-wide Augmented Reality game "Treasure Hunt".

The results of the experiment showed that the intelligibility of both Italian voices is satisfactory.

A deep analysis of the errors, at phoneme level, can be taken as inspiration to improve the following releases of this enabler.

A research paper on this experiment will be submitted to the scientific conference AISV 2016 (Annual conference of the Italian Association of Speech Sciences).

Annex D CIVIC PARTICIPATION GAME – PARTICIPATORY GAME DESIGN

Experiment by Takomat: Participatory game design with a game about civic participation

Zurich Experimentation Site

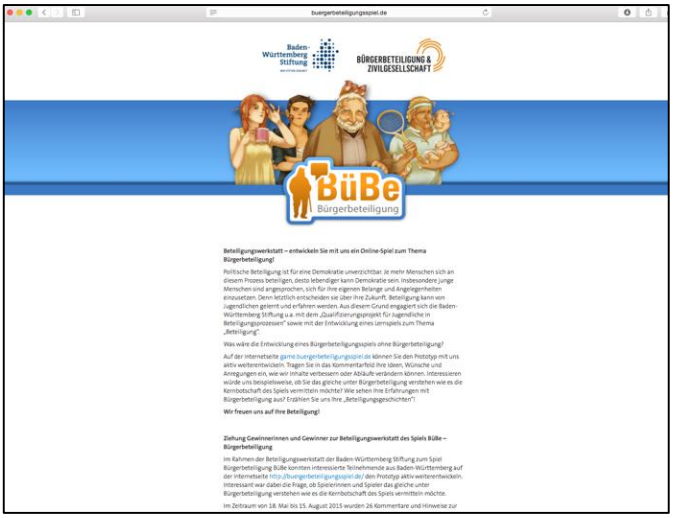
Description

TAKO's specific enablers Phenomobile Dialog Manager and the 2D-character functions of the Phenomobile Character Manager have been used in a game that has been published by takomat in May 2015. The game "Buebe-Bürgerbeteiligung" is an online game about civic participation and can be played online under the following link: http://game.buergerbeteiligungsspiel.de. The game has been produced for the Baden-Württemberg Foundation.

For evaluation purposes TAKO created a website: http://buergerbeteiligungsspiel.de

The website of the game had 1776 unique visitors until end of October 2015. TAKO implemented an online participatory design contest for players that was hosted on this website. In this competition players could comment on the game and make suggestions to improve it. The two winners of this participatory design contest have been announced on August 17th 2015.

The game has been tested so far by 120 web users who successfully played the online game until the end of the game. TAKO created a review and comment function for players for the participatory design competition. TAKO collected 26 online comments and 8 offline comments from players to improve the game and game technology.



Website of the game and the participatory design contest:

Screenshots of the game:

Annex E APPS AND CULTURE TECHNICAL DELIVERABLES

Apps & Cultura FIcontent2

Barcelona Experimentation Site

Description of FIWARE's FIcontent2 technologies used in your project	
Project name	**Hey Moth!**
Company name	**Hey Moth!**
Project Owner	**Onofre Pouplana**
Category	**Pervasive Games**

PROJECT ABSTRACT

HeyMoth! Set the tune of your city

When the night fall over the city, hundreds of moths came over the blinking lights. They use their impressive audition to scan all audible sounds, miles ahead, and sort them as either dangerous or friendly.

HeyMoth! Brings you the power of these small and furry creatures, and allows you to discover how your city sounds like never before.

Join HeyMoth! to explore the musical map of your city, populated by pubs, discos, music halls and points of interest. Each one has a list of snaptracks: 10 seconds of audio that captures music, audio or sound related to these point.

Discover the ambient and music taste of each place, through these snaptracks, and even become the Guardian of any place recording their most representative snaptrack.

How it works?

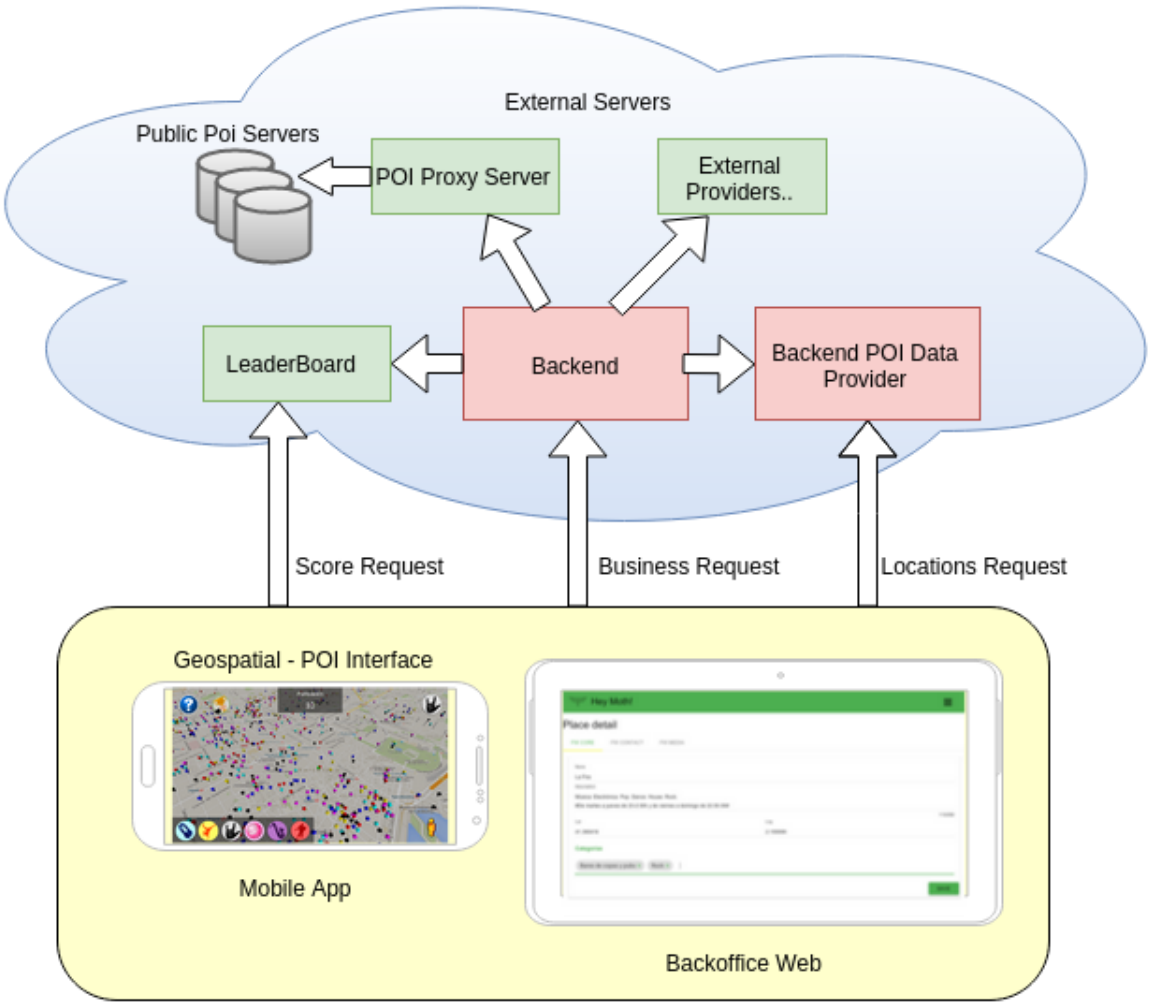
Earn prestige points interacting with the app: vote for the best snaptrack on each point or upload your own snaptrack and earn votes, until it become the most representative one, crowning you as the Guardian of the place.

Explore your city and share with others with the same music tastes your best places. Anytime you will be able to see the city rank, to know who is the best musical advisor of each musical genre and explore their recommended places.

ARCHITECTURE

Global Architecture

HeyMoth! is a social network able to link a recorded audio with an identified point, through a gamified application. We use 4 FIWARE enables to construct our core services. The following diagram show the global architecture, their specific parts and the relations between the enables and the other components:



Fundamentally, we can split our solution in 6 autonomous parts, that work nicely together:
Mobile App. Coded with Unity3D, is currently available in the Android Play Store and soon will be available in the Apple Store too.

- **BackOffice web**. Designed with AngularJS, restricted to HeyMoth! Administrators. It enables to administrate and generate the places, audios, and users and share it with the others tools.

- **Backend POI Data Provider**. Server with the FIWARE's POI Data Provider enabler. It allows you to persist and act on geolocated points, its audio and supplementary information. Developed with PHP PostgreSQL and MongoDB.

- **Backend**. NodeJS server on which we realized the management of users and all the business logic and communication commands.

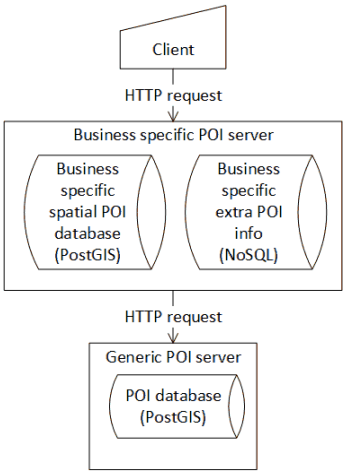
- **External Servers**. POIProxy servers. Their main function is to feed the Data Provider with musical ubications.

- **Leaderboard Server**. It offers and displays the leaderboard. Rating Registration is done on the Data Provider, so that we are practically independent of the server. It is mainly used as a structure to display the information.

POI Data Provider

We have assembled the enabler POI Data Provider on a Ubuntu server, using it as one of the two cores of the backend of the ecosystem.

Geolocation registered locations, and audio associated with supplementary information is the main point of our system persistence. We have therefore decided to use the enabler that allows us precisely persist locations through geolocation and add additional information types, such as the address or the related multimedia files.



The decision was taken by the potential of the technologies used by the enabler. Our main requirement was to persist and retrieve information and geo multimedia files with great efficiency.

The geo places persist in a database in PostgreSQL, which together with the PostGIS module, allows us to make different queries based on the geolocation with minimum response time.

MongoDB is used in a complementary manner. It allows us the freedom to complete additional information about uploads audio; and it provides powerful scalability to distribute various media on different servers if required in the future.

Having a relational database, such as PostgreSQL, which allows us to have a powerful geopositioned searches, and another relational database (MongoDB) for additional information, is a perfect solution for the needs of HeyMoth!

The POI Data Provider is divided into different modules. We currently use:

- **fw_core**. We keep the location, the categories, the name and description.

Example

```
"fw_core": {
  "location": {
     "wgs84": {
        "latitude": 41.380938,
        "longitude": 2.180922
     }
  },
  "categories": [
     "Bares de copas y pubs"
  ],
  "last_update": {
```

```
      "timestamp": 1443895178
   },
   "name": {
      "es": "Sor Rita Bar"
   },
   "description": {
      "es": "Disfruta de la mejor música disco de la ciudad. Entrada gratuita. Abierto todos los dias de 20:00-03:00"
   }
}
```


- **fw_contact**. We keep nicely formatted postal address and other contact information as the website and social networks, if they have.

Example


```
"fw_contact": {
   "properties": {
      "visit": "Carrer de la Mercè, 27, 08002 Barcelona, Barcelona, Spain",
      "postal": [
         "Carrer de la Mercè",
         " 27",
         " 08002 Barcelona",
         " Barcelona",
         " Spain"
      ]
   },
   "last_update": {
      "timestamp": 1443101159
   }
}
```


- **fw_media**. Save the list of audios, with the url of the source, the name, the user who has uploaded it, the genre to which they belong and the points they have.

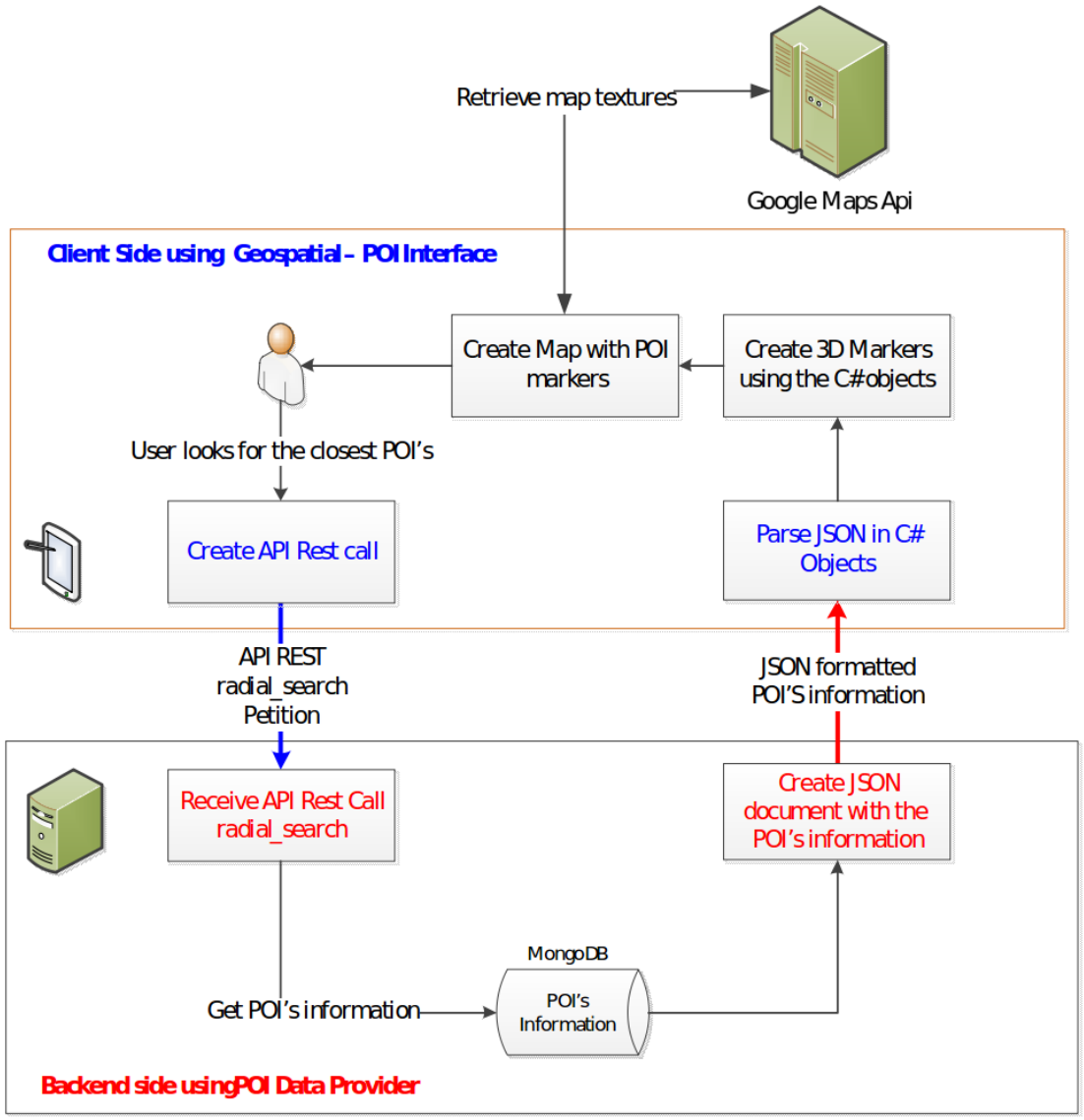
Example


```
"fw_media": {
   "entities": [
    {
        "short_label": {
           "es": "ROCK"
        },
        "url": "https://p.scdn.co/mp3-preview/f33487f30b6463dbd8a3afd77d980e0d091bd53d",
        "copyright": "javi",
        "genre": "ROCK",
        "score": 10
    }
   ],
   "last_update": {
      "timestamp": 1445185943
   }
}
```

Geospatial - POI Interface

HeyMoth mobile application is made with Unity 3D. The enabler Geospatial POI Interface provides the perfect way to integrate information served by the POI Data Provider in the mobile client.

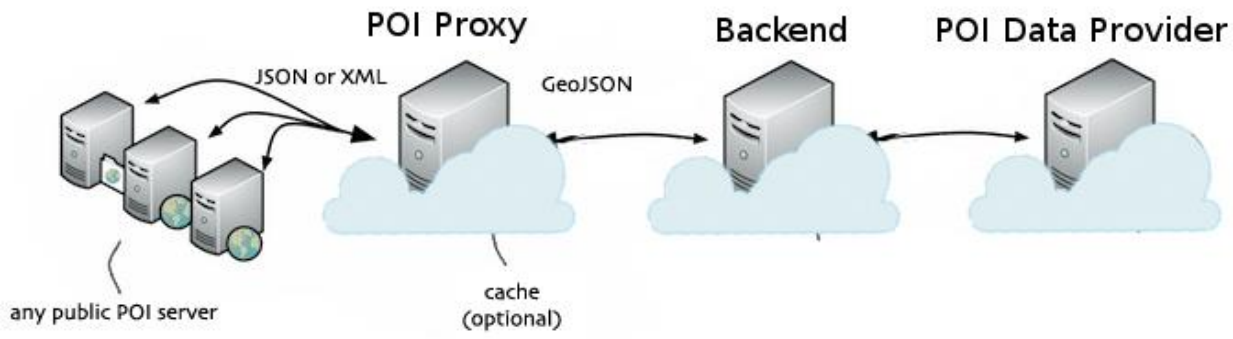
Geospatial - POI interface provides a simple way to access the data as well as manage, edit and create it.



The diagram shows schematically the integration of Poi interface as the requesting radial search the POI Data Provider, parse the JSON response and enter the markers on the map google associating points to additional information.

POI Proxy

HeyMoth users can only upload audio associated with previously recorded locations. We get those places from two sources:
By using APIs such as foursquare, or other more specific, we get the music venues. This gives us the sites that have a periodic musical activity.
Then we add the places of interest we got thanks to POIProxy. This gives us the sites where there may be sporadic musical activity.



As we discussed above, the core for the persistence of the places is the POI Proxy so that the places obtained through it are introduced into the data provider.

Specifically, we have developed a command that reads specified points of POI Proxy, and enter them in the POI Data Provider. This command is run daily to update POI Proxy services we want.

For functional prototype in Barcelona, we used the server "Panoramio" requesting the geolocated places in town and nearby:

http://app.prodevelop.es/poiproxy/browseByLonLat?service=panoramio&lon=2.1685658&lat=41.387128&dist=3000

Leaderboard

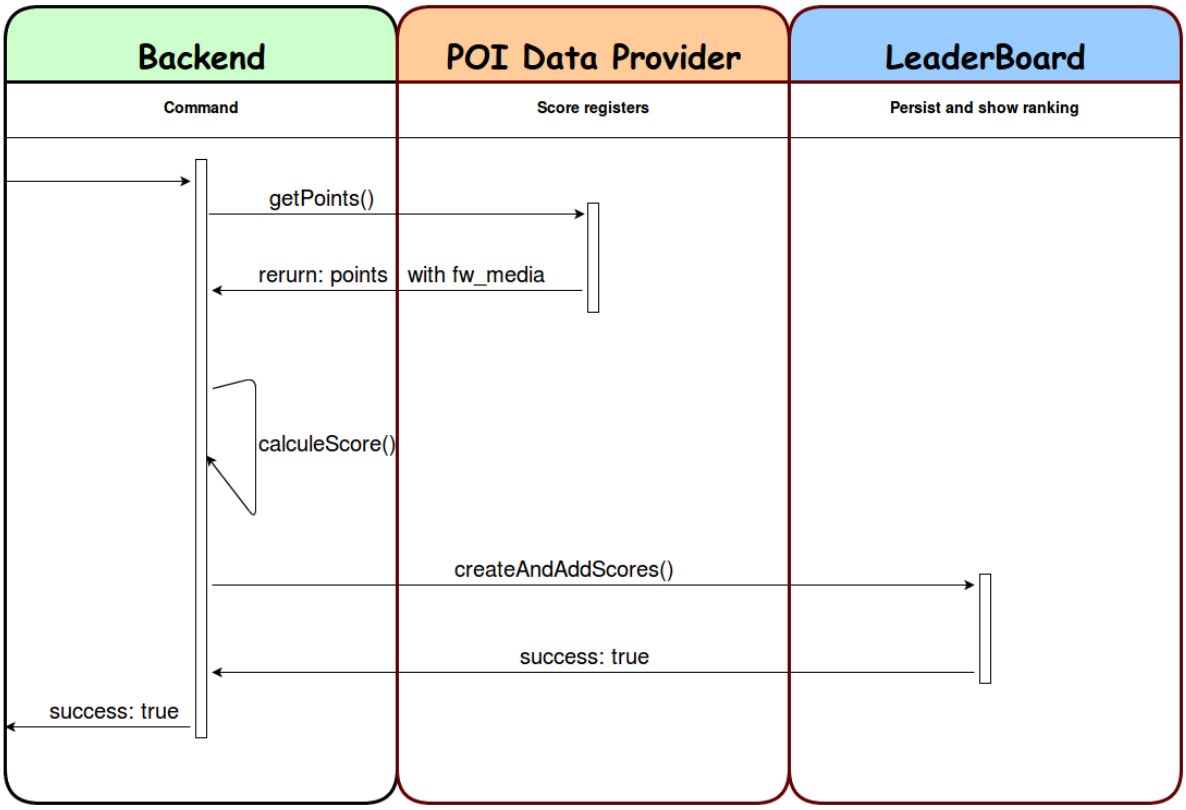
We use the Leaderboard enabler for several reasons:
Has a simple structure, easily it integrates with Unity3D and
It has a standard format.

Its main function is to show the overall rating, which will be updated as they interact with the application.

In our system there are different ways to increase the score of a user: uploading a new audio; receiving votes in the already uploaded audio or one of your audio will become the main audio of a site.

This information is recorded in the POI Data Provider and is associated with an audio or multimedia file in each of the registered locations. For this reason, a mediator process is necessary to calculate the overall rating.

We have created a command able to do these calculations and leave the resulting scores persisted in the leaderboard. In this way we guarantee some independence on the server Leaderboard we want to use, and allows us to launch the calculations when it suits us (to improve performance).



Currently, this calculation is performed also on the time when a new audio is inserted into the platform. Later, this will be done when you access the leaderboard from the application interface. When the number of users grows, we plan to delegate a periodical Cron the command execution.

Mobile App

How sounds the world? Start playing!
The mobile application is the key to enter HeyMoth! We offer a game that lets you know that sounds close to you, and to participate in creating a musical map.
Conquer new places capturing your audio, give points to other audio players, discover new related sites to your tastes, knows who frequent these sites .. all through a mobile application you already have available in the Android Market:

Android Store: https://play.google.com/store/apps/details?id=com.heymoth.heymoth

The application is developed with Unity3D, a framework cross-platform, so it will soon also offer for IOS and web.

Here are a basic cycle of use of the application.

Mobile App: SIGN IN

The first time you start, it will ask your username. This name will identify you within HeyMoth! and will be your avatar. All interactions that are made in this terminal will be associated with the score of that avatar. In later we introduce a more robust registration system that guarantees the only access across platforms and devices and access control.

Once registered, we show a window with a brief explanation on how HeyMoth! works and how you can interact with it. This view will have it accessible at all times, in case you had to consult it again.

Mobile App: NAVIGATION

You can see a geolocated map on your location. Browse on the map to discover which sounds around you, and if you get lost in it .. do not worry! Click on the icon location and return to your current location.

Mobile App: FILTERING

You can define your musical style as well as filter between them to find places according to your tastes. For example on the next screen we see everywhere in Barcelona jazz sounds.

Mobile App: LOCATION DETAIL

If you click on any of the markers on the map, a detail window opens. In the window you will see the details of the site, and the list of audio linked to it. You can play the main audio to discover how it sounds and other audio candidates for principal that have been uploaded. Finally, it will offer the ability to record audio and upload your own if you are close to that place.

Mobile App: GAME PLAY

Find the best 10 seconds of audio that represents the place for users to vote for you and become the benchmark of the place.

Each new audio you upload will give you 10 points. Then, these points can be increased if the audio gets positive feedback, and even more if the audio becomes the main track site.

In this first version you can only upload new audio. In later versions will incorporate the ability to vote audios uploaded by users.

Follow your progress on the Leaderboard to see how you compare with other HeyMoth! users. You can access it from the main screen.

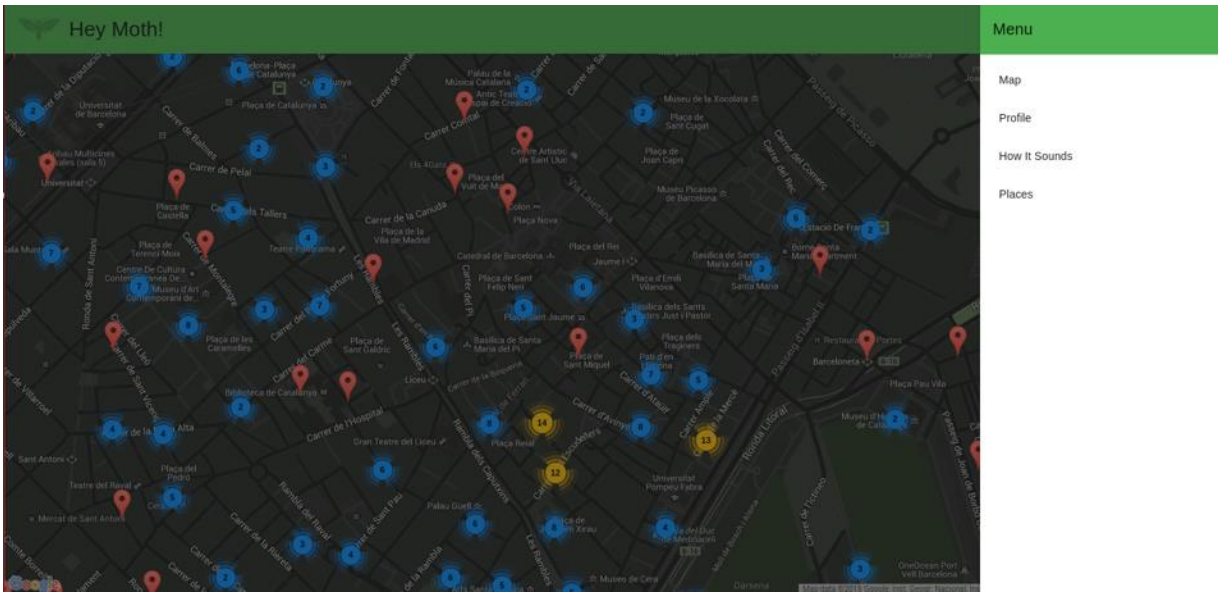
We currently offer the world rankings, will soon be extended to a classification by genres and cities.

BackOffice

We have developed a web BackOffice to facilitate the administration and management of registered places, its associated audio, users of the platform and other business processes.

In the same way that the mobile application, the backoffice directly access the various servers: Backend, backend and POI Data Provider LeaderBoard; showing the information and offering functionalities.

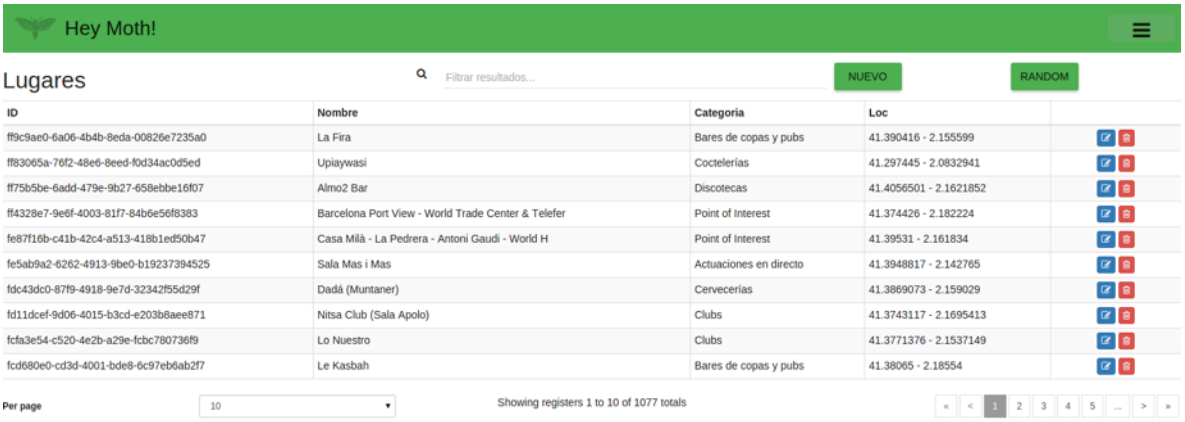
The backoffice is web access and is limited to administrators HeyMoth !, since its objective is to facilitate the management of the ecosystem. In this initial phase, the end user interacts only through the mobile application.



The development was carried out with angularjs, using its library of material design. This guarantees a flexible and modern design in line with the latest trends in android applications.

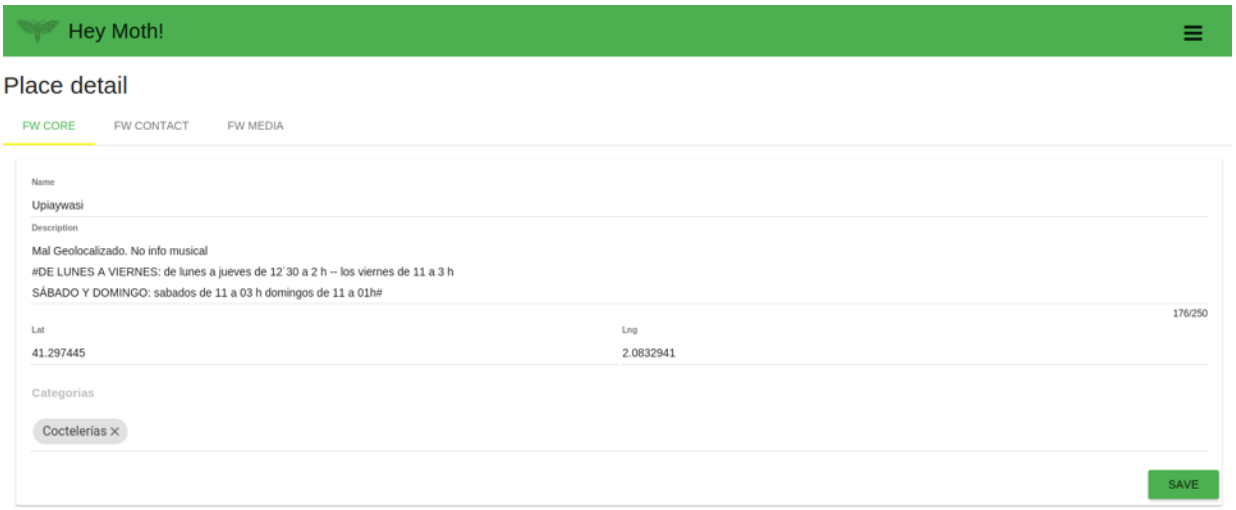
We communicate with other servers by http requests, just as does the mobile application, using exactly the same logic server.

If we go into detail in the administration section of places, we can see how allows us to operate on our POI Data Provider: filter places paginarlos, delete, create new, and browse its detail.



In its detail, we have divided the information into sections of the same way as the POI Data Provider: fw_core, fw_media, fw_contact.

Each of the sections has its own interface to edit, respectively, the geographic information, audio or contact information. Below is a representative of the views.



DEMO

You can be a part of HeyMoth!

Currently HeyMoth! It is located in Barcelona, where we started the pilot.

Coming expand our range, introducing new towns and villages using local festivals and specific agreements.

After monitoring the use and profile characteristics, we will open HeyMoth! everyone, creating a global music map.

The Android application is now available for download, and soon will be available for iOS.

Android Store: https://play.google.com/store/apps/details?id=com.heymoth.heymoth

Web: https://www.heymoth.com/en

Facebook: https://www.facebook.com/heymoth

Twitter: https://twitter.com/heymoth

Descripció tècnica de les tecnologies FIWARE	
Project name	**Common Locals**
Company name	**Common Locals**
Project Owner	**Eduard Bonada**
Categoria	**Pervasive Gaming**

PROJECT ABSTRACT

Common Locals is a marketplace platform where travelers can contact local people. The objective is to connect them so the local is able to:

(1) help the traveler in the trip planning task and

(2) provide additional services and activities during the trip.

In such marketplace, the first action the traveler will take is to select the visiting destination (mockups in Figure 1 illustrate the initial user workflow). Afterwards, the traveler will be able to browse among different locals available in the visiting destination. Each local will have a detailed user profile including description, list of interests, favorite spot, recommended example route, services and additional activities, reviews from other travelers, etc. The platform includes a so detailed local profile because it is very important to help the traveler find the local that better fits him. In addition to this, we plan to implement a recommendation engine that optimizes the matching between the traveler and the locals with most similar profiles. Once the local is chosen, the trip planning co-creation phase occurs. In this step the traveler and local remotely interact to build a trip plan.

Figure 1. Initial user's workflow: Chose destination => Browse locals => Local profile

While the trip-planning co-creation is a task performed before the trip starts, Common Locals is also present during the trip itself. This is where the other services offered by locals come into action. Although, some of them are not platform dependent because they are based on the personal interaction between the traveler and the local (e.g. *Airport Pickup* or *Welcome Meeting*), the ***Online Gamified Trip Support*** service is a real-time gaming and communication tool that indeed requires technological effort and hence it will be part of the software platform as well (figure 3 shows a mockup of this feature).

This feature aims at introducing a gamified experience during the trip; we consider it will help in making a better experience for the traveler. We have designed this gamified experience as a clue-based game where:

- Each clue is a different place to visit (we see it as a gamified tourist route).
- The traveller only sees the picture of the next visit, and she has to guess where it is located.
- When the traveller physically arrives to the place in the clue, the next one is unblocked.

The local is the person than manually selects the personalized clues for the traveller.

Figure 3. *Online Gamified Trip Support*

The described game is a multi-user gamified platform where players interact in order to boost their travelling experience. Note that this type of game requires no physical structure (just the city) and it brings the possibility to introduce different 'tasks' to facilitate relationship between traveller and other locals (for instance one task could be to take a picture on the place to visit together with other locals). Note that, in the end, the objective is to enhance the traveller experience, and making contact to local people can really help. Also note that the game is not limited to two people (local and traveller): we think of introducing group-tasks to be completed together with other travellers, or even more complex clues where several locals are involved.

It is exactly around this feature that we will test the Fiware/FIcontent platform possibilities

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Testing Specific Enablers

The project is still in an early development phase and we plan to put together an initial *Minimum Viable Product* (MVP) in the next few months. We still do not have any working platform where functionalities can be integrated but we see this contest as an approach to the Fiware/FIcontent platform and our objective is to understand which of the software modules can help us in building the Common Locals platform and specially the *Online Gamified Trip Support* feature.

In this sense, we have been testing the following FIcontent Special Enablers (SE):

- ***PoiProxy*.** Common Locals will allow the local and the traveller to communicate during the trip. And not only this, but we envision this communication in a gamified manner. This game would represent a more funny way to present information to the traveler (e.g. secret places in the main city park). Hence, in this step it is very important that the local has in hand ready information to show to the traveler. For this reason we consider the POIProxy an important asset to use in order to obtain this information.

- **Leaderboard**. Every gamified platform requires a ranking of best performing players. Managing the score data and accessing it when necessary is hence a very important aspect to work. This is why a software module such as the Leaderboard SE can be very helpful.

- ***Social Network***. Our product has a simple but powerful mobile interface where locals and travelers can communicate in a gamified manner. The Social Network enabler seems a very interesting candidate to help us implement this feature, especially in the early versions of the product such as a hi-fi MVP.

- ***Content Optimization***. One of our key features will be profile matching between the local and the traveler. We are hence interested in extracting characteristic keywords from different text-based sources that the users provide ('About' description, own blog, comments in social networks...). This is why we consider that this enabler can help us with the semantic enrichment task based on NLP.

ARCHITECTURE

This specification details the software platform elements that are needed to construct the gaming platform that will manage the *Online Trip Gamified Support*. The objective of this platform is to provide a means of communication in a gamified way.

Since Common Locals is still in a very early stage, the details of this game have not yet been detailed. We will closely work with our early-adopter travelers to create the type of game that they really want. However, we consider a couple of aspects that will be definitely needed:

- ***External Information Gathering*** so the local has in hand enough information - and easy to be used - to prepare the game for the traveler.
- ***Communication Interface***. This game will be a form of communication between the local and the traveler.

The following description takes into account the two features above.

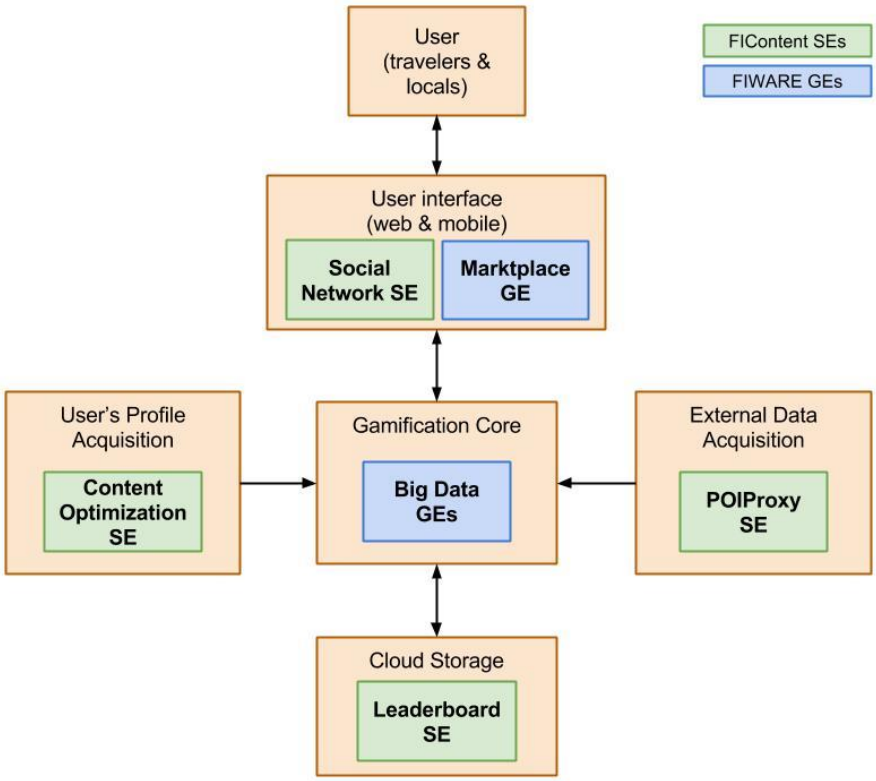


Figure 4. Global architecture diagram with selected Fiware/FIcontent enablers

Architecture diagram

The picture in figure 4 includes an initial architecture diagram. The main functional blocks identified are:

- User Interface
- User's Profile Acquisition
- External Data Acquisition
- Gamified Core Functionality
- Cloud Storage

As commented before, at the current moment Common Locals is still in a very early stage and hence the level of detail of this specification is still low. Nevertheless, we have certainly identified the different architectural modules under consideration and how the Fiware/FIcontent technologies could be used in our first MVP.

3.1 -

Architecture description

The core block of this architecture is the ***Gamified Core*** where all the *Online Gamified Trip Support* and communication is managed. In other words, in an MVC architecture this block would be the main controller that manages all the rest of blocks. Note that the current version of this block is still in a very early stage and we expect it to change considerably. We consider this module of high importance and we know the scalability and reliability risks that it involves. The Common Locals application requires managing huge amount of data with high query ratio from different sources (frontend/users and backend/sources) and hence we might consider splitting it into different sub-cores in order to ease both the definition and the implementation of a core module that is going to work with such huge amount of data processing. In that sense, here we consider using **Fiware BigData Enablers**.

The rest of the blocks work as information providers and receivers of the previous 'Co-creation core' block:

- The ***User interface*** manages the visual representation of the information to show to the user (or get from him). It will be web-based for any type of interface (desktop, mobile).
- The ***User's Profile Acquisition*** is a block that includes those functionalities used to compile information about the user. This could include gathering details from their online social networks profiles, reading content from their personal blogs, processing their profile information in the platform,... The objective of this block is to create a representative profile of each user so it can be used mainly for making recommendations (e.g for instance a restaurant close to the pit-stop of the game's leg he is playing).
- The ***External Data Acquisition*** is a block that gathers information from different external sources so this can be used in the process of *Online Gamified Trip Support*. For instance, obtaining open data about a city's events during the travel dates so these can be recommended while the game is played.
- The ***Cloud Storage*** block is the responsible of storing and providing access to all data in an efficient and effective way.

The FIcontent Enablers selected in task 2 are used in the following blocks (also shown in figure 4):

- The **POIProxy** is very useful to allow the local and the traveler to communicate and participate in the game. In this step it is very important that the local has in hand enough information about his city (e.g. events happening at a given point of time so these can be included in the game). For this reason we consider the POIProxy an important asset to use in order to obtain this information and hence included in the *External Data Acquisition* block. We also consider the Open City Database as an alternative to the POIProxy enabler (we did choose the POIProxy because it was easier to test and it was enough for the functional implementation we carried out).

- The **Leaderboard** enabler is aimed at managing and getting access to the score data that every player generates. Finding an implemented software module that is aimed specially at this functionality really helps in optimizing the resources available for implementing the MVP.

- The **Social Network** enabler helps in constructing a mobile interface where locals and travelers can communicate. Hence this enabler will be used in the *User Interface* block for the mobile interface (given its chat-based communication, this enabler is a clear candidate for implementing the communication part of the *Online Gamified Trip Support* from figure 3). An additional enabler to use in such block is the Fiware Marketplace GE. This actually seems a more interesting module as we can use it as a base of our platform and start building the rest of functionalities on top of it.

- The **Content Optimization** enabler is used to help in the profile matching between the local and the traveler. We are interested in extracting characteristic keywords from different text-based sources that the users provide ('About' description, own blog, comments in social networks...). This is why we consider that this enabler can help us with the semantic enrichment task based on NLP and hence it is included in the *User's Profile Acquisition* block.

DEMO (WEB TESTS)

As it can be interpreted from the text, the project is still in an early development phase and we still do not have a working platform prototype where Fiware/FIcontent modules can be integrated. However, we have considered our participation in the Apps&Cultura contest as an approach to Fiware/FIcontent platforms and technologies and hence what we have done is to individually test the different chosen enablers in order to understand which of the software modules can help us in building the Common Locals platform.

We have carried out this test in two phases:

1. An implementation of simple web-services to understand how to use the enablers (described in this section 3).
2. A development of an initial prototype implemented as a mobile iOS app (described in following section 4).

Note that all this must be seen as a proof-of-concept implementation as both the web-services and the app still lack of some important functionalities that are totally necessary in a production environment.

POIPROXY SE

We have implemented our own interaction with the POIProxy SE communicating with its API by means of a set of python scripts. This web-service is implemented in a public and accessible instance at http://52.28.21.228/commonlocals/poiproxy/index.html. This prototype has been used to learn how to interact with the POIPproxy and hence understand which are its functional possibilities. We have chosen to interact with:

- **Photo services**: Instagram, Panoramio, Flickr
- **Events services**: Songkick, Eventful
- **Weather services**: OpenWeather

We also tried many other services available under POIProxy, but unfortunately only the ones listed above did properly work.

As shown in the screenshots in figure 5, the main focus has been on functional aspects rather than design. The objective was to understand what POIProxy could offer to the Common Locals gaming feature, hence just testing the interaction with its API has been enough. In this sense, right now we consider the POIProxy enabler as an interesting candidate for the *External Data Acquisition* module. However, we have been pointed out that maybe the *Open City Database* enabler could be an even better option; we will definitely explore this possibility as well.

Python scripts

Our implementation is based on developing an interface to interact with the POIProxy enabler, which in turn interacts with several data services. For the current testing we have used the installation already provided by the developers in the server '*app.prodevelop.es/poiproxy*' (this way we have focused on testing the enabler and really understanding what it can offer to the Common Locals platform). For instance, using the HTTP GET call

http://app.prodevelop.es/poiproxy/browseByLonLat?service=instagram&lon=139.6917&lat=35.6895&dist=500

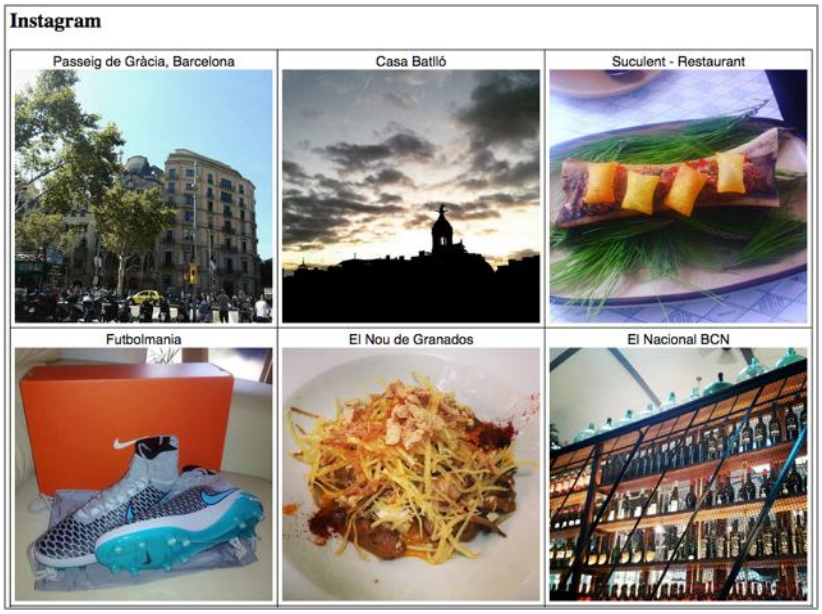
one obtains a JSON file with the latest Instagram photos (*service=instagram*) published around the center of Tokyo (*lon=139.6917, lat=35.6895, dist=500*). The created python scripts help at both (1) automating the different calls to this simple API and (2) process the received information.

This automation and processing is executed by means of different python scripts (as shown in figure 6):

- *index.html* is just a static HTML file that links to the rest of scripts.
- *photos.py* loads the photos from Instagram, Panoramio and Flickr.
- *events.py* loads the events from Songkick and EventFul.
- *weather.py* loads the weather information from Open Weather.
- *poiproxy.py* contains the class PoiProxyInteraction that manages all the interation with the enabler.

Note that the all intermediate scripts (photos.py, events.py, weather.py) are provided with both the longitude and latitude of the geographic point where we want to obtain the information from. This flexibility makes it easy to collect the information for different places.

For further details about the code, refer to the scripts included in the submitted 'poiproxy.tar.gz' file.



(a) Photos

Songkick

Event type	Event date	Url
Concert	2015-10-08	LINK

Eventful

Title	Venue	Start Time
La petita Flauta Màgica	Gran Teatro del Liceu	2015-12-28 18:00:00
Els Pastorets	Gran Teatro del Liceu	2015-12-27 12:00:00
Els Pastorets	Gran Teatro del Liceu	2015-12-20 11:00:00
Barcelona Meeting Point	Fira de Barcelona	0:00
Cécile McLorin Salvant - Voll-Damm Festival	Barts	2015-11-19 21:00:00
Festa Major de l'Esquerra de l'Eixample. Vermut amb Impro Show	Golferichs Centre Cívic	2015-10-03 12:00:00
Dylan Moran	Sala Apolo	2015-12-04 21:00:00
Connexionsl Big OK: Paul Fuster + Edi Za! + Sara Fontán	Sala Apolo	2015-10-10 21:00:00
VICTOR DE DIEGO TRIO	Milano Cocktail Bar	2015-09-28 21:00:00
AMADEU CASAS TRIO	Milano Cocktail Bar	2015-09-30 21:00:00

(b) Events

Weather

Weather Description	Temperature	Humidity
scattered clouds	22.45°C	73%

(c) Weather

Figure 5. Screenshots of webpages showing information about the center of Barcelona

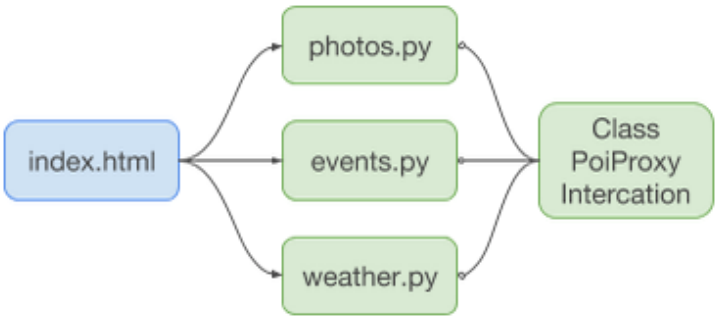


Figure 6. Diagram of the interaction with the POIProxy enabler

SOCIAL NETWORK SE

We have installed the Social Network SE in a public and accessible instance at http://52.24.3.157/. In this implementation it is possible to log-in with a Traveler's name and access to the threads of different Locals where a chat-based communication can be done. Figure 7 shows the two representative screenshots of the Social Network SE functionality:

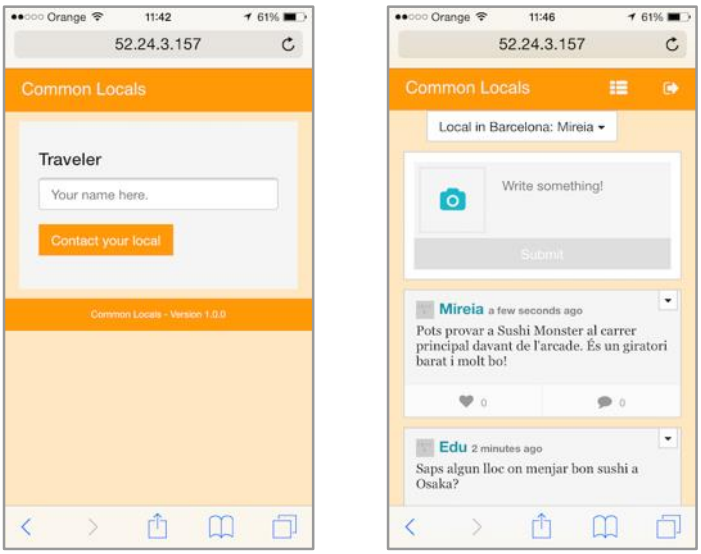


Figure 7. Social Network Screenshots: Login & Chat

As said before, the Social Network SE enabler is a very interesting candidate for the *Online Gamified Trip Support* feature - see figure 3.

The current implementation is based on the original version of the code with small changes to personalize the view. We have made changes to the following files:

- *[installation-folder]/ppnet-proxy/www/* **config.json**
- *[installation-folder]/ppnet-proxy/www/* **index.html**
- *[installation-folder]/ppnet-proxy/www/views/* **login.html**
- *[installation-folder]/ppnet-proxy/www/views/* **stream.html**
- *[installation-folder]/ppnet-proxy/www/views/partials/* **header.html**
- *[installation-folder]/ppnet-proxy/www/styles/* **main.css**

For further details about the code, refer to the 'www' folder included in the submitted 'social_network_www.tar.gz' file.

CONTENT OPTIMIZATION SE

The Content Optimization SE was initially one of the most interesting for its functionality of annotating texts in order perform a semantic enrichment task based on NLP. We would like to use such functionality to extract characteristic keywords of different texts provided by the users (e.g. a travel blog) and hence construct a better user profile that is later used to match this user to others.

However, we have encountered different problems that have delayed and finally avoided the testing we wanted to perform:

- The online documentation for this enabler resulted to be mistaken because a bad port mapping description.
- An alternative was to install our own instance, but the enabler is not installable and the developers must use the instance deployed in the Fiware cloud (which online documentation was wrong).
- In addition, any enabler that involves the use of the FIWARE-Filab platform requires a special Filab account. The test user account is enough for this duties, but the platform seems to be filled this type of accounts. The alternative is to get a Community Account - which is what we did - but this requires a small documentation and it introduces some delay until it is approved.
- After several days interacting with the SE developers, the documentation has been finally updated. Unfortunately it is now too late for us given the close deadline for the Apps&Cultura FIcontest. However, we will definitely perform the planned tests as soon as we can.

DEMO (iOS APP)

The second part of the tests has involved the implementation of a functional prototype as an iOS mobile app. Note that this is not a production-grade application as it still lacks of some important functionalities. Nevertheless, its implementation has been very useful to really, first, understand how the special enablers could be used, and second, how to really use them in a real development environment.

Although the app functionality is still limited, we will use it as the base of our MVP (at least regarding the *Online Gamified Trip Support*). In fact, we now have some working code that interacts with the enablers, so now it is just a matter of working other aspects such as design, server-communication to persist data, additional functionalities, etc...

This section is divided in two sub-sections that map each one of the uses of the game depending on the player role: from the local and from the traveller perspectives. Note that right now the two functionalities are implemented in the same app but only for demonstration reasons. This is why the first app screen is a main menu where the demo user must select whether he is acting as a local or as a traveller.

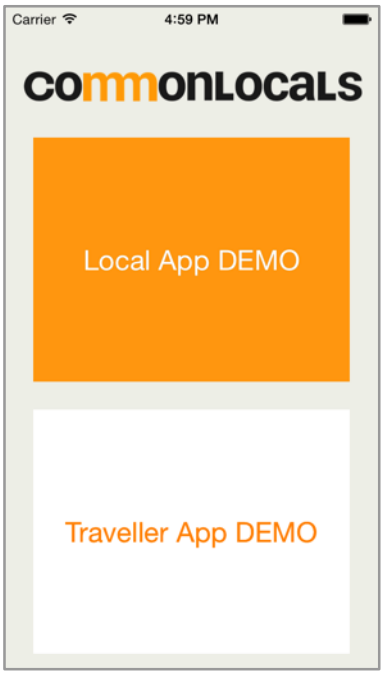


Figure 8. Main menu of the demo game app

Refer to this video for a visual demo of both the local and traveller functionalities.

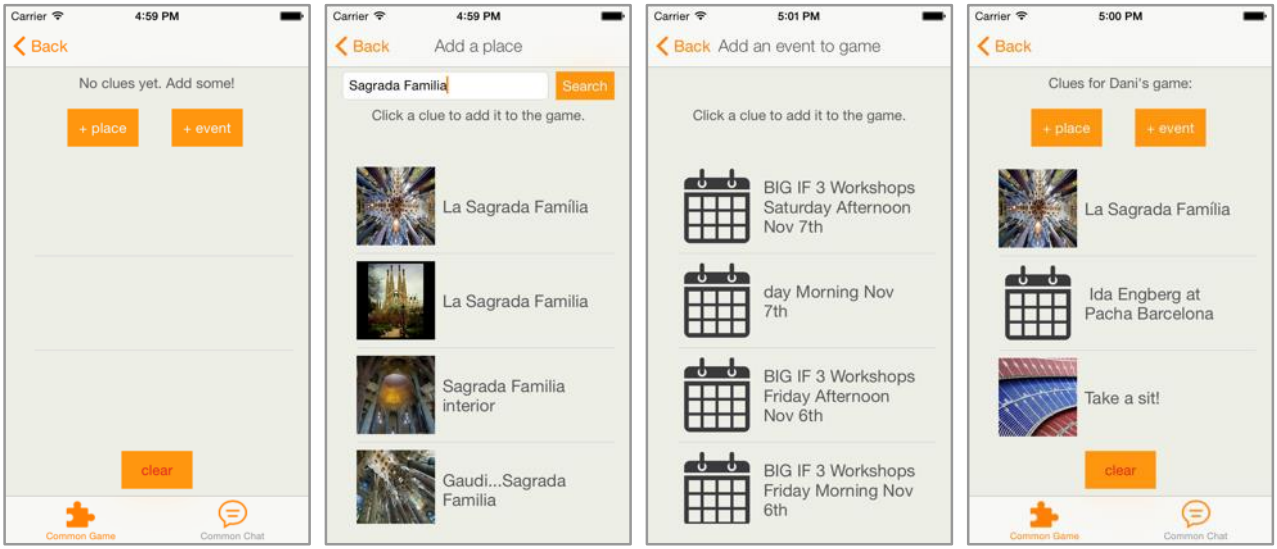
You can download and test the demo app via this Hockey App link.

LOCAL APP DEMO

This part of the demo shows the main function that a local performs: to create the route with the clues that the traveller will come across:

1. Empty Clues List
2. Add a place to the list
3. Add an event to the list
4. Finalized clues list

The following figure shows the corresponding screenshots for each step of the process:



1. Empty Clues List
The local is presented with a list (empty at this moment) that represents the set of clues for the traveller. In other words, the places that he recommends to visit.

2. Add a place
In order to fill the list of clues, the local can add a place. The local can search for the picture of the place he wants to add as a clue (e.g. a picture of the Sagrada Familia). The data is obtained from the POIProxy enabler using its service to interact with the 'Flickr' API.

3. Add en event
In order to fill the list of clues, the local can add a event. The local can search for the event he wants to add as a clue (e.g. a Dj session). The data is obtained from the POIProxy enabler using its service to interact with the 'Eventful' API.

4. Finalized Clues List
Every time a clue (either a place or an event) is added, these are added to the list that was initially empty

Figure 9. Local App Demo: steps to add places or events to the clues list

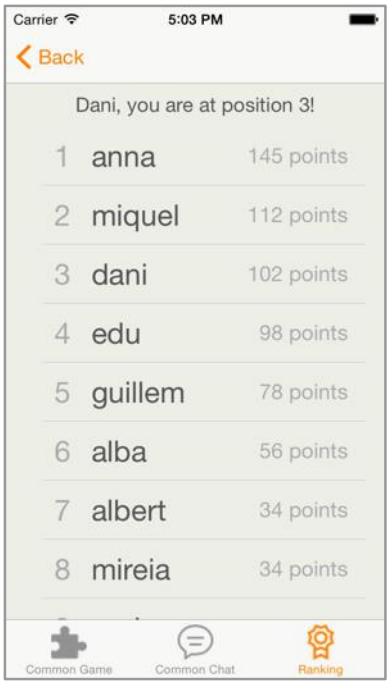
TRAVELLER APP DEMO

The part of the app the related to the traveller includes three functionalities:

1. Next Clue
2. Travellers Ranking
3. Communication with the local

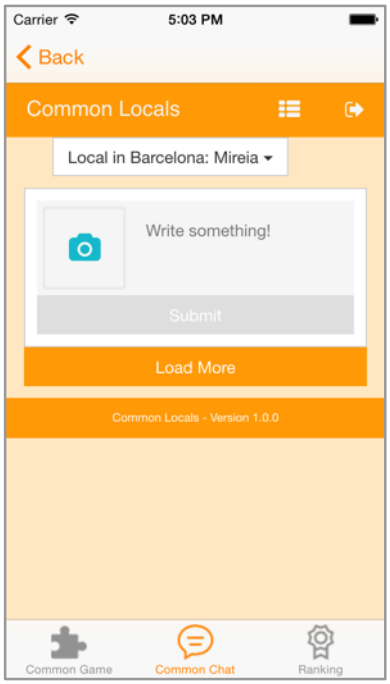
Next Clue

The traveller is presented with only the next clue. This clue is represented by a picture that the traveller has to interpret and guess what is the place to visit next.



Travellers Ranking

Since this online interaction with the local is based on a game, a ranking to compare the performance of different travellers is provided. This information is obtained from the Leaderboard SE*.



Communication with the local

A means of chat-based communication to the local is also provided (note the local can also see this chat on its part of the app). This chat is a direct embedding of the Social Network SE described in section 3.2.

* Note on the use of Leaderboard SE: We have used the default instance provided to test and installed in `130.206.83.3:4567/lb/`

Figure 9. Local App Demo: steps to add places or events to the clues list

Descripció tècnica de les tecnologies FIWARE	
Project name	**Propozapp - Unfolden**
Company name	**Saogap - Magí Sanchón Soler**
Project Owner	**Magí Sanchón Soler**
Categoria	**Smart City Services**

PROJECT ABSTRACT

Propozapp - Unfolden is a two part solution, empowering artists for their promotion and providing new entertainment alternatives to event seekers.

Artists of any size can create their new event and start promoting themselves by going to our web, entering their personal space and creating events and places where they perform. The focus on simplicity and feedback allows the artist to see how the event will be displayed when they are gathered and distributed through the second part of the solution, our agenda.

The agenda is a mobile app where you can find those alternative events the artists just created mixed with other events and data to ensure you find what you most like. And don't worry, the design is simple and focused on easiness: you are presented with just an event at a time, you can like it or dislike it by swiping right or left respectively, and the app will learn from that, making future suggestions so much better.

We focus on empowering the artists with a good and easy tool to promote themselves to new audiences, and for that, we aim at having a dynamic agenda very appealing to the public.

ARCHITECTURE

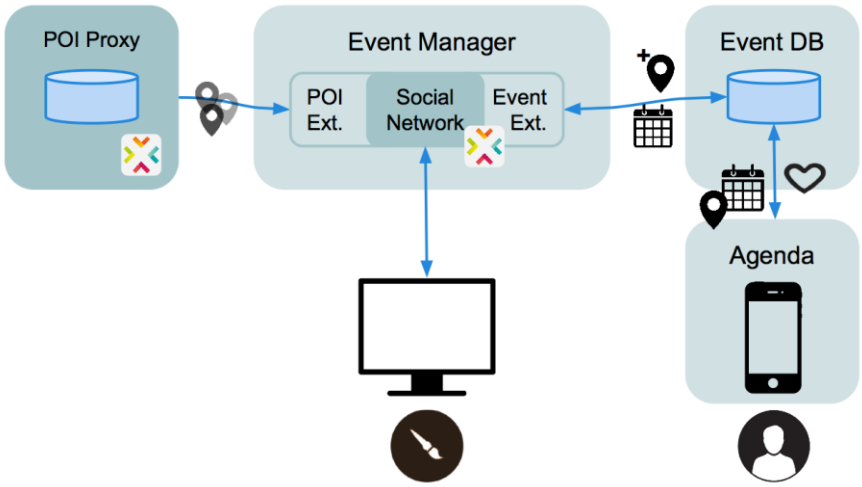
Architecture description

The solution has two main pieces. The first one where the events are created, the Event Manager, and the second part where the events are displayed, the Agenda.

The goal of the event manager is solely to create events, and the goal of the agenda is to make those events accessible to the public.

This division of tasks is done in purpose. After interviewing many customers we realized that the event creators and the event consumers have very different needs. The consumers just need to see events fast and have no need to create, while the event creators (artists) already have their images and data available to a computer, and prefer to use a web interface for better control of what they are creating. Allowing the creation of events just in the event manager (just through web) helps rising the content quality of the events, since it requires the creator of such event to think about it longer.

We will now describe the components installed locally (the agenda) and then pass to the server side (the Event Manager and the pieces it relates to).



Overall view of the software components of the project. top line the three server components

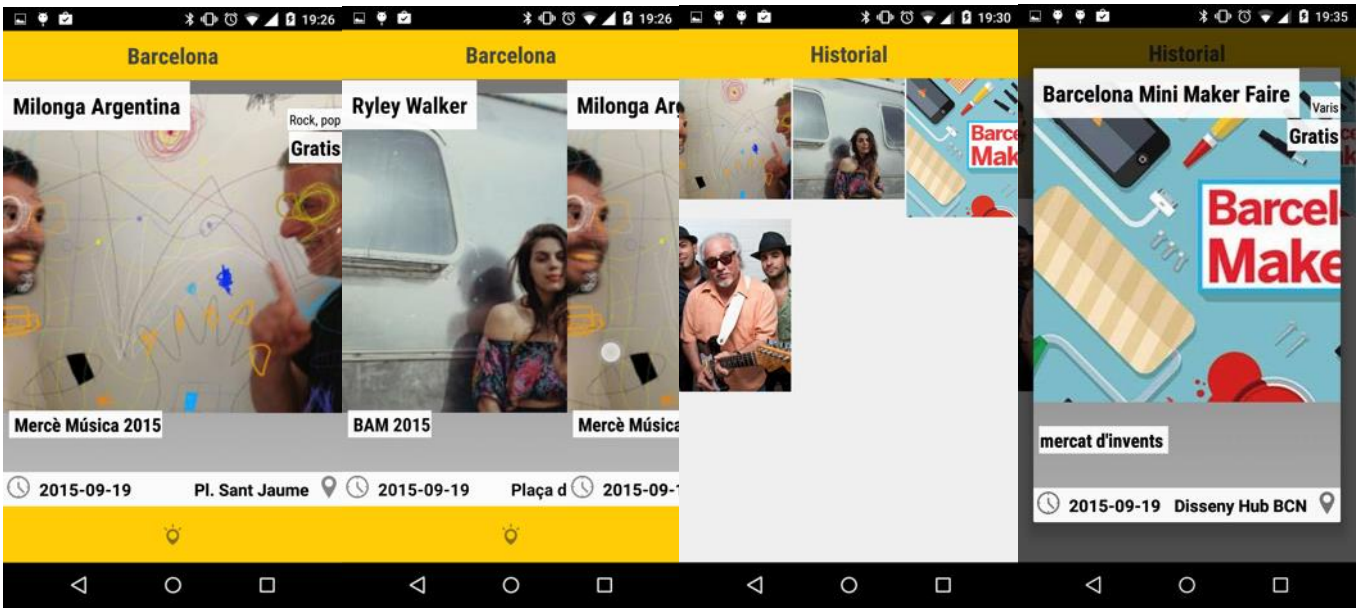
Components of the Agenda

The architecture of the agenda is very simple. Is right now a native Android application that connects to the database where the events are stored and displays them. After interviewing many customers we decided to not allow the creation of events through the Agenda, so it is kept simple and at the same time we raise event quality.

No FIWARE technology has been used in this part, so you can pass to the next chapter if you are just interested on the FIWARE usage.

The Agenda is mainly composed of two main views:

- **The Browser**: where the events are shown one by one and where the user can interact with them. A swipe to the left indicates not liking the event and a swipe to the right indicates we liked it. This information is used to narrow the following suggestions.
- **The History**: all the events that have been liked and are still available in the future are displayed here in a grid format. On a simple click the user can see the original information of the event.



screenshots of the Agenda. from left to right:

event, swiping event as liked, history of liked events, event detail in history

Flow of creation of an Event in the Event Manager:

Let's pass now to where the events can be created, the Event Manager. We first describe the flow to better understand how it works.

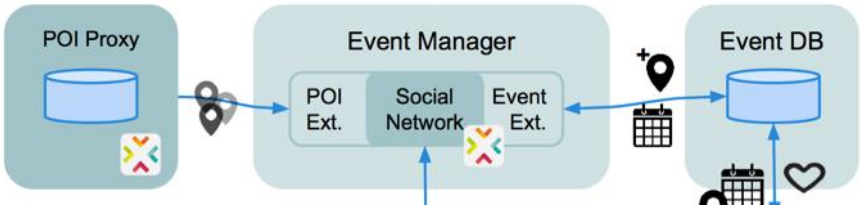
The Event Manager allows the Artist to create two things: Places and Events in those places. The user flow would:

1. Log into the event manager (web)
   Once in we are directly presented with a screen to create events. if we scroll down we can see other events created and an approximate format on how they look in the Agenda.
2. Create a Place if we need to
   To create an Event we need to select a place where the event is performed. If we don't already have one, we can create one.

   When creating a new place we are presented with suggested places as we type the place name. Those suggestions are taken using the POIProxy, so the system uses public information to have many places already available with extra information, including the coordinates. Those will be saved in our newly created place, giving us an "Enhanced" POI.
3. Create an Event
   The main screen allows the creation of an event. It asks us for several basic pieces of data, including a mandatory picture, and it also suggests us the available places (that we have created before).
4. Nothing else. you are done.
   Yes it is that simple. The event is now in the database and can be picked up by the Agenda.

Components of the Event Manager and rest of server side.

The architecture of the Event Manager is more complicated. We use here two enablers: the Social Network and the POIProxy.



server software components

- **Event DB**: Events and places are stored in this database. The Artist or promoter uses the Event Manager to create the information that is stored here, and the Agenda uses it and displays it to the end user.
- **Event Manager**: Used by the artist or promoter to create events and places (where the event will be hosted). The core of the Event Manager is the Social Network enabler. It has been extended heavily to be able to create those events and perform searches of information to help the user. The next chapter covers those changes more in detail. Here we provide a brief description:
    - POI Extension: This extension to the Social Network Enabler enhances the application by providing smart access to venue information. When creating a place, an automatic search is performed against the POI proxy in order to suggest existing real venues, providing localization and extra information about the venue to be later on used in the Agenda, and help the artist filling in information. And when the artist is later on creating an event, this extension helps by providing access to the venues that have been created (we represent those in the diagram with the name “Enhanced POI”).
    - Event Extension: This extension to the Social Network Enabler enhances the application by providing everything that is necessary to create places and events. It provides a fully new type, the PLACE, on top of the existing post type. And it extends the post type to become an event: many more fields, datepickers, timepickers, autocomplete for the category, link to a place, etc. It is finished by the providing also the needed changes to visualize the events in a similar way on how it would look in the Agenda.
- **POI Proxy**: Is responsible for suggesting real venues based on the search string provided by the Artist. The POI Proxy is contacted by one of the built extensions within the Event Manager.

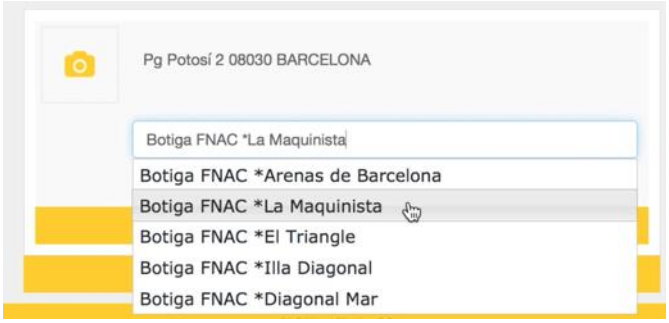
Important changes to the Enablers

Some changes have been performed to the Enablers in order to provide the functionality we needed for this application and was not available within the enablers. In this chapter we go through the different changes, providing detail about them.

POI Extension to Social Network Enabler

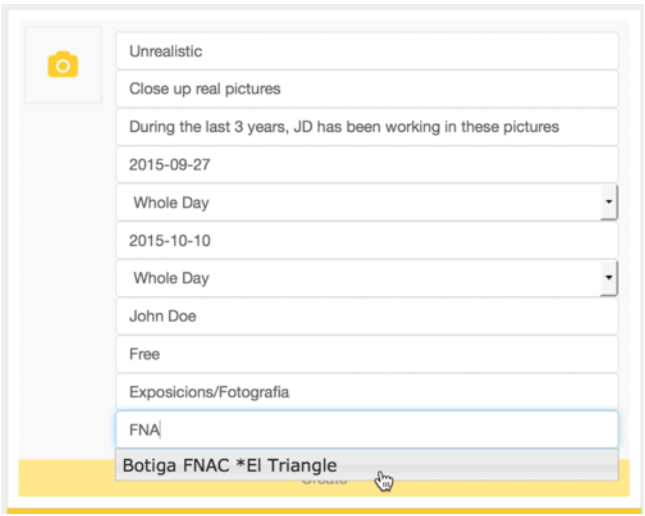
This extension to the Social Network Enabler enhances the application by providing smart access to venue information.

When creating a place, an automatic search is performed against the POI proxy in order to suggest existing real venues, providing localization and extra information about the venue to be later on used in the Agenda, and help the artist filling in information. This call is performed using the services of the POI Proxy and an Ajax call.



real places are suggested from the POI Proxy interface

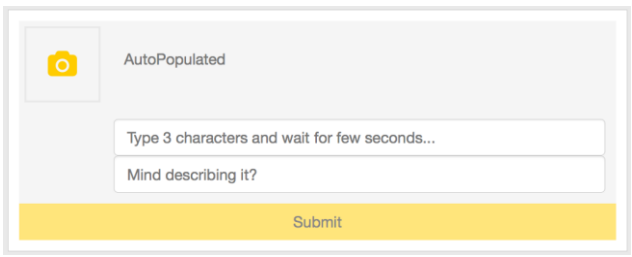
And when the artist is later on creating an event, this extension also helps by providing access to the venues that have been created (we represent those in the diagram with the name “Enhanced POI”).



previously created places are suggested for us to create an event into

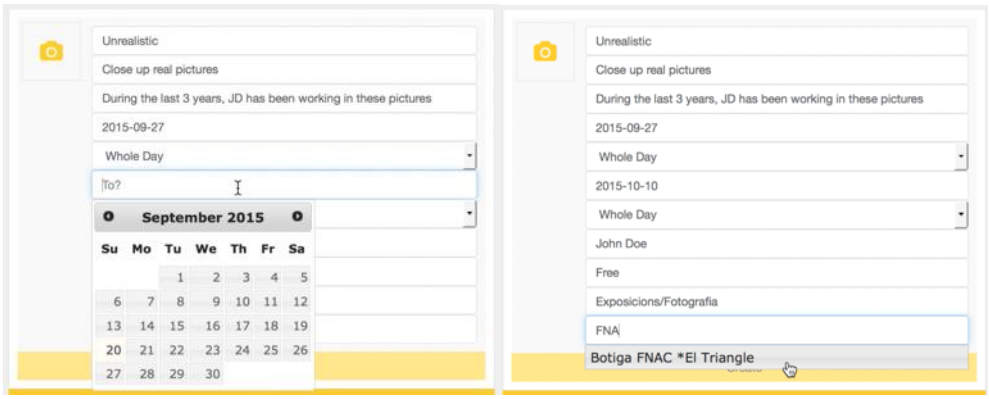
Event Extension to Social Network Enabler

This extension to the Social Network Enabler enhances the application by providing everything that is necessary to create places and events. It provides a fully new type, the PLACE, on top of the existing post type.

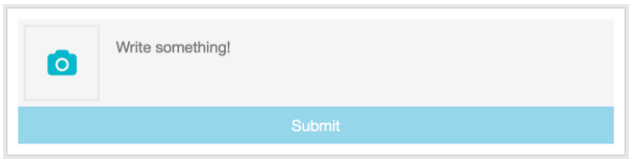


new interface to create a place, with optional picture

It extends the post type to become an event: many more fields, datepickers, timepickers, autocomplete for the category, link to a place, etc.

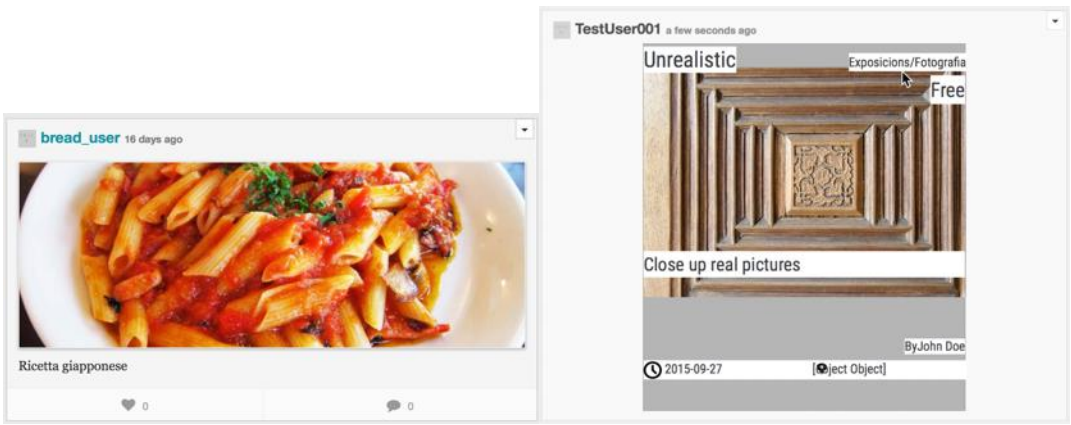


from left to right: overall view of the fields with datepicker, autocomplete and suggestions



view of ppnet post was before the changes to adapt it to being event

It is finished by the providing also the needed changes to visualize the events in a similar way on how it would look in the Agenda.



comparison of ppnet post view with current event view and the many more fields

Enablers Considered

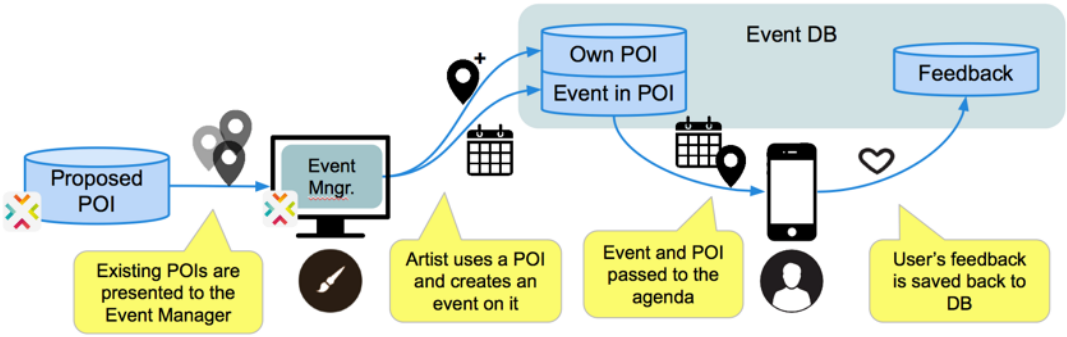
We considered several enablers and we ended up choosing what we thought it was best for our needs. Here we summarize our thought and experience on them, as well as why we took them or not.

Name	Good	Bad	Decision
POI Proxy	simple and ready to	merge of same POI	take it because of it's

	use. requires tomcat installation. worked almost directly. provides single format for many sources of POIs	coming from different sources is not done. would need to do it in own db	readiness for a MVP
Social Network (PPnet)	adaptable to not just posts but events and places. simplicity of interface	security. needs to be extended. impossible to make work the phonegap variants	take it because it was feasible to make the Event Manager out of it
Fusion Engine	seems to merge POIs from many sources into one POI. would be great for suggestions	impossible to install. tried tomcat 7 as per instructions and already made .war was undeployable. tomcat 8 working but very hard to do a first configuration.	maybe in the future. not for current MVP
App Generator		no need to generate multiple apps.	not needed
Content Optimization	could be used to analyze the text provided with each event and be able to suggest better in the Agenda	works JUST in german and english AND the code is not open. This makes it unusable for most of europe.	discarded.
Open City Database	seems a good source for POIs in the cities	made it work and the only information available were the city names themselves. can't really say that an event happens in "barcelona".	discarded.

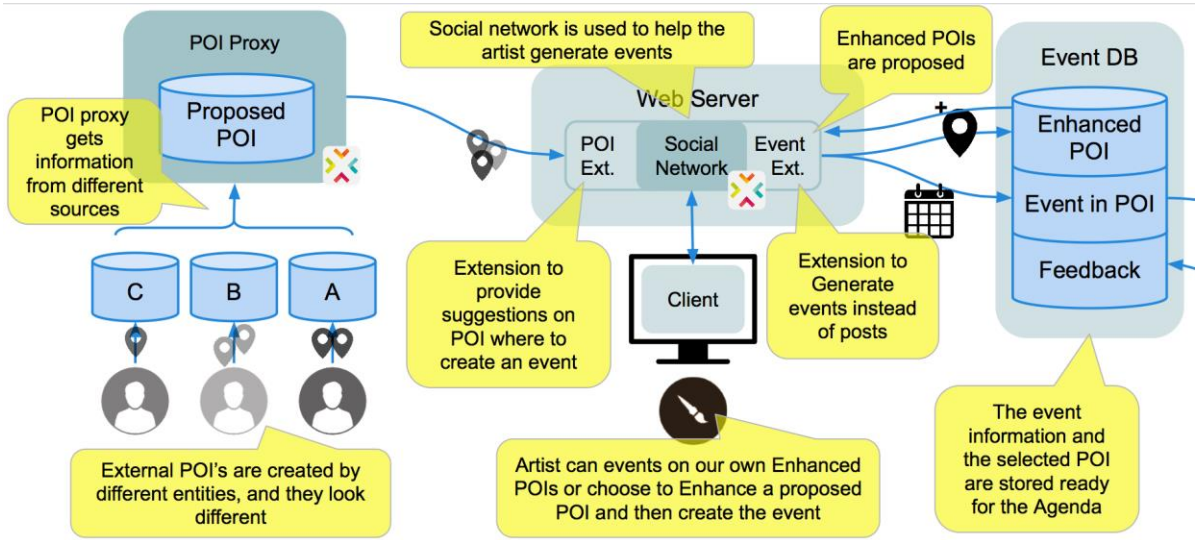
Architecture diagram

Overall flow of information



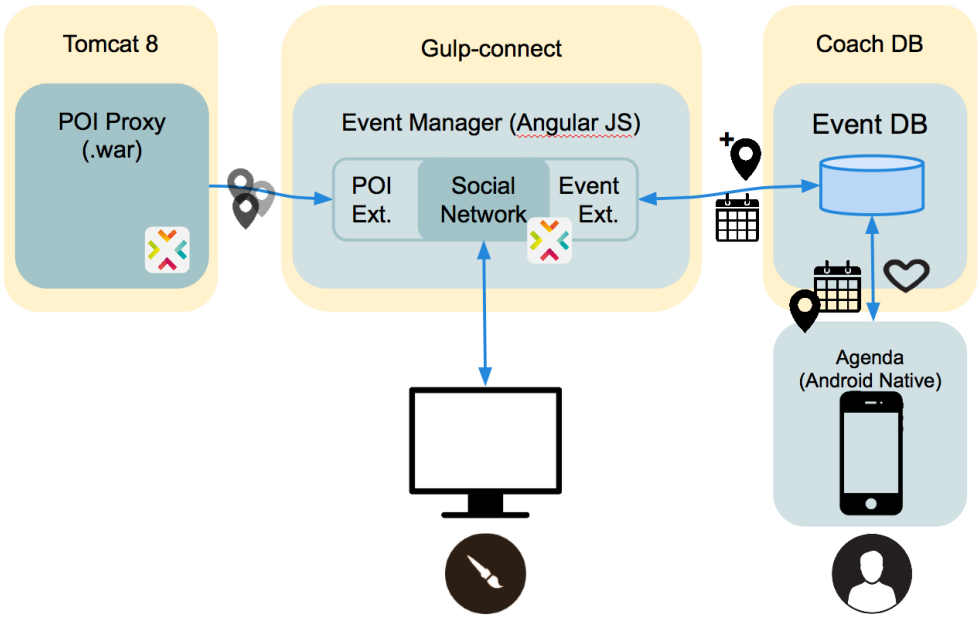
normal flow for an event creation

Detail of the Event Manager



event manager details

Technical Details



technologies used on the solution

DEMO

Instructions on how to run the demo

Demo location and video instructions

For testing purposes and to not interfere with the production environment, a complete demo environment has been created. The data generated with the manager in the demo environment is just accessible in the demo environment. Just the demo agenda has access to it (link to apk provided below). The following links grants you access to the different parts of the application.

There is a demo of the Manager (allows you to create events, and it uses the enablers) at

http://www.unfolden.com/demo/manager/

And if you want to see where those events go, check our app demo (for Android at the moment), which connects just to the demo environment, so you will see what you created (production environment contains hundreds of events and we can't provide access to it):

http://unfolden.com/demo/unfolden_agenda_demo.apk

For your convenience we added an instructional video about creating the events and usage of fiware. you can have a look at

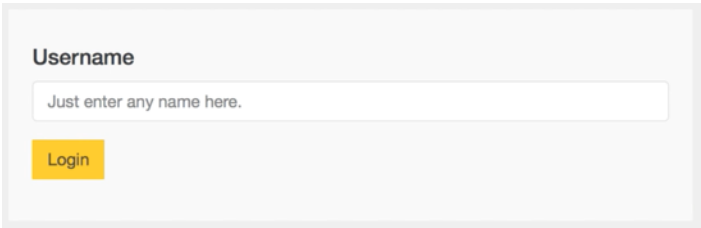
https://youtu.be/6l2ASFxV0ek

Instructions on the agenda are provided within the agenda itself. please download the apk accessing the demo environment from the link above.https://youtu.be/6l2ASFxV0ek

Step by step instructions

We are going to log into our Event Manager and create both an event and a place where to create that event.

1. Log into the event manager.
   Browse to http://www.unfolden.com/demo/manager/
   Provide any username. you are in a Demo version of the Event Manager.



user screen on demo version

   Once in we are directly presented with a screen to create events. if we scroll down we can see other events created and an approximate format on how they look in the Agenda.

2. Create a Place where we will create the event

To create an Event we need to select a place where the event is performed. If we don't already have one, we can create one.

Click on the pin icon to go into the screen where to create a place. it's located on the top-right corner of the screen

pin icon

When creating a new place we are presented with suggested places as we type the place name. Those suggestions are taken using the POIProxy, so the system uses public information to have many places already available with extra information, including the coordinates. Those will be saved in our newly created place, giving us an "Enhanced" POI.

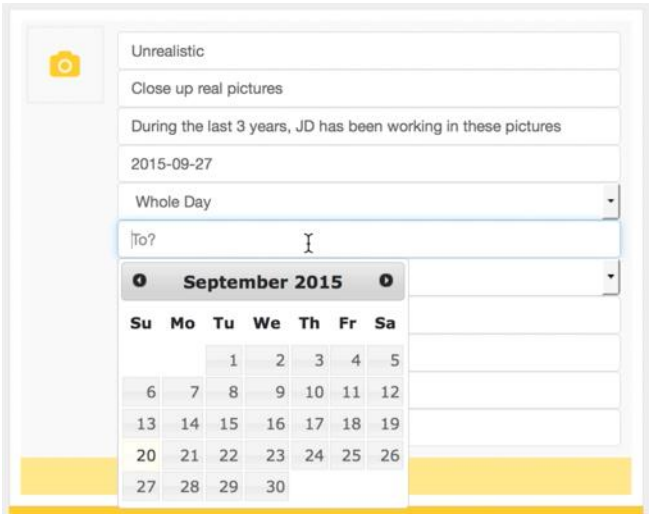
real places are suggested for us to create our own venue

3. Create an Event

   Click on the list icon to go into the screen where to create an event. It's located on the top-right corner of the screen

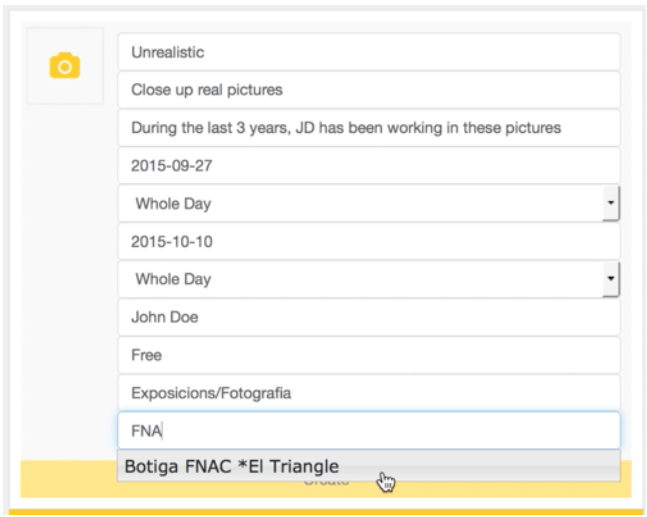
events button

The main screen allows the creation of an event. It asks us for several basic pieces of data, including a mandatory picture.



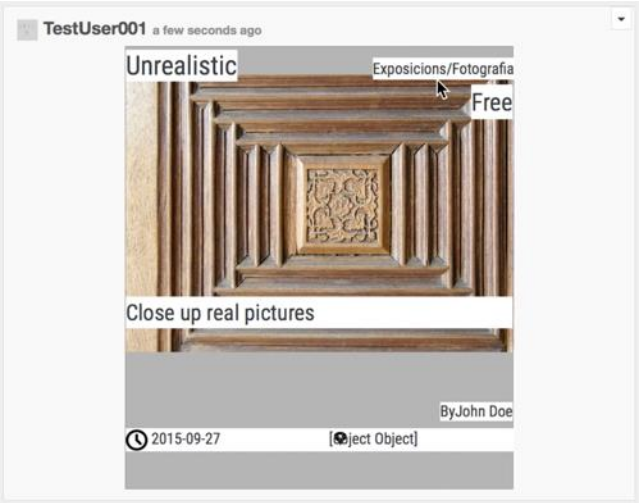
calendar shown among other event fields

It suggests us the available places (that we have created before).



previously created places are suggested for us to create an event into

And shows us the created events with an approximate view on how it looks on the Agenda



created event

4. Event created!.
   Yes it is that simple. The event is now in the database and can be picked up by the Agenda. You can now log out.

log out button

5. Open the Agenda.
   You can find the .apk (Android) agenda accessing the demo environment here:

   http://unfolden.com/demo/unfolden_agenda_demo.apk

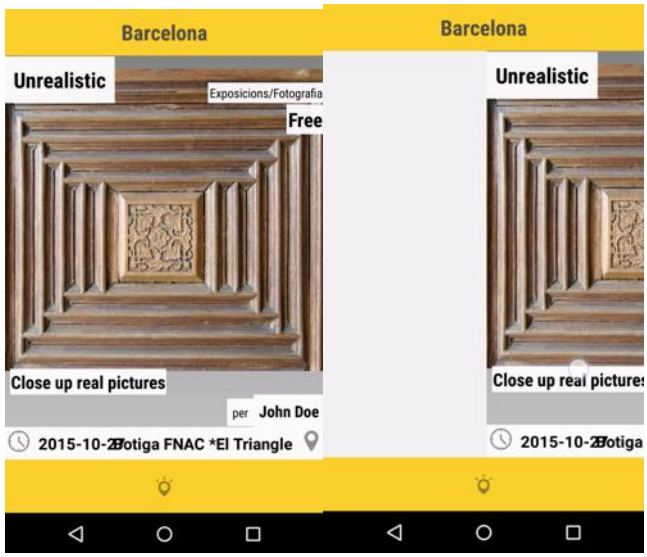
   After installing the Agenda app, just open it. You are presented with some instructions on how it works

initial instructions

6. Swipe right to signal we like the presented event

   After the instructions, events in a FUTURE date are presented here.

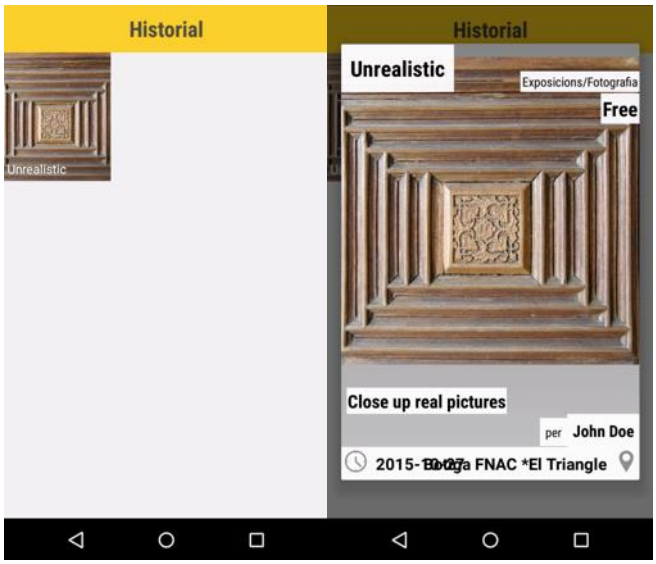
   Swipe one of the presented events to the right to save it as liked.



created event and swiping it to the right (we indicate we like it)

7. Check the history

   Click on the button on the lower part of the screen to access the history of liked events. Jus



history with the event we liked and details of the event on history

Justification (only for non public demos)

There is no need for justification.

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