



SOCIETIC
**SOCIety as Infrastructure for E-Science via technology, innovation and
creativity**

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1. SUMMARY

After the great start of the project, the project keeps going very well thanks to the involvement of the partners and their outstanding work. Main tasks are focused on project development and Green Paper writing. Nevertheless, overload of work may cause some minor delays in dissemination and documentation.

2. INTRODUCTION

This deliverable follows directives set up in the Deliverable D12 Quality Management and Progress Monitoring Plan. So, this reports includes following practices:

1. Monitor progress against the schedule
 - measuring actual completion of activities and milestones
 - comparing actual completion of activities and milestones against the work plan in the DoW
 - identifying significant deviations from the work plan in the DoW
2. Monitor project's costs and expended effort
 - measuring actual effort and costs expended and staff assigned
 - comparing actual effort and costs expended and staff assigned against the budget in the DoW
 - identifying significant deviations from the budget in the DoW
3. Monitor the attributes of tasks (such as size, complexity, knowledge provided, skills required or social impact)
 - measuring actual attributes of work and tasks
 - comparing actual attributes against the tasks description in the DoW
 - identifying significant deviations from the tasks description in the DoW
4. Monitor the project risks against those identified in the DoW

In order to ease the activities carried out, we group them in work packages where each activity is described as well as the role of each partner. All the work packages started in month 1 and will finish in month 24, so all of them must appear in this report.

3. WP1 Management

During the second six months period several events were organized in addition to open calls that required an effort related to the project management.

Two hack days were organized and held in Spain: one in Madrid and one in Zaragoza. First one counted with the attendance of around sixty people and lasted for two days. While the first day had

conferences that fostered interesting discussions, the second day was a hands-on for several proposed projects. The second one in Zaragoza lasted only for one day with around sixty attendants also working on ideas proposed by those attendants.

With the Green Paper in mind, a call for contributors was launched with the aim of an open discussion about EC policy recommendations. Contributions were made online. Additionally, through the tool *All Our Ideas*¹, a votation for a proper Citizen Science definition was set.

Together with the open call for contributors, an open call for subcontractors was launched to subcontract two Citizen Science applications. Among the sixteen proposal received, two of them were selected. Process for contract signing was initiated and, at the time of the current document creation, being processed.

During the first six months, most of the communications were done by mail, using the mailing lists of the project. Given the significant amount of documents to be shared, Google Drive has been widely used. Four virtual meetings have been held during these months: on 4th April, 1st July, 3rd September, and 24th September. Some specific topics like software development issues were addressed by inner mailing lists among the people involved in the work instead of the whole consortium. Similarly, some other meetings were held to discuss more concrete issues like requirement analysis and planning for Mind Paths or Sun4All applications where the presence of the whole partners was not mandatory.

Including this **D1.3.2. Progress report**, we have delivered eight deliverables (sorted by date):

- **D.3.1.1. Operational Platform for Experimental Research**
 - Infrastructure Description
 - Maintenance and Application Porting Policies
 - Interoperability Requirements
- **D.3.2.1. First Year Technical Workshops and Seminars Outcomes Report**
 - Citizen Science Open Technical Workshop
 - Citizen Science Hack Day in Madrid
 - Citizen Science Hack Day in Zaragoza
- **D.4.2. Cell Images Application Report**
 - Application Specifications
 - Development
 - Design and User Experience
 - Deployment
 - Results
 - Publications
- **D.5.2. External Advisory Board Report**
 - EAB Selection Procedure
 - EAB Roles and Visibility
 - EAB Meeting Schedules
 - Non-Disclosure Agreement
 - Societize EAB Members

¹ <http://www.allourideas.org/>

- **D.1.3.2. Project Progress Report**
- **D.2.3.1. Annual Report of Activities**
 - Major Achievements
 - Editorial Process
 - Events
 - Memorandums of Understanding
- **D.3.3.1. Report on the Deployment, Administration and Use of the Infrastructure**
 - Infrastructure Description
 - Maintenance and Application Porting Policies
 - Interoperability Requierements
 - Infrastructure Usage
 - Aggregated Statistics
- **D.5.3. Draft White Paper**

The amendment of the project is still on progress. We suffered big delays due to the maternity leave and summer holidays of one key person in the administrative issues within the BIFI-Unizar team. This unexpected situation joined together with summer holidays and the financial problems of the UNIZAR, made impossible to work properly on this important issue. Some unsuccessful attempts were done but legal procedures were not properly addressed. This is a critical point which should be done as soon as possible.

3.1. Partnership team and PMs

Unizar has allocated 9.43 PMs. The team involved in the work are Alfonso Tarancón, Fermín Serrano, Arturo Giner, José Luis Alonso, Isabel Vidal, Beatriz Antolí, Eduardo Lostal and Francisco Sanz.

UC has allocated 1,57 PMs in WP2, WP3, WP4 and WP5. The team is formed by Rui Brito and Cândida Silva.

MCUC has allocated 4.5 PM in the project in WP2 and WP5 (Estimated). Four people have been involved in the work, namely Carla Coimbra Alves, Gilberto Pereira, Miguel Gomes and Paulo Mota.

UFCG has allocated 21 PMs. Six people were involved with the work, namely: Francisco Brasileiro, Nazareno Andrade, José Antonio Leal Farias, Adabriand Furtado, Lesandro Ponciano and Jeymisson Oliveira.

ZSI has allocated 6.18 PM. The people involved are Teresa Holoher-Ertl: WP5 work package leader, evaluation expert; science communication; Barbara Kieslinger: strategic advisor for science communication and evaluation; Claudia Magdalena Fabian: evaluation expert; administration; Pamela Bartar: expert for public relations, coordination of Austrian dissemination activities; dissemination plan in general; Josef Hochgerner: scientific manager, quality assurance, consultancy.

TECN has allocated 1,92 PMs from Manuel Perez and 0.66 PMs from Jaime Gonzalez.

4. WP2 Communication and citizenship

The objectives for SOCIENTIZE dissemination activities are defined in the deliverable **D2.2.Dissemination Plan**. This document describes the basis of a successful dissemination of the SOCIENTIZE project, and contributes to a comprehensive awareness strategy.

In this plan we cover the following key points for dissemination and awareness activities:

- We select widespread models around which guidelines are organised
- We identify and refine steps for a successful strategy that includes: a key message, target audience and tools/communicating channels
- We present the existing partner networks to be used for the successful dissemination of the project
- We set metrics for monitoring the dissemination activities against which we are going to improve our strategy

The SOCIENTIZE project targets six distinct stakeholder groups:

- the general public
- educational institutes
- artists
- policy makers
- the science community
- and e-Infrastructure providers

For each of these target groups the requirements, expected benefits, motivators for participation as well as a set of targeted dissemination instruments were elaborated.

All target groups will be addressed over the project website and social media tools. For the general public, dissemination instruments like press releases and cooperation with media, flyers and give-aways as well as the participation in public events will be used. SOCIENTIZE will also intend to involve artists in this communication process.

Major achievements:

- Creation of SOCIENTIZE brand identity guide and project documents templates.
- Development and publishing of SOCIENTIZE's website and maintenance of their contents.
- Publishing SOCIENTIZE's contents in Social Media channels (Twitter, Facebook, LinkedIn SOCIENTIZE's group).
- SOCIENTIZE's events Technical Workshop
- SOCIENTIZE's events promoting experiments with teachers (Spain, Portugal)
- Continued development of dissemination materials (brochures)
- Participation in various external events (Forschungsfest Viena, Researchers' Night 2013 in Coimbra and Zaragoza) and conferences all around Europe.

4.1. Dissemination activities

Dissemination tasks	Item	Status
Design	Dissemination Plan	Done
	Design	Done
	Image Handbook	Done
	Powerpoint Template	Done
Online Communication	Website Publication	Done
	Website Communication	Done, currently operating all languages
	Facebook Site	107 likes, Twitter module inserted to pulish in Facebook all the tweets
	Twitter Account	209 following, 225 followers
	Other Internet	15/06/2013: All Our Ideas survery, redefining concept of Citizen Science
	LinkedIn	Socientize has created his own Citizen Science space in LinkedIn
Hard Communication	Publications in General Media	Please, refer to D.2.3.1
	Publications in Specialised Media	Please, refer to D.2.3.1
	Third Party Publications referred to Socientize	Please, refer to D.2.3.1
	Posters, flyers and brochures	General brochure editable in vectorial format
	Promotion Materials	"I'm a scientist" giveaway buttons
Video Productions	Video	Video Cell Spotting
		Video Facing the Grand Challenges, by ZSI
Socientize Events	Public Events Organized	17-18/05/2013: Citizen Science Hack Day in Madrid 29/06/2013: Citizen Science Hack Day in Zaragoza
		Target Group Specific Events
	Co-organized events	26/04/2013: Café Científico, Instituto de Física de Cantabria, Santander (Spain), introducing Socientize as a model of Citizen Science Project
		14-16/09/2013: Vienna Citizen Scieene Festival
Attending Conferences		27-28/05/2013: Congress SciCom Pt 2013, Lisboa (Portugal), "Socientize. Sociedade com una infraestrutura para la ciencia"
		08/06/2013: "Curso de Ciencia Ciudadana" in Barcelona to introduce Socientize
		24/06/2013: The OpenScience Laboratory launch in London
		09-13/09/2013: "Science, culture and participation" course in Santander (Spain) organized by Universidad Internacional Menéndez Pelayo (UIMP)
		18/09/2013: "Current and Future Directions of Citizen Science" Workshop in London
		25-27/09/2013: BOINC Workshop in Grenoble (France)

		26/09/2013: Grid Event at Zaragoza
Dissemination Events	Volunteers oriented activities	27/09/2013: Researchers Night in Coimbra and Zaragoza

Table 1. Dissemination activities

4.2. Dissemination in Portugal

Portugal has been developing several activities to attract and motivate the public to contribute actively to science experiments. At the moment we have established contact with educational institutes, with a network of universities for elderly people, participated in events for the general public and organized dissemination activities.

4.2.1 Educational Institutes (Secondary Schools)

To engage the school community in SOCIENTIZE experiments, we organized several activities to take place during the new school year 2013/2014. We planned a public session about SOCIENTIZE, a general activity called “Citizen Science Goes to School”, a national contest called “School of Scientists”, and more specific workshop on the Cell Spotting application for teachers and students.

At the moment we have 7 schools recruited: 6 in Coimbra region and 1 in the city of Aveiro. All of them will receive at least, the Cell Spotting Workshop (for teachers and students).

So far we made 3 workshops with a total of 31 teachers attending. We have scheduled 4 more workshops with 22 more teachers.

Date of the event	School	Attendance Expected	Attendance
09/09/2013	Secondary School José Falcão, Coimbra	12	11
18/09/2013	Pedro Hispano Institute, Soure	18	14
27/09/2013	Secondary School Infanta D. Maria, Coimbra	6	6
02/10/2013	Secondary School Avelar Brotero, Coimbra	4	
16/10/2013	Secondary School Quinta das Flores, Coimbra	11	
22/10/2013	Secondary School José Estevão, Aveiro	5	
23/10/2013	Secondary School Jaime Cortesão, Coimbra	2	

Table 1: Schools participating in the Cell Spotting Workshop for teachers and attendance details

In order to reach schools all over the country, apart from the “Citizen Science Goes to School” and the national contest “School of Scientists” initiatives, we are preparing dissemination material that will be sent to 523 schools around the country in October, 2013. These materials include a leaflet of SOCIENTIZE and publicity to our activities.

4.4.2. General Public

First event where SOCIENTIZE was presented to the general public was in September 27th in the Researchers Night. This event, organized locally by the Science Museum of the University of Coimbra, had the participation of 420 citizens who had the opportunity to visit the “Citizen Science Kiosk”. In this dissemination kiosk, citizens could have the opportunity of trying the SOCIENTIZE experiments, watch a promotional video, get informed about SOCIENTIZE and Ibercivis project, get a bookmark and leaflets, and finally, to be invited to the public session of October 9th, 2013.

Before all these events, besides not being addressed for the general public, SOCIENTIZE was presented at SciCom Pt 2013 Congress² on 28th May 2013, a science communication congress held in Lisboa, Portugal.



“Citizen Science Kiosk” at Researchers Night

4.4.2.1 Elderly People

We established contact with Luis Jacob, president of RUTIS, the Universities of the Third Age Association Network³ and we will collaborate with 2/3 schools of this network. The activities are planned to start in a couple of months and will involve all experiments promoted by SOCIENTIZE.

4.2.3 Social Network

In an attempt to be closer to the Portuguese community, it was decided to go local and create a Facebook page called “Socientize Portugal”⁴. In this page, local events and news will be regularly posted. Socientize Portugal Facebook page should be online in the beginning of October, 2013.

4.2.4 Newsletter

A newsletter will be created so participants and interested parties can be periodically informed about SOCIENTIZE. The first newsletter should be out in October, 2013 and its subscription will be

² <http://comunicacaodeciencia.wordpress.com/>

³ <http://www.rutis.org>

⁴ <http://www.facebook.com/socientizeportugal>

made through Ibercivis webpage⁵ and promoted through Facebook and during public presentation sessions.

4.3. Dissemination in Austria

The main dissemination event for Societize in the first project year from ZSI was the participation at the Vienna Science Festival 2013, from 14th to 16th September 2013.

During the three day's event with the topic "Smart Cities" innovative projects were invited to take science out of its "ivory tower" and let thousands of Vienna citizens experience science. Societize used this innovative event to introduce visitors to the concept of citizen science, presenting different citizen science projects and letting visitors collect first "hands-on" experiences on site.

4.4. Dissemination in Spain

Most of the dissemination work from BIFI-UNIZAR was focused on networking and increase visibility of the project through event attendance and talks. Following previous work with Secondary schools, some events and agreements are set in order to get more volunteers contributing to the applications. Also, the reformatory of Zaragoza has been contacted and a proposal for their participation is being processed.

The following talks were given presenting Societize in different scopes:

- Within Encuentro Campus Hiberus in Jaca (Spain) on 3rd April, to introduce Societize to the Campus de Excelencia Internacional Hiberus, the Project of evolution for University of Zaragoza
- In Café Científico in Santander (Spain) on 26th April, organised by Instituto de Física de Cantabria; that was an opportunity to introduce Societize as a model of Citizen Science
- Societize Introduction for a Citizen Science course in Barcelona on 8th June
- Within "Science, culture and participation" course in Santander (Spain) between the 9 and 13th September organized by Universidad Internacional Menéndez Pelayo (UIMP) presenting Societize as catalysator for Citizen Science principles on the future White Paper
- At a Grid Event organized by the University of Zaragoza on the 26th September introducing Societize project resources

For the general public, during the Researchers Night held on the 27th September in Zaragoza, Societize was presented and within the booth of Ibercivis, Societize could be discovered and applications used through the computers available for such aim. In addition, two hack days were organized to attract general public attention. First one was organized in Madrid with Medialab Prado as the perfect venue. It was held on 17th and 18th May with a first day of talks and discussions and a second hands on day. Second one was organized in Zaragoza on 29th June as a hands on day to work on the proposed ideas.

In order to increase awareness of the project and looking for common interests and collaborations with similar organizations, some other institutions have been contacted and events attended with the goal of networking. European Citizen Science Association (ECSA) and Citizen Cyberscience Centre are some of those organizations with which some links have been created. Therefore, some

⁵ <http://www.ibercivis.pt>

events were attended like “The OpenScience Laboratory launch” and a Workshop on “Current and Future Directions of Citizen Science”, both held in London on 24th July and 13th September 2013 respectively, at the Royal Society. As well, BOINC workshop held in Grenoble between the 25th and 27th September was a good chance to meet people working on similar topics.

In what concerns to schools, BIFI-UNIZAR has continued with the Young Scientists Circuits where groups of high school students run visits to the facilities of Institute for Biocomputation and Physics of Complex Systems (BIFI). Among the activities and projects presented, Societize was mentioned and students encouraged to contribute. Also, thanks to an agreement between BIFI-UNIZAR and the Aragón regional government, 14 high schools from Aragón participated in Societize applications from May to June 2013. In practice, that meant more than 400 students using the previous version of the Cell Spotting application. On 26th June 2013, an event took place in Sierra de San Quílez High School of Binéfar (Spain), the school with the highest contribution where the Minister of Education, University, Culture and Sport, Mrs. Dolores Serrat came to deliver a Certificate of Recognition for his collaboration with the Citizen Science program and Collective Intelligence.

Also, an agreement with the Education, Youth and Sport Office of the Region of Madrid was set encouraging high schools to join Societize.

4.5. Dissemination in Brazil

UFCG was involved in the organization of the e-Science Workshop of the Brazilian Computing Society that took place in Maceió, Brazil⁶. The program of the event featured a presentation of one of the SOCIETIZE applications.

Moreover, UFCG has established a cooperation with the GalaxyZoo project in the area of characterization of volunteers in large volunteer thinking projects. The results of this cooperation have been reported in a paper entitled “Volunteers’ Engagement in Human Computation Astronomy Projects” that has been submitted for publication in the Computing in Science and Engineering journal.

5. WP3 Infrastructure operation and deployment

During this period, we have maintained and improved the infrastructure described in the deliverable **D.1.3.1. Project Progress Report**. One can find more details about this topic on the last WP3 deliverable **D.3.3.1. Report on the Deployment, Administration and Use of the Infrastructure**.

5.1 Infrastructure operation

BIFI-UNIZAR provides most of the infrastructure of the project, although other partners provide

⁶ <http://www.ic.ufal.br/csbc2013/noticias/bresci>

their own hardware to install, test and use software related to the project. UFCG was responsible for carrying out periodical check and installation of security patches and software updates in one of the PyBossa's servers later mentioned.

We're using mainly OpenVZ virtual machines to deploy different software components, although kvm virtual machines are used to support other services. These virtual machines are hosted in four physical nodes that are described in Table 1.

Name	CPU	Mem	HD	OS
srv1.ibercivis.es	Intel(R) Xeon(R) CPU E5520 @ 2.27GHz (x16)	24GB	1TB (Raid 1)	Debian 6.0
srv2.ibercivis.es	Intel(R) Xeon(R) CPU E5520 @ 2.27GHz (x16)	48GB	1TB (Raid 1)	Debian 6.0
srv3.ibercivis.es	Intel(R) Xeon(R) CPU E5520 @ 2.27GHz (x16)	48GB	1TB (Raid 1)	Debian 6.0
srv4.ibercivis.es	Intel(R) Xeon(R) CPU E5520 @ 2.27GHz (x16)	24GB	1TB (Raid 1)	Debian 6.0

Table 2: Description of the physical nodes supporting SOCIENTIZE infrastructure

5.1.1 Virtual host related with SOCIENTIZE

Most relevant virtual host related to SOCIENTIZE project are:

- **monitor.ibercivis.es:** This host runs in srv1.ibercivis.es. It is responsible for the daily incremental backups and weekly full backups of the other hosts. This is performed through a software called BackupPC⁷ under a 2TB file system mounted using RAID5. Additionally, a weekly snapshot of the virtual host is performed using the vzdump tool which is stored in the same file system.

⁷ <http://backuppc.sourceforge.net/>

Host pybossa.societize.eu Backup Summary

- This PC is used by [backuppc](#).
- Last status is state "idle" (idle) as of 10/31 09:00.
- Pings to pybossa.societize.eu have succeeded 338 consecutive times.
- Because pybossa.societize.eu has been on the network at least 7 consecutive times, it will not be backed up from 7:00 to 19:30 on Mon, Tue, Wed, Thu, Fri.

User Actions

Start Incr Backup Start Full Backup Stop/Dequeue Backup

Backup Summary

Click on the backup number to browse and restore backup files.

Backup#	Type	Filled	Level	Start Date	Duration/mins	Age/days	Server Backup Path
160	full	yes	0	10/23 20:14	15.4	7.6	/var/lib/backuppc/pc/pybossa.societize.eu/160
161	incr	no	1	10/24 20:15	1.1	6.6	/var/lib/backuppc/pc/pybossa.societize.eu/161
162	incr	no	1	10/25 20:12	1.1	5.6	/var/lib/backuppc/pc/pybossa.societize.eu/162
163	incr	no	1	10/26 20:07	1.1	4.6	/var/lib/backuppc/pc/pybossa.societize.eu/163
164	incr	no	1	10/27 19:07	1.1	3.6	/var/lib/backuppc/pc/pybossa.societize.eu/164
165	incr	no	1	10/28 20:19	1.4	2.6	/var/lib/backuppc/pc/pybossa.societize.eu/165
166	incr	no	1	10/29 20:05	0.9	1.6	/var/lib/backuppc/pc/pybossa.societize.eu/166
167	full	yes	0	10/30 20:09	10.1	0.6	/var/lib/backuppc/pc/pybossa.societize.eu/167

Xfer Error Summary

Backup#	Type	View	#Xfer errs	#bad files	#bad share	#tar errs
160	full	Xfer_OG_Errors	46	0	0	0
			45	0	0	0

ackuppc: backup of pybossa.societize.eu

- **alfasocietize.ibercivis.es:** This host is used to develop PyBossa⁸ apps. This server maintains the same configuration as the one present in societic.ibercivis.es, the production PyBossa infrastructure. This server is hosted by srv2.ibercivis.es.
- **societic.ibercivis.es:** Hosted under srv3.ibercivis.es, this is our PyBossa production server. We install only stable experiments and stable and tested versions of PyBossa at this server.

⁸ <https://github.com/PyBossa/pybossa>

Societize
Online assistance in performing tasks that require human cognition, knowledge or intelligence such as image classification, transcription, geocoding and more!

- Help advance research
- Everything is open and freely usable
- Things computers can't do

Get Started
It's really simple to start contributing.

[Start Contributing](#) [Create an App](#)

Most Active Applications

Fronteira	CE	1.96
Brasília	DF	1.88
Curitiba	PR	1.47
Recife	PE	1.34
Porto Alegre	RS	1.28
Belém	PA	1.14
...

- **testsocietize.ibercivis.es:** PyBossa middleware is tested at this server. New features of the middleware are developed in this host, although our developers are moving to Vagrant⁹+KVM¹⁰, which allows server software to be developed easier using the developers personal computers. It is hosted under srv4.ibercivis.es.
- **mail.ibercivis.es:** Using Qmail¹¹, this host is used to serve the emails under the SOCIENTIZE domain name. It is hosted in srv3.ibercivis.es.
- **webs.ibercivis.es:** In this host, we have installed the Drupal CMS that serves the main page of SOCIENTIZE project¹². We have also a MySQL server to support some different applications. This is hosted also in srv3.ibercivis.es.

All hosts described above run under Debian 6.0 operating system. This configuration is not static, that is, OpenVZ allows us to move each of these virtual servers between each physical server with a very short downtime. This feature grants a lot of flexibility in maintenance tasks.

5.2 Infrastructure Maintenance

As we understand that we must provide only validated experiments, we have defined a set of procedures that must be followed for the maintenance and upgrade of PyBossa servers as well as for the development of PyBossa applications:

PyBossa infrastructure is comprised of three distinct servers, each with its own purpose:

⁹ <http://www.vagrantup.com>

¹⁰ <http://www.linux-kvm.org>

¹¹ <http://www.qmail.org>

¹² <http://www.societize.eu>

- PyBossa production server, hosted at societic.ibercivis.es, is used to deploy the validated SOCIENTIZE applications.
- PyBossa alpha server, hosted at alfasocientize.ibercivis.es, is used to develop new applications.
- PyBossa test server, hosted at testsocientize.ibercivis.es, is used to test new versions of the PyBossa middleware.

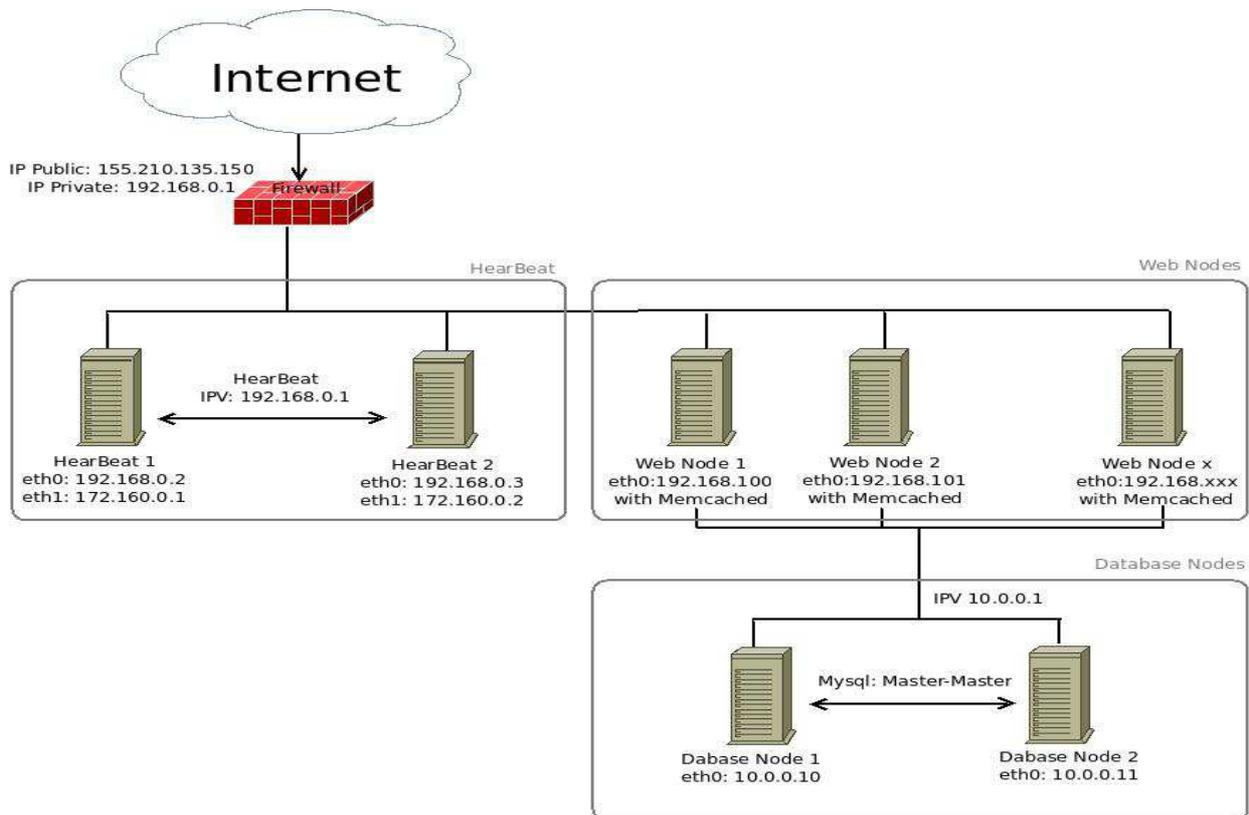
5.1.1 High Availability

Users tend to feel themselves frustrated when an online service is not available whatever is the reason: either because of a system failure or a denial of service given too many accesses at a time. Eventually, the result is the same, user is unable to access the service.

Availability is the grade in which an application or service is available when and how users expect to. Main features to be considered are:

- **Reliability:** Both hardware and software are critical elements in order for the system to work properly.
- **Recovery:** Is there a plan to make our application to keep working in case of a failure? How long would it take to restore the system in case of a disaster? These are some of the points to be studied and planned in order to minimize consequences of an unexpected event.
- **Error Detection:** It is necessary to know the status of an element (i.e. failed, saturated, etc) in order to fix it in case of failure. Monitoring is a key point to figure out that status.
- **Constant Improvement:** Maintenance tasks must be transparent for the end user.

Thus, in order to provide high availability of our services, we are using Keep Alive, HA Proxy and the Memcache tools. With the first one, the public IP is always up although even if one server is down; with the second one, we provide load balancing which allows us to scale the system as needed. The third one decreases the number of queries to our database servers, caching them. We have also an active-active database system, thus queries are balanced between them. The infrastructure can continue to function properly even if one of this database servers fails.



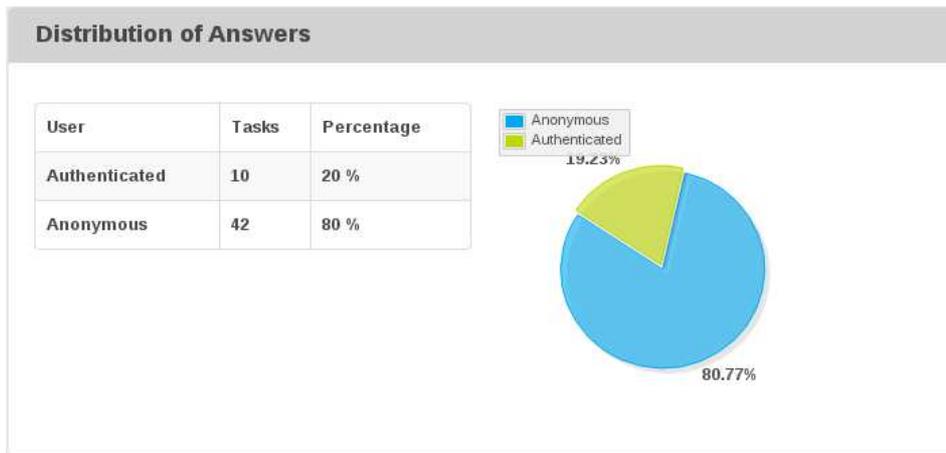
ovology of SOCIENTIZE infrastructure

5.3 Usage statistics

One of the most important things that WP3 must ensure is that the whole infrastructure is running properly. In such a way, we collect some data of the usage of our platform that eventually trigger alarms to warn us when something is not working as expected.

5.3.1 PyBossa

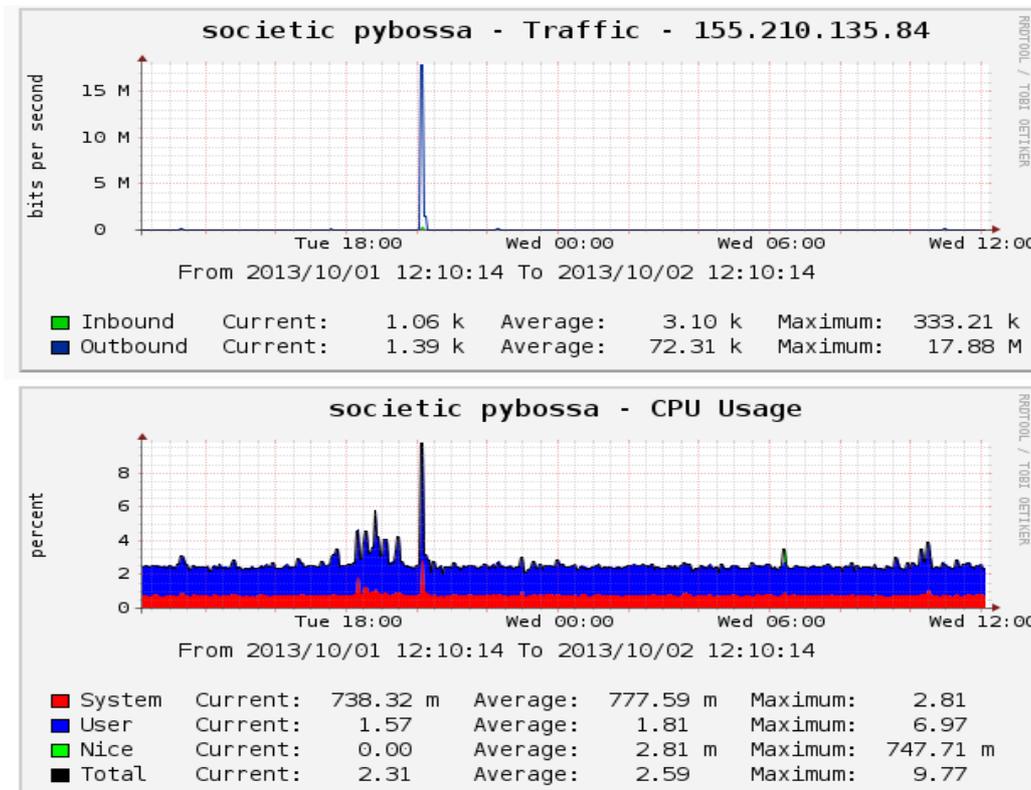
PyBossa, by default, presents some statistics of its usage. These statistics are available to the general public. In order to do that, PyBossa server collects some data from its database and plots them using Python libraries.



Global distribution of answers by authenticated and anonymous users for Mind Paths application running under PvBossa

5.3.2 Cacti

Cacti is an open-source and web-based network monitoring and graphing tool designed as a front-end application. It is generally used to graph time-series data of metrics such as CPU load and network bandwidth utilization. In Figure 7 some graphs obtained using this tool are depicted.



Cacti graphs for the network traffic and CPU usage of PvBossa server

5.3.3 Google analytics

We started to capture some traffic analytics using the Google analytics tool by March 2013 in societize.eu web page and by April 2013 in pybossa.societize.eu web.

Google Analytics is a free service offered by Google. It generates some detailed statistics about a website's traffic. It is implemented with page tags, i.e. a snippet of JavaScript, that the website owner adds to every page of the website. This tracking code runs in the client browser when the client browses the page and collects visitor data and sends it to Google data collection server as a part of a request for a web beacon.

6. WP4. Use of the infrastructure. Applications and Creativity

As planned, either Mind Paths (former Semantics Map) and Cell Spotting applications are ready, running in the production server and, hence, in production stage. In the last six months two deliverables were submitted concerning these two applications **D.4.1. Semantics Map Application**

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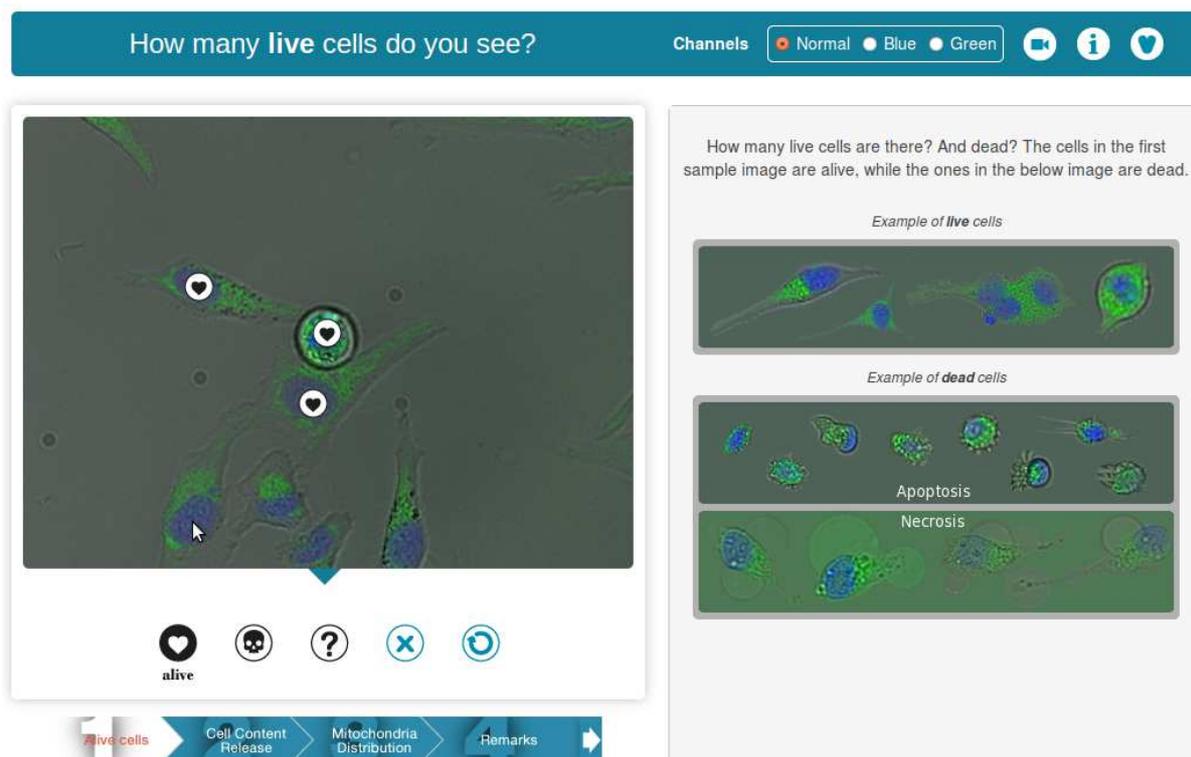
Report on 17 April 2013 and **D.4.2. Cell Images Application Report** on 22 July 2013. Some others applications have been developed to be deployed in the environment of Societize project. Also, during this period the selection of the subcontracted applications have been done.

6.1. Cell Spotting

This application was launched in Spain as a proof of concept between the months of March and July, besides that it was still available until late October. During that period, students from several schools used the application providing a useful feedback to improve it. Application results to be difficult and long (too many steps).

As a consequence, a new version was developed during the summer keeping as a starting point the former one. The goal was to improve the user experience easing the task of cell marking, reducing the number of steps to be done and providing magnified images, thus less cells per images must be classified making the tasks simpler. Multilingual support was added for Spanish and Portuguese in addition to the English version. German one will be soon available. Since the application seem to fit very well with the Secondary Education, didactic units have been prepared for students.

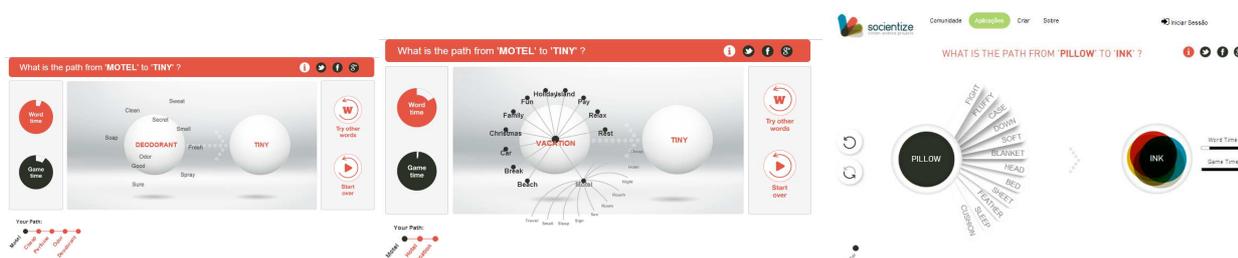
Since September, new version is in production and currently being used by schools in Portugal and Spain besides the whole amount of volunteers that come to it through Societize project.



A complete description of the scientific motivation, development, design and everything related to this application is included in the **D4.2 Cell Images Application Report**.

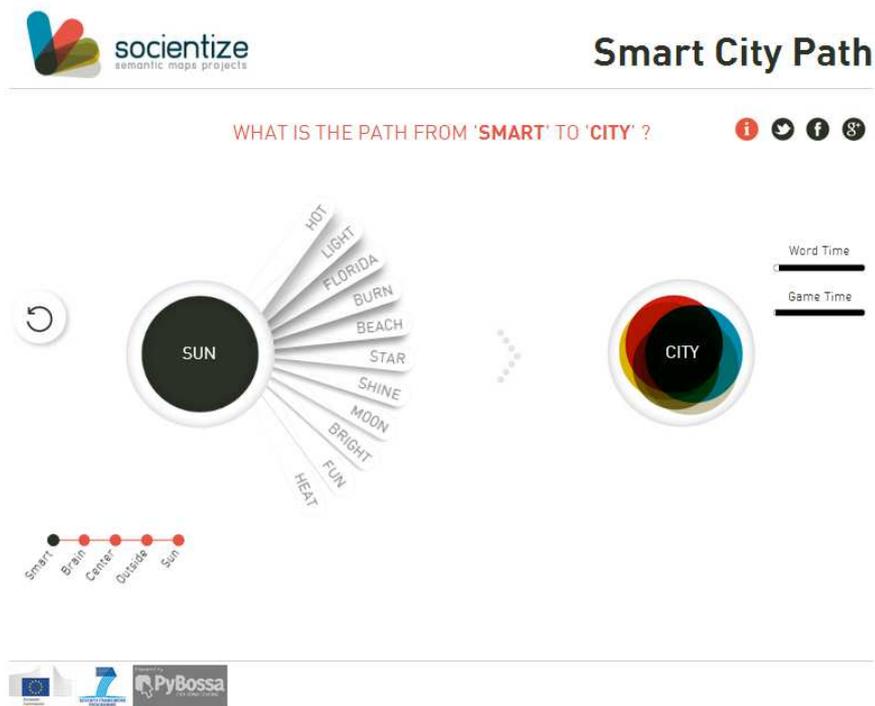
6.2. Mind Paths

Several tests were made in the application interface to maximize user engagement (see below). Each change required a complete reprogramming of the application view layer, but all versions still use the standard W3C HTML5, so that they could be executed in any compatible browser. This application is now in production stage.



Mind Paths interface evolution since first beta

We also developed a special version for The Vienna Science Festival, which invites participants to know the full version of the application in the Societize website. This simpler application was configured to always ask how the words ‘Smart’ and ‘City’ could be linked, taking advantage of one of the main themes of the event.



Mind Paths for Vienna Science Festival

6.3. Temperature Maps

This experiment about energy saving is planned to be launched by the end of the year. The goal is to create a web-application that allows citizens to store in a database their energy consumptions and habits to get specific energy saving tips according to the input they provided. The research group behind the project gather information and data to improve the theoretical model they developed.

Given the nature of the application and interaction with the users, the development team decided to customize Epiwork¹³ as the infrastructure for the application. It provides user management and questionnaire creation and reminders that fit very well with the needed for the application. At the time of the current document creation, requirements are being fixed for the application and infrastructure customization has started besides new parts implementation.

6.4. Other applications

As it was also mentioned in the previous progress report, other applications and experiments were searched to be performed in the Societize environment. Some have been already developed and deployed, others are in development or testing stages while others are being negotiated or just agreements.

¹³ <http://www.epiwork.eu/>

In development:

- Turing test, volunteers playing in groups interacting with other volunteers and with machines while their behaviour is analyzed
- Collective intelligence and creativity, users can perform music live and online using HTML5 beat sequencers: By checking neighbors sequences, they can mix and incorporate better items to their solution so best-fitness solutions evolve and prevail

In negotiations:

- Astrophysics images analysis from Centro de Estudios de Física del Cosmos de Aragón (Aragón Physics of the Cosmos Studies Center), Teruel: It consists of two different applications: one for supernovae detection and another one for galaxy delimitation; images production starts in December 2013, thus, still under negotiations
- Biotechnology application running over BOINC with GPUs
- Water network distribution topology impact in running water quality analysis through Citizen Science

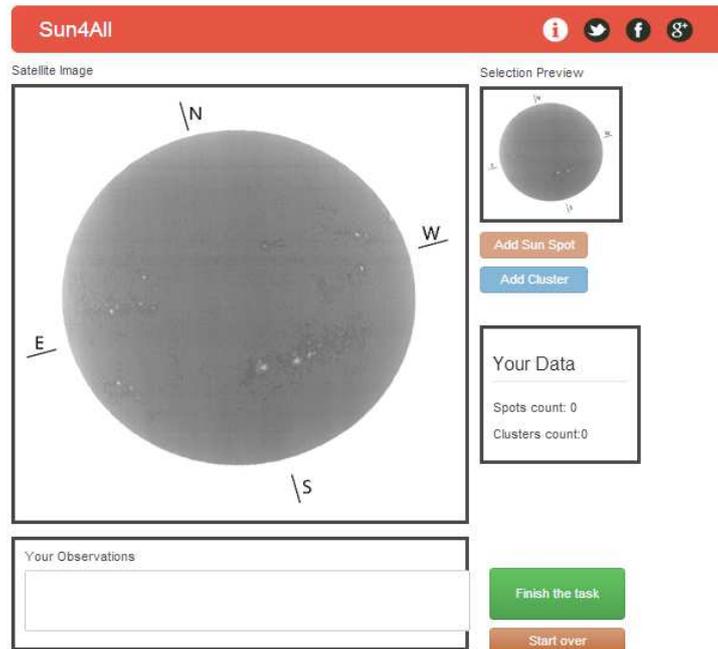
6.4.1. Sun4All

The application was initially produced as a prototype to help gathering the application requirements from the researcher behind the application. He provided a temporary link to the images required for the experiment, which was used during the period of tests.

The researcher recently agreed with the suggested changes and sent the complete batch of images that will be used by the application in production environment.

Images are being uploaded in Societize website and new server application was created that will provide the images to the application. This application is now in test stage.

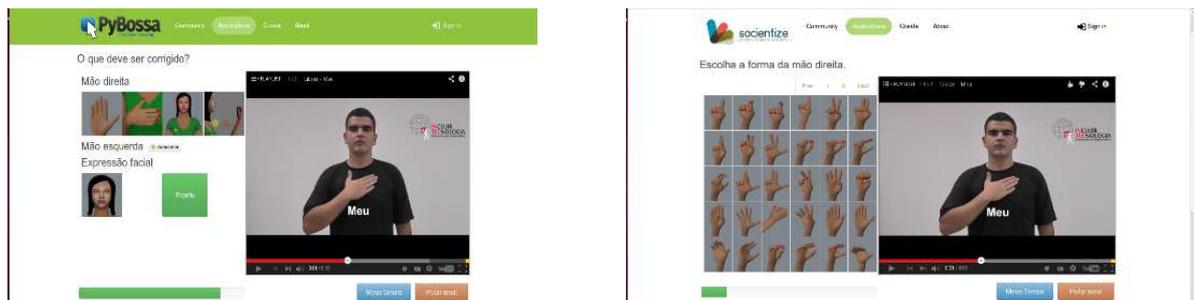
Sun4All test version



All versions of the application have been developed using HTML5 plus JavaScript on the client side, and Python on the server side.

6.4.2. Libras Dictionary

The application is in final stage of development, with the steps of collection, playback, editing and validation of the hands signals running in tests. The team is now working on tutorials and general improvements in interface design and usability. The beta tests are scheduled to start in early October.



Libras signals capture

6.4.3. Table Transcriber

The transcription process of an table is a four steps activity:

1. Selection of pages containing tables
2. Marking of the table region and the transcription of the header

3. Correction of the table cells previously identified by a computer vision software
4. Correction of the content of the cells previously identified by an OCR software

The first three steps are developed using Python and PyBossa, while the last one is still in development process, using C++ and an open-source computer visualization framework called OpenCV.

Each step is linked with the following step in the process through a customized workflow that generates tasks for Pybossa dynamically, integrating all steps to obtain the necessary information to fully transcribe the tables.

The following figure is the interface developed for the task of selecting the table, where we ask the user if there is a table on the page.

All applications are deployed in the project's test server.

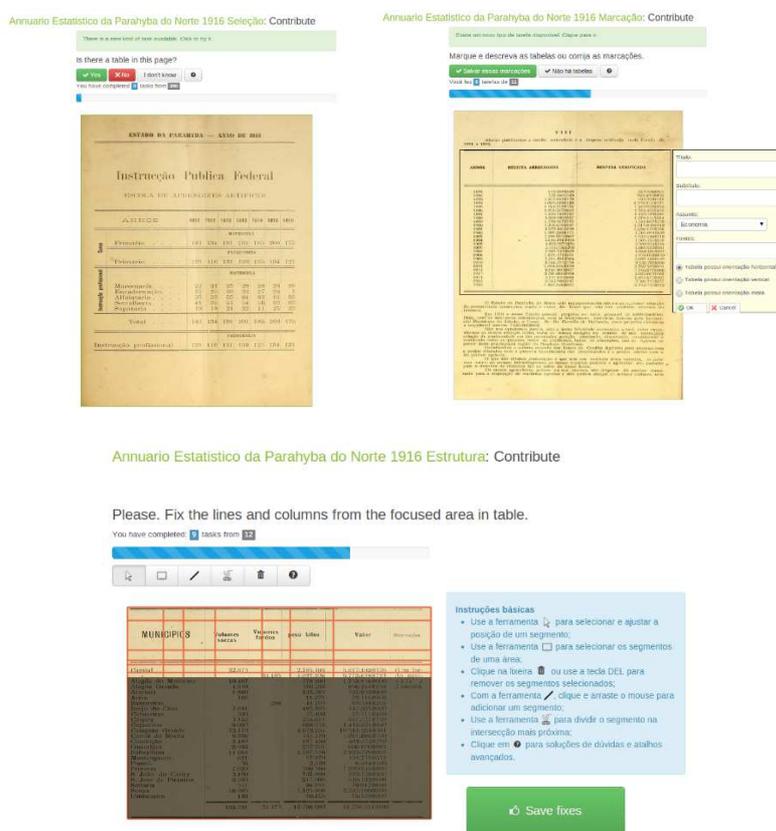
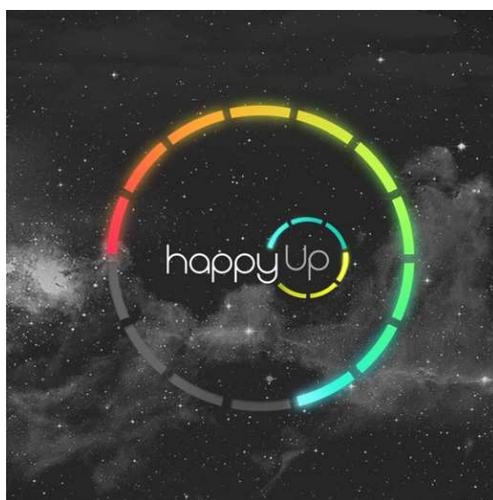


Table transcriber applications

6.4.4. HappyUp App

In collaboration with FelicicomLab, a research group from a spanish university, a phone application is developed. The goal of the group is to analyse the most common happiness scales and propose a more complex measurement model. Through a tool that is installed in smartphones, information about people happiness can be gathered. It is thanks to the information supplied that tasks, to

improve some aspects in the daily life of users, are provided. HappyUp is an interactive mobile phone application available either in iTunes and Android market.



happyUp screenshot

6.5. Subcontracted Applications

During the summer (from mid July to early September), an open call for subcontractors was launched looking for two Citizen Science applications to be deployed in the framework of the project. 15 candidates from all over Europe presented proposals highlighting the interest of the community in this kind of experiments, even with the minor budget offered: 8.000€ per subcontractor.

Next table shows the 16 candidates. It is relevant the high number of Spanish proposals and also the number of Global Systems Science related participatory experiments.

NAME	PROPOSER	COUNTRY	TOOL
birds identification	Belongie	US	web app
flu epidemiology	Smallenburg	NE	questionnaires
Policy dilemma	Vigalondo	ES-BE	experiment
socioeconomic pool	Sanchez	ES+FI	questionnaires
bees in the city	perello	ES+FR+FI	kits
hotpot	Vermeulen	NL	app
Remote laboratory	Garcia	ES	remote kits
Great Crash	Zamora	ES	app web
Wireless maps	Tato	ES	app
Graphs isomorphism	Severini	UK	web
Search	Bartumeus	ES	app web

Roadkill	Zaller	Austria	app web questionnaires
nanotechnology	Gordienko	Ucrania	web+boinc
Odour	rosa arias	ES	app
Kindergarden	kalogiannakis	Greece	app
Antimatter	Doser	Switzerland	web app

The selection process was designed upon following criteria: Scientific Impact (Potential publications), Social Impact (Potential No. Users), Novelty in Citizen Science, Resources Committed by the Proposer Group / Sustainability beyond the end of Societize, Users learn with the experiment, Experience of the proposers (Ease of implementation and deployment). Votes came from all the consortium and we had a very nice debate. Two rounds were required until select two winners: Antimatter and Urban Bees. Further desc

6.5.1. Antimatter

This experimet was proposed by Michael Doser, a senior research physicist at the European Organization for Nuclear Research, CERN. It aims to measure the gravitational interaction between matter and antimatter. To do this, antihydrogen atoms are **short** horizontally over 1 m, and drop slightly due to gravity. At the end of their trajectory, their impact point is determined by recording the fragments produced when they annihilate with matter in photographic emulsions. General public collaborates finding these points by scanning through the emulsion: they determine the length and ionization density of the tracks, they combine tracks into common originating points producing several fragments. All this is done via a web application.

This is the first Citizen Science project in experimental high energy physics. It involves the public in cutting edge research on antimatter and asks them to find unexpected phenomena.

6.5.2. Urban Bees

Given that the survival of bees is crucial for human sustainability, there is a great urgency to improve the ways in which colonies could thrive, since are now threatened in all industrialized nations. This experiment proposes to do that by building intelligent beehives in three different European cities (Barcelona, Bourdeaux, and Helsinki) attached to three different cultural centers in order to increase public exposure to this issue and with intense collaboration with urban beekeepers, artists and citizens. These hives are enhanced with sensors, processing power and telecommunication facilities in order to monitor the health of the colony without interference and thus allow better care. Bees are recognized as important biomarkers being very sensitive to pollution, chemical products and electromagnetic fields. The intelligent beehive will analyze the quality of pollen and propolis as well as the behaviour of the bees in order to monitor the surrounding urban area ecosystem. The experiment starts merging the three different experiences from Helsinki, Barcelona and Bourdeaux, and aims to enhance the impact of each separate initiative at an European level with unified citizen science practices.

Some of the main features that helped in the selection of this experiment were:

- Science in the city with specific-devoted groups versus general public online experiment already covered in our work
- Tangible outputs
- Co-creation
- Public playful engagement
- Environmentally situated work with physical components, making use of open source tools and surrounding environment
- Conducted around participatory events, not talks, inspiring participants and scientists
- Cutting-edge research addressing complex systems: emergent properties, chaos, simulation and so on

7. WP5 EVALUATION AND POLICY RECOMMENDATIONS

In the first project year WP5 elaborated **D5.1. Evaluation Plan** and submitted the document on the 31st of January 2013. The evaluation plan sets the basis for the further activities related to assessing the project's achievements and potential impact. A framework has been developed based on three axes, namely, the target group, the expected output and the means of verification or methods of measurement.

1. The target groups are evaluated on three levels, the first level covers the internal perspective of project participants and users of the SOCIETIC services, the second level gives an expert view from the external advisory board and other related experts and the third level integrates the external perspective of people addressed via broader dissemination means, such as events.
2. The expected output has been defined along seven core objectives related to the impact that have been developed in a collaborative process within the consortium. After a joint weighting exercise these objectives were transferred into specific questions to be addressed during evaluation. For each of the objectives a certain set of indicators has been defined.
3. Regarding the measurement of the indicators a set of qualitative and quantitative methods was defined. The evaluation instruments include focus group discussions as well as questionnaires and structured interviews. In addition, monitoring data collected continuously during the project execution will feed into the assessment process.

WP5 coordinated the selection of the three members of the External Advisory Board and documented this activity in **D5.2 External Advisory Board Report**, which was transmitted end of August 2013 to the EC.

7.1. D5.3. Draft Version of White Paper (Green paper)

To create the draft white paper on Citizen Science or “green paper” the project partners started an initial analysis of the State-of-the-Art of citizen science, to identify common features, crosscutting concerns, shared issues, correlations and patterns. This initial analysis was conducted in dialogue

with consortium members, external Advisory Board (EAB), subcontractors, external experts and other stakeholders.

After an initial desktop research on citizen science, eight expert interviews were conducted via telephone with experts in citizen science, three of them are the members of the external advisory board.

An open call for contributions was launched during two month (August and September 2013) to invite a larger group of experts to provide input via an online questionnaire. In addition several internal workshops were organised to compile the knowledge from the whole consortium.

The results from these activities were analysed and synthesised and lead to the creation of the “Green paper on Citizen Science” which was primarily discussed with experts from the field a Virtual Workshop, organised on the 17th of October 2013. The final green paper will be officially introduced at the ICT Conference 2013 in November in Vilnius and put under a broad consultation process during the first trimester of 2014.

8. CONCLUSION

The project has continued properly with a significant load of work. During the second six months period of the project four virtual meetings, eight deliverables and one milestone have been realized. A significant effort in the technical part, to get the infrastructure and some applications working, has been invested as well as in dissemination to draw attention on the project. Keeping the schedule of the project the Green Paper, draft of the White Paper, is ready with the initial outcomes and recommendations from the project. Since infrastructure and experiments are mostly set up, efforts should focus now on dissemination to increase awareness and impact of the project.