Symbiosis of smart objects across IoT environments

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Initial Dissemination Plans

The symbIoTe Consortium

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1 Executive Summary

The deliverable D7.1 – Initial Dissemination Plans describes the dissemination strategies that have been initially planned. The symbIoTe dissemination activities target a large audience that spans from the academic to the industrial communities, and includes, also, the wider public through dedicated dissemination channels. Other relevant deliverables about dissemination will follow this one, such as the D7.2 - Report on first External Liaisons Workshop, which is closely related to the D7.1, resulting from the planned liaisons with other projects.

This deliverable will address the communication channels to advertise the project outcomes, providing a map of all the public dissemination material that is planned to be produced across the project lifetime. symbIoTe's liaisons with stakeholders include both the industrial and the scientific community, and also the active participation in alliances such as the IoT EPI ([2]), and the strict collaboration with other projects in the IoT environment. External scientific and industrial dissemination of the symbIoTe vision and concepts is of primary importance for the project consortium. To this objective, several tools have been considered to disseminate the project results; they include the organization of workshops and other technical events, publications in journals, magazines, and online technical periodicals.

The outcomes of the symbIoTe project will be externally disseminated mainly through publications, presentations, white papers, and press releases, so dissemination targets are to reach over 15 peer-reviewed publications, complete 1-2 white papers and write at least 5 press releases. Partners intend to participate at prestigious international academic and industrial events, in order to reach large audiences of stakeholders, increasing the awareness and fostering the interest around the symbIoTe project, expecting to present at least to 2-3 conferences and 1-2 fairs.

symbIoTe´s website will recollect and link the dissemination activities, to provide a unique information point; social networks, such as Twitter, can be used to quickly spread information on the project and announce news, activities and events, and help the collaboration both inside the consortium as well as provide visibility to a potentially high number of actors.

Dedicated tools, such as Confluence ([1]), have also been set up to facilitate the internal dissemination and collaboration among the partners in the consortium.

External dissemination will be carried out through publications in international conferences, magazines and journals, as well as participation in industrial events, scientific workshops and panels, organized by symbIoTe alone or together with other research initiatives and projects. A workshop focused on IoT technologies and architectures, possibly co-located with a major conference or event, will be organized to present the project outcomes, exchange ideas and create synergies with other major players in the IoT community. Strong presence on the social networks and wide distribution of dissemination material like leaflets, newsletters and white papers will finally contribute to reach a larger audience and create awareness around challenges and potential of IoT solutions. Two Open Calls will be launched, having as target stakeholders like SMEs, providers and developers, in order to improve symbIoTe visibility and giving the possibility to the project to be extended and enhanced.

This deliverable describes the strategies planned to ensure the widest possible impact of the symbIoTe project outcomes in the most relevant communities, it is clear that it is essential to target the correct audiences, and so, to avoid poor dissemination towards relevant stakeholders, partners must ensure the circulation of clear messages, across all dissemination material.

This document is structured as follows:

- Section 1 is the executive summary;
- Section 2 is the introduction;
- a detailed description of symbIoTe dissemination plan is provided in Sections 3 and 4, for internal and external dissemination respectively;
- initial dissemination actions, carried out in the first months of the project, are reported in Section 5;
- as final step, Section 6 reports conclusions and planned forthcoming actions;
- in the Appendix, the topics discussed in the first two plenary meetings are briefly discussed.

2 Introduction

WP7 Dissemination, Exploitation and Standardisation is in charge of coordinating the consortium activities dedicated to guarantee a wide impact of the project results in the most relevant research and industrial communities within and outside the consortium. This deliverable reports on dissemination, which is part of the more general WP7 tasks such as exploitation and standardization; therefore, three main types of activities have been planned, in this direction:

- *Dissemination:* the project will activate a variety of dissemination channels, from the website to publications in international conferences, magazines and journals, up to the participation in workshops and industrial events and the presence in social networks, to promote symbIoTe scientific and technical outcomes to large communities in the academic and industrial arenas. Moreover, the project has setup tools to facilitate the collaboration among the different partners in the consortium and to encourage the internal dissemination.

- *Exploitation:* the project will define suitable exploitation plans, for individual partners or the consortium as a whole, for both industrial and scientific results.

- *Standardization:* the project has identified a set of relevant standardization bodies, mostly focused on the IoT field, which will be monitored to ensure the alignment of the symbIoTe solution with the latest standards and to identify potential contributions to the ongoing standardization activities.

The aim of deliverable D7.1 is to create a concrete and workable plan for all dissemination actions of the symbIoTe project.

3 Internal Dissemination Strategy and Plan

Internal dissemination is the dissemination of information, activities, results and work output produced in the framework of symbIoTe between the project consortium members.

3.1 Internal communication

The main tool used for internal symbIoTe communication is a team collaboration software called Confluence ([1]), a widely used platform with a long history as an enterprise wiki / content collaboration tool. The symbIoTe Confluence platform is maintained by Intracom Telecom (ICOM) that owns the license, has installed the software on one of its machines and handles its daily management.

Confluence is a web-based team collaboration tool, accessible only with registered accounts, and it is widely used in the project to share and assemble ideas, project requirements and documentation in the consortium. The symbIoTe team chose to organize Confluence contents following a per-work-package partitioning, with subsections related to deliverables and tasks, each of them indicating the corresponding leader and the work-plan, as a reference point for partners of the consortium about their work (Figure 1). Therefore, WP*n* named specific pages have been created, which in turn contain task and deliverable views, in order to split discussions and resources across topics. Other pages are: File List, IoT-EPI, Meeting notes, Plenaries, Reviews, Submitted Deliverables and Tech Overview.

This tool also allows users to handle version control of files and documents, and to comment and brainstorm directly on single web pages. Deliverable specific pages are therefore used in order to collect partner contributions for the documents, and also as a hub for ideas, proposals and notes in the comments dedicated space.

As mentioned before, Confluence contains sections with dissemination material (e.g. IoT-EPI section) and supports project management with conference calls and meetings schedules and minutes, too.

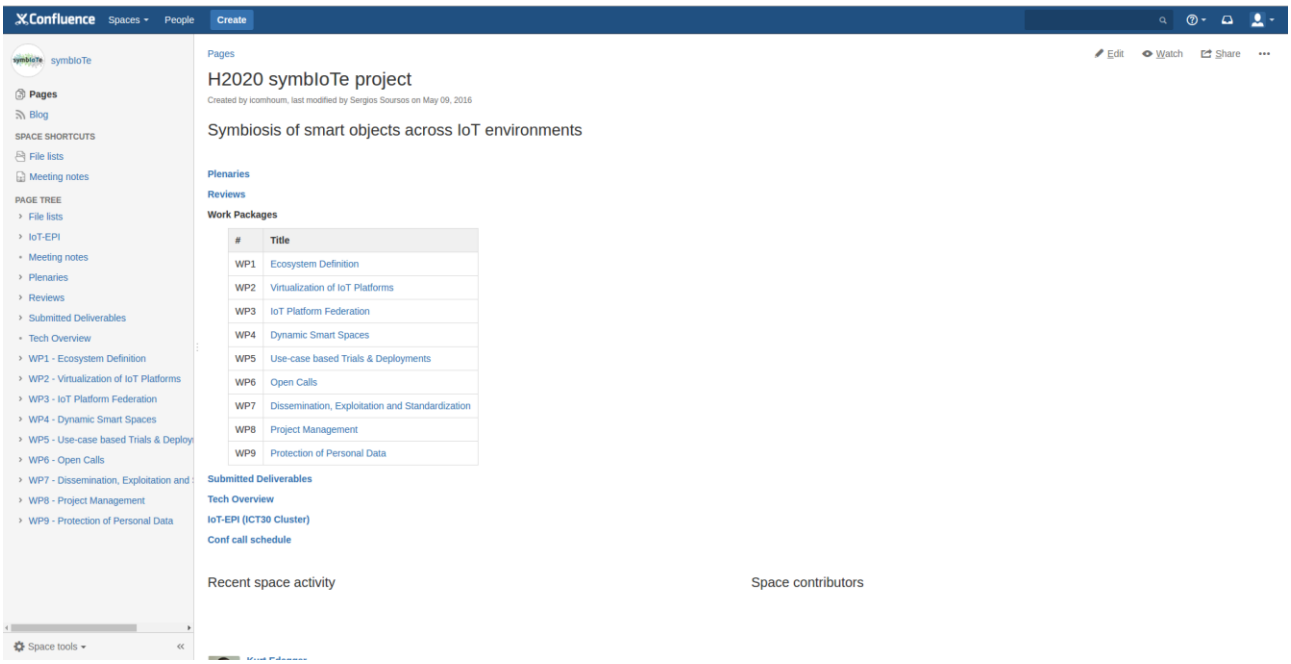


Figure 1 – a view of the symbIoTe project Confluence page

Besides this, mailing lists have been set up for all the project participants (*symbiote-all@lists.cs.univie.ac.at*) and for WP-specific recipients (e.g., *symbiote-wp1@lists.cs.univie.ac.at*, etc.) to enable the communication among project members.

3.2 Face-to-face and remote meetings

Conference calls are scheduled to take place weekly and plenary meetings are foreseen to take place about every 3 months (both plenary and WP-specific). The aim of both conference calls and meetings will be twofold: on one hand, they will improve the coordination among the different partners and, on the other hand they will help to follow the project evolution towards the achievement of the objectives. Ad-hoc task forces can be activated on specific activities when needed, as another tool to foster the collaboration and work on specific aspects arisen during the project development.

Within the first six months of the project, two plenary meetings were held. The first kick-off meeting was held in Athens, January 19-21, 2016 and the 2nd plenary meeting was held in Zagreb, April 20-22, 2016. In the meantime, a number of conference calls were organized by several partners and WP/Task leaders in order to discuss and coordinate ongoing activities (tasks, deliverables, plenary meetings, etc.).

3.2.1 Conference calls

Conference calls within the project are organized by following the specified procedure:

1) Every WP/Task leader is free to schedule conference calls when required to address specific issues and discuss with the rest of the partners. The organizer should announce any conference call at least 3 days before the actual date of the call;

2) Doodle polls for coordination of conference calls should happen earlier than the 3-day deadline of 1);
3) A reminder of the conference call should be send to the respective mailing list on the previous date;
4) The regular slot is for everyone to use. However, conference calls can be scheduled for other dates (see 2));
5) By default, no conference call is scheduled for the regular slot. Anyone can use it as long as it announces it at least 3 days before (see 1));
6) Regular Project Management Committee (PMC) calls will be scheduled once a month, following the steps 1) - 4) (no specific dates will be reserved for PMC calls). Urgent PMC calls can be scheduled on demand;
7) All conference calls should be registered in Confluence, under the page “Conference Call Scheduler”, so as to keep track of them.

4 External Dissemination Strategy and Plan

External dissemination of the symbIoTe concepts and outcomes is of primary importance for the project consortium. To this objective, several channels have been considered to disseminate the project´s results; they include the realization of the project website (as detailed afterwards), the organization of workshops/symposia and other technical events, publications in journals, magazines, on-line technical periodicals and scientific conferences, technology transfer seminars, booths at major international events, presence in professional social networks, media and press.

The outcomes of the symbIoTe project will be externally disseminated also through publications, presentations, white papers, and press releases. Prestigious international journals and magazines will be considered for publications. Moreover, the symbIoTe partners will submit papers based on architectural outcomes and simulation or experimental results to relevant conferences. Workshops and demo sessions will be organized, possibly co-located with other European and international conferences (e.g. the IoT Week). The possibility to organize joint workshops in cooperation with other European projects focusing on similar or complementary technical areas will be a priority in the project dissemination plans.

Particularly relevant to foster synergies with other projects is the symbIoTe presence in the IoT-EPI group ([2]), The European Platforms Initiative federating the new H2020 programs regarding IoT platform development (see 4.10.4). SymbIoTe project also aims at attracting SMEs, companies and research groups, through the launch of specific Open Calls (see 4.11); this will provide the opportunity for application developers, IoT platform providers, gateway manufacturers and cloud operators to collaborate with the consortium, in order to provide extensions of the symbIoTe system.

The project website will recollect and link the dissemination activities, to provide a unique information point. Twitter will be used to quickly spread information on the project and announce news, activities and events, and help the collaboration inside the consortium as well as provide visibility to a potentially high number of stakeholders. Videos and infographics will be released in the YouTube channel of the project ([3]).

Detailed plans for the different dissemination channels planned in symbIoTe are reported in the following sections.

4.1 Website

The symbIoTe consortium is committed to use information and communication technology in disseminating information to the public, taking advantage of the Internet’s ability to host a massive repository of dynamic information to be made available to everyone anywhere at any time. In order to achieve a successful dissemination strategy, the symbIoTe consortium decided to develop a public accessible web site.

The symbIoTe website ([4]) is the main dissemination tool. It was launched in January 2016 and apart from the basic information related to the symbIoTe project, visitors can be informed about all the latest news, technical news and events. Additionally, it provides relevant information in an efficient and effective manner, with a homogeneous structure and design, followed and enriched by a well-documented content.

4.1.1 Homogeneous Design

The web site retains the same look and feel in all web pages during user's navigation. In detail, each web page is divided into four sections that are structured in the same manner through all pages. These sections are:

a) the upper section called "header" which includes static content like social media buttons and menu navigation bars;

b) the main content section which is the area that it displays dynamically generated content and is located under the header;

c) the right sidebar in which are provided small snippets of news content as well as twitter feed news and is located next to main content;

d) the footer section in which also provided symbIoTe link connections with other channels like IoT-EPI and European union.

The header and footer sections provide links to the other symbIoTe dissemination channels, listed below:

- Twitter ([5]);
- YouTube ([3]);
- SlideShare ([6]);
- GitHub ([7]).

In this way, several target groups can reach symbIoTe's channels and can have a look at symbIoTe´s environment (Figure 2).

Figure 2 – symbIoTe website home page

4.1.2 Structure

The symbIoTe web site structure consists in some main web pages categorized by a conceptual and hierarchical manner, in order to provide to the user, the most effective result.

All the web site pages can easily be viewed from the main website navigation menu, which includes the following main pages: The Project, Business Cases, Resources, News, Tech Blog, Partners, Open Calls and Contact Us.

The Project: This is the home page (Figure 2) of the web site and its purpose is to provide to the visitor a quick overview regarding the symbIoTe vision, target groups, latest news, social presence, social activity and symbIoTe consortium contact points.

It must be mentioned that this page is leveraged in the upper section layer by the embedded symbIoTe YouTube ([8]) promotional video. Moreover, this page includes a special section located to the right side of the web site in which the visitor can see and

follow the latest twits relative to symbIoTe project with which can easily interact. Submenu items include the *Detailed Overview*, the *Objectives* and *Work Package Structure* of the project.

Business Cases: Under this menu item the visitor can explore the five symbIoTe business cases: *Smart Residence*, *Edu Campus*, *Smart Stadium*, *Smart Mobility and Ecological Urban Routing* and *Smart Yachting*. For each business case, a brief text description is provided, accompanied by a descriptive image (Figure 3).

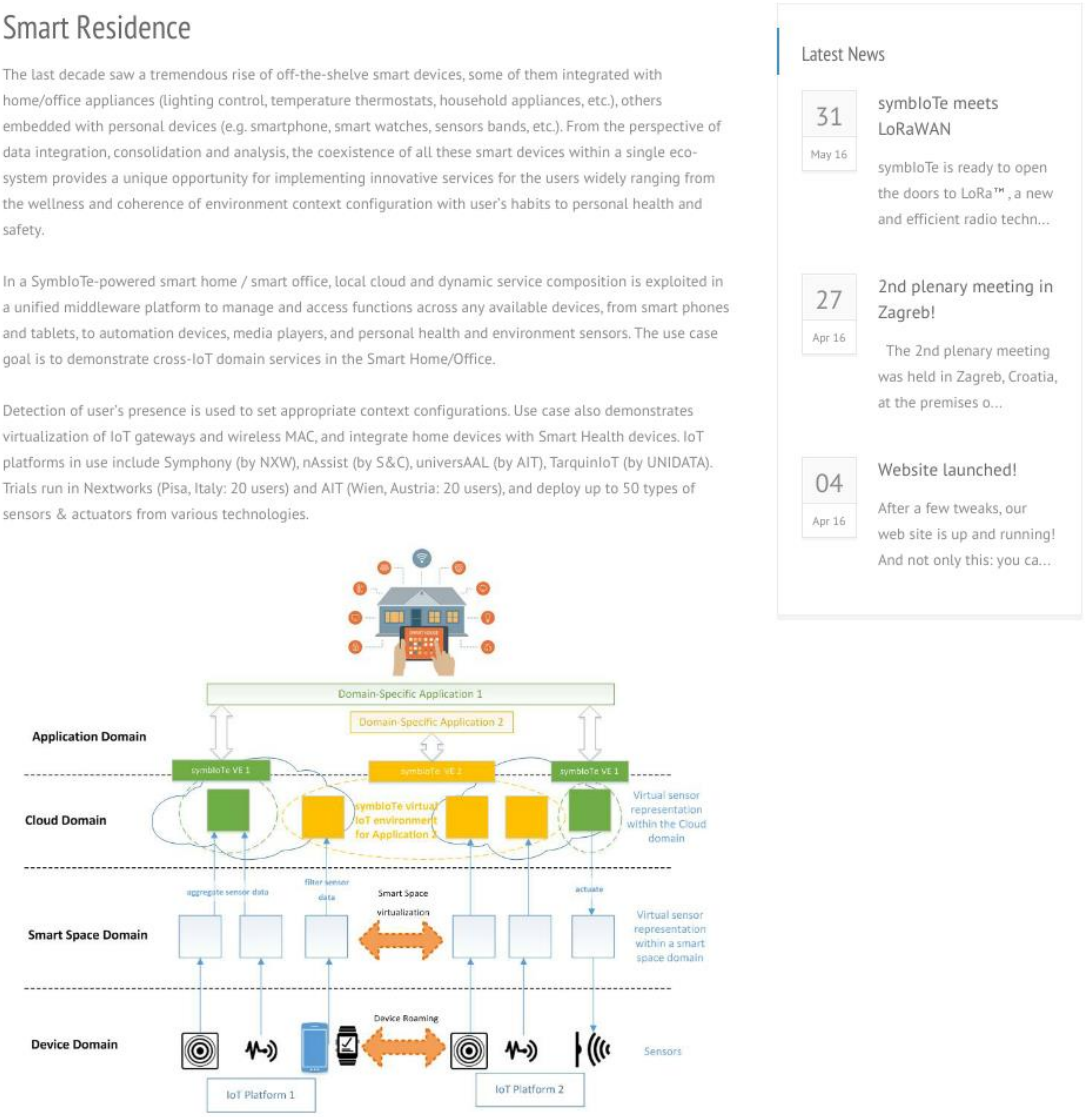


Figure 3 - Smart Residence use case web page

Resources: Under this menu item, all the public resources that enforce the symbIoTe dissemination are provided. The different categories of public resources include *Deliverables*, *Publications* and *Outreach Material*. The first category will be updated with the public deliverables of the project as soon as they are submitted to the EC, the second category includes the gold and green access papers, and the third category includes any other public dissemination material, like factsheets, leaflets, newsletters, etc.

News: This section contains all the news posted from the symbIoTe partners (Figure 4). Articles are automatically re-tweeted by the symbIoTe twitter account (see 4.1.3)

Tech Blog: This section hosts technical articles that will capture the progress of the project, including insights on the architecture of the symbIoTe middleware, the implemented components and the available APIs, as well as examples on how to use them, and any other similar information which will be useful for researchers outside the symbIoTe consortium to understand the details of the proposed solutions and use the project's outcomes.

It is worth mentioning that each article, news post or technical blog entry, can be easily shared to Twitter or LinkedIn social networks through the respective buttons that appear under the article's title. In this way, the symbIoTe website allows readers to instantly share interesting contents through their own social media channels.

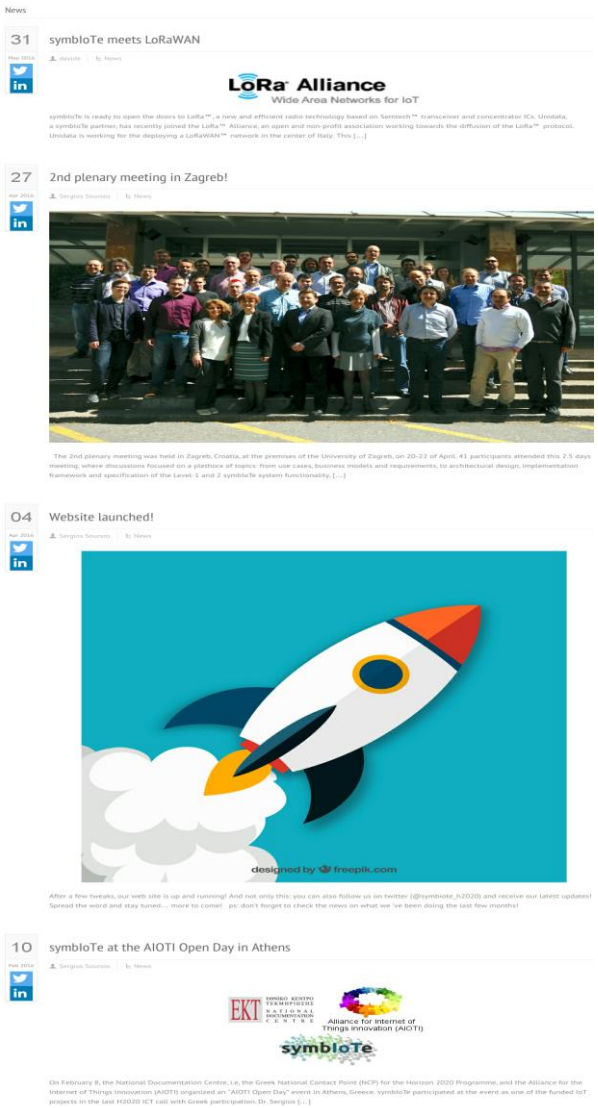


Figure 4 – the news web page

Partners: This menu item includes two subsections: the *Consortium* page and the *Team* page. By accessing the *Consortium* page, a visitor can be informed of the project

participants. Information like institution description, website links and logos are provided and can be easily found either by the map or through participants' list.

By accessing the *Team* page, the visitor can find personal contact information about all the individual participants. Contact information like e-mail address, LinkedIn profile, Research Gate profile, GitHub account, Skype ID and other contact details are provided by a simple and interactive design.

Open Calls: This web page will host information regarding open call schedule, procedures and general information. Additionally, the page will provide the proper web forms to register and upload open calls documents and information.

Contact Us: In this page, the visitor can contact to symbIoTe consortium by filling the respective contact form.

4.1.3 Features

The symbIoTe web site is based on the popular *WordPress* open source content management system. A number of features, either inherently supported by WordPress or added by the site designed, are active on the web site.

a) *Multiple accounts* and article writing, editing, posting and updating: this is an inherent feature which allows all symbIoTe partners to create and post news and technical blog entries.

b) *Automatic posting* to Twitter: as already mentioned, news posts can be automatically posted to Twitter when published. This feature is enabled by default, but authors are allowed to easily disable it for specific news posts, if needed.

4.1.4 Analytics

In order to assess how well the website is reaching visitors and acting as a source of information, standard web traffic analysis tools (provided by Google) are used to track the number of visitors and relative metrics during website lifetime.

4.1.5 Updates

The content of the website will be continuously updated throughout the course of the project, and thus act as a dynamic and up-to date source of information for the visitors. Even the static pages will be updated to capture the progress of the respective work packages and tasks.

4.2 Social Networks

The chosen channel for social media dissemination is Twitter ([5]) which will be continuously updated with project news, activities and IoT related news. It represents a dissemination tool that will be exploited until the end of the project in order to widely spread information about symbIoTe.

A good result for social media dissemination is to get more than 50 followers of the Twitter page.

4.3 Newsletter

The symbIoTe project will issue a newsletter, in order to periodically report updated results, based on the project roadmap. This must show what has been done until then, results achieved and won challenges.

There will be 3 publications of the newsletter, which will match main project milestones; these will focus on three different phases of the project:

- Scientific Orientation: newsletter will describe the basic principles of symbIoTe, showing the decisions made during the first phase of the design process.
- Design and Implementation: this is a more technical focused phase, leading through the software actual implementation
- Deployment: the final phase will be mostly dedicated to the deployment of the use cases.

The symbIoTe newsletter targets are the IoT community, vendors and service providers, with a distribution list of about 50 people and reaching at least 50 downloads from the website.

4.4 Dissemination material

The dissemination activities will be steered towards generating impact through targeted publications, presentations, talks, demonstrations, panels, workshops, and events.

The objectives of symbIoTe communication and dissemination activities are:

- To raise and foster awareness of the symbIoTe project vision, concept, objectives, and results among the various stakeholders (R&D community, market players, and the general public).
- To establish synergy links with other related projects, in particular within the IoT programme, with the aim of promoting a coherent overall IoT architecture and developing consistent technology building blocks.

The symbIoTe project comes with its own Logo, which shows the name of the project in the front, with a set of colored network nodes in the background, that represents the interconnected IoT things (Figure 5); it will be also created a promotional poster (see 5.4) and a video, in harmony with the participation in the IoT-EPI consortium (see 5.2, in order to describe the symbIoTe concepts and vision. A factsheet will also be prepared for project presentation inside this group (see 5.4).

Both the poster, the video and the factsheet will be made available to download from the website.

Figure 5 – The symbIoTe Logo

4.5 Communicating technical results

Below is shown a list of the planned dissemination of symbIoTe outcomes, in terms of press releases and whitepapers. The intent is to draw up 5 press releases and 2 whitepapers.

Press releases	- 1st at project start - 2nd issued with Open Call #1 - 3rd by mid-2017 – summary on architecture design & available implementations - 4th issued with Open Call #2 - 5th at project end – promotion of all project results (incl. standardization)
Whitepapers	- 1st at M18 – Architecture and middleware - 2nd at M36 – Trials, use-cases, interoperation of IoTs

Table 1 - planned press releases and whitepapers

4.6 Publications in conferences, workshops and journals

A major asset for the dissemination of the symbIoTe project will be the scientific results presented in publications, conferences, workshops and journals. The work plan for symbIoTe distinguishes between three different phases, with different focus areas for the dissemination:

- 1st Phase Scientific Orientation: publications will be mostly focused on research oriented topics, describing the basic principles of symbIoTe;

- 2nd Phase Design and Implementation: in this more technical focused phase of symbIoTe, publications will need to address the technical community and early adopters of the symbIoTe software results. The purpose is to engage external developers to contribute and participate in the open source developments;
- 3rd Phase Deployment: The final phase of symbIoTe is dedicated to the actual deployment of the use cases. The accompanying publications will have to address the perspectives and the different stakeholders of a symbIoTe deployment.

Access to the published articles will follow a combination of the 'gold' and 'green' open access models. Open access publishing will be primarily selected for the scientific publications and conference proceedings that will result from the project. Nevertheless, for publications targeted to major journals and magazines with high impact factors and wide audiences stricter access policies could be applied in line with the publishing houses' guidelines. For such cases, delayed self-archiving will be adopted, either at the project's website, or at partners' institutional websites or even in Open Access online repositories, like OpenAIRE ([9]).

Some academic venues are especially suitable for symbIoTe's publications, because on the one hand target IoT, sensor and networking-related topics and on the other hand attract experts from industry, such as listed in the following:

- IEEE ICC, GLOBECOM, INFOCOM: flagship conferences on all communication-related topics (i.e. wireless communications, IoT management, interdisciplinary aspect, and fundamentals);
- IEEE ISSNIP, IEEE SENSORS, RIoT, IEEE FiCloud: conferences focusing on sensors, sensors networks, advances in IoT and cloud computing;
- IEEE PIMRC, IEEE WoWMoM, WiOpt: conferences dedicated to wireless communication (i.e. personal indoor, multimedia, and modelling/optimization)
- ACM CoNEXT, SIGCOMM: Highly-selective flagship conferences for network (services) and related research fields.

In parallel, the following high-profile journals will be considered:

- IEEE Internet of Things Journal (IoT-J): Internet of Things;
- Elsevier Computer Networks, IEEE/ACM Transactions on Networking: networks and Internet;
- IEEE Transactions on Wireless Communications, ACM Transactions on Sensor networks and Elsevier Ad-Hoc journals: fundamental results on wireless networks;
- IEEE Communication Letters and IEEE Wireless Communications Letters: fast dissemination of accurate scientific results.

Apart from that, the results of symbIoTe cover a broad range of scientific and applicative domains. We will, thus, consider publications in magazines targeting multidisciplinary articles, including:

- IEEE Communications Magazine
- IEEE Wireless Communications Magazine
- Communications of the ACM

To measure the dissemination success, the following minimum numbers of publications are expected:

- Academic and industrial publications to create awareness and promote the project achievements and to provide input to IoT standardization bodies:
  - over 15 peer-reviewed publications,
  - 1-2 white papers,
  - over 5 press releases
- Workshops to receive feedback about the technical and commercial feasibility of the proposed solution:
  - 1-2 workshops,
  - over 5 meetings with researchers and stakeholders

4.7 Participation in events

The following list is a set of academic and industrial events, which symbIoTe's partners foresee to attend and address. The effective participation at these events depends on many factors that could not be all know a priori (i.e. acceptance of submitted articles/papers, deadlines, etc.); so this chapter shouldn't be considered as a list of what will be absolutely done, but mostly as what symbIoTe partners intend to do.

4.7.1 Academic events

Targeted Event	***Expected Impact and Audience Size***	***Participant***
IEEE International Conference on Communications, May 21-25 2017, Paris, France	A premier conference for the networking and communication community. Impact: HIGH Audience size: 2,000	UNIZG-FER
International Conference on the Internet of Things, November 7–9 2016, Stuttgart, Germany	A series of conferences focused on the original, high impact research papers on all topics related to the Internet of Things. Impact: HIGH Audience size: 150	UNIZG-FER
IEEE World Forum on Internet of Things, December 12–14 2016, Reston, Virginia, USA	An IoT conference sponsored by nine IEEE Societies that are directly involved in the research in the IoT domain Impact: HIGH Audience size: 300	UNIZG-FER
ACM International Conference on Distributed and Event-	A premier conference in the fields of	UNIZG-FER

Based Systems, June/July 2017 (location not yet defined)	distributed and event-based systems Impact: MEDIUM Audience size: 70	
International Conference on Telecommunications, June/July 2017, Zagreb, Croatia	A conference for the academic and industrial communities to share solutions and discuss issues in information and communication technology. Impact: MEDIUM Audience size: 70	UNIZG-FER
Open Living Lab Days, 23-26 August 2016, Montreal, Canada	A series of training sessions and practical workshops on cutting edge living lab and open innovation methods and techniques with special focus on the IT domain.	PSNC
IoT Living Lab sessions, August 2017 - May 2018, Poznan, Poland	Workshops organized to engage symbIoTe users, co-create platform application ideas and validate functionalities	PSNC
Conference of Telecommunication, Media and Internet Techno-Economics (CTTE), November 2017, Europe	Publishing results from the symbIoTe bartering and trading model	PSNC
IEEE GLOBECOM, IEEE ICC TBC	Submitting trading and bartering mechanisms between IoT islands Impact: HIGH Audience size: over 2.000	UNIVIE
IFIP Networking Conference 2017 TBC	Making for instance a contribution about symbIoTe's security architecture Impact: HIGH Audience size: 120	UNIVIE

Table 2 – List of planned academic events

4.7.2 Industrial events

Targeted Event	***Expected Impact and Audience Size***	***Participant***
SEATEC and YARE 2017 / 2018 ([10]),	It is an exclusive event in Italy and one of the few international events dedicated	Navigo

March 2017/2018, Carrara, Italy	to the Superyacht sector attracting experts, suppliers, end users from all over the world. Impact: HIGH	
Yachting Festival Cannes ([11]), September 2017, Cannes, France	It is Europe's leading in-water boating event. The major players in pleasure yachting come here to launch the show season by showcasing their new worldwide models. Impact: MEDIUM	Navigo
METS ([12]), November 2017, Amsterdam, Netherlands	It is the only international B2B exhibition for the marine leisure industry. Impact: HIGH	Navigo
Monaco Yacht Show ([13]), September 2018, the Principality of Monaco	It is the world leading event for luxury yachting stakeholders (companies, superyacht builders, yacht designers, luxury manufacturers, etc.) Impact: HIGH	Navigo
IoT Solutions World Congress ([14]), October 2016, Barcelona, Spain	It is the leading global event for industrial IoT. Impact: HIGH Audience size: over 8,000	Ubiwhere, S&C, Atos
Internet of Things World Europe ([15]), November 2016, Dublin, Ireland	Europe's largest and most comprehensive IoT event, focusing on commercial and business opportunities. Impact: HIGH	Ubiwhere, S&C
Smart City Expo World Congress ([16]), November 2016, Barcelona, Spain	A referential global event to support the development of smart cities. It's a summit of discussion about the link between urban spaces and technological solutions. Impact: MEDIUM Audience size: over 14,000	Ubiwhere, S&C
Mobile World Congress ([17]), February 2017, Barcelona, Spain	It is the world's largest gathering for the mobile industry. Impact: HIGH	Ubiwhere, S&C

	Audience size: over 100,000	
CeBIT ([18]), March 2017, Hannover, Germany	It is the largest and most internationally represented computer expo. Impact: HIGH	TBC
Hannover Messe Industrie ([19]), April 2017, Hannover, Germany	It is the world's leading trade fair for industrial technology. Impact: HIGH	TBC
Internet of Things European Summit, ([20]) TBC	It is the leading event of its kind by focusing on the current developments driving the industry. Impact: HIGH	TBC
Intertraffic ([21]), March 2018, Amsterdam, Netherlands	The world´s leading trade event for infrastructure, traffic management, smart mobility, safety and parking. Impact: MEDIUM Audience size: over 30,000	Ubiwhere, S&C
Maker Faire ([22]), October 14-16 2016, Rome, Italy	A faire where there will be many industries from sectors like smart home, automotive, energy, etc. Impact: HIGH Audience size: over 70'000	Unidata
Securex / SAWO, April 2018, Poznan, Poland	International fair on security systems and installations	PSNC
PolEcoSystem / Gmina, October 2017, Poznan, Poland	International fair on communal systems and services	PSNC

Table 3 – List of planned industrial events

4.8 Workshop organization

To reinforce the interest of the research community in the topics which symbIoTe addresses, symbIoTe will organise and co-organise workshops together with the participation of researchers, cluster projects and stakeholders in well-recognised conferences and events, like Net Futures and IoT Forum's IoT Week. The main purpose for it will be to receive feedback about the technical and commercial feasibility of the proposed solution.

The symbIoTe specific target is to organise two workshops with the participation of sister projects/initiatives and stakeholders: one in the first year, to receive the first inputs regarding the business models and promote the project and its preliminary results; the other on M30, to promote the whole symbIoTe achievements and ensure the sustainability and exploitation of the project results.

The 1st workshop will be named "2nd Workshop on Interoperability and Open-Source Solutions for the Internet of Things", it is co-located with the "6th International Conference on the Internet of Things (IoT 2016)", on November 2016, in Stuttgart, Germany. The workshop will be organized by two H2020 projects, symbIoTe and BIG IoT ([39]), which are both part of the IoT-EPI ([2]).

The main objective of this workshop is to exchange experiences and ideas with the IoT community as well as contribute to build new knowledge around open issues and gaps on Internet of Things interoperability, architectural principles and standardization efforts. It will showcase practical experiences on interoperable IoT solutions and promote open-source solutions.

This will be a full day length workshop, and it targets to an expected audience of 30-40 participants.

4.9 Open source contributions

One of the main results of the symbIoTe project will be the software produced as foreground intellectual property of the consortium. It is an objective to publish symbIoTe APIs and middleware components as open source by using "business-friendly" licensing, which facilitates open software and triggers the commercial and innovative diffusion on top of the symbIoTe interoperability framework.

In the current phase of the project, the open source strategy to not yet fully defined. However, the following questions are in the focus:

- What do we want to archive by facilitating the Open Source Software (OSS) model?

The main goal is to provide helpful software to trigger new commercial projects and to boost innovation within European IoT-Community. The symbIoTe software results will be made available in a business friendly way, in order to enable reuse without any restricting barriers.

A second goal is to invite the OOS community to contribute to the symbIoTe software. symbIoTe will provide concepts and solutions to connect different IoT-middleware products. However, there are many more products in the IoT-domain than the symbIoTe consortium is able to support. It's therefore essential to attract external contributors to adopt symbIoTe to their own products and to share their work.

- How is the ownership of contributions to symbIoTe arranged?

Even when software is available to be used freely, it is still owned by someone. In most cases, the author of the software is also the owner and the maintainer of the software. This will also be the case for the symbIoTe software.

- What are we willing to share?

The symbIoTe architecture is in development, so this question cannot be fully answered at this stage of the project. For each asset, there is a tradeoff between "invite adopters/customers to use" and to "protect intellectual property". This is tied closely to the license model that is used, since what contributors are willing to share depends on the conditions under which the contributions are shared. License models are discussed later.

- What user expectations do we want to serve? Do we provide “proof-of-concept”-code or “production-ready”-code?

When adopting OOS there is always an uncertainty about the quality of the software. While customers like to see high quality code, new software for innovative and complex solutions within research projects very often tends to have restricted scopes and only limited quality control. Because this is an unavoidable contradiction, it is very important to be transparent to the community about the code quality. The OOS community shall always be able to evaluate the symbIoTe software and it is important to be very transparent to the potential adopters to get an unbiased assessment. If the trust is lost, failure is certain.

- What about long-term sustainability? Do we plan to do this ourselves or do we expect the OSS-community to adopt the software and maintain it in the future?

Many OOS developing groups tried to install a foundation as a business model in order to provide a long-term sustainability. Only a few have been successful. A more robust way to archive sustainability is to make sure every contributor and therefore owner of symbIoTe software has a solid interest in maintaining his contribution. This can be archived when the software contributions are in-line with the individual business cases.

- Which license model is the most appropriate?

The main Issue in Open Source Licensing is the question about copyleft vs non-copyleft (permissive): “copyleft” licenses are licenses that require redistributed copies and derivative works to be under the same license. In other words, you're free to use the code for any purpose, and to share and modify it, but any resultant works you distribute must be distributed under the same license. The best-known copyleft licenses are:

- the GNU General Public License (GPL)
- the GNU Lesser General Public License (LGPL)
- the GNU Affero General Public License (AGPL)
- the European Union Public License (EUPL)

A “non-copyleft” license is simply one that permits the code to be incorporated in a program that is, overall, distributed under some other license – even a proprietary, closed-source one. Non-copyleft licenses are thus sometimes called “permissive” licenses. Some examples of popular non-copyleft licenses are:

- the MIT license
- the BSD license (or license family)
- the Apache License 2.0 from the Apache Software Foundation

Some copyleft licenses allow the covered software to be used bundled "as a library" in software that itself is not covered by that license. Examples of this are LGPL and EUPL.

With a non-copyleft license, anyone can take symbIoTe code, improve it and not give back those improvements. With a copyleft license, when someone changes symbIoTe code, they have to contribute those changes back.

The symbIoTe team is still discussing about the license to choose: the debate so far is converging to the Apache License 2.0.

4.10 Liaisons with target groups

4.10.1 Industrial community

The symbIoTe project results will be disseminated to technology providers and manufacturers of software, and hardware enabling information exchanged between the industrial community and the end users. Additionally, application developers and entrepreneurs may leverage symbIoTe results with the development of new added-value services. Through the industrial community symbIoTe will be able to gain knowledge about user preferences, market needs and opportunities and therefore adapt the exploitation plan and increase the business potential. The main exposure and interaction of symbIoTe partners will be through participation in IoT Expos and other industrial events. Minimum target: 1-2 fairs, over 5.000 visitors, over 20 contacts

4.10.2 Scientific community

Scientific dissemination among the academic world is a key target of the symbIoTe project dissemination. For this purpose, scientific articles will be published in international journals with a high impact factor (see 4.6). The participation in scientific conferences and other dissemination events that target scientific communities related to IoT topics and specific issues, are other relevant activities.

4.10.3 European commission

The symbIoTe consortium will continually inform the project officer and EC about interesting results, news and events concerning the project. Demonstrate what has been achieved through this European collaboration and highlight the scientific excellence and contribution to technological challenges and innovation. This can be achieved through specific available channels:

- Articles (minimum target: 1 article per year):
  - Horizon Magazine ([23])
  - Project stories ([24])
  - Research*eu results magazine ([25])
  - Research*eu focus ([26])
  - Newsletters ([27])
  - CORDIS Wire ([28])
  - Co-publications or editorial partnerships

- Audio-visual material (minimum target: 1 video):
  - Futuris Magazine ([29])

- Disseminating symbIoTe events:
  - Events on the Commission’s Research & Innovation website ([30])
  - Events on the CORDIS website ([31])

Also symbIoTe plans to use the several freely accessible tools and networks such as the IoT European Research Cluster ([32]) and the IoT Open Platforms ([33]) and consult the available guide for Communicating EU Research & Innovation ([34]).

4.10.4 IoT EPI

The IoT European Platforms Initiative (IoT-EPI, [2]) was formed to build a sustainable IoT-ecosystem in Europe, maximizing the opportunities for platform development, interoperability and information sharing. In the context of seven Research and Innovation Activities (including symbIoTe) 3rd parties will gain access to innovative IoT-platform technologies. IoT EPI works in close collaboration with all 7 projects and coordinates the actions for common dissemination activities. IoT EPI uses its own communication external channels (website, twitter, LinkedIn and YouTube) to inform all interested 3rd parties about the development and progress of the 7 projects. IoT EPI will create a common dissemination calendar in order to align projects' participation in events and will also facilitate dissemination procedures for the Open Calls. Since the very beginning IoT EPI have taken a strong coordinating role for ensuring common goals and actions.

For internal communication IoT EPI has established a communication group which is comprised by all projects dissemination leaders. The communication group has regular conference calls in order to plan common participation in important IoT events. There is also an online platform called eRooms provided by SINTEF for sharing all common documents.

4.10.5 Cluster Projects

The symbIoTe project will collaborate closely with the cluster projects that resulted from the same call for proposals and started in January of 2016. The aim of symbIoTe is to participate to events and meetings, co-organize workshops and other activities.

The cluster projects are presented in the following list:

- Inter IOT ([35])
- TagItSmart ([36])
- Vicinity ([37])
- Agile ([38])
- BIG IoT ([39])
- bIoTope ([40])

Specific target: Collaboration with 3 relevant H2020 projects and initiatives

4.11 Open Calls – Specific dissemination campaigns

The dissemination activities will foresee a special focus on Open Calls. In order to get the widest audience and to reach targeted applicants, a special dissemination campaign has been planned.

The reason to launch specific dissemination campaigns related to Open Calls lies in the opportunity to create awareness and interest in the community of IoT sector's companies and research centres potentially eligible for applications. SymbIoTe aims at awarding brilliant SMEs, companies and research groups that can collaborate with symbIoTe consortium in order to provide extensions of the system. We are aware that

communication and dissemination are the keys for stimulating involvement and attracting the most interesting applications.

The targeted applicants for symbIoTe extension are companies, SMEs and Research Groups, which are key players in the IoT domain and specifically: application developers, IoT platform providers, gateway manufacturers and cloud operators.

The launch of the official announcements and related documentation are planned to happen at M11 (end of November 2016) for the first call and at M22 (end of October 2017). From the publication of the official announcement to the deadlines, applicants will have a period of two months for sending the proposals. This time constraint requires at least a pre-announcement period in which potential applicants can acquire information and get more familiar with symbIoTe focus and objectives.

The information campaigns (pre-announcement) will pave the way to more focused proposal according to specific needs and requirements of symbIoTe project.

The pre-announcements actually will consist in the dissemination of high-level messages on expected proposal scopes, according to the different compliance levels required by symbIoTe project for integration of extensions.

According to the Open Calls implementation plan, the information campaigns should start at least one month before (i.e. October 2016 and September 2017) the launch of the official announcements and will be organized as follows:

Exploitation of all the existing communication channels already established and running as above described. In addition to Press releases abovementioned, a specific page of the web site will be dedicated to Open Calls information and announcements;

Involvement of each symbIoTe partner in disseminating pre-announcement information by deploying its own professional/scientific network;

Exploitation of synergies established through IoT-EPI Task Force Innovation for disseminating announcements on EU institutional web sites and networks.

The information campaigns and their key messages will be organized in strict synergy with WP6 – Open calls.

4.12 Dissemination risks

The overall dissemination objective of symbIoTe is to contribute to knowledge generation and innovation within the IoT domain. The specific goal of the dissemination activities is to communicate the results, examples and technical solutions, from the project to different audiences and stakeholders. However, there are some specific risks to consider:

- The project is heavily dependent on a successful timing of demonstration objects and input provided by project partners. This stresses the need for structured internal communication and clarity, with regards to the responsibilities and tasks of all involved project partners.
- The partners need to make sure they disseminate the project outcomes on frequent and timely manner to a wide audience, but increasing workload and priorities within the project can affect the quality of dissemination.

- In external communication, it can be challenging creating the right impact at each specific target group, as the project addresses a wide variety of audiences in a number of different countries. This particularity gives rise to an additional difficulty in providing efficient distribution of information and ensuring proper impact of communication initiatives, implying to work closely with all partners.
- To avoid poor dissemination towards relevant stakeholders, must result in ensuring the circulation of clear messages, across all dissemination material. To use a wide range of tools to disseminate the project results in an effective way (i.e. project website, newsletters, press releases, etc.)
- To target the correct audiences; this refers in knowing audience's interests and building the message according to the audience itself.

5 Initial report on dissemination activities

5.1 Website

The symbIoTe website embeds Google Analytics to gain insights on website usage and accessibility. The timeframe reported in this section concerns the period from April 1, 2016 until June 7, 2016. More specifically, this section gives an overview of the total 1,268 web page viewing sessions. During the aforementioned period, out of the 725 visitors, 56.3% were unique visitors (Figure 6); in Figure 7 it is shown that most users landed on the homepage with a percentage of 78.25%.

Time spent on website: During the aforementioned period of time visitors spent an average of 3 minutes 21 seconds browsing on the website (Figure 6).

Bounce Rate: The bounce rate for the website is 50.55%. This is the percentage of visitors that came to the page and left without taking further action on the page (Figure 6).

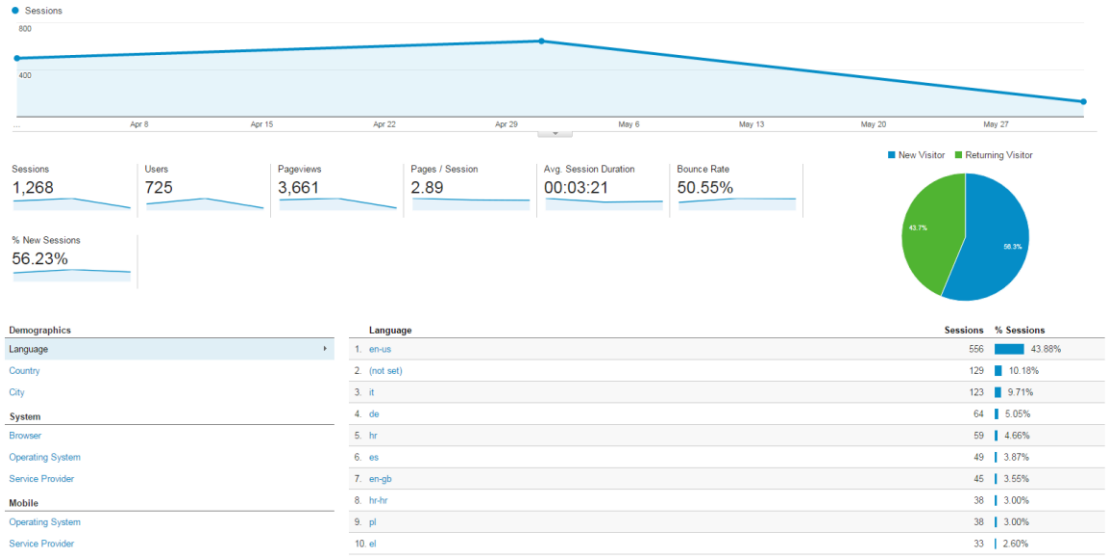
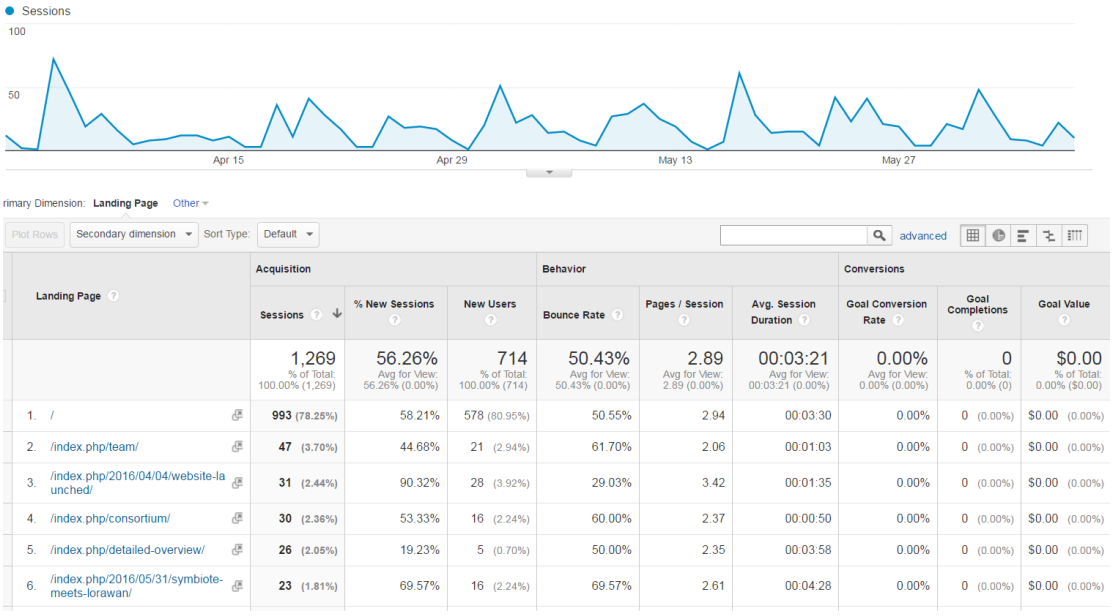


Figure 6 - Overview of sessions (monthly observation)



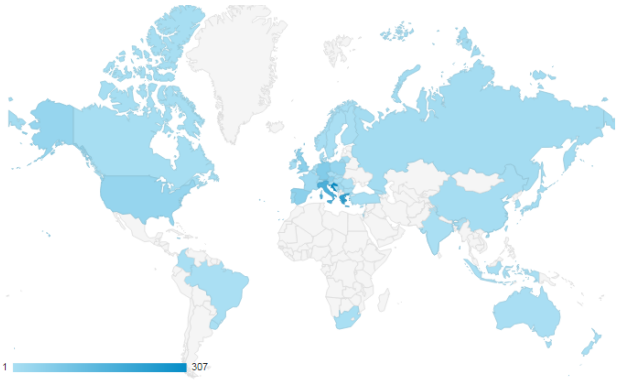
rimary Dimension: **Landing Page** Other

Plot Rows | Secondary dimension | Sort Type: Default | advanced

Landing Page	Acquisition			Behavior			Conversions		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration	Goal Conversion Rate	Goal Completions	Goal Value
	1,269 % of Total: 100.00% (1,269)	56.26% Avg for View: 56.26% (0.00%)	714 % of Total: 100.00% (714)	50.43% Avg for View: 50.43% (0.00%)	2.89 Avg for View: 2.89 (0.00%)	00:03:21 Avg for View: 00:03:21 (0.00%)	0.00% Avg for View: 0.00% (0.00%)	0 % of Total: 0.00% (0)	$0.00 % of Total: 0.00% ($0.00)
1. /	993 (78.25%)	58.21%	578 (80.95%)	50.55%	2.94	00:03:30	0.00%	0 (0.00%)	$0.00 (0.00%)
2. /index.php/team/	47 (3.70%)	44.68%	21 (2.94%)	61.70%	2.06	00:01:03	0.00%	0 (0.00%)	$0.00 (0.00%)
3. /index.php/2016/04/04/website-launched/	31 (2.44%)	90.32%	28 (3.92%)	29.03%	3.42	00:01:35	0.00%	0 (0.00%)	$0.00 (0.00%)
4. /index.php/consortium/	30 (2.36%)	53.33%	16 (2.24%)	60.00%	2.37	00:00:50	0.00%	0 (0.00%)	$0.00 (0.00%)
5. /index.php/detailed-overview/	26 (2.05%)	19.23%	5 (0.70%)	50.00%	2.35	00:03:58	0.00%	0 (0.00%)	$0.00 (0.00%)
6. /index.php/2016/05/31/symbiote-meets-lorawan/	23 (1.81%)	69.57%	16 (2.24%)	69.57%	2.61	00:04:28	0.00%	0 (0.00%)	$0.00 (0.00%)

Figure 7 - Landing page statistics

Geographical distribution: The geographical distribution of users primarily stems from Croatia (24.19%), followed by Greece (18,52%) and Italy (13.87%) (Figure 8).



Primary Dimension: **Country** City Continent Sub Continent

Secondary dimension

Country	Acquisition			Behavior		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	1,269 % of Total: 100.00% (1,269)	56.26% Avg for View: 56.26% (0.00%)	714 % of Total: 100.00% (714)	50.43% Avg for View: 50.43% (0.00%)	2.89 Avg for View: 2.89 (0.00%)	00:03:21 Avg for View: 00:03:21 (0.00%)
1. Croatia	307 (24.19%)	60.26%	185 (25.91%)	49.19%	2.67	00:02:29
2. Greece	235 (18.52%)	25.53%	60 (8.40%)	35.32%	4.91	00:08:50
3. Italy	176 (13.87%)	53.98%	95 (13.31%)	33.52%	2.73	00:03:53
4. Germany	73 (5.75%)	39.73%	29 (4.06%)	39.73%	2.70	00:01:10
5. United Kingdom	58 (4.57%)	89.66%	52 (7.28%)	91.38%	1.55	00:00:40
6. Spain	57 (4.49%)	45.61%	26 (3.64%)	35.09%	3.11	00:02:52
7. Austria	56 (4.41%)	48.21%	27 (3.78%)	46.43%	3.14	00:03:04
8. Poland	39 (3.07%)	48.72%	19 (2.66%)	51.28%	2.18	00:01:01
9. United States	39 (3.07%)	92.31%	36 (5.04%)	94.87%	1.23	00:00:19
10. (not set)	37 (2.92%)	100.00%	37 (5.18%)	100.00%	1.00	00:00:00

Figure 8 - Geographical distribution of website visitors (top 10 locations)

User acquisition: This metric indicates the traffic source to the symbIoTe website. In a total of 1.270 sessions, as observed in , the largest number of users stem from Google organic search (393), followed by direct traffic (385) and referrals (336), with only a small percentage to have been driven to the website through social media (156).

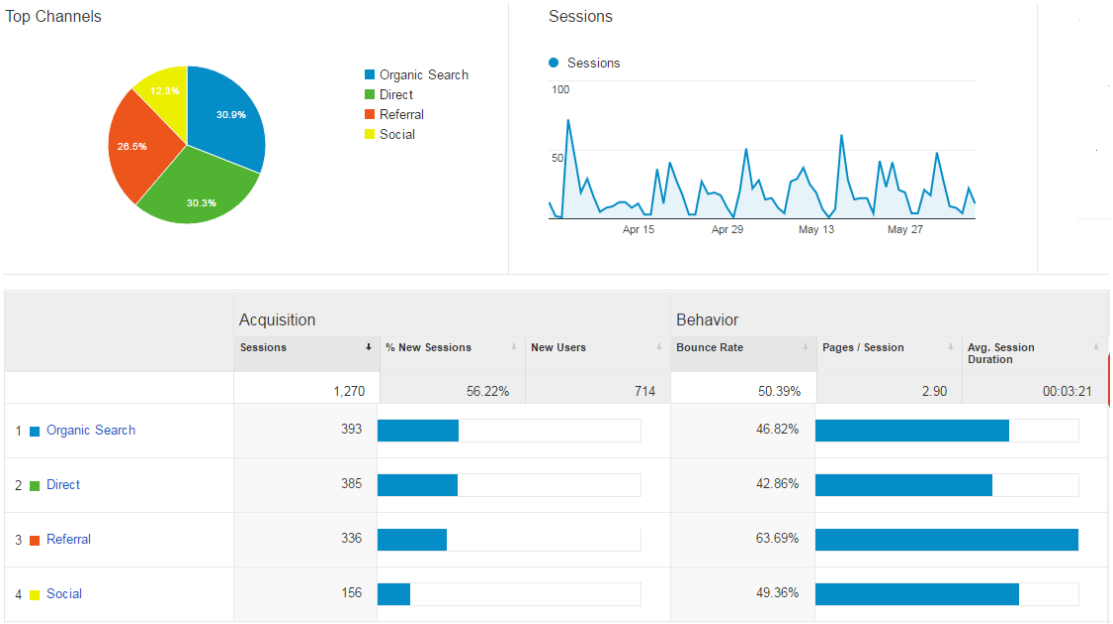


Figure 9 - User Acquisition overview

Number of pages visited: This metric outlines the webpages visited, listed by their URI, i.e., the portion of a page's URL following the domain name. The most visited page was the homepage of the project with 1,459 pageviews, followed by the *Team* page with 422 pageviews and the project's *Detailed Overview* with 278 pageviews (Figure 10).

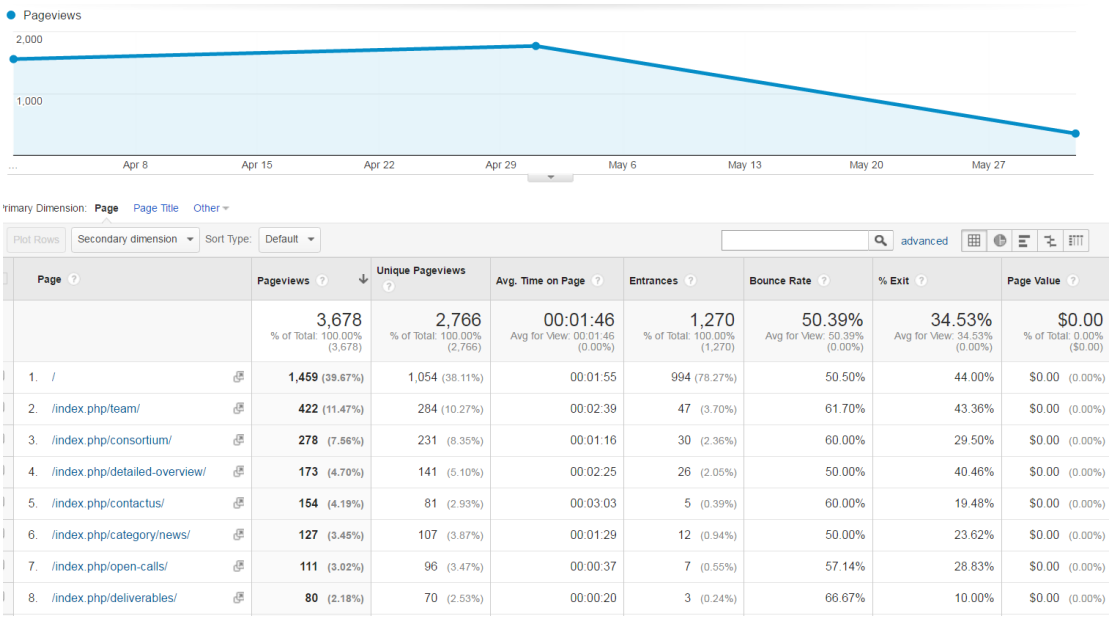


Figure 10 – Number of pages visited

5.2 Video

The symbIoTe consortium, in collaboration with the IoT-EPI coordinators, decided to create a promotional video with the symbIoTe concepts and vision. The discussions between the project partners led to the decisions that the video should

- be simple and direct,
- visualize the vision of the project in a simple language,
- avoid getting into technical details so that the main message is clear for non-technical viewers,
- not be too long; one minute or so would be enough,
- avoid using real-life images since it would make the video too “heavy”, but
- instead, use cartoon-like graphics.

The idea of the video script stemmed from the storylines of the use cases that the project was working on at that time. After a couple of ideas, the following script was promoted as the most appropriate one:

We live in a smart connected world!

Show many smart devices (cameras, light sensors, smart plugs, smart light bulbs, smartwatches, smartphones, etc.), each one in different color (same devices in different colors denote different brands/vendors)

… where you can interact with smart environments with a simple touch on your smartphone!

A girl using her smartphone to interact with a smart environment (e.g. smart home) is showed. The smartphone and the smart device (of the smart home) have the same color (they are both red, indicating they belong to the same system)

… using purpose-specific mobile applications!

Zooming into the smartphone, showing dummy mobile app with the same color (red) used in the previous scene.

But changing smart environments requires using different apps!

Showing the previous scene with the girl, where the smartphone and the smart device are red. Then scene switches, showing the girl with her smartphone on her bicycle. The color of the smartphone changes and so a smart device on a lamppost by the road, to green. Scene changes again: now the girl is at her university; her smartphone is now blue and so is the smart panel and her university’s wall.

Imagine now a world where your digital presence adapts to the smart environment you visit!

Quickly replay of the previous scenes, but in this version smartphone has multiple colors (like a rainbow), while the rest of smart devices change color (red, green, blue).

What if you can use the same mobile app to interact with different IoT platforms?

Quickly showing the following scenes (each time the smartphone is colorful-rainbow, while the smart environment has only one color): the girl is at her university, then she’s riding her bicycle, then she’s going to the stadium, then she’s visiting her boyfriend at another university.

What if you can develop cross-domain applications for third-party IoT platforms?

A guy typing in front of a pc is showed. The ‘software code’ on the PC screen can be colorful. The code leaves the PC and “flies into” a grey smartphone. When the code enters

the smartphone, it turns from grey to colorful.

What if your platform can interact with nearby IoT platforms?

Showing a house with several sensors (some green, some blue) and two gateways (one green, one blue). One blue sensor sends a blue message to the blue gateway. The blue gateway sends the blue message to the green gateway. The message turns from blue to green and is sent to a green smart light bulb which then lights up.

Welcome to the symbIoTe world!

Show symbIoTe logo, H2020 logo and IoT-EPI logo

Show symbIoTe URL and twitter below

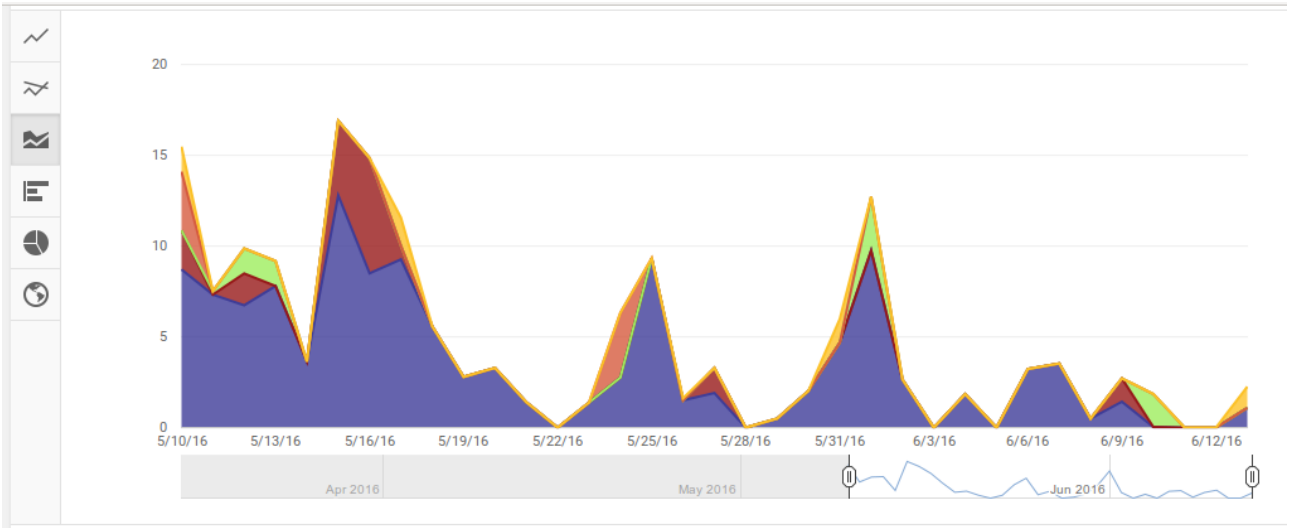
After providing the above script to the video producers and fine-tuning certain details on the produced draft video, the final video was published to the symbIoTe YouTube channel ([8]) and embedded into the start page of the symbIoTe website.

Since its publication (May 10, 2016), the video has been viewed 187 times and viewers originated from 16 different countries (mainly European ones). More details on the viewing analytics of the promotional video can be seen in the following figures.

Figure 11 – Views of symbIoTe promotional video (daily view).

Geography	Watch time (minutes)	Views	Average view duration	Average percentage viewed
Italy	58 (35%)	59 (32%)	0:59	72%
Croatia	26 (16%)	26 (14%)	1:00	72%
Greece	22 (13%)	34 (18%)	0:39	47%
Spain	14 (8.5%)	14 (7.5%)	1:01	74%
Austria	11 (6.5%)	10 (5.3%)	1:05	79%
Germany	9 (5.5%)	10 (5.3%)	0:55	66%
United Kingdom	6 (3.3%)	4 (2.1%)	1:22	100%
Poland	5 (3.2%)	8 (4.3%)	0:40	49%
Serbia	4 (2.6%)	4 (2.1%)	1:06	81%
Belgium	3 (1.9%)	6 (3.2%)	0:31	38%
United States	3 (1.7%)	4 (2.1%)	0:42	51%
Norway	1 (0.8%)	1 (0.5%)	1:22	99%

Figure 12 – Geographical distribution of viewers with watch minutes and average view duration.



Traffic source	Watch time (minutes)	Views	Average view duration	Average percentage viewed
External	126 (75%)	138 (74%)	0:54	66%
Other YouTube features	18 (11%)	21 (11%)	0:50	61%
Suggested videos	8 (4.6%)	8 (4.3%)	0:57	70%
YouTube channels	7 (4.0%)	6 (3.2%)	1:07	82%
Playlists	6 (3.3%)	6 (3.2%)	0:55	67%
Direct or unknown	4 (2.6%)	6 (3.2%)	0:44	53%
YouTube search	1 (0.3%)	2 (1.1%)	0:17	21%

Figure 13 – Traffic sources (“External” mainly refers to traffic from web sites having embedded the YouTube video, i.e. the symbIoTe and IoT-EPI web sites).

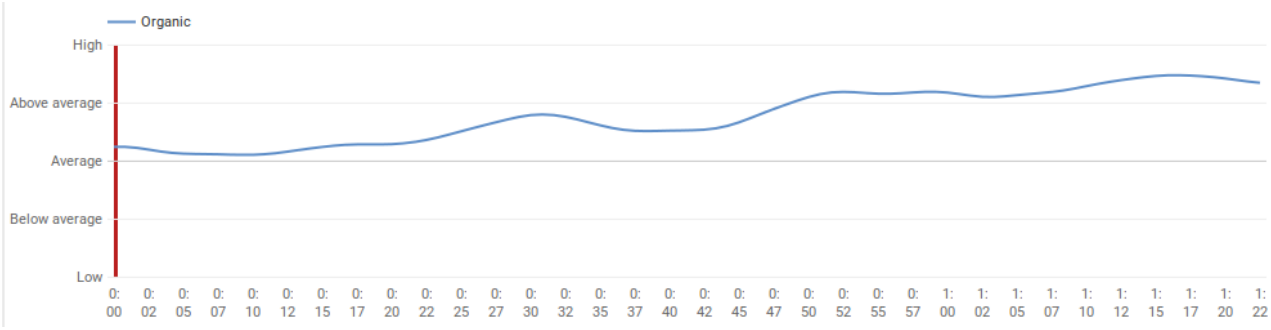


Figure 14 - Relative audience retention shows the video's ability to retain viewers during playback by comparing it to all YouTube videos of similar length.

5.3 Social Networks

The symbIoTe project has established a twitter account ([5]) on March 6th 2016 (M3). Since then we are engaging with relevant high-profile professional, projects, networks and organisations. Currently symbIoTe has 85 followers and 75 tweets.

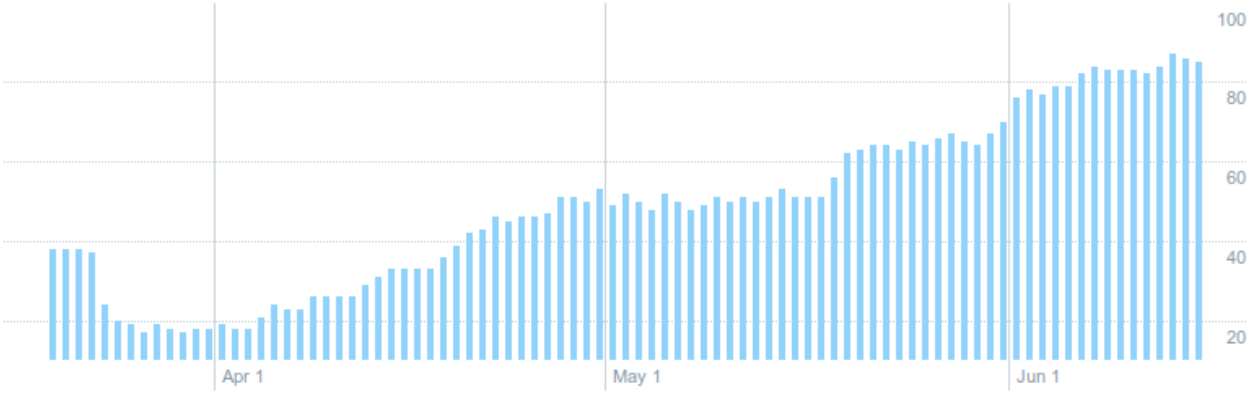


Figure 15 – Number of followers (daily view)

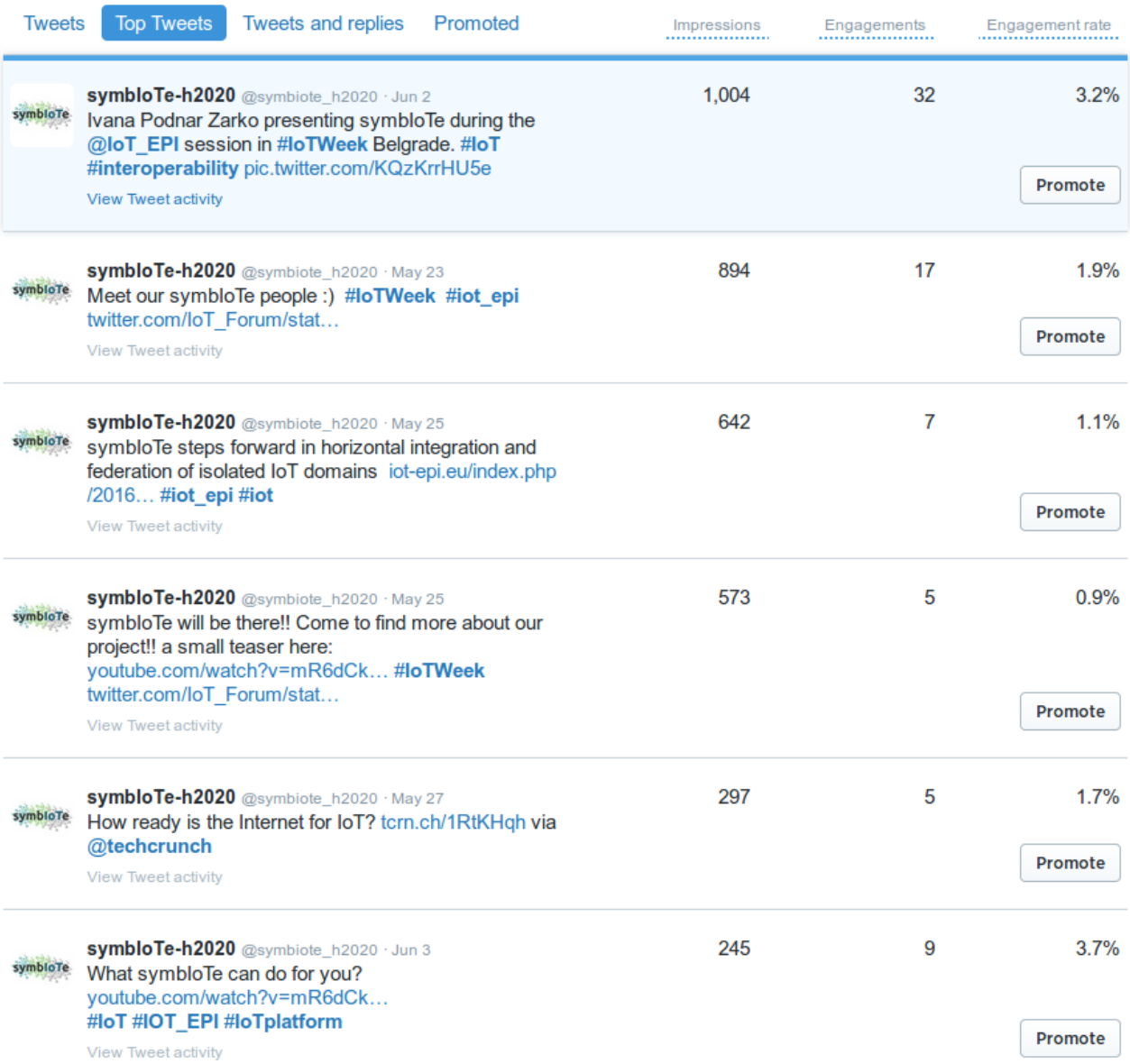


Figure 16 – Top tweets during the last 28 days, along with their tweeter metrics

5.4 Dissemination materials

In the context of symbIoTe presence in IoT-EPI (the European group federating the new H2020 programs about IoT platform development), a poster (Figure 17) and a factsheet (Figure 18) has been prepared for symbIoTe presentation inside this group. The poster is a short snapshot of the most relevant information, in order to understand what is the symbIoTe project; the factsheet, instead, contains a short description of all the important aspects of symbIoTe (i.e. goal, technologies, challenges, solutions, etc.). Both the poster and the factsheet are available on the project website ([41]).

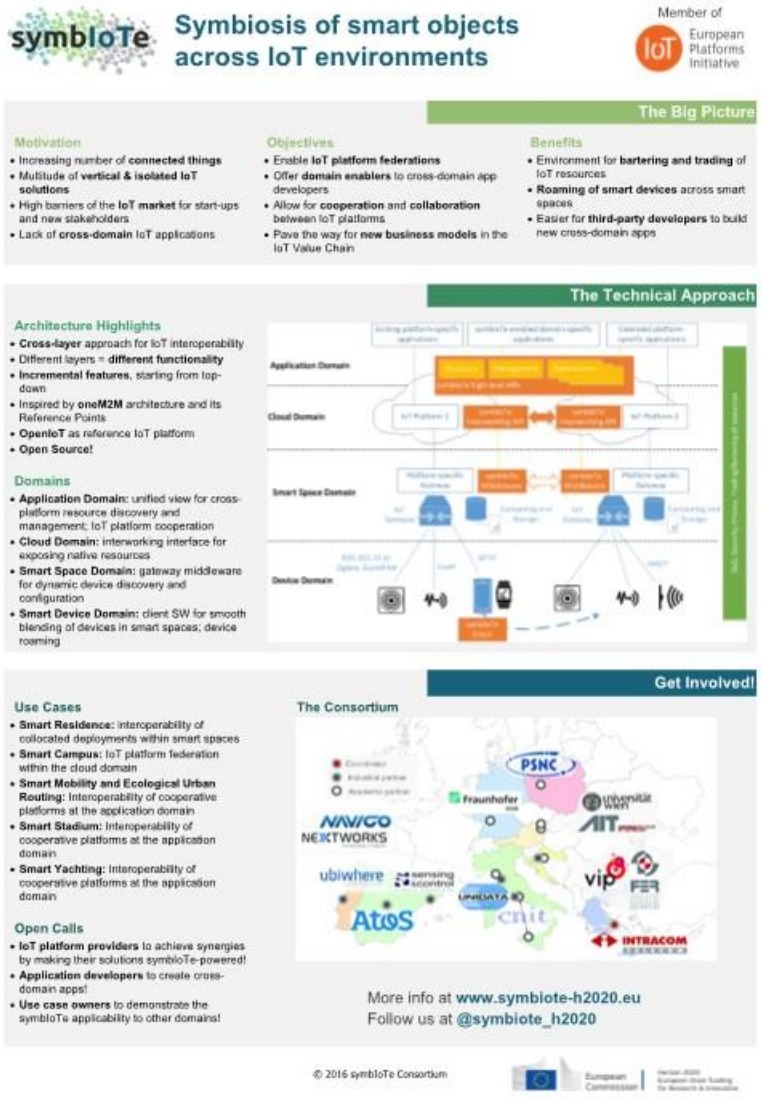
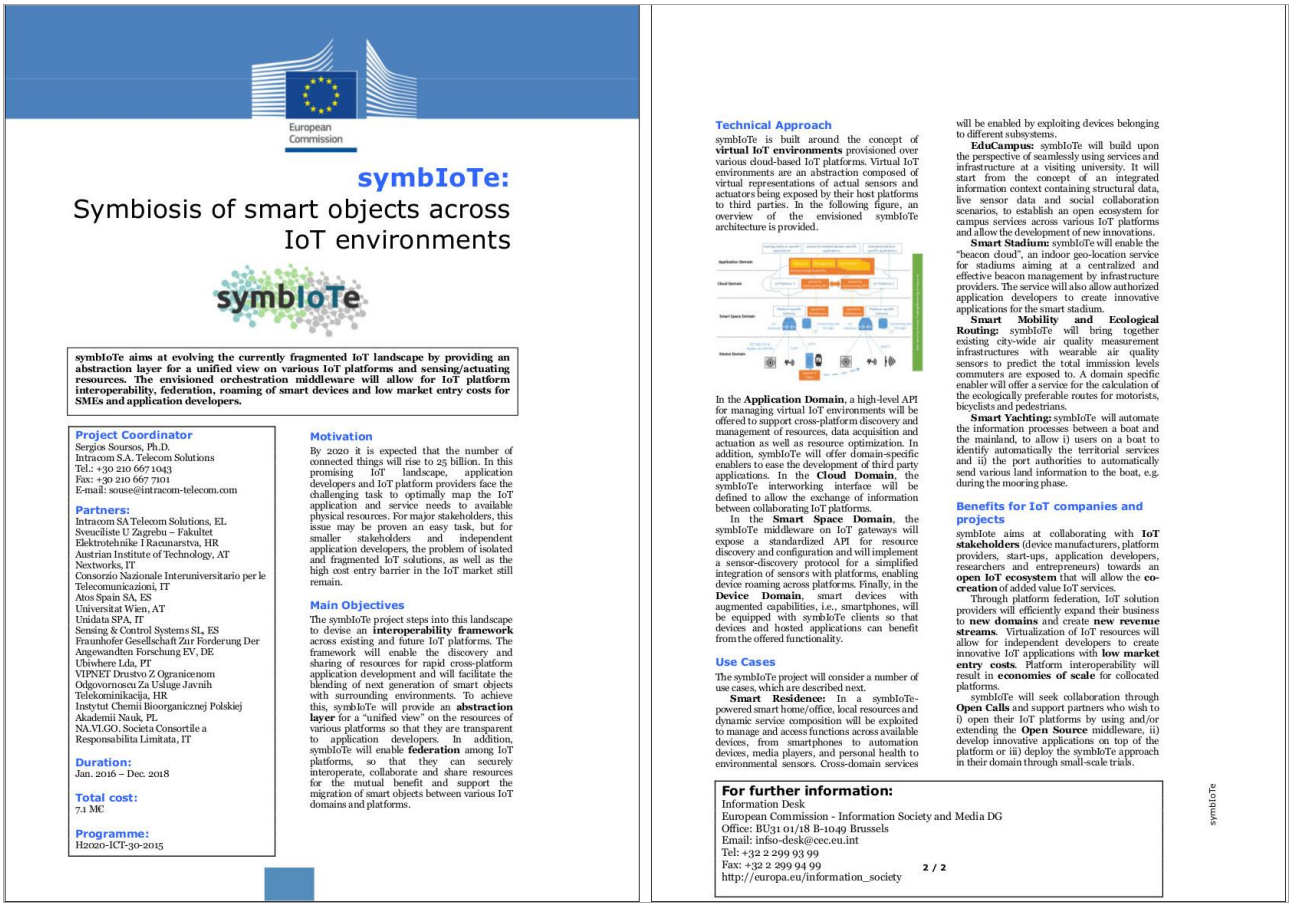


Figure 17 – symbIoTe poster



European Commission

symbIoTe:
Symbiosis of smart objects across IoT environments

symbIoTe

symbIoTe aims at evolving the currently fragmented IoT landscape by providing an abstraction layer for a unified view on various IoT platforms and sensing/actuating resources. The envisioned orchestration middleware will allow for IoT platform interoperability, federation, roaming of smart devices and low market entry costs for SMEs and application developers.

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7.1 M€

Programme:
H2020-ICT-30-2015

Motivation
By 2020 it is expected that the number of connected things will rise to 25 billion. In this promising IoT landscape, application developers and IoT platform providers face the challenging task to optimally map the IoT application and service needs to available physical resources. For major stakeholders, this issue may be proven an easy task, but for smaller stakeholders and independent application developers, the problem of isolated and fragmented IoT solutions, as well as the high cost entry barrier in the IoT market still remain.

Main Objectives
The symbIoTe project steps into this landscape to devise an **interoperability framework** across existing and future IoT platforms. The framework will enable the discovery and sharing of resources for rapid cross-platform application development and will facilitate the blending of next generation of smart objects with surrounding environments. To achieve this, symbIoTe will provide an **abstraction layer** for a "unified view" on the resources of various platforms so that they are transparent to application developers. In addition, symbIoTe will enable **federation** among IoT platforms, so that they can securely interoperate, collaborate and share resources for the mutual benefit and support the migration of smart objects between various IoT domains and platforms.

Technical Approach
symbIoTe is built around the concept of **virtual IoT environments** provisioned over various cloud-based IoT platforms. Virtual IoT environments are an abstraction composed of virtual representations of actual sensors and actuators being exposed by their host platforms to third parties. In the following figure, an overview of the envisioned symbIoTe architecture is provided.

In the **Application Domain**, a high-level API for managing virtual IoT environments will be offered to support cross-platform discovery and management of resources, data acquisition and actuation as well as resource optimization. In addition, symbIoTe will offer domain-specific enablers to ease the development of third party applications. In the **Cloud Domain**, the symbIoTe interworking interface will be defined to allow the exchange of information between collaborating IoT platforms.

In the **Smart Space Domain**, the symbIoTe middleware on IoT gateways will expose a standardized API for resource discovery and configuration and will implement a sensor-discovery protocol for a simplified integration of sensors with platforms, enabling device roaming across platforms. Finally, in the **Device Domain**, smart devices with augmented capabilities, i.e., smartphones, will be equipped with symbIoTe clients so that devices and hosted applications can benefit from the offered functionality.

Use Cases
The symbIoTe project will consider a number of use cases, which are described next.

Smart Residence: In a symbIoTe-powered smart home/office, local resources and dynamic service composition will be exploited to manage and access functions across available devices, from smartphones to automation devices, media players, and personal health to environmental sensors. Cross-domain services will be enabled by exploiting devices belonging to different subsystems.

EduCampus: symbIoTe will build upon the perspective of seamlessly using services and infrastructure at a visiting university. It will start from the concept of an integrated information context containing structural data, live sensor data and social collaboration scenarios, to establish an open ecosystem for campus services across various IoT platforms and allow the development of new innovations.

Smart Stadium: symbIoTe will enable the "beacon cloud", an indoor geo-location service for stadiums aiming at a centralized and effective beacon management by infrastructure providers. The service will also allow authorized application developers to create innovative applications for the smart stadium.

Smart Mobility and Ecological Routing: symbIoTe will bring together existing city-wide air quality measurement infrastructures with wearable air quality sensors to predict the total immission levels commuters are exposed to. A domain specific enabler will offer a service for the calculation of the ecologically preferable routes for motorists, bicyclists and pedestrians.

Smart Yachting: symbIoTe will automate the information processes between a boat and the mainland, to allow i) users on a boat to identify automatically the territorial services and ii) the port authorities to automatically send various land information to the boat, e.g. during the mooring phase.

Benefits for IoT companies and projects
symbIote aims at collaborating with **IoT stakeholders** (device manufacturers, platform providers, start-ups, application developers, researchers and entrepreneurs) towards an **open IoT ecosystem** that will allow the **co-creation** of added value IoT services.

Through platform federation, IoT solution providers will efficiently expand their business to **new domains** and create **new revenue streams**. Virtualization of IoT resources will allow for independent developers to create innovative IoT applications with **low market entry costs**. Platform interoperability will result in **economies of scale** for collocated platforms.

symbIoTe will seek collaboration through **Open Calls** and support partners who wish to i) open their IoT platforms by using and/or extending the **Open Source** middleware, ii) develop innovative applications on top of the platform or iii) deploy the symbIoTe approach in their domain through small-scale trials.

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symbIoTe

Figure 18 – the symbIoTe factsheet

5.5 Publications

Five (5) articles have been submitted and accepted within the first six months of the project, as indicated in the following list:

Conference papers:

- S. Soursos, I. Podnar Zarko, P. Zwickl, I. Gojmerac, G. Bianchi, G. Carozzo, "Towards the Cross-Domain Interoperability of IoT Platforms", *25th European Conference on Networks and Communications*, Athens, Greece, 2016.
- P. Boccadoro, M. Barile, G. Piro, and L. A. Grieco, "Energy consumption analysis of TSCH-enabled platforms for the Industrial-IoT", *Proc. of IEEE International Forum on Research and Technologies for Society and Industry Leveraging a better tomorrow (RTSI)*, Bologna, Italy, 2016.
- S. Schröder, J. Hirschl, P. Reichl, "CoConUT - Context Collection for Non-Stationary User Testing", *MobileHCI*, Florence, 2016.

Book chapters:

- S. Soursos, I. Podnar Zarko, “Chapter 9.5 symbIoTe: Symbiosis of Smart Objects Across IoT Environments”, *Digitising the Industry – Internet of Things Connecting the Physical, Digital and Virtual Worlds*, to be published.

Journal papers:

- R. Herzog, I. Podnar Zarko, M. Jacoby, “Semantic Interoperability in IoT-based Automation Infrastructures”, *Automatisierungstechnik,* to be published.

5.6 Participation at events

5.6.1 SymbIoTe at IoT week in Belgrade

IoT week, organized by IoT Forum and Dunav NET, was held from 31 May until 2 June in Belgrade. The event brought together researchers, companies, stakeholders, standardization bodies and policy makers, all active in the IoT domain. It was a good opportunity for symbIoTe partners to see what previous research IoT projects have accomplished and discuss with various stakeholders on the vision of IoT interoperability.

During the event, the symbIoTe poster was exposed within the IoT-EPI booth, along with posters of other IoT-EPI projects. All the interested participants had the opportunity to inquire about the project from IoT-EPI personnel, as well as from the symbIoTe team who was represented by Sergios Soursos, Ivana Podnar Zarko, Mario Kusek, Pavle Skocir, Zvonimir Zelenika, Alberto Tekovic and Tomislav Lastavic.

Figure 19 – IoT-EPI booth with symbIoTe poster on the right

Within the session dedicated to presentation of IoT-EPI projects (*IoT-EPI: project objectives, approaches and how to leverage FP7 outcomes*), the technical coordinator of the project Ivana Podnar Žarko gave a presentation entitled "*symbIoTe – IoT platform interoperability by designing an orchestration framework"*.

Figure 20 - presentation of symbIoTe project at IoT week

5.6.2 SymbIoTe at CityOS Brave New World Festival

The City OS Brave New World festival, organized by HUB385 an Innovation Center from Zagreb, was held from June 4 till June 12 2016 in Zagreb. The Brave New World festival is the biggest startup creation program in the region. The event was held under the title *Makers United* because the goal of the event is to unite developers, engineers, makers, hackers, designers, and beyond.

The symbIoTe project was presented during the first day of the event in a fair section that was held in parallel with conference and workshops. symbIoTe was represented by the technical coordinator Ivana Podnar Žarko and Aleksandar Antonić who presented the symbIoTe vision of IoT platform interoperability to interested audience. The event also included the Founders Challenge Hackaton where students from the University of Zagreb applied the concepts derived from the symbIoTe vision.

Figure 21 - post on the official Facebook page HUB385

6 Conclusions and next steps

This deliverable has described the dissemination strategies planned to ensure the widest possible impact of the symbIoTe project outcomes in the most relevant European communities.

The symbIoTe dissemination activities target a wide audience of the academic and the industrial communities in the area of IoT, spanning from individual researchers and developers, to providers and users. The project consortium will be active in publishing the major scientific results in international journals and conferences. In addition, the project will be present in key events like workshops and special sessions or panels at international conferences. Dedicated workshops may be considered, potentially in cooperation with other related EU projects and research initiatives.

Launching specific dissemination campaigns related to Open Calls, gives the opportunity to increase the visibility of the symbIoTe concepts and the impact of the project outcomes, pointing towards SMEs, companies and research groups, that can collaborate with the consortium in order to provide extensions of the system.

Next steps planned in symbIoTe are:

- to initiate 1st White Paper (deliver M18)
- to initiate Open Community Building (T7.2) and Standardization Strategy (T7.4)
- to work for the exploitation roadmap and deliverable
- to participate in listed academic and industrial events
- to plan for joint symbIoTe publications
- to create dissemination material
- to build a dissemination network
- to issue the newsletter

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[12] METS, www.metstrade.com

[13] Monaco Yacht Show, www.monacoyachtshow.com

[14] IoT Solutions World Congress, http://www.iotsworldcongress.com

[15] IoT World, https://iotworldeurope.com/

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[17] Mobile World Congress, www.mobileworldcongress.com

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7 Acronyms

ACM	Association for Computing Machinery
BIG IoT	Bridging the Interoperability Gap of the IoT
bIoTope	Building an IoT OPen innovation Ecosystem for connected smart objects
CORDIS	Community Research and Development Information Service
EC	European Commission
EU	European Union
FP7	7th Framework Programme for Research and Technological Development
H2020	Horizon 2020
IEEE	Institute of Electrical and Electronics Engineers
IEEE ICC	IEEE International Conference on Communications
IEEE ISSNIP	IEEE International Conference on Intelligent Sensors, Sensor Networks and Information Processing
RIoT	Recent Advanced in Internet of Things
IEEE FiCloud	IEEE Future Internet of Things and Cloud
IEEE PIMRC	IEEE International Symposium on Personal, Indoor and Mobile Radio Communications
IEEE WoWMoM	IEEE World of Wireless, Mobile and Multimedia Networks
WiOpt	Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks
ACM CoNEXT	International Conference on emerging Networking EXperiments and Technologies
ACM SIGCOMM	ACM Special Interest Group on Data Communication
IoT	Internet of Things
IoT-EPI	IoT European Platforms Initiative
M	Month
METS	Marine Equipment Trade Show
PMC	Project Management Committee
SME	Small Medium Enterprises
T	Task
TBC	To Be Confirmed
YARE	Yachting Aftersales & Refit Experience
WP	Work Package

Appendix A

Athens plenary meeting

Athens plenary meeting was held in the premises of the coordinating partner, Intracom Telecom (ICOM). Altogether 34 participants were present from all 14 partners. The meeting lasted for 2,5 days and was divided into 12 sessions. Since this was the first meeting of the consortium, first sessions of the first day were dedicated to introduction of the partners. The following sessions, during the end of first and the beginning of the second day, focused on the WP1 Ecosystem Definition, and task T1.1 Use cases specification. All the use cases were presented, as well as platforms that were brought into the project by consortium members.

During the rest of the meeting, all other WPs were presented, with focus on the ones that were about to start during the first months (WP2 and WP5) including the WP7 that concerns dissemination activities.

During the 3rd day the overview of the WP7 was presented by the WP7 leader. The main topics discussed were: the internal dissemination reporting, the role of social media and it was agreed to use fewer means of communication (website, newsletters and twitter not LinkedIn/or other groups) but the content to be the key driver of all shared items and also to engage all symbIoTe partners to contribute to dissemination.

Figure 22 - participants of the Athens kick-off meeting

Zagreb plenary meeting

Zagreb plenary meeting was held at University of Zagreb, Faculty of Electrical Engineering and Computing (UNIZG-FER). Altogether 42 participants were present from all 14 partners. The meeting lasted for 2,5 days and was divided into 11 sessions. The meeting started by discussing activities within WP1 Ecosystem Definition. The focus was on the tasks regarding system requirements and system architecture that started in the month of the meeting. The rest of the first day was devoted to use case specification and preparation of the deliverable D1.1.

Second day was dedicated to WP2 and WP5 which also started in the month of the meeting. Additionally, the preparations for kick-off of activities within other work packages were also discussed (WP3, WP4, WP6). During the second day, a first breakout session was held that focused on system requirements.

Within regular agenda during the third day of the meeting, discussion about WP5 was continued, and plans for dissemination (WP7) were considered. Another two breakout sessions were held on that day that focused on already launched activities of the project, architecture specification and security aspects.

During the WP7 dedicated time the partners planned the dissemination strategies for the coming period which included: the organization of a project workshop, creation of advertising material, construction of a dissemination network, planning of a project publication and issuing of newsletters.

Figure 23 - participants of the Zagreb plenary meeting