Symbiosis of smart objects across IoT environments

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D6.4 Report on Open Call and Contest Impact

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1 Executive Summary

This document summarizes the results of all the activities carried out in the context of WP6 Open Calls, and the impact that they had both in the project and in the external participants to highlight the value proposition of symbIoTe.

During the project lifetime two open calls and one contest, so-called hackathon, have been organised to attract external participants and show the benefits that symbIoTe can bring to external stakeholders. These stakeholders also shared valuable feedback about the real benefits of using and interoperable solution, like the one proposed by the project, on their daily businesses. But the benefits were also twofold, as the project itself has gathered feedback for improving not only technical aspects, but its commercial offerings, adjusting them to real market expectations and needs.

The main conclusions extracted in this deliverable have been used as inputs for developing the exploitation strategy of symbIoTe, in order to reach and develop a sustainability framework once it ends.

2 Introduction

2.1 *Purpose of the document*

D6.4 Open Call and Contest Impact contains a summary of the activities carried out in the context of WP6 and their impact in the project and in external businesses. Several different criteria have been selected to measure and analysis it to be further used to develop the sustainability strategy of symbIoTe.

2.2 *Structure of the document*

This document is divided into three main blocks:

Section 3 describes the goals for organizing this kind of events and lists the evaluation criteria for the winners' election.

Section 4 describes the impact on the contest and the two open calls within the project but also within external businesses (aka open call winners).

Finally, Section 5 contains the summary of the key findings.

3 Goals and Criteria

3.1 *Goals*

symbIoTe has organized two open calls and one contest in order to attract external stakeholders to the solution proposed by the project, validate it and provide a wider perspective on business considerations.

Thus, the main goals can be summarized as follows:

- To increase the impact of the symbIoTe ecosystem.
- To create a common business vision.
- To validate symbIoTe technical approach and business impact.
- To establish mature and lasting collaboration with external stakeholders.
- To approach the real needs of the IoT companies deploying their own solutions.
- To collaborate with highly innovative players (mainly SMEs).
- To build a sustainable ecosystem.

3.2 *Criteria*

The project has established a set of criteria to evaluate the viability of the proposals submitted to the different project open calls and the contest organized during the project lifetime.

For the proper understanding of the impact assessment presented in this deliverable, the criteria selected is also listed below:

Evaluation Criteria for OC1:

- Impact of the IoT solution
- Clarity of business vision and ambition
- Maturity of the IoT solution involved and appropriateness of the approach
- Clarity of the offered resources/services and alignment with symbIoTe vision
- Extent of potential benefits from the involved IoT solution
- Feasibility of the work plan
- Soundness of approach with respect to management of sensitive/private data, if applicable.

Evaluation Criteria for OC2:

Same criteria as for OC plus some add-ons:

- Expertise of the team in relation to the proposed solution
- Level of innovation of the proposed IoT solution with respect to other competitors.

Evaluation Criteria for the Contest:

- Usage of symbIoTe technologies

- Technical Quality

- Interoperability

- Business Potential

- Pitch Quality

The objective behind these selection criteria is to allow the selection of not only good technical solutions, but also of those ones that can bring added-value to symbIoTe from a business perspective.

3.3 *Hackathon goals*

symbIoTe created symbCity, a virtual interoperable smart city on top of symbIoTe-enabled IoT resources (sensors and actuators), available through the symbIoTe's IoT Portal[1]. For symbCity, symbIoTe made available resources suitable for creating new mobile apps and Cloud-based Domain Enablers. Such resources were ideally located in the city of Zagreb.

The goal of the Hackathon was to prove the usability and effectiveness of the symbIoTe middleware in a virtual context, and to further enhance the community building activities of the project, by attracting different kind of target groups to get familiar with the symbIoTe middleware (the complete description of the Hackathon in available in D6.3 [1])

In order to be eligible, all participants must be able not only to design and implement their application, but to pitch and demonstrate the innovation level of the proposed solution.

The common criteria for evaluation the applications is listed below:

- Usage of symbIoTe technologies – max. 30 points. Usage extent of the symbIoTe technologies and how suitable they are for the designed and implemented solution.

- Technical quality – max. 20 points. Technical quality of the demonstrated solution, including design and correctness of operation.

- Interoperability – max. 20 points. Cross-platform and cross-domain usage of symbIoTe resources, number of IoT platforms and domains covered by the proposed solution.

- Business potential – max. 20 points. Business perspective of the proposed solution.

- Pitch quality – max. 10 points. Pitch quality and overall impression.

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[1] *https://symbiote-open.man.poznan.pl/symbioteSearch/*

4 Impact Assessment

This section analyses the impact of the two open calls and the contest organized in the context of the project in two different ways: internal to the consortium and on external stakeholders.

4.1 *Internal impact*

In order to measure the benefits that the open calls and contest organized have brought to the project, the impact assessment has been done into three different ways: social impact, according to the baseline proposed at the beginning of the project; economic impact, that can be used as a starting point for a feasibility analysis to determine the costs of launching a ready-to-market symbIoTe release; and the business impact that they have had into the offerings of the project.

4.1.1 Social impact

For measuring the social impact, a set of KPIs where defined at the beginning of the project, in order to measure the potential of symbIoTe for attracting external stakeholders.

The proposed criteria for evaluating the social impact was selected taking into account the need of the project to create a community of interest around it, reaching potential stakeholders, end users and early adopters, who will be (nearly) unreachable in other way.

Thus, a dedicated dissemination campaign per open call and for the contest were designed and implemented.

In order not to only attract interested parties, but to engage them, a decision was taken in order to keep OC1 participants informed on the symbIoTe evolution and the new possibilities for participation.

The results can be seen in the following table:

| | OC1 | | OC2 | | |
Criteria	*Baseline*	Actual	*Baseline*	Actual	*Valuation*
Expressions of interest	*50*	88	*80*	95	Registered in FS6
Proposal received	*15*	34	*40*	53	Nearly the double than in OC1
Publications	*1*	5	*5*	5	Translation into 5 languages (English, Italian, Portuguese, Spanish, Croatian)
Contacts	*16*	34	*16*	44	Registered internally
Associations	*16*	30	*16*	6	Registered internally
Webinars	*0*	1	*0*	2	64 attendees, dissemination material

As it can be seen above, all KPIs were achieved in OC1 and OC2, except the number of contacted associations in OC2. This is mainly due to the necessity of addressing only those ones that the consortium considered that can bring added value to the project through their participation.

There were not KPIs for measuring the contest impact, but the outreach is as follows:
- 45 individuals subscribed in devpost
- 24 attendees to the contest
- 6 teams participating

4.1.2 Economic impact

In order to measure the economic impact of the open call, a set of KPIs where established. As it has been said before, this information can be further extended to make an estimation of the cost of launching a ready-to-market symbIoTe release.

The criteria finally selected took into account the time dedicated to preparing a stable software release to be used by open call winners, as well as the time dedicated to preparing the companion documentation. It also took into account what is considered as software maintenance, answering questions and solving code bugs that any user found while integrating its solution within symbIoTe. Finally, the last criteria is related to the evaluation, not of the open call applications, but of the results of the integration of the solutions provided by winners within symbIoTe in order to determine the feasibility of the winning solutions.

The table below shows an estimation of the time dedicated, per partner, to prepare the software release for the two open calls and the time dedicated to solving issues and questions from the applicants. This information is complemented with the average PM rate per partners to also make an estimation of the monetary costs.

This information can be extrapolated to the release of a most stable version release, available for symbIoTe stakeholders, and its maintenance. It is also important for developing pricing and revenue schemes according to the dedication of each participant.

			ICOM	UNIZG-FER	NXW	CNIT	ATOS	UNIDATA	S&C	IOSB	UW	VIP	PSNC
Open Call preparation	*Time dedicated to preparing documentation*	OC1	300	30	40	280	50	0	30	0	4	70	24
		OC2	440	40	24	100	10	8	15	0	10	50	4
	Time dedicated to answer questions of applicants	OC1	10	10	8	2	6	0	0	0	0	10	12
		OC2	20	30	16	0	10	10	0	0	2	10	30
Implementation of the extensions	*Time dedicated to solving bugs*	OC1	20	10	60	0	30	0	0	0	4	0	50
		OC2	30	40	24	0	30	15	20	60	30	0	30
	Time dedicated to answer questions	OC1	30	10	40	0	30	0	0	0	0	0	20
		OC2	60	40	40	0	20	8	10	80	50	0	8
Evaluation	*Time dedicated to validation of results*	OC1	5	5	16	2	10	0	15	0	8	0	4
		OC2	20	40	64	0	30	30	20	20	38	20	0
Total	*In hours*	OC1	365	85	164	284	126	0	45	0	16	80	110
		OC2	570	190	168	100	100	71	65	160	130	80	72
	In Euros	OC1	13.557	1.579	5.740	10.143	3.350	0	2.121	0	503		
		OC2	21.171	3.529	5.880	3.751	2.659	1.888	2.554	9.257	4.086		

4.1.3 Business impact

Finally, it is important to also measure the impact of the Open Calls on the business strategy proposed by the project. Further considerations are included in the symbIoTe deliverable D7.7 [2] which contains the validated exploitation strategy of the project.

In order to measure the business impact of the Open Calls, a set of conducted interviews were performed with the winners of the first open call, and winners of the second one were requested to do a pitch during a face to face meeting highlighting their expectations when applying to the open call, how they were fulfilled or not and their foresights for the future.

At this stage of the project it is important to determine whether the designed offering of symbIoTe will fit in the current market context. For this reason, the inputs from open call winners, as real-world businesses who symbIoTe has a direct relationship with, were considered as crucial for understanding real expectations and needs.

For OC1 winners, a set of informal interviews were conducted to gather feedback from all of them. There was no fixed template for the interviews, as it was decided to keep them open and interactive based on the information provided, taking into account that not all answers can be measured in the same way, i.e. for being too vague or unconcise.

However, in order to understand the conclusions presented in Section 4.2 and the evolution of symbIoTe exploitation strategy, Annex I contains the results of the conducted interviews.

For OC2 winners, who are nearer to the final results of symbIoTe, a set of KPIs was agreed among the exploitation, innovation and open call managers of the project in order to determine i) the viability of the final solution, and ii) the benefits that symbIoTe has brought to their businesses to be used as the flagship message for potential stakeholders.

symbIoTe has held two business workshops with OC2 winners: in the first one they were requested to provide their initial thoughts on how symbIoTe can support them on their businesses growth (detailed information about the workshop can be found in Annex II); in the second one, near the end of the project, participants were requested to provide feedback about their final results based on the KPIs listed in Section 4.2 (do they consider symbIoTe as a key driver for business growth?).

'Before', during' and 'after' situations are faced and analysed in Section 4.2.1, including their initial thoughts when applying to the OC, their expectations presented in the first OC2 meeting, and the reality faced in the final OC2 meeting.

The gathered information was used to validate the set of business models proposed by symbIoTe for commercializing its results as well as the project value proposition for the different target markets. The results were also used to refine the offerings developed in form of minimum viable products (MVPs).

4.1.3.1 Integration of OCs' business feedback into the symbIoTe sustainability strategy

The gathered information was used to validate the set of business models proposed by symbIoTe for commercializing its results as well as the project value proposition for the different target markets. The feedback received were also used to refine the symbIoTe offerings developed in the form of Minimum Viable Products (MVPs) which are explained in detail in deliverable D7.7 [2].

- Most of the OC1 and OC2 partners confirmed their willingness to keep sharing resources in symbIoTe ecosystem and continue the collaboration for upcoming opportunities. But their main concern was whether symbIoTe resources will continue to be maintained and supported in the near to medium term timeframe once the project is completed in end of 2018. This was an important feedback that was taken into consideration for the future sustainability strategy of the project as detailed in deliverable D7.7 [2]. The symbIoTe Alliance (symbIoTA) has been envisaged as the entity that will take forward the future development, maintenance, support, and joint exploitation efforts. The three core members of the symbIoTe consortium have agreed in principle to be the founding members of the alliance. All the OC partners, both winners and those who applied will be invited to be part of the symbIoTA and contribute to the further sustainability of the symbIoTe. Since the OC partners being one of the earliest adopters of symbIoTe, their positive feedback and their possible involvement in the alliance is an important criterion for the future business sustainability of the project.

- Among the different symbIoTe offerings, OC1 partners expressed more interest in the L1 related offerings, and OC2 winners in L2 were keener to exploit the platform federation functionality, since it enables them to connect their platforms to other symbIoTe enabled platforms in a safe and efficient manner, and exchange information in a controlled manner. These business feedbacks were identified as an initial level of business validation of the different symbIoTe offerings and influenced the final selection of joint offerings (MVPs).

4.2 *External impact*

In order to understand how symbIoTe can influence the market and develop the appropriate messages for the different stakeholders, the impact over open call winners' businesses was also measured.

4.2.1 Business impact

Open Call 1

Within open call 1 a set of interviews were conducted, as explained in the previous section. This section contains the evaluation of features performed by OC1 winners and how they can impact into their businesses. The whole interview text (questions and answers) can be found in Annex I.

The following table presents the rating of the symbIoTe offerings made by OC1 winners, going from 1 as the less interesting to 5 as the most interesting one, and the reasons for the assigned score.

Level	Offering	Terracom		OPTIONSNET		Fincons
L1	Semantic IoT Search Engine	symbIoTe is a search engine for IoT resources so providing search mechanisms is crucial. Secure API is also important and the interaction with other IoT platforms is very appealing and valuable.	5	It is valuable that there is a 'common' search place for IoT resources. In this way, our specific Smart Yachting sector resources are exposed in the IoT community providing	4	These offerings are necessary and 'unavoidable'.	5

	Unified Access to IoT resources on the Platform side	5	For semantic interoperability, CIM is more than enough (BIM is not needed). Flexible access control was important for further implementations and very useful. Domain enablers are useful for intelligent access to platform resources which makes accessing to data and services easier for IoT developers.	N/A	type of sensors' and area-specific search capabilities.	5	
	Semantic Interoperability	4		4	It enabled the creation of metadata that use the BPIM for the Smart Yachting domain, for our own resources.	5	
	Flexible Access Control	5		3	Working for this component we had the opportunity to get deeper and further develop our access control policy framework overall.	5	
	Domain Enablers	5		5		5	
L2	IoT Platform Federation	5	Federation and closer collaboration are interesting concepts that can help to improve Terracoms' solutions. Available resources with less access and security issues creates added value. Terracom is interested in using other platforms' devices, therefore bartering and trading are also appealing.	5	It is of great significance for us to become a L2 compliant platform in the symbIoTe ecosystem and federate with the other domain specific platforms. This will give us edge on combining Smart Yachting related data and deliver upgraded or new services to our already established pool of customers.	4	L2 and L3 can be of interested but need further investigation.
	Bartering and Trust Mechanisms	4		5	This offering is also very valuable for our business because it will give us the opportunity to enhance our interoperability procedures, built trust models with other platforms and verify the quality of our resources' input to potential B2B partners.	4	

L3	Dynamic smart spaces	5	Terracom is not so into "Flexible Access Control in Smart Spaces" domain. But the gateway interaction with other platforms can create closer collaborations.	N/A		4	
	Flexible Access Control in Smart Spaces	4		N/A		4	
L4	Smart Device Migration and Roaming	5	Terracom is working with wearable devices, therefore L4 could also create value for them.	N/A		2	Seems to be out of their short-term vision.

It is important to highlight that OC1 winners only interacted with L1, thus the rating from the other levels was done based on the potential they foreseen in the correspondent offerings. The above set of 10 offerings were identified at the end of the first half the project which were further refined to a final set of 7 offerings (MVPs) presented at the end of the project and documented in D7.7 [2].

Some of the OC1 participants applied to OC2, including Terracom (OC1 winner which also won L2) and Vizlore (which was not selected in OC1 but won L2), according to the interest expressed in the new features offered by symbIoTe.

Open Call 2

The information gathered from the second open call winners was collected from a set of pitches where the different organizations presented their expectations when applying to the open call and show the improvement over their businesses that they have seen during its interaction with symbIoTe. Also, some information related their businesses expansion was collected. The following table shows the KPIs included by each of the participants in their pitches:

	L1		L3/4			
KPIs	Sharigo	Gdi	Modosmart	Gridnet	Envira	ASN*
New services	x	x	x	x	x	
New Type of Costumers	x	x	x	x		
New Market	x	x	x		x	
Business Model			x	x		
% Savings (Time, costs, resources)	x					
Value co-creation			x		x	
New revenue sources (investors, municipalities…)	x	x		x		
Expected increased ROI			70%			
Internal Learning Curve	x	x	x			
Client satisfaction (n. requirements addressed)			x			

Expected Time to Market			5y	6m	x	

* There is no information about ASN because they couldn't attend to the meeting.

KPIs	L2				Apps		
	Vizlore	Terracom	Sensinov	UPM	CUT IOT Lab	Tecnalia	Envi4All
New services	x				x	x	x
New Type of Costumers	x			x	x	x	
New Market	x		x	x	x	x	x - expanded
Business Model	x				na		
% Savings (Time, costs, resources)		x					
Value co-creation							
New revenue sources (investors, municipalities, …)					x		x
Expected increased ROI				x			
Internal Learning Curve		x			x		
Client satisfaction (n. requirements addressed)						x	
Expected Time to Market		1y	6m				

In order to be able to properly measure the information presented in the pitches, a set of KPIs was distributed among participants that should be included in their presentations.
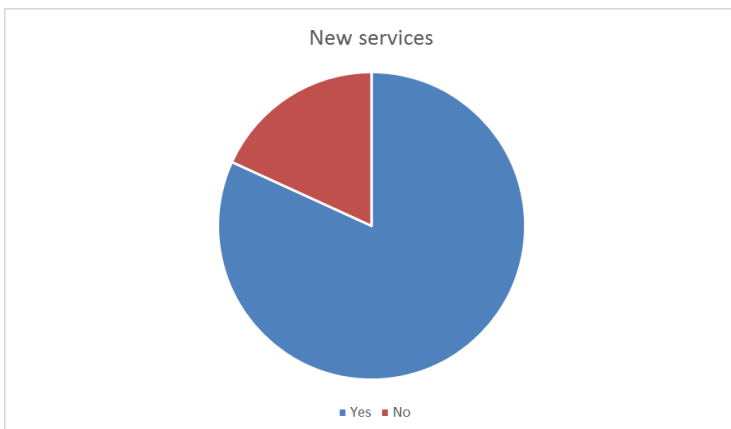

New services

9 out of 12 participants stated that symbIoTe allowed them the creation of new services. It will not be possible without their participation in the open call.

Savings
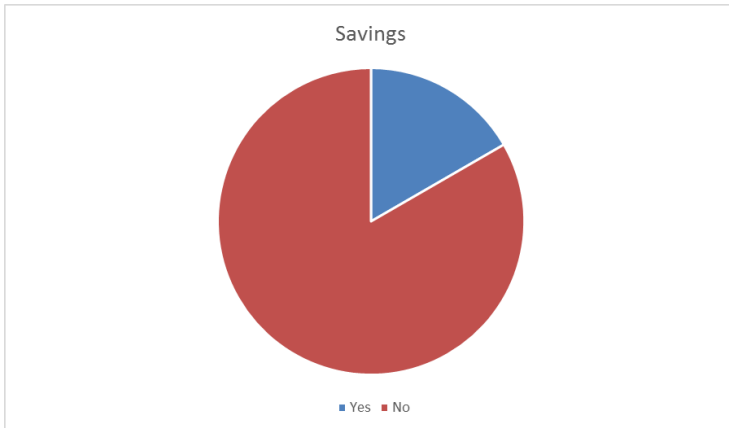
Through the access of a new set of resources and services, 8 out of 12 participants found that the can access to new type of customers. This was not possible before as they were limited to the available resources they have.
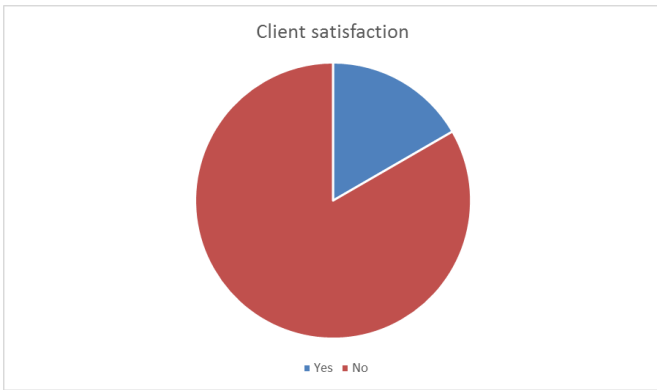
10 out of 12 participants found that by using the symbIoTe middleware they are able to enter into new markets, or expand their businessess in their already targeted ones. This is directly related with the previous question and the possibility to access to new types of customers.

New customers

New Markets
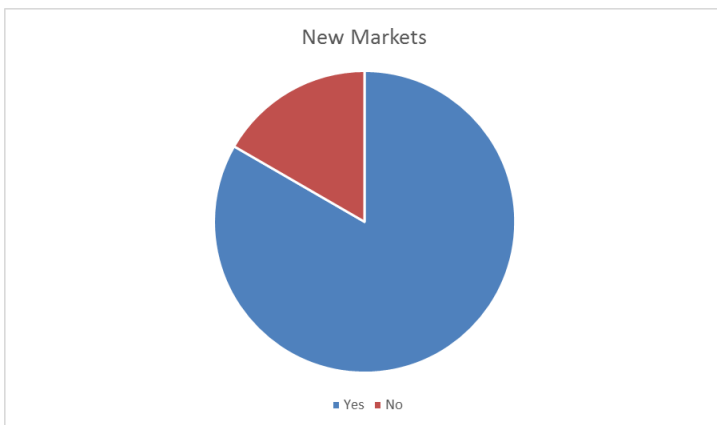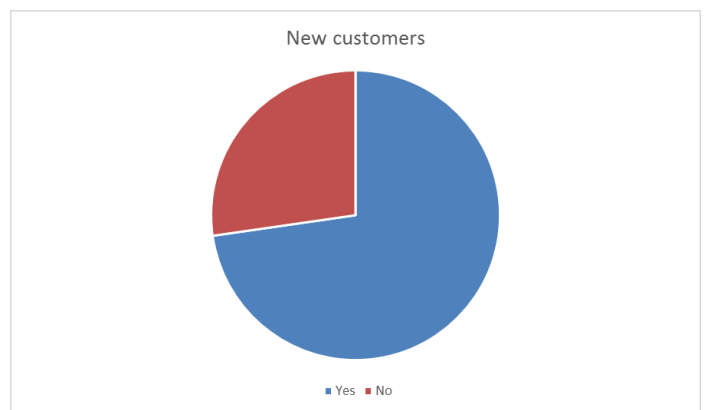
According to their pitches, 3 out of 12 participants found that they can develop new business models on top of symbIoTe. However, the rest of participants found that they can improve or extend their current model.
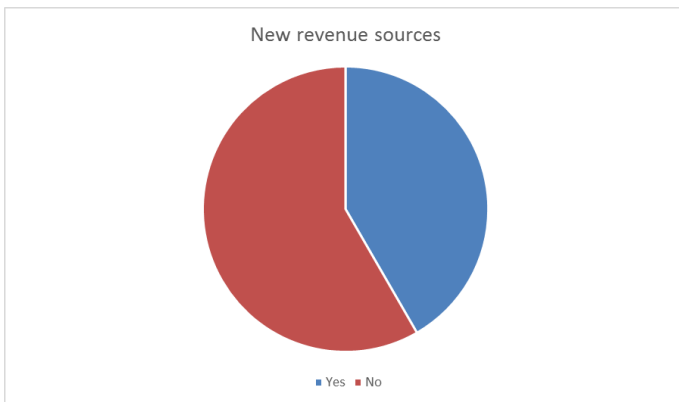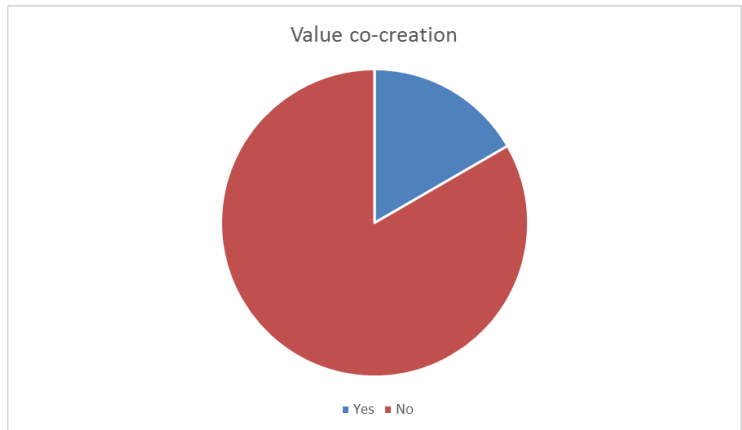
2 participants found that they can save time, money or resources by using symbIoTe. This mainly applies to participants in L1 or L2, as they are able to share or access to resources from other platforms.

New Business Models

Client satisfaction

Yes ■ No
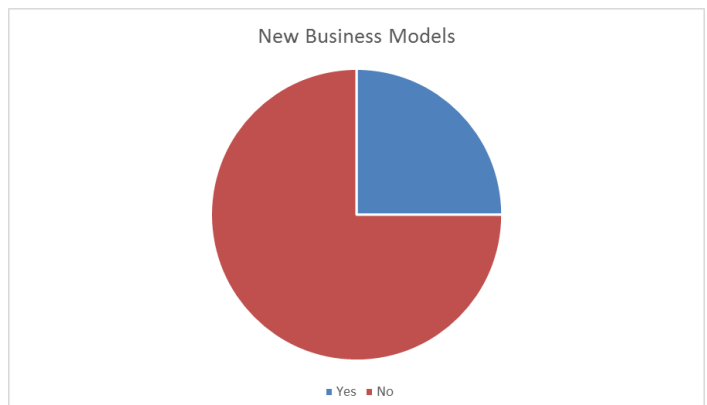
2 of the L3/L4 participants found value co-creation a real possibility by using symbIote. This is something basic in the symbIoTe proposal, as one of the interoperability principles is based on that.

Nearly half of the participants, 5 out of 12, found that by using symbIoTe they can access to new revenue sources. This is directly related with the previous questions about new type of customers and new markets, but also refers to the possibility of finding investors who can now foresee a higher potential on their businesses.

Value co-creation

Yes ■ No

New revenue sources

Yes ■ No

2 participants expected to see their ROI increased as they already have ready-to-market solutions that have been enhanced through their participation in the symbIoTe open call.

5 out of 12 participants found that they needed to learn how to develop new businesses on top of symbIoTe. However, they valued it possitively as they already know how to do it and can reuse this knowledge in the future.

Increased ROI

Yes ■ No
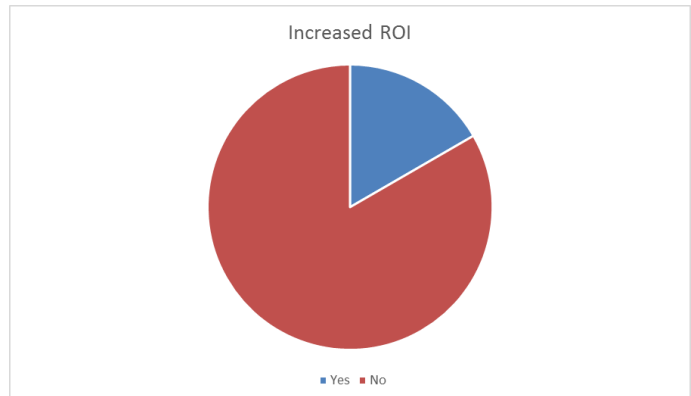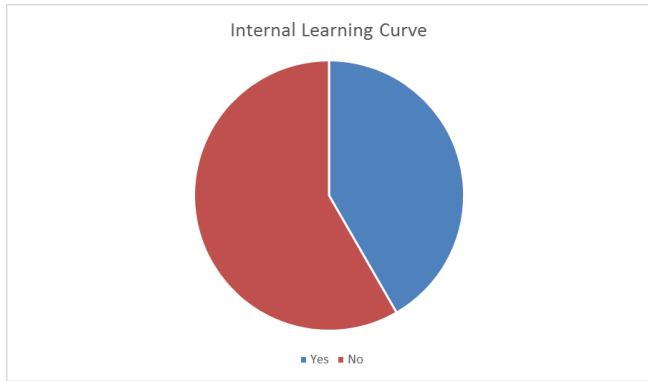
2 of the participants validated the new services with their customers, and potential ones, and found easier to satisfy their increasing demand of new interoperable services.

Finally, most of the participants were interested in continuing using symbIoTe for developing their own services. The differences that can be seen in the tables above about the time to market (5 years to 6 months) is mainly due to the exact timeframe they considered: some of them made the estimation from now to the time symbIoTe has a TRL high enough for being a commercial product, while others made the estimation from when symbIoTe is already available in the market.

Another important thing to highlight here, is that two of the L2 winners (Vizlore and Sensinov) were able to create a new shared business thanks to their participation in the open call.

5 Key Findings

Different meetings were held with mainly open calls' winners, in the form of conducted interviews or workshops, in order to identify the strengths of symbIoTe and how it can influence the current market. The results of the meetings, further developed in Section 4, showed a set of findings as listed below:

- symbIoTe allows the co-creation of new businesses, what it is the unique value proposition of the platform. Business co-creation was something already identified by participants at different levels, mainly L1 and L2.

    o For L1, symbIoTe allows the access to third party resources in a very easy manner. This allows small organizations to interact with other players in the same field in a simple way they could not do before. L1 participants are also engaged for continue their collaboration with symbIoTe ecosystem due to the benefits that they saw it bring to their businesses: access to new services and resources, possibility to create business on top of them, access to new markets and customers, development of new services.

    o For L2, symbIoTe allows the creation of new businesses on top of signed agreements (federations) between entities. This goes one step further from the usage of discovered resources, as in L1. In this specific case, two OC2 participants 'discover' each other through their participation in the open call and goes one step further from the initial requirements federating and establishing a new business line between their organizations that have continued after the end of their participation period. This situation shows the benefit that interoperability can bring to different providers, allowing them to create new shared businesses.

- There is a real need in the market for solutions like the one proposed by symbIoTe, thus it is necessary to properly identify market gaps to reach potential customers. There are several IoT platforms available in the market, but not enough work on interoperability has been done until this moment. One good example of disconnected platforms are smart cities, where several IoT platforms co-exist focused on different subdomains (energy, transport, air pollution, etc.). City administrators want solutions that combine many different resources to measure, monitor and control several factors of a smart city, such as air pollution, traffic or mobility among others. symbIoTe offers the possibility to develop new services accessing to their resources in order to provide added value services for citizens, like it was demonstrated by Sindikat Biciklista and the smart routing based on air pollution.

- symbIoTe can pave the way to new domains, mainly in industrial applications. Although the use cases have been focused mainly on smart cities, symbIoTe is domain agnostic what it is one of its key value propositions that supports its integration with different verticals. Although most of the open call participants also focused on different subdomains of a smart city, CeDint extrapolated the interoperability concept to the industry domain aiming to apply symbIoTe to one of their ongoing offerings for industry 4.0.

- SMEs expect to attract new customers under different domains, as the interoperability proposed by symbIoTe allows them to combine resources from different platforms. Participants, mainly SMEs, are focused on smaller niches due to the own nature and size of their companies. However, through their participation in symbIoTe and the possibility to access to third party resources and services they were able to create new services for their same domain but tackling different niches, i.e. services for the tourist market with different offerings for public authorities, tourists or hotel owners; or extending services for marina authorities to yacht owners.

- At the same time, symbIoTe has demonstrated that can reduce the time-to-market in different organizations, as it allows them to develop new services in a more agile way. Mainly OC2 participants realised that they have already reduced their learning curve for developing new services through their participation in the open call. But there is also an additional value for them, as they can access to raw data or already developed services without the need of starting from scratch. Through their participation in the open call, winners found an opportunity to work in a novel approach in the IoT market, improving skills and knowhow.

- symbIoTe can change the current portfolio offering of SMEs as it allows them to access to technology in a less expensive way thanks to its open source approach. SMEs have a more innovative focus and are less reluctant to change. At the same time, they are also limited by available personnel and cost resources. Thus, this kind of companies tends to adopt open source solutions as they imply lower costs. Although traditionally open source solutions have not been very valued, the trend has change in the last years as many companies have released products of good quality with very affordable prices allowing smaller player to access to technology and markets they were not able before.

- Participants will be interested in a symbIoTe marketplace, where the consortium will act as an intermediate single entity, some short of brokerage, allowing SMEs and start-ups accessing to different resources and services to develop added value services on top of them, while attracting providers to the ecosystem who will bring those services and resources.

- Finally, although participants found some difficulties during the integration phase within symbIoTe, they were aware of the low TRL due to the research nature of the project. However, they were interested with the engagement within the symbIoTe community, with more stable versions and further improvements at technical level, and a clear defined sustainability path at business level.

The meetings with the open call winners were a good opportunity to not only identify the strengths of the project, but also the weaknesses and how to bypass them. At the same time, the inputs were very valuable to adjust the offerings of the project, as participants represents real-world stakeholders, external to the project, with different expectations and needs that may vary from the ones already stated by the project use cases.

6 Summary of Key Facts, Figures and Findings

This section summarizes all the information related to the two Open Calls of the project, the focus of which was presented in details in D6.1 [3] and D6.2 [4]. The following subsections provide information on the submission statistics, the selected projects, and the feedback received.

6.1 *Submission Statistics*

The project has measured the impact of the open calls over potential stakeholders taking into account different criteria such as: number of applicants, country, type of organizations and use case domains.

6.1.1 1st Open Call (OC1)

For the first Open Call, a total of 78 applications were opened, although only 37 were finally submitted and 34 of them were eligible (3 of them came from non-European countries). Most of the applications where received from startups and SMEs (30 out of 34), since this is the main target of symbIoTe solution which will benefit the most from the proposed solution. Applications were received from 14 different countries across Europe, namely Greece, Italy, France, Spain, Portugal, Netherlands, England, Germany, Poland, Finland, Croatia, Serbia, Cyprus and Israel.

There has been a good balance within participants related to the application domains involved in their proposals, as well as a nice alignment with the domains addressed by the symbIoTe use cases. 24% of the submissions received were addressing the Smart Residence domain. Also 24% of the submissions were addressing the Smart City domain, while 17% was addressing Smart Mobility aspects. From the 34 eligible applications only 3 were selected for funding.
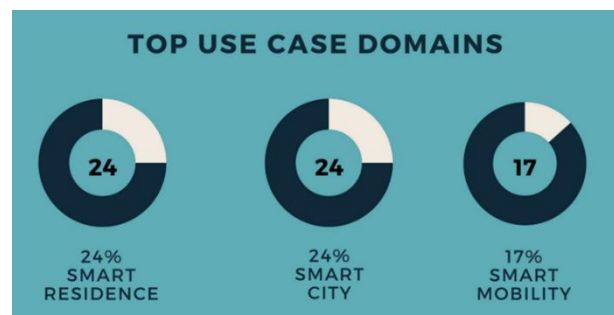
6.1.2 2nd Open Call (OC2)
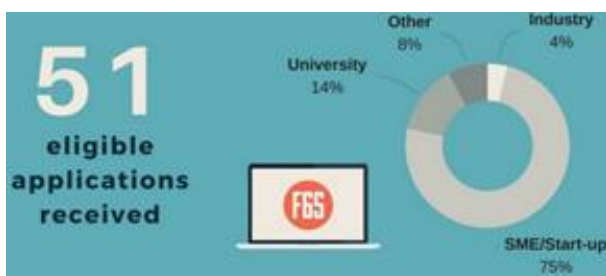

For the second Open Call, a total of 95 applications were opened, and finally only 53 were finalized, out of which 51 were eligible. As in OC1, most of the applicants represented SMEs or startups (75%). Applications were received from 14 different countries across Europe, namely Greece, Italy, Spain, Croatia, Israel, Cyprus, France, Sweden, Serbia, Germany, Austria, Poland, Portugal and

Romania. There were applicants that applied both in OC1 and OC2, while there have been also many new applicants applied for the first time in OC2.
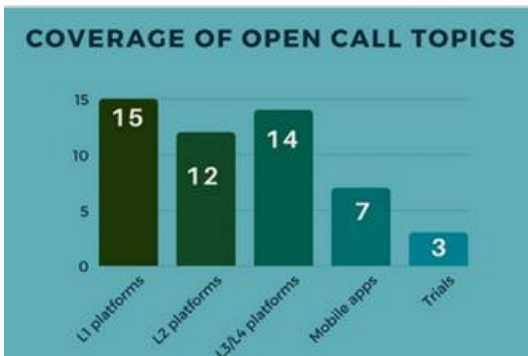

In this second Open Call, there have been 5 topics open, namely for L1 compliance, L2 compliance, L3/4 compliance, Applications and Trials. The topics on L1 and L3/4 gathered the most interest among the submitted proposals, with L2 being slightly lower. From the 51 eligible applications, 15 were selected, based on the budget limits per topic: 2 L1 participants, 4 L2 participants, 4 L3/4 participants, 3 mobile apps and 2 trials (1 less than expected, as the remaining one did not reach the threshold).

In total, during these two Open Calls, a total number of 199 different organizations subscribed to our open call mailing list, which allowed them to stay informed about the latest news of the project and our results.

6.2 *Open Call Projects*

In total, 18 projects were funded from OC1 (3) and OC2 (15), corresponding to 17 Open Call partners, since one of them was successful in both Open Calls. As depicted in the following figure, most partners come from Southern-European / Mediterranean countries: 4 from Greece and 4 from Spain, 2 from Croatia and 2 from Italy, as well as 1 from France, Serbia, Cyprus, Croatia and Portugal.
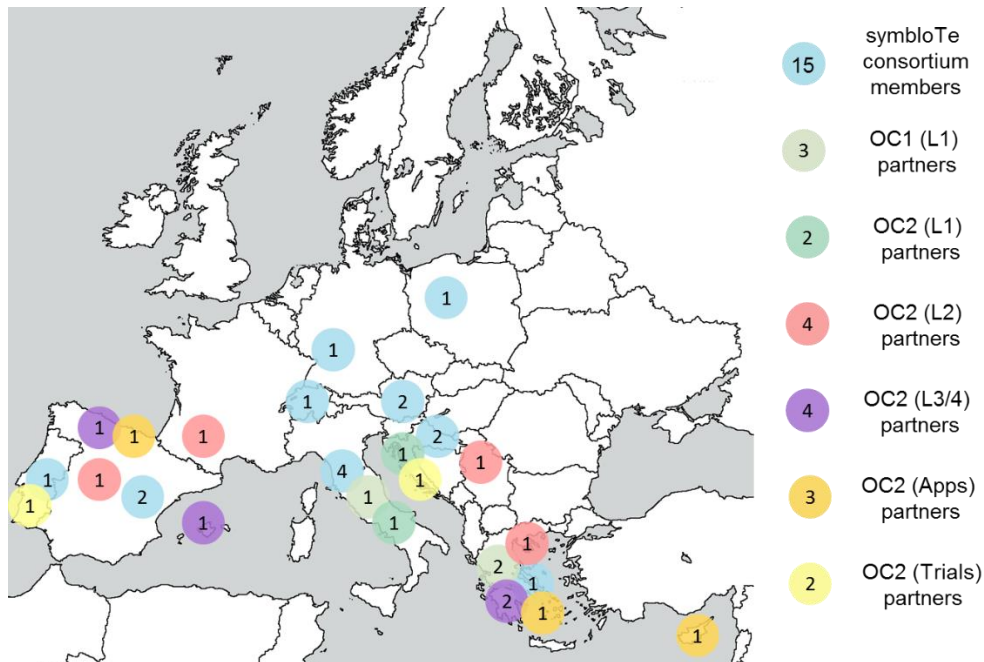
In order to better understand the impact of the Open Call projects to the symbIoTe ecosystem and vision, it is important to map the funded projects and their contributions to the use cases and activities of the symbIoTe project. The following diagram summarizes this mapping.
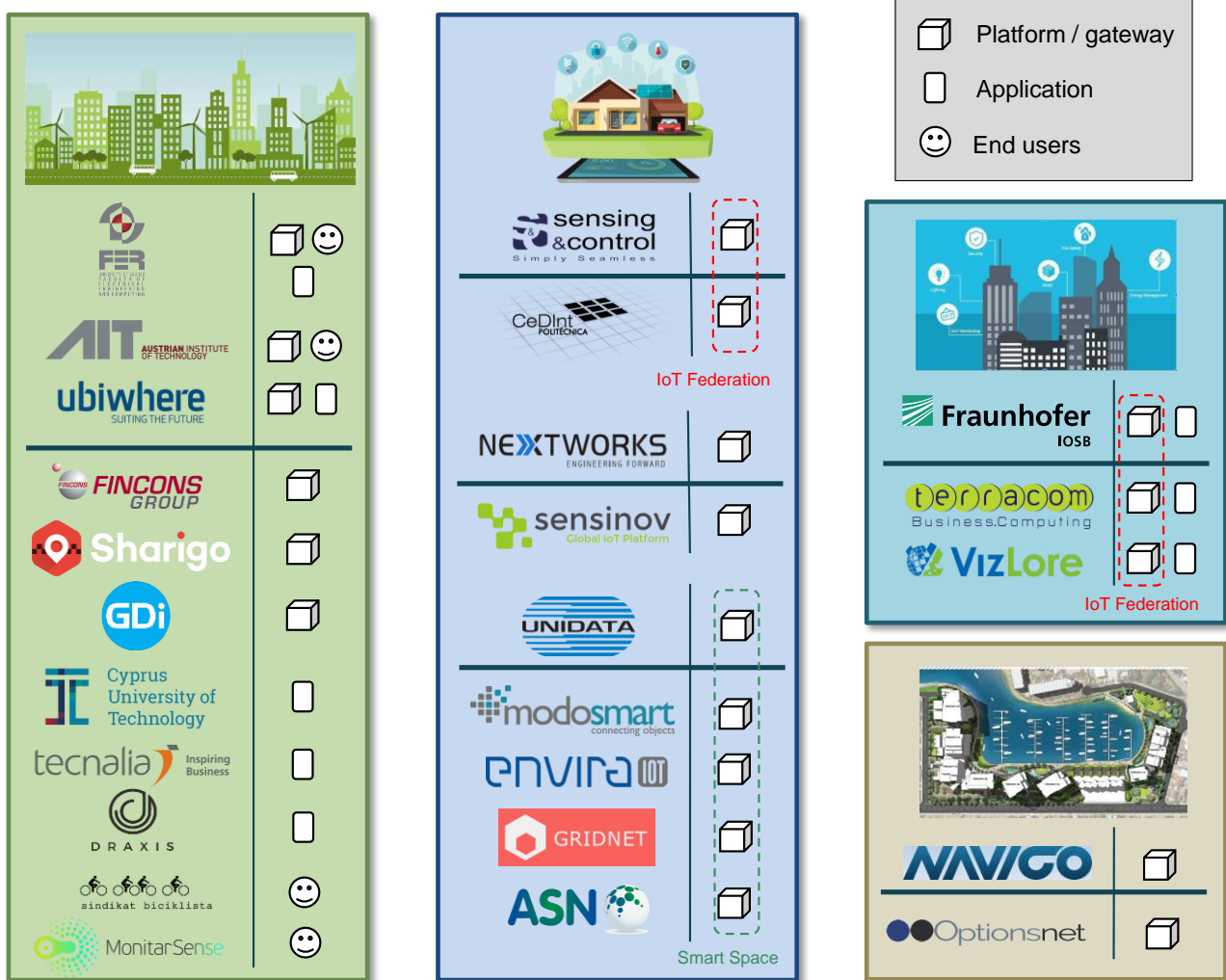
The colored boxes denote the respective use case domains of symbIoTe: Smart City/Mobility, Smart Residence, Smart Campus and Smart Yachting. There was no project applying for the Smart Stadium. The grey box includes the signs used for capturing the contributions of the Open Call partners (platform/gateway, application, users). The diagram also shows the contributions from project partners so as to show the complementarity achieved.

It is evident that the majority of Open call partners was attracted by the Smart City/Mobility domain. It's worth noting that the OC2 topic asked specifically for organizations supporting the Smart City trials (the last two partners on listed on the green box). Smart Residence has attracted a lot of attention, especially due to the fact that several companies making their gateways L3/4 compliant were active in the Smart Homes market.

Some of the highlights of the Open Call projects are summarized below:

- OptionsNet realized the value of its IoT data and is in discussion with the municipality to open up part of them

- Terracom demonstrated the viability of L1 and L2 adoption through its participation in the two open calls.

- The federation between IOSB (symbIoTe partner), VizLore and Terracom improved the EduCampus use case, but also created new business opportunities for VizLore and Terracom.

- The four participants in L3/4 were able to create extensions for both proprietary and Open Source IoT gateways, such as OpenHAB.

The following table focus on the Open Call partners that made their IoT Platforms or Gateways symbIoTe-compliant and shows the type and number of devices exposed through the symbIoTe middleware.

Platform	Partner	Resource types	Nº. of registered resources
L1			
SoundMap	OC1	Noise level measured by smartphone	-
Sammy	OC1	Stationary sensors for marinas	16
Sharigo	OC2	Taxi speed, mobile sensor	37
GDi Ensemble	OC2	Average traffic speed and rotational speed	13
Sensinov	OC2	Indoor sensors and actuators	14
L2			
VizLore IoT Platform	OC2	BLE beacons, door controller and associated services	24
QRPatrol	OC2	BLE Beacons	20
CeDint	OC2	Voltage, current, real energy, apparent power, real power, temperature, humidity illumination	207
L3/4			
GRIDNET	OC2	Various gas concentration, temperature, humidity, pressure	11
Modosmart	OC2	Presence, temperature, humidity, air	>5

		conditioner controller	
Envira	OC2	Various indoor, ambience sensor	>5

<u>The symbIoTe project allocated 119,700.00€ to fund the OC1 Extensions and 496,452.93€ for the OC2 Extensions.</u> Considering that majority of the partners were SMEs and startups, in addition to helping test and validate the symbIoTe components, the Open Calls contributed to expand the scope of the project to further the interoperability innovation landscape across Europe.

6.3 *Business Findings*

OC participants provided valuable feedback about their participation within the project that can be summarized in the following bullet points. These were very useful for the project to get direct industry feedback about the market viability of the project results and helped shape the project's business strategy as explained in detail in section 4.1.3 of this deliverable.

- Participants realized how valuable their data is and how they can improve their exploitation through symbIoTe.

- Interoperability is a recognized solution for business co-creation that will allow the entrance of small players in different market domains. The most remarkable example is the partnership established between VizLore and Terracom (OC2 participants).

- Participants showed their interested on continuing their relationship with symbIoTe acting as a broker whenever it goes to the market.

- symbIoTe has demonstrated its value for smart cities, but can be successfully applied to other blooming markets, such as smart manufacturing.

- Participants, mainly SMEs and startups, agreed on seeing the value that symbIoTe can bring to their businesses reducing time-to-market building services on top of it.

- Finally, symbIoTe allows participants entering into new markets accessing to resources they were not able before.

7 References

[1] symbIoTe project, "D6.3 - Context Text and Supporting Documentation".

[2] symbIoTe project, "D7.7 - Final Dissemination and Exploitation Plans".

[3] symbIoTe project, "D6.1 - First Open Call Text and Submission Template".

[4] symbIoTe project, "D6.2 - Second Open Call Text and Submission Template".

Annex I: OC1 feedback on exploitation

The purpose of the interview is to receive feedback to evaluate symbIoTe offerings, identify the needs of the end users (business or final users), the problems that symbIoTe solves and the added value that it provides. It will also serve as an evaluation before reaching the market to identify the strong and weak aspects of the symbIoTe services with the purpose to understand better how to make a closer-to-market product. The interview questions and responses from the three OC1 partners is presented below.

1. *What is the added value that symbIoTe provides you (or can provide you under a more elaborated integration scenario beyond the OC1) that can enhance your services/products? What problems does symbIoTe solves?*

Partner 1	To be part of an ecosystem that can provide them with more robust services and create opportunities is the added value. City administrators want solutions that combine many things such as air pollution, traffic, mobility, etc.
Partner 2	In order of preference, it will choose symbIoTe to: 1. Reduce costs of sensors/infrastructure, access to resources 2. Be part of an ecosystem-networking 3. Increase reputation 4. Access new markets
Partner 3	Benefits in order of importance: • Reduce cost sensors' infrastructure • Provide co-creation opportunities • Increase reputation.

2. *What new service (enhanced service) will you develop while being part of symbIoTe or will be interested to develop? Could you do it without symbIoTe?*

Partner 1	Integrated solutions for smart cities. Also provide enhanced services and build a greater ecosystem.
Partner 2	The envisioned service is to further connect the yacht with the marine and the close by cities' services. Connect city with city facilities. Deliver added value services within this ecosystem. This can be done without symbIoTe but at higher cost and time and resource consuming.
Partner 3	Enrich services. Provide more information to users and more accurate alerts to guards and authorities. They don't have these data and it can boost their competitiveness.

3. *Who are your customers?*

Partner 1	Smart Cities, public authorities, energy operators, insurance companies.
Partner 2	Yacht owners/users and Marina administrators.
Partner 3	Security customers, hotels, hospitals, any building that needs protection, facility companies, stores, metro…

4. *What is the added value for customers of this new service?*

Partner 1	There is a big potential for customers providing more robust integrated solutions.
Partner 2	Service provision and automation, improving existing services.
Partner 3	Provide enhanced services for security with real-time data.

5. *What do you like in the symbIoTe concept?*

Partner 1	- Ease of use and easy integration - Access to IoT resources - Scalability potential
Partner 2	In the current market solutions there is no access to IoT resources, and symbIoTe can provide that. This can leverage offerings and expand products, increase reputation and networking. symbIoTe provides opportunities to work in a novel approach into the IoT market, symbIoTe can become a marketplace for start-ups if the ecosystem grows and provides added value. It offers the opportunity to collaborate with other IoT platform providers and symbIoTe to become the intermediate for other IoT service providers.
Partner 3	It gives access to devices and new services, this can provide added value and increase competitiveness, new skills, know-how, scalability of services, networking opportunities.

6. *What is the weakness of the symbIoTe concept and what would you change for better?*

Partner 1	Latest versions, as work already done needed to be re-done. However, guidelines were not particularly difficult, and the forum was very helpful.
Partner 2	They found it a bit difficult to connect. It needs to be easier. The manuals should have more examples. New 3rd parties might find them challenging. The guidelines can be improved. If it is easier to connect it will be a great boost for symbIoTe. But considering the development of the project is understandable.
Partner 3	Regarding the concept, they really like it and creates great opportunities for companies. For negative aspects: complicated guidelines, hard to use. There were missing permissions. And the migration to the latest version was challenging. They understand that it is an ongoing project and the challenges though. More clear and correct instructions and technical support are very important. The technical team and experts did a great job and helped a lot to answer every question.

7. *What resources (data, sensors) will you be willing to share with the symbIoTe ecosystem? Under which level of compliance will you be more willing to share them?*

Partner 1	Its solution is based on an IoT platform and collects data directly from citizens (citizens' science) without sensors. Private data cannot be shared. Map visualizations and overall data about a city can be shared.

Partner 2	Best space availability, water quality and weather. Based on this experience. Public marines are willing to share resources, but they usually do not have the funds to seek IoT solutions in contrast with private marinas.
Partner 3	They have added services like indoor location to symbIoTe. They are willing to share their services depending on the circumstances.

8. *What type of other platforms and 3rd parties (service providers, enablers, application developers, cities) will you need to be a symbIoTe-enabled in order to develop the new service(s) for your products?*

Partner 1	Partners that provide air pollution, traffic control, smart mobility, energy efficiency data and, at a second degree, data for tourism and restaurants.
Partner 2	Platforms, service providers that can offer OD for cities, customer services, transportation data, sightseeing, restaurants, fuel providers, etc.
Partner 3	Smart cities, building, industry.

9. *Will you be willing to pay for symbIoTe if it reaches the market?*

Partner 1	Yes
Partner 2	Yes
Partner 3	Yes

10. *Additional comments.*

Partner 1	Data management, privacy, security and validations are very important for clients but also for symbIoTe as well.
Partner 2	Recommendation: step by step procedures documented with more examples. Makes steps not easier but straightforward.
Partner 3	A very nice experience collaborating with symbIoTe and a big consortium. A unique experience to work with an ongoing project / making changes and adapting to new developments.

Annex II: 1ˢᵗ OC2 business workshop

In May 2018 a workshop with OC2 winners was organized in Viareggio (Italy). The purpose of the workshop was twofold, first to discuss between the teams about the symbIoTe levels of interoperability and understand their value, and secondly for sumbIoTe partners to receive the first feedback from new partners.

Participants had to form teams according to the level they are involved within the projects, but with a few exceptions that had to join a different team due to the low number of participants. The teams formed were the following ones:

Team 1 Analysis of L1	Team 2 Analysis of L2	Team 3 Analysis of L3/4
• Sharigo SRL • GDi d.o.o • Udruga "Sindikat Biciklista"	• Universidad Politecnica De Madrid CeDInt • Terracom Informatics Ltd. • SENSINOV • Vizlore Labs Foundation	• Spyridon Skiadopoulos-Envi4All • Envira Sostenible SA

Teams developed a SWOT analysis making market considerations for the level of interoperability they were involved in. They had to consider aspects such as product commercialization, innovation, user acceptance, competition among others and fill the SWOT. After that, the teams had to present their findings. The, each participant must state their interests and expectations within the project.

L1 SWOT

S	W
• Large number of different sensor data on one place (accessible, search). • SW/HW abstraction. • Open (public) but still controllable. • It is scalable. • Open source. • It is free. • Large/ heterogeneous community.	• Reputation. • Difficult to monetise.
O	**T**
• New business models. • Create innovative services. • New ways to use resources. • After project's end someone can Extend/fix/monitor the developments.	• It is open source. • What happens after the project ends? In case no one is interested to maintain it. • Security after project's end.

Participants considered that the open source nature of the project it is one of its strengths, as it allows to join the symbIoTe ecosystem as a lower cost. At the same time, it is very valuable that the platform allows user to access to different discover different resources through the searching mechanism.

However, as a research results it is difficult to see how it can be monetised as there is no clear business model defined yet.

The project will be a quite innovative results into the market, allowing the creation of new business opportunities. But security should be a must after the end of the project, as well as to define a clear sustainability path.

L2 SWOT

S	W
- Access to other platforms for new federations. - More resources for app developers and service providers. - More freedom in organising federation goals. Create own framework. - Provision of complimentary resources. - Increased cooperation.	
O	**T**
Drive SME and start-up collaboration for accessing the market.	- End of project impact on sustainability. - After the end of the project if symbIoTe doesn't continue but people rely on the federations, what happens?

As well as it happened with L1 SWOT analysis, L2 participants considered accessing to resources a great benefit for organizations, even more in this level with the possibility to federate with other platforms to create new business opportunities.

At the same time, participants have the same concerns about the sustainability path of project results.

L3/4 SWOT

S	W
It is modular, more sensors can be attached to it.	Lack of unified protocols for satellite data (satellite data have many different formats).
O	**T**
Explore interoperability of Earth Observation (EO) data.	- Data protection. - Availability of several different protocols.

L3/4 participants are interested in the modularity of the solution proposed by symbIoTe and the possibilities for interoperate with third parties' data. But found the lack of unified protocols, not directly related to symbIoTe, a harm for some cases. Data protection is also that should be taken into account according to new regulations.

Summary of different partner expectations from participation in OC2

- Expect to see opportunities to create new services for customers that will combine different data from sensors. They expect to have some more innovation for business customers (B2B), with data related to mobility (vehicles, trains, boat, traffic). The focus is not on consumers.

- New service features and security considerations through their participation in OC

- For one of the partners, Interoperability is a core services, and their aim is to have new users.

- Validate the partner's solutions with EduCampus use case of symbIoTe.

- For one of the partners, to expand geographically, in Zagreb, Vienna and Porto. Also, they expect to reach smarter indoor air quality vendors and expand business in smart cities. How they can collaborate and commercialise their new symbiote solutions.

- symbIoTe provides an opportunity to combine different sensor protocols.

- To access to more data through federations and improve interoperability in a global scale not only within the scope of symbiote.