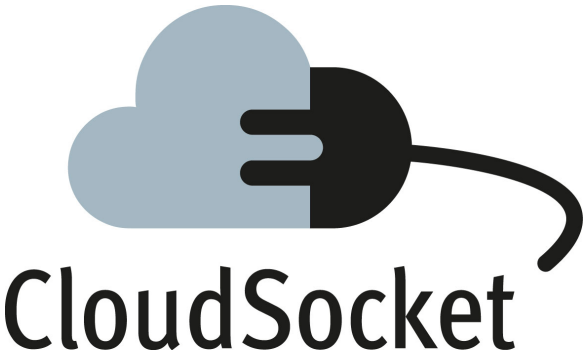

SECOND YEAR DISSEMINATION COLLECTION

D7.5

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EXECUTIVE SUMMARY

This deliverable aims at reporting the individual and joint dissemination activities that have been conducted during the second year of the CloudSocket project. It also explicates the status and coverage of the respective dissemination plan which has been prescribed in the previous version of this deliverable, namely D7.3 - First Year Dissemination Collection [1], as well as the current status of the dissemination-oriented KPIs that have been posed. Finally, it reports over the individual dissemination plans for the final year of the project, thus complementing the respective roadmap provided in D7.3 which prescribed the joint actions to be performed at that year.

Compared to the first project year, this year can be considered as a dissemination booster: this can be evident by considering the following facts: (a) the twitter account has now over 700 followers while 212 tweets has been posted; (b) research-oriented dissemination activities have been intensified leading to 18 publications, including a journal one; (c) the project web site has been revamped by including a great deal of new content; (d) until the end of the reporting period, at least seven webinars have been held and a magnitude of them is planned to be provided in the project final year. By considering that the research and development activities continue until the middle of the final year, 12 webinars in total are to be held in a monthly basis and that the demonstrators will become ready at that year, we look forward for even a greater intensification of dissemination activities in the last project year. Both the dissemination roadmap as well as the individual plans of each partner bare witness on this. As such, this will ensure both a vast awareness of the project as well as guarantee the best possible impact for it which could enable its potential adoption in one or more forms within the current market.

PROJECT CONTEXT

Workpackage	WP7: Dissemination, Collaboration and Standards
Task	T7.1: Dissemination
Dependencies	N.A.

Contributors and Reviewers

Contributors	Reviewers
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Version History

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1.0	December 23, 2016	Kyriakos Kritikos	Final version

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1 INTRODUCTION

Work package (WP) 7 creates, collects and manages the communication, dissemination, and cooperation activities of the project. It also identifies possibilities for contribution to standards. All partners participate in WP7 which spans the duration of the whole project. As such, the importance of this WP is paramount in order to raise the awareness of the project as well as guarantee its respective impact.

This document reports the dissemination activities that have been conducted during the second year of the CloudSocket project. It builds upon the content of Deliverable D7.3 [1], in which a specific dissemination strategy and roadmap have been designated along of course with the reporting of the first project year dissemination activities. To this end, this strategy and roadmap can be used to indicate not only that the current set of dissemination activities is well planned but also that these activities are in accordance to the main dissemination goals set.

Based on the latter, the aim of Chapter 2 is not only to shortly analyse the main dissemination activities performed by the project partners but also to assess the current dissemination status with respect to the given dissemination goals. Then, Chapter 3 designates what is remaining to be done according not only to the dissemination roadmap but also with respect to the partners individual dissemination plans such that in the end we are able to reach the main KPI thresholds set. Please note, however, that failing of reaching a KPI threshold does not mean the end of the world. Each KPI threshold has been set based on a particular method and the respective expectations of corresponding deliveries / dissemination actions by the project partners. It is thus rather an estimation and not a hard dissemination goal. As such, a KPI violation can mean that possibly some over-estimation was involved. In fact, in this deliverable, we will attempt to correct some KPI thresholds in order to become more realistic and reflect the remaining resources for this WP as well as the respective dissemination roadmap and partner plans.

By inspecting the content of Chapter 2, it is apparent that a boost of dissemination activities has been achieved which has enabled the project to outreach many of the main dissemination target groups. This can be evident at both the academic and research level, and the level of social media and webinars. This is also witnessed by the fact that particular KPI thresholds have already been over-passed. However, there are also specific slight shortcomings compared to our ambitious goals which will be addressed via conducting remediation actions in the context of the final year of the project.

In overall, the dissemination intensiveness has been increased during this second project year and this conforms to the current project developments and the respective phase that this project is within. We believe that this intensiveness will be greatly enhanced in the third project year by relying on three main powerful tools / instruments: (a) a full CloudSocket prototype implementation will become available; (b) various demonstrators will be developed showcasing the added-value of this prototype; (c) the plethora of CloudSocket webinars that are planned to be held in the final project period. By also considering that research activities are still on going, we expect that the successful outcomes at the research level will be retained and possibly enhanced in the last year of the CloudSocket project. Finally, the successful social media strategy will continue in the project final period with many different opportunities for message dissemination, by considering also the aforementioned instruments, thus enabling to better target some of the project's main audience types.

2 DISSEMINATION ACTIVITIES

2.1 Overview & Roadmap Conformance

During the second year, the project conducted several types of dissemination activities. All these activities will be shortly summarised in respective sections of this chapter, each focusing on one dissemination activity type. In the following, we attempt to provide an overview of the activities as well as explicate their conformance to the dissemination roadmap and the corresponding KPI goals set.

By focusing on the roadmap specified in D7.3, we can clearly see that many of the planned activities have been conducted. The respective status of the roadmap for this second project period can be seen in Table 1. This table shows the planned activities and the respective partner responsible to deliver them as well as their degree of fulfilment in this reporting period. By closely looking at this table, we can clearly see the intensification of the project dissemination activities. These activities include: (a) submitting all project deliverables on time; (b) producing and making available the CloudSocket components (either in source-code or SaaS form for proprietary components) and their respective documentation; (c) producing videos showcasing the CloudSocket environments; (d) producing project-related material, such as roll-ups and leaflets (to be used in dissemination activities); (e) producing presentations about research results and CloudSocket environments which will be collected and made available on the Innovation Portal; (f) enriching and updating the project web site content based also on the previously reported dissemination material (e.g., videos, presentations and documentation); (g) intensifying the presence of CloudSocket project in social media via respective campaigns; (h) conducting webinars; (i) participating in industrial events; (j) participating in networking and cluster events; (k) achieving appearances in press (magazines); (l) submitting research papers, achieving respective publications and participating in the corresponding events; (m) uploading research publications on Zenodo[1] as well as publishing guidelines for the respective upload process; (n) teaching courses with content related to CloudSocket.

Table 1 also signifies that for some types of activities, in particular tutorials and workshops, the respective target set in the roadmap has not been achieved. This will be remedied by moving the respective dissemination actions in the final project year. This has also led to updating the KPI targets for these activities as can be seen in Table 2 to become more realistic subject to the resource constraints of this WP. The respective issue can be justified as follows: (a) eChallenges did not take place in 2016, which was foreseen for a workshop; (b) as these two dissemination activity types are mainly conducted by the project research partners, these partners were already overwhelmed with major research activity as well as with respective dissemination actions including attempts in terms of individual or common paper submissions, participation in conferences and workshops as well as participation in cluster events. However, in the last project year, the research activity ends in M30. In this sense, the research partners will have the enough time and resources in order to remedy for these two activity types by submitting respective proposals in well targeted conferences. In fact, already finalised submission material has been produced for one workshop (at CLOSER 2017) and one tutorial (at ICEIS 2017), while other interesting venues are currently investigated.

Finally, there have been very scarce cases where no activity has been performed for a specific type. This is evident from the rows mapping to the whitepapers and newsletters. This occurred mainly due to the lack of respective resources. After investigating these issues, we have decided either to plan to remedy – in the case of the white paper – or to look for alternative approaches that better fit the context of the project – in the case of a newsletter. In the case of the latter, we plan to integrate the respective dissemination messages into the

[1] https://zenodo.org/

newsletters of existing partner organisations. Again, respective targets have been modified in Table 2 to become more realistic.

Phase	Delivery	Activity	Partner	Fulfillment
First Release	M13	Guidelines on the process for uploading publications/datasets on Zenodo are produced to be followed by the project partners	FORTH	✓
	M15	Linked-in Account Launching	BOC	✓
	M18	D3.2 Modelling Prototypes for BPaaS	FHNW	✓
	M18	D3.3 BPaaS Allocation and Execution	UULM	✓
	M18	D4.2 First BPaaS Design and Evaluation Environment	BOC	✓
	M18	D4.3 First BPaaS Execution Environment	ATOS	✓
	M18	D4.4 First BPaaS Allocation Infrastructure	FHOSTER	✓
	M18	Source-code for components made available (GitHub)	UULM, FORTH, ATOS	✓
	<= M18	Documentation, guideline & presentation documents for 1st prototype	Partners involved (BOC, FHOSTER, UULM, FORTH, ATOS)	✓
	M18	Press release about 1st prototype	BOC, YMENS	2 press appearances
	M18	Newsletter for 1st prototype + project results/progress		-
	M21	D4.5 Final CloudSocket Architecture	BOC	✓
	M22	1 whitepaper about architecture	BOC or ATOS	-
	M22	1 poster about architecture	BOC & UULM	1 Poster about project

	M22	Presentations about CloudSocket Architecture are made available	BOC or ATOS	✓
	M24	D3.4 BPaaS Allocation and Execution Environment Prototypes	UULM	✓
	M24	D3.5 BPaaS Monitoring and Evaluation Blueprints	FORTH	✓
	M24	D7.5 Second Year Dissemination Collection	FORTH	✓
	<= M23	2 whitepapers (overall, one environment-specific)		-
	<= M24	6 publications (research performed in WP3, architecture)	FORTH, FHNW, UULM, BOC, ATOS	✓
	<= M24	Research datasets & publications made available at Zenodo & Openaire	FORTH, FHNW, UULM, BOC, ATOS	✓
	<= M24	5 webinars		✓
	<= M24	1 industrial event		✓
	<= M24	1 workshop organisation		-
	<= M24	6 courses taught	FORTH, UULM, FHNW	✓
	<= M24	2 tutorials given	BOC	1
	<= M24	Continuous update of project website	FORTH, BOC, rest of partners	✓
	<= M24	Intensification of presence at social media	FORTH, UULM, rest of partners	✓
	<= M24	< 1 video produced (cloud transformation framework + environment specific videos offered individually + client-based usage of CloudSocket prototype)	FHNW + BOC	✓
	<= M24	Presentations about research results should be produced and made available	FORTH, UULM, FHNW,	✓

			BOC	
	<= M24	2 Leaflets/Brochures produced		✓
	<= M24	1 networking event		✓
	<= M24	2 newsletters will be published and communicated		-
	<= M24	4 Clustering events	ATOS, UULM, BOC, FORTH	✓

Table 1 - Status of the dissemination roadmap for second project year

By examining, now, the next table, we can see the status of some indicative KPIs which also witness the intensification of the dissemination activities and the level of fulfilment of the respective goals set. In this table, as already indicated, we also make some adjustments on some KPI targets to become more realistic, where a yellow colour has been used to denote the new target for a certain KPI. As it can be examined, we have already surpassed some KPIs, even we have not yet reached the third year of the project. This can be clearly seen for the number of publications in conferences, the number of courses, PhDs and MScs, and the number of followers in twitter. As such, this clearly indicates that the academic and research activities are more than originally expected, while the respective recommendation of the reviewers for intensifying our presence in twitter has been not only be taken into but has also been achieved.

Of course, this table also shows that some KPIs are at the blue level which means that we need to satisfy them in the course of the last year of the project. In our view, this will not lead to a substantial dissemination effort but only in a slight increase of that effort only in some few cases in order to reach the KPIs targets set. As such, in the end, we believe that most, if not all, of the KPIs will be achieved and will be shown in green colour in the final dissemination deliverable of this project.

Finally, we have made 5 adjustments over KPI targets. For the number of workshops and tutorials, the respective adjustment is well expected as we should of course remedy for the missed activities but also be as realistic as possible. In this sense, we expect that 2 workshops will be targeted to be conducted in the final project year and at least 2 tutorials. This is quite feasible from the project side by considering the remaining resources left mainly for the academic partners.

Concerning the number of leaflets / flyers, we have downgraded to 3 with the main rationale that: we have produced two different project flyers suitable for different types of audiences and we are going to produce a final project leaflet to outline the main research results of the project.

As far as the social media KPIs are concerned, the target for 1000 tweets was quite unrealistic and impossible to reach. To this end, it has been reduced to 350 tweets by considering that 204 tweets have already been posted and the respective vast amount of events / messages that are going to be disseminated in the final project period. As linkedin is not a major dissemination target, in contrast to twitter, the goal of reaching 100 members was again not very realistic. In this sense, the respective target was reduced to 40 to match the respective prediction for the last project year.

Type	Channel	KPI Metric	KPI Target	Status
Personal	Conferences, Journals, Peer-reviewed Papers, Events (workshops, tutorials)	Number of Publications	>= 16 conference/workshop, >= 4 journal	29, 1
		Number of workshops organised	>= 4, >=3	1
		Number of tutorials	>= 6, >= 4	2
	Educational Activities	Number of courses	>= 6 per year	6
		Number of MSc	>= 2	2
		Number of PhDs	>= 1	2
	Networking & Clustering	Number of networking events	>= 2	10
		Number of cluster events	>= 14	11
	Project Presentation	Number of project presentations in major events (hosted, sponsorship, booths)	>= 3	4
		Number of attendees	>= 30	
	Press Media	Number of press releases	>= 2	~3 press appearances
	Dissemination Material Production & Distribution	Number of posters	>= 3	1
Telcos & Internet Workshops	Webinars	Number of webinars	>= 11	6
WebSite & Email	Web Site & Email	Number of leaflets / flyers	>= 6, >= 3	2
	Web Site	Number of videos	>= 9 (4 Envir., 2 tools, 2 use-cases, 1 overall)	5
		Number of documentation, guidelines, presentation documents	>=20	15
Social	Twitter	Number of tweets	>= 1000, >= 350	204

Media		Number of followers	>= 100	781
	LinkedIn	Number of linkedin members	>= 100, >= 40	28

Table 2 - KPI Status & threshold update

2.2 Publications / Press Releases

As already indicated in the previous section, the paper submission activities have been intensified. This has resulted in the production of numerous publications which were also uploaded in the Zenodo repository. This has also led to overpassing the conference publications KPI.

We should note here that an interview was given to an online German newspaper (http://www.com-magazin.de/) and the press presentation is planned for January, 2017. This is in addition to the 2 publications in respective magazines that have been achieved by YMENS which map to 3 related publications in the end. Of course, press releases are planned for the final project period where the focus will be on further promoting the final CloudSocket prototype.

In the following, we provide a short overview of each publication achieved by following the respective presentation format that has been adopted in D7.3, which involves the header of the publication, its short overview description and its abstract.

– Cloud Forward 2016: K. Kritikos. P. Plebani, D. Plexousakis, "Semantic SLAs for Services with Q-SLA", Madrid, Span, October, 2016 (partner: FORTH (+ external), URI: https://zenodo.org/record/164151).

  Description: This paper presents the SLA-based extension of OWL-Q which targets the semantic specification of SLAs. This extension is proven in that paper to advance the state-of-the-art in SLA modelling.

  Abstract: This paper reports the re-engineering efforts over OWL-Q, a prominent semantic quality-based service description language. These efforts have focused on making OWL-Q more compact without reducing its level of expressiveness as well as enriching it with semantic rules towards semantic validation of quality specifications and new knowledge derivation. It also presents a new OWL-Q extension called Q-SLA advancing the state-of-the-art by covering all possible information aspects needed which along with the semantic rules enable proper and automatic support to all service management activities. A particular use-case is also provided to highlight the main benefits of Q-SLA.

– CloudCom 2016: K. Kritikos, K. Magoutis, D. Plexousakis, "Towards Knowledge-Based Assisted IaaS Selection", Luxembourg, December 2016 (partner: FORTH, URI: https://zenodo.org/record/164165).

  Description: This paper deals with the enrichment of the deployment reasoning process with knowledge derived from the cloud application execution history in order to speed it up as well as rely only on solutions which have been deemed the best possible in the past, thus bypassing the trial-and-error problem that is exhibited by other highly-related approaches in deployment reasoning.

  Abstract: PaaS platforms enable single or hybrid cloud deployments. However, such deployment types cannot best cover the user application requirements as they do not consider the great variety of services offered by different cloud providers and the effects of vendor lock-in. On the other hand, multi-cloud deployment enables selecting the best possible service among equivalent ones providing the best trade-off

between performance and cost. In addition, it avoids cases of service level deterioration due to service under-performance as main effects of vendor lock-in. While many multi-cloud application deployment research prototypes have been proposed, such prototypes do not examine the effect that deployment decisions have on application performance. As such, they blindly attempt to satisfy low-level hardware requirements by neglecting the impact of allocation decisions on higher-level requirements at the component or application level. To this end, this paper proposes a new IaaS selection algorithm which, apart from being able to satisfy both low and high level requirements of different types, it also exploits deployment knowledge offered via reasoning over previous application execution histories to take the best possible allocation decisions. The experimental evaluation clearly shows that by considering this extra knowledge, more optimal deployment solutions are derived, able to maintain the service levels requested by users, in less solving time.

– ESSOC 2016: K. Kritikos, D. Plexousakis, "Subsumption Reasoning for QoS-based Service Matchmaking", Vienna, Austria, September 2016 (partner: FORTH, URI: https://zenodo.org/record/164171).

  Description: This paper attempts to exploit subsumption-based reasoning techniques in conjunction with a smart arrangement of the service advertisement space in order to speed up the non-functional service matchmaking process. In result, various non-functional matchmaking algorithms are proposed which in some cases overpass in performance the state-of-the-art.

  Abstract: Service-orientation has revolutionized the way applications are constructed and provisioned. To this end, a proliferation of web services is being increasingly available. To exploit such services, an accurate service discovery process is required with a suitable performance focusing both on functional and quality of service (QoS) aspects. In fact, QoS is the main distinguishing factor for the plethora of functionally-equivalent services available in the internet. Accuracy in service discovery comes via exploiting formal techniques and ontologies in particular. Satisfactory performance levels can be reached via using smart methods that intelligently organise the service advertisement space. In this paper, we propose smart ontology-based QoS-aware service discovery algorithms that exploit ontology subsumption as a means of matching QoS requests and offers. These algorithms exploit a variety of methods to structure the service advertisement space. Based on the empirical evaluation conducted, our proposed algorithms outperform the state-of-the-art in certain circumstances. To this end, ontology-based subsumption is indeed a promising technique to realise QoS-based service matchmaking.

– ESSOC 2016: K. Kritikos, D. Plexousakis, "Towards Combined Functional and Non-Functional Semantic Service Discovery", Vienna, Austria 2016 (partner: FORTH, URI: https://zenodo.org/record/164172).

  Description: This paper explores the different ways semantic functional and non-functional service discovery algorithms can be combined to support full service discovery as well as to speed up the matchmaking process. A formal analysis of the performance of these algorithms is supplied which is validated by the experimental evaluation that has been conducted over the algorithms proposed.

  Abstract: Service-orientation is increasingly adopted by application and service developers, leading to a plethora of services becoming increasingly available. To enable the construction of applications from such services, the respective description and discovery of services must be supported. Both functional and non-functional aspects should also be considered as they play a significant role in the service management lifecycle. The focus in state-of-the-art service discovery has been mainly on one aspect and not both of them. As such, this paper aims at investigating the issues involved in considering both functional and non-functional aspects in service discovery. In particular, it proposes different ways via which aspect-specific algorithms can be combined to generate a complete service discovery system. It also proposes a specific

unified service discovery architecture. Finally, it evaluates the proposed algorithms with respect to their performance to give valuable insights to the reader.

– ESOCC 2016 Workshops: D. Metallidis, K. Kritikos, C. Zeginis, D. Plexousakis, "A distributed cross-layer monitoring system based on QoS metric models", Vienna, Austria, September 2016 (partner: FORTH, URI: https://zenodo.org/record/164177)

  Description: This paper presents a cross-layer QoS model as well as the architecture of a cross-layer monitoring system that capitalises on this model to support service measurement and evaluation.

  Abstract: Monitoring of business process workflows based on metric quality models is associated to a gap between the definitions of workflow, service and infrastructure layer quality metrics. Most monitoring frameworks rely only on a layer-specific quality model, covering, e.g., the service layer, without considering the cross-layer dependencies it might have with quality models in the rest of the layers. The novelty of this paper closes the gap between the different functional layers by defining a cross-layer dependency model indicating relationships of quality aspects from three different semantic quality models. Each of these three quality models define metrics, metric aggregations and computations for each of the separate layers. These quality models are being addressed by a continuously, yet evolving distributed monitoring system.

– ReSeRCH - Rethinking Service ResearCH @ ESOCC: K. Kritikos, "Universal Service Discovery", Vienna, Austria, September 2016 (partner: FORTH).

  Description: This extended abstract dealt with presenting an agglomeration of research directions towards supporting universal service discovery, i.e., service discovery that can enable anyone to search over a unified repository encompassing an extensive set of services that are publicly available from all over the world. Such a repository is a move forward from either monolithic and private service repositories or diverse and possibly domain-specific web repositories into a unified public repository that can enable the concretisation of different user applications across different domains.

– ReSeRCH - Rethinking Service ResearCH @ ESOCC: K. Kritikos, "Cross-Layer Service Monitoring and Adaptation", Vienna, Austria, September 2016 (partner: FORTH).

  Description: This extended abstract provided a set of research directions focusing on advancing the state-of-the-art in service monitoring and adaptation by focusing on covering both functional and non-functional aspects in a cross-layer manner.

– Services Transactions on Cloud Computing (journal): K. Kritikos, D. Plexousakis, "Towards Semantic-Based Cloud Application Management", Vol. 3, Num. 3, July-September 2015 (partner: FORTH, URI: hipore.com/stcc/2015/IJCC-Vol3-No3-2015c.pdf).

  Description: This journal paper describes a semantic approach towards the allocation of cloud-based applications. This approach maps to the Smart Service Discovery and Composition tool that has been developed in the context of T3.2 for allocating BPaaSes based on various types of technical requirements of the CloudSocket broker. The paper also proposes a respective ontology for the capturing of the allocation requirements and dependencies.

  Abstract: Cloud computing promises to transform applications and services on the web into elastic and fault-tolerant software. To aid at this target, various research prototypes and products have been already proposed. However, especially with respect to the design phase of cloud-based applications, such prototypes

do not enable the appropriate composition of cloud services at different levels to realise not only the functionality but also the underlying infrastructure support for such applications. Moreover, most existing prototypes and products lack the appropriate semantics to guarantee that the respective design product is the most suitable and accurate one according to the various types of user requirements posed. To this end, this article proposes a semantic cloud application management framework that addresses the aforementioned issues by relying on ontologies to semantically describe cloud service capabilities and application requirements, on semantic cloud service matchmakers considering both functional and non-functional aspects as well as on a novel cloud service composition approach which is able to perform concurrently service concretisation and deployment plan reasoning, thus catering for the different levels involved in a cloud environment and their respective dependencies by also satisfying all types of user requirements posed. The service composition approach is experimentally evaluated deriving quite promising results indicating that the state-of-the-art is advanced.

– ESOCC 2016: Daniel Seybold, Robert Woitsch, Jörg Domaschka, and Stefan Wesner, "*BPaaS Execution in CloudSocket*", Vienna, Austria, September 2016 (partner: UULM, BOC, URI: https://zenodo.org/record/197065)

  Description: This paper presents the realisation of the BPaaS paradigm in CloudSocket

  Abstract: The H2020 research CloudSocket project enacts the business IT-alignment by implementing Business process as a Service (BPaaS).

– ESOCC 2016: Frank Griesinger, Daniel Seybold, Jörg Domaschka, Kyriakos Kritikos and Robert Woitsch "*A DMN-based Approach for Dynamic Deployment Modelling of Cloud Applications*", Vienna, Austria, September 2016 (partner: UULM, FORTH, BOC, URI: https://doi.org/10.5281/zenodo.164178)

  Description: This paper presents a novel approach for the semi-automatic creation of cloud application models with the focus on DMN-to-CAMEL transformations.

  Abstract: Cloud computing is well suited for applications with a distributed architecture and dynamic demand of resources. Yet, current approaches to model cloud application deployment do not cater for the application's dynamic nature and its rapidly changing business requirements. The static description of deployments results in a lack of reusability and also lacks an integrated way to adapt to the current context. To reuse and refine the deployment model, we introduce a simple decision layer on top of a cloud application description, which abstracts from the actual deployment language and allows assembling the deployment model from existing model fragments. Those fragments are chosen based on the input of the decision process. We define an architecture for the decision layer and sketch an implementation based on CAMEL, DMN, and ADOxx. The benefits of the decision layer are illustrated by two use cases. Our approach shifts the focus from a static to a dynamic and reusable modelling process, which also reduces the modeller's effort.

– SLE 2016: Daniel Seybold, Jörg Domaschka, Alessandro Rossini, Christopher B. Hauser, Frank Griesinger and Athanasios Tsitsipas "*Experiences of Models@run-time with EMF and CDO*", Amsterdam, Netherlands, October 2016 (partner: UULM, external: SINTEF URI: https://doi.org/10.5281/zenodo.164181)

  Description: This paper presents the knowledge and experience obtained from three Europeans projects in applying Models@run-time in the cloud context.

  Abstract: Model-driven engineering promotes models and model transformations as the primary assets in software development.The models@run-time approach provides an abstract representation of a system at run-time, whereby changes in the model and the system are continuously reflected in each other. In this

paper, we report on more than three years of experience with realising models@run-time in scalable cloud scenarios using a technology stack consisting of the Eclipse Modeling Framework (EMF) and Connected Data Objects (CDO). We establish requirements for the three roles domain-specific language (DSL) designer, developer, and operator, and compare them against the capabilities of this technology stack. Our assessment is that EMF and CDO are well-suited for DSL designers, but less recommendable for developers and even less suited for operators. For these roles, we experienced a steep learning curve and several lacking features that hinder the implementation of models@runtime in scalable cloud scenarios. Moreover, we experienced performance limitations in write-heavy scenarios with an increasing amount of stored elements. While we do not discourage the use of EMF and CDO for such scenarios, we recommend that its adoption for similar use cases is carefully evaluated until this technology stack has realised our wish list of advanced features.

– CloudForward 2016: Daniel Seybold "*Towards Cloud-centric Distributed Database Evaluation*", Madrid, Spain, November 2016 (partner: UULM, URI: https://doi.org/10.5281/zenodo.164856)

  Description: This poster presents an novel approach for a cloud-centric distributed database evaluation framework.

  Abstract: The evolvement of cloud computing pushed the rethinking of traditional web service architecture from monolithic structures to distributed systems, which will benefit from the cloud offers such as resource pooling or rapid elasticity. Whereas the distribution of the mostly stateless business logic services fits well for distribution in the cloud, the distribution of stateful database services is more challenging. Hence in parallel to the evolvement of cloud computing, distributed databases moved in the focus of academia and industry with the result of variety of distributed database systems, which can be classified in relational databases, NoSQL and NewSQL database systems. Theoretically the current representatives of these three database system classes claim to provide elasticity and "unlimited" horizontal scalability. As the characteristics elasticity and scalability match the cloud offerings, distributed databases seem to be a perfect match for implementing Database-as-a-Service systems (DBaaS). However, academia and industry have already proven significant differences in the elasticity and scalability of distributed databases in specific scenarios. As the cloud stack adds adds another level of complexity to the evaluation of distributed databases, an advanced evaluation framework is required to enable comparable and reproducible evaluations of distributed databases in the cloud. In this context a new approach towards a cloudcentric evaluation framework for distributed databases is proposed, encompassing a model-driven evaluation methodology, an evaluation execution framework and a cloud-centric knowledge base for distributed database scalability and elasticity.

– IEEE Big Data 2016: Daniel Seybold, Nicolas Wagner, Benjamin Erb, Jörg Domaschka "*Is Elasticity of Scalable Databases a Myth?*", Washington D.C., USA, December 2016 (partner: UULM, URI: https://zenodo.org/record/197066)

  Description: This paper presents an evaluation of the scalability and elasticity capabilities of common distributed databases in the cloud.

  Abstract: The age of cloud computing has introduced all the mechanisms needed to elastically scale distributed, cloud-enabled applications. At roughly the same time, NoSQL databases have been proclaimed as the scalable alternative to relational databases. Since then, NoSQL databases are a core component of many large-scale distributed applications. This paper evaluates the scalability and elasticity features of the three widely used NoSQL database systems Couchbase, Cassandra and MongoDB under various workloads and settings using throughput and latency as metrics. The numbers show that the three database systems have dramatically different baselines with respect to both metrics and also behave unexpected when scaling out. For instance, while Couchbase's throughput increases by 17% when scaled out from 1 to 4 nodes,

MongoDB's throughput decreases by more than 50%. These surprising results show that not all tested NoSQL databases do scale as expected and even worse, in some cases scaling harms performances.

– Club IT&C Magazine, article The New Cloud Order: "Everything as a Service", April, 2016, Bucharest (partner: YMENS, URI: https://issuu.com/clubitc/docs/aprilie2016).

  Description: Business Solutions dedicated article, presenting the CloudSocket project in the current market trends.

  Abstract: In the recent years, the cloud technology has significantly optimized the operational processes within a company (improving time and costs), through SaaS, PaaS and IaaS concepts. We speak now about a new cloud model, going beyond software, platforms or infrastructure offered as services. This model wishes to innovate how companies work, through "Business Processes as a Service". In this article we give a short presentation of the BPaaS concept and the CloudSocket objectives, related to the use of BPM in companies and BPM market trends.

– CAiSE 2016: K. Hinkelmann, K. Kritikos, S. Kurjakovic, B. Lammel, R. Woitsch "A Modelling Environment for Business Process as a Service", Ljubljana, Slovenia, 2016 (partner: FHNW, BOC & FORTH, URI: http://link.springer.com/chapter/10.1007/978-3-319-39564-7_18).

  Description: This paper describes the modelling environment for Processes as a Service (BPaaS) that is worked out in the CloudSocket project in the context of T3.1.

  Abstract: Concept models and semantics are used to align domain specific business processes with executable workflows that are deployed and in production in a multi-cloud environment. The Business Process Management System Paradigm (BPMS) is requesting the functional capabilities of the so-called BPaaS Environments focusing on BPaaS design, allocation, execution and evaluation, which technically compose the CloudSocket Broker platform. This paper introduces the first prototype of aligning customers' business needs with BPaaS cloud offerings using a model-based approach.

– CAiSE 2016 Industry Track: R. Woitsch, K. Hinkelmann, A. M. Juan Ferrer, J. I. Yuste, "Business Process as a Service (BPaaS): The Smart BPaaS Design Environment", Ljubljana, Slovenia, 2016 (partner: FHNW, BOC & ATOC, URI: http://ceur-ws.org/Vol-1600/session1p1.pdf)

  Description: This paper introduces the project idea of Business Processes as a Service (BPaaS) that is worked out in the CloudSocket project.

  Abstract: This paper introduces the project idea of Business Processes as a Service (BPaaS) that is worked out in this project. Concept models and semantics are used to align domain specific business processes with executable workflows that are deployed and are in production in a multi-cloud environment. The Business Process Management System Paradigm (BPMS) is requesting the functional capabilities of the so-called BPaaS Environments focusing on BPaaS design, allocation, execution and evaluation, which technically compose, which technically compose the CloudSocket Broker platform. This paper introduces the first prototypes of aligning customers' business needs with BPaaS cloud offerings using a model-based approach.

– ES 2016: K. Hinkelmann, S. Kurjakovic, B. Lammel, E. Laurenzi, R. Woitsch "A Semantically-Enhanced Modelling Environment for Business Process as a Service", Melbourne, Australia, 2-3 November 2016 (partner: FHNW & BOC, URI: https://www.researchgate.net/publication/308396155_A_Semantically-Enhanced_Modelling_Environment_for_Business_Process_as_a_Service).

Description: This paper presents the hybrid modelling approach which supports the continuous alignment of business and IT in the cloud for BPaaS.

Abstract: In this paper we present a hybrid modeling approach which supports the continuous alignment of business and IT in the cloud. Business Process as a Service provides the end-to-end cloud support for business processes instead of single applications. A graphical modelling environment allows non-technical modellers to design business processes and to specify requirements in human-interpretable way. Via semantic lifting, the graphical models can be annotated with classes and values from an enterprise ontology. The BPaaS Ontology contains the relevant classes for the smart Business and IT-Cloud alignment. It supports the modeller in using a standard terminology and thus ensures consistent modelling.

– 2nd International Conference on Cloud Forward: From Distributed to Complete Computing – Cloud Forward 2016 http://cf2016.holacloud.eu/; Inter-cloud Challenges, Expectations and Issues Cluster (https://eucloudclusters.wordpress.com/inter-cloud-challenges-expectations-and-issues/): Ana Juan Ferrer, "Inter-cloud Research: Vision for 2020", Madrid, Spain, October 2016 (partner: ATOS, URL: http://www.sciencedirect.com/science/article/pii/S1877050916321081).

  Description: Inter-cloud Challenges, Expectations and Issues Cluster objective is to enable collaboration among European Research projects addressing topics of multi-cloud and inter-cloud. CloudSocket is a member of the Cluster. The respective publication presents the vision of this cluster over future research directions for multi-cloud systems, services and environments.

  Abstract: Inter-cloud Challenges, Expectations and Issues Cluster objective is to enable collaboration among European Research projects addressing topics of multi-cloud and inter-cloud. Today these projects analyze the question from diverse perspectives and focusing on specific parts of the problem. This position paper provides the work done in collaboration by all these projects to define research areas and challenges for 2020. It identifies a Cluster's vision of Inter-Cloud topics development by 2020, as well as, research areas in order to realize the provided vision. An extended version of this work is available on the Inter-Cloud Cluster position paper.

– 2nd International Conference on Cloud Forward: From Distributed to Complete Computing – Cloud Forward 2016 http://cf2016.holacloud.eu/; Inter-cloud Challenges, Expectations and Issues Cluster (https://eucloudclusters.wordpress.com/inter-cloud-challenges-expectations-and-issues/): Ana Juan Ferrer (Editor), Robert Woitsch, Kyriakos Kritikos, et al. "Inter-cloud Challenges, Expectations and Issues Cluster Position Paper - Initial Research Roadmap and Project's Classification"; Madrid, Spain, October 2016 (partner: ATOS, BOC, & FORTH, URL: https://eucloudclusters.files.wordpress.com/2015/05/inter-cloud-pp_dec-2015.pdf).

  Description: It provides an initial research roadmap for Inter-Cloud computing development areas as well as classification on different areas of work for on-going and past projects. The paper identifies a Cluster's vision of Inter-Cloud topics development by 2020 and it presents and prioritizes both research areas and specific research challenges. In addition, an analysis of EU funded research projects in Inter-Cloud area is being provided in which existing project's work in relation to: Inter-operability approach, Topics and Scenarios addressed, Standards used and enabled Use Cases is classified accordingly.

  Abstract: Inter-cloud Challenges, Expectations and Issues Cluster goal it is to create a critical mass of projects addressing the topic of multi-cloud and inter-cloud so as to share experiences, collaborate on approaches and discuss challenges for adoption and future research. The simultaneous or serial use of services from diverse heterogeneous clouds is a challenge in order to further develop the Cloud market in

Europe. While it presents a series of issues with regards to interoperability among heterogeneous cloud typologies, private and public clouds, services' comparability, portability, migration, networking, it also offers innovative market opportunities in order to avoid vendor lock-in and for the development of new roles in the cloud market related to hybrid cloud models.

– EDOC Workshops: N. Efendioglu, R. Woitch, "Modelling Method Design: An Adoxx Realisation", Vienna, Austria, September 2016 (partner: BOC, URL: https://zenodo.org/record/167844).

Description: The paper proposes a model-driven approach to support the design of a modelling method based on the ADOxx platform as the realisation layer. This approach is evaluated in the context of this and another project where interesting conclusions and outlooks are derived.

Abstract: The importance of Modelling Method Engineering is equally rising with the importance of Domain Specific Languages and individual modelling approaches. In order to capture the most relevant semantic primitives that address domain specific needs, it is necessary to involve both the method engineers as well as domain experts. Based on practical experience in business, more than twenty EU-projects and other research initiatives, this paper presents improved and extended version of a model-driven approach to support the design of a modelling method. The approach is evaluated by two projects in the context of e-Learning, and Business and IT-Cloud Alignment. The paper discusses the evaluation results and derived outlooks.

2.3 Workshops / Tutorial / Networking Events / Cluster Events

The project has also intensified its participation in respective networking and cluster events, while one tutorial has been presented (at I3E). In many of the reported events, respective material has been disseminated. This includes the already developed flyer, a new flyer developed by YMENS but also a project roll-up (available at the project SVN at: https://www.cloudsocket.eu/svn/CloudSocketProject/5_Material/Project-Roll-up-Flyer_Ymens) again created by YMENS. The latter flyer and roll-up can also be seen in the two annexes of this deliverable.

No workshop was held in this period (see respective justification in Section 2.1) but at least two are planned for the next year. As such, we can consider that, for this dissemination activity categorisation, the overall project dissemination efforts were quite satisfactory, while we expect that the respective effort will be increasingly intensified at the last year of the project.

By following the same presentation style as in D7.3, we organise this section into specific parts mapping to respective event types (i.e., networking & cluster events) in which the project has participated. Each part includes a summary of the participation in a respective event of the corresponding type.

- *Networking Events*
    - YMENS: "*MarketPlace of the Future*", presentation held at DevTalks 2016, in Bucharest, by Radu Davidescu (Ymens R&D Manager). The speech tackled the ever-changing perspective of delivering applications. The interaction between application consumers and application providers was always driven by two main targets: seamless delivery and rich user experience. In the context of "all virtualized" paradigm combined with "containerisation", yCONNECT comes to bond demand for applications and vast market offer through a brokerage approach. yCONNECT marketplace is designed to be a bridge between recipe based IT delivery and cloud agnostic execution. The marketplace was presented in the context of the project, as part of the CloudSocket value chain. Presentation of CloudSocket

technological challenges and current results were shared also at Ymens' booth. CloudSocket image was also promoted using customized marketing materials (flyers, roll-up).

- YMENS: "*A Practical Approach to Cloud*", presentation held at the event EuroCloud Forum 2016 – the 7th edition of the EuroCloud Congress, held in Europe, every year, under the slogan "Creating new frontiers in European Cloud". This is the second largest forum dedicated to the future of cloud in Europe. The purpose of the speech was to present real use-cases for Cloud project implementations, from the Ymens portfolio. All models, from private to hybrid to public Cloud, from custom-developed SaaS, PaaS, to BPaaS were discussed along with the specific objectives and challenges in order to pinpoint the market potential for a Cloud Service Provider or Cloud Broker. Presentation of CloudSocket technological challenges and current results were shared also at Ymens' booth. CloudSocket image was also promoted using customized marketing materials (flyers, roll-up).

- YMENS: IWAYDAY 2016 – the 4th edition of a conference organized by Ymens' partners in Bratislava, with the purpose of presenting new IT trends and business solutions, dedicated to private and public representatives. Ymens was represented by Costin Matache (Executive Director), who disseminated information about our projects and products, including CloudSocket.

- UULM: ISC 2016 in Frankfurt (19.-23.6.2016) – CloudSocket was represented by UULM (Frank Griesinger) at the ISC High Performance 2016. The conference has an international recognition to bring different academic and commercial disciplines together and share knowledge in the field of high performance computing. Jointly represented with UULM's booth for the CACTOS project, conference attendees could learn about CloudSocket and take flyers with them.

- UULM: Supercomputing 2016 in Salt Lake City (13.-18.11.2016) – UULM (Stefan Wesner & Frank Griesinger) attended the Supercomputing 2016 in Salt Lake City, which is one of the biggest events on high-performance computing (HPC). A trend could be seen in HPC towards applying the concepts that make up the idea of the Cloud, that is unlimited resources in a pay-as-you-go model. The event gave the possibility to gain insights on how the industry deals with resource management in the Cloud and to cope with SLAs. We distributed flyers and had discussions with representatives of multiple companies, such as Bright Computing and ScaleMatrix. Furthermore, container solutions optimised for different use cases were analysed in discussions with members of the Berkeley Lab.

- UULM: PUMPS 2016 workshop in Barcelona (26.-30.6.2017) – At the PUMPS 2016 (Programming and Tuning Massively Parallel Systems) workshop, UULM (Frank Griesinger) participated in order to learn about the concepts to optimise code for heterogeneous infrastructures so as to meet SLA requirements. Such technique should not only be used for CloudSocket components (e.g., data analysis in Visor and Axe), but also to enrich concepts of supporting applications for heterogeneous infrastructures. During the course of this event, we distributed flyers and came in contact with researchers of different research areas.

- UULM: 7th Workshop of the AG CAA (5.-6.2.2016) – UULM (Frank Griesinger) participated at the "7th Workshop of the AG CAA" in Hamburg that is a stage for researchers in the field of archaeology to present their computer-based applications, such as data analytics or image processing. We distributed flyers and discussed with participants on the possible usage of the concept of BPaaS for their applications and its use in the organisation of archaeological endeavours.

- ATOS: the Net Futures 2016 conference, Brussels Belgium, 20-21 April 2016 (http://netfutures2016.eu/). CloudSocket representatives participated in the Concertation meeting of http://www.cloudwatchhub.eu/

that was held at the Net Futures 2016 conference. CloudSocket together with Cluster Inter-cloud Challenges, Expectations and Issues (participating partner: Atos (Ana Juan Ferrer - Cluster Chair)) participated in the session dedicated to Cluster activities http://www.cloudwatchhub.eu/clusters-collaboration-and-creating-impact-market.

- BOC: Strategic Partner Meeting of BOC, Vienna, Austria, 8/9 September 2016. BOC demonstrated in front of 300 customers the BPaaS Design Environment. The BOC research over BPaaS, continued demonstrations on BPaaS design and a video on BPaaS execution had been shown. Customers were interested in the possible transfer of their business process management environment into the cloud.

- BOC: NEMO Summer School from OMiLAB, Vienna, Austria, July 17-28, 2016. BOC participated with opportunities for networking and collaboration being explored, especially as two different communities were involved, modelling and cloud computing ones.

- MATHEMA: MATHEMA presented the CloudSocket project to the JamToDay Fair 2016 in Florence (November 2016), where a discussion with the partners has started, illustrating respective aspects and possible deployment in several applications.

- MATHEMA: Presented CloudSocket at the University of Florence during a workshop on Machine Learning (March 2016), and during a meeting on collaboration among public and private institutions in June 2016.

- *Cluster Events and Collaboration with third parties*
  - ATOS, FORTH & BOC: Participation in the cluster for Inter-cloud Challenges, Expectations and Issues - Cluster chair is Ana Juan (Atos) and together with BOC and FORTH is participating in cluster activities on behalf of the Cloudsocket team. Member activities in this cluster are related to contributing into the cluster's main objectives definition, identifying Future Research Areas and their prioritisation, identifying collaboration opportunities with other cloud related projects, identifying a cloud inter-operability approach, establishing connections with other European projects to raise awareness about CloudSocket and setting the basis for future cooperation, among others. Some of main actions which took place in 2016 were the following:
    - Various telcos performed in a monthly basis to organise the cluster work during this year
    - Contribution to the “Inter-cloud Challenges, Expectations and Issues Cluster Position Paper - Initial Research Roadmap and Project’s Classification” position paper (contributing partners: BOC, ATOS, FORTH).
    - Contribution to the “Inter-cloud Research: Vision for 2020” paper (contributing partners: Atos)
    - Participation in Event Cloud Forward Conference, Madrid, Spain, 18-20 October 2016, http://cf2016.holacloud.eu/ where Ana Juan from Atos (cluster chair), and FORTH participated in the Cluster meeting https://eucloudclusters.wordpress.com/inter-cloud-challenges-expectations-and-issues/ and contributed to the respective session reporting. In this meeting, FORTH presented a 10 minute overview of the CloudSocket project.
    - ATOS presented the paper on “Inter-cloud Challenges, Expectations and Issues Cluster Position Paper - Initial Research Roadmap and Project’s Classification”.
    - Establishing early relationship with the projects involved in the cluster for Inter-cloud Challenges, Expectations and Issues, thus promoting adherence of CloudSocket to this cluster.

- BWCON: BWCON transfers the CloudSocket technology to the CloudMall BW initiative of the State of Baden-Württemberg. CloudMall BW is the SME Cloud initiative pushed by the local ministry of

economy. Currently, only the CloudSocket technology is presented to the initiative since there are not yet mature services available; however, beyond the technological concept, the demand for "Business Process as a Service" as well as the CloudSocket validation scenarios have been discussed.

- BWCON: A further area, where BWCON pushed spill-over effects is the Baden-Württemberg initiative "Allianz Industrie 4.0". Also here CloudSocket concepts and technologies were presented to the initiative. Concerning the applicability of CloudSocket technology in the manufacturing domain, areas with real-time requirements are currently not considered; however, for areas with less stringent real-time demand, the potential applicability of CloudSocket has been positively evaluated.

- FORTH: Participated at the IFIP Working Group on Service Oriented Systems WG 2.14/6.12/8.10 meeting that took place at ESOCC 2016 in Vienna. This meeting was co-located with a respective workshop ReSeRCH – Rethinking Services ResearCH @ ESOCC 2016 which was dealing with the reformation of the service research agenda via the presentation of novel research directions. FORTH presented in this workshop two main research directions related to universal service discovery and cross-layer service monitoring & adaptation.

2.4 Educational Activities

The educational activities can be considered to be stable within each year where a specific number of courses is taught. These courses can also be used as an instrument to attract students in performing CloudSocket related research. In fact, in the context of current Master and PhD thesis related to CloudSocket, we can see that respective research and dissemination activities are already undertaken.

This section is organised in respective parts which focus on providing a summary of the respective educational activities conducted by a certain CloudSocket partner.

UULM. UULM presented CloudSocket and the problem of business and IT alignment in the scope of several lectures throughout the year as detailed below. In addition to that, acquisition of students for CloudSocket-oriented bachelor and master thesis has started.

- Stefan Wesner, "Storage and Data Center Networks", Lecture for Master Students, University of Ulm, Summer Term 2016.
- Stefan Wesner, Lutz Schubert: "Cross-organisational distributed systems and clouds", Lecture for Bachelor and Master students, University of Ulm, Summer Term 2016.
- Stefan Wesner, Lutz Schubert: "Heterogeneous and Parallel Computing Infrastructures", Lecture for Bachelor and Master students, University of Ulm, Winter Term 2016.
- Jörg Domaschka: "Seminar Research Trends in the Internet of Things", Lecture for Bachelor and Master students, University of Ulm, Summer Term 2016, Winter Term 2016.
- Stefan Wesner, "Research and Teaching at OMI", Presentation for Master Students, University of Ulm, February 2016.

FORTH. FORTH has presented CloudSocket and elaborated over various issues in business process management during a course that was held in the previous semester at the University of Crete for MSc and PhD students. One Master thesis was also conducted which also led to production of one publication as well as the preparation of a new one. This thesis also led to the development of respective implementation code for the BPaaS monitoring research prototype. FORTH also participated in the SSAIE Summer School in Crete where it presented CAMEL in a training session. The relevant course is the following:

- Kyriakos Kritikos and Chrysostomos Zeginis, “Business Process and Workflow Management”, Lecture for Master & PhD Students, University of Crete, Summer Term 2016

FHNW. Prof. Stella Gatziu (FHNW) taught the course "IT Management and Cloud Computing" in the autumn semester in the Master of Science in Business Information Systems at FHNW. There was one student that finished his Master thesis and two students are currently working on a Master's thesis related to CloudSocket research topics.

- Stella Gatziu: IT Management and Cloud Computing, Spring Semester 2016 and Autumn Semester 2016.

BOC: BOC participated in the NEMO Summer School at OMiLAB where subjects from modelling and cloud computing were touched and presented to the students.

FHOSTER. Antonio Leonforte taught a course on “Software Engineering and Model-Driven Software Development” at the Frosinone chapter of the National Engineering Association, with 30+ attendees. While discussing the Model-Driven paradigm, the basics of Business Process modeling have been presented, and the concept of BPaaS has been introduced as defined in the CloudSocket project

2.5 The CloudSocket Website

The CloudSocket website was continuously updated during the course of this second year with both modifications to existing content as well as incorporation of new content. However, its internal structure, as has been reported in D7.3, has been left untouched. The content modifications were mostly related to the entry points and the outlook of the root web page. Updates were constantly performed over publications, deliverables and respective events in which the project has participated this year.

New content was introduced in the download page to enable the reader to take a glimpse of the respective BPaaS environment or component's offered functionality as well as to have access to its detailed documentation. In particular, as it is depicted in Figure 1, the reader can view in an organised manner a very small overview of the components per environment which includes: (a) part of the component description, (b) a component snapshot as well as (c) respective links enabling the reader to either experiment with that component (either download it or to have direct access on it, provided that he / she communicates with the code responsible in order to obtain the respective demo credentials) or find out additional information about it. Once the `Read More` link is followed, the reader is moved to a page dedicated to the component summary where he / she has the opportunity to inspect the short component description, to have a look over small details about how the component can be accessed and how to contact the component responsible, as well as see a component snapshot and watch a respective video that showcases its functionality. As such, all the information required for a certain component is integrated within one summary page.

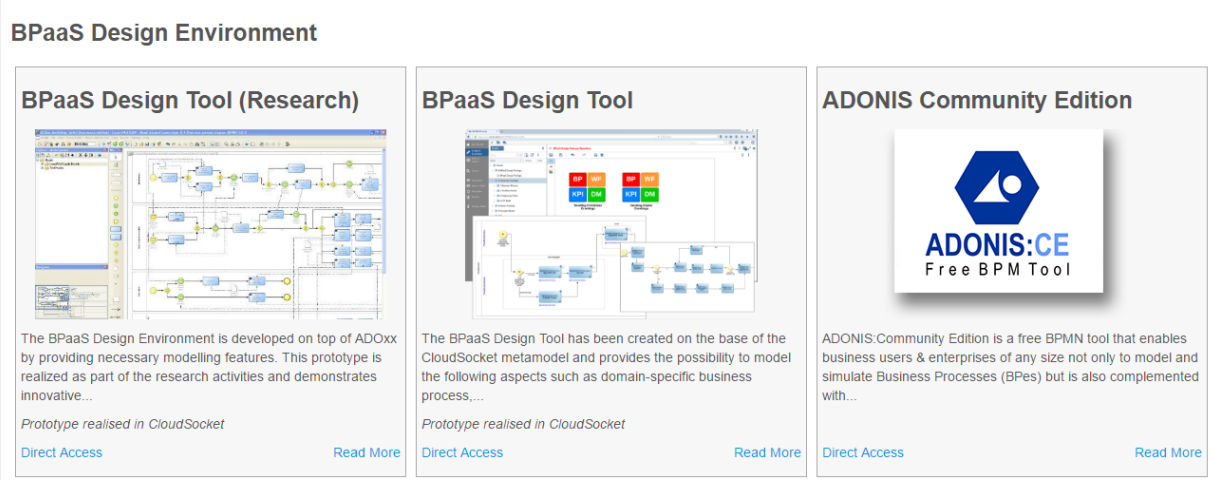


Figure 1 - Overview of CloudSocket components per BPaaS environment

Obviously, new content cannot be considered only the summary page but also the respective documentation that has been produced for the CloudSocket components and the videos that have been developed for them. Based on the aforementioned presentation way, the CloudSocket components are well disseminated and documented while the opportunity to experiment with a component is also granted.

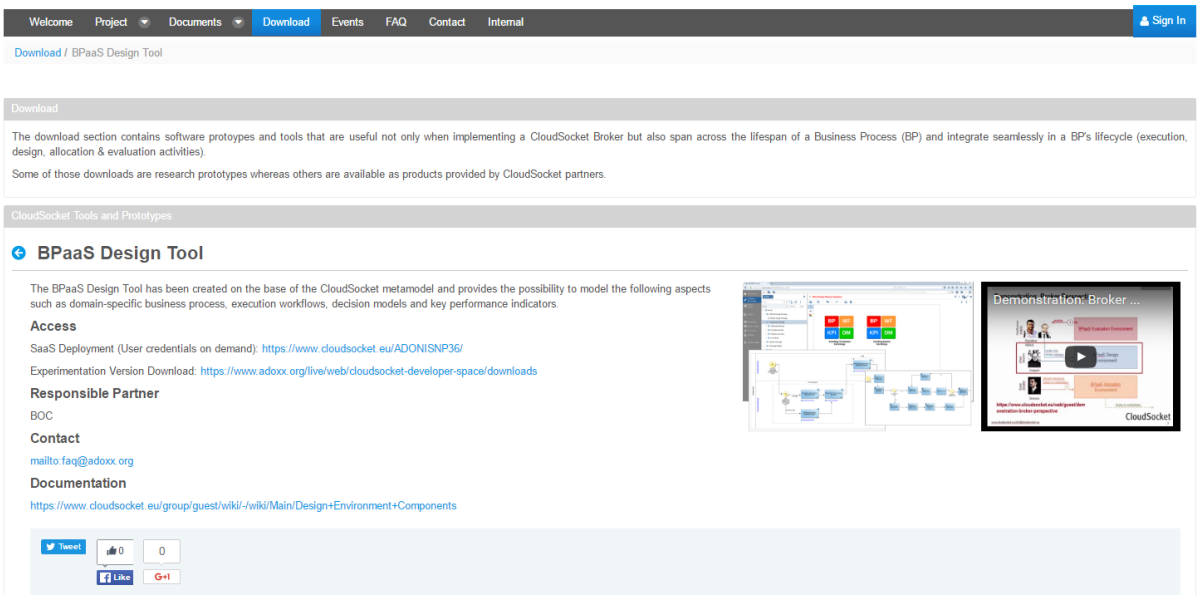


Figure 2 - Summary page for a CloudSocket component

The documentation page of a component has followed a particular structure which involves 7 main sections: (a) *Introduction*: Short introduction about this component; (b) *Architecture design*: details about the component architecture; (c) *Installation manual*: a manual which explicates the way(s) a component can be installed; (d) *Test Cases*: a description of cases which can be involved in testing the component; (e) *User Manual*: a well-detailed manual over the usage of the component; (f) *API Specification*: detailed description of the component API; (g) *Handbook*: the overall handbook of the component. The following figure shows this structure as well as a portion of the content that has been generated for a certain CloudSocket component (BPaaS Design Environment).

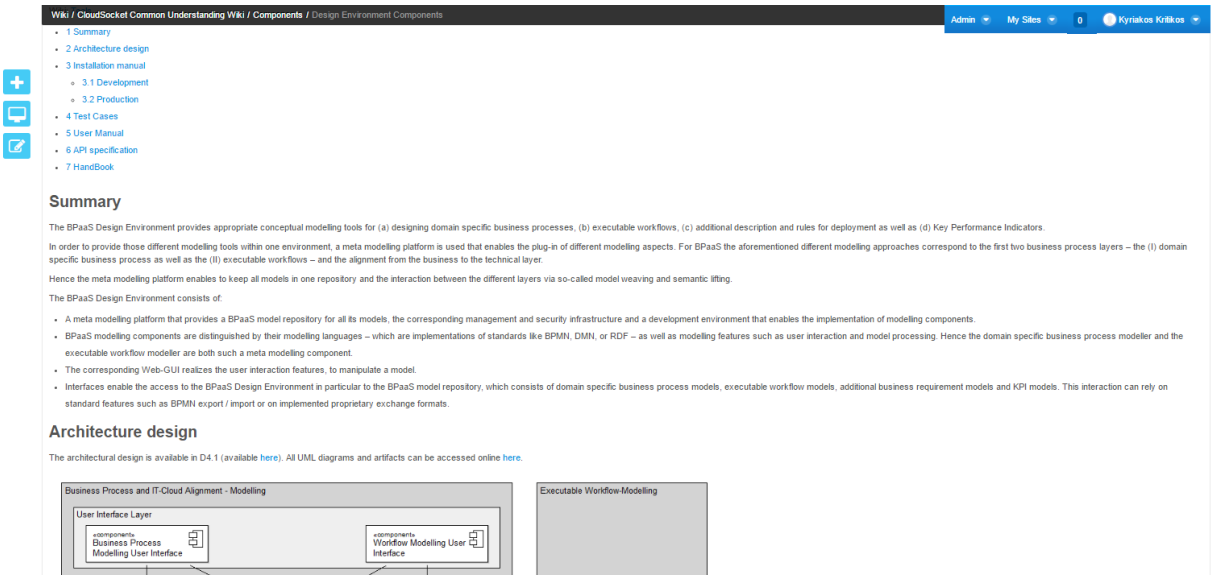


Figure 3 - Full documentation page for a CloudSocket component

A new design proposal for the project web site was a subject of several discussions within the consortium. Based on the recommendations received for the dissemination, after the first review, Ymens tapped internal resources and competences in order to build an optimized version of this website. Please see the current template below, in Figure 4, which is currently transferred to the website. As it can be seen, the updated web page has been widely modified and now includes a set of concatenated vertical windows which focus each on a certain theme, including the main entry points, an overview of the main CloudSocket idea, the project consortium organised in a pyramid style, the list of events and social media tweets enabling users to engage in CloudSocket and the respective structure of the project web site.

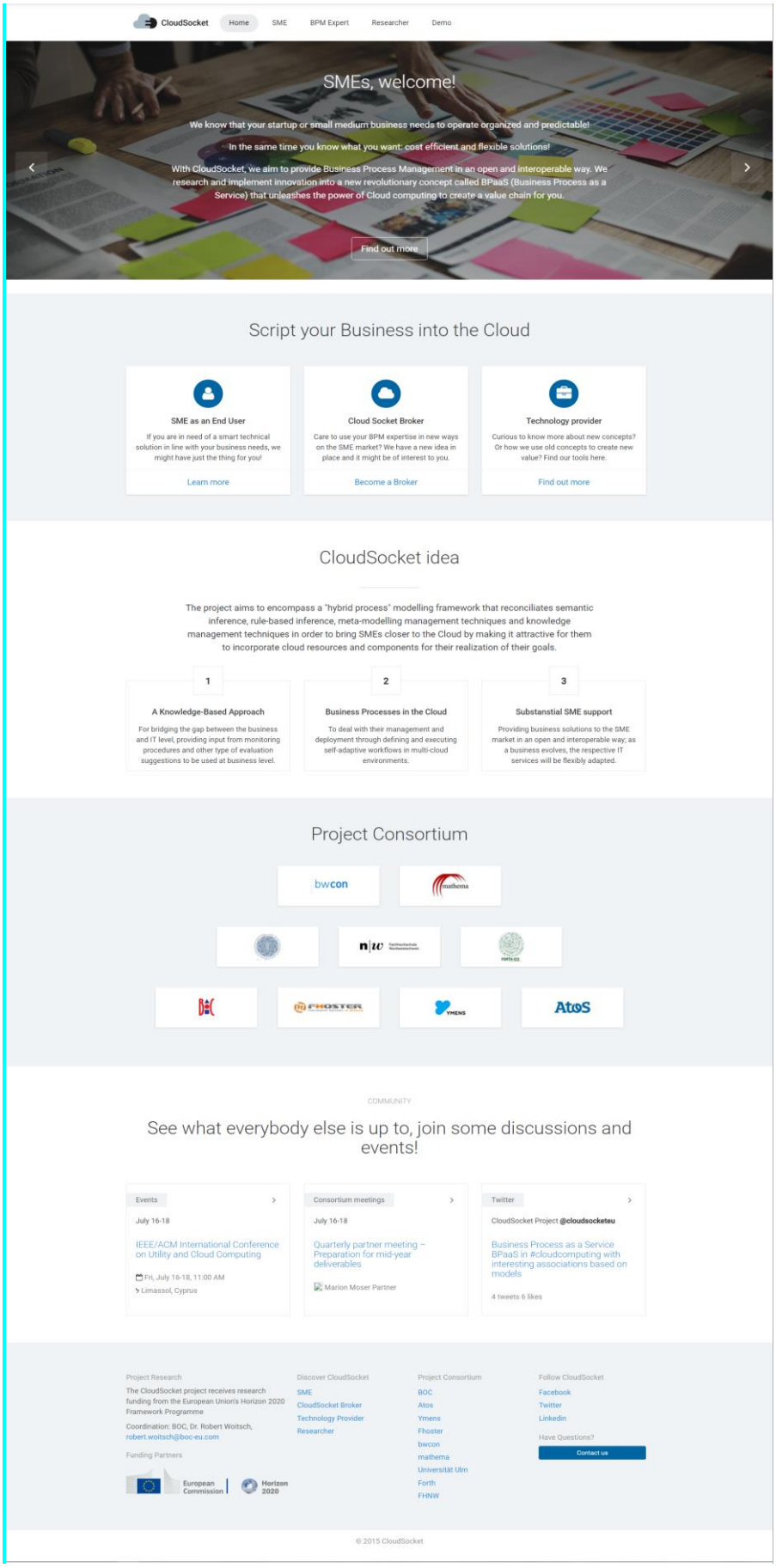


Figure 4 - Web Site Revamp Proposal from YMENS

2.6 CloudSocket in Social Media

Motivated by the first review comments but also aiming to outreach the respective audience types targeted, the presence of CloudSocket is social media has been intensified, especially with respect to Twitter. This has resulted in a plethora of twitter messages being sent (212 in total from the start) as well as to a tremendous increase in the number of twitter users following the project which has reached 715 followers (as of the submission date of this deliverable). These results were produced mainly by following two different strategies: (a) performing social media campaigns over a certain CloudSocket-specific topic or event. Such events were spanning: the first version of the CloudSocket prototype and its respective components, specific BPaaS bundles becoming available, the webinars being held, participation in conferences and workshops, project meetings, and other interesting events; (b) performing social media campaigns over individual topics or events which are related to CloudSocket (e.g., presentation of a lecture over CloudSocket related topics). In this second case and in the context of Tweeter, the campaigns were conducted by an organisation's personal twitter account which was referring to CloudSocket such that the re-tweet could be guaranteed by the CloudSocket twitter account. In both cases, the respective organisation had the opportunity to either perform a manual or an automatic campaign. An automatic campaign was facilitated by the introduction of respective BPaaSes in the CloudSocket platform which enabled conducting different types of social media campaigns, from one-shot small ones, to multiple-shot big ones. Such a BPaaS has been produced in the context of the services to be offered by a certain CloudSocket broker (BWCON). This actually witnesses the fact that CloudSocket technology is also exploited in order to suit internal goals of this project, related to dissemination activities.

We should stress here that a specific strategy for social media campaigning over webinars was followed which involved performing two campaigns before and after the finishing of the webinar. The pre-webinar campaign involved the exploitation of various social media (5 Tweets + 5 posts in the Facebook Groups + 5 posts in the LinkedIn Groups) and the respective publishing in Banners as well as the event announcement in specific pages of both ADOxx.org and cloudsocket.eu web sites (see also Figure 5 for a proof over this). The post-webinar campaign involved exploiting again the same set of social media (3 Tweets + 3 posts in the Facebook Groups + 3 posts in the LinkedIn Groups) in order to announce the finishing of the webinar and supply the corresponding webinar Youtube link[2]. This link groups all the project-specific webinars that will be held in the course of this project.

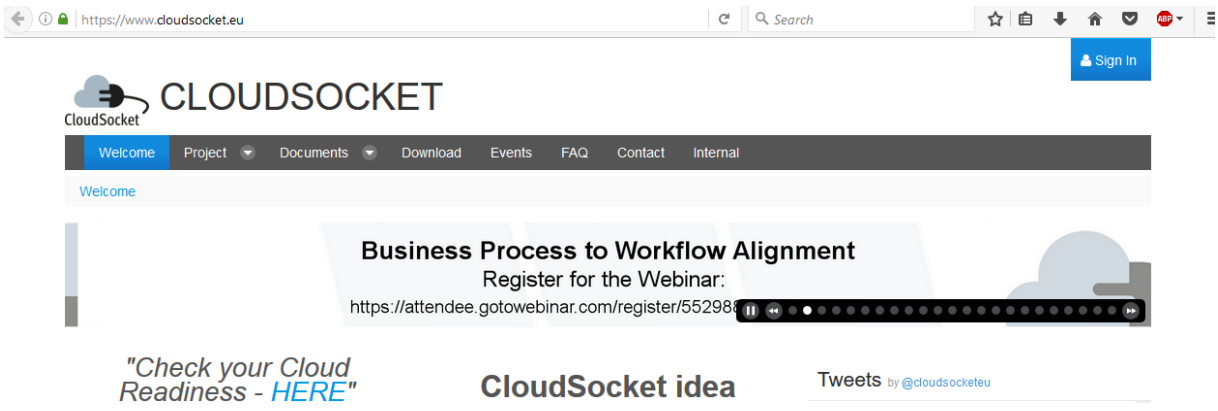


Figure 5 - Snapshot of the project web site showing the banner content for the second webinar

[2] https://www.youtube.com/watch?v=feBaBfcPTYk&index=1&list=PLrrOjki3mo9sXRQOC0KmtajWhE6Dk_Ilq&t=365s

Twitter related information which also witnesses the intensification of activities and the respective impact can be seen in Figure 6 and Figure 7. The first one shows an overview of the project twitter account which also showcases some interesting statistics. The second one shows some statistics over a 91 days period.

Figure 6 - General statistics about the CloudSocket twitter account

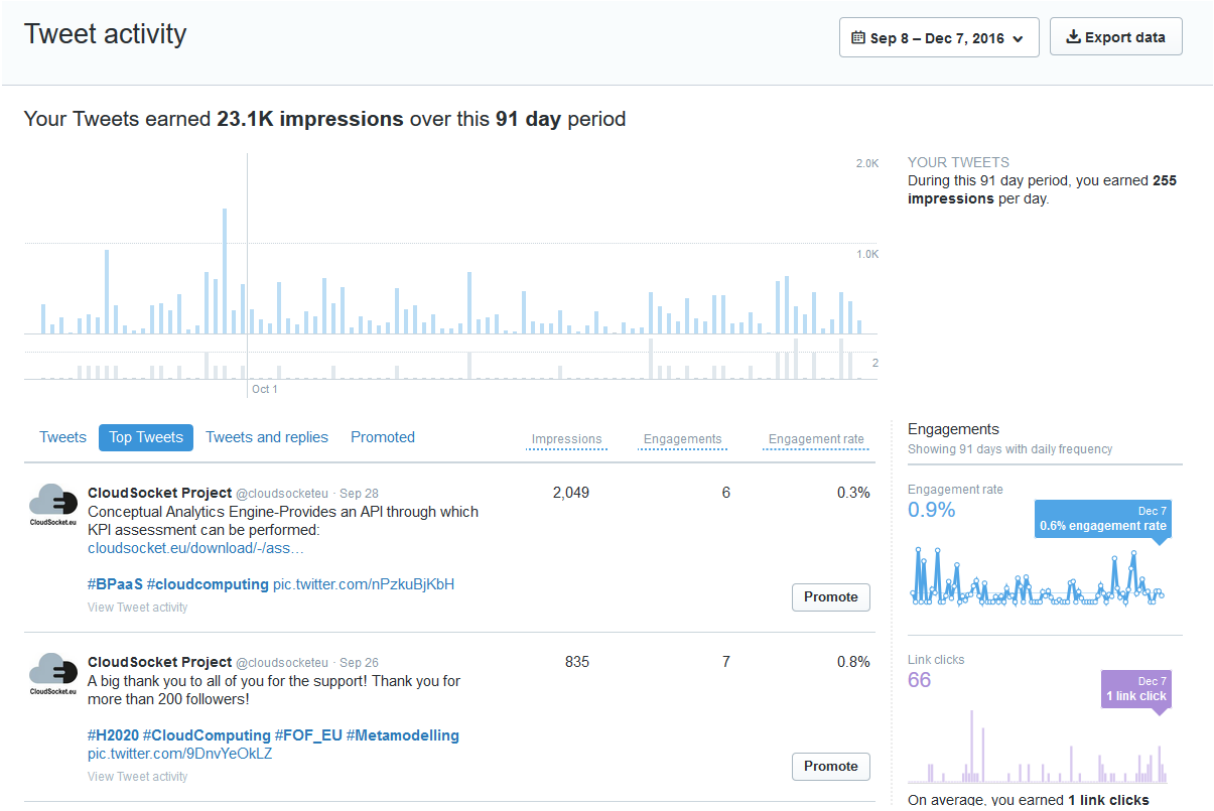


Figure 7 - Tweet activity statistics over a 91 day period

2.7 Webinars

Another medium for project dissemination is in the form of webinars. Such webinars enable presenting a particular topic to a respective audience which is approached via an email and twitter campaign, thus being able to disseminate research results as well as project prototypes and components. In the context of this project, two main types of webinars have been held: (a) CloudSocket webinars held by a respective individual from a partner organisation and focusing purely on CloudSocket related-subjects (which are available on YouTube[3] as already stated); (b) individual webinars held by one organisation in order to disseminate in its own audience or community project-related results. As such, the first webinar type has a more extensive scope while the scope for the second type is more limited. Nevertheless, we need to highlight the following two major facts: (a) the main KPI related to the number of webinars has already been reached and will be overpassed as 12 webinars of the first type are planned to be held in the last project year; (b) main target audience types are outreached via these webinars, even by the individual ones. In particular, we can see that ATOS & BOC webinars target their own communities while BWCON webinars target possible BPaaS / broker customers.

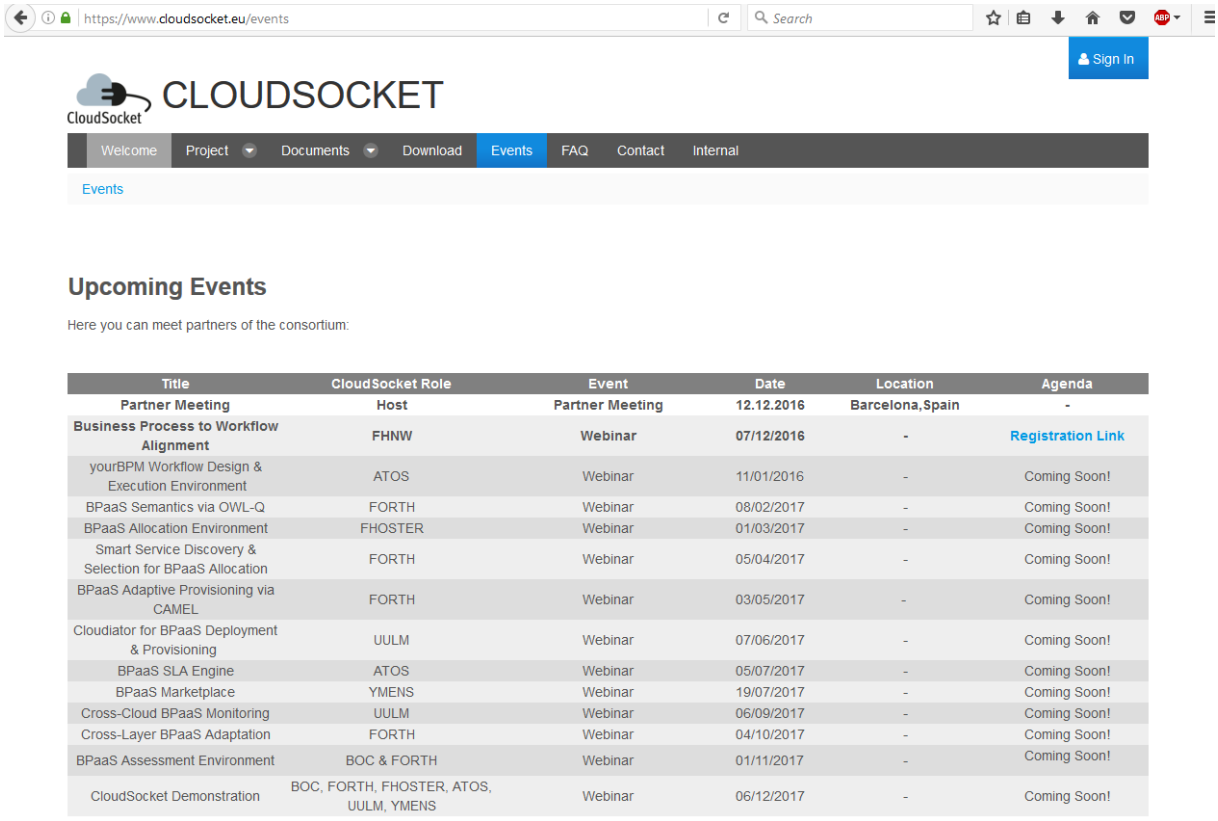
In the following, we shortly describe the webinars that have been conducted starting from the first type and then moving to the second one. The description follows a specific structure which includes the webinar title, date, presenters, content, audience and number of participants.

2.7.1 Project Specific Webinars

The whole list of webinars, apart from the last one, is depicted in Figure 8, which shows the respective events page on the CloudSocket web site. Compared to the initial plan provided in D7.3, Annex C, there have been

[3] https://www.youtube.com/watch?v=feBaBfcPTYk&index=1&list=PLrrOjki3mo9sXRQOC0KmtajWhE6Dk_Ilq&t=365s

some small changes while the respective dates and presenting partners have been determined. As it can be seen, a vast amount of webinars is planned to be held in the last year of the project. Please, now, see below a summary of the seminars held during this year.



Title	CloudSocket Role	Event	Date	Location	Agenda
Partner Meeting	**Host**	**Partner Meeting**	**12.12.2016**	**Barcelona,Spain**	-
Business Process to Workflow Alignment	**FHNW**	**Webinar**	**07/12/2016**	-	**Registration Link**
yourBPM Workflow Design & Execution Environment	ATOS	Webinar	11/01/2016	-	Coming Soon!
BPaaS Semantics via OWL-Q	FORTH	Webinar	08/02/2017	-	Coming Soon!
BPaaS Allocation Environment	FHOSTER	Webinar	01/03/2017	-	Coming Soon!
Smart Service Discovery & Selection for BPaaS Allocation	FORTH	Webinar	05/04/2017	-	Coming Soon!
BPaaS Adaptive Provisioning via CAMEL	FORTH	Webinar	03/05/2017	-	Coming Soon!
Cloudiator for BPaaS Deployment & Provisioning	UULM	Webinar	07/06/2017	-	Coming Soon!
BPaaS SLA Engine	ATOS	Webinar	05/07/2017	-	Coming Soon!
BPaaS Marketplace	YMENS	Webinar	19/07/2017	-	Coming Soon!
Cross-Cloud BPaaS Monitoring	UULM	Webinar	06/09/2017	-	Coming Soon!
Cross-Layer BPaaS Adaptation	FORTH	Webinar	04/10/2017	-	Coming Soon!
BPaaS Assessment Environment	BOC & FORTH	Webinar	01/11/2017	-	Coming Soon!
CloudSocket Demonstration	BOC, FORTH, FHOSTER, ATOS, UULM, YMENS	Webinar	06/12/2017	-	Coming Soon!

Figure 8 - The updated webinar list

BOC

– Title: Business Process as a Service (BPaaS) - The BPaaS Design Environment
Date: November 18th 2016
Presenter: Robert Woitch
Content: An overall overview of the CloudSocket project was provided as well as an insight over the first environment involved in the management of BPaaS, the BPaaS Design one, which has been built from the ADOxx platform.
Audience: The audience was attracted via respective social media campaigns over twitter, facebook and linkedin. The project also had the opportunity to disseminate the announcement of the event over their individual email lists. In this sense, different types of audiences could be attracted which matched well also the content of the webinar presentation.
Number of Participants: 23

FHNW

– Title: Business Process to Workflow Alignment
Date: December 7th 2016
Presenter: Knut Hinkelmann
Content: The webinar focused on how to achieve business process to workflow alignment and especially on the research contribution from FHNW and BOC related to the semantic modelling and lifting of business process and workflow information and the semantic rule-based matching of business process activities to workflow fragments.

Audience: Same as in the previous webinar. Different types of audiences could be attracted which matched well also the content of the webinar presentation.
Number of Participants: 15

2.7.2 Individual Webinars

BWCON: BWCON has provided a vast number of webinars all underlining the functionality of the CloudSocket broker. These webinars can be accessed by: https://venture-dev.com/group/2308/dashboard/, while Figure 9 depicts all of them when the aforementioned link is followed. Below is a summary over all the seminars that have been held.

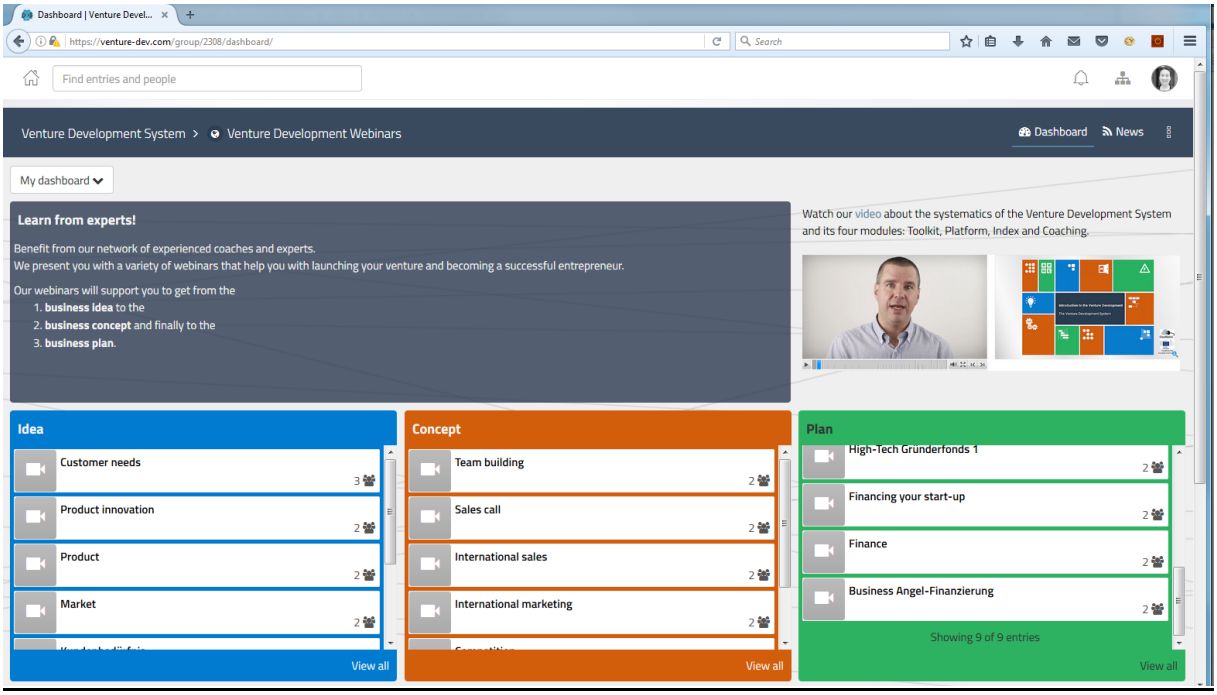


Figure 9 - Snapshot of the BWCON Venture Development System showing the available webinars

– Title: A set of webinars for helping start-ups and SMEs with launching their venture and becoming a successful entrepreneur.
Date: Online on the bwcon Venture Development System. The registered users can access them at any time.
Presenter(s): Joaquin Soucheiron
Content: It is a set of webinars which support start-ups and SMEs to get from the business idea to the business concept and finally to the business plan.
Audience: Start-ups and SMEs
Number of participants: 300

ATOS:

– Webinar title: "YourBPM, Business Process Modelling. How to work with the business process definition efficiently?".

Date: September 29th 2016
Presenter(s): Joaquin Iranzo Yuste, Ilona Cieslik
Content: This webinar aimed at introducing YourBPM tool. It was a combination of the business and technical approach, including a short demo presentation.
YourBPM is an open and multiplatform tool for designing business processes and orchestrating associated services. It is integrated with Activiti engine in order to support the BPMN2.0 standard to ensure interoperability. It extends and provides additional functionalities, such as automatization of code generation, integration with external registries and Identity Managers, supporting multi-tenancy, working to introduce a semantic solution to reduce the gap between business and technical skills, and introducing innovative concepts like BPaaS.
The main idea lying behind a service orchestration tool, which is facilitated by YourBPM, is to convert implicit business knowledge into an executable solution to implement the different processes within an organization. Besides, YourBPM is fully domain-independent, since it can be applied in different domain such as Industry 4.0, Advanced Manufacturing, IoT, or even day-to-day management operations within an organization (i.e. Public Administrations, big corporations, etc.).
Audience: Atos Research and Innovation (ARI) internal community. The main objective was to raise awareness and transfer knowledge to scientific community of Atos on CloudSocket results and achievements.
Number of participants: +25 researchers, technicians, business consultants, and head of sectors, including Business Development and Technology Transfer managers.

– Webinar title: SLAs – Service Level Agreement.
Date: November 24th 2016
Presenter(s): Olivier Barreto Rodriguez, Roman Sosa
Content: This webinar presented the next asset of Atos ARI, which is a part of CloudSocket framework, the SLA Engine. This webinar involved presenting a combination of the business and technical approach for this asset, including a short demo showcase. The asset´s presentations included the following topics:
    - Why SLAs ?
    - Atos Research and Innovation 's work on SLAs
    - SLALOM's Models: Legal Contract & Tech Specifications
    - SLA Technical Framework & Tools

Audience: Atos Research and Innovation (ARI) internal community. The main objective was to raise awareness and transfer knowledge to scientific community of Atos on CloudSocket results and achievements.
Number of participants: +30 researchers, technicians, business consultants, and head of sectors, and including Business Development and Technology Transfer managers.

FHOSTER:

– Webinar title: Data & Processes modelling in tracking hotel reservations for pricing optimization
Date: June 15th 2016
Presenter: Antonio Leonforte
Content: Applying filters and pre-processing steps to an historical dataset of reservations is critical to define the best pricing for rooms in a hotel. The sequence of such filtering & pre-processing steps plays an important role in the final result, and it is important to let an end-user to easily and interactively define such sequence using BPM techniques, in order to find out the best one. During the webinar, Livebase has been presented as the reference platform to model reservation data, and the CloudSocket project has been

introduced as a potential tool allowing hotel managers to pick up and execute pre-defined algorithms for calculating the best pricing according to historical reservations.
Audience: FHOSTER R&D team + employees of a potential customer (Franco Grasso) in the hotels-management industry.
Number of participants: 4 software engineers + 3 business domain experts

– Webinar title: Data & Processes modelling in tracking hotel reservations for pricing optimization
Date: July 13th 2016
Presenter: Antonio Leonforte
Content: Calibrating measurement tools generates a vast amount of structured data, whose gathering and storage can be conveniently provided by a model-driven platform like Livebase. However, a number of authorization and quality procedures require a platform whose modelling capability goes further than plain data-modelling to cover business process modelling as well. During this webinar, the customer has been introduced to the paradigm of Business Process modelling and to the CloudSocket concept, as a way to quickly pick a business process from a predefined set, and immediately start using it as a service.
Audience: FHOSTER tech pre-sale team + employees of a customer (STI Sviluppo Tecnologie Industriali) in the metrology industry.
Number of participants: 2 FHOSTER tech pre-sale engineers + 4 business domain experts

3 DISSEMINATION PLAN FOR YEAR 3

In order to achieve the main dissemination goals of CloudSocket, we need to carefully follow the dissemination roadmap that has been designed and planned. To this end, the consortium will focus on fulfilling all the planned activities as well as attempt to realise the very few that have been left from the second phase of this roadmap. This will also include the production of respective research posters that will be shown in the 2nd project review and will be used for further dissemination purposes in related events. In the sequel, we first present two main events that are planned to be held by CloudSocket and then we focus on outlining the individual dissemination plans of the CloudSocket partners which provide evidence that a great deal of activities will be carried out in the final year of the project which conform to the last phase of the dissemination roadmap.

CloudSocket will submit a workshop proposal on CLOSER 2017 at early January. This workshop will attempt to attract as many participants as possible by encompassing a wide range of topics which are however all related to CloudSocket. The respective submission content has already been specified while the potential PC members are currently contacted. In order to also reach the respective KPI target, additional workshop submissions will also be pursued mainly by the research partners of the project focusing on respective conferences related to business process management and cloud computing.

CloudSocket will also submit a tutorial proposal on ICEIS 2017 which will focus mainly on BPaaS modelling and validation aspects which will be shown to be handled by the respective BPaaS Design Environment produced out of this project. Venues for showcasing additional CloudSocket results are currently under inspection, including BPM 2017 or cloud-related conferences.

FORTH: Apart from planning to disseminate CloudSocket via teaching and participating in EC cluster events, the following conferences are targeted by FORTH towards the publication of CloudSocket related research results for the final year of the project:

- CLOSER 2017 – Presentation of results related to BPaaS evaluation (mainly KPI analysis), cross-layer BPaaS monitoring as well as SLA modelling and enforcement
- BPM 2017 – Presentation of results related to BPaaS evaluation (focusing on other types of analysis that are being supported)
- CloudForward / CloudCom 2017: Presentation of results related to the knowledge-assisted cloud service selection in the context of BPaaS
- ESSOC 2017: Presentation of results over cross-layer BPaaS monitoring and adaptation (especially the latter part).

Please note that some of the results to be presented involve other partners which means that joint publications can be achieved. In addition to submitting papers in relevant venues, FORTH will also attempt to submit journal articles. Moreover, it is planned to conduct 2 webinars as well as to organise one CloudSocket-related workshop. During the participation in relevant events or the conduction of respective workshops and webinars, FORTH will use the project twitter account in order to make the respective announcements while it will also distribute project-related material.

FORTH also considers participating in future events of the IFIP Working Group on Service Oriented Systems WG 2.14/6.12/8.10 as this will also enable a better dissemination and outreach of the CloudSocket project, especially as the members of this group are both academic and industrial parties. This will also enable keeping in contact with future research agenda over services.

UULM: As already performed in the course of the project, dissemination is conducted via teaching and participating in EC cluster events. Concerning teaching, we spread the idea of BPaaS to emphasize and demonstrate the extension of the common cloud-stack in the lecture “Cross-organizational distributed systems and Clouds”. Additionally, in the data centre seminar, the students are represented with process topics related to Business-to-IT-alignment as addressed in CloudSocket. Moreover, several conferences are targeted towards the publication of CloudSocket related research results for the final year of the project, such as:

- CLOSER 2017: We aim to publish the cloudiator tool-suite as a cloud computing enabling technology.
- CloudForward / CloudCom 2017: We aim to publish the developments on our Cross-Cloud Orchestration Tool that were enacted during CloudSocket.
- ADBIS 2017: We target a publication towards our research on benchmarks and host selection for distributed databases in the cloud.
- ESSOC 2017: The achieved CAMEL extensions and their suitability could be published at this conference.
- Middleware 2018: We aim to have a publication focusing on comparing our Cross-Cloud Orchestration Tool with related state-of-the-art tools promising to have similar functionalities.
- EDOC 2017: This is a target to publish results concerning the DMN-to-CAMEL based mapping, i.e., from high-level models to the lowest technological ones.

Journal publications are also targeted: for example, in the International Journal of Cloud Applications and Computing (IJCAC), Journal of Cloud Computing: Advances, Systems and Applications (JoCCASA), or the Business Process Management Journal. Similar to the publications mentioned by FORTH, some of the results to be presented involve other partners, which means that joint publications can be achieved.

UULM is planned to conduct 2 CloudSocket webinars. Concerning a CloudSocket-related workshop, we will support FORTH in this undertaking where possible. The Communication and Information Centre (kiz) at the University of Ulm is currently preparing a proposal related to project management. UULM's CloudSocket representatives will drive and lead the discussion targeted around how to deliver cloud-based project-management services. With the KIZ being a broker on their own data centre, CloudSocket is a convincing approach to realise this goal. While participating in relevant events or conducting respective workshops and webinars, UULM will also use the institute's twitter account in order to make the respective announcements which will be eventually picked up by the CloudSocket twitter account for re-tweeting.

FHNW: At the International Conference on Enterprise Information Systems (2017), there will be a workshop on Advanced Enterprise Modelling, Co-organized by FHNW. At this workshop the hybrid modelling environment of CloudSocket shall be presented.

ATOS: ATOS is monitoring on a regular basis potential dissemination opportunities for CloudSocket internally and externally. As in year 2, ATOS communication team will use internal networks to disseminate information on CloudSocket participation in the events, the scheduled Webinars and technologically mature results. More intensive and rigorous campaigns will take place through:

- Atos ZEN – this is the main Atos internal tool to communicate, share information and contribute to drive innovation in our social enterprise. We identified in Y2 around 10 top employee groups of project interest like: Atos Research and Innovation (155 members: researchers, business consultants and head of sector), Canopy Product & Project Management (100 members oriented at Cloud technologies), ARI-ALL Exploitation and Dissemination (69 business and exploitation consultants), Atos Sales Today (2594 marketing, sales and management members). The mail purpose will be to share articles and short blogs

about diverse CloudSocket-related topics like “yourBPM for BPaaS”, “CloudSocket architecture”, and to invite ATOS colleagues to webinar and events organized by project partners.
- Atos Sales Portal – it is the main ATOS place to share and look for intimation related to ATOS portfolio. CloudSocket communication team will contribute to online content and newsletter updates (informing about CloudSocket Events and On-Site Trainings, results, etc.)
- Atos Spain social media, especially ATOS Spain twitter account to re-tweet and share CloudSocket news with aim to improve project visibility
- Internal dissemination through ATOS blog (http://ascent.atos.net/) and ATOS Research and Innovation yearly booklet release "Innovation is in our DNA" https://atos.net/content/dam/global/documents/we-are/atos-brochure-research-innovation1.pdf (the new release for 2016 is under preparation).
- Internal webinars (similar to SLA & yourBPM webinars organized in Y2) to disseminate project´s outcomes and to identify potential synergies with other projects.

ATOS, through its participation in the cluster for Inter-cloud Challenges, Expectations and Issues, will continue (as till today) monitoring projects related to multi-Cloud, BPM, automated discovery and composition of services, establishing connections with other European projects to raise awareness about CloudSocket and setting the basis for future cooperation, re-use or share of assets (current and planned collaboration activities are presented in the parallel report on CloudSocket D7.6 Second Year Cooperation Report).

In terms of external communication, ATOS together with other cloud initiatives from Cloud Cluster and project partners are identifying on a regular basis for the final period a set of events which could be of further interest. Some of events which will be considered are under revision and Atos Research & Innovation group will consolidate a final ARI list at the beginning of 2017 to align efforts between all ARI sectors and projects, including CloudSocket. Some of the promising events are: Cloud Expo Europe 2017, Net Future 2017, or eChallenges 2017.

YMENS: YMENS intends to exploit all the company’s communication opportunities in order to increase the awareness of the project. All marketing activities related to the project dissemination will be shared on social media. Additionally, YMENS will run dedicated initiatives as follows:

- Dissemination through articles / PR
    - Dedicated article presenting the progress of the project, the innovation of BPaaS concept towards SMEs and the expected impact.
- Dissemination through dedicated content
    - Online CloudSocket section describing the project within YMENS website
- Dissemination through events – YMENS intends to promote the project by participating to at least one cloud dedicated event.
- Internal Communication
    - internal newsletter
    - internal workshops, within Teamnet Group, with the purpose of gathering ideas for ‘go-to-market’ strategies.

BWCON: BWCON still transfers the concept of BPaaS to various SMES. Discussion with two specific SMEs, namely GADV (www.gadv.de) and fabricado (www.fabrikado.com), has been already started. Additionally, BWCON plans a large sensitisation event in Summer and during the e-health forum 2017 (http://ehealth-forum-freiburg.de/), to be held in Freiburg in May 2017. The concept of BPaaS will be discussed there with experts from the telemedicine/digital health domain.

MATHEMA: The dissemination plan for the third year of the project is based on the collaboration that MATHEMA has with important scientific institutions in Florence, namely CNR, PIN and University of Florence (Faculty of Engineering). Within this partnership, the CloudSocket project will be presented in workshops for final year students and doctoral candidates of the faculties of information engineering and Cloud Computing. The potential of the CloudSocket project will be disseminated within the other technology research projects in which MATHEMA is partner at European level (e.g., Replicate H2020), and at regional level. The CloudSocket potential will also be shared with other scientific and industrial stakeholders for its re-proposition in national and European projects.

FHOSTER: FHOSTER has a long-term agreement with the Roma Tre University to make a three hours seminar and a half-day laboratory hands-on exercise on its model-driven technologies. Such event is held annually since 2011 (April 4th 2011, May 28th 2012, June 4 2014, May 25th 2015) and is mainly attended by students close to obtaining their Master Degree in Software Engineering. It is our plan to dedicate the 2017 event to introducing the BPaaS concept and the CloudSocket project.

As already done during 2016, FHOSTER will introduce the BPaaS concept and the CloudSocket platform to any of its existing customers already using its cloud-based Livebase platform as well as to potentially new ones, thus highlighting the need to implement business processes in an agile and cost-effective way.

Finally, FHOSTER will extensively use the CloudSocket Allocation Tool as a demo harness to present all the new Livebase features that have been implemented into Livebase in order to achieve the CloudSocket goals.

BOC: BOC will shift their CloudSocket results onto the ADOxx.org community and accompanies this shift with conference, workshop and webinars presentations. In particular, the CloudSocket development space on ADOxx.org will be continuously updated to also include training material and updated prototypes to be used in the regular ADOxx.org training days. Possible conferences are CAISE, INFOCOMP, RE, ER, IFIP, PoEM or AEM in 2017. AEM and IFIP are candidates for additional tutorials. Beside the academic line, BOC will strengthen the channel-based dissemination by distributing a white paper through its own & project channels as well as pushing towards public press releases to attract also the non-academic community.

4 SUMMARY

The consortium has developed a project specific dissemination strategy and roadmap that are followed in the course of the project. During the second project year, the consortium has achieved most of the goals in the dissemination roadmap with very scarce exceptions that will be remedied or adapted in the final project period. As a result, a great effort has been put by many project partners in intensifying the dissemination activities. Apart from reporting all these activities, this deliverable has provided a status on how far the project is with respect to the fulfilment of the respective dissemination goals set and has updated these goals in some cases to become more realistic. In fact, it should highlighted that some of the dissemination goals set have already been reached while the project is on track for fulfilling the rest of them.

This document has also outlined the individual dissemination plans of each CloudSocket partner for the final year of the project. Apart from fulfilling individual dissemination goals, these plans are in accordance to the last phase of the dissemination roadmap. As such, by faithfully following these plans as well as the overall roadmap, the consortium is confident that most, if not all, of the dissemination goals that have been originally designated will be achieved in the end. As such, this will be a major sign of the project success, its outreach and its overall great impact.

5 REFERENCES

[1] R. Woitsch, I. Febles, D. Irimia, A. Leonforte, Y. Liang, E. Bellini, J. Domaschka, D. Seybold, D. Plexousakis, K. Kritikos, C. Zeginis, and K. Hinkelmann, 'D7.3 – First Year Dissemination Collection', CloudSocket project deliverable, 2015.

ANNEX A: NEW PROJECT FLYER BY YMENS

CloudSocket

European Commission

Script your business into the Cloud

Creates an environment for
the conversation between business and IT.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 644690. The document does not represent the opinion of the European Commission. The European Commission is not responsible for any use that might be made of its content.

BENEFITS:

- **Flexibility and cost effectiveness** by providing access to technical resources on a "need to use" basis
- **Easy and fast upgrade** for technical internal processes within SMEs
- **One-stop shop** providing customized multi-cloud solutions

CloudSocket covers the discovery, orchestration, deployment and execution of BPM services in the cloud. The project shapes the concept of Business Process as a Service (BPaaS), aiming to maximize the added value provided to SMEs.

It represents a learning cycle which improves cloud individualization over time. With CloudSocket, the level of integration is shifted from the technical to the business level.

It translates and wraps business processes into specific technical solutions (BPaaS) available in the cloud.

www.cloudsocket.eu info@cloudsocket.eu

ANNEX B: PROJECT ROLL-UP BY YMENS