Development of knowledge-based web services to promote and
advance Industrial Symbiosis in Europe (**eSYMBIOSIS**)

LIFE09/ENV/GR/000300

END-OF-ACTION REPORT

ACTION 4

SERVICE ARCHITECTURE & IMPLEMENTATION

June 2014

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1. INTRODUCTION

1.1 MANAGEMENT FRAMEWORK AND PROCEDURES

NTUA is the overall Project Coordinator supervising the progress of all the actions in close collaboration with all the associated beneficiaries. In project Management, NTUA:

(i)   has the global view on the project;

(ii)   ascertains the progress;

(iii)   manages the priorities during the project;

(iv)   secures the flow of information between the project actions/activities as well as between the project beneficiaries as required for the implementation of the project..

The Executive Committee composed from representatives of all beneficiaries of the project with the Project Coordinator manage the progress of the project, resolve issues, enhance communication among the participants and to inspect the quality and deliverables and reports. For each Action / Activity there has been assigned a Leader amongst the beneficiaries.

The end-of-Action Reports are internal management quality reports of eSYMBIOSIS, as described in the technical Annex of the project and conform to the standard of the Life+ Programme for monitoring project progress via reports/deliverables.

The end of action report is produced in the scope of Action 7, which is responsible for the monitoring and evaluating the project's progress and performance and is running during the whole duration of the project

The general procedures of Action 7 mandate that the coordinating beneficiary (NTUA) together with all the associated beneficiaries perform their monitoring tasks assessing progress of each Action with respect to the expected results and the performance indicators.

For each Action - Activity a managing representative is responsible to prepare a short end-of-Action report and submit it to the Executive Committee assessment. The end-of-Action reports contain information on the work done within the Action under the scope of the Action objectives and the Indicators set.

1.2 END OF ACTION 4 REPORT

Summary

The present document is the *End-of-Action* report of Action 4, "Capacity building".

Action 4 involves 2 Activities: A41 and A4.2 as follows:

- Activity 4.1:   Training;
- Activity 4.2:   Forum with participants to fine tuning the platform in operation.

In Activity 4.1 training sessions took place for specific target groups (training courses with sets of printed material) including authorities so to promote the concept of Industrial Symbiosis and support and the personnel of companies that are expected to be involved in Industrial Symbiosis Activities.

It was foreseen that approximately 50 persons will participate at each training courses, these numbers have been exceeded.

In Activity 4.2 a focus group was formed to review the functionality of the developed platform in operation. The user feedback on the platform was used for the final modifications and tunings. The original target was that 20 persons from a wide range of companies in the target region will be used for this purpose which was exceeded.

The main results of the Action 4 is the successful delivery training of the industry and to get useful feedback to improve the platform performance.

Action 4 of eSymbiosis has the target: to receive a minimum of 80% positive feedback.

The main indicators for the performance of Action 4 are:
- To train at minimum 40 participants,
- To establish e groups of 10 participants each in focus groups for discussion

The project delivered 3 events, where training took place as follows:
- **Launching / Capacity Building, Oinofyta, Greece**: An event in Livadia has taken place, 20/03/2012, to disseminate Industrial Symbiosis concepts in the regional industry. The event was advertised in regional press and sites. The Event was organized by NTUA and ENVIRECO, and was hosted by the Region of Sterea Ellada, in Oinofyta, Municipality of Tanagra. The Industrial Participation and reach was assisted by the Chamber of Regional Industries of Sterea Ellada.
- **Training session of Capacity Building in NTUA**: PIC & ENVIRECO contributed to the preparation and delivery of the event organized by NTUA, held on 3rd April 2014, at NTUA, which was well attended and raised interest to the participants on Industrial Symbiosis.
- **Training session of Capacity Building in the eSymbiosis Conference**: The technology team, led by CLMS prepared and carried out the presentation of the platform to the participants of the SYMBIOSIS 2014 conference on 19th and the 20th of June. CLMS delivered training sessions during the conference

which introduced and presented the platform in depth to the interested companies of the region, but also to the public including international conference participants and individuals. Both CLMS and AVCO were present during the SYMBIOSIS 2014 International conference and met parties interested in the platform and its techniques to explain and present the technologies behind it.

2. ACTION ASSESSMENT AND EVALUATION

2.1 WORK PERFORMED

With the aim to initiate early as possible industry oriented activities, Activity actually started (with the launch – capacity building event) 20th March 2012, by presenting to the Regional Industry the Industrial Symbiosis concepts. A training event on the concepts of Industrial Symbiosis and a platform demonstration took place in NTUA, 03/04/2014. Finally Training and forum activities took place in the European eSymbiosis Conference event in Athens, 19-20 June 2014.The details of Action 4 are shown in Figure 1.
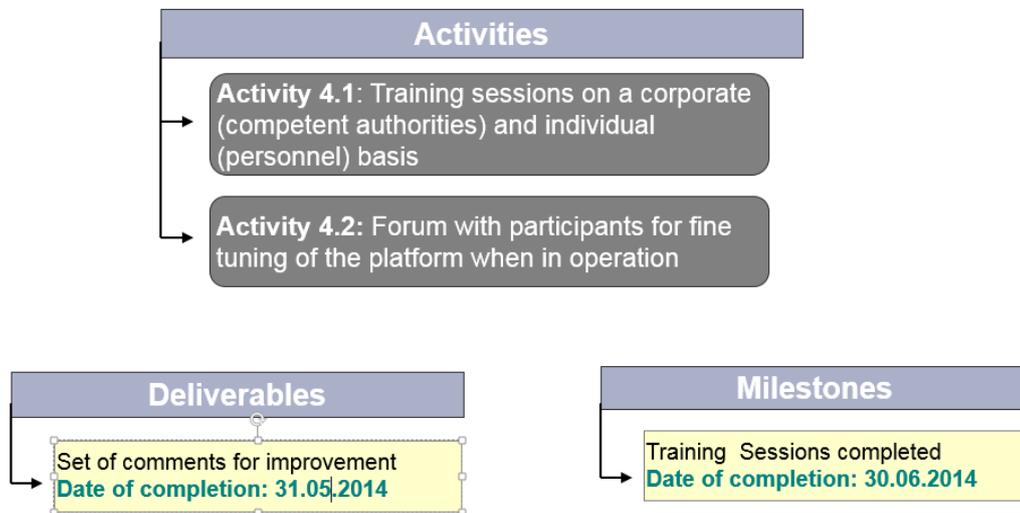

Figure 1: Action 4

According to the Management / Monitoring Procedures Framework of eSymbiosis as previously described, partners responsibilities are shown in Figure 2:
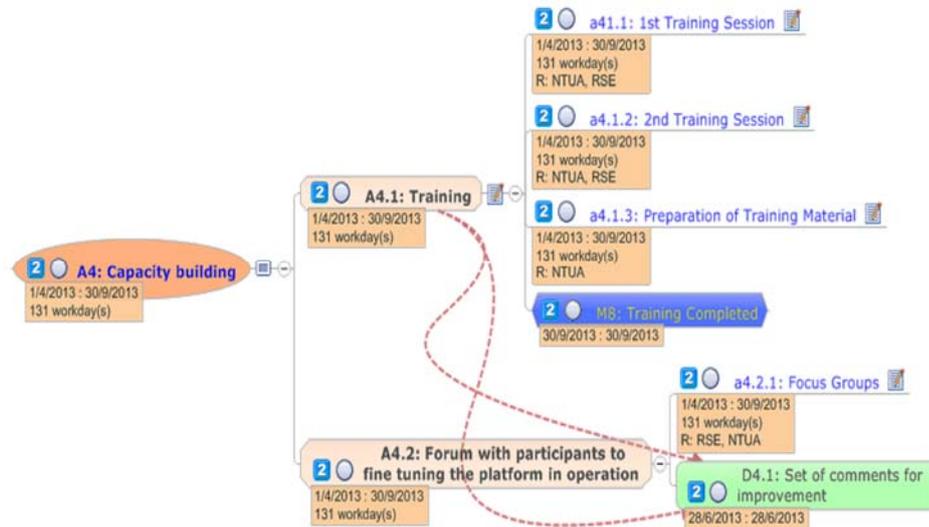
Figure 2: Acton 4 Tasks and Responsibilities

Activity A4.1 Training: Beneficiary NTUA was responsible for this activity. NTUA has a great experience in organizing training, as delivered in the course of the last months of the project. A training handbook was prepared.

Activity A4.2 Forum with the participants for fine tuning the platform in operation: Beneficiary NTUA was responsible for this activity. NTUA has a great experience in organizing focus group interviews, in the course of the last months of the project.

Action 4 started earlier on March 2012, involving the following activities:

a. **Activity 4.1 Training**: In order that the Industry starts using the eSymbiosis platform, first must understand and adopt Industrial Symbiosis, as the platform actually automates a model process of Industrial Symbiosis.

For the benefit of the project and the early as possible engagement of the regional Business community in the project, the consortium has decided to bring the "Launch Event" forward, as early as possible the start of this Activity, ca. one (1) year ahead of schedule in the Description of Work. .

The subsequent event took place in Athens, in the premises of NTUA, with the aim to again establish a good understanding of Industrial Symbiosis and to

demonstrate the supportive technology developed by the eSymbiosis consortium.

Finally, in the European eSYMBIOSIS conference, the highly improved and tuned version of the platform was presented and tested by users, and members of Industry. The conference topic was on Industrial Symbiosis. There were a number of sessions, involving a large number of companies and participants, from both the Region but also Europe

b. **Activity 4.2 Forum with participants to fine tuning the platform in operation:** The presentations did link technology with the business concepts of eSymbiosis, the feedback we got from the conference held events was very positive.

2.2 PROGRESS ACHIEVED

This action focused on generating a core of interest and enthusiasm amongst the potential IS network in Viotia, through engagement events, demonstrations and the development of 'hands on' training capability that will support the eSymbiosis IS community as it develops. This core forms the 'fuel' for the future growth of the network by acting as local 'champions' who are willing and able to promote IS with their own contacts.

The events that were held through the lifetime of the project were carefully designed to provide a clear and compelling case for IS, and illustrate ways in which it has generated direct benefits to industry and the local economy in other locations – for example in the UK. They engaged with the intended number and mix of audience, including industries (with a focus on SMEs), authorities, regulators and academics. The presentations used were made available in both Greek and English to ensure that they were able to have maximum impact.

2.3 DEADLINES AND DELIVERABLES

The deliverables of Action 4 were performed as planned, considering the required project extension, so that a mature solution to be delivered as the Platform or eSYMBIOSIS was presented to the events participants.

The benefit for the time extension was the enrichment of the Portal services, the nice user interface, the robust feeling of the facilities..

The Action Deliverable are is the set of comments for the improvement of the platform.

Table 1: Action 3 Deliverables

Name of the Deliverable	Status	Planned[1]	Actual
4.1 Set of comments for improvement	Delivered	30/06/2013	30/6/2014

The Milestone related to Action 4 has been achieved at the end of the project. The functionality of the portal was demonstrated to a large audience during the Conference and the training events.

Table 2: Action 3 Milestones

Name of the Milestone	Status	Planned	Actual
Demonstration workshops	Delivered	31/07/2013	30/6/2014

After the modification the project was extended by nine (9) months. The platform integration tests by the users were delayed, mainly because of cash flows problems, as the second payment of the project was released in December 2013. For this reason the events could not be performed earlier, thereby, this has affected capacity building events.

2.4 PROGRESS INDICATORS

The overall assessment of Actions is performed on the basis of evaluating the level of target figures reached. As regards Action 4, all Activities have been completed successfully regarding expected results and progress indicators as presented in the following tables.

Table 3: Action 4 Results

Expected Results	Status	Comments
Successful training of the personnel and the useful feedback to improve the platform performance with a minimum of 80% satisfaction in feedback.	Complete	Feedback received exceeded the >80% positive criterion

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[1] In the original Plan, i.e. before the project's nine (9) months extension.

Table 4: Action 4 Progress Indicators

Indicators of Progress	Status	Comments
Number of participants to the training session to a minimum of 40 participants;	Complete	65 participants
Number of participants in the focus group discussion. With a minimum of 2 groups with at least 10 participants in each.	Complete	More than 25 participants

As shown above in Table 3 and

Table 4, the targets of the action have been achieved or exceeded. The platform accurately and realistically represents and captures all details of the Industrial Symbiosis processes, enhancing the easiness to engage and interact, perform waste resources interests matching and exchanges, and support learning and process improvement. The platform supports realistic business interactions scenarios, and ready to be used with the necessary adaptation, in extended National and International applications of eSymbiosis. The trainings were delivered using plain, business oriented language avoiding technology jargon. The audience reaction was very positive.

2.4 OVERALL ACTION EVALUATION

When considering the outcome of this Activity, while we feel that it was generally successful, the most efficient use of our resources and met the intended targets, we feel that holding more regular, smaller capacity building events (perhaps focused on particular industry or location groupings) might have had even more impact. We recognise that it would, however, have been less efficient - so we might have had to take resources from other activities, potentially having a negative impact on them.

3. RISKS, PROBLEMS ENCOUNTERED, REMEDIATION

In Action 4 the main risks for the platform production of were that the:

   a. Industrial Symbiosis process is complicated and not well documented,

   b. results would be perceived as simply an academic exercise not capable to be used in Industrial applications,

   c. the trainings would be very technical for the Industrial participants, making communication not effective

   d. time required to develop would not suffice for the proper demonstrations.

The above during the process of the platform integration and deployment

   a. The requirements task was covered in Action 1, and in this action the final trimming and tuning of the applications, and the definition and enhancements of the user environment were driven by PIC which has sound knowledge and understanding on the process. At the same time, this knowledge has been used to improve the documentation existing for the processes.

   b. All presentation scenarios were based upon practical examples, based on best practices from industry in the UK, thereby capturing the interest of the audience. The platform is user friendly, and as said in the conference, the ease of use of the platform outperforms existing facilities.

   c. The trainings were very carefully designed and practiced before, so to avoid the exclusion of individuals from the audience not interested in the technical implementation details but to practical solutions to their problems and to understand the benefits and improvements of their industrial production.

   d. The time planned was more than sufficient, however at the end was too much pressure, due to the delay in capacity building actions, so to include user's feedback, which was delivered late. The reason for this delay was that the cash flows of the project were very much behind schedule, caused by unforeseen events. Rapid development and over sourcing at the end on the side of the development teams has allowed to complete the project in within the project timeframe.

During all the performance of Action 4 tasks, there were weekly regular teleconference meetings for the Technical Platform Developments, go co-ordinate and align development.

The worst problem as explained elsewhere was the cash flows situation affecting the projects' ability to perform the capacity building actions, as those were not possible to be internally absorbed (e.g. development) by the consortium.

When finally this issue was resolved, the project fast-tracked development, and capacity building actions, so that all was well towards the final project Conference.