

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

LIFE09/ENV/GR/000300



ACTION 2: Service architecture and implementation

**D2.3 Design and implementation of analysis, feedback and interface
tools**



May 2013

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Revision History

<i>Revision</i>	<i>Description</i>	<i>Date</i>	<i>Authors</i>	<i>Notes</i>
Draft v.0.1	Initial Version Document	30/04/2013	CLMS	
Draft v.0.2	Extended with Feedback from Paul Innes	30/05/2013	CLMS	

1. INTRODUCTION

This document examines in depth the design and implementation of the toolset that supports establishment, management, and monitoring of the synergy lifecycle (*Activity 2.3: Design and Implementation of analysis, feedback, and interface tools*). This requirement is served by the high level modules of Information Management and Synergy Tracking & Reporting.

The components that materialize the aforementioned aspects are in close collaboration with the Semantic component (implemented by Avco Systems Ltd.), which is responsible for the semantic functionality of the platform. Before examining in detail the aspects of the platform that refer to the Activity 2.3, it is worth presenting the overall high level architecture and the consisting components of the platform from a functional perspective.

2. HIGH LEVEL ARCHITECTURE AND COMPONENTS

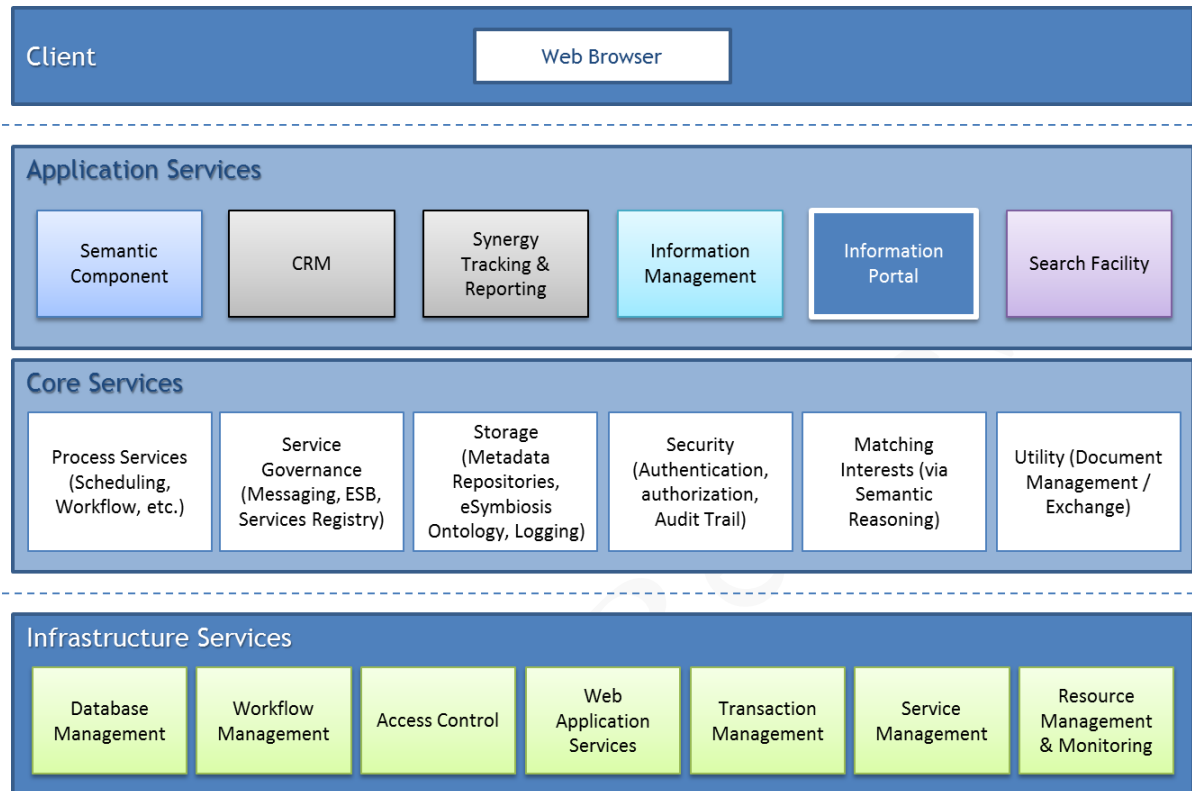


Figure 1: High level architecture of eSymbiosis platform

Figure 1 is a technical diagram based on a number of assumptions following the SOA philosophy. It identifies mainly two categories of services:

1. *Application Services* and
2. *(Platform) Core Services*.

These services use a number of Infrastructure services provided by the various technologies that are used in the project, including semantic technologies (e.g. Jena), RDBS (e.g. SQL Server), Communication (e.g. WCF) etc.

The high level functional components of the eSymbiosis platform are presented in the diagram of Figure 2.

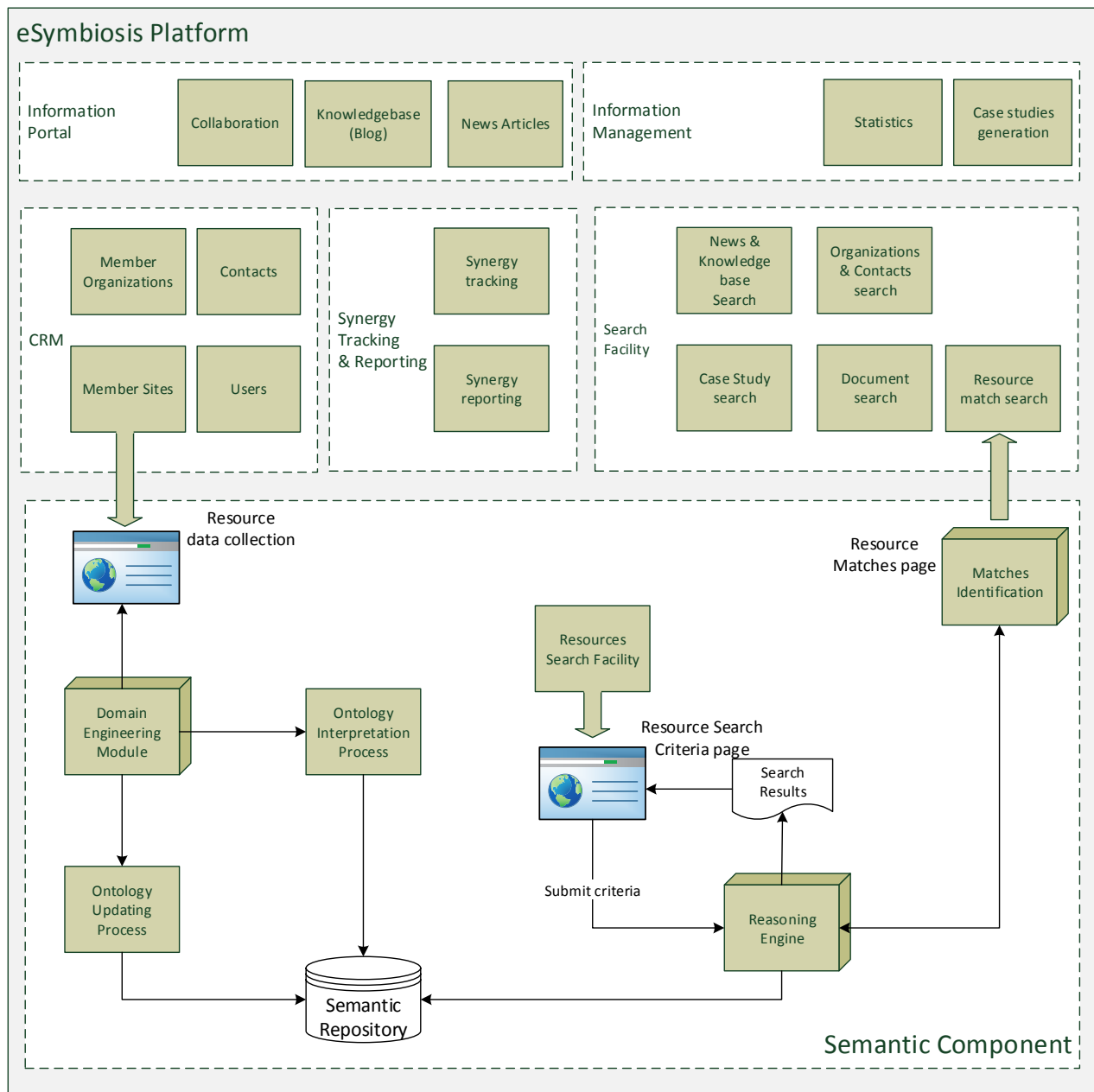


Figure 2: Functional components of eSymbiosis platform

The components and their services, as demonstrated in the above figure, are:

1. Semantic Component
2. Information Portal
3. CRM
4. Search Facility
5. Information Management
6. Synergy Tracking & Reporting

The current document focuses on the *Information Management* and on the *Synergy Tracking & Reporting* components. A more detailed analysis of the aforementioned components follows.

Draft for Review

3. INFORMATION MANAGEMENT

DOCUMENT MANAGEMENT

The platform offers document management services to different levels. Practitioners are able to attach documents to case studies, to news articles, etc. So the Information Management component implements a Document Management module that is the central store for all documents, files and e-mails that pass into and out of eSymbiosis.

CASE STUDY GENERATION

The component also provides functionality for generating Case Studies on completed Synergies based on templates. A practitioner is able to get a pre-filled case study of a synergy based on a selected template. In more detail, after the Synergy has been completed and the metrics of the two participating organisations have been validated, the IS Practitioner can create a new Case Study based on the Synergy and its relevant metrics. The IS Practitioner can access the case study form from the synergy form. In the case study form, the Practitioner can view the metrics of the

Edit Case Study

Synergy Metrics per Organisation

KAorg			
New Businesses Created	43	Jobs Created	32
Businesses Assisted	0	Training Outcomes	0
New Businesses Surviving	2	Jobs Safeguarded	23
Hazardous Waste Reduction	23.00	CO2 Reduction	5.30
Water Savings	11.00	Material Diverted	32.00
Additional Sales	0.00	Virgin Materials	0.00
Private Investment	0.00	Cost Savings	12.00
KVorg			
New Businesses Created	356	Jobs Created	2323
Businesses Assisted	35	Training Outcomes	5654
New Businesses Surviving	323	Jobs Safeguarded	2343
Hazardous Waste Reduction	45.00	CO2 Reduction	756.00
Water Savings	456.00	Material Diverted	345.00
Additional Sales	456.00	Virgin Materials	857.00
Private Investment	45.00	Cost Savings	32.00

Case Study Info

Title:

sample Case study

Last edited by:

Konstantinos Vasileiou

Edited on:

22/05/2013

Summary:

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.

Attachment Doc:

symbiosis1.jpg

Choose File

No file chosen

Save

Exit

Figure 3: The Case Study editing form (accessible by the IS Practitioner)

Synergy and can add descriptive details in relation to the Synergy's successful outcomes. The participating members of the project can review the existing case studies from the menu option *Success Stories*.

STATISTICS

Another aspect of the information management component is the Statistics. The Organisation user can view Statistics in relation to the Synergies created, the matches, the Sites per county, and the Sites per code. To access this screen, the Organisation user clicks from the top menu: *Information Center > Statistics*. A view of the statistics is provided in Figure 4.

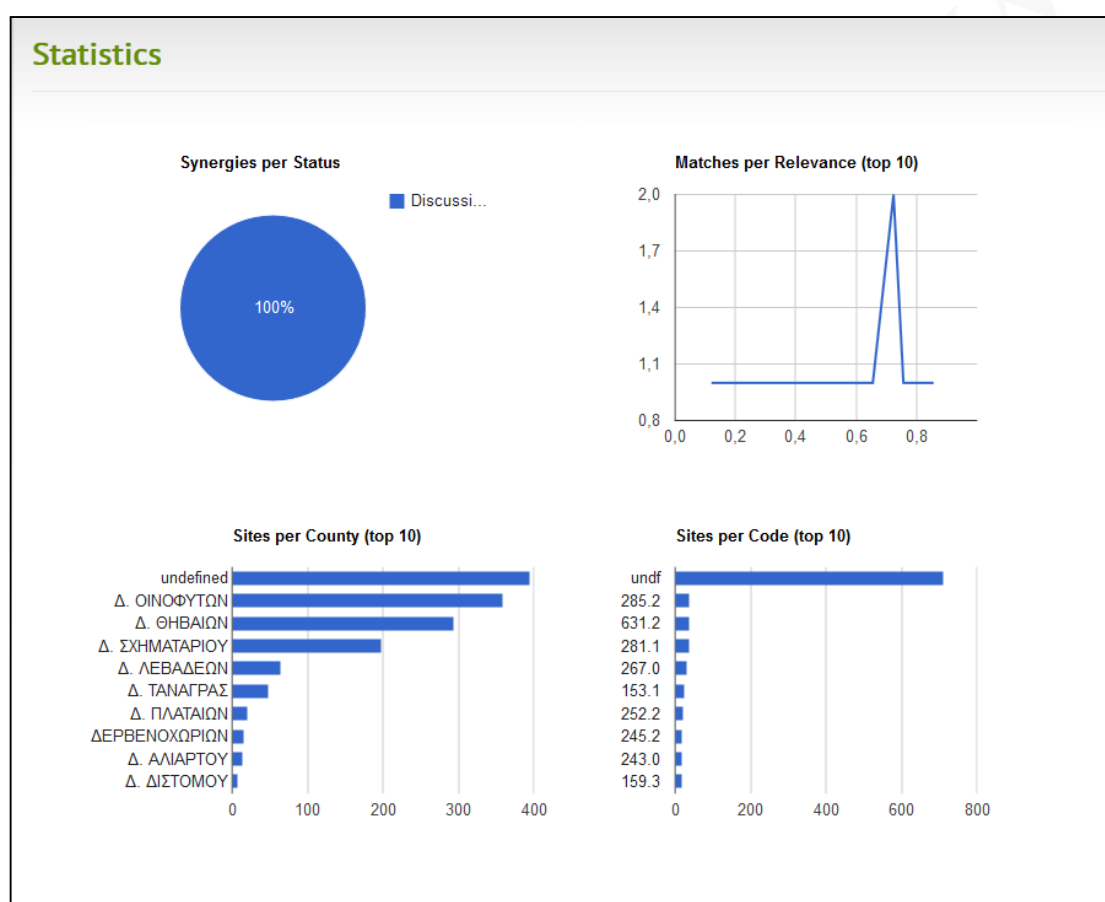


Figure 4: The overall statistics of the synergies

4. SYNERGY TRACKING & REPORTING

The details and the management of the Synergy by the two participating organisations and the assigned Practitioner is done from the corresponding web form of the component.

The Practitioners also have access to a summary list of all synergies that are assigned to them (i.e. to all synergies that take place within a region of their responsibility). The synergy list view is offered in four tabs, with the following synergy categories:

All Synergies: all the synergies that are in regions assigned to the specified IS Practitioner.

Completed Synergies: only the synergies that have reached the final step (Completion).

Pending Synergies: only the synergies that are not yet completed (i.e. have not yet reached the Completion status).

Blocked Synergies: synergies that blocked by one of the participating members and need the Practitioners intervention in order to resolve the issue and proceed towards their completion.

From the Organisation member's point of view, the following actions can be performed:

- View details about the other participant
- View details about the resource match, the properties of the resources, etc.
- Submit their agreement to proceed to the next step of the Synergy lifecycle.
- Block the Synergy process for a specified reason, so that the IS Practitioner will have to be involved to resolve the issue and unblock the Synergy.
- Submit comments for the other participating Organisation.
- Submit the synergy metrics from their perspective, in relation to the metrics that are utilized for the case study generation.

PROGRESS OF THE SYNERGY LIFECYCLE

The Synergy Tracking and Reporting component handles the workflow and monitoring of a match during its lifecycle:

- **Idea** – proposed synergy, known by all the parties involved, potential understood
- **Discussion** – The parties discuss in more detail (costs, quantities, critical path, etc.)
- **Negotiation** – The parties are now working towards a formal agreement
- **Implementation** – formal agreement reached and resources being exchanged

- **Completion** – Synergy is successfully completed

To progress from one step to the next, both Organisations have to agree that they are ready to proceed, by selecting the corresponding checkbox (i.e. *First party ready to proceed to next Status*) and clicking *Proceed to Next Step*.

The screenshot shows a web interface for managing Synergy progress. At the top, there are five tabs: 'Step 1: Idea', 'Step 2: Discussion', 'Step 3: Negotiation', 'Step 4: Implementation', and 'Step 5: Complete'. Below the tabs, the current status is 'Proposed synergy, known by all the parties involved, potential understood.' The main section has two tabs: 'Synergy Progress' (active) and 'Block Synergy'. Under 'Synergy Progress', there is a form with the following fields: 'Synergy ID' (1903), 'Creation Date' (09/05/2013), 'Completion Date' (empty), 'Blocked' (checkbox), 'Cancelled' (checkbox), 'First Party ready to proceed to next Status:' (checkbox checked), and 'Second Party ready to proceed to next Status:' (checkbox). A red box highlights the 'First Party ready to proceed to next Status:' checkbox, and a red arrow points to the 'Proceed To Next Step' button below it.

Then a notification is sent to the other Organisation user, in order to review the Synergy and maybe agree to the continuation of the process. When this agreement is mutual, the Synergy progresses to the next step and a notification is sent to both parties. A notification is also sent to participants when the Synergy has been updated or blocked.

An example of the notification is shown in Figure 5.

The screenshot shows a 'Notification Information' form. It contains the following fields: 'NotificationId:' (432), 'OrganisationName:' (Generic Power Supply Organisation), 'Header:' (Synergy saved.), 'Creation Date:' (12/11/2012), 'Content:' (Synergy has been saved. Please visit Synergy List to view details.), 'View related item:' (~/Forms/SynergyForm/EditSynergy?ID=767), and 'isRead:' (checkbox checked). At the bottom, there are two buttons: 'Delete' and 'Exit'.

Figure 5: Notification to member user about Synergy modification

BLOCKING/UNBLOCKING SYNERGY

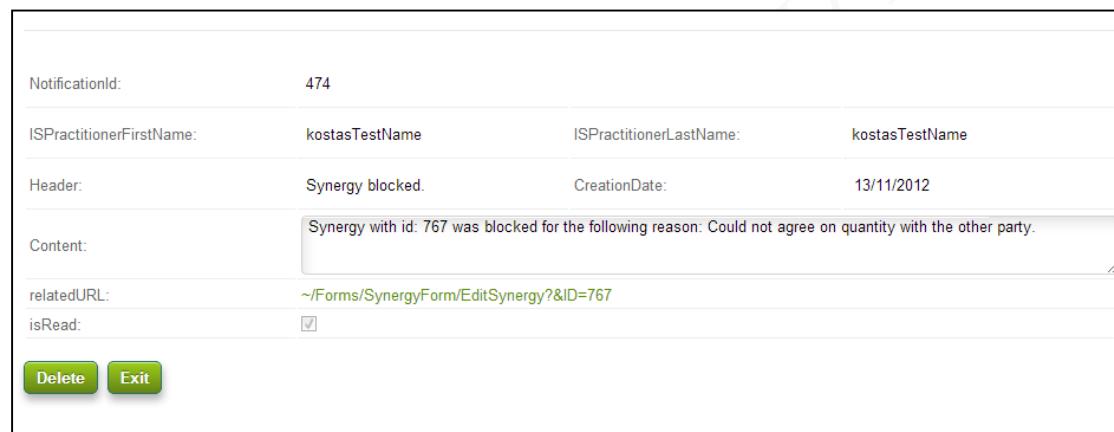
As mentioned previously, the participating Organisations can block the Synergy progress from the corresponding option.

In case one of the two participants selects to block the Synergy progress, the IS Practitioner is notified about the issue. [Note that the IS Practitioner users are created from the Administrator].



The screenshot shows a web interface for managing synergy progress. At the top, there are five tabs: 'Step 1: Idea', 'Step 2: Discussion', 'Step 3: Negotiation', 'Step 4: Implementation', and 'Step 5: Complete'. Below the tabs, the 'Current Status' is 'Proposed synergy, known by all the parties involved, potential understood.' The main area has two buttons: 'Synergy Progress' and 'Block Synergy'. The 'Block Synergy' button is highlighted. Below these buttons, there is a 'Select blocking reason:' dropdown menu with 'Logistics' selected, and an 'Additional comments:' text area containing 'Could not satisfy logistical requirements.' At the bottom, there is a red-bordered button labeled 'Block Synergy Progress'.

Figure 6: Synergy blocking functionality



The screenshot shows a notification form for an IS Practitioner. The form contains the following fields: 'NotificationId:' with value '474', 'ISPractitionerFirstName:' with value 'kostasTestName', 'ISPractitionerLastName:' with value 'kostasTestName', 'Header:' with value 'Synergy blocked.', 'CreationDate:' with value '13/11/2012', 'Content:' with value 'Synergy with id: 767 was blocked for the following reason: Could not agree on quantity with the other party.', 'relatedURL:' with value '~/Forms/SynergyForm/EditSynergy?&ID=767', and 'isRead:' with a checked checkbox. At the bottom, there are two buttons: 'Delete' and 'Exit'.

Figure 7: Notification to the IS Practitioner

The IS Practitioner is responsible for resolving the issue and can then unblock the Synergy from the corresponding button in the Synergy screen. At this stage also, the system provides to the IS Practitioner the possibility of submitting comments in relation to what was done in order to unblock the synergy progress. After the Synergy

is

Step 1: Idea

Step 2: Discussion

Step 3: Negotiation

Step 4: Implementation

Step 5: Complete

Current Status: *Proposed synergy, known by all the parties involved, potential understood.*

Synergy Progress

Block Synergy

Synergy ID	1903		
Creation Date	09/05/2013	Completion Date	
Blocked	☒	Cancelled	☐
First Party ready to proceed to next Status:	☒	Second Party ready to proceed to next Status:	☐

Figure 8: The view of a Blocked Synergy.

unblocked, its lifecycle can continue as normal. Otherwise, the Practitioner might select to Cancel the Synergy, if the issues of the block cannot be resolved.

5. SUMMARY AND CONCLUSIONS

Within the eSymbiosis platform the user has access to the information sources in relation to the overall IS results and to the management of the Synergies that his/her Organisation participates in. This deliverable summarized the architecture and the design of the corresponding platform modules (belonging to the Activity 2.3).

In more detail, the two components that implement the aforementioned functionalities are the Information Management and the Synergy Tracking & Reporting. The Information Management component is responsible for the maintenance of the documents, case studies, and statistics of the platform. The Synergy Tracking & Reporting component allows to Member Organisations and to the IS Practitioners to collaborate for the successful progression of an IS Synergy, from its initial stage to its completion. The provided functionality covers a variety of potential scenarios relevant to the synergy progress (e.g. Progression from one step to the next, Blocking and Unblocking, case study generation based on validated metrics from the member organisations), with the objective to provide full control over the synergy via the platform. The corresponding components were analysed and described both from the business process and from the technical perspective.

6. ΠΕΡΙΛΗΨΗ ΚΑΙ ΣΥΜΠΕΡΑΣΜΑΤΑ

Μέσω της πλατφόρμας του eSymbiosis, ο χρήστης έχει πρόσβαση στις πηγές πληροφορίας σε σχέση με τα συνολικά αποτελέσματα της Βιομηχανικής Συμβίωσης (ΒΣ), όπως επίσης και στη διαχείριση των Συνεργασιών στις οποίες ο οργανισμός του συμμετέχει. Αυτό το παραδοτέο συνοψίζει την αρχιτεκτονική και τον σχεδιασμό των σχετικών λειτουργικών μονάδων της πλατφόρμας (οι οποίες υπάγονται στη δραστηριότητα 2.3).

Πιο αναλυτικά, οι δύο μονάδες, οι οποίες υλοποιούν τις προαναφερθείσες λειτουργικότητες, είναι η Διαχείριση Πληροφορίας και η Παρακολούθηση & Αναφορά Συνεργασιών. Η Διαχείριση Πληροφορίας είναι υπεύθυνη για τη συντήρηση των εγγράφων, των περιπτώσιολογικών μελετών, και των στατιστικών της πλατφόρμας. Η Παρακολούθηση και Αναφορά Συνεργασιών επιτρέπει στους συμμετέχοντες οργανισμούς και στους Υπευθύνους ΒΣ να συνεργάζονται για την επιτυχή εξέλιξη μιας Συνεργασίας ΒΣ, από το αρχικό της στάδιο μέχρι την ολοκλήρωσή της. Η παρεχόμενη λειτουργικότητα καλύπτει ένα πλήθος από πιθανά σενάρια σχετικά με την πρόοδο της συνεργασίας (π.χ. μετάβαση από τη μία κατάσταση στην επόμενη, απενεργοποίηση και επανενεργοποίηση, δημιουργία περιπτώσιολογικών μελετών βασισμένων στις μετρήσεις των συμμετεχόντων οργανισμών), με σκοπό να παρέχει πλήρη έλεγχο πάνω στη συνεργασία, μέσα από την πλατφόρμα. Οι αντίστοιχες λειτουργικές μονάδες αναλύθηκαν και περιεγράφηκαν τόσο από την πλευρά της επιχειρησιακής διαδικασίας όσο και από την τεχνική πλευρά.