COMBINING MODEL-DRIVEN AND CAPABILITY-DRIVEN DEVELOPMENTS
A CASE STUDY OF INDUSTRIAL SYMBIOSIS

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CONTEXT OF THE USE CASE

Software service from the area of industrial symbiosis- ***i-symbiosis platform***

- developed using a combination of (a) an existing software development platform based on the Model Driven Architecture (MDD) paradigm[1] and (b) the method and tools that have arisen as a result of a project funded by the European Commission[2]

[1] This platform is a proprietary platform for the CLMS (UK) Company, known as zAppDev, details of which can be found in http://www.zappdev.com.

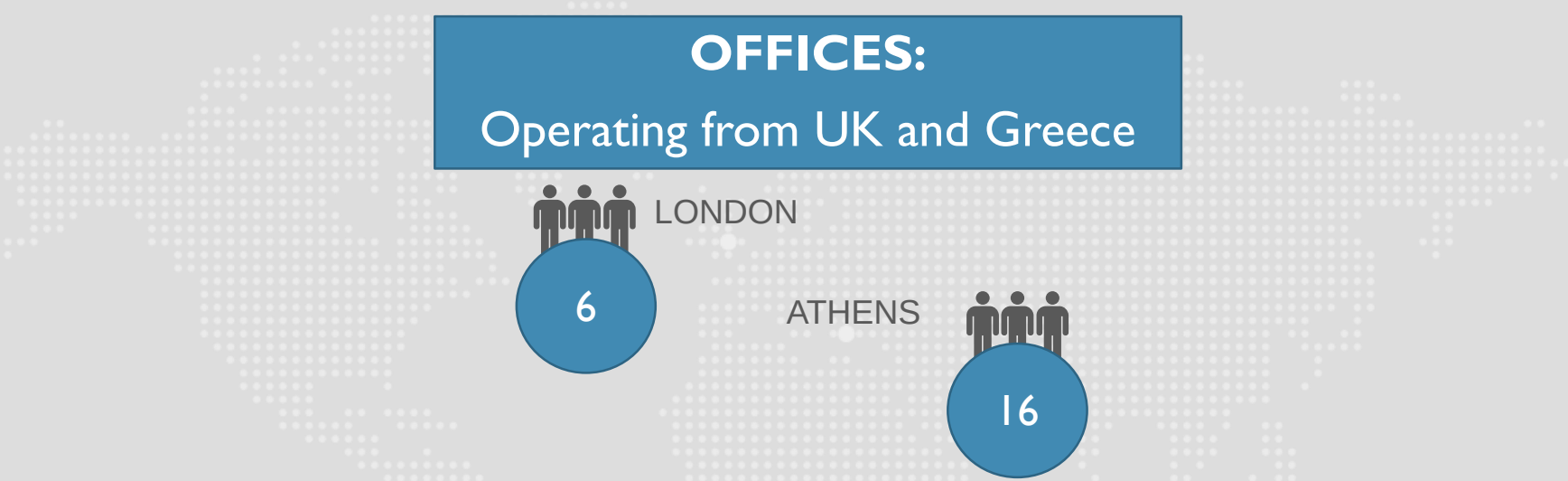
[2] Information about this project, known as CaaS (Capability as a Service) can be found in http://caas-project.eu.

About CLMS

Est.1998

OFFICES:

Operating from UK and Greece



WHAT WE DO

We design and produce business-driven IT systems that are fast to build and are easily upgraded.

INTRODUCTION OF CLMS (UK) LTD

Ecosystems

- e-Freight
- e-Mar Ecosystem
- Core Ecosystem
- Eurosky Ecosystem
- EcoHubs Ecosystem
- iCargo Ecosystem
- EuTravel

Case Studies

- Industrial Symbiosis Platform
- ERP Solutions
- Banking Solutions
- Document Management
- Air Cargo Management System
- Toll Violations Tracking System

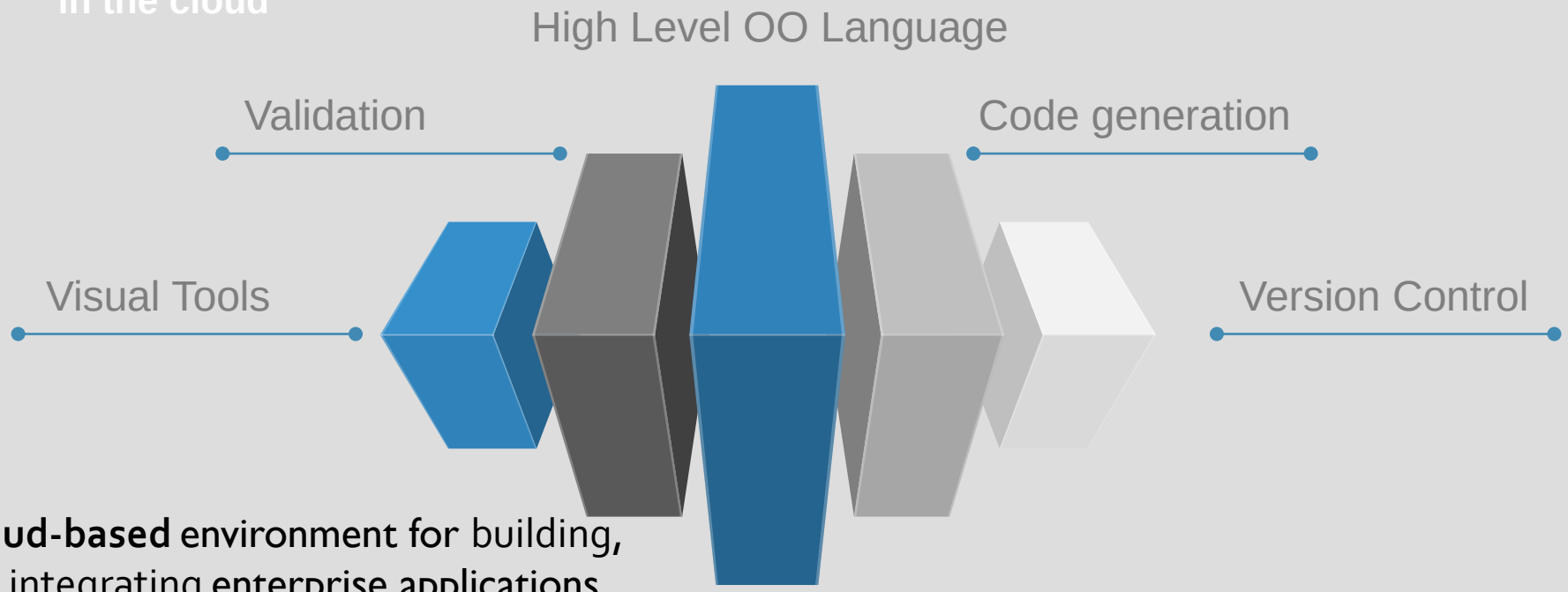
Clients

- Alpha Bank
- Nea Odos
- G4S Telematix
- General Accounting Office, Hellenic Republic, Ministry of Finance
- Aluminium SA

INTRODUCTION TO ZAPPDEV

WEB **IDE**

in the cloud



zAppDev® is a **cloud-based** environment for building, maintaining and integrating **enterprise applications**

INTRODUCTION TO ZAPPDEV

HOW IT **WORKS**

Domain Driven Design

DESIGN

Visual Editors to model

- Entities
- Relationships
- Roles
- Workflows
- Processes

BUILD

Business semantics turn in high quality standardised code.

Code generation based on:

- Application Frameworks
- Industry Best Practices
- Design Standards
- Technology Libraries

TEST

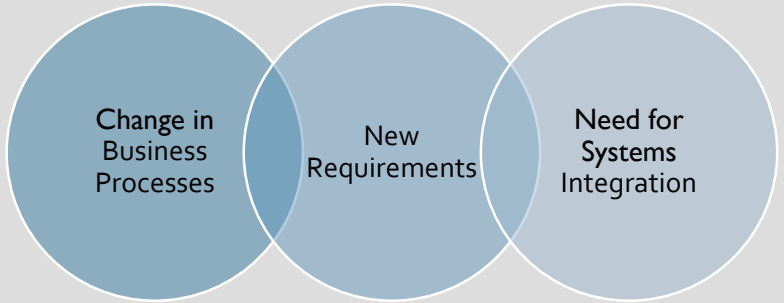
Run on premise or on the cloud

No proprietary software

Full ownership of Apps

Sustaining Business Evolution

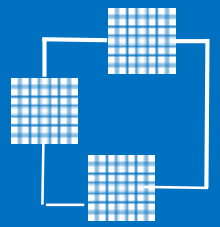
LEVEL 1



Change Drivers

BUSINESS MODEL

LEVEL 2



SEMANTICS

Models capture critical business information without being tied to specific technologies .

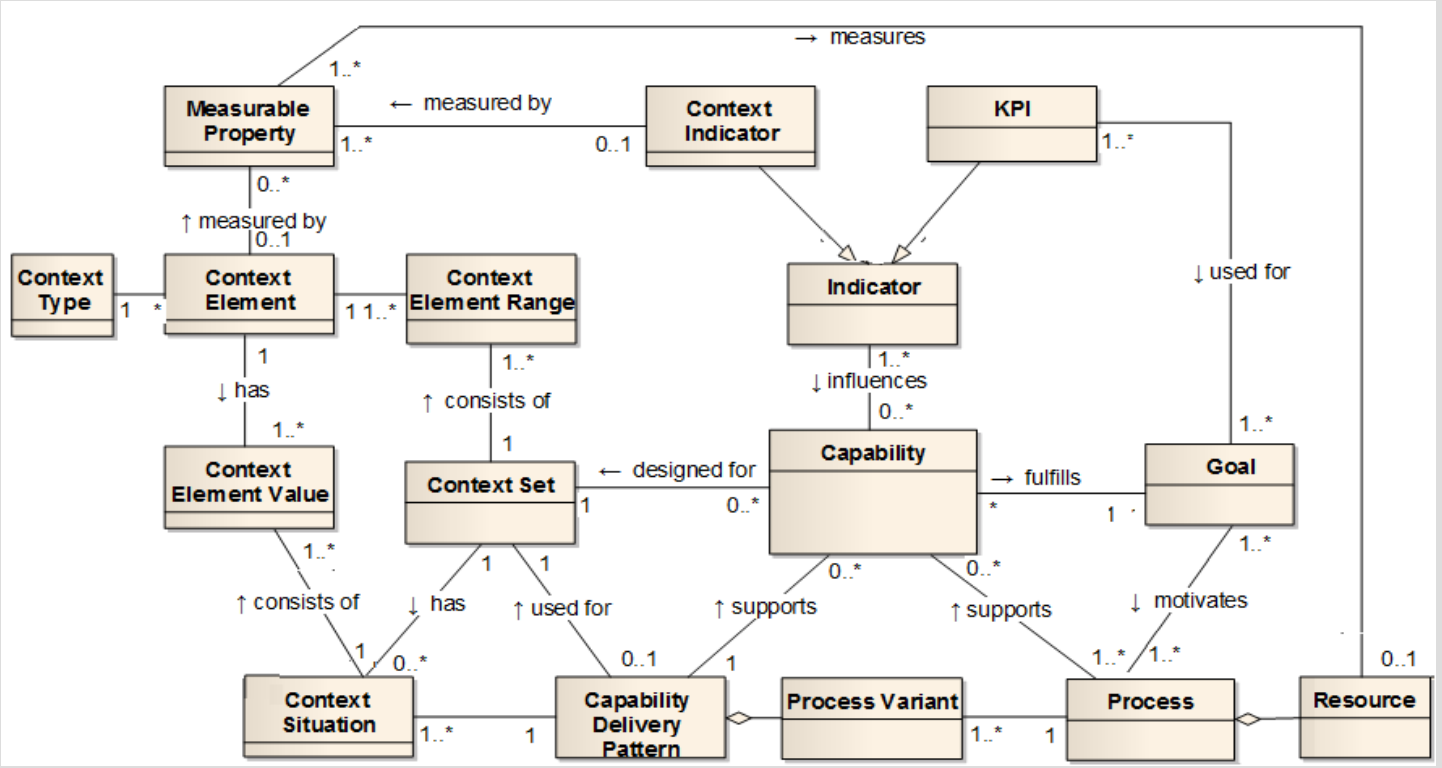
LEVEL 3

APPLICATIONS

Keep the semantics and build your application. As compilation templates are continuously updated, zAppDev helps you quickly produce applications aligned with the state-of the art technologies.

INTRODUCTION TO CAAS

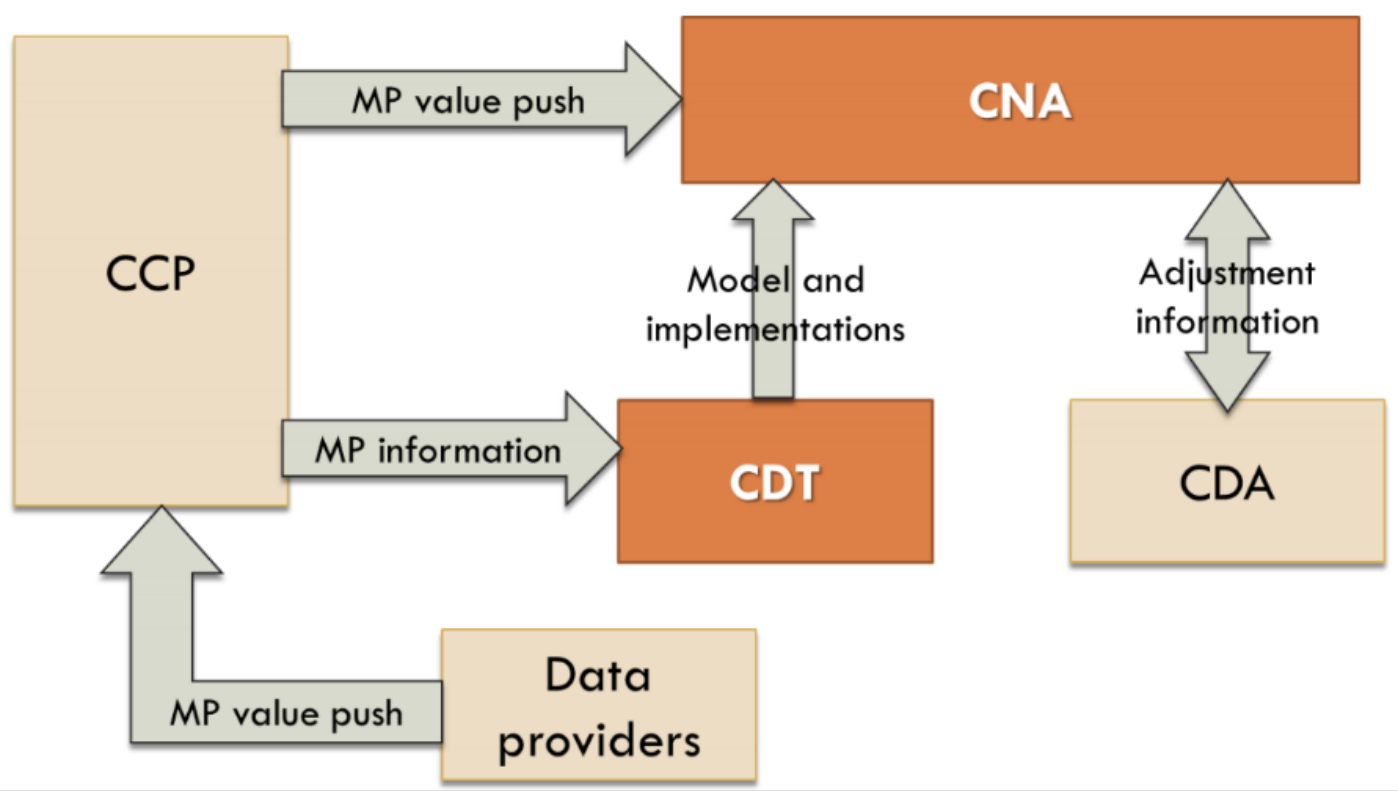
- The overall ethos of the CaaS project is to create an integrated approach consisting of methods, tools and reusable best practices that allow digital enterprises to take advantage of changes in business context and technologies.
- The main contribution is a new methodology for joint digital business and information system development referred as the *capability driven development (CDD)*. CDD methodology provides the means for coping with a variety of business execution alternatives and for adjusting business delivery according to changes in the operating context.



Information about this project, known as CaaS (Capability as a Service) can be found in http://caas-project.eu.

INTRODUCTION TO CAAS

- **Capability Design Tool (CDT)**: a graphical modelling tool for supporting the creation of models (goal models, process models, concept models, context models, business processes and capability models) according to the capability meta-model.
- **Capability Context Platform (CCP)**: The context platform is a platform for gathering the context information defined in a context model and distributing it to the CNA.
- **Capability Delivery Navigation Application (CNA)**: a web application that imports the capability models defined in the CDT in order to monitor the described context. CNA connects to the context platform to monitor the capability context, informs the capability analyst and business services manager about current KPIs and handles run-time capability adjustments.
- **Capability Delivery Application (CDA)**: A CDA represents the business application or service used to support the capability delivery. **In our case is the i-symbiosis platform**.



INDUSTRIAL SYMBIOSIS

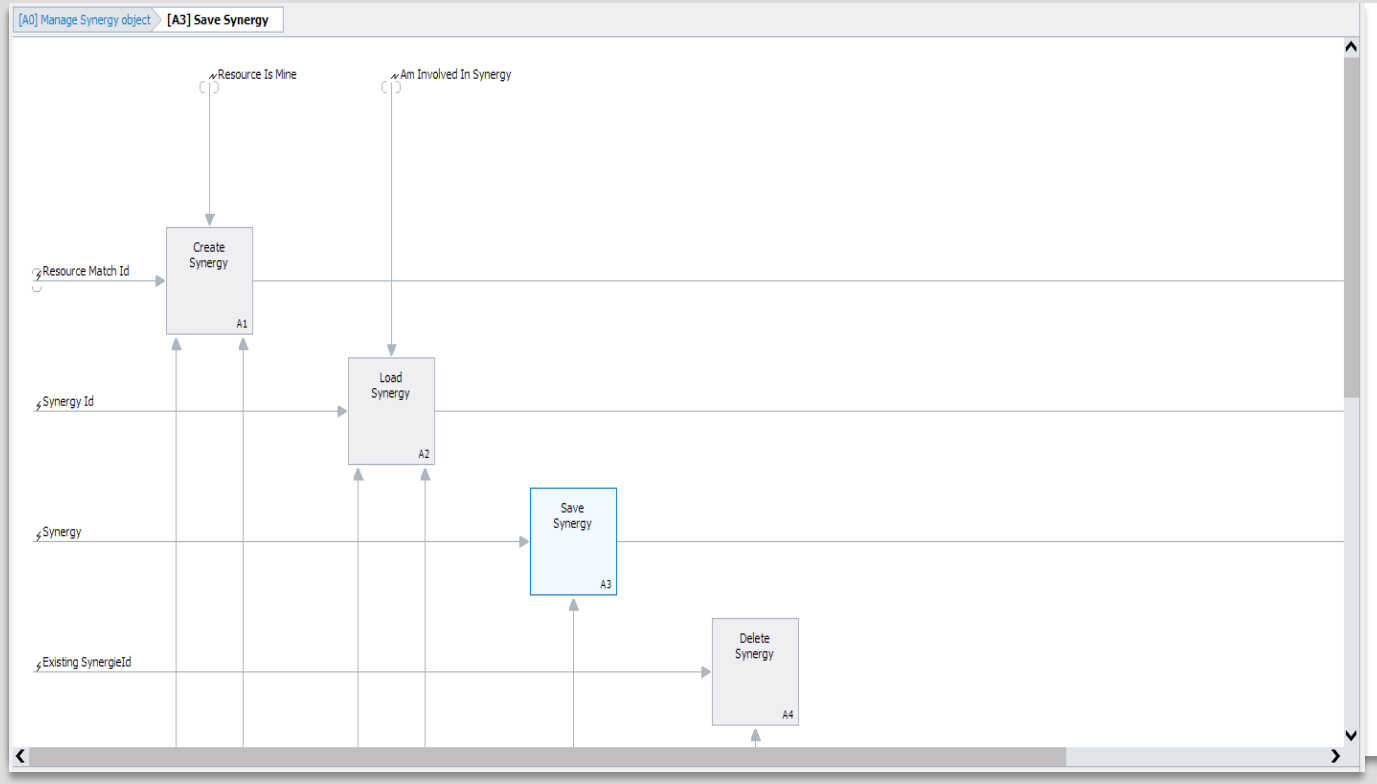
WHAT IS IT?

Industrial symbiosis is an association between two or more industrial facilities or companies in which the wastes or byproducts of one become the raw materials for another. Within a digital industrial symbiosis ecosystem, companies improve resource efficiency, trade material, energy or water and share assets, logistics services and expertise.

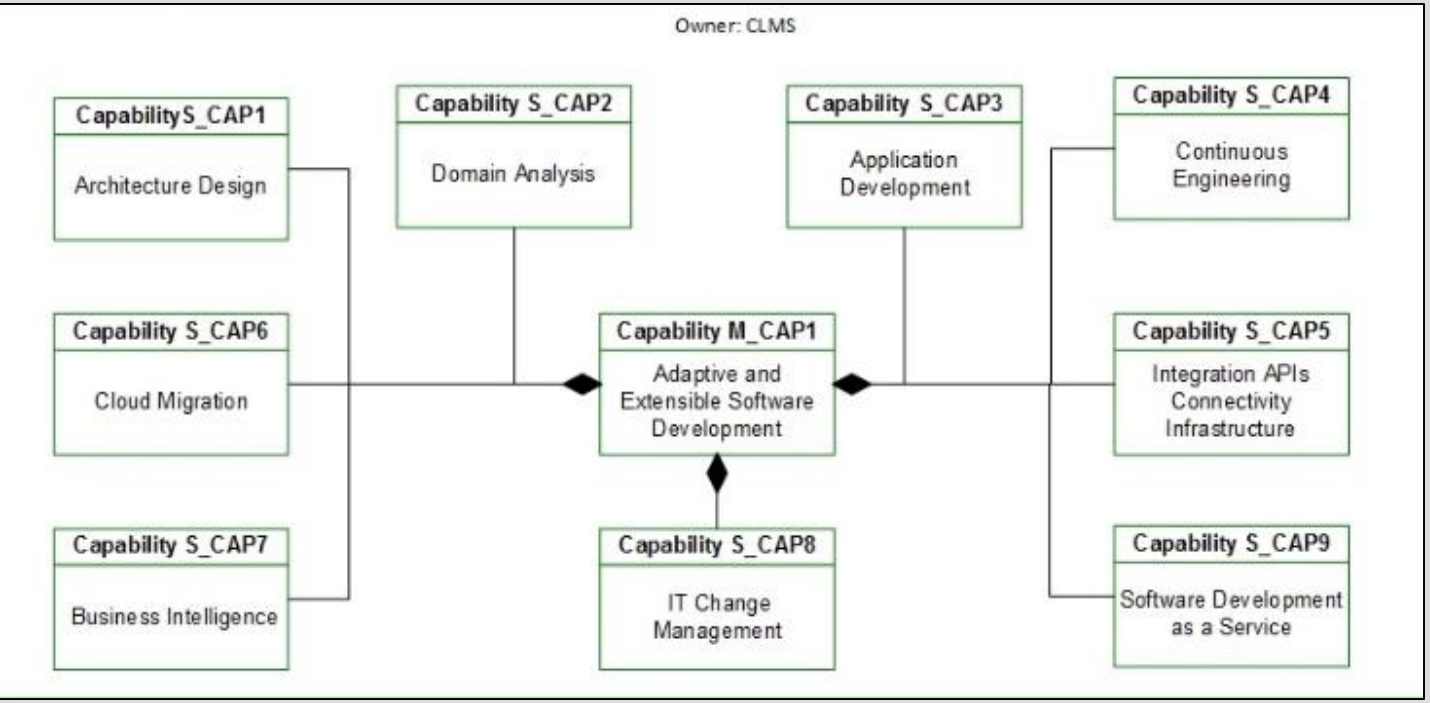
THE I-SYMBIOSIS PLATFORM

The i-Symbiosis Platform:

- Is a bilingual web-based platform which enables users to participate in industrial symbiosis activities.
- Supports ontology-based semantic matching of shared and requested resources in order to identify possible synergies; collaboration tools enables stakeholders' communication within the same environment.

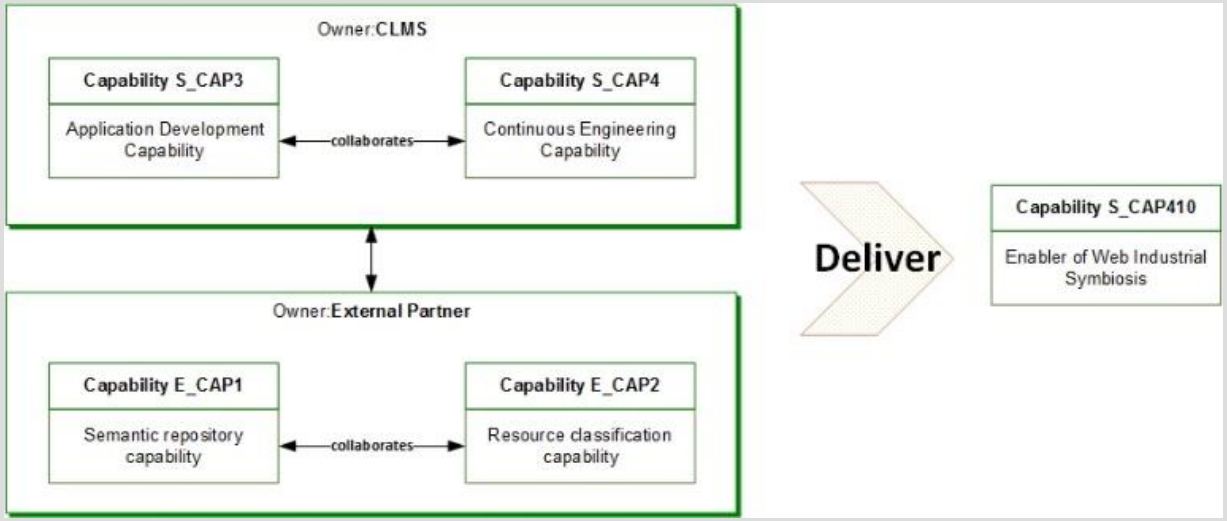


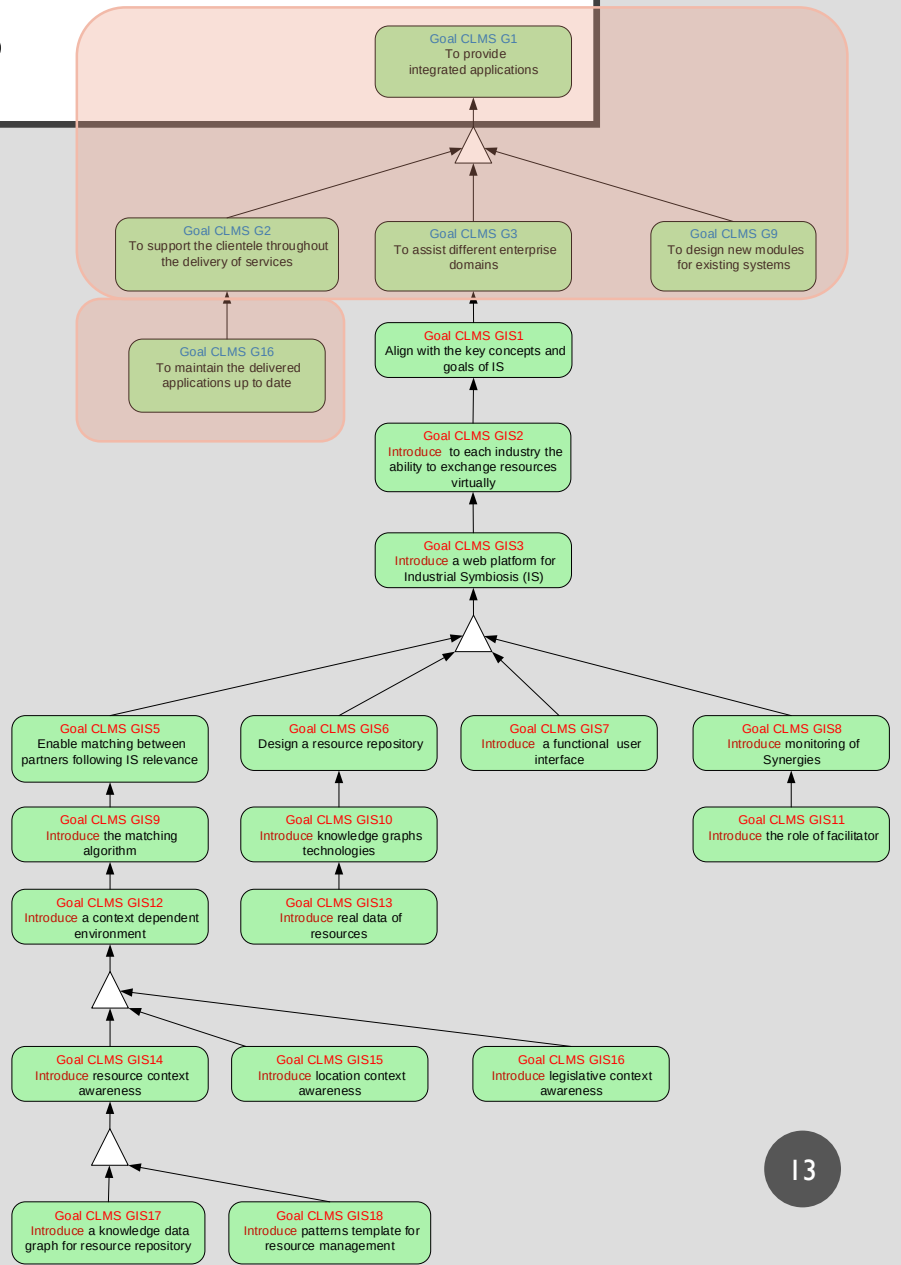
CAPABILITY DRIVEN ANALYSIS
CLMS BUSINESS CAPABILITIES



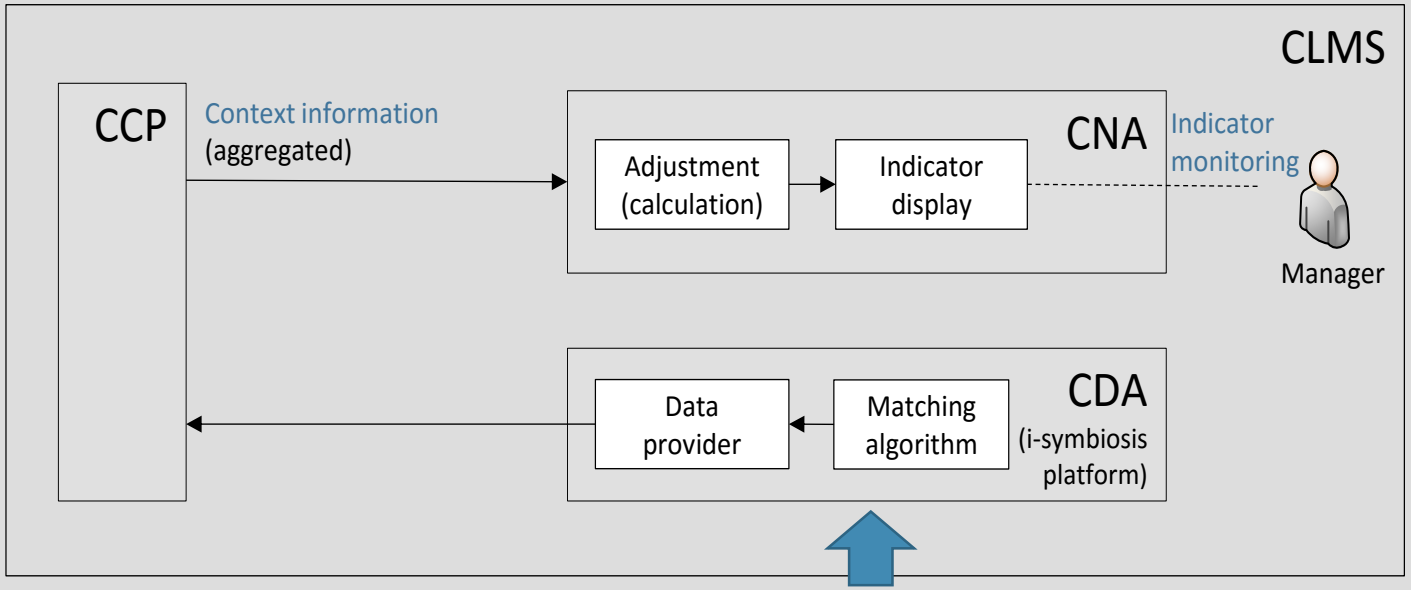
Services	Capabilities
ERP Solutions	S_CAP1 Architecture Design
	S_CAP2 Domain Analysis
	S_CAP3 Application Development
Industrial Symbiosis Ecosystem	S_CAP3 Application Development
	S_CAP4 Continuous Engineering
Maritime Connectivity Infrastructure	S_CAP4 Continuous Engineering
	S_CAP5 Integration APIs Connectivity Infrastructure
Bank Enterprise	S_CAP8 IT Change Management
	S_CAP9 Software Development as a Service

CAPABILITY DRIVEN ANALYSIS I-SYMBIOSIS

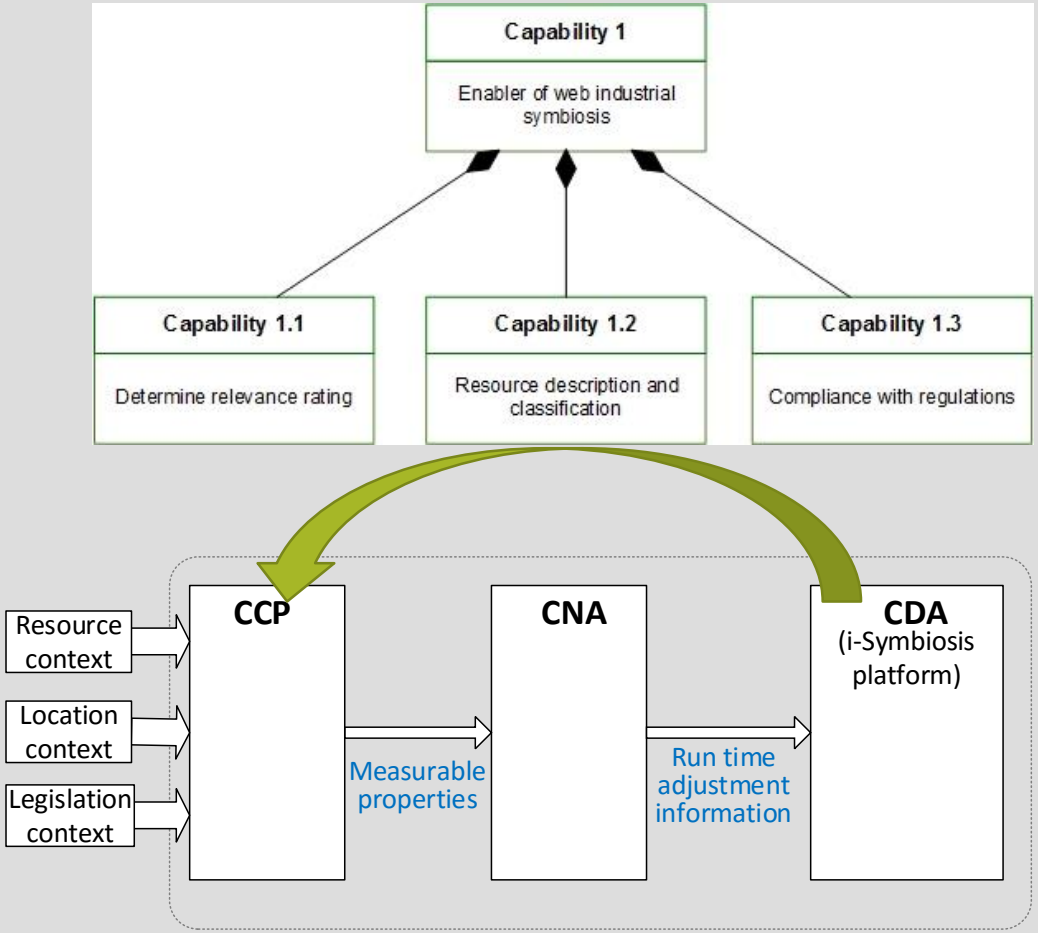




I-SYMBIOSIS LINKAGE TO CDD ENVIRONMENT



CDA (i-symbiosis platform) has an implemented **API REST service** that sends, with interval time set to one day, the percentage of successful matches achieved.



Use of Capability Driven Tool Set for the i-symbiosis case

LESSONS LEARNED

- The capability driven analysis of CLMS on a business level defined our strengths and ‘possessions’ in terms of resources, setting of business goals and identification of business processes.
- The capability driven analysis was useful for identifying how the available technologies can be combined and how flexible zAppDev is, to adopt new ones.
- Model driven environments share common ground with the CDD concepts since they are both aligned with various modelling concepts. It is only logical to further examine their interrelationships and any correspondence of concepts in order to combine their individual characteristics into an integrated approach.