

## Deliverable D400.21

# Specification of engineering tools and core services for context sensitivity & Aml – first version

## WP 400

<b>Grant Agreement number:</b>	NMP2-LA-2013-609143
<b>Project acronym:</b>	ProSEco
<b>Project title:</b>	Collaborative Environment for Eco-Design of Product-Services and Production Processes Integrating Highly Personalised Innovative Functions
<b>Funding Scheme:</b>	IP
<b>Date of latest version of Annex I against which the assessment will be made:</b>	01.10.2013 (Version I)
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<b>Start date of the project:</b>	01.10.2013
<b>Duration:</b>	48 months
<b>Responsible of the Document:</b>	ATB
<b>Document Ref.:</b>	D400.21 Specification of engineering tools and core services for context sensitivity & Aml – First version
<b>Version:</b>	V1.0
<b>Issue Date:</b>	31.03.2015

## 1 Executive Summary

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This report is deliverable D400.21 which presents the specification of the early prototype of Engineering tools and Core services which will allow to use Aml systems/sensors included in the products and process for Product Extension Services (PES) and provide means for making PES context sensitive, as well as to use data provided by Aml systems/sensors for analysis of the product use. The core services will also support users of PES in searching for knowledge need to use products/PES. This is the evolution of what was developed within the concept phase of the project.

The objectives of WP 400, and specifically of T420, are to elaborate the specification of the early and full prototypes of the components for Engineering tools and Core services for Context Sensitivity & Aml, including:

- Engineering tool and core service for Aml definition and design and Aml based Monitoring,
- Engineering tool for context modelling for PES,
- Engineering tool for Data Mining for PES
- Core service for context extraction for PES,
- Core service for knowledge provision for PES,
- Core service for Data Mining for PES.

For each engineering tool and core service the same approach is followed;

- analysis of the requirements collected at Business Case requirements and analysis phase (see deliverable D100.2),
- further detailing these requirements
- derivation of the data model,
- functional specification,
- external interfaces
- technical specification.

The main objective of the first version (early prototype) specification is to specify, satisfying user' requirements within four Business Cases (see [6]). The objective is to specify support for ProSEco users in the PES design and deployment with respect to context sensitive and Aml solutions. These will then be tested within four Business Cases (BCs) in order to allow for fast feedback from the end-users. Therefore, the early specification of Context Sensitivity and Aml includes elaboration of (limited scope of) all engineering tools and core services, needed to explore the basic assumptions of ProSEco (within four Business Cases) which means 'minimal' specification of these engineering tools and core services needed to test the critical issues within ProSEco addressed in four Business Cases (see [6]) and specifically to explore critical issues regarding application of the proposed related methodology (see [4]) within these BCs.

The specification of Core Services follows Service Oriented Software Engineering approach. The specified and implemented EP of engineering tools and core services will be customised and combined with the application specific SW within each BC and tested by the users. Based on testing of EP within BC full prototype of context sensitive and Aml related ProSEco solutions, will be specified and implemented.

The main challenges in specification of Early Prototype specification are:

- Specification of engineering tool to support Aml selection, context modelling and data mining activities aiming to support the user in developing Aml based and Context sensitive PES, especially in the cases where the product/processes include high numbers of Aml systems/sensors and where the context under which the product is used or manufactured asks for complex modelling.
- Specification of engineering tools taking into account the goal of integration of all tools in a common ProSEco collaborative PES development platform.
- Specification of generic core services for Aml based monitoring, context monitoring and extraction, and data mining, aiming to offer functionalities that would enhance a PES with environment data for better performance of a PES with respect to product use; the key challenge is specify core services which can be applied in number of various PES and in different industrial sectors with minimal customisation efforts
- Elaboration of the Data Models, serving as a bridge among core services in the cloud
- Specification of Knowledge Provision core service aiming to the reduction of efforts for seeking and reusing knowledge.

- Specification of services that can work in a “nominal” state, i.e. working with Aml based monitoring data or data mining results, and taking the context extracted by the Context Monitoring/Extraction as an add-on to the refinement of results that the PES can deliver.

This document D400.21, Specification of Engineering tools and Core Services for Context Sensitivity & Aml – First version, focuses on the specification for the early prototype of the software concerning the Context sensitive and Aml related software. The second version of this document, D400.22, Specification of Engineering tools and Core Services for Context Sensitivity & Aml – Final version, due on month 30 of the project, will present the complete specification for the above mentioned engineering tools and core services and will be able to provide more detailed specification and functionality that will come into attention during the development and testing of the early prototype.