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Specification of Development Platform & Collaborative KM Services

WP 200

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1 Executive Summary

The ProSEco project aims at providing a novel methodology and a comprehensive ICT solution for collaborative design of product-services (Meta-product) and production processes relying on Ambient Intelligence (Aml) technology, lean and eco-design principles and applying Life Cycle Assessment (LCA) techniques, to allow the effective extensions of different products (from different manufacturers) with services. In this direction, one of the important milestones, in providing the ProSEco services, is specifying a comprehensive development platform to offer successful collaborative knowledge management services from the start of the project (new product conceptualization) until its deployment. Depending upon the nature of the ProSEco project, where the actual exploitation of the services requires expertise from different domains *i.e.* PES solution providers and the industrial partners, it is very important that PES development platform acts as a bridge to perform collaborative activities at each phase of the workflow.

To address these challenges and to comprehend the PES development process, this report presents a conceptual PES development platform that has been modelled with reference to the stages of the *Software Development Life Cycle (SDLC)* together with the *Information Delivery Manual (IDM)* approach. A standard SDLC is tailored, customized and mapped to the consecutive phases of the PES development process which starts from idea creation to market simulation, knowledge specification/data mining, data capturing methods/Aml selection, functional specifications, context modelling, security configuration, PES development, PES orchestration and finally deploying the PES. In the same line, the *Information Delivery Manual (IDM)* methodology helps in designing the workflow process and stipulating the actors involved in creating, consuming and benefitting from the information as well as what information is created, exchanged and consumed. This conceptual framework that is modelled by using IDM is illustrated using flow oriented notations called the *Business Process Model and Notation (BPMN)*.

This report further details the view-specific particularities of the collaborative PES development environment that help to understand the conceptual framework at a comparatively lower abstraction level. Similarly, mapping these views on the system architecture articulates the system's functionality - particularly with regard to capturing complex system logics and dynamics.

The last part of the report elaborates the overall PES development process at component level by using *Unified Modelling Language (UML)* which helps to comprehend the states and activities of the workflow in more detail. This section augments the understanding of PESDLC by articulating the interaction among various components at each phase of the development process that eventually helps to understand the workflow of the states of the PES under development (*i.e. Nominal Workflow*), transitions between different states of the development process based on pre-defined conditions (*i.e. State Transition Diagram*) and an activity model (*i.e. Activity Diagram*) that expands the activities of these states in a sequence.

Finally, a physical architecture of the system is presented that illustrates the representation of the system by mapping its functionality onto hardware and software components, by a mapping of the software architecture onto the hardware architecture, and the human interaction with these components.