Deliverable reference:	Date:	Responsible partner:
D1.6	07 February 2017	ATC

Project co-funded by the European Commission within the Seventh Framework Programme (FP7-ICT-2013-10))
ICT-2013.1.2: Software Engineering, Services and Cloud Computing
Grant Agreement No.: 611337

www.heads-project.eu

Title:

D1.6: Final use case implementation

Editor(s):
Thanasis Dalianis (ATC)
Eva Jaho (ATC)
Knut Eilif Husa (TellU)
Martin Skorsky (SAG)
Franck Fleurey (SINTEF)

Approved by:
Project Coordinator: Arnor Solberg (SINTEF)
Technical Manager: Franck Fleurey (SINTEF)

Classification:
Confidential

Abstract / Executive summary:

This deliverable is a report accompanying the prototype deliverable of the final version of HEADS use cases implementation. It is an updated version of deliverable D1.4, after taking into account the evaluation report of deliverable D1.5. In this document, we describe the application targeting the final HEADS scenarios (Safe@Home by TellU and SensingNews by ATC). Minor modifications will continue to be done on the applications until the end of the project including optimization of some system features. Applying the development of HEADS IDE and the HEADS methodology (produced in WP5 by integrating contributions from WP2-3-4) the two use cases have developed a number of use case oriented artefacts. Those software artefacts are the realization of the use case scenarios defined in D1.1 and revised in D1.2. HEADS IDE was utilized in its different versions as being provided by WP5. Besides the implementation of software assets defined in Y1 and Y2 of the project, use case providers revised/updated the demonstrators/scenarios so as to cover and validate as many KPIs as possible and thus to highlight HEADS innovations. Notably, both demonstrators are validating both the heterogeneity and distribution aspects supported by HEADS technologies, and they cover all the KPIs defined in D1.2 as well as the HEADS objectives and requirements defined in D1.1. Thus, use case demonstrators are complete HEADS realizations of envisioned achievements, ensuring efficient validations of HEADS innovative technologies. The use case demonstrators has been steering the development activities all the way to the end of the project. In this last year (Y3) a particular focus was to evaluate scalability, as to validate that HEADS approach can handle scalability issues.

The industrial use case from TellU, implemented in HEADS, is a smart-home system enabling elderly people to live longer at home (Section 2.1). The main purpose of this use-case, in addition to specify a system of industrial relevance, has been to assess the HEADS IDE capabilities of handling heterogeneous computing nodes and distribution of services and scalability of the system. Thus, it has focused on specifying a broad range of computing nodes spanning from small and very constrained platforms (Arduino, Raspberry PI, Intel Edison) to cloud resources with virtually unlimited capacity. In terms of distribution, the use case has also focused on deploying different communication technologies spanning from wired sensor communication (e.g., I2C), via wireless (e.g., ZWave, WiFi, BLE) to communication with Internet protocols (e.g., TCP/IP, HTTP, MQTT). Eventually, a set of sensors has been included in the use case. Through this use-case, the way the HEADS IDE provide efficient support for the service developers and operators, in particular by providing

novel abstractions to support efficient handling of differences in the underlying platforms implementations and system distribution, is evaluated. Through these facilities the HEADS IDE significantly speed up the development and operation process.

The SensingNews use case is referring to the future computing continuum applied in the media domain. It is composed of a wide set of heterogeneous platforms and promises to be an environment that will definitely affect the media industry in terms of creating, managing and exploiting media items. Nowadays, interesting media info is out there in the digital world and can be possessed and exploited by utilizing a variation of nodes and software engineering practices like network nodes, gateways, smart-phones, cloud computing and service-oriented methods, etc. HEADS innovations are envisioned to offer this opportunity to SensingNews. HEADS IDE is offering the creation of a “HEADS news item” as the outcome of the analysis of data that are coming from different and heterogeneous resources (Section 3.1). The nodes could be social networks, mobile devices, existing news wires and sensor networks. The Complex Event Processing (CEP) is used to perform the analysis of the raw data aggregated (Section 3.2.2). The open source SocialSensor Platform that collects, processes, and aggregates big streams of social media data and multimedia to discover trends, events, influencers, and interesting media content is used. SocialSensor is tailored to utilise HEADS technology, in order to be able to adapt to a heterogeneous and distributed environment, (Section 3.2.1) enabling it to discover interesting media content from a variety of sources and forward it to the NewsAsset core engine. The challenge in the media domain is that there is a big variation in the amount of data over time. When an event happens, there is a tremendous amount of data to analyse. Thus, in that case the system needs to automatically, quickly and efficiently scale up. The HEADS runtime platform (Kevoree) allows to monitor and adjust this scaling in real time. Effective scaling can improve user experience and mitigate information overload when a sudden event happens.

Document URL:

ISBN: