Sense&React Newsletter

Preface

Dear Reader,

We are glad to introduce you the second Newsletter of the Sense&React IP project. Sense&React is a European Union funded Research & Development Project under the 7th Framework Program (FP7). The project has started on 1st October 2012 and will last until the 30th September 2015. The project engages 12 organizations from various EU countries and the consortium is coordinated by the Laboratory for Manufacturing Systems and Automation (LMS) of the University of Patras, Greece.

During the first project year the industrial pilot cases have defined and a first version of the Sense&React System has been developed that address several industry requirements.

The project is on its second year and the focus is put on the development of Sense&React system and its application upon the industrial pilot cases. Since Sense&React system consists of different modules, both HW and SW, integration has also emerged as important aspect of the project.

The main goal of this Newsletter is to provide an overview of the main project results after the first project year as well as an overview of the next steps. Finally, recent project activities and future events are presented.
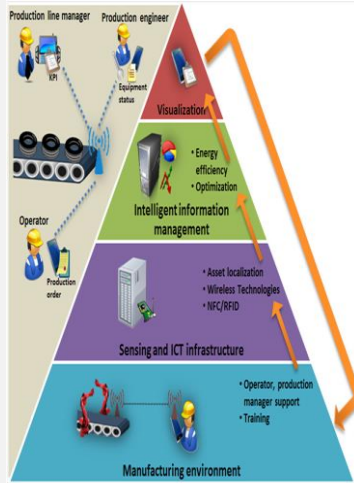
Sincerely,

The Sense&React project consortium

The project

Sense&React – The context-aware and user-centric information distribution system for manufacturing (FoF-ICT-2011.7.1, Grant agreement no: 314350) is a European Union funded Research & Development Project.

The project started on **1st October 2012**. The overall work plan is divided into work packages and their sub and covers **36 months** of industrial driven requirements, research, development and realization of final demonstrators.

- Phase 1: Industrial requirements and system specification.
- **Phase 2: Modules development**
- Phase 3: Integration
- Phase 4: Pilot cases execution and assessment

Sense&React Key Achievements in 1st Year

Key Achievements within 1st year:

- ✓ **Sense&React pilot cases:** Sense&React plans to deliver results that have been verified by the pre-commercial demonstration, testing and validation of the developed methodology and platform in 4 industrial pilot cases namely: automotive (VOLVO), white goods (Electrolux), shipyard (ENP) and an energy efficiency focused pilot at Demonstration Factory at the RWTH Campus Cluster Logistics (FIR) (more details are available in 1st Newsletter).

- ✓ **Sense&React localization and sensors platform:** The design and first implementation for localization and asset tracking has been achieved. The localization solution proposals and technologies are targeting to the pilot cases requirements.

- ✓ **Sense&React Backend Prototype:** The first version of the Backend System prototype that provides context data services to applications. The modules that have been included in the first version are: Server-Proxy interface implementation (for sensor data gathering), Central Authentication Service with Dynamic Role Based Access Control, Operator Instructions Composition, Semantics Based Context Engine and Complex Events Processing (CEP).

Sense&React represents a strong opportunity for the company to improve factory efficiency, especially supporting assembly and maintenance operations at the factory floor

Project Highlights

Main results achieved within 1st year:

- ✓ **Sense&React pilot cases:** Definition of 4 industrial relevant pilot cases.

- ✓ **Sense&React localization and sensors platform:** The design and first implementation for localization and asset tracking.

- ✓ **Sense&React Backend Prototype:** Backend System prototype provides context data services to Sense&React applications.

- ✓ **Situation-and Context-Based User Interface (Sense&React Shell):** Innovative single access point for all relevant shop floor information.

- ✓ **Cognitive Load Assessment Method - CLAM**: A method designed for quick assessment of cognitive load connected to a workstation.

- ✓ **Sense&React Context-Aware Applications**:
  - o *Context-Aware User Notification App*.
  - o *Context-Aware Map application (coMaSh)*.
  - o *Shop-floor User Context-Aware Dashboard*.

- ✓ **Situation-and Context-Based User Interface:** Situation- and context-based User Interface adaptation will result in innovative features that can be directly experienced by shop floor personnel. During the 1st Year the prototype of an HTML5-based Shell (Sense&React Shell) that serves as a unified and device independent access point for the Sense&React application GUIs has been developed. The user is provided with the most appropriate apps and content while making the interaction with the IT system easier.

- ✓ **Cognitive Load Assessment Method - CLAM**: A method designed for quick assessment of cognitive load connected to a workstation and a task has been defined. This method can be used by an engineer, working with design of new workstations and evaluation of current ones, as a guide for reducing the cognitive efforts required by the worker to perform a task efficiently.

- ✓ **Sense&React Context-Aware Applications**: A number of context-aware applications for the shop floor personnel have been implemented and integrated in a unified prototype:

  - o *Context-Aware User Notification App:* A context-aware user notification concept, available through mobile devices, for mission-critical communication at a plant

  - o *Context-Aware Map application (coMaSh):* Role-based and context-sensitive information access and cooperative work on touch sensitive display at a workstation.

  - o *Shop-floor User Context-Aware Dashboard:* Production Information (such as assembly instructions) to different roles in the shop-floor.

Next Steps

The next steps of the project will focus on the following aspects:

- We will put situation-awareness into the focus of the research activities in order to create the methodological underpinnings of a new generation of shop floor communication systems.
- Sense&React HW and SW modules integration.
- Laboratory testing and system packaging prior to industrial installation
- Industrial pilot setup, field testing and validation.

Latest Events and News

- On 30 October 2013 LMS participated in the "Cyber-Physical Systems in manufacturing and production" workshop organized by EU, in which the focus was to present the potential of using Cyber Physical Systems technology paradigm in improving the performance of manufacturing companies.

- On 7th November 2013 the ICT Event 2013 in Vilnius on 6-8 November took place in Vilnius/Lithuania. In the scope of this event, FIR hosted a networking session for the topic "Intelligent energy management in production - real-time e-monitoring and demand-side-management with ICT". LMS presented Sense&React project within this networking session.

- An updated catalogue of all the academic publications of Sense&React is now online. Please visit Public Material > Publications to see the whole list and browse to the online available publications. This page will list all available publications of Sense&React, once they are accepted for publication.

Upcoming events

- From 9 to 11 April 2014, in Athens, Greece, the Industrial Technologies 2014 conference (http://www.industrialtechnologies2014.eu/) integrates nanotechnology, biotechnology, advanced materials and new production technologies. The event offers opportunities for developing valuable research and industry collaborations, and showcases cutting-edge research, latest innovations and rising companies from all around Europe.

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Context-aware and user-centric information distribution system for manufacturing

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Consortium