ITEA3

Project Results

InValue

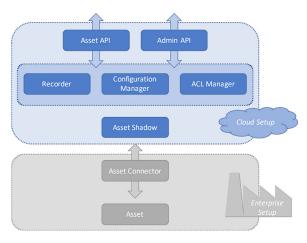## Implementing the "boundless enterprise" paradigm

EXECUTIVE SUMMARY

Consistent and end-to-end data management throughout the whole production process – the ITEA project InValue (Industrial Enterprise Asset Value Enablers) enables companies to build specific applications on a shared information architecture and finally implement the "boundless enterprise" paradigm.

PROJECT ORIGINS

Global competition, technology trends, digitalisation, development costs, product life cycles ... these are all factors that constantly shift and shape the industrial landscape. As a result, industrial processes have to be remodelled, new partnerships formed, new business models adopted and the use of information and knowledge intensified. What is needed is a service platform to support these new paradigms, relying on existing standards while combining novel and integrated solutions for the content and knowledge management of heterogeneous information derived from various sources.

InValue addressed these needs by developing such a service platform. It includes information acquisition and aggregation, representation, analysis and exchange between smart devices, automation systems, information systems and respective stakeholders, such as technical and management staff, as well as suppliers and customer organisations. The development and prototypical implementation of a distributed data acquisition infrastructure means that smart objects, enterprise data stores and sensor data can be integrated. Also, by realising a semantically enhanced data processing backbone and defining data delivery interfaces, the acquired data can be interpreted and homogeneously transferred to downstream business analytics services and operational service components.

High-level InValue architecture

TECHNOLOGY APPLIED

Bearing these integration features in mind, the service platform capabilities developed by the InValue project were explored through a number of demonstrations from different industrial domains in order to reveal the economic and societal potential of the solution. In the Belgian use case, Barco investigated predictive end-of-life and maintenance models in a projection light lease set-up whereby light is sold at a fixed price per projection hour. This included real-time monitoring of lamp performance, predictive alerts to replace lamps before they fail along with purchase, selection, supply and warranty claim management of lamps. In Spain, the focus lay on manufacturing and quality control through virtual metrology for EPC's camshaft production

lines including system integration, real-time information, traceability enhancement and knowledge generation.

Neighbouring Portugal concentrated its efforts on proactive maintenance approaches in which Facort, a metallurgic company specialising in precision parts, wanted to reduce machine downtime and prevent and diagnose failures. The current prototype contains an acquisition system for collecting real-time data at Facort and transforming the data with Big Data analytics to generate meaningful information as well as a dimensionality reduction. This information is then presented to users on the basis of their access rights. The InValue Cloud Platform for collecting data from the production machines, ERP and

IT systems among different manufacturers was demonstrated in Turkey. Here different building blocks were defined and partly implemented, and a demo kit was developed to demonstrate the solution to potential customers.

MAKING THE DIFFERENCE

The project partners individually and collectively produced a number of convincing use cases that were indicative of the potential business impact of the project results. For example, the use cases performed by Barco and Sirris. For Barco the project provided a test bed to acquire knowledge on data analytics and to fuel its digital servitisation strategy. Sirris defined a generic conceptual architecture combining IoT, Big Data and Cloud elements to support the different use cases in the project. This architecture allows the collection, processing and mining of data from digital and digitally enabled assets as well as from data assets. It enables solutions to be deployed on-premise as well as in the cloud.

The impact of the project on the Turkish SME partner Acd is clearly demonstrated in its data acquisition process. Before InValue, the company's existing products acquired data by using sensors in a traditional way. During the course of the project, Acd developed supporting multi-protocol software for different kind of

machines with sensitive data and secure cloud communication. For two other Turkish partners the project provided a vehicle to create a reporting tool for managers of manufacturing plants along with a decision-making tool for industrial managers (Hisbim). And Ericsson has developed cloud-based asset management software including APIs, data analytics and industrial statistical analysis.

Three Portuguese partners have also made good use of the results. SisTrade has added not only value to its Asset Management Module in terms of predictive maintenance but also new features such as notifications, alarms and trend graphics. Evoleo has developed sensor data aggregation, edge analytics, remote device management and heterogeneous data management features for its OS, middleware and server packages for condition monitoring. Finally, GECAD is making use of Big Data technologies for predictive maintenance, going beyond typical vibration and noise analysis for failure prediction by performing multi-feature analysis through machine learning and data mining techniques.

MAJOR PROJECT OUTCOMES

Dissemination
- 4 publications (e.g. ISAMI, WorldCist)
- 8 presentations at Conferences
- 1 press Release
- 7 end user Presentation
- 3 workshops (e.g. ITEA Digital Transformation Masterclass)

Standardisation
- 2 contributions to standardisation bodies (e.g. QIF standard for quality related information sharing and Integration of 3D optical sensor with robotics)

Products/Services
- 1 new product (Quality information sharing tool)
- 3 new services (Manufacturing monitoring at part and system, Statistical analysis for manufacturing assess, On-line integration of 3D optical systems)

InValue
13015

Partners

Belgium
Barco
Sirris

Portugal
Evoleo Technologies
Facort
ISEP/IPP-GECAD
ISQ
SisTrade

Spain
DATAPIXEL
Engine Power Components
Innovalia Association
Unimetrik

Turkey
Acd Bilgi Islem
Ericsson
Hisbim
Turkgen

Project start
July 2014

Project end
December 2017

Project leader
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Project website
https://itea3.org/project/invalue.html