

Internet of Things

- an essential part of the Future Internet

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Abstract— Within this presentation, the author wants to highlight another view on the Future Internet – the ‘Internet of Things’ (IoT) with key aspects and benefits. Additionally, he bridges the gap to the Usage in Business Processes with the alliance ‘Digital Product Memory’. He introduces the current research activities in this area.

Keywords - Internet of Things, Smart Items, Digital Product Memory, RFID, Real-World Awareness

I. INTRODUCTION

Over the past couple of years, SAP Research has been continually developing its vision of how the Internet can reach out to the real world of physical objects. The Internet of Things fuses the digital world and the physical world by bringing different concepts and technical components together: pervasive networks, miniaturization of devices, mobile communication, and new models for business processes. Applications, services, middleware components, networks, and endpoints will be structurally connected in entirely new ways.

The Internet of Things will bring tangible business benefits, such as the high-resolution management of assets and products, improved life-cycle management, and better collaboration between enterprises. Improved sensor and device capabilities will also allow business logic to be executed on the edges of a network – enabling existing business processes to be decentralized for the benefit of performance, scalability, and local decision-making.

II. INTERNET OF THINGS – A SUMMARY

The Internet of Things combines the power of universal network connectivity with embedded systems, sensors, and actuators in the physical world. Starting with RFID tags, the technology has developed to integrate a wide range of software platforms spanning from embedded software and middleware to enterprise resource planning. The Internet of Things makes it possible to extend the reach of information and communications technologies beyond the confined use in public or private organizations into everyday service interactions at all levels of society and economy. Sensors and embedded systems collect and carry information about objects in the real world and their respective context. Devices mounted in different environments, embedded in systems, and worn by users – combined with ubiquitous wireless communications

infrastructures – can transfer information to all kinds of applications whether local, remote, or distributed.

The increasing computing capabilities of such devices will also allow the implementation of new software for completely novel processes. This allows the Internet not only to exchange and process information but also to control actions in the real world.

The Internet of Things adds an enormous range of new business opportunities & service offerings. This will lead to tremendous efficiency gains in many industries, particularly in combination with the Internet of Services. The alliance ‘Digital Product Memory’ is one specific example for this future value.

III. DIGITAL PRODUCT MEMORY

The development of the Digital Product Memory (DPM) is funded by the German Ministry for Education and Research (BMBF). It is an alliance of three major projects, they develop a joint technical infrastructure covering the following aspects of the Digital Product Memory:

- Short-term memory: The SemProM (Semantic Product Memory) project aims at collecting information that is primarily of a short-term usefulness. Sometimes this information will be stored directly on the product using a variety of technical solutions like RFID or embedded systems.
- Long-term memory: In the Aletheia (Aletheia = the Greek goddess of truth) project the focus is on finding and semantically harmonizing product related information from a huge variety of information sources like enterprise systems, office applications, or Web 2.0 applications. The project aims at providing a consistent view on all available information about a product or a product category and storing it for a later re-use even after years.
- Memory access: The ADiWa (“Allianz Digitaler Warenfluss”, Alliance Digital Product Flow) project provides the means to access the information stored in the DPM. It develops mechanisms allowing to expose the information in the DPM to the outside world via services providing the ground for new Software as a Service business models. Thereby ADiWa will be a major step forward towards the convergence of the Internet of Things and the Internet of Services.