

Chapter XXIV

CoBIs: Collaborative Business Items

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ABSTRACT

This chapter describes example use cases for ubiquitous computing technology in a corporate environment that have been evaluated as prototypes under realistic conditions. The main example reduces risk in the handling of hazardous substances by detecting potentially dangerous storage situations and raising alarms if certain rules are violated. We specify the requirements, implementation decisions, and lessons learned from evaluation. It is shown that ubiquitous computing in a shop floor, warehouse, or retail environment can drastically improve real-world business processes, making them safer and more efficient.

BACKGROUND

Currently every year, despite enormous preventive effort, a significant number of employees in the chemical, oil, and gas industry become seriously injured or die due to accidents at production or storage sites (Fewtrell & Hirst, 1998). Technology can help to minimize the risk of such tragic events that also cost companies and society a great deal of money. Increasing the safety of employees is a

fundamental ethical value and part of corporate social responsibility (CSR), a concept more and more demanded from companies that contributes to their (accounting) goodwill.

The research project *Collaborative Business Items*, or CoBIs, made real-world items smarter by attaching wireless sensor nodes to them. These nodes communicate in a peer-to-peer fashion, collaboratively executing business logic and interacting with back-end enterprise systems. An

enterprise software back-end and the network of ubiquitous sensors together formed ubiquitous applications. Using this technology, the project looked into the promising application scenario of making business processes that involve hazardous goods safer and more efficient. The project, partly funded by the European Union, brought together corporate end-users like BP^a and Infineon^b with SAP as a provider of enterprise software solutions as well as leading experts in research on ubiquitous hardware and software.

The project focuses on one central scenario: *supervision of hazardous goods*. Using the tools and expertise generated by working on this scenario, we also looked into *safe entry into confined vessels* and *real-time inventory and RFID reader coordination*.

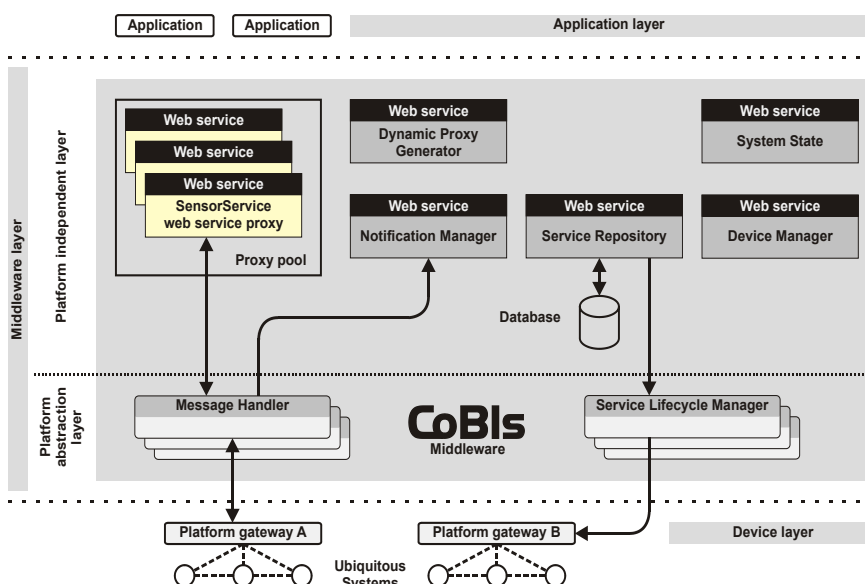
APPLICATION SCENARIO

Focus Scenario: Supervision of Hazardous Goods

Hazardous goods must be stored safely in order to prevent accidents. Appropriate storage conditions are expressed by regulations imposed by governments and companies. Companies are obliged to comply with these regulations, which set the minimum standard in an industry. Most companies, however, voluntarily commit to standards that go beyond legal requirements. Storage regulations include rules like these:

1. For a given substance, only a maximum amount may be stored in the same storage location.

Figure 1. Architecture overview of integration middleware



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