

## **A Software as a Service RFID Middleware for Small and Medium-sized Enterprises**

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### **Abstract**

Strategies for enhancing supply chain performance often require data sharing between supply chain partners to remove inefficiencies such as out-of-shelf situations, incorrect inventory levels, and incorrect demand and sales forecasts. Radio Frequency Identification (RFID) combined with the Electronic Product Code (EPC) makes it possible to use unique identifiers for each object. RFID furthermore allows the automation of collecting events and lowers costs for enhancing information granularity about an object traveling through the supply chain. Given the fact that Small and Medium-sized Enterprises (SMEs) are integrated into a global Supply Network (SN) with modern Supply Chain Management strategies like Vendor-Managed Inventory, Collaborative Planning, Forecasting and Replenishment, and Demand-Driven Supply Network, they have to invest in technologies like RFID if they want to become or stay part of the SN. SMEs, e.g. Wal'marts suppliers, are often subject to mandates or legal requirements which require the companies to implement a certain technology. This will probably happen in the pharmaceutical supply chain over the next few years. In contrast to large enterprises, SMEs do not have the financial capacity to invest in modern technology which might not even bring the promised advantages. This often results in a difficult situation for SMEs. On the one hand, they depend on being part of a modern SN. On the other hand, they only want to invest in technologies which have proven to bring substantial advantages. Furthermore, SMEs are facing various problems by the integration of RFID technology. The IT resources of SMEs are limited to the needs of the companies' everyday business without additional capacities for an RFID implementation. The high upfront costs coming with such an implementation are also a burden for many SMEs. In the end, the SME has to make a make-or-buy decision. We claim that it is possible to serve SMEs with a Software as a Service (SaaS) solution especially for their purposes. In other business areas this already proved to be successful as examples like Salesforce.com show. In this contribution we will present the— to the knowledge of the authors — first SaaS solution for a RFID middleware especially for SMEs. In this paper we will first describe the requirements on a SaaS RFID middleware. Then we point out our solution and describe its architecture. After that we point out business models and a conclusion summarizes the paper.