A Study on RFID Innovative Service Systems Using Systems Engineering and Platform-based Technology

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ABSTRACT

As one of the Ten Major important technologies in 21 century, a complete Radio Frequency Identification (RFID) system including the integration of reader, tag, antenna and software. It is a combination of wireless auto identification and data procession technology, with various good characteristics as environment-proof, rewritable, contactless, plentiful data record, simultaneously reading many tags in one reading field and others. At present, the industry has introduced RFID into many application areas such as airline luggage monitoring, automatic control of manufacturing, warehouse management, transportation monitoring, security control and medical management, and others. RFID will be the leading trend of innovative science and technology in the future. As how to implement RFID in order to gain more added value of systems and to integrate cross-discipline of present system function module in order to make the RFID system more adaptable and expandable to access a variety of information transformation with humanized operation interface is an important step toward a customized total solution in accordance with different needs. This RFID system can combine with different readers, tags, frequencies (such as LF 125-134kHz, HF 13.56MHz, UHF 860-930MHz, Microwave 2.45-5.8GHz), sensors with different characteristics and information communication technology（ICT）to make multiple-by-multiple basis innovative application. Hence, present analysis has constructed an e-service system development platform drive by the RFID technology innovation with the help from the application of system engineering and integrated platform technology. This platform is including an automatic search engine module, modulated tool knowledge database, and customer-interactive communication interfaces. This RFID innovative services systems development platform can be applied in RFID relatived component suppliers, systems provider, systems integrator, software provider and other user to assist in solving each different needs, different applications, different properties of customized problems. Finally, this research has shown the results of two different actual application case of innovated-service systems with respect to different needs in the development of the RFID library system and the RFID innovated-service system of nursing house. Tags in differint frequencies such as HF 13.56 MHz and UHF 902.6 ~ 927.4 MHz have been selected and the software such as MATLAB, JAVA, VHDL have been chosen as the development tools, This research has achieved to develop the middleware and system operation software, and integrate with RFID equipment and MySQL database to provide the industry and users with a Platform-based RFID innovative service systems development platform.

Keywords : systems engineering ; radio frequency identify（RFID） ; innovative

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