RFID Based Smart Personal Baggage System

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Advances in the RFID technology over the last three decades have revolutionized the field of engineering. The technology has been applied to an enormous number of applications where contactless identification is required. The rate of adoption of the technology keeps increasing due to the relatively low cost of the modern RFID based systems. Personal asset tracking is becoming more and more important since people tend to forget their belongings due to their hectic schedules and the increased number of personals gadgets in use. In this paper, a method of using RFID based system to track the personal items and their safety during travel has been introduced. The system is designed in such a way that it is embedded into a backpack, a handbag or a traveling bag. With the help of the area tagging and the pre-programmed schedule, the customized RFID reader system is capable of real-time tracking, managing the integrity and providing anti-theft capabilities to the personal belongings while traveling. Then, the system integration method and the special strategies of controlling the RFID system with a constrained environment inside a baggage have been elaborated in detail. In addition, we introduced a dynamic transmit power controlling algorithm to maintain the tracking perimeter to be restricted only to the baggage, even when the items inside the baggage are changing and the signal attenuation is changed. Furthermore, we discussed a patch-antenna, which is designed to use with the specific application requirements and space constraints in detail. The integration and research results have been successful and based on that, future improvements to the system with technology advancements have been discussed along this paper.

Keywords: RFID, Personal-assets, Smart-baggage, Anti-theft, Patch-antenna