

Does the Introduction of RFID Technology Improve Livestock Subsidy Management? A Success Story from an Arab Country

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EXECUTIVE SUMMARY

While the expected benefits and challenges of RFID technology have been well studied in the manufacturing and service sectors at the private organization level, little understanding exists of these two issues when exploring RFID adoption in the agricultural field and at the public organizational level. Previous tracking programs in Kuwait have been unsuccessful in reducing illegal activities that lead to fraud and the wasting of public money in animal feed programs. To alleviate these problems, an RFID program, supported by information systems, was designed to help monitor and control feed distribution and animal tracking. Unlike previous studies, this case describes the application of RFID for the tracking and monitoring of livestock by the Kuwait Public Authority of Agriculture Affairs and Fish Resources. It reviewed the subsidy process before and after RFID adoption and found a large reduction in the actual number of animals claimed after RFID adoption, which reduced fraud and increased animal accountability.

Keywords: Electronic Commerce, Information System, RFID Advantages, RFID Application, RFID Cost, RFID Investment, RFID Obstacles, Top Management Support

ORGANIZATION BACKGROUND

Even though RFID technology seems to have emerged quite recently, the concept is not new. It has its origins in military applications during World War II, when the British Air Force used RFID technology to distinguish allied aircraft from enemy aircraft with radar (Asif & Mandviwalla, 2005). RFID received great attention by academia and practitioners after the Society of Information Management (SIM) conducted its last survey of Information Technology executives, and RFID was rated among the top 20 developments in application and technology (Luftman et al., 2006).

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Literature review papers on RFIDs (Roussos & Kostakos 2009) identified a variety of RFID applications including supply chain, ticketing, asset tracking, retail stores, personal identification, library books, hospitals, and animal tracking. Moreover, these studies have shown numerous potential advantages as listed in Table 1.

Firms are making huge investments in information technology to improve their efficiency. Available statistics, according to IDTechEx, a market research, specializing in RFID (www.idtechex.com), estimates that more than 3.7 billion RFID tags have been deployed in the field by 2007 (with more than 1.6 billion new tags introduced in 2006 alone) and this trend is accelerating. Another consulting firm, eMarketer, 2005, estimates that worldwide investments in RFID technology may rise from \$363 million in 2004 to almost \$3000 billion in 2010. However, the impacts from these investments remain a challenging and controversial task to assess. For example, Brynjolfsson and Hitt (1996) concluded that IT investments can lead to cost savings, improved quality in service and better customer service. However, Willcocks and Lester (1994) suggested that there is no clear link between IT spending and a firm's gains in terms of market share or profitability, while others have concluded that the value of IT is high when the adoption is aligned with the organization's strategic objectives (Chan & Reich, 2007). A recent study found the existence of a high correlation between perceived potentials of RFID and CIO's intention to invest in RFID (Leimeister et al., 2009); however, the real challenge facing decision makers, as is the case of the PAAF, is how to systematically leverage the potential of RFID in other cultures and settings (Curtin et al., 2007; Leimeister et al., 2009) and how to align the application with the organizational objectives.

While there is a growing interest in the application of RFID and several conceptual and empirical studies do exist (Ngai et al., 2008; Roh et al., 2009; Leimeister et al., 2009), there is, however, a dearth of case studies or research that report the benefits and challenges of using RFIDs. The following are exceptions: RFID case studies in the healthcare industry (Tzeng et al., 2008; Wang et al., 2006), in supply chain management (Roh et al., 2009), in retail and ecommerce industry (Roh et al., 2009; Wamba et al., 2008), in air transport (Roh et al., 2009), in manufacturing (Roh et al., 2009), and other focused on the description of information system based RFID (Harry et al., 2007).

In his analysis of seven cases of RFID applications in seven industries, Roh et al. (2009) identified three key benefits of RFID adoption namely: cost savings, supply chain visibility, and new process creation. Then, they proposed a classification of RFID application based on two dimensions: scale (internal solo vs. internal multiple applications) and scope (internal integrated vs. multiple integrated applications). Roh et al. (2009, p. 363) concluded that the proposed classification helped organizations consider "which benefits they consider most important and thus which direction they should to take in RFID adoption."

After analyzing five cases of RFID adoption in the healthcare sector in Taiwan, Tzeng et al. (2008) made several propositions to derive value creation from RFID: (i) implementation of RFID provides sources of value through new business opportunities; (ii) adoption of RFID and estimation of its effectiveness is not straight forward and is dependent on the analysis of many uncontrollable factors and the psychological climate of the organizations; (iii) evaluation of RFID applications need to be done from both strategic and operational viewpoints; (iv) implementation of RFID systems should consider stakeholders outside the organization's boundaries, whose action may impact the organization; and (v) through RFID and the wireless sensor network environment, the meanings and constraints associated with location, space and time can be changed, so that RFID allows for new services to be created.

Wamba et al. (2008) analysed the application of RFID in four case studies related to four companies operating in the retail sector and concluded that cost reduction and expected benefit

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