

# Chapter 21

## The Role of Radio Frequency Identification in Modern Libraries

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### ABSTRACT

*This chapter reveals the role of radio frequency identification (RFID) in modern libraries, thus demonstrating the theoretical and practical concept of RFID; the utilization of RFID in global operations; RFID perspectives in modern libraries (i.e., operating cost, information technology infrastructure cost, skilled RFID workers, access rate, patron policy, data security, barcode factor, and patron issues); the applications of RFID in modern libraries (i.e., data management, circulation, inventory, assistance in searching and orientation, data accuracy and reliability, theft prevention, utilization statistics for serials, and personal service); and the significance of RFID in modern libraries. RFID solutions can be utilized to reduce the operating costs through decreasing labor costs, enhancing automation, improving tracking and tracing, and preventing the loss of materials. Applying the RFID will significantly improve educational performance and gain sustainable competitive advantage in modern libraries.*

### INTRODUCTION

As a technology solution, RFID has proven increased efficiency and accuracy within traditional production and inventory control environments (Ryan, Lewis, Doster, Daily, & Glass, 2013). RFID becomes an increasing interest in several application areas (Wu, Wang, Sheng, & Siror, 2010). RFID technology has gained considerable attention from business executives because of its potential to change the way commerce is conducted (Park, Koh, & Nam, 2010). The developments

of information and communication technology (ICT) systems are rapidly becoming the vital and core component for conducting and transacting business in organizations (Makori, 2013). University libraries are increasingly adopting RFID technology in order to improve the efficiency of information services and increase quality service (Makori, 2013).

RFID technology is broadly utilized in many university libraries (Hossain & Prybutok, 2008). RFID technology has potential for both cost savings and revenue enhancement (Zelbst, Green,

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Baker, & Sower, 2010). RFID technology is emerging as the innovative solution for managing information operations and services in university libraries (Makori, 2013). The use of RFID can significantly transform the current practice of conducting business, improve efficiency of operation and management, and support decision-making process (Barjis & Fosso Wamba, 2010). The application of RFID makes the technology the next big thing as the total RFID market (including RFID tags, RFID readers, software, and services) has been forecast to exponentially grow (Wyld, 2006).

The strength of this chapter is on the thorough literature consolidation of RFID in modern libraries. The extant literature of RFID in modern libraries provides a contribution to practitioners and researchers by describing a comprehensive view of the functional applications of RFID in modern libraries to appeal to different segments of RFID in modern libraries in order to maximize the business impact of RFID in modern libraries.

## **BACKGROUND**

RFID system began during the Second World War in the 1940s, when the system was used to locate and distinguish friendly aircraft from enemy ones. With time the system spread to other business industries such as manufacturing firms and livestock (Waddenkeri, 2006). Adopting a technological innovation for the right business need at the right time is one of most important strategic decisions that a firm has to make to gain and retain a competitive advantage (Park et al., 2010).

There are various reasons that motivate university libraries increasingly to go for RFID solutions. A number of authors (Biswas & Paul, 2010; Howard & Anderson, 2007; Madhusudhan, 2010; Waddenkeri, 2006) have advanced numerous reasons that make RFID systems practically attractive in library and information establish-

ments. The development and evaluation of the library application has demonstrated that RFID can be successfully integrated into library systems (Mehrjerdi, 2011). The success of RFID application depends on many factors such as the size of enterprise as data should travel along the movement path of tracked objects, hardware components (tag readers) should be installed, signal collision among RFID tags at different levels (i.e., item, box, and pallet) need to be dealt with (Barjis & Fosso Wamba, 2010).

RFID in modern libraries is recognized as a productive tool for flow management rather than barcodes and other identification technologies (Koneru, 2004). RFID technology is the rising interest in the library community because of its applications, which promise to increase efficiency and productivity and enhance user satisfaction (Biswas & Paul, 2010). Technical challenges of RFID implementation include tag cost, standards, tag and reader selection, data management, systems integration and security (Li, Visich, Khumawala, & Zhang, 2006).

## **ROLE OF RADIO FREQUENCY IDENTIFICATION IN MODERN LIBRARIES**

This section demonstrates the theoretical and practical concept of RFID; the utilization of RFID in global operations; RFID perspectives in modern libraries (i.e., operating cost, information technology infrastructure cost, skilled RFID workers, access rate, patron policy, data security, barcode factor, and patron issues); the applications of RFID in modern libraries (i.e., data management, circulation, inventory, assistance in searching and orientation, data accuracy and reliability, theft prevention, utilization statistics for serials, and personal service); and the significance of RFID in modern libraries.

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