Chapter 9
Application of RFID Technology in Banking Sector

Lotfollah Forozandeh Dehkordi
Payame Noor University, Iran

Ali Ghorbani
Payame Noor University, Iran

Ali Reza Aliahmadi
University of Science & Technology, Iran

ABSTRACT
Nowadays, the banks are using new technologies to provide better services to customers. One of these new technologies is RFID. In this chapter first a brief introduction presented about RFID technology and its components. Then, some applications of RFID in banking sector such as RFID applications in the cheques between banks, reducing the manual operation, customer relationship management, tracking and tracing, money transferring system, countering counterfeiting, contactless smart cards, people identification, phone banking, establishing security, checking purpose and so on are explained. Finally some of the barriers to technology acceptance by the customers and some methods to data protection and increasing security in RFID systems are described.

INTRODUCTION
Technological developments particularly in the area of information technology are revolutionizing the banking industry. With the development of this technology, Commercial banking is undergoing rapid change.

Radio frequency identification (RFID) is a seemingly simple technique. Data is stored in RFID tags that are attached to objects or located in Smart cards, and this data can be read using radio signals and presented on a display by using a suitable reader. The data can then be transmitted automatically to an information technology (IT) system for further processing (Hasen & Gillert, 2008). The appeal of this technology is its convenience and efficiency offered to both the consumers and the merchants. (Banks, Pachano, Thompson & Hanny, 2007)

RFID’s ability to perform as an auto-identification technology was first utilized by the Royal Air Force in World War II to differentiate between friendly and enemy aircraft. Friendly planes were
equipped with bulky “active” RFID transponders (tags) energized by an attached power supply and interrogated by an RFID transceiver (reader). Applications today rely on similar communication between RFID tag and reader, although the tags (miniscule microchips attached to antennae) are generally “passive,” powered by an electromagnetic field emitted by the reader. Radio signals inform nearby readers of a serial number stored on the tag that uniquely identifies any item bearing the tag. (Angell & Kietzmann, 2006). Table 1 shows RFID application fields.

The Auto-ID Center, established in 1999 as an academic research project at the Massachusetts Institute of Technology, developed the architecture for creating a seamless global network of all physical objects (www.autoidlabs.org/aboutthelabs.html). The technology has since been transferred to EPC global (www.epcglobalinc.org), which oversees development of standards for electronic product code (EPC) tags. These tags are used for every imaginable item from clothes to medicine, electronics, food, motor vehicles, books, door locks, and airplanes revolutionizing logistics and supply-chain and inventory management worldwide. (Angell & Keitzmann, 2006)

**ELEMENTS OF RADIO FREQUENCY COMMUNICATION**

The communication takes place between two devices: a reader that needs the information and a tag that has the information. Before we dive into the physics of communication, let’s get on the same page about some concepts that are at the heart of this communication (Sanghera, 2007).

Radio frequency communication uses the EM waves with frequencies from a specific part of the EM frequency spectrum. Therefore, the underlying physics behind RF communication is the same as for any communication that uses electromagnetic waves to carry information.

The four major players that make this communication happen are the following: (Sanghera, 2007)

- **Data signal**: This is the wave that actually contains the information that needs to be sent to the receiver.
- **Carrier signal**: This is the wave that carries the data signal.
- **Modulation**: This is the process that encodes the data signal into the carrier signal and creates the radio wave that is actually transmitted by the antenna to propagate.
- **Antenna**: This is a device used to transmit and receive signals such as radio waves.

In an RFID system, both the reader and the tag have their own antennas through which they communicate with each other. A tag is also called a transponder because it responds to the reader’s attempt to read it, and the reader is also called a transceiver because it receives information from the tag (Sanghera, 2007).

**THE APPLICATION OF RFID IN THE CHEQUES BETWEEN BANKS**

One of most important application of RFID tags is in the field of issuing cheques between the banks and cheques to the order of banks. As you know when the customer asks for a cheque between the banks, after issuing the cheque and referring of the customer to the destination banks, there, it is necessary to exert a high level of care about