



Privacy in Libraries using RFID

No Chance for Intruders

There is no doubt: that Radio Frequency Identification Technology (RFID) is future-oriented, efficient and often controversial when discussed. Over the past few years RFID has either successfully found its way or is seriously being tested in a number of different industries.

Retailers want to more effectively track items that they sell and stock so supply chain operations are taking advantage of RFID technology by installing RFID systems to track pallets and cases of goods. Identification of individuals for controlled access into buildings, and ski resorts is another area where RFID is being successfully utilized.

This year at the annual CeBit IT-fair in Germany a RFID passport prototype was presented for the textile industry. To prevent counterfeiting of trademarked clothing, achieve supply chain control, and anti-theft protection, RFID labels are integrated into items. Integration of RFID tags into textiles is an up and coming matter that has created privacy concerns.

Meanwhile, libraries are using RFID technology very successfully. Media circulation, as well as item security, is optimized by the use of this technology. In addition, RFID helps to reduce routine work. This frees librarians to assist patrons with reference materials, research questions and provide instructions. Library patrons also utilize the self check-out and check-in stations which help alleviate long waiting lines at the counters. Libraries who use RFID notice a significant increase in total media being checked-out. In Winterthur, Switzerland's town library media checkout has increased by 50 percent. Although the benefits can be enormous, RFID is creating concerns with consumers and privacy activists. Most of the concerns and public discussions have focused on the popular use in the retail business.

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Currently, Wal-Mart is doing extensive tests of tagging and tracking pallets. The METRO-Shop in Germany is also testing the tagging of its goods. Customers fear that they are being watched. They protest against any spying on their buying behavior. People are feeling threatened by the vision that all goods are being tagged with intelligent chips that track personal information. They fear that their personal data is invisibly being transmitted by radio waves. Their fear actually is: every person might be monitored at any time and anywhere without noticing it. So RFID is often interpreted as an unnoticed and uncontrolled method of access to individual, personal data.

Often, what we don't understand causes insecurity. For the most part, RFID is soundless and unseen. Users often do not identify reading devices. That is the reason why unscrupulous misuse might be possible. However, RFID has many limitations and it is very important to communicate the benefits and limits of RFID.

What is technically and organizationally possible and allowed?

Chances and Limits of RFID use

The reading of private data in patron cards or debit cards by unauthorized third parties would be an invasion of privacy. At the same time, if employers or insurance companies use this information without permission, this would also be a dramatic violation of privacy rights. To read Patron Cards, Book Labels or other forms of RFID cards or labels with hidden readers or satellites would not only constitute a violation of privacy rights, it would also be a criminal act.

Even so, can user profiles be created and misused for market research purposes? Will it be possible to read cash amounts from bank accounts if bank notes are equipped with electronic chips? Will uncontrolled debiting of bank accounts be possible if debit cards have integrated chips?

Which of these scenarios are realistic? In general, is it technically possible to read the data? Could this data be interpreted or used in an automatic process? Would the benefits be worth the economical cost to gain the information? What are the legal consequences? Not all questions will be answered in this article,

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especially those regarding commercial profitability. Hopefully it will shed some light on some technical aspects which will be most relevant for libraries; however, it may be useful in other industries. More technical information can be found in the ISO Standards, or in other technical reference books.

Readability of data and Interpretability

A major concern among privacy advocates is the impending capability to access individual personal information without the control of the user. However, in libraries the RFID tags do not contain any individual patron data. All patron data are kept in a bibliographic in-house database that is subject to the strict privacy terms of the libraries. When a library utilizes RFID there is no change regarding the use and security of the data stored on the in-house database. Until recently nobody took offense at creating these databases.

Nonetheless, even if the tag could be read, RFID does not support a direct connection between the tagged items and the patron. In addition, the chip's data are stored in a binary format. Even though the format could be read by an external person, the data could not be analyzed. That means that all the patron cards are useless for gathering individual data for tracking and profiling of single persons.

Read Distance

The read distance is the major aspect that limits remote data collecting, compiling and recording of user profiles.

RFID tags are passive – they do not contain a battery. Therefore, they cannot send out strong signals which would cover a large area. The read range of 13.56 MHz tags that are used in libraries is not more than 3 to 4 feet. Active tags that are equipped with a battery would not have a life as long as books, they would also be too expensive; and difficult to attach. The read distance at a Self Check-out station is about one foot. Patrons who want to check out items using the Self



Check out need to be within that read range. The tag cannot send signals further than the read range.

Besides the read range the tag orientation to the reader is an important factor. Signals can be exchanged only when an RFID tag reader and tag are adjusted to each other in the right distance and orientation. To compensate for a patron's movements, a mobile reader similar to what is used at airport security checks would need to be utilized.

In addition, read ranges are limited by government regulations. The transmitting power can not be optionally increased as this may interfere with other electronic devices. Another limitation is that the read distance could be manipulated. For example, metal could absorb or even deflect radio waves. A patron ID kept in a purse could not be read if it were close to a metalized credit card.

Conclusion: It is absolutely impossible to locate RFID tags from long distances or even from satellites with commonly used library tags. In addition, since the chip's data are stored in a binary format, the remote reading of data would be very unreliable. Also, when read distance and orientation are taken into account, tracking data from patron cards is impossible.

Privacy in the library

Individual patron data has to be maintained in a library's database to be able to make people responsible for returning books. Usually, the patron knows what it means to pass his/her personal data to the library and become registered in the database. When RFID is implemented into a library there is no change regarding the database's maintenance. Libraries have very strict privacy terms and patron information is strictly confidential. Like many business, association and institutions, libraries are required to insure the privacy of personal information. They must adhere to their own strict privacy rules and also take into consideration the serious legal consequences of sharing patron information with anyone else.



Summary

Modern data communication uses electromagnetic (radio) waves in a wide variety of ways. Both mobile phones and wireless LAN services are examples of very common everyday uses. RFID belongs to this type of data communication. It has been used for many years in a variety of applications and is taken for granted in many fields. For example, it is used in ski areas and company buildings for access control, in car keys as an immobilizer, and on highways for toll collection. These examples should not play down the possible risks. Nonetheless, they show that society is already very familiar with RFID. The use of RFID in libraries definitely does not provide a base for internal or external data misuse. Technical and organizational conditions do not allow it.

There are two aspects that are very important in helping RFID be accepted in a more positive way. One, make the technology familiar and two, make the function transparent.

Reviews and Literature

ISO-Standard 15693 (2001): Part 1: Physical characteristics -- Part 2: Air interface and initialization, Part 3: Anticollision and transmission protocol

ISO/IEC FDIS 18000-3: 2003 (E) Information Technology AIDC techniques – RFID for item management – air interface, -Part 3 : Parameters for air interface communications at 13.56 MHz