

Risk Assessment in Securing Radio Frequency Identification (RFID) Systems: A Case Study on Petra Christian University Library

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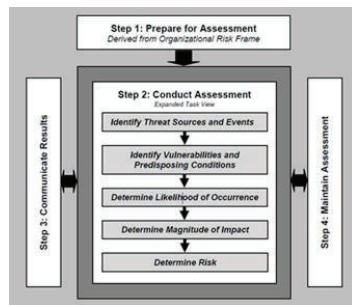
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Graphical abstract



Abstract

Each library collection has an identification number which is unique number for each book. Identification numbers are used in searching process, and library's circulation. Identification number is presented by barcode, and will be coupled with RFID, in order to facilitate collection information searching service, collection circulation service, and as a function of the collection security. The current barcode system problem lacks security features, the process of collection finding is very difficult, and the circulation process takes more time. This problem can result in losses of the library assets, and reduce library user satisfaction. Therefore, Petra Christian University Library plans to implement the RFID system as the solution of collection security. The RFID implementation process requires an analysis to be done to assess the risk factors that affect the library's business processes and provide a response to those risks. This paper discusses the risk assessments for the RFID system to be implemented in the library. Risk assessments are based on the NIST SP800-98 standard Guidelines for Securing Radio Frequency Identification (RFID) System and NIST SP800-30 Guide for Conducting Risk Assessments. Risk factors are categorized into two, namely business process risk and risk intelligence process. The results show most of the risk factors are related to the server system.

Keywords: Risk assessment; RFID; NIST; library

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1.0 INTRODUCTION

Organizations in the public and private sectors depend on information technology and information systems to successfully carry out their missions and business functions. Information systems can include very diverse entities ranging from office networks, financial and personnel systems. Information systems are subject to serious threats that can have adverse effects on organizational operations and assets, individuals, and other organizations. It is imperative that leaders and managers at all levels understand their responsibilities and are held accountable for managing information security risk - that is, the risk associated with the operation and use of information systems that support the missions and business functions of their organizations.

Risk assessment is one of the fundamental components of an organizational risk management process. The purpose of risk assessments is to inform decision makers and support risk responses by identifying: (i) relevant threats to organizations or threats directed through organizations against other organizations; (ii) vulnerabilities both internal and external to organizations; (iii) impact (i.e., harm) to organizations that may occur given the potential for threats exploiting vulnerabilities; and (iv) likelihood that harm will occur. The end result is a determination of risk (i.e.,

typically a function of the degree of harm and likelihood of harm occurring) [1].

Risk management is expected to identify and analyze the risks that might occur when the project is implemented, and from these analyzes can help the companies protect and anticipated losses that may adversely affect the company. Therefore, using risk management, the company can identify risks that may occur earlier and be able to anticipate and mitigate the impact of risks.

At this time, many libraries still use barcode system for inventory control. Moreover, the barcode label is used for help librarian in circulation process such as lending collection for library users, checking in collection returned, and monitoring collection for damage and routing them to the appropriate staff for repair or replacement. The barcode label results in speed and accuracy at a central lending and return point. The barcode system cannot be used as security for collection theft. It needs a separate electromagnetic detection system for theft [2].

Currently, Petra Christian University library plans to implement the Radio Frequency Identification (RFID) system. The RFID system has the ability to store information relating to the specific item which they are attached to. It facilitates multiple, automatic object identification, tracking, sorting as well as speedier data collection, which tremendously improves the efficiency of