Chapter 5
Authentication Model for Enterprise Resource Planning Network

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ABSTRACT

Enterprise Resource Planning (ERP) software is business-management software that allows an organization to use a system of integrated applications to manage the business. ERP software often contains highly confidential information that is vital to a firm's competitiveness, so it is critically important that appropriate security be implemented to reduce its vulnerability. In this chapter, security issues are presented that could arise when ERP software is integrated with many systems and with web environments. The security issue is one of the major issues with ERP software, and it has not been a major focus of the developers of the software, who leave this issue to different components of the system and to vendor implementation. In this chapter, the author presents a new security model for ERP software. The author also presents a new authentication model that consists of the following layers: Role base, Data mining, Risk-based access control, and PKI.

INTRODUCTION

Enterprise Resource Planning is a business integration approach; it was first developed by the Gartner Group in 1990 as the next generation of manufacturing business system and manufacturing resource planning software. Today, ERP software is considered to be “the price of entry for running a business” (Kumar, 2000). ERP software integrates internal and external information across an entire organization, including finance, accounting, manufacturing, sales and service, customer-relationship management, and others. ERP software computerize these activities with a unified software application. The objectives are to facilitate the flow of information between all business functions inside the limits of the organization and to manage the connections outside the organization (Bidgoli, 2003). ERP software can be used to manage and modernize all the resources in an enterprise, and it incorporates the business processes within and across the functional boundaries in the organization. With ERP
software, an enterprise can systematize its central and essential business applications; decrease the-complexity and cost of collaboration; ensure that the enterprise takes part in the BPR to optimize its operations, and become a successful business (She, 2007; Thuraisingham, 2006). ERP software allows enterprises to share information systems with trusted associates over supply chain management, and the number of authorized users and operators continues to rise. The ERP approach represents a new way of managing business systems that is beyond the perimeter of conventional IT security. Enterprises must trust the actions of employees and trust their partners’ employees and perimeter security. For most ERP systems, security starts with user-based controls, which limit a user’s access to the system based on her or his individual, customized, authorization level. The fact that security is a big issue is evidenced by the following statement: “When you consider that the average business loses 3 percent to 6 percent of annual revenue due to fraud, most agree that the ERP security features listed above are not working” (Holsbac & Johnson, 2004).

In this work, The general architecture of ERP software has been presented, and security issues are presented that could arise when ERP software is integrated with many systems and with web environments. The work is focused on current issues in ERP, such as:

- Role-Based Access Control;
- Security in SAP R/3;
- Baan Security.

The major contribution of this chapter is a new authentication model that consists of the following layers:

- Role base,
- Data mining,
- Risk base access control,
- PKI.

These layers are presented in:

**ERP SYSTEMS AND APPLICATIONS**

Enterprise Resource Planning (ERP) is an industry expression for the wide set of accomplishments that assist and manage the significant parts of a business. The information is presented through an ERP system that provides great assistance in meeting the industry’s objectives. ERP software applications can be used to purchase parts, manage product planning, provide customer service, assess inventories, interact with suppliers, and track orders. ERP software can also include applications for the finance and human resources aspects of a business. Classically, an ERP system uses a relational database system or is integrated with such a system. The deployment of an ERP system includes significant business process analysis, employee retraining, and new work procedures.

The history of ERP began in the 1960s, when organizations developed mainframe computing systems for use in automatically managing the company’s inventories. In the 1970s, these systems were based mainly on programming languages, such as COBOL. The evolution from simple inventory tracking systems to Material Requirements Planning (MRP) software permitted the planning of production and the required supplies of raw materials by working back from sales forecasts. Consequently, the controller first looked at Marketing and Sales’ forecast of demand, then looked at the manufacturing timetable required to meet that demand, calculated the raw materials required to meet production, and projected the quantities of raw materials that should be purchased. For a company with many products, managing the raw materials sharing production resources would be impossible without a computer to keep track of various inputs.

The fundamental functions of MRP were conducted by mainframe computers. Electronic Data Interchange (EDI) is a paperless exchange of business information using electronic mail (e-mail), computer bulletin boards, Electronic Funds Transfer (EFT), and other similar technologies.