



## **Chapter XVI**

# **Data Mining for Human Resource Information Systems**

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## **ABSTRACT**

*This chapter focuses on the potential contributions that Data Mining (DM) could make within the Human Resource (HR) function in organizations. We first provide a basic introduction to DM techniques and processes and a survey of the literature on the steps involved in successfully mining this information. We also discuss the importance of data warehousing and datamart considerations. An examination of the contrast between DM and more routine statistical studies is given, and the value of HR information to support a firm's competitive position and organizational decision-making is considered. Examples of potential applications are outlined in terms of data that is ordinarily captured in HR information systems.*

## **INTRODUCTION**

The role of Human Resource (HR) professionals in organizations has evolved parallel to business-related technological advances. HR professionals are now able to dedicate more time to strategic business decisions as the development of technology has allowed for the automation of many transactional HR processes (Walker & Reif, 1999). While HR professionals may no longer need to manage the manual processing of data, they should not abandon their ties to data collected on and about the organization's

employees. The human resources data that is available within organizations has the potential to help support their decision-making processes. The challenge is identifying useful information in vast human resources databases that are the result of the automation of HR-related transaction processing.

Data mining may be regarded as an evolving approach to data analysis in very large databases that could become a useful tool to HR professionals. Data mining involves extracting knowledge based on patterns of data in very large databases. Yet, data mining goes beyond simply performing data analysis on large data sets. Organizations that employ thousands of employees and track a multitude of employment-related information might find valuable information patterns contained within their databases to provide insights in such areas as employee retention and compensation planning. To develop an understanding of the potential of data mining HR information in a firm, this chapter will first discuss how HR-related information contributes to a firm's competitive advantage. Next, we will discuss the components of Human Resource Information Systems (HRIS) and gain an understanding of the steps in the data-mining process. Finally, we will identify opportunities as well as concerns in applying data-mining techniques to HR Information Systems.

## **BACKGROUND**

### **Building a Competitive Advantage**

The resource-based view of the firm posits that organizational resources and capabilities that are simultaneously rare, valuable, non-substitutable, and imperfectly imitable form the basis for a firm's sustainable competitive advantage (Barney, 1991). If a firm is able to uniquely manage its most valuable asset—its people—then it may be able to differentiate itself from the competition to create an advantage. Boxall (1993) suggests HR management can create a sustained competitive advantage by “hiring and developing talented staff and ‘synergizing’ their contributions within the resource bundle of the firm (p. 66).” Huselid, Jackson, and Schuler (1997) found investments in a firm's human resources are a potential source of competitive advantage in their examination of HR effectiveness. However, many organizations lack the management know-how or the information necessary to make strategic human resource decisions.

The competitive advantage is sustained if other firms are unable to imitate their resources. The management of a firm's human resources is often less susceptible to imitation because competitors rarely have access to a firm's HR management practices, as these practices are not transparent to those outside of the company (Pfeffer, 1994). For this reason, effective HR management provides a unique opportunity for firms to establish a sustainable competitive position. One step in the process of developing a firm's human resources involves planning. Human resource planning goes hand in hand with an organization's strategic planning. As a firm develops its business strategy, it must consider the abilities of its staff to meet its strategy. As a firm identifies its strategy, HR must then ensure the strategy's success by ensuring the right HR resources are in place. HR must collect, store, and analyze data to move forward in the planning process.

All organizations collect data about their employees. However, the actions taken with that data varies widely among organizations. Some organizations use the data only

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