# Chapter 15
# Application of Data Mining in e-Commerce

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## ABSTRACT

*The web in recent years has been a big trend, which helped make it a source of information and essential in the various fields of research, in particular, the commercial area that represents the e-commerce (electronic commerce). However, the competition in the e-commerce sites is very tight. This has pushed companies to conserve and retain customers rather than seeking to expand its market share by conquering politically. These requirements have introduced the extraction of knowledge from data in e-commerce sites, using data mining techniques. This article will be an introduction to the concept of data mining, a definition of economic concepts related to e-commerce, and the authors' approach to the application of data mining techniques in e-commerce.*

## 1. INTRODUCTION

Electronic commerce refers to all trade where the purchase is made on a telecommunications network. The evolution of the web has introduced a greater use of e-commerce sites, which allows generating a large amount of data. The data generated by e-commerce sites is a precious source of knowledge of the business, but only if it is analyzed in an optimal way. This constraint (Jambu, 2000) has motivated researchers to find techniques which have the power to deal with this mass of data. Data mining (Fayyad et al., 1996) is represented as the magic tool to bring up relationships, trends and hidden associations. E-commerce sites have used data mining models (Agrawal & Srikant, 1994; Zaki & Hsiao, 2002), to build optimal business strategies, recommend products intelligently and treat client individually and targeting the right customers using the right channels of communication to achieve maximum benefit.

Data Mining is based on the concept that exists within each data amount of hidden information. The data mining techniques allow extracting the knowledge, existed in the data.

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## 2. DATA MINING TASKS

Data mining tasks can be divided into 5 parts:

### 2.1. Description

This is often one of the first tasks required of a data mining tool asked to describe a complex data base. This often creates an additional operation to provide explanations. For example, a customer calls can be summarized in total minutes, total number of calls, and so on.

### 2.2. Classification

The classification determines the class of an object based on its attributes. A set of objects is given as the training set. Each object is represented by a vector of attributes followed by its class. The function or classification model is built by analyzing the relationship between the attributes and classes in the training set. This function or model can then classify objects in the future.

### 2.3. Clustering

Segmentation is to extract previously unrecognized groups, having the same characteristics, called clusters. Alternatively it is segmenting a heterogeneous population into homogeneous populations. Unlike classification, subpopulations are not predetermined.

### 2.4. Associations Rules

This problem is to find the connection between objects, this relationship called rule associations. An association rule indicates that the appearance of a set of objects in a database is strongly related to the appearance of a set of other objects.

### 2.5. Prediction

The prediction is similar to classification except for with the prediction the results are in the future. Examples of tasks applied to marketing forecast: "Predicting the commercial value of a stock three months in the future".

## 3. E-COMMERCE

E-commerce or electronic commerce includes all commercial transactions taking place remotely through electronic and digital interfaces and essentially involves commercial transactions taking place on the Internet from different types of terminals (computers, tablets, smart phones, consoles).

Although everyone believes that e-commerce is a new technological innovation, the term e-commerce is not entirely new. Indeed trade existed since the 60s thanks primarily to standard EDI (electronic data interchange). But the trend is related to the evolution of the internet.

### 3.1. CRM

The client is usually the main source of revenue for businesses. However, in e-commerce sites, the competition is tight and customers have more options in choosing their supplier with a simple click. The criteria for selecting clients include financial criteria, responsiveness of the company but also purely emotional criteria (need for recognition, need to be heard, etc...).

However, companies seeking to manage the customer relationship, which is known as CRM (Customer Relationship Management) is defined in (Newell, 2000) as "the process of changing customer behavior, seeking to learn from every interaction with it. CRM also aims to treat the customer in an individualized manner and to strengthen the link between it and the company ".