Chapter 79
Supporting Companies Management and Improving their Productivity through Mining Customers Transactions

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ABSTRACT

Selling products or services online plays an important role in the success of businesses that have a physical presence, like a retail business. For many businesses, a retail website is an effective line of communication between the businesses and their customers. Even if the business does not present all of its products and services in the website, the website may be just what the customer needs to see to choose it over a competitor. Therefore, it is important to have a successful website to serve as a sales and marketing tool to participate in meeting the core requirements of the business. Clustering and classification are two important data mining techniques that are widely used to assign customers to different categories. Those categories are used to analyze customer behavior and interestingness. In this chapter, we use clustering and classification to support web designers to have better designed retail websites. This is done during the design phase by improving the structure of the website depending on the extracted patterns in a way that makes it easy for the website's navigator to find his target products in an efficient time, give him the opportunity to have a look at some products that may be of interest for him, and encourage him to buy more from the available products which will consequently increase the business's overall profit. This approach will open the eyes of business leaders to adapt new efficient technological tool that when invested in their organizations will improve the strategic goals and meet their basic requirements to be successful, productive, and competitive. The experimental work shows very promising results that can positively change the traditional techniques of the process of designing retail websites.

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INTRODUCTION

Recently, the web is becoming an important part of people's life. The web allows people to easily communicate and exchange ideas and views about any subject anywhere in the world. The web is a very good place to run successful businesses. Almost everything can be bought from online stores without the need to go to physical shops. In e-commerce, instead of having your business in a limited physical place and being limited to a sector of customers who are usually near to your store or business, you have it in the web. In e-commerce websites, you have the ability to sell, advertise, and introduce different kinds of services and products in the web. E-commerce websites have the advantage of reaching a large number of customers regardless of distance and time limitations. Furthermore, an advantage of e-commerce over traditional businesses is the faster speed and the lower expenses for both e-commerce website owners and customers in completing customers' transactions and orders. Creating a successful online business can be a very difficult and costly task if not taking into account e-commerce website design principles, web engineering techniques, and what e-commerce is supposed to do for the online business. Understanding the requirements of both e-commerce website owner and customer is an important aspect in building a successful e-commerce website. A successful website is a well-structured website. The website is well-structured from the user's point of view if it contains services that satisfy user's needs, if the user navigation is simplified, and if he can reach his target page in a short time without the need to make any search or to guess where his target page could be found. The authors in Ranganathan et al. (2002) found that *information content*, *design, security,* and *privacy* have an impact on the effectiveness of a website as well as on the online purchase intent of customers. *Security* and *privacy* were found to have greater effect on the purchase intent of customers.

On the other hand, from the point of view of the website owner, a website is well-structured if it participates in increasing the business overall profit, if it increases the user's trust in the business and its products, and participates in supporting the business marketing strategies. Therefore, it is important to develop and use tools that can guarantee to a high degree the quality of websites to meet the requirements of both website owners and users.

One of the effective used technologies for that purpose is data mining. Data mining is the extraction of useful patterns from large databases. Researchers attract much attention to data mining because of its wide applicability in many different fields (Kohavi et al. (2001)). Two major data mining techniques are classification and clustering. Classification, known as supervised learning, is the process of assigning objects to one of several predefined categories. In contrast to classification, clustering assigns objects into different groups (*clusters*) that are meaningful. The rules extracted using such data mining techniques can be used to support a variety of business related tasks. In our methodology, we get benefit from the patterns extracted through mining the business information system that records customers' transactions and profiles to support the design of the business's website that the transactions database belongs to. This is done during the design phase by improving the structure of the website depending on the extracted patterns in a way that makes it easy for the website's navigator to find his target products in an efficient time, give him the opportunity to have a look at some products that may be of interest for him, and encourage him to buy more from the available products which will consequently increase the overall profit of the business\company.

This chapter is structured as follows: In section 2, we introduce the knowledge discovery process and discuss data mining as it is considered the most important step in the knowledge discovery process and we discuss some of its business ap-