

EFFECTS EXAMINATION OF THE FACTORS AFFECTING CHOICE OF TYPE OF FURNITURE WITH DATA MINING TECHNIQUE (DECISION TREE)

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ABSTRACT

Data mining is the process of analyzing data from different perspectives and summarizing it into beneficial information. Data mining is a very important technique in determining customer behavior. However, the work done on this subject is limited. By analyzing customer behavior, consumer needs can be identified and satisfaction can be increased at the same time. In this study, factors (age, gender, marital status, child status) affecting the selection of the furniture type (classical and modern furniture) will be analyzed using decision tree which is one of the techniques of data mining. Our analysis is intended to guide future research and to assist in the accumulation of knowledge on the implementation of data mining techniques.

Keywords: Data mining technique, type of furniture, factors.

INTRODUCTION

A significant part of the consumption expenditures are furniture products. At the same time, people use furniture to express themselves. Three factors are often influential in furniture preferences. These can be listed as style, price and utility of the furniture.

The increase in the diversity of products and services, the emergence of different types of stores, the differentiation of distribution channels and methods (such as electronic and catalog sales) have transformed the complex decision-making processes of customers into a more complex structure [1]. The fierce competition between companies shows that they are in favor of consumers, in terms of product characteristics and other marketing factors. Sectors try to reveal the reasons for the purchase of their own brands by revealing the superior aspects of the brands from their competitors [2]. Besides, it has become an important issue in determining the target group for companies.

Data mining is an important part of the information discovery process in medical economics, finance and various branches of science. It helps to identify and reveal important information, relationships, trends and patterns [3]. Data

mining is generally expressed in the form of large amounts of data, hidden, valuable, usable information. When this statement is examined, it is evident that data mining, a term that has not been heard until recently, has evolved since 1990s, despite the fact that it has long been realized [4].

Decision-making is a condition that people often encounter throughout their lives. Many processes that are seen as ordinary in daily life actually involve a series of decisions. Decision analysis is often used in many disciplines [5]. These computer programs, which are housed in the algorithms used in decision analysis methods, analyze and interpret the results, model the decision problem of the decision maker or decision maker by using these algorithms, and solve the established model. These package programs are Decision Trees, Bayes Network Structure, Analytic Hierarchy Process, Game Theory and their derivatives, thus enabling the decision maker to reach decision by solving the related decision problem [6]. In Figure 1, various decision trees are shown.

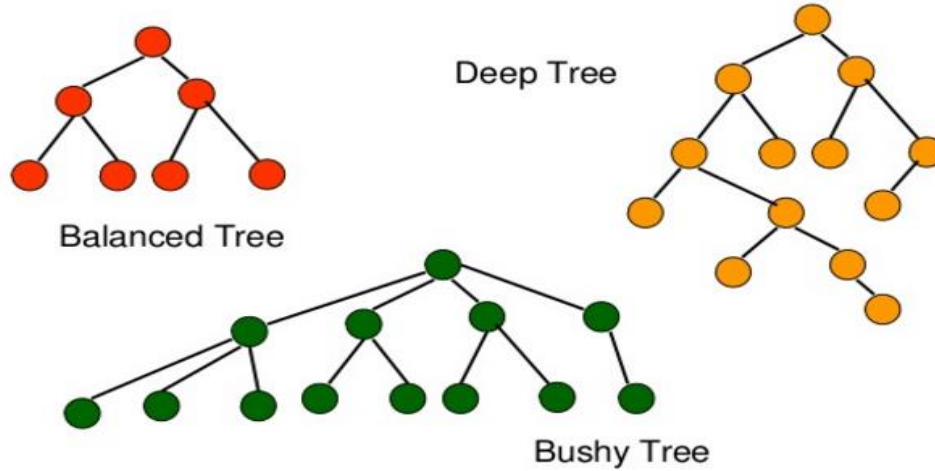


Figure 1. Decision trees [7].

Decision tree is a nonparametric learning method used for classification. Decision trees are easy to understand and interpret. However, it gives very good results and offers flexibility. At the same time decision trees are actively researched [8].

In this study, the factors (age, gender, marital status, child status) affecting the choice of furniture classical (modern and modern furniture) will be analyzed using decision tree that is one of the techniques of data mining.

MATERIALS AND METHODS

Modelling

The aim of the study is to analyze factors (age, gender, marital status, child status) that influence the choice of furniture type (classical and modern furniture) using the decision tree (J48) algorithm. The J48 algorithm finds the classes of newly produced samples based on training samples. This algorithm generates rules for estimating the target variable. With the help of the J48 classification algorithm, the critical distribution of data can be easily understood [9]. The J48 algorithm is based on the C4.5 decision tree algorithm. The WEKA program was used in the study, which is an open source data mining program developed by Waikato University in New Zealand, and it incorporates machine learning algorithms [10, 11].

Collection of data

A questionnaire was prepared in which factors (age, gender, marital status, and number of children) affecting the choice of furniture type (classical and modern furniture). The questionnaire is presented in Table 1.

Table 1. Survey to collect data.

Age	Gender	Marital Status	Number of Children	Preference
	Male ()	The married ()		Classic furniture ()
	Woman ()	Single ()		Modern Furniture ()

This questionnaire was made to 60 people using any furniture. Those who participated in the survey were asked about their preferred furniture style. In this way, the data needed for the algorithm are collected.

RESULTS

Decision trees are an intuitive tool for intelligent data analysis in data mining. Decision trees are a method approaching different valuable target functions, where functions learned are represented by a tree [12, 13]. The decision tree formed by the J48 algorithm for the furniture preference variant is shown in Figure 2.

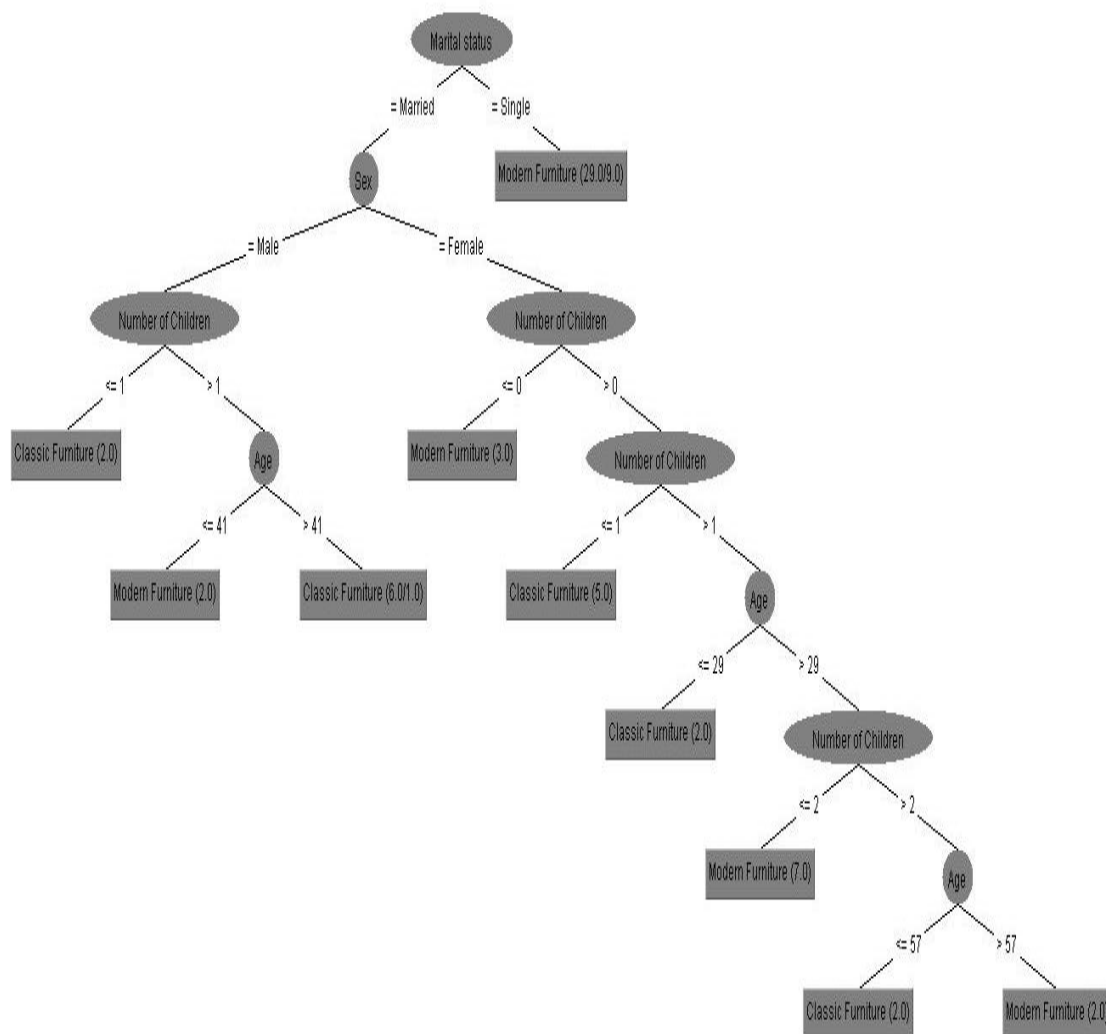


Figure 2. Decision tree formed by J48 algorithm for furniture preference variable.

As can be understood from the visual tree structure presented by the J48 algorithm, each rectangle represents a class (classic and modern furniture). The elliptical shapes represent parameters (age, gender, marital status, child status). For example, the decision tree tells that those with marital status (married), gender (male), and number of children (equal or less than one) chose classical furniture. The parameter at the top of the tree is the most important parameter. In this case, the "Marital Status" parameter is the dominant factor influencing the choice of furniture type (classical and modern furniture). As can be seen here, the majority of the single "marital status" has a preference for "modern furniture". The second most important parameter is the "gender", the third most important parameter is the "number of children", and the least important parameter is the "age" parameter.

CONCLUSIONS

Determining the right customers for companies is an important issue in terms of providing superiority to the market. In this study, a decision tree was established to determine the degree of importance of the parameters affecting furniture preference with the j48 algorithm. As a result of examination, it was understood that the most important parameter in furniture preference is marital status. Other important parameters are gender, number of children and age. In this case, it is advisable to first look at the marital status while determining the target group according to the furniture type they produce. At the same time, data flows constantly at the firm. Companies can be stronger on the market if they can get meaningful information from the data mining.

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