Decision in Planning Ceremony Using Decision Tree

Yi Mon Shwe Sin; Thin Lai Lai Thein
Computer University (Sittway)
yimonshwesinucsy15@gmail.com, tllthein@gmail.com

Abstract

This paper implements the planning ceremony by using decision tree induction algorithm. Nowadays, ceremonies are held by many people in various form such as wedding, birthday, promotions, award and so on. Since there are many reasons which hold ceremony, they need to make the appropriate decision for their ceremonies. So, this system will help people to plan a great ceremony. This paper intends to make decision for a person who holds ceremony using decision tree. Moreover, this system assists the user in making decisions based on their preferences and budget while taking in updated and current making pricings for their desired goods and services. Decision tree are powerful and popular tool for classification and prediction. The main task performed in these systems is using inductive methods to the given values of attributes of an unknown object determine appropriate classification according tree rules. The Decision tree algorithm produces accurate and interpretable models with relatively little user intervention. The algorithm is fast both at build time and applies time.

Keywords: Data mining, Classification, Decision tree induction, Decision support system

1. Introduction

Decision support system are interactive, computer- based systems that aid users in judgment and choice activities. They provide data storage and retrieval functions. Database Management System is one of the fundamental components of decision support system. This system would be agreeable if the user is able to utilize a decision support system that can assist them in making decisions for their renewal ceremonies. A decision support system is a class of computer based information system or knowledge based system that supports decision making activities. A database is an application that stores data such as trading price, business event, and so on, and provide a convenience way to access data for empirical study. Decision tree are one of the most attractive and easy to use tools in decision-making activities. Decision tree is commonly used for gaining information for the purpose of decision-making. Classification rules represent the classification knowledge as IF-THEN rules and are easier to understand for human users.

Preparing for ceremony is always tedious, especially when it does not involve hired help. The users await long checklists before their auspicious ceremony. So, the users face frustrating situation when they decide about their ceremony. This system gathers all the information about the ceremony such as wedding, birthday, and award. Furthermore, this system assists the user to decide the right decision and provide an easy to read graphical presentation to decision under considerations. So, the long and tedious task of information gathering has shortened and make more convenient for the user.

This paper includes the following sections. Section 2 describes related work. Section 3 describes decision tree and classification. Section 4 proposed decision making process for ceremony. Section 5 shows implementation of the system. Section 6 shows experimental result of this system. Section 7 describe conclusion. Finally, references are included.

2. Related Work

Some reports have already been presented concerning the research work of the decision tree. In [2], Jiawei han Micheline Kamber describes the concept buy-computer, that is predict using decision tree induction algorithm whether or not a customer at ALLElectronics is likely to purchase a computer. Decision tree have been used in many application areas ranging from medicine to game theory and business. They are the basic commercial rule induction systems. The knowledge represent in decision tree can be extracted and represent in the form of classification IF-THEN rules. One rule is created for each path from the root to a leaf node. Each attribute-value pair along a given path forms a conjunction in the rule antecedent ("IF" part).The leaf node holds the class prediction, forming the rule consequent ("THEN" part). The IF-THEN rules may

be easier for humans to understand, particularly if the tree is very large. In [5], a DT is "a graphical presentation of expected value (EV) calculation" (Schuyler 2001)-it is "an attempt to explicitly determine the alternatives available…..the expected costs, payoffs and probability of success associated with each alternative" (Mock 1972). The DT's show the sequence of decisions and their consequences with the objective to select the best course of action. By solving the DT decision making is seeking the optimum solution based on the maximum (or minimum) Expected Value (EV).A decision tree(DT) can also be an tool by examining the outcomes under wide range of input variables. Hespos & Strassmann (1965) distinguish between 1) DT's where single number estimates are used and decisions are made based only on the EV criterion;and 2) DT's where probabilistic values are used i.e. where the concept of risk is used in selecting decisions. They named the former a "conventional DT". Decision tree can be applied to a wide variety to business and medical field. Khaing Nay Kyi [3] described classification of industry test by using decision tree induction. Soe San Oo applied diagnosis of acute diarrhea in children by using decision tree induction [7]. Myo Myo Than Naing describes decision making for poularuty diseases using decision tree algorithm [6].

3. Decision tree and Classification

Decision trees are one of the most easy to use tools in decision analysis. Problems where decision tree branches are based on random variables have not received much attention. They analyze decision alternatives in a systematic, chronological way and provide an easy to read graphical presentation to under consideration. Decision tree is commonly used for gaining information for the purpose of decision-making.

Classification has been successfully applied to wide range of application areas; decision tree classifiers have found the widest applicability in the large-scale data mining environments. Decision trees are commonly used for classification purpose. Classification is clearly useful in many decision problems, where for a given data item a decision is to make.

4. Decision making process for ceremony

Nowadays, people who want to holds ceremony face frustration situation because they cannot get the right information without time consuming. So, this paper present to decision planning ceremony with user budget and preferences. So, this system develops to plan ceremony the following algorithm:

```
Begin
Create Budget
 If (all classes in Holds-Ceremony are of the
            same class),
   then return;
Compute the test attribute among attribute-list  with
the highest information gain;
    for each known value of  test attribute
          grow  branch  from  test  attribute  for
          the condition test attributes  ;
              returned by Generate-decision-tree;
     End
End
```

This algorithm can stop only when any one of the following conditions is true:

(a) All samples for a budget node belong to the same class, or

(b) There are no remaining attributes on which the samples may be further partitioned, or

(c) There are no samples for the branch test-attribute. In these cases, a leaf created with the majority class in samples.

Otherwise we use the following equations to compute the gain, if necessary. Firstly. We use equation1, the expected information needed to classify a given samples is given by first, without loss of generality, the entropy of S related to this classification is:

$$I(s_1, s_2, \ldots, s_m) = -\sum_{i=1}^{M} p_i \log_2(p_i) \text{ ------ } \mathbf{(1)}$$

s = a set consisting of data samples
s_i = number of samples of S in class C_i
p_i = probability that an arbitrary samples belongs to class C_i

The entropy, expected information based on the partitioning into subsets of A is given by

$$E(A) = \sum_{J=1} \frac{V\ s_{ij} + \dots + s_{mj}}{s}\ I(s_{1j}, s_{mj}) \text{ ----- (2)}$$

The term $\frac{s_{ij} + \dots + s_{mj}}{s}$ acts as the weight of the jth subset and is the number of samples in the subset divided by the total number of samples in S. The smaller the entropy value, the greater the purity of the subset partitions.

$$\text{Gain}(A) = I(S_1, S_2 \dots S_m) - E(A) \text{ ----- (3)}$$

Gain (A) is the expected reduction in entropy caused by knowing the value of attribute. The algorithm computes the information gain of each attribute. The attribute with the highest information gain is chosen as the test attribute for the given set.

5. System Implementation

People who hold ceremony such as wedding, birthday, award and so on will help to make the appropriate decision using decision tree. This system provides for user to acquire information on goods and services. The users await long checklists before their auspicious ceremony. So, the users face frustrating situation when they decide about their ceremony. This system gathers all the information about the ceremony such as wedding, birthday, award and so on. Furthermore, this system assists the user to decide the right decision and provide an easy to read graphical presentation to decision under considerations.

In our system, four processes are performed. The first stage is the selection of preferences ceremony such as wedding, Birthday and Award which can select by the user. And then, user may choose the desired services which show the system and user may type the desired amount in the second stage. The third stage is the processing user preferences and budget using decision tree algorithm. In the final stage, system show whether their preferences services and amount can hold the ceremony and the information that holds their ceremony. Fig (1) is the general process of the planning ceremony.

The proposed system has been implemented with Visual Studio 2008, **.**NET framework 2.0 and Microsoft office access 2003. So, using the system,
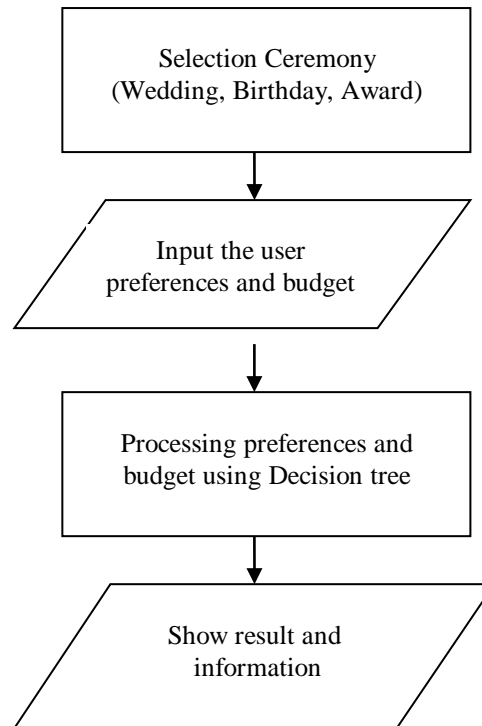

Fig (1) General process of the planning ceremony

user can be help to find right plan to hold ceremony. And, user can obtain the correct and reliable data and know present traditional ceremony styles and customs. It reduces time consuming, costs, and uses easily without requiring much computer skill.

6. Experimental Result

This system introduces the result of applying decision tree induction algorithm to plan the ceremony for user. The user enters into the system. User may see the three ceremonies which show the system. User selects wedding ceremony. And then, user selects continuously the preferences services such as Location, Dress, Hair & Make up, Photo, Entertainment, Food & Beverage, Decoration & Flower, Cake and etc which show by the system. After selection of user, user type 2000000 kyats in price box. (See in fig 2).
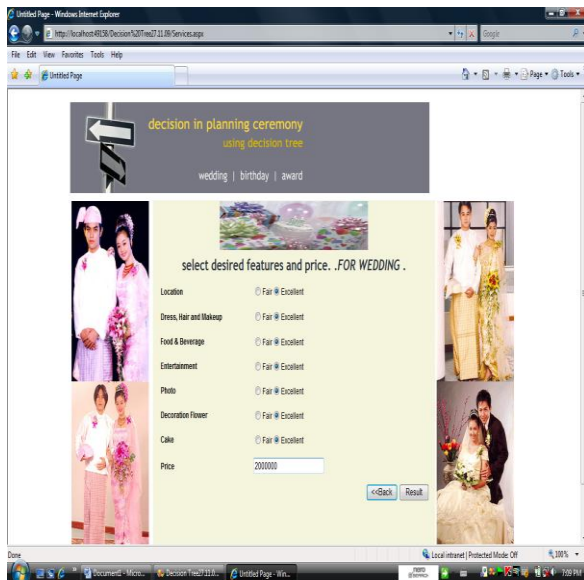
Fig (2) User preferences and budget

Fig 4: Result of the system

And then, this system matches the user preferences and process result which compute the rules. The system show the result as "The amount is appropriate" (See in fig: 3).And then, needed or exceeded budget is shown by the system as "Yes, The real total cost is just 1410000 kyats only. So, 590000 is exceed. Thank You!!!" (See in fig: 4).
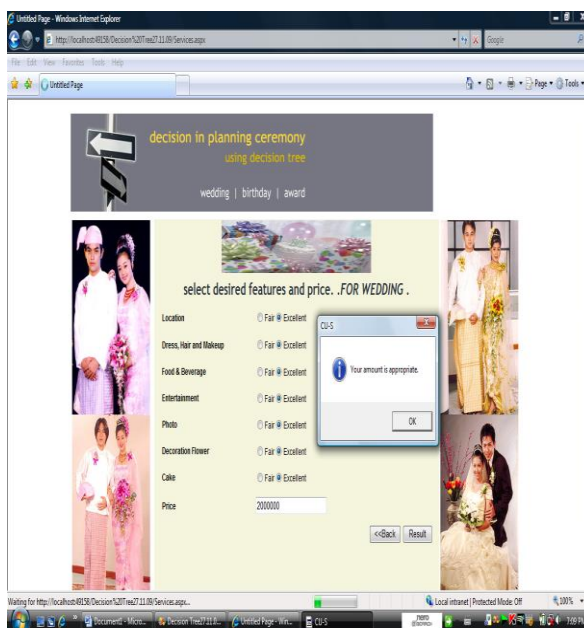

Fig 3: Result of the system

7. Conclusions

This system is intended to develop the Myanmar Ceremony Styles, by using generate decision tree algorithm. The data represented in decision trees can be extracted and represented in the forms of classification IF-THEN rules. Classification is the process of finding a set of models that describe and distinguish data classes or concepts, for the purpose of being able to use the model to predict the class of objects whose class label is unknown. The derived model is based on the analysis of a set of training data objects whose class label is unknown. The derived model is based on the analysis of a set of training data.

This paper presents how to classify the ceremony services by using decision tree induction algorithm. The user can get the right information in a short time. So, the time of information gathering has shortened and make more convenient for the user.

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