**BLACKWELL ELECTRONICS CUSTOMER BUYING PATTERN REPORT**

**INTRODUCTION**

This report has been prepared for Blackwell Electronics to determine the current consumer behavior levels of customers with regards to Blackwell Electronics. Consumer behavior plays a major role for the growth of the company in the modern market scenario. The basic idea of this study is to find the consumer behavior towards Blackwell Electronics. The needs have to be recognized and necessary steps have to be taken to make the changes.

**OBJECTIVES**

* To review and analyze consumer shopping
* To identify the relationship between the region of purchase and the amount spent per transaction. This is to establish how much a customer spend across various regions.
* To describe the relationship between the region of purchase and a customer’s age. This will help to understand age group of customers based on the regional spending which would form the target group based on the demographic data.
* To determine the correlation between the age of a customer and where the transaction took place.
* To analyze the correlation between number of items purchased and amount spent. This is to get an overview of the itemized spending for the target group.

**METHODOLOGY**

In this report methodology based on data mining, decision tree algorithm and Machine learning were used to analyze the customer details. This methodology will assist us identify set of customers that are likely to purchase from store or online and also to predict the customer buying pattern.

**RESULTS AND DISCUSSIONS**

From the given data, the Min, Max and Average values for the numeric data were noted. There are no missing values were noted. Histograms and scatterplots were drawn to understand the various distributions of each attribute and to compare the relation between two features. The following are the results.

**1.The relationship between the region of purchase and the amount spent per transaction**

Despite online or in store, Region 4 seems to spend more on purchases compared to the other regions with Region 3 right behind. Refer figure 1.1

A screenshot of a cell phone

Description automatically generated

Fig 1.1 Scatter plots showing relation between region and amount

The scatter diagram above clearly shows the regions and their spending pattern. Focusing on maximizing the revenue in high spending area gives more revenue in a short time rather than sales which may or may not yield more revenue in the longer run. Could be an idea to divert some of the revenue into sales and marketing for low performing revenues.

**2. The relationship between the region of purchase and a customer’s age**

While an accurate prediction on the exact age group cannot be drawn, but with the help of data mining techniques, such as classifier, decision tree or association analysis it is possible to predict the relationship between the region of purchase in relation with customers age. The results from the data mining methods and the decision tree prediction indicate a trend that points towards <50 years age group spending more in all regions (Refer Fig. 1:2)

A screenshot of a cell phone

Description automatically generated

Fig 1.2 The Bar Graph shows the Purchase that happens in different Regions-age wise

**3. The correlation between the age of a customer and where the transaction took** **place**

From the deeper analysis, training and prediction made predicts the age group >50 category purchases more online than the age group <50. The accuracy is around 60%. The statistic measures the agreement of prediction with the true class where prediction 2 signifies complete agreement.

The Decision Tree (Fig.1.3) below gives a clearer idea on how the pattern of spending is between the different age groups categorized by whether the purchase was done online or in store.

A close up of a map

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Fig 1.4 Decision tree showing correlation between the age of a customer and the transaction

**4. The correlation between number of items purchased and amount spent**

According to the cross validation and the performance vector the pattern of spending is totally different based on the item purchased and the amount spend (Fig 1.5 and Fig.1.6).There is a lot of difference that could happen and hence it is very difficult to arrive in a conclusion about the items being purchased.

A screenshot of a social media post

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Fig 1.5 Decision tree showing correlation between the age of a customer and the transaction

**CONCLUSION AND RECOMMENDATION**

An attempt has been made to find the customer behavior pattern from the data provided by Blackwell Electronics. Most of the active online customers belongs to age group of 50-80 years. So, the company has to concentrate more on the customers of age group of 20-49 years to enhance the online sales. There are different correlations that can be brought about with the data provided but if we take only online purchase it mainly focuses on the ease of use and access of the same anywhere and at any time despite other correlating factors. Also, the decision tree prediction indicates that a trend that points towards <50 years age group spending more in all regions. Despite online or in store, Region 4 seems to spend more on purchases compared to the other regions with Region 3 right behind.

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The Blackwell electronics will also be able to devise the new schemes in order to attract new set of customers. This model will play an important role in understanding demographics of customers by clearly differentiating between the customers that need to retain and that need to be targeted. This will have significant effect in improving sales and hereby achieving targets of departmental store.