Adventure Works Cycles   
New Customer 1-year Sales Feasibility Analysis

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# Objective

Adventure Works Cycles (AWC) management and leaders want to determine if the customer survey demographic data can be utilized to reliably predict the total sales expected from each new customer in the year following the customer’s initial purchase.

# Classifications/Data Sets

For this data mining and feasibility analysis, customers were classified into one of four categories, A through D. Customers receiving an A classification (≥ $4000.00) are highly desirable customers with a greater purchasing habit, and customers receiving a D classification (≤ $2000.00) are less-desirable customers with a lower purchasing habit. Using the Palisade Neural Tools add-in for Microsoft Excel, data mining was performed using an artificial neural network and two data sets extracted from the company’s data warehouse. First data set, OldCustomers, contains a list of long-term customers with survey responses and total first-year sales for each customer. The second data set, NewCustomers, contains a list of new customers to be classified with their survey responses.

# Neural Network Evaluation Findings/Recommendations

Prediction testing was completed on 1,126 random cases with a 46% Good Prediction rate and 37% Mean Correct Probability score. This initial test had low predictability accuracy for the ‘A’ (22%) and ‘D’ (14%) classifications; however, a higher predictability accuracy was seen with ‘B’ (69%) and ‘C’ (41%) classifications. To increase the confidence/accuracy of the neural network predictions, subsequent runs are recommended with removal of low impact fields such as Education and Occupation. Removal of these fields will avoid skewing numbers and can provide a more accurate prediction rate. To increase predictability rate for ‘A’ and ‘D’ classifications, it is recommended to increase the number of cases in the prediction model for those categories.

# Recommendations

When viewing the new customer prediction data, 45% of the new customers fall within the ‘B’ classification category. There is a very comparable percentage within the old customer data set where 42% reside in the ‘B’ classification category, making the new customer prediction for the ‘B’ category fairly accurate and providing a higher confidence level in those outcomes. It is recommended to implement a store sale targeting customers within the 24 to 54-year-old age group as they currently make up 85% of the ‘B’ classification group. Increasing sales within this group will likely move these customers into the ‘A’ classification group and ‘C’ classified customers into the ‘B’ classification category. As discussed in previous analysis, introducing a customer incentive/rewards program will encourage even more purchases for these groups and, ultimately, increase the ‘A’ classification numbers.