

Decoding the DNA of Customer Profitability

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Research Project

Executive Summary

- Client: Outdoor Furnishings Catalogue / Web Retailer
- Goal of study was to predict profitable customers
- Five of seven customer variables were proven to significantly predict profitable customers
- The prediction model was tested and accurately matched actual customer data

Problem Statement

- Catalogue / web retailer is wasting money printing and mailing catalogues to low profit potential customers and prospects
- By targeting efforts to high profit potential customers and prospects they will reduce direct-mail expenses and better allocate sales rep time...
- And increase sales and profit

Proposed Prediction Variables

- Key customer – customers with sales over \$20,000 per year or \$5000 per year for 3 years were designated key customers
- Web Y/N – a binary variable was used to designate if a customer ordered primarily on the web site or by phone
- Coastal State Y/N – a binary variable was used to designate if a customer was located in a state that bordered an ocean
- Sunshine % - using government data we linked the percent sunshine in the customers home state (most customers did business locally)
- Number of employees – because most customers are privately held, this metric was used as a proxy for customer size
- Median income of population in the customers home zip code
- Median population in the customers home zip code

Data Summary

- 50,505 customers used in model development
- 5005 customers set aside for model testing
- Average profit per customer \$1333
- 284 key customers
- 13,641 customers order primarily on the web
- 26,331 customers located in coastal states
- Min sunshine % = 37.6%, max = 84.5%
- Min employees = 1, max = 11,000
- Min zip median income = \$2499, max = \$200,001
- Min zip population = 5, max = 143,987

Statistically Significant Prediction Variables

- Key Customer
- Web Yes
- Coastal State
- Number of Employees
- Median Income of population in the customers home zip code

Profit Prediction Equation

Gross profit per customer = $425.66 + 19977(\text{KeyCustomerYes}) + 741.93(\text{WebYes}) + 332.83(\text{CoastalStateYes}) + 1.29(\text{EmployeeCount}) + 0.0074(\text{ZipInc.})$

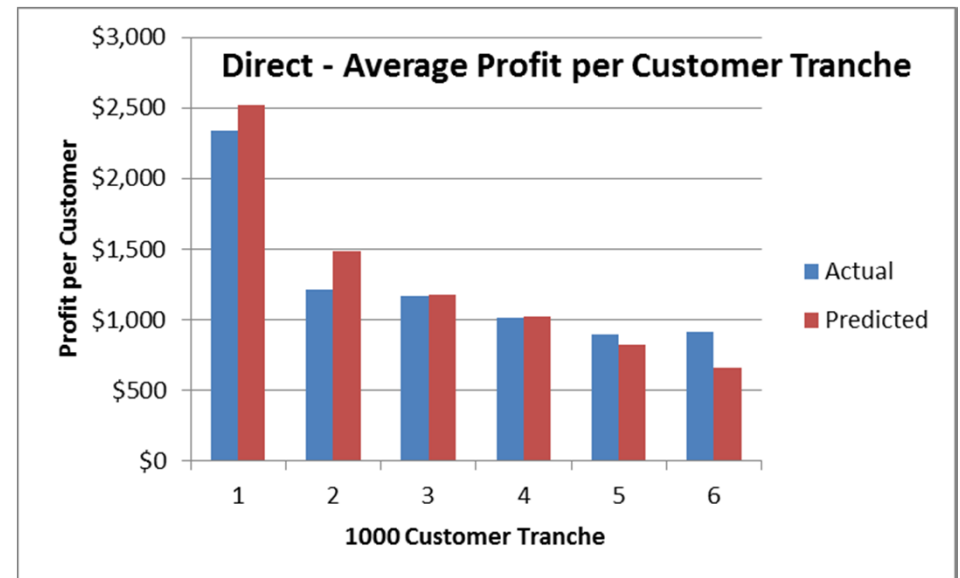
- Holding all other variables constant:
 - Key customers generate \$19,977 more profit
 - Customers that order via the web generate \$741.93 more profit
 - Customers in coastal states generate \$332.83 more profit
 - For every employee, a customer generates \$1.29 of profit
 - For every \$1 of median income in their home zip code a customer generates 7.4 cents of profit

Model Testing

It is good practice to test the model with the 5005 set-aside customers, that were not used to develop the prediction model

1000 Customer Tranche	Actual Average Decile Profit per Customer	Predicted Average Decile Profit per Customer	Error
1 - 1000	\$2,339	\$2,519	7.73%
1001 - 2000	\$1,211	\$1,489	22.97%
2001 - 3000	\$1,165	\$1,180	1.30%
3001 - 4000	\$1,015	\$1,020	0.52%
4001 - 5000	\$896	\$818	8.70%
5001 - 5664	\$917	\$661	27.88%

Table 1: Actual versus Predicted Average (over the 1000 customer tranche) Gross Profit per Customer for the Direct Model



From the graph and table it can be seen that the model does a good job of predicting versus actual customers

Conclusion

- Our Client can use this data to more effectively target high profit customers and prospects, such as those in coastal states and higher wealth zip codes; and larger customers
- They can also use surprise results such as Web-yes to promote web ordering versus call-in orders