TheAnalyticsTeam

# Sprocket Central Pty Ltd

## Data analytics results

Mark Marquez - Virtual KPMG Internship

# Agenda

1. Results Overview
2. Ideal Customer Age
3. Ideal Customer Property Value
4. Ideal Customer Wealth Level
5. Interpretation / Next Steps

# Results Overview

Using customer data to predict customer profits for 3 years, we found that **age** and **property values** had the most predictive power

Customer Profit Predictive Model: Decision Tree Regression was used to predict 3 year customer profits (of new customers) using customer database information

- Final predictive model included age, property value and wealth segment
- Decision Tree was limited to 3 levels
- Mean absolute error is 45% of average customer profit with a standard deviation of +/-1

| | Score |
|---|---|
| Mean Absolute Error | 1429.448 |
| Mean Squared Error | 3206378.231 |
| Root Mean Squared Error | 1790.636 |

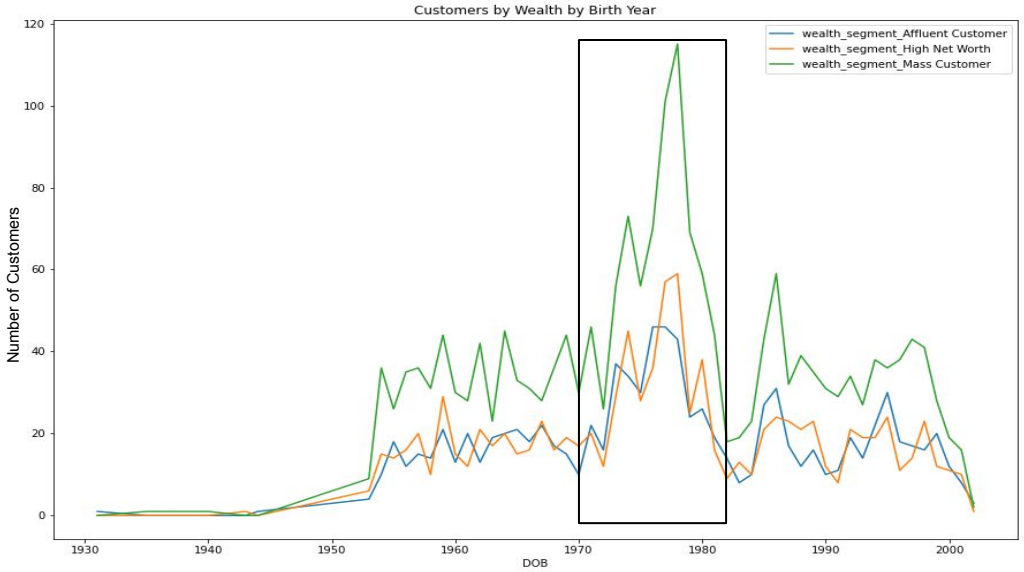
| | Feature Importance |
|---|---|
| age | 0.624291 |
| property_valuation | 0.375709 |
| wealth_segment | 0.000000 |

# Ideal Customer Age

Customer age ended up as the **most** important feature for making predictions

Key customer demographic:

- Gen Xers (1970-1980)

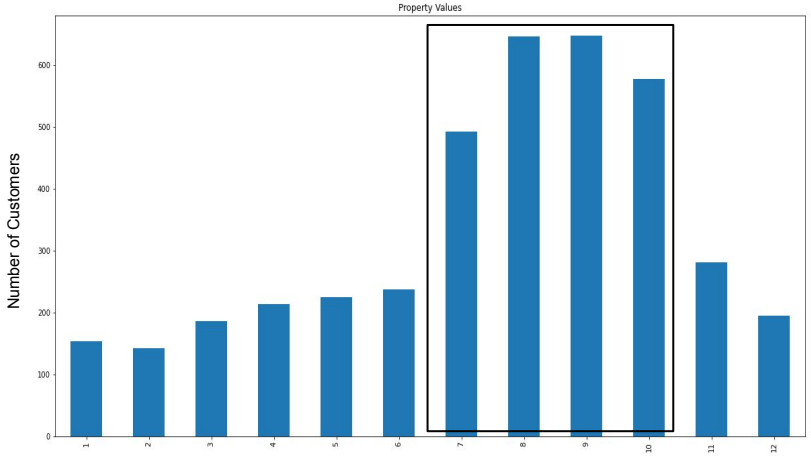


# Customer Property Value

Customer property value was the **second most** important feature for making predictions

Key customer demographic:

- Mid-High Property Values (7-10 of 12)

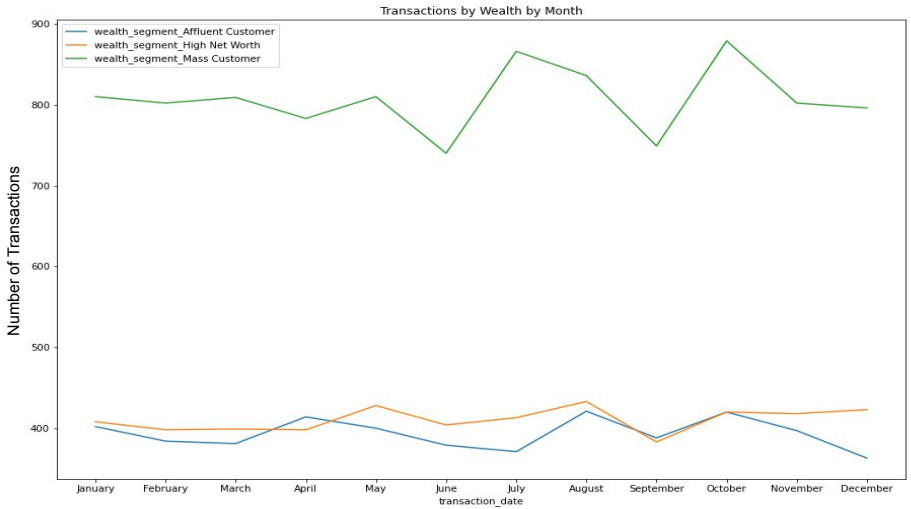


# Ideal Customer Wealth Level

Customer wealth level consistently showed clear differences in profitability throughout the year

Key customer demographic:

- ‘Mass customer’ (wealth level)



# Interpretation / Next Steps

In order to maximize Marketing ROI from customer and transactions insights, we have created an ideal client profile and profit prediction list for new customers

Ideal Client Profile:

- Gen X
- Mid-High Property Value
- Mass Consumer/Customer

| | first_name | last_name | gender | past_3_years_bike_related_purchases | DOB | job_title | job_industry_category | wealth_segment | deceased_indicator | owns_car | ... | country | property_valuation | Unnamed: 16 | Unnamed: 17 | Unnamed: 18 | Unnamed: 19 | Unnamed: 20 | Rank | Value | predicted 3 year profit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 233 | Deborah | Petrovsky | Female | 53 | 1943-07-14 | Teacher | Property | Mass Customer | N | No | ... | Australia | 7 | 0.73 | 0.7300 | 0.73000 | 0.620500 | 233 | 233 | 1.10000 | 7212.000000 |
| 404 | Leese | Huckleby | Female | 67 | 1977-09-10 | Help Desk Operator | Manufacturing | High Net Worth | N | Yes | ... | Australia | 7 | 0.47 | 0.5875 | 0.58750 | 0.587500 | 405 | 405 | 0.93000 | 7212.000000 |
| 231 | Danny | Bodle | Male | 50 | 1943-09-24 | Statistician I | Manufacturing | Mass Customer | N | Yes | ... | Australia | 9 | 0.40 | 0.5000 | 0.62500 | 0.531250 | 231 | 231 | 1.10500 | 7212.000000 |
| 866 | Clarine | Piecha | Female | 99 | 1964-12-07 | Dental Hygienist | Health | High Net Worth | N | No | ... | Australia | 10 | 1.01 | 1.0100 | 1.26250 | 1.262500 | 865 | 865 | 0.55000 | 7212.000000 |
| 110 | Franciska | Stigell | Female | 95 | 1968-11-15 | Food Chemist | Health | Mass Customer | N | Yes | ... | Australia | 7 | 0.50 | 0.6250 | 0.78125 | 0.664062 | 111 | 111 | 1.28125 | 7212.000000 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 541 | Laurel | Devennie | Female | 78 | 1976-09-25 | VP Product Management | Manufacturing | Affluent Customer | N | No | ... | Australia | 5 | 0.66 | 0.6600 | 0.66000 | 0.660000 | 536 | 536 | 0.82500 | 2904.165746 |
| 443 | Gleda | Howerd | Female | 59 | 1964-01-22 | Senior Developer | IT | Mass Customer | N | No | ... | Australia | 2 | 0.75 | 0.7500 | 0.75000 | 0.637500 | 444 | 444 | 0.90000 | 2904.165746 |
| 650 | Gordon | Rewan | Male | 42 | 1988-01-07 | Chief Design Engineer | NaN | Mass Customer | N | No | ... | Australia | 8 | 0.98 | 0.9800 | 0.98000 | 0.833000 | 651 | 651 | 0.72250 | 2904.165746 |
| 135 | Padraig | Snel | Male | 89 | 1970-11-08 | Staff Accountant II | NaN | Mass Customer | N | No | ... | Australia | 7 | 0.95 | 0.9500 | 1.18750 | 1.009375 | 133 | 133 | 1.23750 | 2904.165746 |
| 312 | Seamus | Cains | Male | 61 | 1989-12-15 | Teacher | Manufacturing | High Net Worth | N | No | ... | Australia | 8 | 1.00 | 1.0000 | 1.00000 | 1.000000 | 312 | 312 | 1.02000 | 2904.165746 |

983 rows × 24 columns

(Document Preview)

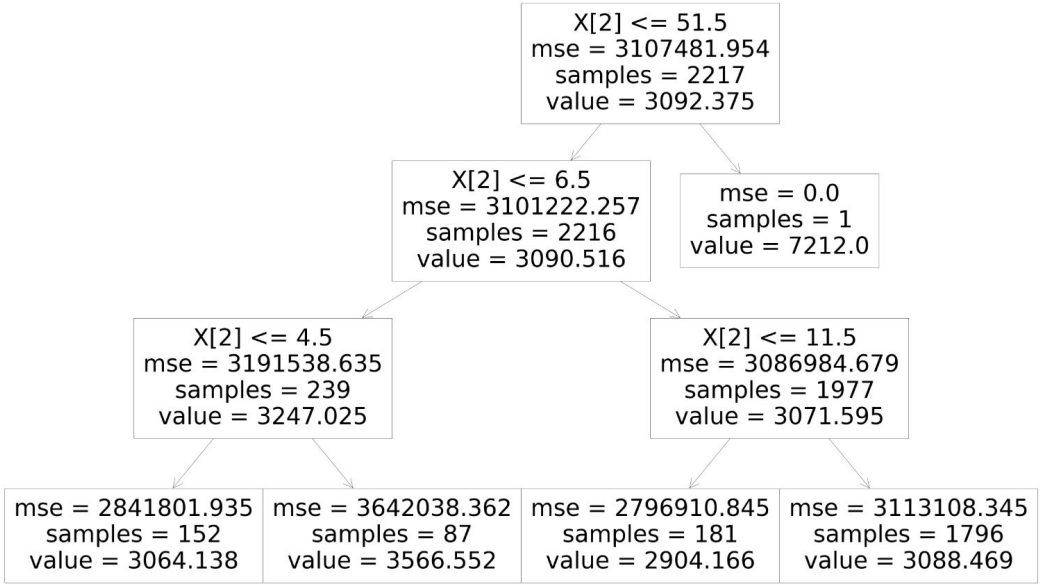
Predicted Profits New Customer List:

- https://github.com/MarkMarquez0224/Resume-Portfolio/blob/master/predicted%20profits%20customer%20list.csv

# Appendix

# Appendix

## Decision Tree Model:



# Appendix

GitHub code:
https://github.com/MarkMarquez0224/Resume-Portfolio/blob/master/Sprocket%20Central%20Analysis%20-%20KPMG%20Virtual%20Internship%20-%20V4.ipynb