Leveraging Attitudinal & Behavioral Data to Better Understand Global & Local Trends in Customer Loyalty & Retention

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Why is Loyalty Important?

“Firms who have superior levels of customer loyalty and retention have consistently higher profits.”*

*Reichheld, 1996, The Loyalty Effect
Loyalty Economics

**Revenue growth** → learn product line - buy more

**Cost savings** → longer revenue streams to depreciate acquisition costs over

**Referrals** → reduced acquisition costs

**Price premium** → don’t require discounts/promotions
How do we build customer loyalty?

Superior value!

Customer Value* = Results + Process Quality

Price + Customer Access Cost

* Heskett, Sasser & Schlesinger, 1997, The Service Profit Chain
Measuring Loyalty & Retention

**Loyalty** ➔ complex and multi-dimensional

**Attitudes and behaviors** ➔ not linear or continuous

**Customers** ➔ heterogeneous

Need to collect data on different components of loyalty!
Behavioral Measures

**Tenure** → length of time a customer

**Churn** → customer status

**Depth of relationship** → # of product/services

**Recency** → time since last transaction

**Frequency** → transaction activity

**Monetary** → value of transaction activity
Attitudinal Measures

Satisfaction
Likelihood to recommend
Likelihood to continue service
Perceived value for the money
Expectations of Service (Exceed/Meet/Fail)
Share of wallet
Perceived Fairness
  (Distributive/Procedural/Interactional)*

* Bowman & Narayandas. JMR August 2001
Strengths & Weakness of Behavioral Measures of Loyalty

**Strengths**
Data already exists
Available for ALL customers

**Weaknesses**
Describes “what” but not “why”
Difficult to infer cause and effect
Strengths & Weakness of Attitudinal Measures of Loyalty

**Strengths**
Flexibility
Describes “why” customers are loyal

**Weaknesses**
Requires additional data collection
Expensive → only collected on a sample
Is there a way to combine the strengths of behavioral and attitudinal measures of loyalty in an integrated way?
Customer Panel Research

**Cohorts** of customers tracked over time

**Behavior and attitudes** on the same customers

**Cause and effect** observed in measures over time

**Rich data** to support complex models
Setting Up Loyalty Panels

Censoring
Sampling & weights
Timing of surveys
Panel attrition
Hybrid Model
Reporting the results
What is censoring?

Event **not observed** during the study period
Values in range recorded as a **single value**

**Right censoring** \( \rightarrow \) value greater than \( c \)
**Left censoring** \( \rightarrow \) value less than \( c \)
**Interval censoring** \( \rightarrow \) \( a < \text{value} < b \)
Why is censoring important?

Changes our answer  \(\rightarrow\) biased results

Informative/Noninformative censoring

**Noninformative** \(\rightarrow\) individuals censored at \(c\) should be representative of those who are not censored

**Informative** \(\rightarrow\) Severe bias
Sampling

**Clear definition** → unit of analysis (study population), unit of measurement

E.g., *attrition rate* (*unit of measurement*) of *broadband customers* (*unit of analysis*)

**Advantage** → know the distribution of the unit of measurement, e.g., historical attrition rates

**Oversample low incidence categories** → greatly aid prediction
Sampling Weights

Based on event outcomes $\rightarrow$ e.g., current customer/former customer

\[
\text{weight}_o = \frac{\text{population}_o \_ \text{proportion}_o}{\text{sample}_o \_ \text{proportion}_o}
\]
Sampling Weights Over Time

Population attrition rates vary over time → sampling weights should follow suit

$$weight_{ot} = \frac{population_{ot} - proportion_{ot}}{sample_{ot} - proportion_{ot}}$$
Timing of Surveys

Need multiple waves of surveys $\rightarrow$ repeated measures

Close as possible to the unit of measurement

E.g., attrition analyzed quarterly $\rightarrow$ surveys should be completed within the quarter
Panel Attrition

Panelists $\rightarrow$ not participate in all waves

Why? $\rightarrow$ understand potential biases

E.g., high level managers less likely to participate in multiple waves of survey

To the extent possible $\rightarrow$ want to measure potential sources of systematic bias and include in model as controls
What is a Hybrid Model?

Combines statistical modeling and data mining

**Statistical models** → good for estimating global trends

**Data mining** → good for estimating local trends
Bias/Variance Tradeoff

Global v. Local models (Bias-Variance Tradeoff)

The more **global** a model $\rightarrow$ the more **biased** the prediction for at least some regions of the data.

The more **local** a model $\rightarrow$ the **higher the variance** of the prediction due to the smaller amount of relevant data being used in the prediction.
Hybrid Tree - Hazard Model

**Step 1** → Use classification tree to find interactions between attitudes from survey, behaviors from database and time

**Step 2** → Create indicator variables for terminal nodes

**Step 3** → Use terminal node indicators and other variables in discrete hazard model
Classification Trees

Identifies complex relationships by searching for significant interactions between inputs that predict the outcome

E.g., income greater than $100K AND graduate degree has a lower attrition rate than income lower than $100K AND non-graduate degree
Classification Trees

Produces segments (terminal nodes) rather than individual scores → all individuals in a terminal node have the same probability of attrition

Very robust to outliers in the data

Can easily deal with missing values
Hazard Modeling (Survival Analysis)

**Hazard rate** $\rightarrow$ number of events per time interval

Derive **survival rate** $\rightarrow$ probability event greater than time $t$

One model provides time profiles of **churn** and **loyalty** rates

Allows for **censoring** and **time-varying covariates**
Discrete Hazard Model

**Discrete time intervals** → months, quarters, etc.

**Censoring** → one row per interval until event or censoring date

**Binary Logistic regression** → 0/1 at each time interval

**Multiple events (competing risks)** → use multinomial logistic regression

**Repeated events** → just code it!
Benefits of Hybrid Models

Excellent for jointly modeling **global** and **local** trends

Minimizes **bias/variance** tradeoff

**Easy to interpret** → main effects and interactions
Costs of Hybrid Models

*Takes longer!*

- estimating two separate models
- still need to transform global variables
- dataset can be difficult to set up correctly

Tree software can be *expensive!*
Reporting the Results

Estimated hazard functions can be used to create **simulations** (what if scenarios) of the impact of different **marketing strategies** or **critical failures** in service delivery on loyalty and retention rates.

Create **graphs** of **survival** and **hazard rates** over time for different scenarios using spreadsheets.
Reporting the Results

Call Center Example

What would be the change in loyalty and retention rates if a critical failure happened at the call center?
Conclusion

**Customer panels**  →  allow estimation of attitudinal and behavioral measures of loyalty and retention

**Hybrid models**  →  identify global and local trends that are not easily found using other methods

**Simulation to aid strategy development**  →  graph impact of different marketing initiatives and critical service delivery failures
Final Thoughts

“Making the simple complicated is commonplace; making the complicated simple, awesomely simple, that’s creativity.”

Charles Mingus
Discussion & Comments

If you have any additional comments or questions about this presentation, please contact me

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