

Customer Analytics

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Churn or Retention Analysis

Customer Retention Rate: The percentage of customers who repurchase in a given time period compared to an equal and preceding time period

Churn Rate: The inverse of Customer Retention Rate, or the percent of users who did not repurchase or whom you lost



proactive churns: losing customers due to cancellations

passive churn: failures to renew

Cohort Analysis and Life Time Value (LTV)

LTV: The expected amount of profit/revenue from a user

CLV = NPV (net present value) of the sum of all future revenues from a customer, minus all costs associated with that customer

Why LTV: - Tracking your LTV to Customer Acquisition Cost (CAC) ratio: Companies typically use the 3:1 CAC ratio or Cost Per Acquisition (CPA)

- Evaluating your most valuable marketing channels
- Focus on retaining your most valuable customers

Historic CLV: sum of the gross profit from all historic purchases for an individual customer

$$\begin{aligned}
 \text{Avg Order Value, AOV} &= \frac{\text{Revenue}}{\text{Orders}} ; & \text{Avg Purchase Rate} &= \frac{\text{Orders}}{\text{NumCustomers}} \\
 \text{Avg Customer Value} &= \frac{\text{AvgPurchaseVal}}{\text{AvgPurchaseRate}} & & \text{gives LTV} \\
 \text{Avg Customer Lifespan} &= \frac{\text{SumCustomerLifespans}}{\text{NumCustomers}} \\
 \text{LTV} &= \begin{aligned} &\text{Avg Customer Value} \times \text{Avg Customer Lifespan} \\ &\text{ARPU} \times \sum_{n=0}^N (1 - CR)^t \dots [N=\text{num months to examine}] \\ &\text{ARPU} / CR_n \dots [\text{ARPU}=\text{Avg rev per User, for n months}] \\ &\text{ARPU} / CR_n \times DR \dots [\text{for variable churn \& n months}] \\ &\text{ASP} / CR + m(1-CR) / CR^2 \dots [\text{for account expansion}] \end{aligned} \\
 \text{CLV} &= \begin{aligned} &\text{AGM} \times \sum_0^{\text{num Transactions}} \text{Transaction} [\text{AGM}=\text{Avg Gross Margin}] \\ &((T_{\text{avg}} \times \text{AOV}) \text{AGM}) \text{ALT} = \text{GML}(\text{gross margin per user lifespan}) \\ &\text{GML}(R/(1+D-R)); [\text{account expansion}] \end{aligned}
 \end{aligned}$$

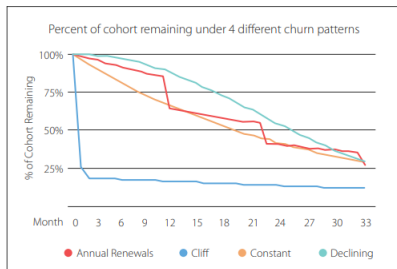
CR=Churn rate; ASP=Avg Selling Price; m=↑ARPU/user/month;
 T_avg = avg monthly transactions; ALT=avg User Lifespan (in months)
 D=monthly discount rate; R=monthly retention rate; DR=Discount Rate to
 adjusts for mix churn (Annual Renewals, Constant, Declining and Cliff patterns)

Steps to LTV:

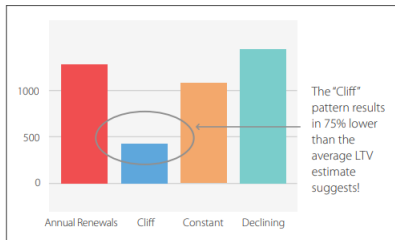
- Normalizing to Acquisition Date: Bin users into buckets like Day 0, Day 1, Day 2 or Week 0, Week 1, Week 2, and so on.
- Normalized to a Closed Time Limit: Broader questions “What is my total CLTV,” should be replaced with “What is our 3-year or 5-year LTV?” & should be based on:
 - ① Average Customer Lifespan
 - ② Customer Retention Rate
 - ③ Churn Rate: The inverse of Customer Retention Rate.
 - ④ Time to General Profitability Against Acquisition Costs: If your business is a “Loss Leader” Model this time may be a longer length than businesses with lower acquisition costs and lower profitability.
 - ⑤ Rate of Discount

Types of churn and LTV

- Annual Renewals: larger churn at each contract renewal.
- Cliff churn: majority of the churn within the first month, and then a small constant churn thereafter.
- Constant: steady, constant churn rate (shown as 3.5%).
- Declining: churn rate starts at zero, increases each month.



Effect on LTV:



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Types

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The Kaplan-Meier curve

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The log-rank test

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Cox proportional hazards regression

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Parametric models

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Frailty models

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Competing risk models

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Discrete Time Model using logistic regression

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Social Network Analysis

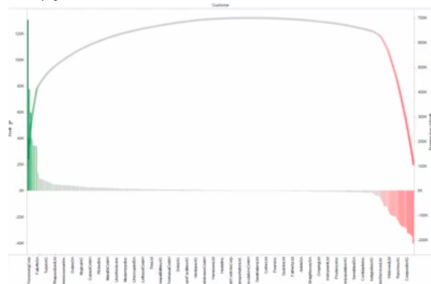
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Whale Curve Analysis

Technique to visualize the data

Sort the data before plotting

Pareto Principle: for many events, roughly 80% of the effects come from 20% of the causes



"Loss Leader" Model

"Loss Leader" Model, where you introduce new customers at a high cost in the hope of building a customer base or securing future revenue?

Market Basket Analysis

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Propensity of Cross-sell

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Thank You!