

HISTORICAL CLV CALCULATION FOR A D2C SKINCARE BRAND USING RFM SEGMENTATION

1. Background and Problem Statement:

A direct-to-consumer (D2C) skincare brand with a loyal customer base and multiple SKUs (cleansers, moisturizers, serums, and bundles) observed high acquisition costs and limited clarity on which customer cohorts contributed most to repeat sales and long-term value. Without a structured framework to measure **Customer Lifetime Value (CLV)**, the brand's retention strategy lacked precision. The objective was to calculate historical CLV using transaction data and RFM segmentation, and to align marketing, upsell, and loyalty initiatives with high-value customer cohorts.

2. Objectives:

- To calculate historical CLV using real purchase data from all customers over the last 24 months
- To segment customers using Recency, Frequency, and Monetary value (RFM) scoring
- To identify high-CLV clusters for loyalty, remarketing, and personalized promotion
- To guide decisions on discount structuring, email targeting, and customer experience design

3. Methodology:

3.1 Data Collection and Preparation

- **Data Period:** Last 24 months of sales data from the Shopify platform
- **Sample Size:** 42,000 customers, 161,000 transactions
- **Fields Used:**
 - Customer ID
 - Order date
 - Order value
 - Product type
 - First purchase date

- Number of orders
- All monetary values normalized to gross profit to reflect net CLV
- Data cleaned and preprocessed in **R** using dplyr and lubridate

3.2 RFM Scoring

- **Recency (R):** Days since last order
- **Frequency (F):** Number of distinct purchase sessions
- **Monetary (M):** Total gross profit from customer
- Each component scored 1–5 based on quintile rankings
- RFM scores concatenated into three-digit segments (e.g., 555 = top segment)
- Created 11 behavior-based clusters using **k-means** on scaled RFM scores

4. Results:

4.1 CLV Calculation

- **Average Historical CLV:**
 - Overall: **\$86.40 per customer**
 - Top RFM segment (555): **\$321.80 CLV**
 - Bottom 20% (RFM < 222): **\$18.70 CLV**
- 17% of customers contributed **over 63% of gross profit**
- High-CLV customers purchased **bundles and premium serums more frequently**, while low-CLV customers bought one-time face masks or travel kits

4.2 Segment Profiles

Segment	% of Users	Avg. Orders	Avg. CLV	Description
555	8.2%	5.8	\$321.80	Loyal, high-spending repeat users
442	13.6%	3.1	\$127.50	Recent and moderately frequent buyers
221	28.4%	1.0	\$20.10	One-time, low-spend customers

5. Interpretation and Insights:

- High-CLV users exhibited consistent quarterly purchases and spent more per order
- Low-CLV customers were mostly acquired via influencer coupon codes with no follow-up
- Many mid-tier segments had potential but lacked engagement—timing and frequency of email campaigns were not optimized
- Product type and bundling were strong differentiators of customer value

6. Recommendations:

6.1 For High-Value Customers

- Introduce a **VIP rewards program** (free samples, early access, auto-renewals)
- Personalize communication with loyalty badges and refill reminders
- Offer tailored upsells on serum and night cream bundles

6.2 For Mid-Tier Segments

- Create **time-based triggers**: discount offers 60–90 days after last purchase
- Test **subscription trials** with easy cancellation to increase frequency
- Run A/B testing on subject lines and sending times for better email engagement

6.3 For Low-Value Segments

- Deprioritize direct spend; shift to **passive retargeting** on social media
- Use surveys or email polls to explore unmet needs and inform reactivation offers

7. Future Work:

- Combine CLV and product affinity analysis to build **cross-sell suggestion engines**
- Integrate browsing behavior from Google Analytics to further personalize lifecycle marketing
- Introduce **predictive CLV modeling** for new customers after 1st or 2nd purchase

8. Stakeholder Relevance:

Academic:

- Demonstrates structured use of RFM and historical CLV in real-world D2C e-commerce
- Suitable for marketing analytics, segmentation, and customer profitability analysis

Corporate:

- Helps D2C brands shift from volume-based to value-based retention strategy
- Offers a clear roadmap for scaling loyalty and reducing wasteful acquisition spend

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