Customer Lifetime Value I (Basic)

This module introduces the concepts of customer profitability, customer lifetime value (CLV), and multi-period revenue streams.

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Businesses wouldn’t exist in the long-run without customers who are willing to pay for their products and services.

The revenues generated from transactions with customers represents the “top-line” of a business, and the revenues less the costs of acquiring and serving customers represent the “bottom-line” or profit of a business. Some of these costs are variable costs (direct costs or cost of goods sold) and some are fixed costs (salaries, overhead, advertising, etc.)

**Insight**
Companies often think of the profitability of particular product lines or services, but thinking about customers that way is relatively new.
We can apply this same approach to customers to determine the profitability of serving a particular customer.

While we could look at the profitability of a customer for a particular period in time (a year, for example), it may make more sense to look at the potential profit generated by a customer over the lifetime of the customer relationship. This is because we want to determine if it makes sense to enter into a relationship (or “acquire”) a customer.

**Insight**
Take a moment to think about your own on-going transactions with a business or product. What affects your decision to return?
The Value of a Customer

One way to illustrate the relationship with a customer from the manager’s perspective is shown below as three distinct stages.

**Target**
Decide whether to target the customer based on the lifetime value of the customer.

**Acquire**
Acquire the customer through a successful initial transaction (sale or trial).

**Satisfy**
Maintain and develop the customer relationship so long as it is profitable.

**Insight**
The fundamental driver of the relative success of a business is doing a better job than the competition at each of these stages. Customer Lifetime Value (CLV) is the underlying principle.
Cathy and Paul are both considering purchasing a new bike.

Cathy is looking for a durable all-around bike in the $500-$1000 range that she plans on using for commuting to work, but she’s also thinking about training for a triathlon on it in the future as well.

Paul is looking for specialized bike for competing in cycling road races and time trials for around $3000. This will be an upgrade to his current bike and while he doesn’t have much disposable income, most of it goes toward his bike.

If they both walked into your bike store at the same time, who would you serve? The salesperson, who receives a commission based on the price of the bike, would likely focus on Paul. But perhaps there is more to consider, especially in the context of CLV.
CLV – An Example

Let’s look in our crystal ball and see what the future holds. As it turns out, Paul is a very knowledgeable cyclist. He does all his own maintenance and already has all the supplemental gear he needs (helmet, shoes, gloves, etc.) that he’ll bring over from his current set-up. He also scans all the online vendors and uses that information to drive a hard bargain for his purchase. Finally he visited the store 6 times for test rides, and chatted quite a bit with the store’s mechanics, resulting in lost service productivity.

In the end, he purchased the bike for $2,400, and bought a few small items over the next 3 years, and became close friends with the mechanics!

<table>
<thead>
<tr>
<th>Total Revenues (3 years)</th>
<th>$ 2650</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total COGS (3 years)</td>
<td>$ 2200</td>
</tr>
<tr>
<td>= Gross Margin</td>
<td>$  450</td>
</tr>
<tr>
<td>Less Fixed Expenses:</td>
<td>$  250</td>
</tr>
<tr>
<td>= Net Profit (Paul)</td>
<td>$  200</td>
</tr>
</tbody>
</table>
Cathy, on the other hand, turned out to be a fairly busy person as she had 3 kids and was working full time. She also was a big believer in supporting local businesses, because she had a local business of her own. She purchased a hybrid bike, but also needed a helmet and other accessories, all of which totaled $1,350. She also continued to have her bike serviced at the shop twice a year. During the 3 year period, she also purchased a specialized tri bike and another bike as a birthday present for her son.

While the initial purchase for Cathy wasn’t as large, over the 3 year period, her net profit as a customer was considerably higher than Paul’s. In fact, by a factor of 10!

\[
\begin{align*}
\text{Total Revenues (3 years)} & \quad $6950 \\
\text{Total COGS (3 years)} & \quad $4700 \\
\quad = \quad \text{Gross Margin} & \quad $2250 \\
\text{Less Fixed Expenses:} & \quad $250 \\
\quad = \quad \text{Net Profit (Cathy)} & \quad $2000
\end{align*}
\]
Impact on Future Cash Flows

While our example focuses solely on the future sales to a particular customer, improving customer relationships has a much broader impact on the success of the business.

Professor Noel Capon identifies the following five strategic options for increasing the average CLV derived from customer relationships:

- **Customer Selection**: Improve targeting of customers based on CLV
- **Customer Satisfaction and Loyalty**: Improve satisfaction rates among current customers leading to increased purchases in the future.
- **Customization**: Targeted offers to provide greater customer value.
- **Raise Prices**: Improved satisfaction, loyalty, and customization may allow for greater acceptance of price increases.
- **Reduced Operating Costs**: Economies of scale at the customer level.
Improving a firm’s relationship with current customers may provide additional benefits beyond the CLV of that particular customer.

Professor Capon identifies four additional benefits to improving the relationship and satisfaction with current customers:

- **Learning**: The firm learns how better to attract and meet the needs of customers in their target population.

- **Network Externalities**: In some markets, having more customers improves the likelihood of attracting new customers.

- **Referrals and WOM**: Satisfied customers provide referrals and positive word of mouth to potential customers, often in the same target market.

- **Signals**: Securing a high-profile customer may provide the firm with credibility among other potential customers.
Simple Model for CLV (X Year Time Horizon)

Contribution from Initial Purchase

Stream of income from initial purchase (service, monthly subscription, etc.)

- Est. $\text{margin} \times \text{avg # of payments}

Stream of income from new products and services to same customer

- Est. $\text{margin}$
- Est. $p(\text{success})$

Contribution / Profit (Current Period)

Contribution / Profit from Future Periods over a Particular Time Horizon (X Years)

Total CLV
Example for Cathy’s Purchase History

Contribution from Initial Purchase ($1350 revs $430 profit)

Stream of income from initial purchase (service, monthly subscription, etc.)
($70 * 2 * 3 \text{ yrs} = 420$)

Stream of income from new products and services to same customer
($5000 \text{ total, } 1150 \text{ profit})

- $850 Profit (incl. initial purchase)

- $1150 Profit

Contribution / Profit ($430)

Contribution / Profit from Future Periods over a Particular Time Horizon ($1,570)

Total CLV = $2000
Note that in Cathy’s example, we calculated the CLV knowing what actually happened. When projecting CLV for a particular customer, we have to use an estimate of the future stream of cash flows. There are two approaches for doing this based on the data available. **Average number of payments** or **probability of success** over a given time horizon.

**Definitions**

\[
CLV = \text{Margin} \times \text{Average Number of Payments} - \text{or} - \text{Margin} \times \text{Probability of Success} \times \text{Number of Periods}
\]

**Question 1:** We know that the average customer has two service visits / year and spends $100 on each visit and that 80% of customers who purchase a bike return to the same shop for service for at least 3 years. If the margin on service visits is 70%, what would be the estimated value over 3 years of the service component of Cathy’s CLV using the probability approach?
Question 2: We also know that after a purchase of a bicycle the average customer returns for service 6.5 times at an average margin of $70 / visit. What is the estimated value of the service component of Cathy’s CLV using the average number of payments approach?

Answer:

CLV = $\text{Margin} \times \text{Probability of Success} \times \text{Number of Periods}

Margin per service visit = $100 \times 70\% = $70

Probability of servicing bike = 80\%

Total number of periods = 3 Yrs \times 2 visits / Yr = 6

Estimated value = $70 \times .80 \times 6 = $336

Therefore, the CLV of the service component of a bicycle based on a 3 year time horizon using the probability approach would be at least $336. It is actually more than $336 because some of the customers continue to service their bikes for more than 3 years. We have artificially limited the timeframe.
Answer:

\[
\text{CLV} = \$\text{Margin} \times \text{Average Number of Payments}
\]

Margin per service visit = $70
Average Number of Payments = 6.5
Estimated value = $70 \times 6.5 = $455

Insight

All methods of calculating CLV are estimates because they are either using historical averages or manager’s estimates. The approach one uses might depend on the information available (for example start-up vs. long-established company), or the situation (constant stream vs. erratic purchase patterns). Just remember that the value of a customer is far more than the initial sale and adjusting strategies to improve the probability that the customer will repurchase, or use new goods or services, increases CLV.
Now let’s try an example with a few more dimensions to it. In the following example, an on-line music start-up wants to estimate the CLV of potential customers to provide insight as to the appropriate pricing approach and promotional budget.

**Question 3:** Several music publishers are considering banding together to create a start-up (PearTunes) that would allow people to download tunes from the recording artists that the publishers represent. The companies hired a marketing research company to give them some insight into pricing and alternative subscriber models.

The research indicated that at $1 / tune, people would download an average of 50 tunes the first month and 15 tunes / month the first year, and 5 tunes/month thereafter. Alternatively, based on a subscription price of $20/month (that allowed for up to 30 tunes downloaded / month), the average length of the subscription would be 16 months. Under the PearTunes model, 40% of the revenue would go to the recording artists. If the time horizon chosen was 2 years, what would be the CLV of the two options?
Question 4: If, at the end of the first year, PearTunes provided a “good pear” discount of 50% off tunes that increased the downloads by 10 tunes / month, what would be the additional value generated by this promotion over two years?

Answer:

CLV = $Margin * Average Number of Payments

Approach 1: Margin per tune = $1 x 60% = $0.60
Number of payments (tunes in 2 years) = 50 + 15 * 11 + 5 * 12 = 275
Estimated value = $0.60 * 275 = $165

Approach 2: Subscription Model = $20 * 60% = $12 / month
Number of payments = 16 months
Estimated Value = $12 * 16 = $192

Based on this, the subscription method would have the higher CLV, though one could argue that a 2 year time horizon is not sufficient to capture the total number of tunes downloaded under approach 1.
Question 5: For the per-tune buyers, market research estimates that 15% of those will purchase the PearBuds within two years of their initial sign-up. What is the estimated CLV for this purchase? In addition, PearTunes is considering providing a set of their PearBud earphones to any monthly subscribers who complete 2 full years (24 months) of their monthly plan. The “PearBuds” retail for $49, but their manufacturing cost is $15. Based on market research, this would increase the average subscription length from 16 to 18 months. Should PearTunes implement this special promotion?

Answer:

\[
CLV = \text{Margin} \times \text{Average Number of Payments}
\]

CLV without “good pear” discount: \[= 24 \text{ months} \times 5 \text{ tunes} \times $0.60 \]
Estimated value \[= $72 \]

CLV with “good pear” discount: \[= 24 \text{ months} \times (5+10) \text{ tunes} \times $.50 \times 60\% \]
Estimated Value \[= $12 \times 16 = $108 \]

Increase in CLV \[= $108 - $72 = $36 \]
Answer:

Per-Tune Plan:
Incremental CLV due to PearBuds purchase = $Margin * Probability
Margin = $49 - $15 = $34
Probability of Purchase = 15%
Incremental CLV = $34 * .15 = $5.10

Monthly Subscriber Plan:
Increase in CLV = $Margin * Increase in Number of Payments - Promo
Increase in CLV w/o promo = (18 – 16) months * $20 * 60%
Estimated value w/o promo = $24
Cost of Promotion = $15
Net increase in CLV = $24 - $15 = $9

Note that it is important to use the manufacturing cost of the PearBuds rather than the retail price for the cost of the promotion to PearTunes.
This module has focused on the basic concepts of CLV, with simple examples to illustrate the importance of CLV analysis.

The second module (CLV2) will introduce advanced techniques for calculating CLV that take into account discounting future cash flows, retention rates, and how to measure average CLV for groups of customers. This module will be especially important for estimating the CLV for constant stream situations such as subscriptions (cell phones, for example).

**Final Insight**

Research tells us that it is more profitable to keep a current customer than to acquire a new one (of the same value). Generally, it is also easier to sell a new product or service to a current customer than a new one. CLV analysis helps business people keep this long-term perspective on the value of customer relationships.
Marketing Metrics by Farris, Bendle, Pfeifer and Reibstein, 2nd edition, chapter 5.


- And -

MBTN CLV II Module which goes into further depth on CLV and provides more sophisticated methodologies for estimating CLV. This module covers CLV remaining, retention rate, attrition rate, discount rate, churn rate, and customer acquisition and related costs.