

Class 3 Workshop: Break-Even Analyses and Customer Lifetime Value

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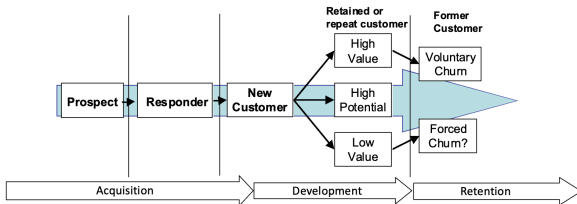
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Section 1

Recap: Customer Lifetime Value

Customer Life Cycle

- CLV is a break-even analysis from the perspective of a **single customer**, which considers a customer as an asset to the company that generates future cashflows
 - incurs customer acquisition costs (CAC)
 - customer generates profits for the company in each period
 - customer churns at some point in time



CLV: Formula

$$CLV = -CAC + \sum_{t=1}^N \frac{CF_t * r^{(t-1)}}{(1+k)^t}$$

where $CF_t = M_t - c_t$

- r is the average annual retention rate; $r^{(t-1)}$ is the cumulative retention rate in year t
- N is the number of years over which the relationship is calculated
- M_t is the margin the customer generates in year t
- c_t is the expected cost of marketing communications or promotions targeted to the customer in year t
- k is the rate for discounting future cash flows

Section 2

Case Study: i-basket CLV

Situation Analyses: i-basket

- Company
- Customer
- Collaborators
- Competitors
- Context/Climate

Step 1: Determine time unit of analysis

- Time unit of analysis
 - [...] (*find info in the case study*)
 - When should we use monthly analysis?

Step 2: Determine number of years

- N : the number of years over which the customer relationship is assessed
 - [...] (find info in the case study)

```
1 N <-
```


Step 3: Compute profit margin for each period

$CF = M - c$: gross profit each year

- most customers paid the \$99 annual membership fee

```
1 membership <-
```

- 40 times each year; each time \$100

```
1 n_visit <-
```

```
2 revenue_each_visit <-
```

Step 3: Compute profit margin for each period

- *profit margin 7% (COGS 93%)*

```
1 profit_margin <- 0.07
2 ## think carefully about how M is calculated, it's tricky ~~~~
3 M <-
```

- *variable delivery costs each order*

```
1 deliverycost_each_visit <- 5 + 100 * 0.035
2 c <- deliverycost_each_visit * n_visit
```

Step 3: Compute profit margin for each period

- the annual CF from customers CF

```
1 # CF is the cash flow for one year
2 CF <-
3
4 # create a sequence of CF for N years
5 profit_seq <- rep(CF,N)
```

Step 4: Compute sequence of retention rate

④ r : retention rate

● [...] (find info in the case study)

```
1 # retention_rate is the probability of customer staying with us after 1 year
2 retention_rate <-
3
4 # create a geometric sequence of accumulative retention rate for N years
5 retention_seq <-
```

Step 5: Compute sequence of discount factors

⑤ k : the discount rate

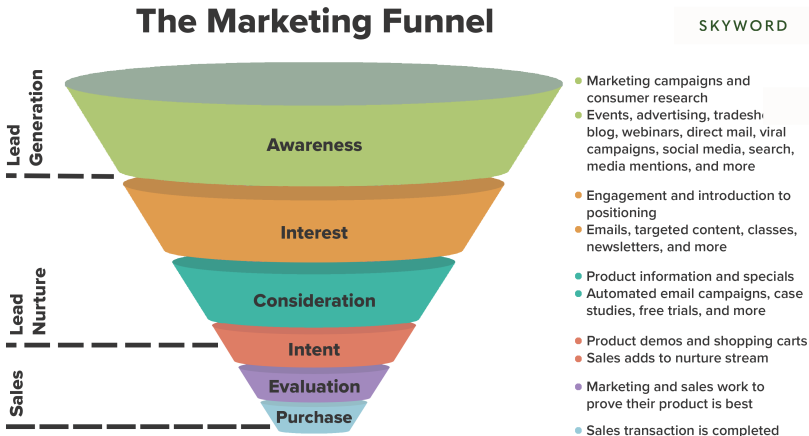
- [...] A yearly discount rate of 10%

```
1 discount_rate <- 0.1  
2 discount_factor_seq <-
```

- [...] The team decided to take a conservative approach whereby all profits are booked at the end of year.
 - All profits earned per customer in year 1 need to be discounted once, the profits earned in year 2 need to be discounted twice, and so on

Step 6: Compute customer acquisition costs

- ⑥ $CAC = \text{total costs for customer ad clicks} + \text{total costs of \$15 promo} + \text{total costs of free deliveries}$
- How the Marketing Funnel Works From Top to Bottom



Step 6: Compute customer acquisition costs

6.1 Total costs for customer clicks

- [...] a fifth of those who clicked on an ad were willing to give the service a try
- [...] 20% of those that signed up for the free trial ended up becoming members

```
1 # click_to_trier_rate is the % of trier customers from clickers
2 click_to_trier_rate <- 0.2
3
4 # trier_to_buyer_rate is the % of final customer from trier customers
5 trier_to_buyer_rate <- 0.2
```

- How many customers need to click the ad to get 1 new customer?

```
1 n_clicks_1newcustomer <- 1/click_to_trier_rate/trier_to_buyer_rate
```

- Total costs for customer clicks

```
1 total_cost_clicks <- 0.4 * n_clicks_1newcustomer
```

Step 6: Compute customer acquisition costs

- ⑥ $CAC = \text{total costs for customer ad clicks} + \text{total costs of \$15 promo} + \text{total costs of free deliveries}$

6.2 total costs of \$15 promo for first order each trier customer

- How many customers need to try the service to get 1 new customer?

```
1 n_triers <- 1/conversion_rate
```

- What is the total promo cost for these “trier” customers’ first order?

```
1 promo_first_order_each_trier <- 15
2
3 total_cost_promo <- promo_first_order_each_trier * (1 - profit_margin) * n_triers
4 total_cost_promo
```


Step 6: Compute customer acquisition costs

- ⑥ $CAC = \text{total costs for customer ad clicks} + \text{total costs of \$15 promo} + \text{total costs of free deliveries}$

6.3 total costs from free deliveries

- Assume two visits, the delivery costs for each visit

```
1 deliverycost_1st <- 5 + 115 * 0.035
2 deliverycost_2nd <- 5 + 100 * 0.035
3 deliverycost_each_trier <- deliverycost_1st + deliverycost_2nd
```

- We also make a profit from each trier

```
1 profit_each_trier <- revenue_each_visit * profit_margin * 2
```

- Net delivery costs for each trier

```
1 NetDeliveryCost_each_trier <- deliverycost_each_trier - profit_each_trier
2 total_cost_delivery <- NetDeliveryCost_each_trier * n_triers
```

Step 6: Compute customer acquisition costs

⑥ $CAC = \text{total costs for customer ad clicks} + \text{total costs of \$15 promo} + \text{total costs of free deliveries}$

```
1 CAC <- total_cost_clicks + total_cost_promo + total_cost_delivery
2 CAC
```

Step 7: Compute CLV

⑦ Compute the CLV based on the CLV formula (Table A)

● 7.1 Revenues, variables costs, and profit for the next 5 years

```
1 profit_seq
```

● 7.2 Apply retention rate

```
1 profit_seq_after_churn <- profit_seq * retention_seq
```

● 7.3 Apply discount factor

```
1 profit_seq_after_churn_discount <- profit_seq_after_churn * discount_factor_seq
```

● 7.4 Compute CLV by summing up future expected profits

```
1 CLV <- sum(profit_seq_after_churn_discount) - CAC
```

Section 3

CLV for Marketing Decisions

CLV as a Key Management Tool



We can use CLV as the key managerial tool for evaluating different marketing initiatives!

Discussion

- ① How important is it for i-basket to measure CLV? Can you think of other companies or industries where CLV is particularly relevant?
- ② Conduct sensitivity analyses
 - what assumptions have we made here? Are these assumptions sensitive to different values?
- ③ From our analyses, what suggestions would you offer to i-basket in order to improve its customer profitability? How are you going to evaluate the feasibility of your proposal?
 - acquisition/development/retention

Exercise

- 1 How much annual membership fee should the company charge to break even?
- 2 The company is looking to develop a personalized recommendation system that can increase the average shopping basket to \$150. Compute the upper bound for the company's investment in developing the algorithm in order to break even? Assume the company has 10,000 customers at this moment.