This contains a few odds and ends that should be combined with the rest of the lectures.

Contents

1. Warby Parker Clones (DTC)

This should be after LTV/CAC is complete. And probably after the entire Biz Strat Timeline

- Warby Parker ("WB") founded in 2010 as a **D**irect **T**o **C**onsumer Seller of eye-wear.
- Specifically they sell prescription eye glasses over the internet in a variety of knock-off styles at lower cost than retail.
- At the time, traditional retailers were struggling to understand how to use new targeted advertisements.
- Brand vs. Performance advertisement (probably need a discussion of eyeballs vs. actions)
- Newer companies were more aware of the environment and able to navigate it more efficiently.
- Newer companies were also cultivating a different image:
  - Experience: Online, generous return policy, "premium" feeling
  - Image: Socially conscious spin (every pair of eye glasses sold = a pair donated).
  - Cost: Usually lower than commiserate branded goods.
  - Material: Organic, sourced, etc.
- They were (are?) successful and transformed eye glass purchasing.
- A bunch of other companies emulated this model:
- All of them were based on the premise that by correctly targeting customers and providing a particular experience (higher end "value") they would be able to create a sustainable business.
- Some people referred to this as the "millenialization" of consumer purchasing. Specifically, millennials are believed to have limited ties to traditional brands – they are much more comfortable purchasing generic rather than paying more for

Brand Name	Type
Harrys	Mens Goods
Dollar Shave Club	Shaving
Away	Luggage
American Giant	Hoodies / Tshirts
Casper	Mattress
MeUndies	underwear
Native	deodorant

many goods. When they want to spend money, however, they want something better than "the middle" – they want the best. (Sometimes called the great hollowing out)

- Digital Natives have no ties to traditional brands and have money to spend!
- For this generation traditional advertising is also ineffective (no broadcast TV, no terrestrial radio, newspapers, magazines, etc.)
- Many of these DTC companies took VC money on the promise of sustained scalability.
- However, there are issues around this. Specifically getting customers.
- CAC: Marginal customer costs much more as n increases.
  (1) Novelty is a huge driver, once a brand is established the cost of getting that $n + 1$ customer is much harder
  (2) Saturation (in general). There are only so many times you need a new mattress/eye glasses /luggage / whatever.
  (3) Entry was incredibly easy and other copy-cats jumped in.
  (4) Over time, other companies also started using these channels, driving acquisition prices up.

TABLE 1. Mobile Video Game acquisition costs (TinyCo/Sega)

Year	Install Cost Per User
2011	$0.15
2014	$1.00
2016	$2-$3

  (5) For example between 2011 and 2016, the cost to acquire a user went up 10X.
- This means that the company projections are often over optimistic on the underlying cost to generate users.

  "It took us $X MM in marketing to get our first 75K customers, so it should take us $10 X to get our next 750K customers."

- Just like in the case of the AI/Consulting issue there is a spectrum between traditional CPG brands and "Technology Companies". The DTC companies raised money on the assumption that they were something new, but instead they behaved (money wise) as if they were CPG goods.
- The article concludes with the CEO of WP stating "Building Brands is Hard" which is a pretty ominous sign for this type of company.
- Some Conclusions
  - It is easy to fall into the trap of thinking that something is "new" and different – even if it is not.
  - Adding something "new" to something "old" – such as targeted marketing to traditional CPG – also doesn't necessarily create something new.
  - Adding venture capital money has a distortive effect on incentives.
    though this is how many people think that modern businesses scale.

2. LTV Other Details

2.1. **Attribution.**

- The purpose of attribution is to increase a company's ROI by understanding CAC at a deeper level, when acquisition cost is done for *performance* reasons.
  - **Performance** marketing is marketing expenses done with an eye toward ROI. E.g. each marginal dollar is spent only because it is expected to bring in more than $1 directly.
  - **Brand** marketing is usually considered the opposite. In this type of marketing the goal isn't necessarily to directly create revenue, but also to achieve other goals, such as brand awareness.[1]
- Returning to CAC. Consider the case where last month Meow-Meet spent $1MM on marketing along a few different channels and there were 250K new users.
- We can do the math and find that our average cost per user was equal to $\frac{1{,}000}{250} = \$4$
- Consider the case, however, when we can break this down further by channel:
  In this case we can see that the Cost Per Install ("CPI") associated with Facebook is much higher than the CPI associated with the other channels. Is this worth it? Is it ROI positive? We can only know this if we can associate the revenue, on a per-customer basis with each of those sources.
- From this we can see that the spending on FB was ROI negative while the rest of the sources were positive. Does this mean that we should shut down *all* spending on FB? Probably not. If we could parse this down further we might be able to identify specific campaigns within those sources which are ROI positive. For example:

[1] Is Brand marketing bad? Nope. There are a lot of goods (think cars and mattresses) which you don't expect the ad to do anything other than keep the brand name in front of a person's mind so that when they make a purchase they know what to do.

TABLE 2. By Source

Source	Installs (000's)	CPI ($)	Total Spent (000's)	Revenue Per User
Facebook	75	7	525	$6.5
Google	50	5.5	275	$6
Instagram	50	4	200	$4.25
Organic	75	0		$8
Total	250		1000	

TABLE 3. FB Spending by Campaign

Campaign	Installs (000's)	CPI ($)	Total Spent (000's)	Revenue Per User
US iPad	75	7	525	$6.5
US iPhone	50	5.5	275	$6
Italian iPad	50	4	200	$4.25
Brazilian iPhone	75	0		$8
Total	250		1000	

- The *Holy Grail* of performance marketing is perfect *attribution*: for each customer how do I quantify the factors that brought them into my application / generated a purchase.
- Specifically, to estimate CAC at a granular level we need to *link* the advertisement / channel / reason that the user came to us with that specific user.
- For example, consider showing two advertisements for our application Meow-meet. Both of which have the same image, but have different call-to-actions ("CTA": the text shown in the ad which tells people what to do)
  (1) "Cats are great, click here!"
  (2) "The app is free, click here!"
- The appeal of each CTA is different and, because of this, it is possible that one may attract users at a higher rate, or even attract higher ROI users!
- If we have exact information on what ads were shown to each user we can use this to optimize our ad campaigns and the advertisements themselves.
- **Why not perfect attribution?**
  - **Privacy:** Devices today protect users privacy by holding back identification information.
  - **Multiple Devices:** If users use multiple devices, even if we had perfect device information we would not be able to discern that the users were the same.
  - **Multi-touch experiences:** Most users experience advertisement multiple times. If a user experiences an advertisement multiple times, how do you break up the costs of those advertisements against the revenue the user generates?

  - **Mixing advertisements:** Even if attribution worked, most large campaigns also include non-attributable advertisements such as TV, podcasts and radio. How do you determine the effect of different types of advertisements on a user's decisions?
    * Historically, non-attributable mediums used phrases like *reach* and *eye balls* in order to evaluate the effectiveness of their campaigns.
    * There are some efforts to fix this, such as when the ad directs you to a specific page with the information in it (e.g. go to $http://www.casper.com/cbs$ or use a promotion code associated with the placement).

- Given this, data scientists (especially in the marketing space) tend to focus on whatever level they can in order to *control* and *evaluate*. In other words, we use easily attributable customer segments, such as those based on device or geographic region since those levels are easiest to identify.
- Even with proper attribution there are a number of *spillover effects* which make effect our attribution efforts:
  - **Organic Rate:** This is the rate that users install or use an application without direct marketing. This can be influenced by things like search engine optimization ("SEO") efforts which try to game search engines.
  - **Virality:** This is the likelihood that users act as marketing either by directly sharing or inviting other users. Social media tends to have high virality. The most common method of estimating an application virality is by using a **K-factor** which an be defined a number of different ways but is usually estimated as the rate of paid users to organic users.
- Organic Rates and Virality also tend to change based on how marketing is done (including the amount spent), so estimating them remains a constant problem.
- Moral: Attribution makes the already difficult problem of understanding the unit economics of a product that much harder.

2.2. **Other LTV systems.**

- There are a number of different ways that LTV can be estimated, here are a few of them:
  (1) **Discounted future cash flow:** We add a discount factor to each term to express the future risk. E.g. if we have a product which costs \$9.99 a month (say spotify) then we apply a discount rate, which is usually an estimate of the cost of capital / interest rate. This model is often used with subscription services which have very low churn rates. While customers aren't expected to last forever, the contribution from far periods is so low that it doesn't matter

for business decision making.

$$\begin{aligned} LTV &= 9.99 + \frac{9.99}{1.05} + \frac{9.99}{1.05^2} + \frac{9.99}{1.05^3} + \frac{9.99}{1.05^4} + ... \\ &= 9.99 \sum_{i=0}^{\infty} \frac{1}{1 + .05^i} \\ &= \frac{9.99}{1 - \frac{1}{1.05}} \\ &\approx 210 \end{aligned}$$

(2) **Finite Term Models:** In these models a finite horizon or term is assumed. In these models the calculation for Spotify would be something like the below. Assuming a 3-year horizon, this would be 36 terms:

$$\begin{aligned} LTV &= 9.99 * (\# \text{ of terms}) \\ &= 36 * 9.99 \\ &= 359.64 \end{aligned}$$

(3) **Payback Period:** A variant on the finite term models is, instead of estimating LTV by the revenue generated, it is estimated instead as the amount of time it will take to payback the CAC. So if the cost of acquiring a user for Spotify if \$75, then the payback period would be: $\frac{75}{9.99} = 7.5$months

(4) **Formula-based methods:** It's not uncommon to find formulas for LTV. Almost all of these formulas make some assumptions around retention and ongoing revenue.

3. Other Considerations

(1) Estimating the effect of product change on LTV
- How do you handle the information timing on effects which are not present on a users initial experience?
- Or those product features which are only experienced by a subset of users?
- Using but-for models.
- Novelty effects.

(2) Understanding COGS