



UNIT ECONOMICS IN PRACTICE

Martin Steinmann PhD

Unit economics became the key metrics for software as a service (SAAS) companies to not only measure performance, but to manage the team and process for growth. I got into Unit Economics while mentoring several SAAS startups at MassChallenge and at Boston University. Ever since, unit economics became my best tool to both assess and support a young company. Recently I got the opportunity to apply unit economics to a large and established company as a tool for cloud transformation. It was surprisingly difficult to get the point across. Many established managers still don't seem to get it.

No, you cannot manage a SAAS business using old P&L metrics and tools!

Applying unit economics in practice can be difficult without specific experience in what to look for, how to benchmark results, and a keen understanding of the sensitivity of its key parameters. The following is a **case study** of a fictitious SAAS company. I present this to students at Boston University as part of the Questrom School of Business entrepreneurship program.

Let's start with the setup. You are selling a B2B app direct to end-users using a subscription business model. Below is the current status of your business. You are at the beginning of your growth phase, post an initial seed round at a good valuation, you have a product and you want to deploy a significant amount of the capital raised to growth and to further test the market.

A word of clarification: CTR is the click through rate or the percentage of people who click on an ad they are served. CPC is the cost per click you pay to the ad channel, and CPM is the cost per one thousand impressions. Some ad channels charge by CPM, but most charge by CPC. Once you know your CTR and CPC you can easily calculate your CPM or vice versa.

Customer acquisition



A down the middle starting point in a channel such as paid search would be 1.9% for CTR, and a cost of \$2 (CPC). That translates to CPM of \$38. Individual campaigns will vary.

The report you're given by your VP Marketing on the state of your user acquisition and business process looks like this:

What we are really interested in is the **total cost of user acquisition**, including all marketing campaign cost and including all labor cost directly related to customer acquisition. You can calculate this by dividing your total marketing cost by the number of new subscribers acquired per month. CAC, customer acquisition cost, is one of the key metrics for unit economics, so let's have a look where we end up taking the current results of our campaigns as reported by our VPM above.

As we can see the cost to acquire a single customer is \$2,564 excluding labor cost. We likely have to double this number taking labor cost into account. With campaign cost alone and a subscription price of \$19.95 per month, it will take about 10 years to recover cost. Taking labor cost into account this could easily be 15 to 20 years.

Clearly, this is not a workable business model, even though the current campaign metrics as reported by our VPM are not completely off the charts.

With CPC and the conversion rate to downloads looking to be inside our preliminary benchmarks, let's focus on **retention** as the key parameter to improve. Below you can see the statistical average 90-day retention curves for the four top tiers in the Android app store. Stats for iOS apps look similar. As you can see with a day-30 retention rate of 3%, we are just below the curve for the top 5,000 apps. Remind you that there are over 1.5 million apps in Google Play.

If we could lift our day-30 retention percentage from 3% to 15%, we would be closer to a reasonable benchmark for an app that is still new and therefore still includes friction with UX improvements still to be done. Before we go back and look at a revised CAC calculation, let's consider day-3 and day-7



retention numbers. You can see that there is a very steep drop-off, followed by a flattening out of the curve.

What this means is that the lever for improvement is in the first day and up to about day 7. That is where your on-boarding happens, where the new users are asked to engage with the app, create a profile, put some personal data into it, invite a friend, or whatever else you ask them to do to improve your stickiness.

Once they started coming back, they will likely continue to do so. Even the very best apps in the app store were not able to significantly bend the slope of the curve upwards after day-7, in spite of the many emails or other notification spam they might send to their lost users.

Ok, so let's revise our campaign assumptions as follows:

Once we fixed day-30 retention, and with very modest improvements elsewhere, our CAC excluding labor is now at \$267, a **10x improvement**. Let's add \$240 for labor cost to arrive at a total **CAC of \$507**. Keep that number in mind as we will come back to it.

Making money

Making money is about your monetization and customer retention strategies. We already said that we sell subscriptions per user @ \$19.95 per month. So that is your monetization strategy or business model. Customer retention then is about how long a customer relationship will last, or how many months in average a customer pays the subscription price until they cancel. Retention is best expressed as the **monthly rate of churn**.

Long-term value (LTV), the 2nd key metrics for unit economics, is defined as the sum of all monthly revenue collected from a customer. Now we need a way to calculate LTV without having to wait for months or years until the customer actually cancels the service. We can do this easily with a little math.



*LTV is equal to the subscription price divided by the rate of churn. Assuming a monthly rate of churn of 3%, the resulting profitability metrics then are as follows: LTV comes out to be \$665, resulting in an average customer lifetime of 33 months. We are profitable on a per unit level as it only takes 25 months to recover CAC (remember CAC at \$507). A useful metric to calculate then is the **LTV to CAC ratio**, which in our case is 1.3. David Skok and the team at Matrix Partners then established an investor benchmark, a metric they look for when evaluating companies for venture investment. Investors look for LTV to be at least 3 times larger than CAC, which represents an excellent profitability metric. They also would like to see CAC recovered in under 12 months, which is a measure for capital efficiency.*

Our company does not yet meet this benchmark. We are off by a factor of about 2 on either metric. Keep in mind that we already improved CAC by about a factor of 10 and that an average lifetime of 33 months is almost 3 years.

The main takeaway from this is the simple fact that turning a SAAS business into a profitable machine is not easy.

The margins of error are quite small and without a strong obsession with improving these numbers, companies often never get there. Sometimes without even knowing or realizing this fact.

Capital requirements

Every subscription business requires an investment to get going. How much capital is required depends on the amount invested in CAC every month and how much money you make in recurring monthly revenue. Note that while you break-even for a single customer after 25 months, negative cumulative cash flow continues to accumulate. The qualitative graph below also illustrates why being careful with spend on CAC initially is the right thing to do.

Don't dig a bigger hole than necessary.

Below is the cumulative cash-flow month by month, assuming that CAC spend is constant @ \$25k per month. Cash-flow break-even is after 48 months, at the point where monthly recurring revenue



(MRR) equals CAC spend in that month. This is also the time of max. capital requirement as you reach the bottom of the hole.

Note that the increase in MRR is not linear (the green bars). If CAC is kept constant, then MRR will flatten out and reach a maximum. That maximum is calculated as $MRR(\max)$ is equal to new revenue per month divided by the monthly churn rate.

This means that for a growing SAAS business with profitable unit economics, the investment in CAC needs to be increased in order to keep MRR growing.

And finally a summary of the timeline of critical events. After 48 months the company is independent of investors as positive cash-flow is now generated. Additional investments serve the purpose of accelerating growth. Without an increase in CAC, the company starts to make a profit after 120 months, or 10 years. We can clearly see that the operating model for our company is not yet really working. We have a business, but it is **not attractive enough** for investors to come in and accelerate it.

So, therefore, the question for management to solve is to figure out which parameters they can tune to improve the business to the point where the company becomes investable. We are going to discuss this next.

Sensitivity analysis

Let's start with the current business status summarized below:

The core problem we are faced with is that we are either spending too much on CAC or we are not making enough revenue per customer (LTV). We are going to consider the following four factors that we can influence to affect either CAC or LTV in a positive direction.



Our goal is to come up with an action plan that we can implement operationally to make it happen.

The four factors are these:

1. Reduce churn rate
2. Cut the cost for campaigns
3. Increase the overall marketing spend
4. Increase the subscription price

Each of these measures requires a different action plan. But before we decide on a plan, we would like to understand which measure would have the biggest impact.

1. Reduce churn rate

Reducing churn is a very potent measure a team can take. At the same time it is a difficult undertaking that involves improving product - market fit and increase the overall value provided to users.

A churn rate of more than 3% typically makes it impossible to succeed.

Consider the following: A churn rate of 1% equates to a customer lifetime of 100 months. Churn rate of 2% reduces that to 50 months and a churn rate of 5% leaves us with only 20 months of customer lifetime.

Reducing churn from 3% down to 1.5% reduces capital requirements by \$100k from \$450k down to \$350k and it pulls in monthly cash-flow break-even from 48 months to 31 months.

2. Cut the cost of campaigns

Reductions in CAC have an immediate impact. Improving economics at the top of the funnel is comparably easy to do, requires experimentation, and lends itself to fairly simple A/B testing and analytics. Micro-targeting leveraging new capabilities of the different paid channels often allows for reductions in CAC as click-through rates go up or better suited customers are found.



Cutting campaign cost in half reduces capital requirements by over half to about \$200k and pulls in monthly cash-flow break-even by 2 years.

3. Increase the overall marketing spend

When things don't feel right it is tempting to conclude that an increase in marketing spend would make things better.

This is exactly the wrong direction to take.

When things are not working right, **marketing spend should be reduced** until unit economics perform better. A founder team can lose a lot of ownership in their company, and an investor can lose a lot of money if marketing spend is increased prematurely.

Doubling marketing spend doubles the capital requirement, but it does nothing to pull in monthly break-even date.

4. Increase the subscription price

Monetization strategies are often first considered much later in a company's life, even though it is one of the most powerful levers. Initial pricing is often based on gut feel, determined without quantitative analysis.

Increasing the monthly subscription price by \$10 has a very positive overall effect pulling in the monthly break-even date by over 2 years. Finding the customer's price tolerance is not easy, but warrants a concerted effort.

The most potent improvement can be realized by combining several of the factors discussed here.



For example, combining a reduction of churn with a reduction in CAC and an increase in price immediately leads to **economics irresistible to investors.**



Summary

Unit economics is the most powerful tool available to both CEOs and teams growing a SAAS company. Understanding unit economics is a requirement to succeed, and probably therefore it is also a requirement to successfully raise capital. Transitioning to Unit Economics can be a very potent tool for a large and established company to spur innovation. Shining light into the different corners of a large company operation can have amazing effects, especially if the team is encouraged to discover the data for themselves.

The analysis presented here is based on the work done by David Skok and the team at Matrix Partners on unit economics.