SaaS Metrics – Definitions

SaaS Metrics Guide to
SaaS Financial Performance
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Recurring Revenue

The amount of subscription revenue owed by a customer over a _fixed time period_, usually measured monthly (MRR), quarterly (QRR), or annually (ARR).

$$\text{recurring revenue} = RR = \frac{R}{\Delta t}$$

$$ARR = 4 \times QRR = 12 \times MRR$$

R = subscription revenue owed during time Δt

Δt = amount of elapsed time

Example

A two year subscription contract with a total contract value (TCV) of $24K

$$ARR = \$12K \text{ per year} = \frac{\$24K}{2 \text{ years}}$$

$$MRR = \$1,000 \text{ per month} = \frac{\$24K}{24 \text{ months}}$$

Recurring Revenue
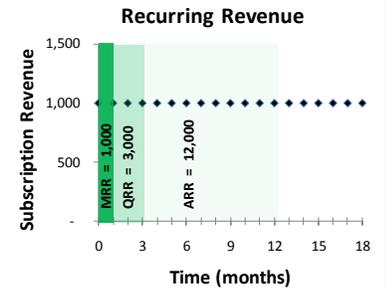
Churn Rate (aka attrition)

Percentage rate of customer cancellations over time, usually on an annual basis. Also, the _probability that a single customer will cancel_ during a specific time period.

$$\text{churn rate} = a = \frac{\Delta C_{cancel}}{C \times \Delta t}$$

C = # of customers

Δt = amount of elapsed time

ΔC_{cancel} = customers cancelling in time Δt

Example

Of 100 customers, 10 cancel in 6 months (0.5 yrs)

$$\text{monthly churn rate} = 1.67\% \text{ per month} = \frac{10}{100 \times 6}$$

$$\text{annual churn rate} = 20\% \text{ per year} = \frac{10}{100 \times 0.5}$$

Decline in Customers from Churn

 # Customers Remaining
- Starting with 100 customers
- 20 % cancel each year

Lifetime 5 years
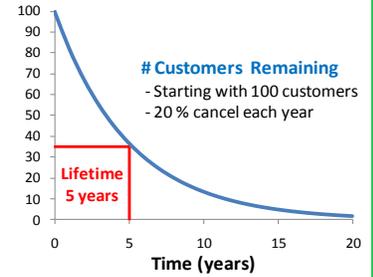
Average Recurring Revenue (aka avg. sale price)

The recurring revenue owed on AVERAGE per customer. Equal to the average sale price for the initial subscription, and then increases over time from upgrades and upsells.

$$\text{average recurring revenue per customer} = ARR = \frac{TRR}{C}$$

TRR = total recurring revenue; C = # of customers

(Beware: ARR is used for both *average* recurring revenue and *annual* recurring revenue; they are different concepts)

Example

Total Current Customers	2,000
Total Current RR	$20,000,000
ARR for Current Customers	$10,000
Average Upgrade Amount	$2,500
# New Customers	400
Total New ARR	$3,000,000
ARR for New Customers	$7,500

Cumulative Revenue with Churn

Cumulative Revenue
- ARR = $7500
- Churn Rate = 20%
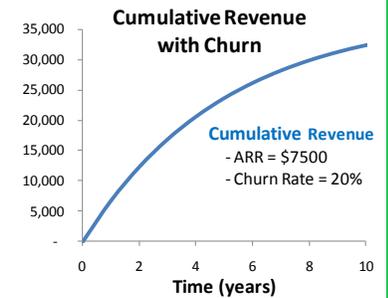
Customer Acquisition Cost (per customer)

The one-time cost of all marketing and sales activities plus all physical infrastructure and systems required to motivate a customer to purchase, including fully loaded labor costs, usually quoted as an average unit cost per _new_ customer.

$$CAC = \frac{\text{marketing \& sales expenses}}{\Delta C_{new}}$$

ΔC_{new} = new customers acquired from activities associated with marketing & sales expenses

Example

# New Customers	400
Total New ARR	$3,000,000
ARR per New Customer	$7,500
CAC per New Customer	$4,875
Marketing Staff	$600,000
Promotions/Website	$300,000
Sales Staff	$1,000,000
Sales Systems/T&E	$50,000
Total CAC	$1,950,000

Covering CAC with ARR

Cumulative ARR
- CAC = $4875
- ARR = $7500
- Churn Rate = 30%

CAC
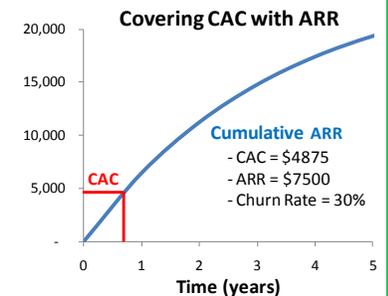
Average Cost of Service (per customer)

The recurring cost of all engineering, support, account management, customer service, and billing activities plus all physical infrastructure and systems required to maintain a current customer, including fully loaded labor costs, usually quoted as an average unit cost per _current_ customer.

$$ACS = \frac{\text{recurring service expenses}}{C}$$

C = all current customers maintained by the associated recurring service expenses

Example

# Current Customers	1,000
Total Current ARR	$10,000,000
ARR per Current Customer	$10,000
CAC per New Customer	$4,875
ACS per Current Customer	$3,200
Engineering & Support	$1,800,000
Account Management & Billing	$600,000
Hardware/Software	$800,000
Total Recurring Cost of Service	$3,200,000

ACS Reduction From Economies-of-Scale

ACS per customer
- Fixed Cost = $300,000
- Variable Cost = $3000
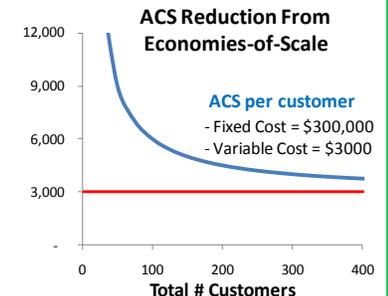
Customer Lifetime Value

The economic value of a customer over its lifetime. Can be built up for increasing accuracy by components as follows: 1. recurring revenue, 2. churn (a), 3. acquisition cost, 4. cost of service, 5. capital interest rate (i), and 6. viral growth (g).

$$CLTV_{simple} = \text{expected lifetime revenue} = \frac{ARR}{a}$$

("customer lifetime" is quoted as L=1/a so CLTV = ARR x L)

$$CLTV_{complete} = \text{NPV profit} = \frac{ARR - ACS - (i + a)\,CAC}{i + a - g}$$

Example

ARR	$10,000	churn	10%
ACS	$3,200	growth	20%
CAC	$4,875	interest	20%
CLTV (simple)		$100,000	
CLTV (complete)		$53,375	

("customer lifetime" L=1/10% per year = 10 years)

Dramatic Effect of Churn on CLTV

Customer Lifetime Value (simple)

ARR = $10,000
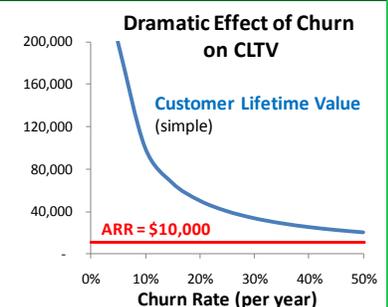
SaaS Metrics – Rules of Thumb

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Churn Kills SaaS Growth

Early on, total churn is small and the customer base grows unimpeded at the acquisition rate. As total customers increase, total churn increases. When the total churn (churn rate times customers) equals the acquisition rate, then the customers joining exactly equal customers leaving. Growth slows, and then stops.

Impact of Churn on SaaS Growth

- early growth acquisition rate x time
- maturity acquisition rate / % churn rate
- Churn wins if acquisition doesn't grow
  - acquisition rate = 100 customers/year
  - % churn rate = 20% per year
  - limit at maturity = 500 customers
  - transition timeframe = lifetime = 5 years

Number of Customers — Time (years)

— with churn — without churn — churn limit
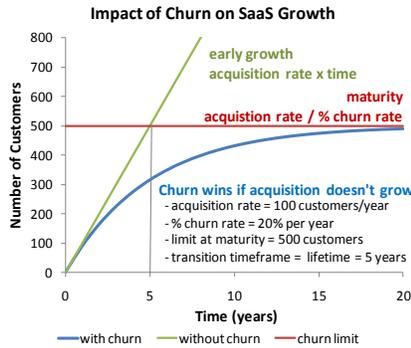
Customer Acquisition Growth Must Outpace Churn

As a SaaS company grows, total churn increases with the total number of customers. For company growth to continue, new customers must be added at a faster and faster pace, such that new customer acquisition grows faster than total churn.

Churn Relentlessly Chases the Customer Acquisition Rate

Increasing Customer Acquisition Rate
- 100 in year 1
- 2,000 in year 10

Increasing Total Churn
- 0 in year 1
- 1,500 in year 10
- 7,500 customers
- 20% churn rate

Number of Customers Joining and Leaving — Time (years)
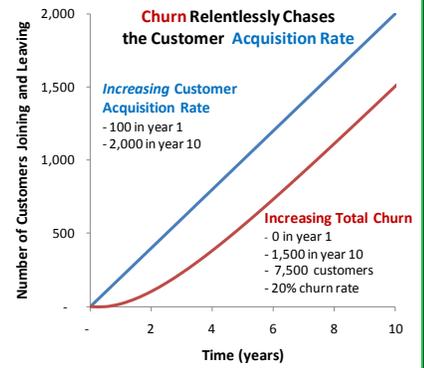
Viral Growth Trumps Churn

Because churn increases in direct proportion to the number of customers, the surest approach is to drive growth at a higher rate that also increases in proportion to the number of customers, i.e., virally.

Viral Customer Growth Trumps SaaS Churn

- viral growth growth = 40% churn = 20%
- baseline growth 100 new customers per year
- churn limit
- churn dominated growth churn = 20%

Number of Customers — Time (years)
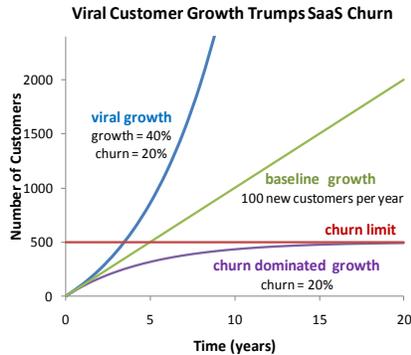
SaaS Company Profitability Follows Customer Break-Even

The accumulated recurring contribution of a SaaS company at any time mirrors the lifetime accumulation of the typical SaaS customer directly linking company time to profit with customer break-even time.

SaaS Company Profitability Follows SaaS Customer Break-Even

- company profitability
- customer break-even

Recurring Contribution / Acquisition Cost — Time (years)

Legend: CAC, cust 6, cust 5, cust 4, cust 3, cust 2, cust 1
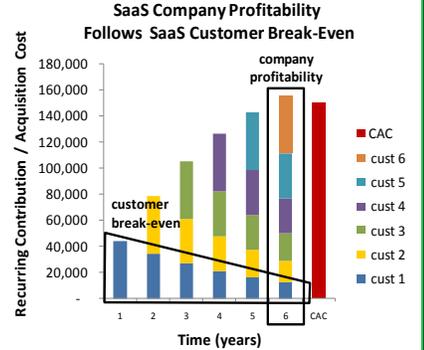
## Best Case Time-to-Profit is Simple Break-Even

The higher your churn, the longer it takes to reach profitability. The higher your growth rate, the longer it takes to reach profitability. For a growing SaaS company subject to churn, the best case time to profit is the average break-even time for a single customer.

Achieving SaaS Profitability with Churn

- acquisition rate = 100 customers/yr
- churn = 25% per year
- ARR 1000; ACS 500, CAC 1500
- break-even = 3.0 years
- time to profit = 5.5 years
- recurring contribution w/o churn
- total customer acquisition cost BE_0
- recurring contribution w/churn of 25%
- time to profit
- profitability not possible w/churn of 35%

Recurring Contribution / Acquisition Cost — Time (years)

Growth Creates Pressure to Reduce Total Cost of Service

Customer acquisition costs are paid with the recurring contribution of current customers. If a SaaS company grows rapidly acquisition costs increase rapidly. It must reduce acquisition costs or increase contribution in order to sustain profitable growth.

Elusive SaaS Profitability with Growth

- High total cost of service combined with high growth delay profitability ($gBE_0 > 1$)
- recurring contribution 20% growth
- time to profit
- increasing costs

Recurring Contribution / Acquisition Cost — Time (years)

— CAC w/gBE=0.5 — CAC w/gBE=0.8 — CAC w/gBE=1.1 — RC w/20% Growth
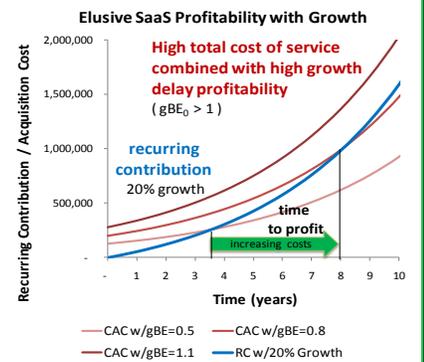
Churn Creates Pressure to Reduce Total Cost of Service

Customer acquisition costs are paid with the recurring contribution of current customers. If old customers cancel before they cover the cost of acquiring new ones, then it's necessary to reduce acquisition cost or increase contribution to be profitable.

Elusive SaaS Profitability with Churn Dominated Growth

- profitability impossible if total cost of service or churn is too high ($gBE, aBE > 1$)
- recurring contribution 20% growth 25% churn
- time to profit

Recurring Contribution / Acquisition Cost — Time (years)

— CAC w/gBE=0.5 aBE=0.63 — CAC w/gBE=0.8 aBE=1 — CAC w/gBE=1.1 aBE=1.38 — RC w/20% Growth 25% Churn
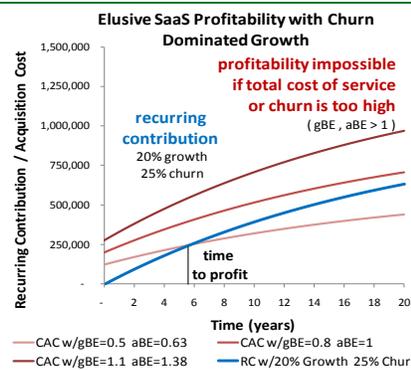
Upgrades and Upselling Accelerate SaaS Company Profitability

Upselling and upgrades leverage the initial investment of customer acquisition cost to accelerate SaaS time to profit by increasing contribution margin and offsetting the delays created by both growth and churn.

Upselling Accelerates SaaS Profitability

- upselling enables profitability and accelerates time to profit 20% growth 15% upsell
- recurring contribution 20% growth
- time to profit Upselling

Recurring Contribution / Acquisition Cost — Time (years)

— RC w/20% Growth 15% Upsell — RC w/20% Growth — CAC w/gBE=0.17 — CAC w/gBE=0.5
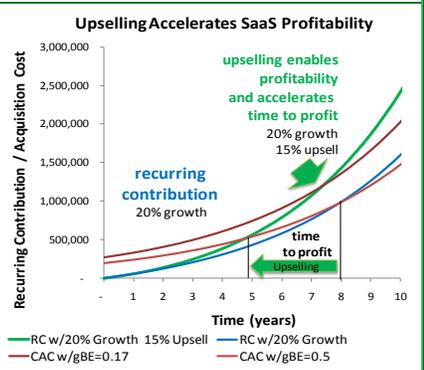
Joel's Magic Number for SaaS Companies

The *average customer rate of return* must exceed both the current customer churn rate and the new customer growth rate for a SaaS company to achieve profitability. Customer rate of return is powerful, because it measures the economic health of a SaaS business.

J	[ARR-ACS] ÷ CAC	SaaS customer rate of return
1/J	BE_0	best case time to profit
approaching	g ⇒ J a ⇒ J	dramatically delays time to profit
exceeding	g ≥ J or a ≥ J	SaaS company will never be profitable
increasing	⇑J by ⇑ARR or ⇓TCS	upsell & lower TCS accelerate profit
benchmark	J ≥ 50%	per year is generally very healthy

Customer Lifetime Value Drives Company Value

The link between SaaS CLTV and SaaS company valuation arises naturally from the SaaS subscription model where topline company revenue emerges as the sum of individual customer revenue streams.

SaaS Company NPV
=
CLTV x NEW_{LTV}

CLTV = average customer lifetime value

NEW_{LTV} is an analogous measure of the *lifetime value number of customers* equal to the discounted number of new customers acquired during the company's lifetime, using the standard NPV formula