

# Update Partners SaaS Metrics

A Closer Look at Churn

2099 Pennsylvania Ave NW, 8<sup>th</sup> Floor, Washington, DC 20006

[www.updatapartners.com](http://www.updatapartners.com)

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## About Updata Partners

*Updata Partners provides growth capital to software and software-enabled businesses. Led by an investment team averaging more than 25 years of technology experience, Updata invests in high-growth businesses where the combination of our capital and operating experience will help accelerate success. As former executives and entrepreneurs, Updata's General Partners collaborate with management teams to build companies that stand out in their markets. With more than \$750 million of committed capital since inception, we have provided growth equity funding to over 40 leading technology companies.*

## About the Authors

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### **Carter Griffin, General Partner**



Carter Griffin is a General Partner and co-manages the firm. Carter has more than twenty years experience as an operator and investor in the software industry. He co-founded Brivo Systems and served as Chairman and CEO until selling the company to a strategic acquirer. Brivo Systems pioneered the software-as-a-service model in the physical security market by introducing the first-ever on-demand system for facility access control. Carter also spent four years as a Senior Vice President at Kaiser Associates, where he advised Fortune 500 clients on competitive positioning and new-market entry strategies. Earlier in his career, Carter worked in London for the Coca-Cola Company and held positions at American Management Systems and Arthur Andersen.

Carter serves on the Board of Directors of Mindshare, a leading forum for over 700 tech CEOs. He also serves on the Board of Directors of the Mid-Atlantic Venture Association where he has twice served as Co-Chair of Capital Connection.

Carter is a graduate of the University of North Carolina at Chapel Hill and holds a M.B.A. from the J.L. Kellogg Graduate School of Management at Northwestern University. He lives in Chevy Chase, Maryland with his wife and daughter.

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### **Neil Hartz, Associate**



Neil Hartz joined Updata Partners in 2009. He supports the firm's business development, deal sourcing, and due diligence efforts.

Prior to joining Updata Partners, Neil worked as a Senior Analyst in the Technology Investment Banking Group at Montgomery & Co., where he provided strategic advisory services to growth-stage companies. While at Montgomery, Neil focused on transaction sourcing and execution in the software and technology-enabled services sectors, with a specific emphasis on software-as-a-service and recurring revenue businesses. His experience includes private placement and merger and acquisition transactions.

Neil holds an A.B. in Economics from Dartmouth College..

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In our April 2011 Cloud Computing whitepaper we describe Updata's framework for analyzing SaaS companies using seven key metrics. Given the central importance of churn to our framework we introduce this follow-up paper to explore several important considerations, including the value of cohorts, types of future revenue, and how to model retention and lifetime value. Most importantly, we conclude by showing how churn can completely undermine a seemingly healthy business that otherwise scores well on our key metrics framework.

### A Refresher on SaaS Metrics

Our SaaS metrics framework, published in April 2011, focuses on customer-level detail to evaluate the performance and scalability of a recurring revenue business. Particular emphasis is placed on GMPP and rCAC—how long it takes to pay back the investment in customer acquisition, and the ultimate return yielded by that investment. The seven key metrics are as follows:

tCAC	Total Customer Acquisition Cost – <i>the fully burdened unit investment required to sign up a new customer, including net one-time onboarding costs</i>
ARPU	Average Revenue Per User – <i>the average revenue per user (paying customer) on a monthly basis</i>
RGP	Recurring Gross Profit – <i>the gross profit generated each month</i>
<b>GMPP</b>	<b>Gross Margin Payback Period</b> – <i>the number of months required to break even on the cost of acquiring a customer</i>
eLT	Expected Lifetime – <i>the length of time a company expects to keep a paying customer</i>
LTV	Lifetime Value – <i>the economic value, net of costs, delivered over the life of a customer</i>
rCAC	<b>Return on Total Customer Acquisition Cost</b> – <i>the multiple of the acquisition cost provided by the lifetime gross margin</i>



**Figure 1: Key SaaS metrics framework example**

Acquisition Channel	CPC	Display	Print	Affiliate	Organic	Product 1 - Basic	Product 2 - Premium
Variable Marketing Spend + Commissions	\$3,300	\$3,000	\$2,400	\$1,500	\$0		
S&M Headcount + Overhead	\$675	\$750	\$300	\$150	\$150		
Onboarding	\$450	\$375	\$375	\$300	\$240		
<b>tCAC (per customer)</b>	<b>\$4,425</b>	<b>\$4,125</b>	<b>\$3,075</b>	<b>\$1,950</b>	<b>\$390</b>		
<b>ARPU (Monthly)</b>	<b>\$375</b>	<b>\$255</b>	<b>\$240</b>	<b>\$180</b>	<b>\$150</b>		
<b>Recurring COGS</b>							
Data Center	\$15	\$9	\$12	\$9	\$6		
Customer Support	\$45	\$48	\$51	\$42	\$33		
Merchant Fees	\$9	\$15	\$6	\$11	\$9		
<b>Total Recurring COGS</b>	<b>\$69</b>	<b>\$72</b>	<b>\$69</b>	<b>\$62</b>	<b>\$48</b>		
<b>Recurring Gross Profit (RGP)</b>	<b>\$306</b>	<b>\$183</b>	<b>\$171</b>	<b>\$118</b>	<b>\$102</b>		
<i>Recurring Gross Margin</i>	82%	72%	71%	66%	68%		
<b>Gross Margin Payback Period (GMPP)</b>	<b>14.5</b>	<b>22.6</b>	<b>18.0</b>	<b>16.5</b>	<b>3.8</b>		
Monthly Churn	2.5%	2.9%	3.1%	3.3%	4.5%		
Expected Lifetime (eLT - months)	40.0	35.0	32.0	30.0	22.0		
<b>Aggregate Gross Profit Contribution</b>	<b>\$12,240</b>	<b>\$6,395</b>	<b>\$5,472</b>	<b>\$3,546</b>	<b>\$2,244</b>		
<b>Lifetime Value (LTV)</b>	<b>\$7,815</b>	<b>\$2,270</b>	<b>\$2,397</b>	<b>\$1,596</b>	<b>\$1,854</b>		
<b>Return on tCAC (rCAC)</b>	<b>2.8x</b>	<b>1.6x</b>	<b>1.8x</b>	<b>1.8x</b>	<b>5.8x</b>		
Return on tCAC (rCAC)	4.3x	4.9x	3.1x	3.2x	15.0x		

## The Importance of Cohorts

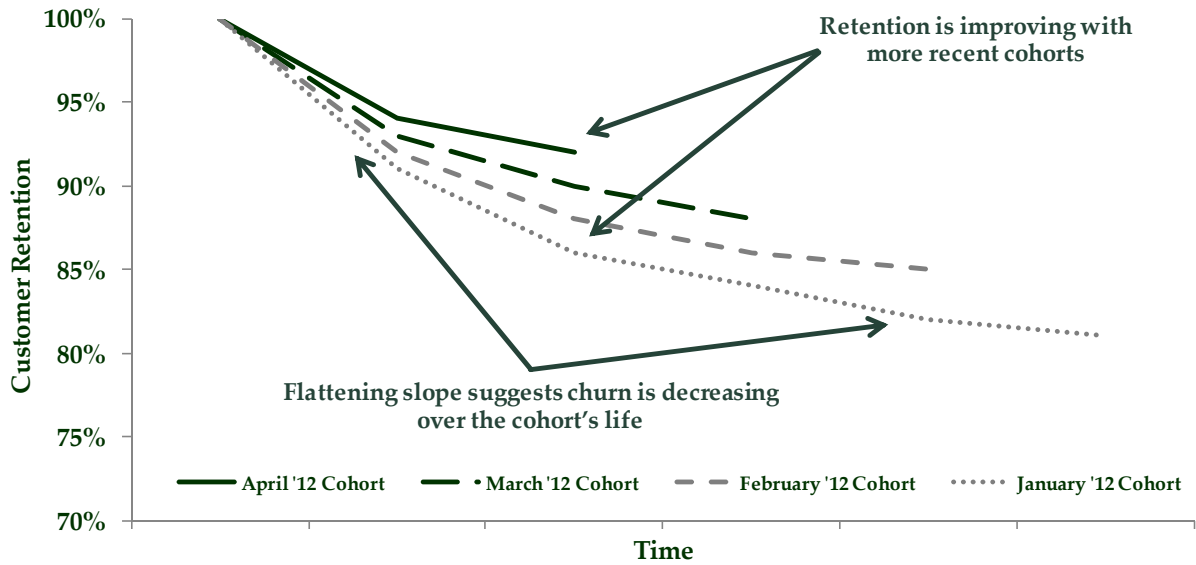
As proponents of component-level analysis we believe cohort analysis provides important perspective when examining churn. How customers behave over time is strongly driven by their unique experiences selecting and using a product. A few examples:

- Product            Do additional features/capabilities increase retention?
- Channel            Do certain acquisition channels bring in higher quality customers?
- ARPU                How price sensitive are users?

Segmenting customers by component and cohort enables tracking of customer behavior, and its reaction to changing variables, over time. For example, we may want to examine churn trends for customers using the “basic” product that were acquired through display advertising. To give us multiple data sets we would create cohorts segmented by the month of acquisition (aka vintage).



Figure 2: Visualizing churn across multiple cohorts of customers using the “basic” product acquired through the display channel



Comparative cohort analysis provides summary-level statistics that may help predict future behavior. For example, looking at the 12 most recent cohorts in a data set might reveal that, on average, 5% of customers churn in their first month, but only 2% churn per month by the sixth month.

### Churn Sucks

For the typical business, monthly churn is often a seemingly small number but one that can suck customers away at an alarming rate. As a result, managers often ignore the difference between, say, 2% and 4% churn per month. Let's look at the difference over time:

Figure 3: The effect of churn on long-term customer retention

Even with 2% monthly churn, more than half of your customers will be gone in three years...

...And at 4% churn more than 75% will be lost

	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%
Monthly Churn:	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%
Monthly Retention:	99.0%	98.0%	97.0%	96.0%	95.0%	94.0%	93.0%	92.0%	91.0%	90.0%
1 Year Retention:	88.6%	78.5%	69.4%	61.3%	54.0%	47.6%	41.9%	36.8%	32.2%	28.2%
3 Year Retention:	69.6%	48.3%	33.4%	23.0%	15.8%	10.8%	7.3%	5.0%	3.4%	2.3%
5 Year Retention:	54.7%	29.8%	16.1%	8.6%	4.6%	2.4%	1.3%	0.7%	0.3%	0.2%



## Customer Churn vs. Dollar Churn

There are two types of churn within a cohort: 1) *customer* or *account* churn that we've referenced previously, and 2) *dollar* churn, which looks at the actual recurring value of a cohort each period.

The holy grail of a high-performance SaaS business is one that has positive dollar churn where a cohort yields more revenue, not less, over time. The beauty of these rare "accretive" customer-base companies is that they can grow revenues without adding a single new customer. Next best is when growth within retained accounts offsets customer-count churn and the cohort pays a constant revenue sum over time. To be fair, most SaaS businesses lose contribution from a cohort over time—a natural phenomenon but one that places an increasing burden on sales as the existing account base grows larger.

While we're on the topic of sales and dollar churn, we would encourage all recurring revenue companies to take a close look at the tradeoff between farming and hunting. Cohort analysis often shows that investing in upsells provides a better return on sales and marketing resources when compared with efforts to acquire new customers.

## Contracts and the Three Forms of Future Revenue

Our discussion so far has looked at month-to-month churn trends, ignoring the fact that customers may have signed a multi-period contract for 12, 24, or 36 months. While long-term contracts are valuable, they can sometimes mask customer satisfaction issues and delay the financial impact of the churn event. Instead of losing 4% of customers a month, a business might experience no churn within a cohort but then see half of the customers leave at an annual renewal date. Don't get us wrong, long-term customer contracts are more valuable than month-to-month arrangements, but contracts add friction to the selling process and contracts can be broken. Our advice is to focus on providing a great service that naturally encourages low churn rather than spending energy binding customers via a legal document.

SaaS businesses generally recognize revenue under GAAP as the services are delivered. But, as we think about contracts and periodic billing, a closer look shows that SaaS models often have three forms of future revenue:

1. **Contracted, on-balance sheet revenue (i.e., deferred revenue):** contracts in which the customer has paid up front for service delivery in future periods (aka "our favorite liability")



2. **Contracted, off-balance sheet revenue:** contracted revenue not yet billed to the customer; typically revenue beyond the first 12 months of a contract that has not been prepaid
3. **Expected revenue:** churn-adjusted expected future revenue streams from current customers factoring in contract renewal expectations.

An analysis of customer contracts (#1 and #2 above) offers some visibility into future revenue—and greater comfort to accountants! We would argue, however, that an expected revenue analysis (#3 above) is the only way to fully capture the true value of a SaaS customer base.

### Calculating Churn and Expected Lifetime

In our April 2011 paper, we used  $1/\text{churn}$  as a shortcut to determine expected lifetime. This shortcut provides directionally accurate, albeit slightly optimistic, guidance. The key is to develop a repeatable internal process for translating customer behavior into eLT so that data can be reliably benchmarked.

A more precise method for calculating lifetime value is to model an individual cohort over time. Eventually, a cohort will cease generating revenue (or a terminal lifetime is imposed for the cohort). Summing up the lifetime cohort revenue and dividing by the number of initial customers yields the average lifetime revenue generated by a customer. Dividing by ARPU provides expected lifetime.

Figure 4: Determining expected lifetime

Monthly Churn:	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%
Initial Customers:	1,000	1,000	1,000	1,000	1,000	1,000
ARPU:	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10
Month 1 Revenue:	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Month 2 Revenue:	\$ 9,800	\$ 9,700	\$ 9,600	\$ 9,500	\$ 9,400	\$ 9,300
Month 3 Revenue:	\$ 9,600	\$ 9,400	\$ 9,210	\$ 9,020	\$ 8,830	\$ 8,640
Month 4 Revenue:	\$ 9,410	\$ 9,120	\$ 8,840	\$ 8,570	\$ 8,300	\$ 8,040
Month 5 Revenue:	\$ 9,220	\$ 8,850	\$ 8,490	\$ 8,140	\$ 7,800	\$ 7,480
...						
Month 60 Revenue:	\$ 3,030	\$ 1,650	\$ 890	\$ 480	\$ 250	\$ 130
Total Cohort Revenue:	\$350,930	\$279,420	\$228,090	\$190,490	\$162,300	\$140,720
Avg. Customer Value:	\$ 351	\$ 279	\$ 228	\$ 190	\$ 162	\$ 141
Expected Lifetime:	35	28	23	19	16	14
1/Churn eLT:	50	33	25	20	17	14

Waterfall out monthly revenue from the declining customer base to determine total lifetime cohort value (max 5 years)



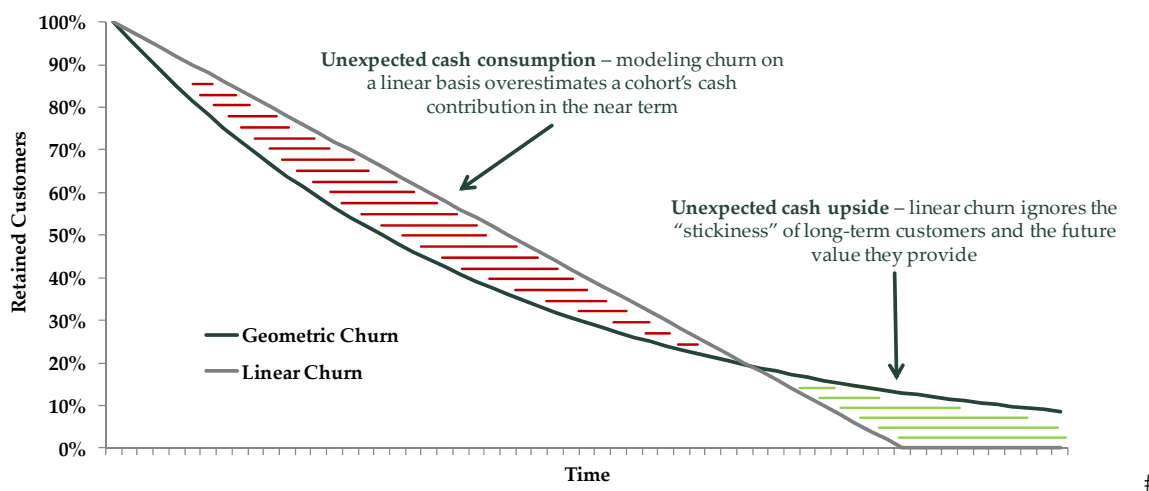
1/Churn eLT shortcut can serve as an (optimistic) approximation to this expected lifetime calculation



## Churn Is Not Linear

Churn is often seen as a linear function while in reality customer retention often looks more like a geometric curve with absolute customer losses decelerating over time. The difference might sound theoretical but the implications for cash flows of a cohort are quite real and are perhaps best explained visually:

**Figure 5: Visualizing the difference between linear and geometric churn and resulting effects on a cohort's cash inflows**



For simplicity, we have assumed that geometric churn occurs at a stable rate in this paper. In other words, the *percentage* decrease month-to-month is held constant. In mathematic terms:  $customers\ remaining\ at\ period\ n = initial\ customer\ count * (1 - churn\ rate)^n$  periods.

In reality, churn rates usually vary with time. Immediately after customers first sign up, canceling service is fairly easy—the software is not yet mission critical or has not been deployed broadly within the organization. However, over time, the solution might become central to key workflows or might warehouse a great deal of the customer's data and therefore yield a very high switching cost. Consequently, the geometric churn rate may be 10% or more at the outset, but fall to 1% or less per month over time. The resulting impact further exaggerates the cash flow effects depicted above. For our purposes, we simplify this by using our cohort retention charts and expected lifetime calculations (figures 2 and 4) to determine a geometric churn curve of best fit.

## Churn – The SaaS Killer

Our favorite metaphor for a recurring revenue business is the “leaky bucket.” Customers are constantly falling out the bottom of the bucket and we need to continue filling the top with new ones. As long as the inflows exceed the outflows, the business is healthy.

New customers acquired in a period are “gross adds,” and when netted against the number of customers churned (lost) in that same period, we arrive at “net adds.” Gross



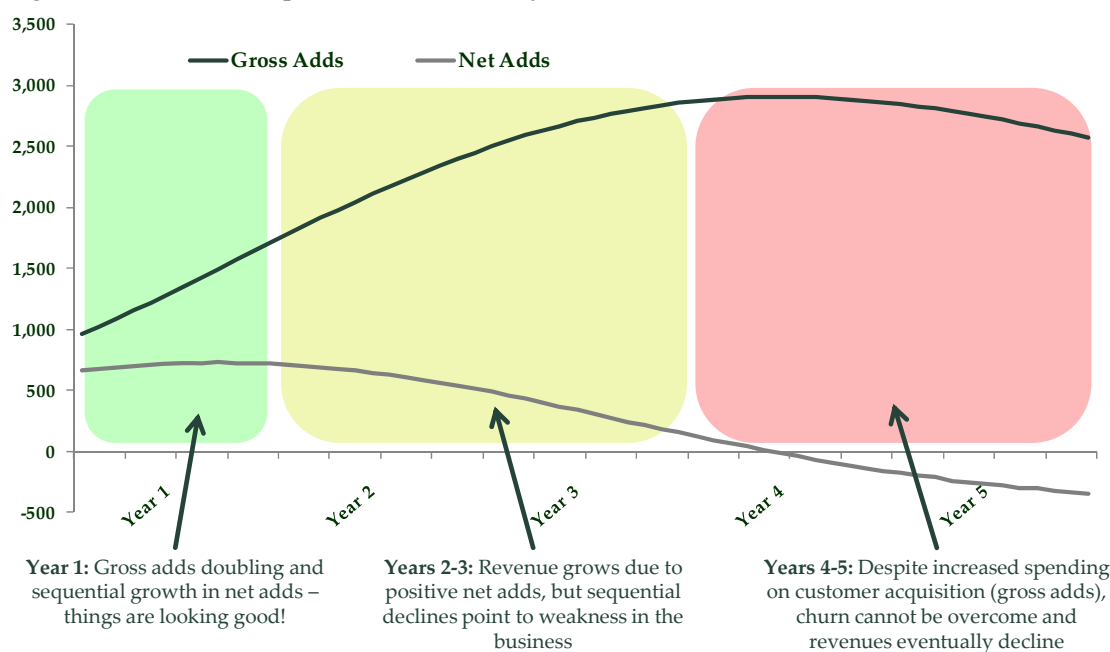


adds focus on customers acquired in a given period, while net adds factor in churn across *the entire customer base*. This highlights the importance of a loyal customer base. A growing SaaS business will see a positive net adds number, while a thriving SaaS business will see net adds growing sequentially month-to-month.

But what happens when the leaky bucket syndrome takes over? Let's take a look at Acme Software. This business charges customers \$40 a month (ARPU) and has a 75% gross margin (\$30 RGP). The company has an average customer acquisition cost (tCAC) of \$250. Historically, monthly churn has averaged 3% (eLT of 33 months). Looking through the lens of our SaaS framework, we see a business with an eight-month gross margin payback period (GMPP) and a 4x return on customer acquisition cost (rCAC). Taken on their own, these are great stats.

Acme currently has 10,000 customers with run-rate revenue of just under \$5 million. Given the unit economics, the company is investing in growth and allocates 60% of its revenue toward customer acquisition. Let's take a look at the company's performance over the next several years:

**Figure 6: Acme Software performance over five years**



After one year, the company has posted excellent growth. Run-rate revenue is now nearly \$9 million, an annual growth rate over 85%. Monthly gross adds have nearly doubled and, more importantly, net adds have improved. Acme seems to have the makings of a great business.

But in years two and three it becomes clear that Acme will not be following an exponential growth trajectory. Despite the continued investment in customer acquisition—which was responsible for more than 25,000 new customers—the total customer base is only 7,500



stronger than it was 12 months ago. Heading into year four the business finally tips over as net adds become negative, and, despite reinvesting 60% of revenue back into customer acquisition, the overall customer base starts to decline.

It's hard to imagine that churn can be such a destructive force, especially on a business with otherwise great numbers. In reality the decline can often be postponed, or even prevented, through improvements such as product enhancements, new pricing models, and revamped sales and distribution efforts. Going back to our original whitepaper we believe a thorough component level analysis of the unit economics can yield insights to create a thriving, profitable SaaS business.

In the case of Acme Software, this outcome might not have been a foregone conclusion. Steps could have been taken on both the customer acquisition side (increasing quality and quantity of gross adds) and the retention side (minimizing churn's impact on net adds) to forestall the weakness that became apparent as early as year two. Using our SaaS framework, Acme might have realized that certain acquisition channels performed better than others, with both a lower tCAC and a greater eLT, and shifting spend to these channels might have increased gross adds while simultaneously reducing the amount of customers lost each period. Furthermore, Acme might have adopted a strategy of upselling customers, either by creating campaigns to expand its footprint within accounts, or by releasing additional modules to increase the ARPU for existing subscribers. In any event, there are always levers available to a business like Acme to drive efficiency and forestall the worst effects of the leaky bucket syndrome.

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At Udata Partners we work exclusively with technology companies and have written from that perspective. The elements described in both our whitepapers, however, are broadly applicable to any annuity or recurring revenue business, whether a telecommunications provider, financial services company, or an alarm monitoring company. In fact, these industries predated SaaS and we would recommend that our readers take the opportunity to study these models to see how they have optimized their unit economics and minimized churn to build large subscription businesses.

Churn is a fact of life for SaaS companies. We hope this paper offers some strategies to better analyze and, ultimately, to defeat churn. We look forward to hearing your thoughts and feedback.